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David Sharp, ed

# FAUNA HAWAIIENSIS

or — the

Zoology of the Sandwich (Hawaiian) Isles,  
BEING THE LAND-FAUNA OF THE  
HAWAIIAN ISLANDS

## VOLUME II

H. S. Barber,  
National Museum,  
Washington, D. C.

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## CONTENTS OF VOLUME II.

	PAGE
ORTHOPTERA BY R. C. L. PERKINS (Plates I and II) . . . . .	I
NEUROPTERA BY R. C. L. PERKINS (Plates III—V) . . . . .	31
COLEOPTERA PHYTOPHAGA BY D. SHARP (Plate VI) . . . . .	91
COLEOPTERA RHYNCHOPHORA (p. 117), PROTERHINIDAE (p. 183), HETEROMERA (p. 246), CICADIDAE (p. 253) BY R. C. L. PERKINS (Plates VII—X) . . . . .	117 ETC.
MOLLUSCA BY E. R. SYKES (Plates XI and XII) . . . . .	271
EARTHWORMS BY F. E. BEDDARD . . . . .	413
ENTOZOA BY A. E. SHIPLEY (Plates XIII and XIV) . . . . .	427
ARACHNIDA (EXCEPT ACARI) BY E. SIMON (Plates XV—XIX) . . . . .	443
CRUSTACEA ISOPODA BY A. DOLLFUS (Plate XX) . . . . .	521
CRUSTACEA AMPHIPODA BY T. R. R. STEBBING (Plate XXI) . . . . .	527
HEMIPTERA (SUPPLEMENT) BY G. W. KIRKALDY . . . . .	531
HYMENOPTERA (SUPPLEMENT) BY R. C. L. PERKINS . . . . .	600
ORTHOPTERA (SUPPLEMENT) BY R. C. L. PERKINS . . . . .	687
NEUROPTERA (SUPPLEMENT) BY R. C. L. PERKINS . . . . .	691
DIPTERA (SUPPLEMENT) BY R. C. L. PERKINS . . . . .	697
TWENTY-ONE PLATES AS MENTIONED ABOVE	



NOV 29 1921  
H. S. Barber,  
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Washington, D. C.

# FAUNA HAWAIIENSIS

VOL. II. PART I.

*ORTHOPTERA*

R. C. L. PERKINS.

*Price Eight Shillings.  
To Subscribers Four Shillings.*



The Fauna Hawaiiensis is being published in parts at irregular intervals, and will it is hoped be completed in about two years.

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Contributions have been made or promised by the following, viz.

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It is also intended to give a list of the Vertebrates, with their distribution, in the Islands.

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N.B. The parts of Volumes I. and II. are being published concurrently in order to expedite the completion of the work.

The price of each part will vary according to its extent and the number of Plates. Subscribers to the whole work will be charged half-price for each part. The parts will be sent, as published, to each subscriber who has paid for the preceding part.

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# FAUNA HAWAIIENSIS

OR THE

## ZOOLOGY OF THE SANDWICH (HAWAIIAN) ISLES :

Being Results of the Explorations instituted by the Joint Committee  
appointed by

THE ROYAL SOCIETY OF LONDON FOR PROMOTING NATURAL KNOWLEDGE

AND THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

And carried on with the assistance of those Bodies and of the Trustees of

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EDITED BY

DAVID SHARP, M.B., M.A., F.R.S.

SECRETARY OF THE COMMITTEE.

VOLUME II. PART I.

*ORTHOPTERA*

By R. C. L. PERKINS, B.A.

*Pages 1—30; Plate I coloured and Plate II uncoloured.*

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## ORTHOPTERA

By R. C. L. PERKINS, B.A.



## ORTHOPTERA.

H. S. Barber,  
U. S. National Museum,  
Washington, D. C.

By R. C. L. Perkins.

### § 1. General considerations on the Orthoptera.

THE Hawaiian Orthoptera, although not very numerous in species, are nevertheless an interesting and important group. In all seventy-three species are at present known, but of these a large proportion have no place in the indigenous fauna. Of the seven great divisions of the Order, the Phasmodea alone are altogether unrepresented. The Mantodea and Acridiodea have each a single species, both of which are known from elsewhere, and have certainly been imported by man.

The Dermaptera and Blattodea are more numerously represented, and together form a considerable portion of the whole fauna, but nearly all the species are well-known insects outside the islands, and the importation of many of them has been rendered easy by their domestic habits. In the Dermaptera there are 4 genera represented, and 7 species, none of which are endemic; but they are nevertheless of some interest from the fact that some of them are in all probability natural immigrants. Thus *Anisolabis pacifica* has been found only on one of the islands, and there only at a considerable elevation above the sea in the mountain forests, where it is well established. Some of the species too exhibit very considerable variation, when a series of examples is examined, but whether these species are similarly variable in other countries I do not know, as the material necessary for such a comparison has not been available.

The Blattodea are a heterogeneous collection of 15 species, four of which belong to the genus *Phyllodromia*, the remaining eleven representing, each one, a different genus. Three species are not at present identified from any locality outside the islands, but in spite of this, two of them (*Phyllodromia hospes* and *Loboptera extranea*) will certainly prove to be recent importations, both being found in company with the foreign forms in the neighbourhood of houses, and in localities, where no native fauna now exists. The third species (*Phyllodromia obtusata*), on the other hand, is no doubt truly indigenous, frequenting the mountain forests, where it is found amongst the leaves of native plants, and beneath the bark of the larger trees. This species is notably variable, and on some of the islands the variation is in a definite direction, so that it would

appear to be in the process of becoming differentiated into other distinct species. All the other species are well-known foreign forms, and in the islands they are generally found in the neighbourhood of settlements, and often within the houses themselves, although some have now spread widely over the lowlands and the lower slopes of the mountains.

Thus of the 24 species representing the four primary divisions of the Order thus far considered, one only has any claim to be considered indigenous, the rest, with the exception of two or three species, which may possibly be natural immigrants, having certainly been imported by man.

In striking contrast with these are the remaining two divisions of the Order, viz. the Locustodea and Gryllodea.

The Locustodea are represented by 13 species distributed in 4 genera. Two of these genera, each with a single species, are foreign, and both are certainly recent importations. The *Elimaea* has now spread throughout the group, over the lowlands, but the *Xiphidium* so far has been found only in Honolulu and the immediate neighbourhood, and its introduction is probably of very recent date. The other two genera, one with a single species, the other with ten, are peculiar to the islands, and they are evidently allied to one another, and the more highly peculiar *Brachymetopa* with its 10 species may well have developed from some such form as the genus *Conocephaloides*.

The Gryllodea are of great interest, and are the most important and extensive section of the Hawaiian Orthoptera. Ten genera are known, and these include 36 species. Four of the latter may be at once set aside, as being of foreign origin, and each of these four represents a different genus. The three species *Gryllus innotabilis*, *Grylloides poeyi*, and *Gryllotalpa africana* are all well-known elsewhere, and a *Myrmecophila*, although now described as new, is certainly a recent importation, since it lives only in the nests of foreign ants, and has been found only in the city of Honolulu. The remaining 32 species are all peculiar to the islands, and are equally distributed between two divisions of the Gryllodea. The 16 species of the Trigonidiides are all referable to the genus *Paratrigonidium*, and no doubt others of this genus yet remain to be discovered on some of the islands. Elsewhere the genus is known from Asia. The other 16 indigenous species of Gryllodea are distributed in 5 allied genera, which are themselves also peculiar to the islands, and are so highly remarkable as to warrant the formation of a separate group for their reception. Three of the genera are represented by only a single species, but there is hope that others may yet be discovered, since neither genus has yet been found on more than one of the several islands. Of the other two genera, *Prognathogryllus* contains five, and *Leptogryllus* 8 species; the former has occurred on Kauai and Oahu only, while the latter is widely distributed, Kauai and Hawaii, at either end of the chain of forest-bearing islands, each having more than one species.

The contrast between the indigenous portion of the Hawaiian Orthoptera and the foreign (whether introduced or naturally immigrant) is most strongly marked.

Thus the 29 foreign species are scattered through all the six great divisions of the Order represented in the islands, while the endemic, to the number of 44, are limited to three of these divisions. Moreover, the foreign species represent no less than 24 genera, with an average of little more than one species to a genus, whereas the indigenous represent but 9 genera, with an average of nearly five species to the genus.

Confining our attention to the indigenous portion of the fauna, the number of species which fail to extend their range beyond a single island is quite remarkable, more so, I believe, than is the case with any of the other Orders of insects.

The *Phyllodromia* is found throughout the whole group, but, as has been remarked, on certain of the islands the examples vary in a definite direction, as if tending to form distinct species.

In the Locustodea the unique *Conocephaloides* has been found only on Hawaii, and of the 10 species of *Brachymetopa* not one is common to any two of the islands.

Of the Trigonidiides two species of *Paratrigonidium* (*P. varians* and *P. pacificum*) are widely, the latter indeed universally, distributed over the 6 larger islands, but it should be noted that both these species exhibit local variation, and owing to the great difficulty of differentiating the species of this genus, it is possible that more than one is included under each of these names. So far as is known each of the remaining 14 species limits its range to one or other of the islands.

In the Prognathogryllides the genus *Leptogryllus* alone has species with a range extending over more than one of the islands, *L. nigrolineatus* having occurred on Oahu and Maui, and *L. forficularis* on Maui and Hawaii.

Thus of the 44 endemic species five only have been found to inhabit more than one of the islands, but the foreign species, excepting a few, which have certainly been only very recently imported, are mostly of general distribution over the group.

There are now added 44 species (35 being truly indigenous) to the list of Orthoptera, published by Herr Brunner in his paper in the Proceedings of the Zoological Society for 1895, wherein 29 species (9 only being indigenous) were enumerated. We are very much indebted to Herr Brunner for help in the identification of some foreign species discovered since 1895, as well as for the great assistance we have derived from the paper alluded to.

It may be noticed that a large Phasmid *Anchiale confusa* Sharp (*Cyphocrania maculata* West.), brought home by the Beechey expedition, is said to have been taken in the Sandwich Islands, as also are several other large and conspicuous Orthoptera of other families. Certainly none of these have any place in the fauna of these islands, although they may have been taken in those other islands in the Pacific known under the name of Sandwich.

## § 2. Systematic account of the Orthoptera.

## DERMAPTERA.

## ANISOLABIS Fieb.

(1) *Anisolabis littorea* White.

*Anisolabis littorea*, Brunner P. Zool. Soc. London, Dec. 1895, p. 892.

HAB. Oahu and Maui (Blackburn). I have never met with this species.

(2) *Anisolabis maritima* Bon.

*Anisolabis maritima*, Brunner l.c.

HAB. Common all over the group, in the mountains.

(3) *Anisolabis pacifica* Erichs.

*Anisolabis pacifica*, Brunner l.c.

HAB. In the mountains of Kauai; not found elsewhere.

(4) *Anisolabis annulipes* Luc.

*Anisolabis annulipes*, Brunner l.c.

HAB. Generally abundant, both on the plains and in the mountains.

## LABIA Leach.

(1) *Labia pygidiata* Dubr.

*Labia pygidiata*, Brunner l.c.

HAB. Widely distributed; found under bark of trees in the mountains.

## CHELISOCHES Scudder.

(1) *Chelisoches morio* Fab.

*Chelisoches morio*, Brunner l.c.

HAB. Taken on nearly all the islands, usually between the leaves of *Freyinetia*, or *Dracaena*.

ORTHOPTERA

5

SPHINGOLABIS Borm.

(1) *Sphingolabis hawaiiensis* Borm.

*Forficula hawaiiensis*, Brunner l.c.

HAB. Common generally throughout the islands.

BLATTODEA.

PHYLLODROMIA Serv.

(1) *Phyllodromia germanica* L.

*Phyllodromia germanica*, Brunner Nouv. Syst. Blatt. p. 90.

HAB. In houses.

(2) *Phyllodromia hieroglyphica* Brunn.

*Phyllodromia hieroglyphica*, Brunner P.Z.S. Dec. 1895, p. 892.

HAB. Found on several of the islands.

(3) *Phyllodromia hospes*, sp. nov.

Tota testacea. Frons inter oculos nonnunquam plus minusve obscurata vel rufescens. Pronotum paullo latius quam longius, antice angustatum, margine postico rotundato. Tegmina testacea, venis testaceis. Alae hyalinae (antice testaceae), venis pallidis. Vena ulnaris 4-ramosa. Abdomen unicolor, testaceum. Lamina supra-analis ♂ apice obtuso, late levissimeque emarginato; lamina subgenitalis ampla. ♂.

Long. corporis, 13 mm.; Long. pronoti, 3 mm.; Lat. pronoti, 4 mm.; Long. tegminum, 11 mm.

The normal number of branches of the *vena ulnaris* appears to be 4, but some examples have only 3, and others 5. The left and right wings sometimes differ in the number of branches. The lamina supra-analis is sometimes hardly more than truncate at the apex.

HAB. Kauai, and Honolulu. Found in houses, and under stones on the plains, and is no doubt an imported species. Herr Brunner has informed us that it is allied to *P. conspersa* Br.

(4) *Phyllodromia obtusata* Brunn.

*Phyllodromia obtusata*, Brunner P.Z.S. Dec. 1895, p. 892.

HAB. Found throughout the group in the mountain forests. The species varies greatly; examples from Molokai are remarkable for their small size, those from Kauai are the largest, examples from Hawaii being on the average intermediate.

## LOBOPTERA Brunn.

(1) *Loboptera extranea*, sp. nov.

Nigrescens vel castanea. Frons inter oculos pallide signata. Antennae pallidae, plus minusve fusciscentes. Pronotum subtransversum, margine antico lateribusque flavo-marginatis. Tegmina lobiformia, marginibus internis contiguis, lateribus flavo-marginatis. Abdomen utrinque flavo-marginatum. Coxae pallidae, nigro-notatae; femora omnia (cum tibiis) pallida, nigro- vel fusco-notata, postica spinis compluribus bilineatim subtus armata. Cerci ad basim nigricantes, apicibus pallidis. Lamina supranalis (♂♀) transversa, triangularis, parum producta; lamina subgenitalis ♀ ampla, medio margine apicali saepe levissime exciso. ♂♀. Long. 8.5—9.5 mm. Tegmen 2.5 mm.

HAB. Maui, on the coast. Hilo, Hawaii (Bro. Matthias Newell). Probably on all the islands, generally living in company with the young of *Periplaneta australasiae*. In the development of the tegmina the sexes are quite alike. The wings are represented by pale lobes at the sides of the metanotum, the inner margins being marked by a deep suture, but not free.

## STYLOPYGA Fisch.

(1) *Stylopyga decorata* Brunn.

*Stylopyga decorata*, Brunner P.Z.S. 1895, p. 893.

HAB. Honolulu (Blackburn).

## METHANA Stål.

(1) *Methana ligata* Brunn.

*Methana ligata*, Brunner l.c.

HAB. Honolulu (Blackburn).

## POLYZOSTERIA Burm.

(1) *Polyzosteria soror* Brunn.

*Polyzosteria soror*, Brunner Nouv. Syst. Blatt. p. 219.

HAB. Common, in company with *P. australasiae*.

## PERIPLANETA Burm.

(1) *Periplaneta americana* L.

*Periplaneta americana*, Brunner P.Z.S. 1895, p. 893.

HAB. Abundant throughout the islands.

(2) *Periplaneta australasiae* Fab.*Periplaneta australasiae*, Brunner Nouv. Syst. Blatt. p. 233.

HAB. Abundant throughout the islands.

## ELEUTHERODA Brunn.

(1) *Eleutheroda dytiscoides* Serv.*Eleutheroda dytiscoides*, Brunner P.Z.S. 1895, p. 893.

HAB. A common and injurious species; very abundant in Honolulu, and elsewhere.

## LEUCOPHAEA Brunn.

(1) *Leucophaea surinamensis* Fab.*Leucophaea surinamensis*, Brunner l.c.

HAB. Oahu, Kauai, Maui; and probably on all the islands.

## NAUPHOETA Burm.

(1) *Nauphoeta bivittata* Burm.*Nauphoeta bivittata*, Brunner Nouv. Syst. Blatt. p. 287.

HAB. Two examples taken under bark of trees in Honolulu.

## ONISCOSOMA Brunn.

(1) *Oniscosoma pallida* Brunn.*Oniscosoma pallida*, Brunner P.Z.S. 1895, p. 893.

HAB. Haleakala, Maui (650 m.). Blackburn.

## EUTHYRRHAPHA Burm.

(1) *Euthyrrhapha pacifica* Coqueb.*Euthyrrhapha pacifica*, Brunner l.c.

HAB. Taken on several islands, and probably to be found on all.

## MANTODEA.

## ORTHODERA Burm.

(1) *Orthodera prasina* Burm.

HAB. Kauai; introduced with fruit trees.

## ACRIDIODEA.

## OXYA Serv.

(1) *Oxya velox* Fab.

*Oxya velox*, Brunner P.Z.S. Dec. 1895, p. 893.

HAB. Abundant on Kauai and Oahu, but had not spread to the other islands in 1897.

## LOCUSTODEA.

## ELIMAEA Stål.

(1) *Elimaea appendiculata* Brunn.

*Elimaea appendiculata*, Brunner l.c.

HAB. Very abundant throughout the islands, on the plains and lower slopes of the mountains.

## BRACHYMETOPA Redt.

The ten species, which represent this genus, are closely allied to one another, and for the most part very similar in general appearance. The genus, though peculiar to these islands, is allied to the widely distributed *Conocephalus*, but still more closely to the Hawaiian genus *Conocephaloides*, described hereafter. The latter indeed, with the general appearance of a *Conocephalus*, combines the characters of that genus with some of those which distinguish *Brachymetopa* from it. All the species of *Brachymetopa* have the tegmina and wings in a more or less rudimentary condition, and they are useless for purposes of flight in either sex, but serve as stridulating organs in the ♂. In *B. deplanata* ♂ the tegmina are extremely short, being only as long as the pronotum, but in some others they extend to the apex of the abdomen, while in others again they are intermediate in length between these extremes.

Several, and perhaps most, of the species have two distinct forms, a green and a darker (or at least not green) one, which are so strikingly different as to suggest at first sight that they are distinct species. There appear to be no really intermediate forms, although the examples that are not green are themselves variable, the colour varying from testaceous or ochreous to dark fuscous in some species. It is quite possible that the two forms are really tending to become distinct species, at least in certain cases, and the two Oahuan species *B. discolor* and *B. blackburni* may not improbably have originated from a single simply dimorphic species. Certain it is that,

although numerous examples of both species have been examined, no green form of the former, or not-green one of the latter has yet been discovered. In this respect they stand alone, for of all the other species which have been examined in such numbers as these, the two distinct forms have been obtained. All the species are nocturnal in their habits, and rest by day on the leaves of various forest trees or plants. The males stridulate freely at dusk and through the night, and can be heard for a long distance, but it is extremely difficult to locate them by sound, and we have only occasionally been able to do so.

The modified cerci of the males, which form organs for copulation, in most cases furnish excellent specific characters.

(1) *Brachymetopa discolor* Redtb.

*Brachymetopa discolor*, Redtenb. Verh. z. b. Ges. Wien, 1891, p. 431; Brunner P. Z. S. Dec. 1895, p. 894.

(Plate I. figs. 1 & 1a; and Plate II. figs. 1 & 1a.)

This is a very distinct species, and may be known at once from dark varieties of several of the green species by the shining coal-black front of the head, and the black-spotted legs.

HAB. Both mountain ranges of Oahu. Mts. near Honolulu (1500—2000 ft.). Waianae Mts. (2000 ft.).

(2) *Brachymetopa blackburni* Bormans.

*Conocephalus blackburni* de Bormans Ann. Mus. Genova, XVIII. 1882, p. 346.

*Brachymetopa blackburni* Redtenbacher Verh. Ges. Wien, 1891, p. 431; Brunner P. Z. S. 1895, p. 894.

(Plate I. fig. 2.)

HAB. Mountains near Honolulu, 1500 ft. and upwards.

De Bormans says that this species is found on several of the islands, but the examples taken on islands other than Oahu, no doubt belong to different species. Although I have frequently taken the adult ♀, and young of both sexes, I have never seen an adult ♂.

(3) *Brachymetopa nitida* Brunn.

*Brachymetopa nitida*, Brunner Proc. Zool. Soc. Lond. 1895, p. 894.

(Plate I. figs. 3, 3a, & 3b; and Plate II. figs. 2 & 2a.)

HAB. The original examples were taken in Kona, Hawaii. I have since collected it on the lower slopes of Mauna Kea, above Hilo, and freely at Olaa in the Puna

district. In neither of these localities do the specimens agree with the typical ones, or with each other, but owing to the variation exhibited, they cannot be regarded as distinct species.

*Brachymetopa nitida*, var. *hiloensis*, var. nov. ♂ with the tegmina shorter than in typical specimens, the greatest length shown by these examples being only 10 mm.

*Brachymetopa nitida*, var. *punae*, var. nov. Generally larger than the other forms, attaining the following dimensions.

Long. corporis (haud contracti) ♂ 25, ♀ 27 mm.; pronoti ♂ 6.5, ♀ 7 mm.; tegminum ♂ 11, ♀ 11—13 mm.; femurum post. ♂ 16, ♀ 17 mm.; ovipositoris 12 mm.

One or two of the ♂♂ however have the femora of only 13 mm. and therein agree with the var. *hiloensis*, but still remain distinct from the typical specimens by the short tegmina, the length of which is only 8 mm.

*Brachymetopa nitida*, var. *crassipes*, var. nov. The tibiae are evidently stouter than in the other forms. ♂.

Long. corporis 23 mm.; pronoti 6.5 mm.; tegminum 10.50 mm.; femurum post. 13 mm.

A single ♂ was taken at Kilauea (4000 ft.). This is the highest elevation at which the genus has occurred.

The ♂ characters seem to be identical in the various forms; the upper hooks of the cerci are bent upwards, the lower are very long and rise up behind the former to a considerably higher level.

(4) *Brachymetopa kauaiensis*, sp. nov.

Viridis. Mandibulae in parte apicali nigrae. Labrum cum fronte tota pallidum. Tegmina abbreviata, tympano ♂ minus infuscato, haud nitido. Tibiae posticae utrinque spinulis armatae. Unci cercorum ♂ inferiores decumbentes. ♂♀.

Long. corporis ♂ 19, ♀ 21 mm.; fastigii vert. ♂ 1.2, ♀ 1.5 mm.; pronoti ♂ 5.5, ♀ 6 mm.; tegminum ♂ 7.75, ♀ 8 mm.; femurum post. ♂ 12, ♀ 13 mm.; ovipositoris 11 mm.

HAB. Makaweli, Kauai (2000 ft.). Rare, 1 ♀ taken in 1895, and 1 ♂ in 1897.

(5) *Brachymetopa unica*, sp. nov.

Viridis. Mandibulae pallidae, margine interno nigro. Frons media plaga lata triangulari rufo-brunnea ornata. Fastigium verticis latum, apice fere truncato. Tegmina ad apicem abdominis se extendentia, subacuminata, densissime venosa. Tibiae posticae interne spinis raris, externe fere nullis (una tantum), armatae. ♀.

Long. corporis 20 mm.; fastigii vert. 1·5 mm.; pronoti 6 mm.; tegminum 11 mm.; femurum post. 12 mm.; ovipositoris 10·5 mm. (Plate I. fig. 4.)

HAB. Mountains near Honolulu, Oahu. A single ♀ taken in 1896, amongst *B. blackburni* and *B. discolor*. It is a very distinct species, and the tegmina with their somewhat sharp apices with the margins narrowly reddish, are unlike any other species.

(6) *Brachymetopa affinis*, sp. nov.

Viridis. Mandibulae ad apices nigrae. Frons tota pallida. Tegmina sublonga, capite cum pronoto evidenter longiora. Tibiae posticae interne spinulis perpaucis armatae. ♀.

Long. corporis 22 mm.; fastigii vert. 2 mm.; pronoti 6 mm.; tegminum 11·5 mm.; femurum post. 13 mm.; ovipositoris 11 mm.

HAB. Mountains of Kauai, 3000 ft. One ♀ taken in June 1894. This individual was referred by Brunner to his *B. deplanata*, a species peculiar to Lanai. From an examination of the much larger material obtained during my second visit, I feel sure that no species of the genus is found on more than one island of the group. The present species is most closely allied to *B. blackburni*, but the absence of the distinct black transverse marks on the face at the base of the mandibles, and the less spinose posterior tibiae will easily distinguish it. The latter on their outer margin have only four spines.

(7) *Brachymetopa parvula*, sp. nov.

Laete viridis, subnitida. Mandibularum pars apicalis plus minusve nigra. Frons tota pallida. Tegmina capite cum pronoto haud longiora. Tibiae posticae externe spinulis nullis armatae. Unci cercorum ♂ superiores validi, fortiter erecti. Ovipositor ♀ perlongus, femore postico longior. ♂♀.

Long. corporis ♂ 18, ♀ 19 mm.; fastigii vert. ♂ 1, ♀ 1 mm.; pronoti ♂ 5, ♀ 5·5 mm.; tegminum ♂ 7·5, ♀ 8 mm.; femurum post. ♂ 9·5, ♀ 11 mm.; ovipositoris 12·5 mm. (Plate I. fig. 6.)

*Brachymetopa parvula*, var. *brunnea*, var. nov. Corpus totum pallide brunneum. (Plate I. fig. 6a.)

HAB. Mountains of West Maui above Lahaina (3000 ft.). One ♂ and several ♀ taken; var. *brunnea* a single pair taken off the same branch of a tree in the same locality. This is on the whole the smallest species of the genus. The male characters are quite distinct from those of any other species, the upper of the two processes of the modified cercus rises erect, and is both long and stout; the lower one is much bent and directed backwards. In the ♀ the ovipositor is of unusual length for the size of the species.

(8) *Brachymetopa mauiensis*, sp. nov.

Nitida, viridis. Mandibulae apices versus nigrae. Frons pallida, juxta basim mandibularum utrinque nigropunctata. Tegmina fortiter reticulatim venosa, capite cum pronoto breviora. Tibiae posticae externe inermes. Unci cercorum ♂ superiores breves, inferiores suberecti et his multo longiores. ♂♀.

Long. corporis ♂ 18, ♀ 21 mm.; fastigii vert. ♂ 1, ♀ 1.25 mm.; pronoti ♂ 5.5, ♀ 5.5 mm.; tegminum ♂ 8—8.5, ♀ 8.5 mm.; femorum post. ♂ 10, ♀ 11.5 mm.; ovipositoris 10 mm. (Plate I. fig. 5; and Plate II. figs. 4 & 4a.)

*Brachymetopa mauiensis*, var. *ochracea*, var. nov. ♀ major (long. 24 mm.), colore ochraceo.

HAB. Maui. West Maui Mts. in the Iao Valley. ♂♀. Haleakala (4000 ft.) ♂. The ♂♂ from the latter locality have the tegmina slightly longer, but otherwise agree exactly with that from the distant western mountains. Var. *ochracea*, Iao Valley 1 ♀.

(9) *Brachymetopa molokaiensis*, sp. nov.

Viridis, praecedenti cognatissima, sed minus nitida. ♂ unco superiore cercorum multo longiore et fortiore: ♀ tegminibus apices versus magis longitudinaliter venosis, minus reticulatis, bene distinguenda. ♂♀.

Long. corporis ♂ 20, ♀ 25 mm.; fastigii vert. ♂ 1.5, ♀ 1.75 mm.; pronoti ♂ 5.5—6, ♀ 6 mm.; tegminum ♂ 8.5—10, ♀ 10 mm.; femorum post. ♂ 11.5, ♀ 12.5 mm.; ovipositoris 11.5 mm.

HAB. Mountains of Molokai (3000—4000 ft.).

The species here described was assigned partly (♂) to *B. nitida*, and partly (♀) to *B. deplanata* by Herr Brunner. The ♂ is quite distinct from the former by the unarmed outer margin of the posterior tibiae, and by the cerci, and the ♀ taken in the same locality agrees so well in most respects with the ♂ that I have little doubt of its identity.

(10) *Brachymetopa deplanata* Brunn.

*Brachymetopa deplanata*, Brunner Proc. Zool. Soc. Lond. 1895, p. 894.

(Plate I. fig. 7; and Plate II. figs. 3 & 3a.)

The ♂ of this species (I have not seen an adult ♀) is very distinct from any other, by the very short tegmina, which are subequal to the pronotum in length, and the cerci are also peculiar, the upper hook being simply transverse in direction and slightly

curved, the lower is also transverse and decumbent with its apex inclined downwards. The females assigned to this species in the original description, I have otherwise disposed of (vide *B. affinis* and *B. molokaiensis*).

HAB. Lanai (2000 ft.).

DISPOSITIO SPECIERUM GENERIS BRACHYMETOPAE.

1. (♂) Tibiae posticae utrinque spinulis multis armatae.
2. (♂) Frons capitis tota pernigra .....*discolor*.
3. (2) Frons pallida.
4. (♂) Mandibulae subtotae nigrae; frons capitis juxta basim mandibularum utrinque linea nigra transversa signata .....*blackburni*.
5. (♂) Mandibulae ad basim pallidae; frons capitis haud nigrolineata.
6. (7) ♂ uncus cercorum inferior decumbens; ♀ tegmina capite cum pronoto evidenter breviora .....*kauaiensis*.
7. (6) ♂ cercorum uncus inferior erectus; ♀ tegmina capite cum pronoto haud evidenter breviora.....*nitida*.
8. (1) Tibiae posticae in margine interno inermes vel perpaucis spinulis (4 ad max.) armatae.
9. (10) Tegmina ♂ brevissima, pronoto longitudine subaequalia .....*deplanata*.
10. (9) Tegmina ♂ pronoto evidenter longiora.
11. (12) Frons capitis plaga magna triangulari rufo-brunnea ornata. Tegminum apices subacuminati .....*unica*.
12. (11) Frons unicolor; tegminum apices rotundati.
13. (14) Tegmina capite cum pronoto evidenter longiora.....*affinis*.
14. (13) Tegmina capite cum pronoto haud longiora.
15. (16) Uncus superior cercorum ♂ erectus, supra inferiorem elevatus. ♀ ovipositor femore postico longior .....*parvula*.
16. (15) ♂ uncus superior cercorum haud erectus. ♀ ovipositor femore postico brevior.
17. (18) Magis nitida. ♂ uncus superior cercorum brevis. ♀ tegmina apices versus fortiter reticulatim-venosa .....*mauiensis*.
18. (17) Minus nitida. ♂ uncus superior cercorum minus brevis. ♀ tegmina apices versus ex majore parte longitudinaliter venosae .....*molokaiensis*.

CONOCEPHALOIDES, gen. nov.

A genere *Conocephalo* differt lobis genicularibus inermibus, a *Brachymetopo* lobis meso- et metasterni angustis, femoribus posticis perlongis, intermediis ter longioribus, alis tegminibusque perfecte explicatis, capite et corpore toto (excepto ovipositore) multo longioribus.

(1) *C. hawaiiensis*, sp. nov.

Viridis. Mandibulae flavae. Labrum pallidum, roseotinctum. Fastigium verticis inferum haud in spinam productum, vix longius quam latius, apice rotundato. Antennarum articulus basalis viridis, caeteri substestacei, apicem versus fusciscentes. Pronotum

supra utrinque fusco-lineatum, lateribus flavomarginatis. Alae tegminibus vix breviores. Femora omnia viridescencia, posticorum marginibus inferioribus spinis armatis. Tibiae pallide fuscescentes, posticae biserialiter spinosae. Tarsi graciles. Ovipositor rectus. ♀.

Long. corporis cum ovipositore 46 mm.; pronoti 8 mm.; tegminum 38 mm.; fem. post. 23 mm.; ovipositoris 17 mm. (Plate I. fig. 8.)

HAB. Oloa, Hawaii (2000 ft.); 1 ♀ taken, Dec. 1896.

#### XIPHIDIUM Serv.

##### (1) *Xiphidium fuscum* Fab.

*Xiphidium fuscum*, Brunner P. Z. S. 1895, p. 894.

HAB. Only in and around Honolulu.

#### GRYLLODEA.

##### GRYLLOTALPA Latr.

##### (1) *Gryllotalpa africana* Fab.

HAB. This introduced species abounds on the windward side of Oahu, and is injurious on the sugar plantations.

##### MYRMECOPHILA Latr.

##### (1) *Myrmecophila quadrispina*, sp. nov.

Atrofusca, ore, antennis, pedibus, cercisque, vel nonnullis ex his, pallidis. Frons capitis breviter pilosa. Corpus subtilissime sericeo-pubescens. Cerci conspicue pallidopilosi. Femora postica obscurata, fortissime dilatata; tibiaram posticarum marginibus interioribus spinis quattuor armatis, prima (sive basali) brevi, secunda quartaque multo longioribus, tertia, quam spina basalis quoque, evidenter multo brevior. ♂♀. Long. 2.2 mm. (Plate II. fig. 7.)

HAB. Honolulu, in gardens in the city. An imported species, living in the nests of foreign species of ants.

##### GRYLLUS L.

##### (1) *Gryllus innotabilis* Walk.

*Gryllus innotabilis*, Brunner P. Z. S. Lond. 1895, p. 895.

HAB. Abundant on all the islands.

## GRYLLODES Sauss.

(1) *Grylloides poeyi* Sauss.

*Grylloides poeyi*, Brunner loc. cit.

HAB. Common generally on the plains, and lower slopes of the mountains.

Obs. An immature example of a second species of *Grylloides* was obtained at Lahaina, Maui, but no adult.

## PARATRIGONIDIUM Brunn. (1893).

The sixteen species of this genus are closely allied to one another, and in some cases the specific characters are difficult to appreciate. This is partly due to the variability of some of the species, but also to the changes which take place after the death of the insect in the process of drying. Thus *P. viridescens* in life is quite different in appearance (Plate I. fig. 11) to any other species of the genus, and its peculiar habits leave no doubt that it really is distinct, yet in dried examples its resemblance to several other species is extreme. *P. pacificum*, the first-described Hawaiian species, is in some respects the most aberrant of the series, since it differs from all the others in the structure of the ♂ genitalia, and of the ♀ ovipositor, as well as in the neurulation of the lateral field of the tegmina (Plate II. fig. 6a).

As to the absence of wings in this genus, it is noteworthy that although in the adult insect the metathoracic wings are entirely wanting, yet in the penultimate state they are as well developed as the mesothoracic (or tegmina). Thus both the tegmina and the wings develop equally during the earlier stages up to the last ecdysis, when the tegmina undergo a further and very great development, while the wings, on the other hand, not only cease to develop, but entirely abort.

The habits of the various species are interesting, and a large number are found to inhabit only one particular species of tree or plant. Thus *P. viridescens* and *P. filicum* live amongst ferns, but each is found only on one particular species of fern. *P. saltator* hides at the bases of the leaves of *Freyinetia*, *P. atroferrugineum* amongst those of *Metrosideros*. Several species are found only beneath the bark of large trees, but *P. pacificum* is to a large degree terrestrial. Most of the species are nocturnal in their activities, others are active by day, but generally only in damp shady gulches and dense forests. *P. pacificum* in such situations sings the whole day through, with a plaintive chirp, but at night all the species are most active and noisy. There is a considerable difference between the songs of some of the species, and in some cases the sound can be heard at a great distance. The power of leaping of most of the species is prodigious, and the time that must be spent to collect a series of the most active ones is very

considerable. The ground-frequenting *P. pacificum* is on the whole the most easily captured, the arboreal species in spite of their small size will clear several feet in one jump, and several leaps will be made with astonishing rapidity. After this however the distance covered at a leap becomes shorter and shorter till eventually the power of leaping is nearly entirely lost, and the insect attempts to escape by running.

(1) *Paratrigonidium freycinetiae*, sp. nov.

Frons pallida. Antennarum articulus primus et secundus nigricantes. Pronotum atrum, postice nonnunquam pallidius. Femora antica et intermedia nigricantia. Femora postica supra nigra; ad apices etiam et externe et interne nigra, ad basim pallida. Tibiae pallidae, anticae et intermediae distincte nigronotatae. Tegmina, cerci, et antennae (basi excepta) pallide flavescentia. ♀.

Long. corporis 6 mm., pronoti 1.5 mm., tegminum 4.2 mm., femorum post. 5.2 mm., ovipositoris 2 mm.

HAB. Oloa, Hawaii (2000 ft.). Very rare, three females taken from *Freycinetia*. I saw one ♂, but was unable to capture it. It is excessively wild and active.

(2) *Paratrigonidium saltator*, sp. nov.

Frons cum pronoto pallida. Femora antica et intermedia nigra; femora postica supra nigricantia, externe interneque ex majore parte pallida. Tibiae intermediae anticaeque, plus minusve distincte, maculatae. Tegmina tota pallide flavescentia. Antennarum articulus primus sat pallidus. ♂. (Long. sp. praecedentis.)

This species is closely allied to the preceding, and only the male sex of the one and the female of the other was taken, but the different colour of the pronotum, and of the hind femora, will readily separate them. The superior tegmen of *P. saltator* is unicolorous, pale yellowish, with no dark mark adjoining the vena stridulans, and the front and intermediate femora are entirely of a dark pitchy or black colour.

HAB. Mountains of Oahu, above 2000 ft. Rare. Apparently attached to the *Freycinetia*.

(3) *Paratrigonidium roseum*, sp. nov.

Caput cum articulo primo antennarum, et femora omnia laete rosea. Tibiae tarsi-que pallidi. Tibiae posticae roseo-tinctae. Pronotum ex majore parte nigrum. Antennae, tegmina, et cerci pallide flavescentia. ♀.

Long. corporis 7 mm., pronoti 1.5 mm., tegminum 4.5 mm., femorum post. 5 mm., ovipositoris 2.5 mm. (Plate I. fig. 9.)

HAB. Mountains of West Maui (3000 ft.). A single ♀ taken from *Metrosideros*. Like the preceding it is a very quick and strong jumper and difficult to seize. I saw several other specimens, when the individual described above was taken, but was unable to revisit the locality.

(4) *Paratrigonidium atroferrugineum* Brunn.

*Paratrigonidium atroferrugineum* Brunner P. Z. S. 1895, p. 895.

(Plate I. fig. 10.)

This is a very distinct species, and cannot be confused with any other. The black tegmen of the ♂ with its orange-coloured border, and the black femora with red apices in both sexes, give it a very distinctive appearance. The tegmina of the ♀ are generally entirely pale, but sometimes black in the centre with a ferruginous border, very much as in the ♂.

HAB. Island of Molokai only. Lives in the leaves of *Metrosideros polymorpha*, but chiefly if not solely in those of one special form of this very variable tree. The young of the cricket is entirely green in all its stages.

(5) *Paratrigonidium subroscum*, sp. nov.

Totum pallidum, plus minusve roseo-tinctum, femoribus tibiisque omnibus immaculatis. ♂♀.

Long. corporis ♂ 7·5, ♀ 7·5 mm.; pronoti ♂ 1·5, ♀ 1·5; tegminum ♂ 5·6, ♀ 4·8 mm.; femorum post. ♂ 5, ♀ 5·2 mm.; ovipositoris 2·5 mm.

This is a very distinct species. There is no dark spot on the tegmen behind the vena stridulans, such as is present in most of the Hawaiian species. In the immature stages the insect is entirely green. After death the rosy pigment has a tendency to become massed in certain parts, as is also the case with the green pigment in other species, but the legs are in reality quite unspotted.

HAB. Mountains of Oahu (2000 ft.). Attached to bushy trees of *Metrosideros*.

(6) *Paratrigonidium filicum*, sp. nov.

Brunneum, testaceum, vel olivaceum. Frons pallida, nonnunquam notis fuscis, plerumque minus distinctis, ornata. Antennae subinfuscatae, basim versus articulis paucis, rare dispositis, obscurioribus. Tibiae anticae minus distincte fusco-notatae. Femora postica interna fere concoloria, vel tantum duabus notis minus distinctis fuscis signata. Tibiae posticae supra pallidae. ♂ Tegmen dextrum post venam stridulantem plaga triangulari nigra ornatum: hac, majore ex parte, laevi, minus rugosa. Cerci minus elongati. (Plate II. fig. 6.) ♂♀.

Long. corporis (cum tegminibus) ♂ 7·2, ♀ 6·7 mm.; tegminum ♂ 5·5, ♀ 4·5 mm.—  
Lat. tegminum ♂ 3 mm.—Long. femorum post. ♂ 5·4, ♀ 5·8 mm.; ovipositoris 2·7 mm.;  
cerci ♀ 3 mm.

HAB. Olaa, Hawaii (2000 ft.). In dense forest frequenting a tall soft fern, which covers the ground beneath the trees. Distinguished from the two following species by the much less distinct markings of the legs generally, and the almost entirely pale posterior tibiae. Immature examples are entirely green.

(7) *Paratrigonidium viridescens*, sp. nov.

Pallidum, subviridescens (vivum eleganter viride), nigro-ornatum. Frons nigro-notata. Pronotum lateribus nigris. Femora omnia cum tibiis distincte nigro-notata. Tegmen (♂) dexterum maculis distinctis circa venam stridulantem, et saepe ad latera, et ad apicem plus minusve ornatum. ♂♀.

Long. corporis ♂ 7·5, ♀ 7 mm.; pronoti ♂ 1·5, ♀ 1·5 mm.; tegminum ♂ 5·2, ♀ 4·5 mm.—Lat. tegminum ♂ 3 mm.—Long. femorum post. ♂ 5·2, ♀ 5·8 mm.; ovipositoris 2·5 mm. (Plate I. fig. 11.)

This species is very distinct in life, the general colour being then of a delicate light green. This unfortunately soon fades in dried specimens although a slight tint still remains. The most noticeable characters are the unusually sharply defined black markings, which vary in extent, but are scattered over the tegmen, and not entirely confined to the neighbourhood of the vena stridulans. The black marks on the legs are very distinct, and the tegmen is rather long in proportion to its width.

HAB. Olaa, Hawaii, 2000 ft. Lives amongst a beautiful creeping fern, which clothes the tree trunks in wet forests.

(8) *Paratrigonidium varians*, sp. nov.

Colore brunneo vel testaceo. Frons pallida, lineis maculisque nigris vel fuscis variabilibus ornata. Antennae basim versus articulis nigricantibus, rare dispositis, variegatae. Pronotum maculis fuscis vel nigris supra ornatum, lateribus fusco-vel nigro-marginatis. Tegmen ♂ dextrum macula nigra post venam stridulantem signatum, ibique ex majore parte fere planum, vix rugulosum; pars caetera (nonnunquam fere tota) plus minusve infuscata. Tibiae anticae et intermediae nigro-notatae; femora postica intus satis distincte nigro-vel fusco-notata. Tibiae posticae juxta basim pallidae; hac parte excepta, fere totae nigricantes, tantum ad basim spinarum pallidae.

Long. corporis ♂ 6·5, ♀ 6·5 mm.; pronoti ♂ 1·2, ♀ 1·2 mm.; tegminum ♂ 5, ♀ 4·4 mm.—  
Lat. tegminum ♂ 2·5 mm.—Long. fem. post. ♂ 5, ♀ 5·5 mm.; ovipositoris 2·7 mm.

This species greatly resembles *P. viridescens*, in dried examples, although when fresh, and not discoloured, it has a totally different appearance. It appears to be a variable species, and the examples taken in different localities are rarely altogether similar.

HAB. Puna (2000 ft.), and Kau (4000 ft.), Hawaii; mountains of West Maui; Honolulu (2000 ft.); Makaweli, Kauai (2000 ft.). Apparently always rare. It is an arboreal species.

(9) *Paratrigonidium grande*, sp. nov.

Statura majore, colore testaceo vel brunneo. Frons cum pronoto plus minusve atro- vel fusco-notata. Antennae articulis multis nigricantibus variegatae. Tibiae anticae et intermediae distincte fusco- vel nigro-maculatae. Femora postica interna notis compluribus nigris ornata. Tibiae posticae supra ex majore parte fuscae vel subnigrae, ad basim spinarum pallidae. ♂ Tegmen dextrum post venam stridulantem plaga triangulari nigra, laevi, haud rugosa. ♂♀.

Long. corporis (cum tegminibus) ♂ 9.5, ♀ 8.7 mm.; pronoti ♂ 1.7, ♀ 2 mm.; tegminum ♂ 7, ♀ 5.75 mm.—Lat. tegminum ♂ 3.8 mm.—Long. femorum post. ♂ 6.2, ♀ 6.2 mm.; ovipositoris 3 mm. (Plate I. fig. 12.)

HAB. Hawaii, in the Puna, Kau, and Kona districts. Lives beneath the bark of trees, coming outside only at night. The young are of the same colour as the adult, not green like those of the three preceding species. The large size, combined with the smooth area behind the vena stridulans of the ♂, will distinguish this species from any other.

(10) *Paratrigonidium crepitans*, sp. nov.

Testaceum, capite plus minusve fusco-variegato, antennarum articulis basalibus pallidis. Pronotum fusco-variegatum. Femora omnia distincte nigro-notata; tibiae posticae variegatae. Cerci pallidi, breviores. Tegmen ♂ dextrum post venam stridulantem macula nigra ornatum, hac plaga tota rugulosa. ♂♀.

Long. corporis (cum tegminibus) ♂ 7, ♀ 6 mm.; pronoti ♀ 1.5 mm.; tegminum ♂ 5.5, ♀ 4.2 mm.; femorum post. ♂ 5.2, ♀ 5.5 mm.; cerci ♂ 3.25 mm.; ovipositoris 2.5 mm.

Very like *P. filicum* and the allied species in general appearance, but the ♂ is quite distinct by the evidently less smooth (more rugulose) dark area behind the vena stridulans.

HAB. Kauai (4000 ft.), rare, or at least very difficult to obtain, living amongst heaps of dead wood, or in low vegetation.

(11) *Paratrigonidium robustum*, sp. nov.

Forma et colore fere praecedentis, sed major et cercis evidenter longioribus distinguendus. ♂.

Long. corporis 9 mm.; pronoti 1.6 mm.; tegminum 6 mm.—Lat. tegminum 3.5 mm.—Long. femorum post. 6 mm.; cercorum 4.6 mm.

Very like the preceding species but decidedly larger and with longer cerci. The species is altogether more robust than most others of the genus. The black area behind the vena stridulans well-marked, and rugulose as in the preceding.

HAB. Kauai (4000 ft.); 1 ♂ taken from beneath the bark of a tree.

(12) *Paratrigonidium molokaiense*, sp. nov.

Testaceum, fronte inter antennis tota nigra. Clypeus totus vel ex majore parte niger. Articulus antennarum primus et secundus nigri vel picei. Pronotum cum capite inter setas distincte pallide pubescens. Femora omnia cum tibiis distinctissime nigro-notata; femora postica notis minimis compluribus nigris intus ornata. Tegmen ♂ dextrum plaga post venam stridulantem nigra, tota rugosa, maculisque compluribus postice, necnon in campo laterali, signatum. Tegmina ♀ supra pallida, campo laterali toto nigricante. Cerci pallidi, minus longi. ♂♀.

Long. corporis ♂ 8, ♀ 7 mm.; pronoti ♂ 1.4, ♀ 1.4 mm.; tegminum ♂ 5.5, ♀ 4.5 mm.—Lat. tegminum ♂ 3.2 mm.—Long. femorum post. ♂ 5.2, ♀ 5.2 mm.; ovipositoris 2.7 mm.; cercorum ♀ 3.2 mm.

Certainly a distinct species, the hind femora (at least in the ♂) rather more strongly clavate, than in most of the genus.

HAB. Mountains of Molokai (3000 ft.); rare, 1 ♂ 1 ♀ taken amongst low vegetation.

(13) *Paratrigonidium attenuatum*, sp. nov.

Pallide testaceum, angustum, elongatum, femoribus omnibus nigro-notatis. Tegmen ♂ dextrum post venam stridulantem plus minusve evidenter nigro-notatum, plaga nigra rugulosa, speculo angustissimo, fortiter elongato. ♂♀.

	Var. major.		Var. minor.
Long. corporis	♂ 8,	♀ 8.25 mm.	♂ 7.25 mm.
pronoti	2,	2 "	1.7 "
tegminum	5.5,	5 "	5 "
Lat. "	3,		2.75 "
Long. fem. post.	6.5,	6.5 "	5.5 "
ovipositoris		3.5 "	

(Plate I. fig. 13; and Plate II. fig. 5.)

Apparently there are two forms, a larger and a smaller, of this species, the former being found at a greater elevation in the mountains than the latter. Except for the difference in size I see no other noticeable distinction between the adults, yet, if I am not mistaken, the immature forms of the larger examples are green, while those of the smaller are not.

This species is easily distinguished by the very narrow speculum of the ♂ tegmen. The large examples are not much less long than *P. grande*, but the ♂ is a much narrower insect.

HAB. Kauai (4000 ft.), the larger form. The smaller at an elevation of 2000—3000 ft. Both live beneath the bark of large trees.

(14) *Paratrigonidium debile*, sp. nov.

Angustum, testaceum, fronte cum pronoto pallida, fusco-notata. Tegmen ♂ dextrum circa venam stridulantem nigro-maculatum. Tibiae anteriores et intermediae distincte fusco- vel nigro-notatae. Femora postica notis parvis nigricantibus nonnullis interne signata. Cerci pallidi. ♂.

Long. corporis 6·8 mm.; pronoti 1·2 mm.; tegminum 4·5 mm.—Lat. tegminum 2·5 mm.—Long. femorum post. 5 mm.

HAB. Mountains of Oahu (2000 ft. and upwards). 3 ♂ taken.

(15) *Paratrigonidium exiguum*, sp. nov.

Minimum, brunneum, fronte et pronoto variegatis, haud concoloribus. Pronotum ex majore parte nigro-fuscum, pallido-notatum. Antennae articulis basalibus exceptis infuscatae. Femora omnia cum tibiis fortiter nigro-notata. Cerci fusciscentes. ♂♀.

Long. corporis ♂ 6, ♀ 6 mm.; pronoti ♀ 1·5 mm.; tegminum ♂ 4, ♀ 4 mm.—Lat. tegminum ♂ 2·5 mm.—Long. femorum post. ♂ 4·2, ♀ 5 mm.

A very small species, bearing a great superficial resemblance to *P. pacificum* Scud., but not really allied at all to that (so far as the Hawaiian species are concerned) isolated species. The variegated pronotum, short cerci &c., will distinguish it at a glance, while the different neuration of the lateral field of the tegmina, and the different form of ovipositor, show that it is really more nearly allied to any of the preceding species, than to *P. pacificum*, which it superficially so greatly resembles.

HAB. A single pair taken in the Waianae mountains, Oahu, at an elevation of 3000 ft. It is an arboreal species.

(16) *Paratrigonidium pacificum* Scudder.

*Trigonidium pacificum* Scudder P. Boston Soc. XII. 1868, p. 139.

*Paratrigonidium pacificum* Brunner P. Z. S. Lond. 1895, p. 895.

This species may be known from any of the preceding by the different neuration of the lateral field of the tegmina. (Plate II. fig. 6a.) The pronotum is never variegate, nor have the posterior femora towards the base outwardly a large number of closely-set small, but separate, spots, as most of the species of the genus. The cerci are unusually long and in the ♀ extend far back behind the ovipositor. The ♂ genital armature (often withdrawn into the body) is quite different to that of any of the preceding, in all of which it terminates in two elongate free processes, which bear minute denticles. In the present species there are no such processes. The ovipositor is also of different form, being interrupted at about the middle of the length of its superior margin. In all the other species, the interruption is nearer the apex than the middle. The ♂ tegmina (which vary greatly in colour) are never maculate. In its habits this species is largely terrestrial, although it often ascends certain plants, especially frequenting the tree ferns, and the stems and dead leaves of the banana. In colour it varies from very dark brown (nearly black) to pale testaceous, and it also varies considerably in size. In the wet woods of Hawaii there would appear to be two races, a larger and generally paler one, and a smaller and very dark one with brightly shining thorax, the latter being the more strictly terrestrial in habits. When, however, examples from all the islands are compared, it seems impossible to keep the two as distinct, without making a number of other and ill-defined species.

HAB. Found on all the islands in the mountain forests, preferring damp and shady places, and moving freely by day.

Obs. There are several examples of this genus, which probably belong to other and distinct species, but they are too closely allied to some of those described above to be separated without the inspection of more material.

## Group PROGATHOGRYLLIDES, new group.

In the Proceedings of the Zoological Society (Dec. 1895) Herr Brunner v. Wattenwyl described a genus *Prognathogryllus* to include two species of Hawaiian crickets. The discovery of 14 additional species allied to these, has made it necessary to form several new genera, and to separate the two original species. The characters of the genus *Prognathogryllus* have in consequence required some modification. The

five genera characterized below are well marked, and their peculiarities seem to warrant the establishment of a special group, Prognathogryllides. They are distinguished from the Podoscirtes group by the form of the head, which is strongly porrect; and by the armature of the apex of the posterior tibiae, there being only two calcaria on either side of each. The number given by Herr Brunner is five, three outer and two inner, but the examination of many more species and examples than were submitted to him, has led to the conclusion that the upper of what he considered to be the three outer calcaria should rather be counted as the apical spine of its series. In the first place its position and appearance are rather those of a spine than of a true calcar, and secondly in some of the species, in certain examples it may be altogether absent, whilst in others of the same species it is present. If this spine be admitted as a calcar, the apical spine of the inner series must in many of the species be also considered as such, since the appearance of both, and their position as regards the calcaria, are precisely similar. This apical spine of the inner series is also sometimes wanting in some examples of a given species, in which case there are no spines adjoining the calcaria, and these stand out distinctly as two on each side. (Cf. Plate II. figs. 10*b*, 10*c*, 10*d*; 15, 15*a*, 15*b*; etc.) In *Prognathogryllus* as now restricted, the apical spine of the inner series is very distinct from the calcaria, and this fact renders it probable that in the allied genera the true inner calcaria are also two, that which might at first sight be considered a third being merely the apical spine of the inner series.

All the species are of elongate and slender form, except *Prognathogryllus robustus*, which is comparatively short and robust. In *Thaumatoeryllus* and *Leptogryllus* the tegmina are very small and scale-like, and sometimes only visible at the sides of the body at the hind margin of the pronotum, and the wings are wanting. *Aphonogryllus* has no free tegmina. In the ♀ of *Prognathogryllus* (the ♂ being unknown) they are about equal in length to the head and pronotum together, but in *P. robustus* they extend nearly to the apex of the abdomen. The wings in this genus are ill-developed, being about as long as the short tegmina in *P. alatus*, and much shorter than the tegmina in *P. robustus*, but they are always present.

In *Nesogryllus* ♂ (the ♀ being unknown), the tegmina are well developed for stridulation, but they do not extend back as far as the apex of the long and slender abdomen, and the wings are rudimentary.

*Prognathogryllus* and *Nesogryllus* have a distinct tympanum on the inner face of the front tibiae. The other genera have none.

The males of those species of *Leptogryllus*, which have the metanotum exposed, bear on this part two punctures, one on either side of the middle line, which are represented by two smooth points in the females. When the scale-like tegmina are larger, and conceal (at least for the most part) the metanotum, its basal part is depressed, and the punctures or orifices, which lie within this cavity, are furnished

outwardly with a small curved process. In *Thaumatoeryllus* this cavity is very deep and abrupt and apparently extends beneath the pronotum, which with the tegmina entirely conceals it. Instead of the two minute orifices there appears to be a large transverse slit, with a small hard spine at either extremity. As in *Leptogryllus* these structures are peculiar to the ♂.

All the species of this group are entirely nocturnal in their activities. In the day-time they conceal themselves beneath the bark of trees, in hollow stems, or amongst dead leaves attached to trees, but we have never met with any species that is not arboreal in its habits. All the species of *Prognathogryllus*, *Nesogryllus* and *Aphonogryllus* are extremely rare insects, while the *Thaumatoeryllus* and several of the species of *Leptogryllus* have been taken in some numbers, but even these are rarely or never to be found unless a special search be made for them.

The genera of Prognathogryllides may be tabulated as follows :

1. (2) Cerci tribus articulis tarsorum posticorum conjunctis multo longiores ..... *Prognathogryllus*.
2. (1) Cerci tribus articulis tarsorum posticorum haud longiores.
3. (6) Spinae tiliarum posticarum internae externis evidenter longiores. (Tegmina aut longa aut nulla).....
4. (5) ♂ tegmina nulla..... *Aphonogryllus*.
5. (4) ♂ tegmina longa .. ..... *Nesogryllus*.
6. (3) Spinae tiliarum posticarum internae externis haud evidenter longiores. (Tegmina squamiformia, saepe minutissima.)
7. (8) Metatarsus anterior longissimus : calcar tiliarum posticarum externum et superius longum ..... *Thaumatoeryllus*.
8. (7) Metatarsus anterior minus longus, tantum bis terve longior quam latior : calcar tiliarum posticarum externum et superius breve ..... *Leptogryllus*.

PROGNATHOGRYLLUS (sensu strictiori).

*Prognathogryllus* Brunner P. Z. S. 1895, p. 896.

Tegmina abbreviata, vel fere ad apicem abdominis extensa. Alae sat distinctae, ad apices tegminum extensae, vel, si haec longa, his multo breviores. Tibiae anticae tympano instructae; tibiae posticae spinis utrinque armatae, internis, quam externae, multo longioribus. Cerci ovipositori subaequales. ♀.

(1) *Prognathogryllus alatus* Brunn.

*Prognathogryllus alatus* Brunner P. Z. S. (1895) p. 896.

(Plate II. figs. 8, 8a, & 8b.)

(2) *Prognathogryllus elongatus*, sp. nov.

Gracilis, elongatus, colore testaceo. Tegmina pallida, fere ad apicem segmenti abdominis secundi se extendentia, venis flavis. Femora postica gracillima, spinis internis externis evidenter longioribus. ♀.

Long. corporis 22 mm., pronoti 4, tegminum 5.5, femorum post. 11, ovipositoris 7 mm. (Plate I, fig. 15.)

A very distinct species, which, although of nearly the same length as the preceding, appears much longer, owing to its much narrower form. The posterior femora are very slender and much less wide at the base, and the inner series of spines on the posterior tibiae are much less strong.

HAB. The high plateau of Kauai. July, 1896.

(3) *Prognathogryllus robustus*, sp. nov.

Brunneo-niger, robustus. Tegmina fere ad apicem abdominis se extendentia. Tibiae posticae cum femoribus minus elongatae, spinis internis quam externis multo longioribus. ♀.

Long. corporis 16 mm., pronoti 4, tegminum 9, femorum post. 9, ovipositoris 10 mm. (Plate I, fig. 14.)

Quite unlike the other species in general appearance, of a dark brownish colour, and with well developed tegmina. The wings are much shorter than these. The posterior femora are formed much like those of *P. alatus*. The inner series of spines on the posterior tibiae is much more strongly developed than the outer, but they are shorter than those of *P. alatus*.

HAB. High central plateau of the Kauai mountains. Very rare, a single ♀ only taken, high up in a dead tree amongst the dry leaves that still adhered.

(4) *Prognathogryllus oahuensis*, sp. nov.

Haud robustus, flavo-testaceus, pronoto fusco-variegato. *P. elongato* similimus, femoribus tibiisque posticis multo brevioribus facile distinguendus. ♀.

Long. corporis 16 mm., pronoti 4 mm., tegminum 5 mm., femorum post. 9 mm., ovipositoris 6 mm.

Easily known from *P. elongatus*, which (of the preceding species) it most resembles, by the shape of the posterior femora, which are much wider near the base in proportion to their length.

The inner series of spines on the posterior tibiae is more strongly developed, and the whole insect is less slender and elongate.

HAB. Waianae Mountains, Oahu. A single ♀ taken under bark in Feb. 1896. It was being attacked by the introduced ant, *Pheidole megacephala*, which had already bitten off the greater part of the antennae and tarsi.

(5) *Prognathogryllus inexpectatus*, sp. nov.

Gracilis, elongatus, testaceo colore. Pronotum totum pallidum, haud fusco-variegatum. Tegmina abbreviata, venis flavis. Femora postica minus incrassata. ♀.

Long. corporis 19 mm., pronoti 3.75 mm., Lat. pronoti 3 mm., Long. tegminum 5 mm., femorum post. circa 9 mm., ovipositoris 6.50 mm.

Readily distinguished from *P. oahuensis* by the much narrower posterior femora, the unicolorous pronotum, which is also narrower, and the shorter spines of the posterior tibiae inwardly. From *P. elongatus* the evidently shorter posterior legs at once separate it.

HAB. Kauai (4000 ft.). Under bark of *Acacia koa*.

APHONOGRYLLUS, gen. nov.

Gracilis, elongatus, tegminibus alisque carens. Tibiae anticae tympano nullo instructae; posticae utrinque spinis armatae, internis, quam externae, multo longioribus; calcar internum et superius multo longius quam dimidium metatarsi. Cerci brevissimi, tarsorum articulis tribus posticorum, una conjunctis, haud aequales. ♂.

(1) *Aphonogryllus apteryx*, sp. nov.

Testaceus, dorso plus minusve fusco-variegato. Tegmina libera nulla, sed latera mesonoti lobate-producta. Femora postica minus fortiter elongata. Tibiae posticae supra infuscatae, spinis utrinque armatae, internis multo longioribus, basi nigris, media parte pallidis. ♂.

Long. corporis 16 mm., pronoti 3.25 mm., femorum post. 7.5 mm., cercorum 2 mm. (Plate II. figs. 9, 9a, 9b, 9c.)

HAB. Mountains of Oahu. Two males taken in 1896, one at an elevation of 2500, the other of 3000 feet.

NESOGRYLLUS, gen. nov.

Gracilis, elongatus. Tegmina capite una cum pronoto bis longiora. Alae tegminibus multo breviores. Tibiae anticae tympano instructae; posticae utrinque spinis armatae, internis, quam externae, multo longioribus; calcar internum et superius haud

minus longum quam dimidium metatarsi. Cerci breves, metatarsis posticis subaequales. Venae tegminis superioris obliquae 2, necnon venae 3 breves ab angulo venae stridulantis externo emissae. Speculum vena transversa una in partes subaequales divisum. Campus apicalis brevissimus. ♂.

(1) *Nesogryllus stridulans*, sp. nov.

Gracilis, flavo-testaceus, tegminibus fere hyalinis, parte basali infuscata et opaca, venis pallidis. Antennae longissimae, testaceae, concolores. Pronotum fusconotatum. Femora omnia cum tibiis tarsisque pallide testacea et translucida. Tibiae posticae spinis pallidis utrinque armatae. ♂.

Long. corporis 22 mm., pronoti 4 mm., tegminum 13 mm., femorum post. 10.5 mm., cercorum 3.75 mm. (Plate II, figs. 11 & 11a.)

HAB. Mountains of Oahu, 3000 ft. A single ♂ taken (in June 1895) from the interior of a hollow twig.

THAUMATOGRYLLUS, gen. nov.

Elongatus cylindricus. Tegmina minima, maris metanotum fere totum, feminae dimidiam fere partem metanoti celantia. Tibiae anticae tympano nullo instructae. Metatarsi longissimi; tibiae posticae spinis brevibus utrinque subaequalibus armatae; calcaria superiora, et externa et interna, longissima et subaequalia. Cerci breves, parte tertia ovipositoris vix longiores. ♂ ♀.

(1) *Thaumtogryllus variegatus*, sp. nov.

Flavo-testaceus, colore fusco nigroque variegatus. Femora omnia cum tibiis intermediis et anticis fortiter nigronotata. Tarsi pallidi. Tegmina brevia, metanotum totum haud tegentia. ♂ ♀.

Long. corporis 15 mm., pronoti 4 mm., femorum post. 10 mm., ovipositoris 8.75 mm. (Plate I, fig. 16; and Plate II, figs. 10, 10a, 10b, 10c, 10d.)

Some individuals are considerably darker than others and there is some variation in size. The anterior legs are remarkably long and slender, their metatarsus being many times as long as wide. The posterior femora are somewhat more strongly and suddenly dilated on their basal part than is usual in the allied forms. The posterior tibiae are very long, and the spines on each side very short.

HAB. Mountains of Kauai (4000 ft.).

## LEPTOGRYLLUS, gen. nov.

Gracilis, subdepressus. Tegmina minima squamiformia, nonnunquam metanotum totum, vel fere totum, tegentia, saepe tantum ad latera extrema mesonoti antice vix discernenda. Alae nullae. Tibiae anticae tympano nullo instructae; metatarsus tantum bis terve longior quam lator. Tibiae posticae spinis brevibus utrinque subaequalibus armatae; calcar internum et superius, quam caetera, longius, parti dimidiae metatarsi haud aequale. Cerci brevissimi. ♂ ♀.

(1) *Leptogryllus nigrolincatus*, sp. nov.

Pallide flavo-testaceus. Femora cum tibiis immaculata. Abdominis latera late nigra. Femora postica perlonga, minus dilatata; tibiae utrinque spinis brevibus armatae. Tegmina metanotum totum haud tegentia. ♂ ♀.

Long. corporis 18 mm., pronoti 4.5 mm., femorum post. ♀ 12 mm., ♂ 11 mm., ovipositoris 7 mm., cercorum 2.5 mm.

HAB. Mountains of Oahu and Maui.

(2) *Leptogryllus nigromaculatus*, sp. nov.

Forma et colore fere praecedentis; femoribus posticis et tibiis evidenter brevioribus facile distinguendus. ♂ ♀.

Long. corporis (haud contracti) 15.5 mm., pronoti 3.5 mm., femorum post. 9 mm., ovipositoris 6 mm. (Plate I, fig. 17; and Plate II, figs. 12 & 12a.)

This species is very like the preceding, but the shorter posterior legs will distinguish it at once. Moreover the abdomen, instead of the continuous broad lateral stripes, has a series of diamond-shaped spots on each side. The tegmina as in the preceding.

HAB. Kauai. In the Mountains 3000—4000 ft.

(3) *Leptogryllus similis*, sp. nov.

Praecedentibus colore simillimus; pallide testaceus; abdomen utrinque late nigro-lineatum; femora antica et intermedia cum tibiis immaculata; metatarsi postici apex niger. Tegmina minutissima, tantum ad latera corporis videnda. ♂.

Long. corporis 12.5 mm., pronoti 3 mm., femorum post. 7.25 mm. (Plate II, fig. 13.)

HAB. Mountain above Hilo, Hawaii, 2000 ft.

(4) *Leptogryllus elongatus*, sp. nov.

Praecedentibus forma et colore simillimus; femora antica et intermedia cum tibiis plus minusve distincte nigro- vel fusco-notata; pronotum utrinque saepius indistincte fuscum; abdomen utrinque fusco- vel nigro-lineatum, aut bilineatum. Tegmina (♂♀) minutissima. ♂♀.

Long. corporis (haud contracti) 14.5 mm., pronoti 3.5 mm., femorum post. 9 mm., ovipositoris 6 mm. (Plate I. fig. 18.)

HAB. Hilo, Puna, and Kau, Hawaii (2000—4000 ft.).

(5) *Leptogryllus kauaiensis*, sp. nov.

Forma fere praecedentium, colore variabili, testaceus, plerumque parte corporis majore nigro- et fusco-variegata; femora antica et intermedia cum tibiis nigro-annulata. Tegmina metanotum totum tegentia (♂), vel multo minora, unum ab altero longe distantia, et brevissima (♀). ♂♀.

Long. corporis 16 mm., pronoti 4 mm., femorum post. 8.5—9 mm., ovipositoris 6 mm.

HAB. Mountains of Kauai (2000—4000 ft.).

(6) *Leptogryllus fusconotatus*, sp. nov.

Praecedentis colore et facie; ♂ tegminibus minutissimis bene distinctus. ♂.

Long. corporis 14 mm., pronoti 3.75 mm., femorum post. 9 mm.

HAB. Mountains of Oahu (2000 ft.). One ♂ taken in 1896.

(7) *Leptogryllus forficularis* Brun. n.

*Prognathogryllus forficularis* Brunner P. Z. S. 1895, p. 897.

(Plate II. figs. 14, 14a, & 14b.)

In the ♀ of this species the tegmina are extremely small and visible only at the extreme sides beyond the margin of the pronotum. It closely resembles the preceding, but its shorter and less wide posterior femora easily distinguish it. The length of these is only about  $6\frac{1}{2}$  mm. I have taken a single ♂ which appears to belong to this species, although taken on a different island. Apart from the sexual characters it does not seem to differ at all from the ♀.

HAB. Kona, Hawaii, 3000 ft. Iao Valley, Maui. 1 ♂.

(8) *Leptogryllus simillimus*, sp. nov.

*L. forficulari* simillimus, tibiis posticis minus spinosis distinguendus. ♂♀.

Very closely allied to *L. forficularis*, but generally if not always with the body darker in colour. The spines on the tibiae are evidently less close and do not extend nearly so far back towards their base. I have examined a series of specimens. The ♂ is often slightly shorter and less robust than the ♀.

Long. corporis (haud contracti) ♀ 14 mm.; pronoti 3.25 mm., femorum post. 6.5 mm., ovipositoris 5 mm. (Plate I. fig. 19; Plate II. figs. 15, 15a, & 15b.)

HAB. Haleakala, Maui (4000—5000 ft.).

The following works are all that contain matter relating to the indigenous Hawaiian Orthoptera.

1. SCUDDER, S. H. A century of Orthoptera. Decade I. Gryllides. P. Boston Soc. XII. 1868, pp. 139—143.  
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29 species, 6 new. This paper deals with the collections received by the Committee previous to 1895.



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The Lord WALSINGHAM, F.R.S. ...	<i>Microlepidoptera.</i>
Mynheer F. M. VAN DER WULP ...	<i>Diptera.</i>

It is also intended to give a list of the Vertebrates, with their distribution, in the Islands.

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N.B. The parts of Volumes I. and II. are being published concurrently in order to expedite the completion of the work.

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# FAUNA HAWAIIENSIS

OR THE

## ZOOLOGY OF THE SANDWICH (HAWAIIAN) ISLES :

Being Results of the Explorations instituted by the Joint Committee  
appointed by

THE ROYAL SOCIETY OF LONDON FOR PROMOTING NATURAL KNOWLEDGE

AND THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

And carried on with the assistance of those Bodies and of the Trustees of

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EDITED BY

DAVID SHARP, M.B., M.A., F.R.S.

SECRETARY OF THE COMMITTEE.

VOLUME II. PART II.

*NEUROPTERA*

By R. C. L. PERKINS, B.A.

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# NEUROPTERA

By R. C. L. PERKINS, B.A.



## NEUROPTERA.

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### § 1. General considerations on the Neuroptera.

THE Neuroptera are rather numerous represented in the islands, but the fauna as represented by this group is of the same fragmentary character, as is seen in the other Orders of insects, some of the extensive divisions of Neuroptera being totally unrepresented.

At present the total number of species known to us amounts to 111, of which 54 or nearly one-half belong to the Hemerobiidae (including herein Chrysopides and Myrmeleonides), 29 to the Odonata or dragon-flies, and 25 to the Psocidae. The remaining three species belong to two other divisions and consist of two Termitidae, and a solitary species of Embiidae.

The divisions Ephemeridae and Trichoptera (or Phryganeidae), and the smaller groups Perlidae, Sialidae and Panorpidae are absolutely unrepresented. The entire absence of the first four of these divisions is a very remarkable fact, as they are aquatic in habits, and the numerous mountain streams and rivers would appear to be admirably adapted for many species; so that one must conclude that these water-frequenting insects are ill-adapted for passing over wide expanses of ocean.

The Hemerobiidae, excluding the Myrmeleonides, have 52 species which belong to 6 genera. Not one of these species is known to occur in other countries, but two of the genera, which are represented by single species, have no alliance with the other forms, and when this family has been extensively collected in other countries, these two species will probably be found elsewhere. This is almost certain to be the case with the small *Chrysopa microphyta*, a species which is abundant in gardens in towns and settlements, although it has extended its range to a considerable elevation up the mountain sides. A single species, referred temporarily to *Megalonus* (although not a true member of that genus), is more remarkable; it may even prove to be peculiar to the islands, but will more probably ultimately be found elsewhere. It is noteworthy that both these insects are of general distribution over the islands, in contrast with most other species of this family, which are so often confined to a single island.

Nineteen species are included in the genus *Nesomicromus*, which has been founded

for their reception. The simpler forms of this genus are very similar to the well-known genus *Micromus*, but the more remarkable species have the wing-contour of *Drepanopteryx*, and bear to *Micromus* a relation very similar to that which *Drepanopteryx* bears to *Megalomus* or *Hemerobius*. Between the extreme forms of *Nesomicromus* species are found in quite intermediate conditions, so that one is compelled to treat the whole series of species as forming but a single genus, and their relationship is strongly evidenced by the apical abdominal appendices of the ♂♂, which though differing in detail in many species, nevertheless possess notable peculiarities common to all.

Allied to *Nesomicromus*, and no doubt evolved within the islands from some such form, are the other two genera, *Pseudopsectra* and *Nesothauma*, each with but one species at present known. The former is in most respects intermediate between the latter and *Nesomicromus*. Both these insects, but especially the *Nesothauma*, have claim to be considered amongst the most remarkable of all known species of *Neuroptera*. *Nesothauma* has no trace of posterior wings and the front pair are almost of the consistency of the elytra of a Coleopterous insect. *Pseudopsectra* is likewise incapable of flight, but the front pair of wings are less abnormal, and the posterior pair are represented by small lobes. Although reminding one of the anomalous and rare genus *Psectra*, *Pseudopsectra* is, without doubt, not related in any way to that genus. The ♂ characters of both *Pseudopsectra* and *Nesothauma* are formed entirely on a similar plan to those of *Nesomicromus*. The two insects included in these abnormal genera are very local and rare, and both frequent the same locality, Haleakala on Maui, where they are found at an elevation of five or six thousand feet above sea-level.

As above mentioned the single species of *Chrysopa* is almost certainly foreign, but another genus, *Anomalochrysa*, not known from elsewhere, includes no less than 29 species. These species form a most interesting series, but are excessively difficult to differentiate, owing to the great variability in colour of many of them, and the instability of the characters afforded by the nervuration. Here again the terminal segments of the ♂ afford great help in many instances, and on these characters there would appear to be two good genera, but the females of the two sections appear to present no points for generic division, at least in dried examples, the distortion of the body after death being much greater in this sex than in the ♂.

The species of Hemerobiidae have in general a much more restricted range than have the indigenous Agrionidae of the Odonata. Excluding the single *Megalomus* and *Chrysopa* as probably foreign, of the genus *Nesomicromus* 15 out of the 19 are restricted each one to a single island, the remaining four being widely distributed insects, Hawaii and Maui each having four species peculiar, while the latter likewise has also its peculiar genera *Pseudopsectra* and *Nesothauma*. The species of *Anomalochrysa* are even more localized, two only of the 29 occurring on more than one of the islands. In this genus the island of Hawaii is extraordinarily rich, since it has 12 species peculiar to itself, and both of the two more widely distributed species are also found there. The

following table of the indigenous Hemerobiidae gives the percentage of species peculiar to each of the islands.

	Species peculiar to.	Total number of species.	Percentage of peculiar species.
Kauai	7	8	87.5
Oahu	6 <sup>1</sup>	9	60
Molokai	6	8	75
Lanai	—	2	—
Maui	9	12	75
Hawaii	16	20	80

Of the two Myrmeleonides I have not met with the *Formicaleo perjurus* Walk., which is almost certainly becoming extinct; the other, *Formicaleo wilsoni*, is locally common in open places on the lava-flows of Hawaii, where there is a stunted vegetation, and it also is found on other of the islands. Very probably it will prove to be a natural immigrant, and will ultimately be found elsewhere.

If we compare this table with that of the Agrionidae given on p. 34 it will at once be seen that the percentage of species peculiar to the several islands is much more nearly equal in the Hemerobiidae than is the case with the dragon-flies. In both tables Kauai stands first in the proportion of its peculiar species to the total number found upon it, and this is no doubt due, at least to a considerable extent, to the greater distance between it and the neighbouring island of Oahu, and probably in a lesser degree to its position at the extremity of the forest-bearing islands. The extraordinary richness of Hawaii in species of *Anomalochrysa* may perhaps point to that island as the spot where these insects first became established. The small percentage of species of *Agrion* peculiar to most of the islands is probably partly due to their greater powers of flight as compared with the Hemerobiidae, the high percentage of species peculiar to the more remote island of Kauai rather pointing to this conclusion, but it may be that they have been established for a shorter time in the islands than the Hemerobiids, or, even if antecedent to these, they may be less susceptible to the effects of isolation and the changes in environment thereby produced. However that may be, there is no doubt that several of the species of *Agrion* are at the present time in the process of forming other distinct species, owing to the isolation and change of conditions brought about by individuals having spread to more than one of the islands.

The Odonata or dragon-flies. The 29 species of Odonata are distributed in 5 genera, but no less than 24 are assigned to the genus *Agrion*. No doubt they will ultimately be separated from that genus, and will themselves form not less than three distinct genera, but at present it seems better to leave them under that name, as many of the species are difficult, being very variable even in important characters, and some have already formed more or less distinct local races, or subspecies, so that the question as

<sup>1</sup> *Anomalochrysa rufescens* McL., the locality of which is not recorded, is included here as being probably Oahuan.

to which are true species is as yet by no means absolutely settled. In the females the climax of difficulty is reached, for these have no structures suitable for distinguishing the species that can compare with the terminal appendages of the abdomen of the ♂, while the superficial distinctions, such as colour, details of nervuration, etc. are notably variable. All the species of *Agrion* are peculiar to the islands and are probably all related to one another, as more or less transitional forms are found between the different groups, and it is probable that all originated from some single species which reached the islands in remote times. Of the other four dragon-flies the *Tramea*, *Pantala*, and *Anax junius*, are no doubt natural immigrants, being all species of powerful flight and all are distributed throughout the group, whereas a large proportion of the species of *Agrion* are either restricted in range to one island, or when occurring on more than one are tending to form other distinct species, or local forms. The larger *Anax*, which is a very fine insect, is so far as is known peculiar to the islands, and has probably been established there sufficiently long to acquire characters which separate it from any other of the genus. It is very powerful on the wing, and is widely distributed over the islands, and extends its range far up the mountain sides. Another moderate-sized species, assigned to *Sympetrum* by Karsch, but for which Kirby has established a genus, *Nesogonia*, is also, so far as is known, peculiar to the islands. It is generally distributed over the group, in the mountains, and is notably variable in size, colour and nervuration.

If we limit our investigation to the species of *Agrion* it will be seen that in the number of species peculiar to it, Kauai ranks easily first of the six larger islands. Excluding *A. xanthomelas* and *A. pacificum*, species ubiquitous over the islands, seven species are restricted to Kauai, nor has it any species that even extends to the neighbouring island of Oahu. The latter island has four species peculiar to itself, and five others which are found also on one or more of the others. Maui, Molokai and Hawaii have each but a single species peculiar to them, while the little island of Lanai with seven or eight species has none. It should be added however with regard to these islands that some of the species upon them form varieties very distinct from the typical examples, and this is especially the case with several of the species found on Hawaii, where diminution in size and corresponding changes in nervuration are often evident. Nevertheless the occurrence of examples in a condition intermediate between the typical and extreme forms of such species renders it inadvisable to consider them as belonging to more than one species. The following table shows the percentage of species of *Agrion* peculiar to each of the islands.

	Species peculiar to.	Total number of species.	Percentage.
Kauai	7	9	77.7
Oahu	4	10	40
Molokai	1	8	12.5
Lanai	—	7	—
Maui	1	10	10
Hawaii	1	9	11.1

Psocidae are richly represented in the islands and twenty-five species are dealt with in the present paper. No doubt many others yet remain to be discovered, indeed other species are certainly included in those collected by me, but owing to their small size and poor state of preservation it was not advisable to attempt the description of the species. Nearly all are subject to much distortion and contraction of the body-segments after drying, as well as discoloration, and owing to the exudation of a sticky substance they are with difficulty relaxed, so as to be suitable for examination. Evidently there are good characters in the terminal abdominal segments of the ♂, but these are not available in dried examples. Many of the species exhibit great variability (in colour, nervuration, etc.), which is so remarkable a feature of so many Hawaiian insects. The difficulties of study in this group are so great from the causes above enumerated, that the present paper on these insects can only be regarded as a preliminary sketch, especially as regards the species referred to the genus *Elipsocus*, in which the instability of nervuration is so great, as to render the discrimination of species almost hopeless, without special attention to the insects in the field. In this preliminary study I have not considered it advisable to enter minutely into the generic question, but have referred all the species to three well-known genera. The solitary species referred to *Stenopsocus* temporarily, is clearly generically distinct therefrom, but only one example, in mutilated condition, was secured. It is very different to any other Hawaiian Psocid, and is interesting as having been taken at a high elevation in the mountains, where the nights, even in August, were cold, with hard frosts. Of the other 24 species, 14 are assigned to *Psocus*, most species of which appear to be confined, each one, to a single island, while 10 are placed in the genus *Elipsocus*. Some species of this latter genus are so variable in nervuration, that not only generic, but even characters of superior value, are affected.

The other components of the Neuropterous fauna are comparatively of little interest. The two Termites belong to the genus *Calotermes*. The smaller of these, *C. marginipennis* Latr., is certainly an introduced species and has done great damage to wooden buildings in the city of Honolulu. The larger one, referred to *C. castaneus* Burm., is very possibly distinct from that species, which was described from winged forms. The soldiers of the Hawaiian species possess well-developed eyes, and it is noteworthy that they are found (and probably only found) in the native forests, and series of them from three of the islands vary distinctly in the length of the gular area on the under-side of the head, as though they were already forming distinct races on the various islands. It is possible however that this variation, although affecting an important character, is merely such as occurs in different communities, and is not due to isolation on different islands, the material at hand not being sufficient for deciding this point.

The solitary Embiid (*Oligotoma insularis* M<sup>e</sup>Lach.) is an interesting insect on account of the dorsal sclerites of the thorax in the winged ♂ not being of the simple structure usual in these insects, and very different to those of the apterous ♀. An

account of its habits and development is published in the Entomological Monthly Magazine, xxxiii. (1897), p. 56.

## § 2. Systematic account of the Neuroptera.

### HEMEROBIIIDAE.

#### HEMEROBIIDES.

The Hemerobiidae represented by the genera *Megalomus*, *Nesomicromus*, *Pseudopsectra*, and *Nesothauma*, as well as the numerous species of *Anomalochrysa* and the solitary<sup>1</sup> one of *Chrysopa* of the subdivision Chrysopides and including also Myrmeleonides form the most extensive section of the Hawaiian Neuroptera. Nearly all the species are confined to the mountain forests. The larvae of the Hemerobiids proper appear to feed on the species of Psocidae, those of *Anomalochrysa*, I have little doubt, prey on Lepidopterous larvae. Their mandibles are sharp and strong, so that they can give quite a sharp bite, when they fall upon the face or neck, as is often the case when one is beating the branches of trees. All the species appear to be nocturnal, although some are very readily disturbed, as one walks through the brush in the daytime.

#### MEGALOMUS Ramb.

##### (1) *Megalomus hospes*, sp. nov.

Head, thorax, and abdomen varying in colour from nearly uniform dark brown or blackish, with obscure pale markings, to a nearly uniform yellowish colour; generally brown with pale markings, or yellow with fuscous markings.

Anterior wings grey, more or less fulvescent, with a more or less distinct dark spot on the cubitus posticus, towards the base. Nervuration set with hairs, and with alternate light and darker spaces. The gradate nervules form two more or less distinct, transverse, oblique darker lines, and there is a third near the base. In one example the whole middle portion of the wing between the inner and the basal series of gradate nervules is deeply infuscate, forming a wide blackish transverse fascia. Radius with three sectors. The posterior wings are almost hyaline, and beautifully iridescent, their nervuration pale.

<sup>1</sup> We have excluded the *Chrysopa oceanica* Walk. from the list as probably not belonging to the Hawaiian fauna. Several species brought home by the Beechey expedition with the locality "Sandwich Is." appear to have come from the other islands of that name.

♂ appendices very long and narrow, the sides subparallel, with an apical depression outwardly, rounded at their extremities; inwardly on their apical portion furnished with short somewhat spinose hairs, which are directed inwardly. Between the appendices there may be seen a short chitinous process, with the apex bifid, forming two spines. Ventral valve very narrow, sublinear, its sides parallel in dorsal or ventral aspect, curved upwards and clothed with long hairs. (Plate IV. figs. 1, 2, 16 & 16 a.)

Expanse 13—17 mm.

HAB. Found all over the group, in the mountains, but not very abundant. This species has no relation with the rest of the Hawaiian Hemerobiidae, and I suspect it has been introduced.

#### NEOMICROMUS, gen. nov.

Allied to *Micromus*, some of the species having the superficial appearance, as well as the nervuration of that genus. The wings are either rounded at the apex, or falcate, somewhat resembling *Drepanopteryx*, the one form passing gradually into the other, so that the species cannot be subdivided on this character, although the extreme forms are vastly different. The species with simply rounded wings can (so far as I can see) only be separated from *Micromus* by the length of the joints of the maxillary palpi, in which they also agree with the species which have falcate wings. The penultimate joint of these palpi is very short, being only about half as long as the terminal.

The ♂ characters are very similar throughout the genus, the appendices being rarely very conspicuous, usually of triangular form and pointed at the apex. In all the species they give off each from their lower margin towards the base a fine spine, and slight differences in the length, form, etc. of these spines furnish useful specific characters. The general similarity in the form of the appendices, which extends also to the two following genera, is very remarkable. As in *Micromus*, there is no free cellule formed by a recurrent nervule at the base of the wing.

#### (1) *Nesomicromus vagus*, sp. nov.

Brown or black; face, legs and palpi paler. Antennae varying in colour from testaceous to nearly black. Thorax with short pale pubescence.

Anterior wings brownish or grey-brown (grey in immature examples), generally with a small pale spot towards the base, situated on the cubitus posticus. Gradate nervules more or less infuscate, forming two transverse darker lines on the wings, often irregular and broken, sometimes wanting. Apical margin evidently, but slightly excised, giving the wings a hooked appearance at the tip. Nervuration dark, sometimes (with the pterostigma) more or less pink, the nervules with short and very inconspicuous hairs.

Radius normally with 5, rarely 4 or 6 sectors; in the latter cases the number is often different on the two sides of the same insect.

Posterior wings subinfusate, but paler than the front wings and more transparent, nervuration generally dark, the apical margin very slightly excised below the tip of the wing.

♂ appendices viewed laterally, sub-triangular, narrowly rounded at the apex, on their inferior margin inwardly they are furnished each with a fine spine, curved upwards, and under a very strong lens finely serrate or dentate, the spines extending backwards rather beyond the apices of the processes. (Plate IV. fig. 3.)

Expanse 12—18 mm.

HAB. Common all over the group in mountain forests, and sometimes found on the coast.

(2) *Nesomicromus latipennis*, sp. nov.

Allied to the preceding, and of similar colour.

Anterior wings brown, posterior pair infumate. Radius with 5 sectors. Readily known by the very broad and short wings, the apical margin not perceptibly emarginate; the posterior pair very obtuse, their apical margin almost straight, not slightly concave. (Plate IV. fig. 4.)

Expanse 15 mm.

HAB. Kona, Hawaii (3500 ft.); 1 ♀ June, 1892.

(3) *Nesomicromus angustipennis*, sp. nov.

Closely allied to *N. hawaiiensis*, but with the wings narrower and the apex somewhat more produced. The radius gives off 6 or 7 sectors. The cellules formed between the outer and inner series of the gradate nervules are extremely narrow in proportion to their length, and this fact gives a character to the wing by which the species may be easily recognized.

The body and anterior wings are brown, but only gradually arrive at this colour, being pale for some time after the emergence of the insect. Normally there is a small pale spot towards the base of the wing on the cubitus posticus, and the radius bears alternate pale and dark spots as in *N. hawaiiensis*. The variation of the present species also appears analogous to that of the other, the nervuration and pterostigmata being pink in some examples, and the wings in some are evidently less narrow than usual, etc.

The ♂ characters differ, in that the spines of the apical processes are shorter, and do not reach to the apices of the processes themselves. (Plate IV. fig. 5.)

Expanse 12—16 mm.

HAB. Mountains of Kauai (4000 ft.).

(4) *Nesomicromus drepanoides*, sp. nov.

Dark brown or nearly black, legs and antennae pale. Anterior wings dark brown more or less mottled with lighter yellowish-brown, or nearly entirely pale yellowish-brown with the gradate nervules delineated by transverse dark lines, the radius with the usual alternate dark spots, and some dark markings near the base of the wing. Posterior wings more or less infusate. Pterostigma sometimes pink.

Allied to the preceding species, but with the apical margin of the anterior wings more deeply excised, and the dorsal margin from the apex to about the middle, evidently, but very slightly, concave. The wings are also less narrow. The sectors of the radius are 6 or 7 in number, whereof the two which are nearest the base sometimes unite close to their point of origin. The general appearance of the nervuration is that of the preceding. In the ♂ the spines of the apical processes appear to extend about to the apex of each process, and they cross each other near the base. (Plate IV. fig. 6.)

Expanse 14—16.5 mm.

HAB. Kauai (4000 ft.). 1 ♂, 3 ♀ taken. Of the latter one example is much paler than the others (as described above), and it also has broader wings, but I doubt whether it is specifically distinct; in fact no two individuals out of the four agree.

(5) *Nesomicromus paradoxus*, sp. nov.

Nearly black, the legs and antennae and some marks on the dorsum of the thorax pale. Anterior wings dark brown, the costal area hyaline for the most part, and some pale spots around the margins, especially along the apical. Posterior wings nearly entirely infusate.

The apical margins in both pairs of wings are excised, in the inferior, very lightly. The dorsal margins of the superior pair are also deeply excised to about the middle, forming there a conspicuous rounded lobe, after which they are slightly concave to the base. The nervuration is black and distinct, and hardly perceptibly furnished with hairs. There are 6 sectors to the radius. (Plate IV. fig. 7.)

Expanse 12 mm.

HAB. Kilauea, Hawaii (4000 ft.); 1 ♀.

(6) *Nesomicromus fulvescens*, sp. nov.

Dark brown with pale markings, antennae and legs pale. Anterior wings pale yellowish-brown, largely but not deeply infusate from the region of the inner gradate series to the apical margin. The outer gradate nervules are blackish and infusate,

forming a distinct transverse dark line, the dorsal margin near the base is also dark, as also spots on the costa, radius, and the cubital nervures. Posterior wings subhyaline, with rather pale nervuration, the outer series of gradate nervules darker.

Anterior and posterior wings very broad in proportion to their length, their apical margins hardly perceptibly emarginate. In the former the radius gives off 5 sectors, the 5th twice furcate before reaching the outer series of gradate nervules.

No doubt some examples of this species will have 6 sectors to the radius.

Expanse 16.5 mm.

Differs from *N. drepanoides* and *angustipennis*, much as *N. latipennis* does from *N. hawaiiensis*.

HAB. Waianae Mts., Oahu (3000 ft.); 1 ♀.

(7) *Nesomicromus bellulus*, sp. nov.

Black, or more or less brown, head and sometimes the prothorax with pale spots, legs pale, front and middle tibiae with two distinct black rings. Antennae with the two first joints black, the rest pale at their base, and dark at the apex. Anterior wings ♂ whitish, subtransparent, iridescent, with a large dark irregular and broken blotch at the base, and another more or less evident at the apex, bounded inwardly by the suffused nervules of the outer gradate series. All the nervuration with alternating dark and pale spaces, the dark ones on the radius very distinct. In the ♀ the anterior wings are much suffused with ochreous-brown, a round spot between the upper parts of the two gradate series being less suffused, but not very distinct. The posterior wings are transparent and iridescent, infumate at the extreme base along the dorsal margin, and their nervuration is to a large extent pale, becoming dark towards the apex. In the ♀ these wings are more clouded, especially along the dorsal margins, and the nervuration is on the whole darker.

The anterior wings are simply rounded at their apices, the apical margin not at all emarginate, but forming a continuous curve with the hind margin. There are 5 sectors to the radius, sometimes 6, at least on one side.

Abdomen ♂ with the terminal appendices yellow; their apices very narrow and somewhat produced, slightly turned upwards and inwards and subtuberculate. The spines are long and very fine, their extremities curved upwards, but they do not extend backwards so far as the apices of the appendices themselves. (Plate IV. fig. 8.)

Expanse 16—17 mm.

HAB. Haleakala, Maui (5000 ft.); very rare, 3 ♂, 1 ♀ taken.

(8) *Nesomicromus molokaiensis*, sp. nov.

Female, very closely allied to the preceding, the anterior wings much more infusate, dark brown in colour, with paler markings, the chief of which is a roundish spot near the apex, between the two gradate series. The posterior wings are entirely infumate, except for a pale apical spot on each, corresponding to those on the front wings, their nervuration is chiefly dark, and the nervures do not bear alternate light and dark spots, although some are entirely pale.

In the anterior wings the radius has 6 sectors.

Expanse 16.5 mm.

HAB. Molokai, above 4000 ft.; 1 ♀ taken in June, 1893. It is possible that this form may prove to be a variety of the preceding species.

(9) *Nesomicromus minor*, sp. nov.

Female closely allied to *N. bellulus*, but smaller, the wings much shorter, the anterior pair for the most part infumate, costal area and the upper part of the wing below and along the radius clearer.

Five sectors to the radius, the sectors themselves, at least towards the base, with alternate dark and light spaces, as also the radius. Posterior wings entirely, but lightly infumate, except for an ill-defined pale spot near the apex. Nervuration for the most part dark, without distinct alternating light and dark spaces.

Antennae pale, testaceous, the joints infusate at their apices, the two basal joints brownish.

Expanse 14 mm.

HAB. Waianae mountains, Oahu (3000 ft.); 1 ♀ taken in February, 1896.

(10) *Nesomicromus infumatus*, sp. nov.

Female closely allied to *N. bellulus*, anterior wings darkly infumate, with only sparse small pale spots, especially along the dorsal margin; costal area paler than the rest of the wing; at the base there are some dark markings, and the gradate nervules are distinct, as two zigzag transverse lines, darker than the ground colour.

The wings are very narrow in proportion to their length. There are 5 or 6 sectors to the radius (5 one side and 6 the other).

Posterior wings infumate, but transparent, no trace of a paler apical spot, the cubitus posticus very strong, black, except at the extreme base.

Two basal joints of antennae dark, the other joints infusate, slightly paler at their bases.

Expanse 16 mm.

HAB. Haleakala, Maui (5000 ft.); 1 ♀ taken in Oct. 1896.

(11) *Nesomicromus longispinosus*, sp. nov.

Dark brown or blackish, antennae, including the two basal joints, testaceous, the apices of the joints lightly infusate. Legs testaceous, front and intermediate tibiae largely fuscous.

Anterior wings brownish-grey, nervuration for the most part dark, but interrupted by pale spots, radius very distinctly alternately light and dark. At the extreme base of the dorsal margin and about the cubitus towards its base, there is more or less dark infuscation, and one or both of the series of gradate nervules are more or less infusate, and form dark lines. The wings are rounded at the apex, and the radius gives off 6 sectors.

Posterior wings hyaline, nervuration pale, but darker along the outer series of gradate nervules, so as to form an evident dark line. Radius connected with the sector by several transverse nervules.

♂ appendices pale, narrow, the spines unusually strongly developed, and very finely spinulose along one edge, very long, extending far behind the apices of the appendices, and crossing one another. (Plate IV. fig. 15.)

Expanse of ♂ 13 mm.; ♀ 15 mm.

HAB. Kilauea, Hawaii (4000 ft.); 1 ♂ and 1 ♀ taken. Remarkable for the long spines of the ♂ appendices, and the additional transverse nervules in the posterior wings of both sexes.

(12) *Nesomicromus haleakalae*, sp. nov.

Female closely allied to the preceding, rather larger and with the anterior wings more grey, less tinged with brown.

The black markings of the wings are more distinct, the dark markings along the cubitus forming with the blackish suffusion along the gradate nervules of the inner series a distinct curved blackish line. The radius gives off 5 sectors, and the elongate cellules formed between the two series of gradate nervules, are evidently less narrow and numerous than those of the preceding species.

Posterior wings very much as in *N. longispinosus*, nearly hyaline, the radius and sector connected by several transverse nervules.

The antennae agree with those of the preceding species in having the two basal joints testaceous, but the rest are much darker, pale narrowly at the base.

Expanse 16 mm.

HAB. Haleakala, Maui (4000 ft.); 1 ♀ taken in April, 1894.

(13) *Nesomicromus brunnescens*, sp. nov.

Brown or blackish brown, legs and antennae testaceous, the joints of the latter infusate on their apical portion.

Anterior wings brown, or brownish grey (the latter colour probably only in examples not fully mature), rounded at their apices, radius giving off 7—9 sectors, the gradate nervules forming two obliquely transverse, fine dark lines, sometimes very indistinct, the cellules between the two series very narrow in proportion to their length.

Posterior wings subhyaline, somewhat iridescent, nervuration light brown or yellowish, the outer series of gradate nervules darker.

♂ appendices narrow towards the apex, not strongly produced, their spines somewhat strong, curved upwards, serrulate, and extending back to the apices of the appendices or even slightly beyond them. (Plate IV. fig. 9.)

Expanse 14—16 mm.

HAB. Molokāi, Lanai, and Haleakala, Maui. Rare (2000—5000 ft.).

(14) *Nesomicromus rubrinervis*, sp. nov.

Head, thorax, legs and antennae testaceous, abdomen darker.

Anterior wings narrow, their apices rounded, pale brown, tinged with pink, the nervuration pink. Radius with four sectors. Nervules of inner gradate series subinfusate, forming a faint dark line. In this series four of the transverse nervules are nearly continuous and form a slightly oblique line, but the two upper ones of the series are greatly separated from the four lower, and from one another. Posterior wings nearly hyaline, the nervuration and pterostigma pink.

Spines of the appendices of ♂ reaching about to their apex, and curved upwards.

Expanse 13—14.5 mm.

Var. *a*. Dark brown in colour, wings dark, shorter and wider than in the type, pterostigmata and nervuration pink. Radius with 5 sectors.

The dark colour may really be normal, the two examples described above being possibly immature. The pinkish tinge to the wings and the condition of the inner series of gradate nervules is so similar, that I have little doubt that the two forms are one species, in spite of the additional sector to the radius.

Expanse 14 mm.

HAB. Kilauea, Hawaii (4000 ft.); 1 ♂ 2 ♀.

(15) *Nesomicromus forcipatus*, sp. nov.

Head, thorax and abdomen all pale, substestaceous. Basal joint of the antennae suffused with pink.

Anterior wings rounded at the apex, dull yellowish, with obscure fuscous spots. Nervuration pale, interrupted by spaces of a pink colour. Radius with 4 sectors. Posterior wings with pale nervuration, more or less pink in parts.

Appendices of ♂ long and strong, of about equal width (in lateral view) from near the base to the apex, their extremities slightly turned inwards, the spines on their inferior margin near the base very short, not nearly extending back to their apices. (Plate IV. figs. 14 & 14a.)

Expanse of ♂ 11 mm. (♀ unknown).

HAB. Makaweli, Kauai (above 2000 ft.); 1 ♂ taken. The form of the appendices will distinguish it at a glance from any other species.

(16) *Nesomicromus distinctus*, sp. nov.

Female, with the head and thorax yellowish-brown, metathorax and abdomen darker. Legs and antennae testaceous.

Anterior wings rounded at their apices, pale yellowish-brown; the outer series of gradate nervules black, and with blackish infuscation around them, forming a very distinct, and but slightly oblique, transverse dark line. Inner series hardly infuscate. Radius with distinct black spots at the points of origin of the sectors, which are five in number. Posterior wings pale, subhyaline, pterostigma and nervuration pink, nervures in the region of the outer gradate series deep black, forming a conspicuous curved marking at the apices of the wings.

Expanse 14 mm.

HAB. A single ♀ taken in the mountains on Molokai, August, 1893.

(17) *Nesomicromus subochraceus*, sp. nov.

Head and thorax yellowish or testaceous, abdomen generally darker, legs and antennae testaceous, the latter with darker annulation.

Anterior wings rounded at the apex, pale greyish-fulvous, more or less mottled with fuscous. Nervures alternately dark and light; radius with 4 sectors, the number being constant in the series examined. Posterior wings hyaline and iridescent with very pale nervuration, the nervures near the apical margin becoming black and forming a distinct marking.

♂ appendices of the usual form, the spines hardly reaching to their apex. Apical ventral segment narrow, tongue-like. (Plate IV. fig. 10.)

Expanse 13—16 mm.

HAB. Molokai, Maui, and Hawaii (from 3000—5000 ft.).

(18) *Nesomicromus stenopteryx*, sp. nov.

Small, blackish, antennae and the posterior legs testaceous, anterior and middle tibiae and femora for the most part dark, their tarsi testaceous.

Wings very narrow; anterior pair rounded at the apex, greyish-fuscous, slightly fulvescent, with a black streak from the base, uniting with the dark inner series of gradate nervules, to form a curved dark line. Radius with 5 sectors, nervuration dark, interrupted by pale spaces. Posterior wings subhyaline, very lightly infumate, nervuration somewhat dark for the most part, the nervures not conspicuously blackened towards their apices; apical margin very faintly, but just perceptibly excised.

♂ with the spines of the appendices, somewhat strong, extending to their apices, crossing each other towards the apex.

Expanse 11 mm.

HAB. Haleakala, Maui (5000 ft.); 1 ♂.

(19) *Nesomicromus minimus*, sp. nov.

Usually of a dark brown or black colour, sometimes paler, prothorax generally with brown or yellowish markings in the darker specimens.

Anterior wings rounded at the apex, narrow, greyish, or yellowish-grey, near the base with two small black spots, one above the other and close together, situated one on the cubitus anticus the other on the cubitus posticus. Other black or fuscous spots are often present, but these are the most conspicuous, and apparently are never absent. Radius normally with 4, rarely with 3 sectors.

Posterior wings hyaline, nervuration pale and inconspicuous, but towards the apical margin the nervures become black, and form a delicate marking. Pterostigma often quite pallid and inconspicuous, but passing from yellow in some to testaceous in others, and then very conspicuous.

♂ with the appendices of the usual form, their spines very finely serrulate, curved upwards, extending slightly beyond their apices. (Plate IV. fig. 11.)

Expanse 10—14 mm.

HAB. Mountains of Molokai and Hawaii (3000—4000 ft.).

## PSEUDOPSECTRA, gen. nov.

Allied to *Nesomicromus*. Antennae longer than the anterior wings. Maxillary palpi with the terminal joint long, acuminate, twice as long as the preceding. Prothorax short.

Anterior wings very short, rounded at the apex, strongly convex above, and concave beneath, coriaceous and opaque, costal and apical margins fringed, the dorsal one bare. Nervuration without hairs. Costal area with no recurrent nervule at the base, and not strongly dilated. Six or seven sectors to the radius.

Posterior wings very minute in both sexes, forming small subtriangular lobes.

♂ characters as in *Nesomicromus*, the appendices each furnished towards the base on their inferior margin with an upturned spine, which is finely serrulate.

(1) *Pseudopsectra lobipennis*, sp. nov.

Brown or nearly black, the legs and antennae testaceous, the latter with darker annulations, the former with the front and intermediate tibiae with more or less distinct fuscous markings.

Anterior wings brown or yellowish-brown, gradate nervules infusate forming dark lines, nervuration with alternate darker and paler spaces, and there are distinct dark spots placed all round the margins of the wings. Posterior wings subtriangular narrowly rounded at the apex, with one very thick longitudinal nervure, and one or two others much less distinct.

Appendices of ♂ short, clothed with long hairs, their spines strongly developed, crossing one another, and extending to the apices of the appendices. (Plate IV. fig. 12.)

Expanse 9 mm.

HAB. Haleakala, Maui (5000 ft.). One ♂ and one ♀ taken.

## NESOTHAUMA, gen. nov.

Antennae short, apical joint of maxillary palpi long, about twice as long as the preceding. Head and thorax strongly, densely and roughly punctured.

Prothorax bilobate in front. Anterior wings very small, their texture almost that of the elytra of a Coleopterous insect, the dorsal margin very strongly rounded, the costal margin much less strongly. Their surface is strongly convex, but somewhat depressed along the margins, which are reflexed. At the base, for about one-third its length, the wing is strongly compressed into a strong longitudinal carina, which in the

natural position of the wings marks off a dorsal from a lateral field. The nervuration is not to be definitely made out, but the transverse nervules are excessively numerous and divide the wing up into great numbers of small square or subcircular cellules; the nervures bear no hairs, nor is there any trace of a marginal fringe. Posterior wings, none.

The ♂ characters are similar to those of *Nesomicromus* and *Pseudopsectra*.

(1) *Nesothauma haleakalae*, sp. nov.

Black, head with pale markings and sometimes the thorax. Antennae variable in colour, the basal joint sometimes black, sometimes testaceous.

Wings black with yellow markings, or yellow with black and fuscous markings, very variable in colour. (Plate IV. figs. 13, 13a & 13b.)

Appendices of ♂ narrow towards the apex, and pale in colour, their spines slender, long, crossing each other, and extending considerably behind the extremity of the appendices.

Length about 4 mm. Expanse 6—7 mm.

HAB. Haleakala, Maui (5000 ft.). Rare.

CHRYSOPIDES.

ANOMALOCHRYSA M<sup>c</sup>Lachl.

(1) *Anomalochrysa princeps*, sp. nov.

Head, thorax, abdomen, legs and antennae flavous. A large species of slender form, but variable in size.

Prothorax with pale and rather long pubescence, gradually attenuate from the base forwards, and with a transverse impressed line near the base.

Wings with pale nervuration, the anterior much broader than the posterior, the latter subfalcate. The former are ornamented with sparse black, or blackish, spots. Their nervuration is not conspicuous, many of the nervules being in part, or wholly, almost colourless, and for the rest of a pale yellow colour, the whole set with pale hairs. The gradate nervules form four longitudinal rows of cellules, the two middle ones sometimes more or less confused, and one or other of them incomplete. Dividing nervule of third cubital cellule received in the apical side of the cellule, instead of in the upper (i.e. the cubital nervure), as is usual in the genus. Posterior wings subfalcate, three distinct rows of cellules formed by the gradate nervules, a fourth sometimes more or less indicated. All the pterostigmata pallid, the wings subhyaline, tinged with yellow.

Abdomen in ♂ with pale pubescence, its apical dorsal plate not strongly dilated, erect, clothed along the margins with pale hairs, and armed, on either side, on the margin at the base beneath with a long fine spine, the apex of which is strongly incurved. Apical ventral valve narrow, tongue-like, not closed against the dorsal plate, its surface clothed with long pale hairs. (Plate III. fig. 1 and Plate IV. figs. 20 & 20a.)

Length 11—14 mm. Expanse 33—43 mm.

HAB. Hawaii; various localities in dense and damp forests (2000—3000 ft.).

(2) *Anomalochrysa molokaiensis*, sp. nov.

Closely allied to the preceding, flavous with a bright sulphur-yellow median longitudinal stripe extending the whole length of the insect. May be distinguished at once from the preceding by the condition of the third cubital cellule, which is of the usual form, the dividing nervule received by the cubitus.

The wings have no black dots. The nervuration is rather more complex; there are four rows of cellules and indications of a fifth formed by the gradate nervules in the anterior wings; four more or less complete rows in the posterior.

Expanse of ♀ about 43 mm.

HAB. Mountains of Molokai (4000 ft.). A single ♀ found drowning in a pool of water.

(3) *Anomalochrysa sylvicola*, sp. nov.

Flavous, with a median longitudinal stripe of a sulphur-yellow colour more or less distinct.

Allied to the preceding species but smaller, the wings of very similar shape, the posterior pair very distinctly pointed at their apex. Nervuration and hairs pale, but the gradate nervules in the anterior wings are more or less black or blackish, and form evidently four longitudinal rows of cellules with a tendency to a fifth, the intermediate series being more or less irregular; posterior wings with four, more or less complete, rows, one of these sometimes consisting of but few cellules. In the anterior wings the gradate nervules (except the lowest series slightly), although dark themselves, have not an evident infuscation along their margins. Abdomen clothed with pale hairs, the apical dorsal plate not greatly dilated, formed much as in the preceding. (Plate III. fig. 2.)

Expanse 35—37 mm.

HAB. High plateau of Kauai (4000 ft.).

(4) *Anomalochrysa debilis*, sp. nov.

Form and colour as in *A. sylvicola* (the yellow longitudinal stripe not always visible in dried examples), but considerably smaller. Nervuration pale; gradate nervules in the anterior wings black or dark forming four rows of cellules, the two middle ones not generally completely separated; posterior wings with three rows. All the cellules in the gradate series distinctly but lightly infuscate on each side of the gradate nervules. Abdomen clothed with pale hairs, apical dorsal plate of ♂ not strongly dilated, erect, the spine on each side at the base beneath, exceedingly fine and hair-like, both dorsal and ventral plates clothed with pale hairs.

Length 8 mm. Expanse 24—27 mm.

HAB. Kona, Hawaii (about 3000 ft.).

(5) *Anomalochrysa peles*, sp. nov.

Form, colour and general appearance much as in the two preceding species. From *A. sylvicola* it may be at once distinguished by the infuscation of the front wings, which is more conspicuous than in *A. debilis*, nearly all the cellules of the anterior wings being narrowly but distinctly clouded along the nervules; and from either of those species it may be known by the form of the third cubital cellule, the apical portion of which has its apical and inferior angle strongly produced outwardly. Of the cellules formed by the gradate nervules the upper and lower rows are distinct and very similar in size; between these there are at least three other rows more or less confused. In the posterior wings four rows are more or less evident. Abdomen of ♂ much as in the preceding species. In the only example I have seen, the basal joint of the antennae, the head, and front of the prothorax, are darker in colour, with a reddish tinge, but this is hardly likely to be a constant character. The hairs on the nervures of the wings are rather long and conspicuous. Ventral valve of apical abdominal segment with long pale hairs.

Expanse 32 mm.

HAB. Kilauea, Hawaii; a single ♂ taken.

(6) *Anomalochrysa montana* Blackb.

*Anomalochrysa montana* Blackburn, Ann. Nat. Hist. (5) XIV. (1884), p. 419.

HAB. Mauna Loa, Hawaii, at an elevation of nearly 7000 ft. (Blackburn).  
Kilauea, Hawaii (4000 ft.).

(7) *Anomalochrysa angulicosta*, sp. nov.

Thorax, abdomen, legs and antennae yellowish, probably more or less green in life, as traces of that colour can still be detected on the metathorax of the ♀. Prothorax rather short.

Wings somewhat broad, costal margin in the ♂ angulated about the middle, the costal area being suddenly narrowed at that point. In the ♀ the costal margin is simple except that it is perceptibly but slightly emarginate before the pterostigma. Nervuration pale yellowish or green, pterostigma pale.

In the anterior wings the gradate nervules form three distinct rows of cellules, whereof the upper are extremely high, the lower towards the apex show a tendency to further division. In the posterior wings there are also three rows. All the cellules of the anterior wings containing fuscous spots or lines. Apical portion of the third cubital cellule pentagonal. Abdomen with pale pubescence, the apical ventral valve with long hairs. (Plate III. fig. 3.)

Expanse 32—34 mm.

HAB. Mountains of Molokai; 1 ♀ taken at an elevation of 4500 ft. in June, 1893, and 1 ♂ at 4000 ft. June, 1896.

(8) *Anomalochrysa cognata*, sp. nov.

Female very closely allied to the preceding, but smaller and with narrower wings. Colour very similar, probably with a bright sulphur-yellow mediodorsal stripe in life. Anterior wings with the cellules infusate along their nervules; gradate nervules forming four rows of cellules, of which those of the upper row are not very high, and have their sides straight (not bent as in the preceding); the third row consists of small and somewhat irregular cellules. In the posterior wings there are three rows. Dividing nervule of the third cubital cellule meeting its apical side, somewhat as in *A. princeps*, but nearer its upper extremity. The lower portion of this cellule is therefore quadrangular, instead of pentagonal, as is usual in the genus.

Expanse 31 mm.

HAB. Mountains near Honolulu (3000 ft.); 1 ♀ taken in 1896.

(9) *Anomalochrysa rufescens* M<sup>c</sup>Lachl.

*Anomalochrysa rufescens*, M<sup>c</sup>Lachlan, Ann. Nat. Hist. (5) XII. (1883), p. 300.

HAB. Hawaiian Islands (loc.?). Blackburn.

(10) *Anomalochrysa viridis*, sp. nov.

Green in life, generally fading after drying to yellow, testaceous, or brown. Prothorax usually with more or less distinct brown spots.

Posterior wings considerably narrower than the anterior pair, pointed at the apex. Pterostigmata olivaceous in mature examples, at least in the ♀, paler apparently in the ♂.

The nervuration although fine is clear and conspicuous in mature examples, but is much darker in some than in others, and is set with very fine hairs, which are evidently easily abraded, being much more numerous in pallid examples which have recently emerged. In the anterior wings, which are moderately broad, but somewhat variable in this respect, four rows of longitudinal cellules are formed by the gradate nervules, of which the two intermediate rows consist of cellules not much higher than wide, and are often more or less confused and incomplete, the nervules, which divide them, failing towards the apex of the wing. One example has three rows only. Posterior wings with three rows.

The abdomen is clothed with subdecumbent pubescence, the apical dorsal plate in the ♂, is erect, not very wide, and fringed with dark hairs, which on its ventral (or inner) surface at the extreme base extend across it for some distance on each side. I can detect no sign of the two fine lateral spines which are present in all the preceding species examined, at about the spot where in this species the fringe of hairs is directed transversely, as just mentioned. These internally-placed hairs are however themselves of a spinose nature, and at their apices are beautifully curved inwards. The apical ventral valve is clothed with somewhat long hairs. (Plate III. fig. 4.)

Expanse 28—32 mm.

HAB. Mountains of Kauai (4000 ft.).

(11) *Anomalochrysa soror*, sp. nov.

Closely allied to the preceding, but probably of smaller average size, with narrower wings, and the nervuration, which is green, paler. It may be known at once by the shape of the wings which are almost perfectly rounded at their apices, instead of forming a distinct angle thereat.

The form and pubescence of the abdomen is much like that of the preceding, the apical dorsal plate is furnished with similar spinose hairs, which are situated along the

lateral margins of the plate beneath, forming a longitudinal row; their colour is dark and their apices are strongly curved.

The characters of the nervuration are those of the preceding species.

Expanse 25—28 mm.

HAB. Haleakala, Maui, 5000 ft.; 3 ♂, 1 ♀. Probably common but overlooked.

(12) *Anomalochrysa frater*, sp. nov.

Closely allied to and with the general appearance of *A. viridis*, which it resembles in the form of the wings, and in the nervuration, and varies in the same way. The pterostigmata are sometimes pale, sometimes olivaceous and very distinct.

The ♂ is easily known by the pubescence of the abdominal segments, the apical portions of which are covered especially towards the sides with long and generally black pubescence, which is directed towards the base of the abdomen, while the basal half of each segment has only short and inconspicuous hairs. The apical dorsal plate has curved hairs, similar to those of the two preceding species, but they are differently disposed, occupying a considerable portion of the lower surface of the plate.

I see no constant differences between the ♀ of this species and that of *A. viridis*, in spite of the conspicuous distinctions between the ♂♂, but the abdomen of the former sex is invariably so greatly distorted in dried examples, that it is useless for the investigation of specific characters. (Plate IV. fig. 18.)

Expanse 26—32 mm.

HAB. Island of Hawaii (2000—4000 ft.); common and generally distributed.

(13) *Anomalochrysa nana*, sp. nov.

A very small species, bright apple-green in life, with a sulphur-yellow mediodorsal stripe from the front of the vertex to the apex of the abdomen. In the dried example the body has for the most part become testaceous, or yellowish, and the yellow line has to a considerable extent become indistinct, or disappeared.

Anterior wings narrow, obtuse at the apex, hyaline and somewhat iridescent, the nervuration green partly faded to yellowish, and rather conspicuously clothed with hairs, which are not very closely set. Gradate nervules very regular, forming an upper and a lower entire row of cellules, and between these other two rows for the length of a few cellules, after which one of the series of gradate nervules fails and there is only a single row of cellules between the upper and lower. There are only about 19 antepostigmatic cellules.

In the posterior wings the nervuration is less distinct. The gradate nervules form three rows of cellules.

Abdomen clothed with fine pale hairs.

Expanse 23 mm.

HAB. Molokai mountains (3000 ft.), June, 1892; 1 ♀ taken.

(14) *Anomalochrysa paurosticta*, sp. nov.

Yellow, pronotum with some fuscous markings, meso- and metanota towards the sides greenish. Head, legs and antennae concolorous with the body.

Wings hyaline, iridescent, with yellow nervuration and pterostigmata, and a few small black spots on the basal portion of the anterior pair, the spots being situated on the nervuration, the gradate nervules are also mostly black, and form four rows of cellules, of which the upper and lower are complete, the part between them not being divided for its whole length. The third cubital cellule has the apical inferior angle greatly produced, so that the length of the upper side of the whole cellule is about equal to the lower. The posterior wings are distinctly pointed at the apex, and have three rows of cellules in place of the four of the anterior. These rows are quite distinct, although the two lower may not be completely divided. The nervuration of the wings is set somewhat sparsely with rather long hairs, which are not at all conspicuous.

Male unknown.

Expanse 37 mm.

HAB. Olaa, Hawaii (2000 ft.); 1 ♀, December, 1896.

(15) *Anomalochrysa longipennis*, sp. nov.

Dark brown, base of antennae and front legs rosy red, thorax especially the prothorax also with red markings, meso- and metathorax also partly pale. (Plate III. fig. 5.)

Wings hyaline, but not perfectly transparent, the anterior pair with a few intracellular dark spots along the dorsal margin. Nervuration green in life, more or less yellow after drying, very similar to that of the preceding species, to which it is very closely allied. It differs from *A. paurosticta* as follows: the dark spots on the wings are placed within the cellules, instead of on the nervuration, the wings themselves are longer, the hairs on the nervules are evidently closer and more conspicuous, the third cubital cellule is more widely produced apically, and the thickening of the dorsal

margin near the base of the wing is more conspicuous, and closes, or nearly closes, the apical portion of the cellule above it.

Male unknown.

EXpanse 42 mm.

The entirely different colour of this insect and the preceding cannot be taken into account in separating the two, as they belong to a group in which different individuals of the same species often show differences in coloration precisely similar to that exhibited by these two insects, but I believe they are really distinct.

HAB. Kilauea, Hawaii; 1 ♀ taken in August, 1896.

(16) *Anomalochrysa maclachlani* Blackb.

*Anomalochrysa maclachlani* Blackburn, Ann. Nat. Hist. (5) xiv. (1884), p. 418.

HAB. Mauna Loa, Hawaii (6000 ft.) in May, 1882. (Blackburn.)

(17) *Anomalochrysa deceptor*, sp. nov.

This is a very variable species, and the extreme forms are totally unlike one another in general appearance.

The following three forms of coloration no doubt constantly occur.

(1) Head, thorax and abdomen entirely flavous, or partly greenish (in life probably sometimes entirely green). (2) Abdomen and sides of the thorax yellowish or green, face yellow or pink, and a crimson stripe extending from the front of the vertex of the head to the mesothorax, antennae at the base in these examples often pink. (3) Whole body dark brown, or with the meso- and metathorax, or one of these parts more or less pale, green or yellow.

Intermediate forms occur, e.g. a large part of the thorax may be yellow or greenish, the abdomen dark, and the face pink, &c.

The wings also vary, and may be hyaline and colourless, or themselves slightly greenish, or they may be whitish and opaque; nor is this condition of the wings confined to examples with a particular coloration of the body. These white-winged examples generally have dark spots on the anterior pair, but this is not invariably the case, and the spots are generally few, and confined to the base of the wing along the dorsal margin, but sometimes are more extensive.

The nervuration is always pale, green or yellow, except that the gradate nervules are usually, if not always, more or less dark, and the dorsal margin of the anterior wings is sometimes pink.

Anterior wings in the ♀ long and narrow, generally somewhat broader in the ♂; the gradate nervures form four rows of cellules, in the upper of which the cellules are very high and narrow; the intermediate rows are subject to further division, so that in some examples as many as 5 or 6 cellules may sometimes be seen in a transverse line at some portion of the wing. In one example there are 5 complete rows.

In the posterior wings there are also 4 rows, but one is often incomplete or may be entirely obsolete. The superior row, as in the anterior wings, consists of extremely high and narrow cellules, with the sides more or less curved.

The third cubital cellule has its inferior apical angle considerably produced, and the dividing nervure is evidently shorter than its apical margin (i.e. the nervure between it and the fourth).

Apical dorsal plate of ♂ strongly dilated, with very short hairs on its margin above, on the margin beneath they are also short, and form a fringe directed inwardly. Apical ventral valve tongue-like, its surface nearly glabrous. (Plate III, fig. 6 and Plate IV, figs. 19 & 19*a*.)

Expanse 33—38 mm.

HAB. Hawaii, various localities (2000—4000 ft.). Haleakala, Maui (5000 ft.). Koolau range, Oahu (above 2000 ft.).

(18) *Anomalochrysa simillima*, sp. nov.

Extremely closely allied to the preceding, flavous, fading to testaceous, or brown, the latter variety with the wings whitish, and subopaque. Probably varies in colour like the preceding.

On the anterior wings 5 rows of cellules result from the series of gradate nervures, and there is a tendency to further division.

The species may be distinguished by the following characters; the cellules of the upper row formed by the gradate nervures, especially in the hind wings, are less high, and not so narrow in proportion to their height. The third cubital cellule is less produced (as a rule hardly at all) at its inferior apical angle, and the dividing nervure is about equal to the apical side of the cellule.

In this, and the other species of the genus, the dorsal margin of the anterior wing is greatly thickened at the base just beyond the petiole, and with the nervure above an elongate cellule is formed. In the preceding species this cellule, although narrow, is distinct and open, but in the present one it is nearly obliterated, owing to the fact that the greatly dilated margin in parts touches, or almost touches, the nervure above.

HAB. High plateau of Kauai (4000 ft.).

(19) *Anomalochrysa gayi*, sp. nov.

Closely allied to *A. deceptor*, and exhibiting analogous variation, but I have not seen any dark-bodied forms such as are found in that species.

Entirely flavous, or the thorax more or less green, sometimes with a bright crimson dorsal stripe on the thorax, and the head and base of the antennae of that colour.

Wings with pale nervuration, green or yellow; anterior pair with 3 very distinct rows of cellules formed by the gradate nervules. Third cubital cellule with its inferior apical angle extremely strongly produced, dividing nervule much shorter than the apical side, and only about one-third the length of the lower side of the cellule.

Posterior wings with 3 more or less complete rows of cellules in the gradate series. Abdominal characters of ♂ as in *A. deceptor*. (Plate III. fig. 7.)

Expanse 32—39 mm.

HAB. High plateau of Kauai. I have much pleasure in naming this distinct species after my friend Mr Francis Gay of Kauai, on whose estate the specimens were captured, and to whom I am indebted for much assistance when working on that island, and for much botanical information.

(20) *Anomalochrysa zoe*, sp. nov.

This species is also closely allied to *A. deceptor* and probably varies in much the same way.

Yellow with a dorsal longitudinal stripe of a brownish colour, extending over the vertex, pro- and mesothorax, or entirely dark, except that the metathorax is more or less greenish, and the apical segments of the abdomen pale. Face, antennae and legs sometimes crimson, as also the dorsal margin of the anterior wings and sometimes of both pairs.

Wings with pale nervuration, green or yellowish, the wings themselves also sometimes with a greenish tinge. Gradate nervules in the anterior pair forming 4 distinct rows of cellules; third cubital cellule with its inferior apical angle strongly produced, but evidently less so than in *A. gayi*, its apical side much longer than the dividing nervule, which is about half as long as the lower side of the cellule. Sometimes there are intracellular spots on the wings, in which case these are less transparent than in unspotted examples, just as was the case in *A. deceptor*.

Posterior wings with three distinct rows of cellules formed by the gradate series.

Expanse 33—39 mm.

HAB. Mountains of Molokai (4000 ft. and upwards). Very rare.

(21) *Anomalochrysa raphidioides*, sp. nov.

Head, legs and antennae usually red in the ♀, the antennae and head sometimes nearly black; in the ♂ the antennae and legs are paler, yellowish, and sometimes also the head. Thorax and abdomen nearly black in the ♀, and sometimes nearly as dark in the ♂, but probably usually paler, the apical dorsal plate yellow.

Wings with very distinct and conspicuous nervuration, in the ♀ nearly entirely dark brown in colour, in the ♂ paler, although many of the nervules are quite dark. The anterior wings are suffused with brown, very conspicuously in the ♀, in the ♂ less deeply, the colour paler (more yellow). The posterior wings are at least for the greater part hyaline and finely iridescent. All the pterostigmata in the ♀ are dark brown or reddish brown, and extremely conspicuous, but much less so in the ♂, and pale in colour.

Prothorax attenuate in front, and conspicuously elongate.

Anterior wings very narrow in the ♀, much wider in the ♂, the gradate nervules form three longitudinal rows of cellules, but the second is often partially divided to form a few cellules of an additional row, and rarely this row is complete. In the posterior wings, which in the ♀ are not much narrower than the anterior, there are three distinct rows, which are usually complete or very nearly so.

The apical dorsal plate of the ♂ is conspicuously dilated, its pubescence pale, somewhat short and inconspicuous. The ventral plate, which is applied to the dorsal, has only very short and inconspicuous hairs. Apex of the abdomen of ♀ reddish. (Plate III. fig. 8.)

Expanse 31—37 mm.

HAB. Kona district of Hawaii, on Mauna Loa and Hualalai, at elevations of 4000 ft. and upwards. I have taken about a dozen examples of this very distinct species, three only being males.

(22) *Anomalochrysa reticulata*, sp. nov.

Dark brown, head more or less red, thorax paler in parts which are probably greenish or yellowish in life; when immature, entirely pale, testaceous, no doubt green or yellow in life. Having seen but two mature, and one immature example I cannot judge of the variation.

Wings hyaline and iridescent, scarcely infusate, pterostigmata olivaceous, nervuration for the most part dark in both pairs of wings, and very clear and distinct throughout. In the anterior wings the gradate nervules form three complete rows of cellules, and in each of the three examples examined another row between the second and third is represented by 3 cellules. The third cubital cellule is scarcely produced at its apical and inferior angle.

In the posterior wings, there are three distinct rows of cellules formed by the gradate nervules, the rows being almost or quite complete. I have not seen a ♂ of this species. It is probably allied to *A. proteus*, but the darker and more distinct nervuration, which is of a simpler character, easily distinguishes it. In size, shape of wings, &c. it resembles that species.

Expanse 35—36 mm. (♀).

HAB. Kona, Hawaii (4000 ft.).

(23) *Anomalochrysa biseriata*, sp. nov.

Dark brown, olivaceous, or more or less testaceous. A rather small species with the wings clear, hyaline, or almost so, and brightly iridescent. In general appearance, but for its smaller size, it greatly resembles the preceding species.

Wings with the nervuration for the most part dark and very distinct. In the anterior pair the gradate nervules form three complete rows of cellules, in the posterior pair only two. In this respect this species agrees with *A. haematura*, but that is readily separated by the crimson terminal segments of the abdomen, and the dense clothing of somewhat long black hairs with which the ventral surface of the abdomen is covered. In *A. biseriata* the hairs on this part are very short, and comparatively inconspicuous. The hairs with which the nervuration is set are very fine and but little evident. (Plate III. fig. 9.)

I have not seen a ♂ of this species.

Expanse 24—27 mm.

HAB. Waianae mountains, Oahu (2000 ft.); 5 ♀ taken.

(24) *Anomalochrysa haematura*, sp. nov.

Female dark brown, or nearly black, head and scape of the antennae red, legs yellow or reddish yellow. Apical segments of the abdomen bright crimson, sometimes yellowish. Pterostigmata pale olivaceous, or brightly pink.

Wings very clear, hyaline, and iridescent, nervuration very distinct, for the most part very dark brown, or black. In the anterior pair the gradate nervules form three rows of cellules, the lower of which consists of 4 or 5 cellules only, the upper of about twice as many. In the posterior wings there are only two rows.

The abdomen is clothed with obscurely-coloured hairs on the dark segments, with pale ones on the apical.

Expanse 27—32 mm.

I have not seen the ♂, but the ♀ is very distinct from that of any other species.

HAB. A single specimen taken in October, 1892, and three more in 1896 in the mountains near Honolulu (3000 ft.). The three latter were all at rest on a low plant.

(25) *Anomalochrysa ornatipennis* Blackb.*Anomalochrysa ornatipennis* Blackburn, Ann. Nat. Hist. xiv. (1884), p. 419.

HAB. Mauna Loa, Hawaii (4000 ft.); 1 ♀ (Blackburn).

(26) *Anomalochrysa hepatica* M<sup>c</sup>Lachl.*Anomalochrysa hepatica* M<sup>c</sup>Lachlan, Ann. Nat. Hist. xii. (1883), p. 299.

(Plate III. fig. 10 and Plate IV. fig. 17.)

HAB. Haleakala, Maui (4000—5000 ft.). Not rare.

(27) *Anomalochrysa proteus*, sp. nov.

An extremely variable species, entirely yellow, green, or liver-coloured, or reddish, often particoloured, the thorax at least being usually more or less yellow or green in some parts.

Wings normally hyaline, colourless or nearly so, sometimes however suffused with pale brown, and sometimes with few or many intracellular blotches of a brown colour. In these spotted examples the wings tend (as has been noticed in regard to other species) to become white and opaque.

In the anterior wings of the ♂ the gradate nervules divide off 5 rows of cellules, sometimes a sixth is partly formed, rarely there are only 4 complete, and a fifth indicated by a few cells. The cellules of the middle rows are generally more or less irregular and confused. In the ♀ there are 4 rows and indications of a fifth, but the wing in this sex sometimes has the nervuration as complicated as in the ♂, although in general there seems to be a tendency to a diminution of the number of cellules.

Posterior wings with 4 rows in the same parts, sometimes more or less of a fifth in the ♂; in the ♀ 4, with one more or less incomplete, sometimes only 3.

The nervuration in general is pale, yellow or green, but some of the nervules are more or less dark, at least those of the gradate series. The third cubital cellule has its inferior apical angle not at all, or only a little produced, and the dividing nervule is equal, or nearly equal, to the apical side of the cellule.

Abdomen in the ♂ somewhat densely clothed with pubescence, which is generally black or dark, and is always directed towards the base of the abdomen, the hairs being suberect. The apical dorsal plate is strongly dilated and its ventral valve glabrous or nearly so. The ♀ in life probably somewhat resembles the ♂ in the character of the abdominal pubescence, as appears from the better preserved examples, but as a rule the

abdomen in this sex is greatly distorted in drying, and the characters are lost. (Plate III. figs. 11, 12 & 13.)

Expanse from about 29 to about 37 mm.

HAB. Oahu and Hawaii. Found at elevations of from 2000—8000 ft. I have examined about 100 examples of this species. The Oahuan specimens seem to be of smaller average size.

(28) *Anomalochrysa fulvescens*, sp. nov.

Face and basal joint of the antennae red, brown, or yellowish, pro- and mesothorax generally red or reddish brown, the sides of the latter and the metathorax often pale, testaceous or yellowish. Abdomen varying in colour from yellow to dark brown. Legs varying in colour from pale yellow to red.

Anterior wings strongly fulvescent, often more or less spotted with dark fuscous, or banded, or even entirely suffused with that colour, but always with a fulvous tinge.

The nervuration in the field of the gradate nervules is extremely complicated, and consists for the greater part of large numbers of small cellules, most of which are but little higher than wide, forming a dense reticulum, and not regularly disposed in rows. The third cubital cellule has its basal side exceedingly strongly thickened in the ♂, and in both sexes the dividing nervule almost meets the upper extremity of the apical side, both being received in an evident thickening on the cubital nervure. The colour of the nervuration varies from yellow to brown through bright pink. The posterior wings are hyaline and iridescent distinctly tinged with fulvous, but much less deeply coloured than the anterior pair. Their nervuration is also irregular and confused, but the gradate nervules are generally less numerous than in the anterior wings. The pterostigmata vary in colour from very pale yellow to reddish.

In the ♂ the abdomen has only an excessively minute and short pubescence, the apical dorsal plate is not strongly dilated, and has an apical fringe of pale hairs; on its lower margin inwardly it is furnished with a row of spinose hairs, directed inwardly, and with curved apices. The ventral valve with only some short pubescence. (Plate III. figs. 14, 15 & 16.)

Expanse 28 mm. (very small ♂) to 37 mm.

HAB. Haleakala, Maui (4000—5000 ft.). I have examined about 50 examples of this remarkable insect. Of the examples with dark-spotted or banded wings there are no two alike, nor do the markings ever agree on the two sides of the same insect.

(29) *Anomalochrysa rhododora*, sp. nov.

Brown, more or less tinged with red, head, basal joint of the antennae, and front and intermediate legs red.

Wings obtuse, the nervuration pale, somewhat densely set with a conspicuous pubescence. Anterior pair greyish, the nervures, especially those at the base of the wings, and the gradate nervules, with a somewhat faint brownish infuscation. The form of the nervuration is very similar to that of *A. fulvescens*, and the third cubital cellule is as in that species, pterostigmata pale. Posterior wings hyaline and iridescent.

♂ characters much as in the preceding.

Expanse 33—35 mm.

Var. ♀ *xerophylla*, var. nov.

Anterior wings brown and white, opaque; posterior pair, white, dull and opaque, with a few obscurely coloured spots. The colour of the antennae, legs and body is less bright than that of typical examples. The insect in a resting position bears an extraordinary resemblance to a small dead leaf that has been attacked by insects. Although its general appearance is utterly unlike the type, there is no doubt it is an extreme form of that species, the variation being analogous with that of other species of the genus.

Expanse 34 mm.

HAB. Kilauea, Hawaii. Very rare, 1 ♂ 1 ♀ taken; var. *xerophylla* 1 ♀. The species is evidently allied to the preceding, but its general appearance is altogether different.

#### CHRYSOPA Leach.

(1) *Chrysopa microphyta* M<sup>c</sup>Lachl.

*Chrysopa microphyta* M<sup>c</sup>Lachlan, Ann. Nat. Hist. (5) XII. 1883, p. 299.

HAB. Common all over the Islands, in the mountains, and in gardens in Honolulu, and elsewhere. Probably introduced.

#### MYRMELEONIDES.

(1) *Formicaleo perjurus* Walk.

*Myrmeleon perjurus* Walker, Cat. Neuropt. Brit. Mus. 1852, p. 340.

*Formicaleo perjurus* M<sup>c</sup>L., Ann. Nat. Hist. (5) XII. 1883, p. 301.

*Myrmeleon violentus* Walker, op. cit. p. 348; *Formicaleo perjurus* var., M<sup>c</sup>L., Ann. Nat. Hist. (5) XII. 1883, l.c.

HAB. Honolulu, Oahu (Beechey expedition); Maui (Blackburn).

(2) *Formicaleo wilsoni* M<sup>c</sup>Lachl.

*F. wilsoni* M<sup>c</sup>Lachlan, Ann. Nat. Hist. (6) x. 1892, p. 178.

HAB. Hawaii, locally common, from sea-level to 5000 ft. Lanai (Scott B. Wilson).

## ODONATA.

## LIBELLULINA.

## PANTALA Hag.

(1) *Pantala flavescens* Fab.

HAB. Abundant all over the Islands in open country, and in the streets and gardens of Honolulu.

## TRAMEA Hag.

(1) *Tramea lacerata* Hagen.

HAB. All the Islands, in open country on the lowlands.

SYMPETRUM<sup>1</sup> Newm.(1) *Sympetrum blackburni* M<sup>c</sup>Lach.

*Lepthemis blackburni*, M<sup>c</sup>Lachlan, Ann. N. H. (5) XII. (1883), p. 229.

HAB. On all the Islands, in mountain forests, or deep valleys, but not very abundant. The species is variable in colour, size, &c.

## AESCHNINA.

## ANAX Leach.

(1) *Anax junius* Drury.

HAB. Very abundant all over the Islands.

(2) *Anax strenuus* Hagen.

*Anax strenuus*, Hagen, Verh. Ges. Wien, 1867, p. 34 (♀); Blackburn, Ann. N. H. (5) XIV. 1884, p. 413, (♂).

HAB. Kauai, Maui and Hawaii, and probably all the Islands, in the mountains. Not rare but often difficult to catch.

<sup>1</sup> A new genus, *Nesogonia*, Kirby, Ann. Nat. Hist. (7) II. 1898, p. 347, has now been established for this insect.

## AGRIONINA.

## AGRION Fabr.

The dragon-flies of the genus *Agrion* are amongst the most important representatives of the Order of Neuroptera in the Hawaiian Islands. Several species are found on all the more important islands of the group, and the range of many of them extends over several islands; wherein they differ from the greater part of the endemic insects, which are for the most part confined to a single island; or to one or two of those which lie most closely together. At the same time, when a series of examples of a species from different islands is compared, certain more or less constant differences are often observable, especially as regards size.

Perhaps the most interesting facts relate to the earlier stages, or nymphs, which are aquatic and carnivorous. Excluding these dragon-flies and a few water-beetles, the insect fauna of the streams and pools is almost non-existent. The Ephemeridae, Perlidae, and Trichoptera, usually so numerous, are entirely unrepresented in the Islands, although the mountain streams, rising at high altitudes, with their superb waterfalls, and various temperatures, appear admirably adapted for many of these. It is therefore not a little surprising to find the group of dragon-flies so well represented, and that the individuals are so numerous, being on the whole the most conspicuous of all the endemic insects. In the absence of the groups above mentioned, I believe that their main food-supply comes from without, consisting of such creatures as accidentally fall into the water. Under ordinary circumstances this is not great, but after rain, when the streams rise very quickly, food becomes abundant. When the streams, as is often the case, become nearly dry, large numbers of creatures resort to the pools that are left, for the sake of the moisture, and the numbers that come to grief is often astonishing, the whole surface being covered with the drowned and drowning.

There are, however, other species, the nymphs of which live under very different circumstances. These have given up their aquatic life, and live hidden at the bases of the leaves of a liliaceous plant—*Astelia veratroides*. Sometimes a little water is held by the plant around the stem, but more often there is merely a collection of damp earth and dead leaves. These nymphs would even appear to dislike the collections of water, for in wet weather they often crawl half-way up the leaves, instead of remaining at the base, where the water accumulates. They differ in some points from those which frequent the water; they are shorter and stouter, and much more sluggish, and the caudal appendages are very short and thick, differing therein greatly from some of the aquatic species, the appendages of which form beautiful tracheal gills.

On the whole they are without doubt better off as regards a food supply than the aquatic species, for there is generally abundance of animal life around them.

A number of interesting beetles breed only in this plant, and minute young of molluscs and earthworms are generally abundant in the same, as well as the larvae of small moths. Moreover nymphs of various sizes often frequent a single plant, and if hard pressed for food the larger, no doubt, devour the smaller individuals.

In consequence of these habits, some of these species of dragon-flies, although their powers of flight are feeble, may often be seen in numbers in localities remote from water, and where they would not naturally be looked for.

These terrestrial nymphs are able to endure extreme drought. On one occasion when out shooting, having no more convenient receptacle, I carried a number for the greater part of the day in an envelope. In the evening, although very dry, they were still quite lively. They were then placed in a tumbler of water, where they remained on the bottom, not being able to crawl up the sides. Here they remained for a day, apparently as happily as on dry land, when they were taken out and preserved.

M<sup>c</sup>Lachlan (Ann. Nat. Hist. (5) XII. (1883), p. 238) established a new genus *Megalagrion* for the two species *A. blackburni* and *A. oceanicum*, on the character that the post-costal area was complicated by the division of its cellules. We have not adopted that genus on account of the instability of the nervuration in this respect. (Cf. description of *A. kauaiense*, *infra*.)

(1) *Agrion xanthomelas* Selys.

*Agrion* (?) *xanthomelas* Selys, Synop. Agrionines, légion *Agrion*, p. 174.

M<sup>c</sup>Lachlan, Ann. Nat. Hist. (5) XII. 1883, p. 232.

(Plate V. figs. 1, 4 & 4a.)

HAB. Probably occurs all over the Islands. Very common on Oahu, Maui and Hawaii. Found both on the coast and in the mountains as high as 3000 ft.

(2) *Agrion pacificum* M<sup>c</sup>Lachl.

*Agrion* (?) *pacificum* M<sup>c</sup>Lachl., Ann. Nat. Hist. (5) XII. 1883, p. 234.

(Plate V. figs. 6 & 6a.)

HAB. Not so abundant generally as *A. xanthomelas*, but found on all the Islands.

(3) *Agrion hawaiiense* M<sup>c</sup>Lachl.

*Agrion* (?) *hawaiiense* M<sup>c</sup>Lachl., Ann. Nat. Hist. (5) XII. 1883, p. 232.

HAB. "Oahu, at no great elevation above the sea." (Blackburn.) I have not met with this species.

(4) *Agrion nigro-hamatum* Blackb.

*Agrion* (?) *nigro-hamatum* Blackburn, Ann. Nat. Hist. (5) XIV. 1884, p. 414.

(Plate V. figs. 5 & 5a.)

Race *nigro-lineatum*, var. nov.

Of considerably smaller average size than typical specimens and with a distinct black line on the upper side of the femora. This point of difference had already been noticed by Mr Blackburn in his note on the species (*l. c.*), but the other distinctions between the type and his Oahuan examples, as there given, will hardly hold in a series of the two forms.

HAB. Typical examples common on Maui and Molokai. Race *nigro-lineatum* common on Oahu and also found on Hawaii.

OBS. The bright yellow face and the colour of the eyes, which are bright green or turquoise blue on the lower half, and red on the upper, give this species a most remarkable appearance when flying around the streams. The colour of the eyes fades after death.

(5) *Agrion koelense* Blackb.

*Agrion* (?) *koelense*, Blackburn Ann. Nat. Hist. (5) XIV. 1884, p. 417.

This species varies considerably in several of the points that are used in the original description. The number of cellules surmounted by the pterostigma is variable in all, or nearly all, the Hawaiian species and of no specific value here or in other species. The number of cellules between the quadrilateral and nodus is three or four. The post-cubitals are usually 16 or 17 in number. The upper margin of quadrilateral usually about one-third the length of the lower, in the front wings, but more than one-third in the posterior pair. Sometimes, as is also the case in allied species, the ♂ assumes more or less the colour of the ♀, the femora being pale beneath, and the sides of the thorax bearing pale longitudinal stripes as in that sex; in fact these are the only characters of colour by which the ♀ is usually distinguished. The valvules are sometimes pale, sometimes black, their appendages, as also the superior pair, are black.

In the ♂ the superior appendages, viewed laterally, have their upper and lower margins subparallel, the apical angles produced into two processes of which the upper is somewhat more strongly developed than the lower. (Plate V. figs. 7 & 7a.)

HAB. Mountains of Lanai (2000 ft. and upwards) and in the Iao Valley of the West Maui Mountains.

(6) *Agrion asteliae*, sp. nov.

Extremely like the preceding in general appearance, sometimes larger, sometimes of equal size. Post-cubital nervules usually 19 to 21 in the anterior wings, but in one ♀ there are only 14. The ♂ characters are extremely like those of *A. koelense*, but are quite sufficiently distinct by the greater development of the inferior apical process of the superior appendages which is rather larger than the upper process, and both of these processes are somewhat more strongly bent inwards, and also towards each other.

Female with the femora pale beneath, some pale markings on the sides of the thorax and sometimes two lateral longitudinal stripes on the dorsum. Superior appendages black, valvules pale, their appendages black. In one example the abdomen is almost entirely black, in the other the bases of the segments have a very narrow distinct pale band, hardly indicated in the former.

HAB. Mountains of Oahu, 3000 ft. Nymphs taken freely in the leaves of growing plants of *Astelia veratroides*. A single pair taken in copula at Kilauea Hawaii (4000 ft.). The individuals from the two Islands do not altogether agree, but I doubt whether they could be separated, even with a long series of examples.

(7) *Agrion amaurodytum*, sp. nov.

Dull black, or in the ♀ (and rarely in the ♂) greenish black with metallic lustre. ♂ with the head, thorax and base of the abdomen usually more or less covered with a slate-coloured pruinose efflorescence, rarely altogether absent in this sex, though invariably wanting in the ♀. Labrum pale along the apical margin. Sides of face along the inner margin of the eyes below the antennae pale, these markings connected, or nearly so, by a pale line in the ♀. Vertex black, the region of the post-ocular spots occupied usually by two patches of bluish pruinosity. In the ♀ the post-ocular spots are sometimes absent, often very small, but sometimes well-developed, and yellow in colour. Prothorax with a transverse pale line in front in the ♀, and sometimes some spots posteriorly, usually unspotted in the ♂, but occasionally with markings like those of the ♀. Thorax with a yellow stripe on each side of the dorsum in front in the ♀, which is rarely, more or less distinctly, present in the ♂; the sides with pale markings (variable) in the ♀, which are generally less bright in the ♂, and sometimes entirely absent. Legs black in the ♂, the femora more or less pale beneath in the ♀. Wings with 19—21 post-cubital nervules. Four or five cellules between the quadrilateral and nodus. Pterostigma dark, not very elongate. Abdomen in the ♀ with a more or less

distinct very narrow pale band at the base of most of the segments; sometimes these bands appear also in the ♂; 1st and 2nd segments often with a pale spot or line at the sides.

♂ superior appendages as long as the 10th segment, entirely black, or sometimes more or less pale inwardly, the apices bent inwards and armed with an excessively short and minute spine. On the inferior margin about half-way between the apex and base of the appendage there is a stout blunt spine directed inwards, so that the appendages may be looked upon as being produced into a long superior and a short inferior process. The inferior margin, as viewed inwardly, is not at all strongly rounded, so that the upper and lower margins are subparallel. Inferior appendages short, pale or black, their apices directed inwards.

♀ superior appendages black, subacute; valvules pale, their appendages dark.

Var. A. Two or three males taken high up on the ridges of the West Maui Mts. are larger than the typical specimens, and show none of the pale-bluish colour on the dorsum of the thorax and abdomen, which would appear to be the case with specimens from Molokai only when the ♀ colouration is assumed.

Race *Waianae anum*, var. nov. Oahuan specimens from the Waianae Mts. differ from typical ones as follows:

♂ With no bluish pruinose efflorescence. Post-ocular spots sometimes present. Prothorax with pale spots. Dorsum of thorax with longitudinal lateral stripes. Femora pale beneath. Abdomen with distinct narrow pale basal bands to the segments.

♀ Rhinarium and part of the post-clypeus pale, legs almost entirely pale, as also the appendages of the valvules. Abdomen with a yellowish transverse medio-dorsal band on the second segment.

Race *peles*, var. nov.

Much smaller than the preceding forms. Post-cubital nervules usually 13—16. Typically this race exactly resembles the Molokai examples in general appearance, and exhibits similar variation, the pruinose efflorescence being absent, when the markings of the ♀ are assumed. There are only three cellules between the quadrilateral and the nodus.

Var. *fallax*, var. nov.

Where the typical form abounds an extraordinary variety is sometimes found. This has the abdomen more or less red in both sexes, the third segment generally almost entirely so; the legs are almost wholly pale. The post-ocular spots are red or yellow, large and connected (or almost so) by a red or yellow line. The prothorax is much spotted and the longitudinal lateral lines of the dorsum of the

thorax are broad and distinct, while the pale marks which border the eyes inwardly are connected by a transverse band just behind the posterior margin of the clypeus.

The measurements of this species are about as follows:

Typical form and race *waianaeaeum*. Length of abdomen 36—38 mm.; of post. wings 25—27 mm.; expanse 52—54 mm.

Var. from W. Maui. Length of abdomen 42 mm.

Race *peles* and var. *fallax*. Length of abdomen 30 mm.; of post. wings 19 mm.; expanse 43 mm.

HAB. Typical specimens from Molokai (3000—4000 ft.), and from the Iao Valley, Maui. Larger and darker var. from high ridges of W. Maui Mts. (4000 ft.). Race *waianaeaeum* from the Waianae Mts., Oahu (2000—3000 ft.). Race *peles* widely distributed on Hawaii (2000—4000 ft.), the var. *fallax* found with it.

(8) *Agrion eudytum*, sp. nov.

Closely allied to the preceding and very similar in most respects. Black; ♂ with the post-ocular spots, those on the prothorax, the lateral longitudinal lines of the dorsum of the thorax, the greater part of its sides, the first two segments of the abdomen, and the femora beneath pruinose, of a bluish, almost white, colour. Face below the antennae obscurely pallid.

Female with the face yellow below the antennae, as also the post-ocular spots which are distinct and a line on the posterior margin of the vertex. Prothorax with yellow spots. Thorax with the latero-dorsal lines reaching half-way to the insertion of the wings, its sides for the most part pale. Femora almost entirely pale. Abdomen with the first two segments and base of the third pale at the sides and also partly above.

Anterior wings with 3 or 4 cellules between the quadrilateral and the nodus, and about 20 post-cubitals. Upper side of quadrilateral very short; one-fourth as long as the lower in the anterior, one-third the length of the lower, in the posterior wings.

♂ superior appendages as long as the 10th segment, pale inwardly on the basal portion, formed very like those of *A. amaurodytum*, but more dilated, the inferior apical spine evidently smaller, between which and the base, on the inferior margin of the appendage there is a minute black tubercle. Inferior appendages black, pale at the base, curved upwards, the narrow apical portion longer than in the preceding species and much less strongly bent inwards.

♀ superior appendages black, valvules and their appendages pale.

HAB. Kauai (about 1000 ft.). 1 ♂, 1 ♀ taken. Probably not rare as I spent only an hour or so in the locality and did not revisit it.

(9) *Agrion adytum*, sp. nov.

Closely allied to the preceding, and like it of very slender form in the ♂. Neither sex pruinose. Abdomen dark, black or more or less piceous. Apex of labrum pale, otherwise the face below the antennae nearly black in the ♂, in the ♀ it is nearly entirely pale. Post-ocular spots wanting in the three ♂ examples, but one has a pale line on the posterior margin of the vertex in the middle. Dorsal thoracic markings present or absent in this sex, in the single ♀ the latero-dorsal stripes are abbreviated into a spot on either side in front. Legs black or piceous, femora more or less pale beneath. Abdomen of ♀ with a yellow spot on the sides of the first and second segments. Wings with 18—22 post-cubitals in the front pair, and 3 or 4 cellules between the quadrilateral and the nodus.

♂ characters very like those of the preceding, but the apical process of the superior appendages is shorter and the minute tubercle on the inferior margin between the apical inferior tooth and the base is absent. They are distinct at once from those of *A. amaurodytum* by the small size of that tooth.

♀ superior appendages black, valvules and their appendages pale.

HAB. Mountains of Kauai (4000 ft.).

(10) *Agrion oresitrophum*, sp. nov.

Male of very slender form with red abdomen, the 6th and 7th segments at least black. Face below the antennae red or pale, post-ocular spots of the same colour and connected. Prothorax spotted, the front and hind margins also red or yellow. Latero-dorsal lines of thorax and median crest similarly coloured. Legs red or pale, with black spines. Wings with 14—17 post-cubitals in the front pair, and 3 cellules between the quadrilateral and the nodus.

Superior appendages very short, much shorter than the 10th segment in lateral view, the apex black and directed downwards, viewed inwardly the inferior margin is very strongly rounded, and near the base gives rise to an acute spine directed upwards, its point attaining to about the level of the superior margin of the appendage. Lower appendages long extending considerably behind the superior, curved inwards and upwards, their apices black, very slightly emarginate (hardly perceptibly in some examples), to form two exceedingly minute spines. Tenth segment angulately excised.

Two female examples from the same locality may belong to this species; the abdomen is entirely blackish above, with a narrow pale ring at the base of the segments. Clypeus and labrum black or blackish at the base. Wings as in the ♂. (Plate V. figs. 8 & 8a.)

Length of abdomen 31—36 mm. Posterior wing 20·5—23 mm. Expanse 44—49 mm.

HAB. Mountains of Kauai (4000 ft.). Not noticed at lower altitudes.

*A. leptodemas* is closely allied to this species and has very similar ♂ characters but the tubercle of the superior appendages of that species inwardly is differently situated, not reaching higher than half the height of the appendage, and the lower appendages extend only about as far back as the superior pair.

(11) *Agrion orobates*, sp. nov.

Male of the form, size and colour of the preceding. Superior appendages short, in lateral view shorter than the 10th segment, resting on the lower pair, and terminating in a black tubercle. Viewed inwardly, they are much less strongly rounded on the lower margin than is the case with that species, and on this margin towards the base they are armed with an extremely minute black spine, which is not directed upwards to the level of the dorsal margin. Lower appendages long, directed upwards and inwards, their apices meeting in the middle line, each armed with two minute but distinct spines, the inferior rather the stronger. Tenth segment extremely deeply excised, almost to its basal margin.

A single ♀ taken in the same locality may belong to this species. It resembles those mentioned under the preceding in most respects but has the abdomen nearly entirely red, a dorsal longitudinal line on the second segment and the apex of this and the five following segments being black.

HAB. Mountains of Kauai above Waimea (4000 ft.). A single ♂ taken in May, 1894.

(12) *Agrion leptodemas*, sp. nov.

A small and very slender species. Face below the antennae entirely red, vertex of head posteriorly with a red transverse line. Prothorax with the front and hind margin and four spots on the dorsum yellow; thorax above and at the sides with yellow or red stripes, the median ridge red. Legs red, the spines black. Four basal and three apical segments of the abdomen red, the intermediate ones dark. Thirteen post-cubital cellules in the front, eleven in the hind wings. Three cellules between the quadrilateral and the nodus. Upper side of quadrilateral  $\frac{1}{3}$  in the upper wings, in the lower  $\frac{1}{2}$  the length of the lower side.

Superior appendages very short, in lateral view hardly half as long as the 10th segment, very strongly dilated, almost from the extreme apex, which forms a small

black tooth directed transversely and downwards as is easily seen in an apical view. The strongly curved margin of the dilatation is dark, and inwardly, at about the middle of the height of the appendage, gives rise to a distinct black spine or tubercle directed upwards. Inferior appendages with acute black apices, and directed inwards and upwards.

Length of abdomen, 29 mm.; post. wing, 18.5 mm.; expanse, 40 mm.

HAB. Halemano, Oahu, above 2000 ft. A single ♂ taken in February, 1893.

(13) *Agrion calliphya* M<sup>c</sup>Lachl.

*Agrion* (?) *calliphya* M<sup>c</sup>Lachl., Ann. Nat. Hist. (5) XII. 1883, p. 236 (♂).

I have examined many examples of this species. The abdomen (♂) of those from Haleakala attains a length of 40 mm. and that of the largest examples from Lanai is only a little shorter. In those from Molokai the length is about 35 mm., but some are considerably shorter, as is also the case in some from Lanai. The number of cellules between the quadrilateral and the nodus is variable, 3, 4, or 5, the number to some extent apparently depending on the size of the individual.

The ♀ typically is very unlike the ♂ in general appearance, the abdomen being for the most part black, the base of segments 1—7 very narrowly pale or red and (except on the first and second) with a red spot near the apex of each of these segments. The three terminal segments are red in the middle, black at the sides. Clypeus black on the basal portion, thoracic markings as in the ♂. Posterior margin of prothorax strongly raised and sinuate, its middle portion being strongly produced posteriorly. Superior appendages dark, valvules and their appendages pale. (Plate V. figs. 9 & 9 a.)

Race *microdemas*, var. nov.

Like the typical individuals in colour and form but of uniformly smaller size; length of abdomen about 30 mm. or less, posterior wing 19 mm. Usually 12—14 post-cubitals. Three cellules between the quadrilateral and the nodus.

This dwarf form of the species is analogous to the race *peles* of *A. amaurodytum*, which indeed is nearly always found with it.

The colour of the ♂ is somewhat variable, the darkest example has only the first three and the last two segments of the abdomen red, while in others it is nearly entirely this colour. I have several times taken the sexes coupled.

HAB. Molokai, Maui and Lanai. Race *microdemas*, abundant on Hawaii.

(14) *Agrion nesiotae*, sp. nov.

Very slender in form, with the abdomen black, the two basal segments entirely or for the most part red above, as also the two apical. Face pale below the antennae, clypeus black above in the ♀. Posterior margin of head pale, post-ocular spots present or absent. Thorax with the median carina and lateral dorsal lines yellow or red. Legs red or pale. Abdomen with five or six segments more or less pale in tesseral examples, otherwise as above. Wings with 16--20 post-cubitals. Three cellules between the quadrilateral and the nodus. Post-pterostigmatic cellules of the posterior wings more or less duplicated. Posterior margin of the prothorax in the ♀ produced backwards in the middle, the lobe so formed subtruncate.

♂ superior appendages very long, twice as long as the 10th segment, gently curved on their outer margins, the extreme apex bent inwards, dilated only for a short distance at the base, the inferior margin of the dilated portion armed at its apex inwardly with a black spine. Inferior appendages bent inwards, acute at the apex, short, extending only about as far back as the apex of the dilated portion of the superior pair. Tenth segment strongly raised at the apex about the middle of its margin, and narrowly excised, with a regular fringe of hair along the excision.

♀ superior appendages short, black; valvules and their appendages pale. (Plate V. figs. 10 & 10 a.)

Length of abdomen 36 mm.; posterior wing 23 mm.; expanse 49 mm.

HAB. Hawaii (2000—4000 ft.); widely distributed, but rarer than the other species found on this Island. Taken in Kona, Kau, and Puna districts.

(15) *Agrion jugorum*, sp. nov.

Very slender and elongate in form; abdomen with several of the basal segments red.

Face below the antennae entirely or almost entirely red or yellowish in the ♂, base of clypeus and labrum more or less black in the ♀. Post-ocular spots red or yellow and always united by a line of the same colour. Pronotum with the anterior and posterior margins and some spots on the dorsum red or yellow. Median crest of the thorax, a line on either side of the dorsum and the sides more or less of one or other of these colours. Legs red or yellow with black spines. Wings with 22—24 post-cubital cellules, pterostigma bright wine-red in the Lanai examples, generally much less brightly coloured in those from Maui. Post-pterostigmatic cellules often forming two complete rows, and nearly always forming more or less of a double series at least in one wing, but very variable, sometimes slightly infuscate. Three, four, or five cellules between the quadrilateral and the nodus. Abdomen of ♂ with the first four segments nearly entirely red, the next three usually black, or dark, the three apical for the most part red. In the ♀ three to five segments from the base are red with their apical

margins black, as well as two or three of the terminal segments, but the colour is very variable.

♂ superior appendages red on the basal portion, curved inwards but not very strongly, about equal in length to the 10th segment, strongly and suddenly dilated on more than their basal half. The black apex is armed inwardly with an extremely minute tubercle; the dilated portion bears on its apical margin a well-developed black tooth, directed inwardly, and situated just above its inferior apical angle (when the appendages are viewed inwardly). The lower appendages are short and bent inwards, their apices forming a black spine. The apex of the 10th segment is emarginate.

Female superior appendages short, red or piceous, rounded at the apex, not very acute. Valvules more or less pale, their appendages of the same colour or piceous. (Plate V. figs. 2, 11 & 11 a.)

Length of abdomen 40—47 mm. Wing post. 27 mm. Expanse 56 mm.

HAB. Mountains of Lanai and high ridges of the W. Maui Mts. (4000 ft.).

(16) *Agrion molokaiense*, sp. nov.

Almost exactly like the preceding in general form and appearance and of the same dimensions. Three males (one much mutilated) differ as follows. The basal part of the clypeus is black, the post-ocular spots are somewhat smaller. The pterostigma is of a dark brownish colour. The post-pterostigmatic cellules, especially in the posterior wings, are very distinctly clouded. The third segment of the abdomen and the three apical ones are nearly entirely red, the two basal are much suffused with black, the rest black or blackish. It is probable that none of these distinctions would hold good in a long series, but the species is easily known by the genitalia.

Superior appendages in strict dorsal view, very little produced beyond the extremity of the dilated portion: in lateral view the apex is obliquely truncate and each of these angles is produced into a minute tooth or spine. The dilatation of the appendages is very gradual and the spine at its inferior apical angle is evidently smaller than that of the preceding species.

A single ♀ which belongs to this species differs from the preceding, so far as I can see, only in the smaller size of the post-ocular spots and the almost black basal two segments of the abdomen.

A single ♂, which is evidently somewhat immature, almost exactly resembles this ♀ in colour, and is so different in colour to that sex as described above, as to make it doubtful whether the species could be separated from the preceding without the examination of the appendages.

Length of abdomen, &c. as in *A. jugorum*.

HAB. Mountains of Molokai, above 4000 ft., but one taken at about 1000 ft. less elevation.

(17) *Agrion oahuense* Blackb.

*Agrion* (?) *oahuense* Blackburn, Ann. Nat. Hist. (5) xiv. 1884, p. 414 (♂).

Female with the abdomen black or more or less piceous, most of the segments with a narrow pale basal band. Apex of labrum widely, and a transverse band behind the clypeus pale. Post-ocular spots present, connected, sometimes obscure. Posterior margin of prothorax slightly produced in the middle. Latero-dorsal lines of thorax and median carina reddish. Legs pale. Three cellules between the quadrilateral and the nodus. Post-pterostigmatic cellules at least in the posterior wings more or less duplicated. This series consists of 12—14 cellules at least, the divided cellules, which vary from one only to many, being considered as single cellules in the count. Superior appendages dark, valvules and their appendages generally of an obscure colour, sometimes quite pale. Size about that of the ♂, and of similar slender form, the abdomen very slightly stouter. (Plate V. figs. 12 & 12 a.)

HAB. High ridges of mountains on Oahu (3000 ft.). Nymphs living between the leaves of *Astelia veratroides*.

(18) *Agrion satelles* Blackb.

*Agrion* (?) *satelles* Blackburn, Ann. Nat. Hist. (5) xiv. 1884, p. 414.

HAB. Haleakala, Maui (4000 ft.). (Blackburn.) I cannot identify this species with any known to me. A large form of *Agrion deceptor* and a similar one of *A. calliphya* are common in the locality.

(19) *Agrion deceptor* M<sup>c</sup>Lachl.

*Agrion* (?) *deceptor* M<sup>c</sup>Lachlan, Ann. Nat. Hist. xii. 1883, p. 235.

A common species in most parts of the Islands. Examples from Maui, Lanai and Molokai are generally larger than the Oahuan specimens, the largest attaining a length of 46 mm., the front wings often having as many as 22 post-cubitals. The thoracic markings and the amount of red on the abdomen are variable. In Maui specimens the two basal abdominal segments are often nearly entirely black above in the ♂. In dark-coloured ♀♀ the two basal segments are black above, with or without red spots, the third black at the base and apex and with a median black line in the central red portion, the following segments except for a narrow pale basal band nearly entirely dark, the apex of the 8th and 9th and the whole of the 10th more or less red. In the ♂ the small lower

tooth of the upper appendages is rather less developed in some specimens than others, but there is no constancy in this respect even with examples from the same locality. Some specimens show an evident tendency to the form of nervuration on which the genus *Megalagrion* was founded.

HAB. All the Islands from Oahu to Hawaii inclusive.

(20) *Agrion vagabundum*, sp. nov.

Allied to *A. deceptor* M<sup>c</sup>Lachl., larger specimens of which it sometimes exactly resembles in general appearance. Abdomen usually with the first 6 segments red. Face below the antennae pale, clypeus more or less dark in the ♀. Post-ocular spots large and connected. Prothorax spotted, thorax with longitudinal latero-dorsal stripes. Legs reddish. Wings usually with 4, sometimes 5, cellules between the quadrilateral and the nodus. Four to six post-pterostigmatic cellules in the posterior wings. Pterostigma not brightly coloured.

♂ superior appendages as long or longer than the 10th segment, curved inwards but not very strongly, widely dilated on the basal half, the inferior margin within bearing a very minute tubercle, sometimes hardly visible, towards the apical angle, which is rounded off. No distinct tooth or spine at the inferior apical angle, such as is seen in *A. deceptor*. Inferior appendages acute, extending rather beyond the dilated portion of the upper ones, curved inwards and upwards.

♀ superior appendages red or blackish, valvules pale. (Plate V. figs. 13 & 13 a.)

Length of abdomen 31—36 mm.; hind-wing 23·5 mm.; expanse 50 mm.

HAB. Widely distributed on Kauai from 1000 ft. to 4000 ft. or more, in the mountains.

Some females which certainly belong to this species show hardly any red colour on the abdomen, the variation being much as in *A. deceptor*, from which the ♀ can hardly be distinguished.

(21) *Agrion kauaiense*, sp. nov.

Face below the antennae red or pale, as also the post-ocular spots which are connected. Prothorax with red or pale spots; thorax above and at the sides with red or pale lines. Legs red with long black spines. Pterostigma bright red. Abdomen with the basal five segments and the two apical ones (more or less) red; 6th, 7th and 8th black usually, but the 6th sometimes red. First five segments often with a narrow apical black band.

Wings with 16—22 post-cubital cellules. Upper side of the quadrilateral about  $\frac{1}{3}$  the length of lower in the front wings, somewhat longer in the posterior pair. Post-costal area with either a single row of cellules, or with a double row for a considerable part of its length, extremely variable in the number of cells that are divided.

♂ superior appendages terminating above in a stout hook very strongly curved inwards, below this is a distinct but much smaller black tooth, and on the lower margin inwardly nearly half-way between the latter tooth and the base of the appendage is a third very minute tooth or tubercle. The appendages themselves more or less red, the teeth black. Inferior appendages red with black tips curved upwards and inwards.

♀ superior appendages generally black, sometimes red, pointed; valvules more or less pale, their appendages generally dark.

Length of abdomen 33—40 mm.; posterior wing 25—28.5 mm.; expanse 57 mm.

Allied to *A. deceptor* but generally larger and with the nervuration of the postcostal area more complicated. The ♂ is very distinct by the form of the superior appendages which are much more strongly curved inwards at the apex, and also by the position of the second tooth which, if the appendage be viewed inwardly, is seen to be situated about in the middle of its greatest height, whereas in *A. deceptor* the tooth is situated at the lower angle. The bright colour of the pterostigma is also a useful character.

HAB. Kauai, widely distributed (2000—4000 ft.).

(22) *Agrion oceanicum* M<sup>c</sup>Lachl.

*Megalagrion oceanicum* M<sup>c</sup>Lachl., Ann. Nat. Hist. (5) XII. 1883, p. 239 (♂).

Female with the wings, &c. as in the ♂, which it resembles in most respects, but the abdomen is stouter and the amount of black colour is more extensive than is usual in that sex. Posterior margin of the prothorax strongly raised, angulate in the middle, and fringed with long hairs. (Plate V. figs. 14 & 14 a.)

HAB. Island of Oahu, common and widely distributed, frequenting the streams of both the mountain ranges.

(23) *Agrion blackburni* M<sup>c</sup>Lachl.

*Megalagrion blackburni* M<sup>c</sup>Lachl., Ann. Nat. Hist. (5) XII. 1883, p. 238.

(Plate V. figs. 15 & 15 a.)

HAB. Maui, Lanai (Scott B. Wilson), Molokai and Hawaii (windward side). Common generally.

(24) *Agrion heterogamias*, sp. nov.

Male with the abdomen red, that of the ♀ greenish-black. Labium, apex of labrum, a space along the inner margin of each eye, connected by a transverse line, pale. Vertex of head black with pale post-ocular spots, which are nearly connected by a pale line. Prothorax more or less spotted. Dorsum of the mesothorax with the median crest and two lateral lines pale, rarely reddish; sides of thorax more or less pale. Legs pale or reddish, with long black spines. Wings with elongate pterostigma of an obscure colour. Post-costal area of both pair with a double row of cellules for a great part of its length. Abdomen in the ♂ generally with the apical half of the 6th, the 7th, and more or less of the 8th black, the rest nearly entirely red, and not very variable; in the ♀ the abdomen is nearly entirely greenish-black above, with the basal margins of the 3rd to the 7th segments very narrowly pale and the apices of the following obscurely and narrowly reddish, or testaceous.

♂ superior appendages as long as the 10th segment somewhat incurved, the apex black and armed at its extremity with a minute tubercle directed inwards; inwardly, a short way behind the apex, is a second minute spine or tubercle, from which the appendage is greatly produced downwards and dilated: at the apex of the lower margin of the dilated portion inwardly there is a small black spine directed inwardly, and the margin itself now becomes thickened and strongly raised, and near the base of the appendage gives rise to another black spine directed upwards. Lower appendages elongate-triangular, extending beyond the dilated portion of the superior pair, hardly curved inwards, red, terminating in a minute tubercle or spine. Tenth segment angulately excised.

Female superior appendages acute, triangular, black or obscurely reddish; valvules pale, their appendages darker. (Plate V. fig. 3.)

Length of abdomen 36—40 mm.; of hind-wing 29 mm.; expanse 64 mm.

HAB. Kauai, widely distributed from near sea-level to 4000 ft. Allied to *A. oceanicum* and *A. blackburni*, the females of which are quite distinct from the present species by their general appearance, and the males by the form of the appendages.

## PSOCIDAE.

In this group we have followed Reuter in the description of wing-nervuration.

## Psocus Latr.

(1) *Psocus haleakalae*, sp. nov.

Head with the labrum dark, the post-clypeus pale with longitudinal dark lines, the front more or less pale, with dark markings. Eyes in the ♂ not very large, the space between them in a front view of the head being (where least) fully equal to, or rather

greater than, the width of the two together. In the ♀ they are somewhat more remote. The antennae of the ♂ near the base are clothed with long and conspicuous hairs, which stand out on all sides nearly erect from the surface, but towards the apex they become less so. In the ♀ the antennal hairs are much shorter, and inconspicuous.

The surface of the mesothorax is dull, and its margins more or less pale.

Wings hyaline, the anterior slightly infuscate along the margin about the apex. At the extreme base there is a dark band, and a very distinct unbroken transverse fascia about the middle. The apical portion of the pterostigma, a spot beneath and adjoining this, and one on the transverse portion of the inner branch of the cubitus, are also black or dark. Posterior wings with an infuscation on the dorsal margin towards the base.

Legs pale, the tarsi dark.

Abdomen more or less pale, at least in some examples. The apical ventral segment of the ♂ is flat at the base, but the apical portion is bent upwards at right angles to this and forms a sort of long process.

Expanse 8.5—10 mm.

HAB. Haleakala, Maui (5000 ft.).

(2) *Psocus simulator*, sp. nov.

Resembles the preceding in general appearance. It is rather larger, the median transverse fascia of the anterior wings is slightly interrupted about the middle. There is a small spot on the cubitus about half-way between the base of the wing and the median fascia. In the ♂ the eyes are much larger, the width of one of them (in a front view of the head) being considerably greater than the distance between its inner margin and the nearest ocellus.

Expanse 10—11.2 mm.

HAB. Haleakala, Maui (5000 ft.). The ♂ is quite distinct by the size of the eyes should the slight colour distinctions prove inconstant.

(3) *Psocus unicus*, sp. nov.

One of the largest Hawaiian species, wings hyaline, faintly clouded. The pterostigma is for the most part brownish and there is no spot adjoining it. There is a faint fuscous stain, forming a transverse band, which passes through the cubitus at its furcation. Otherwise the wings are without markings. The median lobe of the mesothorax is faintly shining in front. The unique example appears to be a ♀, but the eyes are more prominent than is usual in that sex, although they are widely separated. The pubescence of the antennae is short and inconspicuous.

Expanse 13.5 mm.

HAB. Haleakala, Maui (5000 ft.); unique.

(4) *Psocus hualalai*, sp. nov.

Allied to *P. haleakalae*, but readily distinguished by the less conspicuous wing-markings. The apical portion at least of the pterostigma is black, and there is a spot below adjoining it, and one on the transverse portion of the inner branch of the cubitus, as in that species. The median fascia is usually represented by two or three disconnected spots, which, however, are sometimes sufficiently developed to form a transverse band, but this is always more or less interrupted. The head above the antennae is for the most part dark. The antennae of the ♂ have a pubescence similar to that of *P. haleakalae*, and the eyes are widely separated, the width of one of these being only about equal to the distance between its inner margin and the nearest ocellus. In the ♀ the eyes are still smaller.

Expanse circa 9 mm.

HAB. Mauna, Hualalai (about 8000 ft.).

(5) *Psocus kona*e, sp. nov.

Allied to *P. simulator*, but distinguished by the lack of the distinct median fascia of the anterior wings, which is represented by two or three detached spots. The small spot on the cubitus between the base of the wing and the median fascia is also wanting. In the wing-markings this species exactly resembles some examples of *P. hualalai*, but from that species the large eyes of the ♂, which are similar in size to those of *P. simulator*, will easily separate it.

I have not seen the ♀ of this species.

Expanse 10 mm.

HAB. Kona, Hawaii (4000 ft.).

(6) *Psocus kawaiiensis*, sp. nov.

Of smaller average size than any of the preceding species, and varying greatly in the wing-markings. Sometimes the anterior pair have an entire submedian transverse dark fascia, as in *P. haleakalae*, &c., sometimes this is broken up into two or three separate spots, as in *P. hualalai*, &c., or the wings may be without any markings, except the dark pterostigma. The most usual form is that which resembles typical *P. hualalai* in markings. The transverse portion of the inner branch of the cubitus is dark on the part towards the costal margin, pale towards the other extremity, but it is not traversed by a distinct black spot as in all the preceding species, and at the most shows a hardly perceptible infuscation along its margins.

The ♂ is readily distinguished by the antennae, the pubescence of the third joint being less long and conspicuous; nor does it stand out suberect from the surface, but on both upper and lower surfaces is strongly inclined in the direction of the apex. The eyes are large and in a front view of the head the width of one of them is much greater than the distance from its inner margin to the nearest ocellus.

Expanse to 9 mm., generally less.

HAB. Mountains of Kauai (4000 ft.). Examples from Haleakala (5000 ft.) appear identical with those from Kauai, but of slightly greater average size.

(7) *Psocus molokaiensis*, sp. nov.

A small species, the dark markings of the anterior wings as follows: the apex of the pterostigma, and a spot adjoining it, the costal margin to the pterostigma (generally), more or less infuscation along the cubitus, a spot close to the base of its inner branch, and another on the transversely-directed portion of the same, a band or line along the dorsal margin from the base to the middle of the wing. These markings vary, but are sufficient to distinguish the species, from the fact that their general tendency is longitudinal and not transverse as in the other species. In the ♂ the eyes are moderately large, but the space between them is rather wide, being about equal to the width of the two taken together. The pubescence of the antennae is short and inconspicuous and not erect. Thorax in both sexes with the surface dull.

Expanse to about 8 mm.

HAB. Mountains of Molokai (3000 ft.). On *Cyathodes*.

(8) *Psocus distinguendus*, sp. nov.

Wing-markings and general appearance as in *P. haleakalae*. The transverse fascia is narrow, and sometimes interrupted, and, as in the other species, the markings are generally rather more developed in the ♀ than in the ♂.

*P. distinguendus* may be known from any of the preceding species by the polished surface of the mesothorax, at least in front both of the median and lateral lobes.

The hairs on the third joint of the antennae of the ♂ are shorter than those of *P. haleakalae*. Its eyes are very large, the space (where least) between their inner margins being hardly wider than the width of one of these organs. In the ♀ the eyes are comparatively small, and widely separated.

Expanse min. 8, max. 11 mm.

HAB. Molokai (3000 ft.); Lanai, Maui, Hawaii.

(9) *Psocus oahuensis*, sp. nov.

I have not seen the ♂ of this species; the female is very like that of *P. distinguendus*, to which it is closely allied. The mesothorax is highly polished, the abdomen has bright yellow transverse stripes above. It may be distinguished by the evidently wider and more distinct submedian dark fascia of the anterior wings; the absence of the black spot on the *cubitus* at about the middle of its length, and that on the transverse portion of the inner branch of the same nervure is almost obsolete.

Expanse 10 mm.

HAB. Waianae Mountains, Oahu.

(10) *Psocus lanaiensis*, sp. nov.

Somewhat similar in general appearance to the other Hawaiian species. The anterior wings have a more or less evident transverse median band, the pterostigma contains a large dark spot, and there is another adjoining this, without it. The radius is pallid, a character which readily distinguishes the species from any of the preceding. The *cubitus* is also often pale (yellow), but sometimes infusate. Elsewhere also the nervuration is widely interrupted by pale spaces, but the terminal furcations of the nervures are always dark.

The face in the ♂ in front of the ocelli bears a yellow mark enclosing a dark spot; around the ocelli it is dark; in the ♀ the face is pale with dark markings; antennae very long, and towards the base in the ♂ clothed with rather long hairs; the eyes exceedingly large, the width of one of them even greater than the distance (where least) between their inner margins; in the ♀ the eyes are small and distant.

Mesothorax dark with yellow margins, and sometimes a median yellow stripe. Abdomen more or less pale above.

Expanse 8—8.5 mm.

HAB. Mountains of Lanai.

(11) *Psocus sylvestris*, sp. nov.

Very closely allied to the preceding, but the ♀ has the mesothorax pale. The ♂ appears to vary somewhat in this respect; it may be distinguished, however, by the less conspicuous pubescence of the third joint of the antennae, and the hairs on the lower side of this joint are less erect.

Expanse as in the preceding species.

HAB. Kona, Hawaii (4000 ft.).

(12) *Psocus heterogamias*, sp. nov.

General appearance very like that of the two preceding species. Thorax almost entirely pale. Nervuration almost entirely of a pale yellow colour, the apical furcations of the nervures being all pale. There is an evident, but not deep, infuscation along the apical margin of the anterior wings, which extends also on to the dorsal margin and thence inwardly to the pterostigma, thereby enclosing a clearer space. The eyes of the ♂ are evidently smaller, and more widely separated, than those of the preceding species. The pubescence of the antennae is subdecumbent and inconspicuous. The ♀ is micropterous, and robust in life, but distorts so in drying that its characters cannot be satisfactorily determined from pinned specimens.

Expanse 8—8.5 mm.

HAB. Mountains of Oahu.

(13) *Psocus monticola*, sp. nov.

Closely allied to *P. heterogamias*. The apical margin of the anterior wings has an infusate band as in that species, but it is rather more definite, narrower, and less diffuse. Of the furcations of the inner branches of the radius and cubitus, which terminate in the apical margin of the wing, those of the latter are all dark; of those of the radius the outer is yellow at the extreme base, the inner for fully half its length, the apical half dark. The eyes in the ♂ are not very large, the width of both together being subequal to the distance between their inner margins. The pubescence of the antennae is inconspicuous and subdecumbent. In the ♀ the eyes are smaller and more remote, and the pubescence of the antennae extremely short and inconspicuous.

Expanse 8.5—9 mm.

HAB. Mountains of Kauai (4000 ft.).

(14) *Psocus vittipennis*, sp. nov.

Extremely like the preceding in general appearance. The single ♂ that I have seen has the radius in the anterior wings dark, but it is pale in the females, as in all the allied species, and probably would often be so in the ♂. Superficially the present species may be distinguished as follows: the apical margin of the wing has a darker border, which is very distinct and definite, and the inner apical branch of the radius is pale for a shorter distance, the yellow part not extending so far as the apical

furcation of the inner branch of the cubitus. The mesothorax in both sexes is more or less smooth and shining. The third joint of the antennae in the ♂ is conspicuously clothed with long hairs, which stand out strongly from the surface of the joint. The eyes are of about the size of those of the preceding.

Expanse 9—10 mm.

HAB. Mountains of Kauai (4000 ft.).

#### STENOPSOCUS Hag.

(1) *Stenopsocus pulchripennis*, sp. nov.

Head black, the face shining, behind the post-clypeus with indefinite brown markings. Antennae black, with very long and slender joints, the third with the apex dark, the rest pale, the pubescence is short in general, but at intervals there are placed rather long single hairs.

Anterior wings hyaline, with three transverse dark fasciae, the basal one broad, extending from near the radius to the dorsal margin, the middle one very narrow along the inner branch of the cubitus. The apical fascia extends transversely from the costa, at the apex of the pterostigma, to the inner branch of the cubitus, when it becomes deflected along that nervure and its terminal furcations, forming an irregular dark apical mark, containing two clear spaces. All the nervuration pale as far as the basal fascia from the base of the wing, beyond this, dark. Discoidal area quadrangular. Pterostigma at the apex obliquely truncate, its inner angle connected by a pale nervule to the point of furcation of the inner branch of the radius. Area postica very small, triangular, appendiculated at its vertex, the area adjoining it on the apical side very large, longer than high, as large or larger than the other two areas formed by the apical furcations of the inner branch of the cubitus, taken together. Posterior wings clear, nervuration dark.

Length of anterior wing 2.5 mm.

HAB. Mount Hualalai, Hawaii (8000 ft.). This is certainly no true *Stenopsocus*, but as I have seen only one much mutilated example, I have only been able to examine it very imperfectly. The wings show no trace of a marginal fringe, nor of hairs on the nervuration, but it is possible that this may be due to abrasion.

#### ELIPSOCUS Hag.

(1) *Elipsocus montanus*, sp. nov.

Body black or dark brown, the front of the head, the margins of the thorax, and generally some lines on the abdomen more or less pale.

Post-clypeus and the front of the head along the inner margins of the eyes, somewhat shining. Eyes in the ♂ widely separated, the space between them greater than their combined width. Antennae with short pubescence. Wings subhyaline, anterior pair usually evidently clouded, but not deeply. Their markings are very faint and consist of five fuscous spots along, but not touching, the apical margin, and two others placed in a line with the second of the series, at equal distances apart towards the base of the wing. There is often also a spot adjoining the pterostigma, one on the cubitus about the middle, and another in the angle at the meeting of the anal and dorsal nervures, the latter sometimes forming, with infuscations placed inwardly to it, a very faint transverse band. The pterostigma varies in colour from being entirely pale to a dark brown colour, its apical margin is long. There is a distinct but narrow space between the inner branch of the cubitus and the vertex of the area postica. The nervuration is nearly entirely dark in both pairs of wings.

Expanse circa 9 mm.

HAB. Haleakala, Maui (5000 ft.).

(2) *Elipsocus inconstans*, sp. nov.

This species varies greatly in size and in the wing-markings. In strongly marked examples nearly one-half of the anterior wings is fuscous from the base; there is then a transverse hyaline or subhyaline fascia, and the apical portion of the wing is strongly variegate with fuscous, enclosing hyaline spots. In other examples the wings are but little infuscate on the basal portion, and the other markings may be disconnected and form only detached spots, in which case the species bears a considerable resemblance to *E. montanus*, but the markings are never so faint as in that species, and the area postica is always, at least partly, infuscate. It may further be at once distinguished from the preceding species by the entirely dull surface of the post-clypeus, and of the front of the head, which is more depressed transversely.

The area postica is sometimes free, with a distinct space between it and the inner branch of the cubitus, but sometimes its vertex touches (or is connected by an excessively short transverse nervule with) that branch. In the latter case a closed discoidal area is formed and the examples have no longer the nervuration of the genus. This variation is exhibited by examples of the most different superficial appearance, as well as in those of similar general aspect, and the nervuration on the two sides of the same insect may be markedly different, so that it is evidently in a very unstable condition. Examples from the most widely separated islands of the group show analogous variation.

In any case the more highly variegated wings easily distinguish the species from any other of the genus found in the Islands.

Expanse 6.5—8.5 mm.

HAB. Found throughout the group in mountain forests (2000—5000 ft.).

(3) *Elipsocus psylloides*, sp. nov.

Head pale, yellowish or testaceous; thorax and abdomen also more or less pale. Wings hyaline, nervuration on the basal part mostly pale, becoming dark towards the apex. Space between the inner branches of radius and cubitus evidently, but faintly, infusate. Pterostigma pale. The extremities of the nervures in the dorsal and apical margins are slightly infusate, giving them the appearance of being slightly thickened at their apices. The inner branches of the radius and cubitus do not directly meet at the points where they are angulated near their base, but the angles are connected by a very short transverse nervule. This character, however, appears to vary, as the angles approach each other more nearly in some examples than in others. Antennae with short pubescence in both sexes.

Expanse circa 8 mm.

HAB. Haleakala, Maui (5000 ft.); Kona, Hawaii (2000—4000 ft.).

(4) *Elipsocus criviger*, sp. nov.

Very like the preceding, the nervuration pale, darker towards the apex in the anterior wings, but the extremities of the nervures have not the appearance of being thickened. There is a distinct (but somewhat faint) fuscous blotch within the pterostigma, and another in the area postica, and the basal portion of the inner branches of the cubitus and radius, to their point of contact, is infusate. The species may further be recognized by the longer hairs on the front of the head, as well as those of the antennae, which are somewhat long and irregular.

Expanse 8 mm.

HAB. Kona, Hawaii (2000 ft.); one example.

(5) *Elipsocus debilis*, sp. nov.

Allied to *E. psylloides*, but smaller, the wings less clear, with a slight yellowish tinge. Head, thorax and abdomen for the most part pale. As in that species the terminations of nervures are slightly infusate, and have an appearance of being thickened at the margins of the wings. Near the base there is a somewhat extensive,

but vague, infuscation, and the clouding of the apical part of the wings is more extensive, not being confined to the area between the inner branches of the cubitus and radius, although that part is generally slightly more deeply clouded than the rest. The apex of the pterostigma is more obtuse, and the inner branches of the radius and cubitus are directly in contact at the point where they are angulated.

Expanse 6 mm.

HAB. Waianae Mountains, Oahu (above 2000 ft.).

(6) *Elipsocus erythroctictus*, sp. nov.

Allied to the preceding, the apical extremities of the nervures with a similar appearance. Anterior wings with a yellowish tinge, the nervuration pale at the base, dark towards the apex. This species is readily distinguished by the two crimson or pink marks in the pterostigma, one of which is small, and situated at the basal extremity, the other at the apical is paler and more diffuse.

Expanse 5.2 mm.

HAB. Kona, Hawaii (2000 ft.).

(7) *Elipsocus vinosus* M<sup>c</sup>Lachl.

*Elipsocus vinosus* M<sup>c</sup>Lachlan, Ann. Nat. Hist. (5) XII. 1883, p. 228.

The colour of the pterostigma which is given as the main character of this species is probably not constant. The species appears to vary greatly in size and colour and also in the shape of the pterostigma itself. Some examples have the wings entirely infuscate.

HAB. Many and probably all of the Islands, in the forests.

(8) *Elipsocus inaequifuscus*, sp. nov.

Allied to *E. vinosus*, but easily distinguished by the more variegate appearance of the anterior wings. These are rather deeply infuscate for the most part but clearer in places. The greater part of the area postica, and more or less of the wing adjoining it, are always pale and subhyaline, and the region between this area and the nearest branch of the inner division of the cubitus is always very perceptibly more deeply infuscate than the wing in general. The nervuration is dark and very similar to that of *E. vinosus*, but in that species the infuscation of the wings, whether deep or light,

is much more uniform over the whole surface. The pterostigma is uniformly infusate like the wings, but not otherwise darkened.

EXpanse 5.5—6 mm.

HAB. Haleakala, Maui (5000 ft.).

(9) *Elipsocus micramaurus*, sp. nov.

Face yellowish, the post-clypeus with dark lines, generally with a radiate arrangement, front dark about the ocelli, and a number of very conspicuous dark spots, placed closely together near the inner margins of the eyes, on each side. Thorax and abdomen dark. The anterior wings are strongly infusate, the infuscation extending from near the base to the apex, and occupying a large part of the middle of the wing and about the apical branches of the inner division of the cubitus. The general appearance of the wings is dark with paler areas. The latter are chiefly the region around the pterostigma, some small spots on the apical margin, part of the area postica and the region adjoining this on the basal side, and sometimes more or less of the wing at the base. The nervure forming the apical side of the area postica is colourless to the vertex, which touches and is confluent for some distance with the inner branch of the cubitus. The pterostigma is abruptly truncate at the apex, its apical margin, and more or less of the inner margin towards the apex conspicuously blackened, as also the spot at its base. The inner branches of radius and cubitus at the point where they are angulated do not meet, but the angles are rather distant, and connected by a transverse nervure of a white colour.

EXpanse 4.5 mm.

HAB. Kona, Hawaii (4000 ft.). This minute species is easily distinguished by the form of the area postica, and the nervuration is not that of the genus *Elipsocus* at all. Nevertheless I have not cared to separate it, because of the fact that other species have a tendency towards a similar nervuration, e.g. *E. inconstans* (supra, q.v.).

(10) *Elipsocus frigidus*, sp. nov.

Size and general appearance of the preceding, from which it differs in the less strongly blackened apical margin of the pterostigma, and the fact that the nervure defining the vertex of the area postica, though contiguous to, does not become confluent with the inner branch of the cubitus at that point. I have seen but two examples which are in poor condition, and it is not improbable that a good series of examples would show this to be a variation of the preceding species. (Cf. variation of *E. inconstans*.)

HAB. Hualalai, Hawaii (8000 ft.).

## TERMITIDAE.

## CALOTERMES Hag.

(1) *Calotermes castaneus* Burm.

*C. castaneus* Burm., M<sup>c</sup>Lachlan, Ann. Nat. Hist. (5) XII. 1883, p. 227.

Soldier with distinct eyes and variable in the length of the head beneath. Several royal pairs often found in a small colony. The abdomen of the ♀ appears to undergo little or no increase in size after the perfect state is attained.

HAB. All the Islands, in the mountain forests. Colonies often occupy the whole of a large forest tree.

(2) *Calotermes marginipennis* Latr.

*C. marginipennis* Latr., M<sup>c</sup>Lachlan, loc. cit.

HAB. Towns and settlements. Abundant and destructive to the wooden buildings in Honolulu.

## EMBIIDAE.

## OLIGOTOMA Westw.

(1) *Oligotoma insularis* M<sup>c</sup>Lach.

*Oligotoma insularis* M<sup>c</sup>Lachlan, Ann. N. H. (5) XII. p. 227; Perkins, Ent. Mag. 1897, p. 56 (development and habits).

HAB. Most and probably all of the Islands. Kauai, Oahu, Molokai, Maui and Hawaii, from sea-level to 3000 ft.

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# FAUNA HAWAIIENSIS

VOL. II. PART III.

*COLEOPTERA. I.*

D. SHARP.

R. C. L. PERKINS.

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# FAUNA HAWAIIENSIS

OR THE

## ZOOLOGY OF THE SANDWICH (HAWAIIAN) ISLES:

Being Results of the Explorations instituted by the Joint Committee  
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VOLUME II. PART III.

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By D. SHARP AND R. C. L. PERKINS.

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COLEOPTERA PHYTOPHAGA

By D. SHARP.

COLEOPTERA RHYNCHOPHORA, PROTE-  
RHINIDAE,

COLEOPTERA HETEROMERA, CIOIDAE

By R. C. L. PERKINS.



COLEOPTERA<sup>1</sup>.

## I. COLEOPTERA PHYTOPHAGA.

By D. Sharp.

*Contents.* § 1, *General remarks*; § 2, *Systematic account*; § 3, *Bibliographic list*.§ 1. **General Remarks.**

THE remarkably successful zoological work of Mr Perkins has thrown fresh light on many points connected with the entomology of the Hawaiian Islands. It would be out of place to discuss most of these points at present, but there is one to which I may here allude. It was formerly supposed that very few specimens of any of the precinctive<sup>2</sup> species could be obtained. As the geographical area of the islands is very small, it of course followed as a corollary that the number of individuals existing of a species was extremely small. Although there is still much truth in this idea, it has nevertheless become clear that in many cases the limitation is far from being so great as we supposed it to be, Mr Perkins having procured a large number of individuals of numerous precinctive species. He has however succeeded in doing this in most cases only by tracing the exact conditions under which they exist. It thus remains true that, compared with the great majority of Insects in other parts of the world, the individuals

<sup>1</sup> Owing to the great extent of the Hawaiian Coleoptera this Order will be dealt with in divisions.  
EDITOR.

<sup>2</sup> I use the word precinctive in preference to endemic or peculiar—both of which are in common use—in the sense of “confined to the area under discussion.” The word endemic has been objected to on the grounds that its derivation does not indicate geographical restriction, and that it is actually used in medicine to signify constant, but not necessarily exclusive, presence in a locality. The word peculiar has no special connection with geography and when used by itself is often inadequate to convey the meaning intended; so that when one speaks of “peculiar” forms it is necessary to add some expression to make it clear that geographical peculiarity is meant. Hence we require another word that can be used when there is no context (as in tables), or when the context does not make it clear that geographical restriction is the point in view. Precinctive appears to me suitable for this purpose and I see no objection to the use of the word restricted. “Precinctive forms” means therefore forms that are confined to the area specified.

of a species actually existing are very few; the species having not only a very small geographical distribution, but also being found in but few stations in the area.

The fact that species are sometimes found in considerable numbers at some of these stations renders it doubtful whether there is diminished fertility of the individuals, as I formerly supposed. At present there is but little evidence on this point.

Whether the Insects are unusually specialised in their modes of life is also doubtful. Most of them are either forest species, or are of alpine or subalpine habits.

Many forest Insects in other parts of the world are notorious as being but rarely met with. In the New Forest, in the south of England, this is certainly the case, and it is probably due to the fact that trees are only attacked when they are in certain stages of decay, or offer some special kind of shelter, or are accompanied by some particular kinds of fungoid growths.

**Variation.** In the case of two or three of the species dealt with in this paper I have had at my disposal some hundreds of specimens for examination. It therefore seems necessary that I should make some remarks on their variation, though on considering this I find that the data are very inadequate for a complete discussion. Nevertheless it will be well to present certain facts with regard to the genus *Plagithmysus* which appears to be one of the most suitable genera for the study of variation in Hawaiian Insects.

Twenty-nine species of this genus are now known. But about nineteen of these have each been found only in a single station, and of the remaining ten several are so rare that no opinion can be pronounced as to their variation. We have little or no information as to the distribution of the species beyond the fact that no species has yet been found on more than one island. It would scarcely be possible to find species more closely allied than are some of these *Plagithmysus* and yet, so far as the specimens yet procured entitle us to judge, though found in the same locality and at the same season they appear to be really distinct. *P. varians*, *P. darwinianus* and *P. lamarckianus* are examples of this, all of them having been procured at Kilauea in August; they are as closely allied as any three species can be.

Varieties of the same species may be found together, and copulate indiscriminately. The variation is not indiscriminate. It appears probable that each species has its own set of variations and in some cases closely allied species could be defined by their variation. As an example I may refer to the colour of the hind legs. In *P. aequalis* these are either black or red, there are no intermediates although the two kinds copulate indiscriminately. The species is as regards this character dimorphic. In the three closely allied species—*P. varians*, *P. darwinianus*, *P. lamarckianus*—the facts are different. Here also there is variation in the redness or blackness of the legs, but the varieties of one species are not completely discontinuous. Moreover the species differ from one another in their variation in this respect. *P. varians* is very variable as regards the character in question. A highly remarkable variety of it has each leg half

red, half black. This variety is very common in this species but does not occur at all in either of the two allies though each of them is variable to a greater (*P. lamarchkianus*) or less (*P. darwinianus*) extent as to the redness and blackness of the legs. *P. varians* is almost trimorphic as regards the colour of the legs, but the three forms are not completely distinct, and one of them is very much rarer than the other two.

Of *P. darwinianus* I have not a large series before me, but Mr Perkins examined a large number of specimens of this species captured by Mr A. Koebele and tells me that the legs are always red or nearly so in it<sup>1</sup>.

Thus as regards the character here considered we find that *P. aequalis* is dimorphic, that *P. varians* is imperfectly trimorphic, and that *P. darwinianus* is only slightly variable.

Very little information is available as to local variation. We have not received any one species of *Plagithmysus* from more than one locality in any considerable number; the specimens we have received lead me however to anticipate that considerable local difference in the variation exists. As an example I may mention that the five specimens of *P. aequalis*—a species confined to the island of Kauai—found at Waimea in April cannot be quite matched by any specimens of the large series found at Makaweli in January and February. Whether greater information as to local variation would lead to the union of some of the species at present treated as distinct, is a point on which I am not at all positive.

I may however point out that the three closely allied species I have already mentioned as being found in one locality have there each a different food-tree. In other words they are segregated by food though not by locality.

The two closely allied species, *P. blackburni* and *P. darwinianus*, exhibit the converse of this. Though both are found in the island of Hawaii and have the same food-tree they have not yet been found in the same locality. Each of these species has however as yet only been once or twice met with. It would be very interesting to know whether they ever occur together, and if so whether they still remain distinct.

In connection with this I must not omit to call attention to the peculiar case of *P. vitticollis* with its var. *longulus*, and of *P. bishopi* with its var. *gracilis*. In the case of these species the variety and typical form inhabit either different localities or different trees. We know however but little about these two species, and it is possible that these "varieties" may be incipient species, or even closely allied, but actually distinct forms. At present it holds good that all the forms I have treated as distinct species are segregated either geographically or by food: and this also applies to the two varieties just mentioned.

<sup>1</sup> A small series only of *P. lamarchkianus* having been procured I do not mention its variation here, but may refer the reader to p. 110. It appears to be different from either of the other species as regards the character under discussion.

**Distribution.** Turning our attention to distribution, we note that the Coleoptera Phytophaga of the world consist of three great families: Chrysomelidae, Bruchidae, and Cerambycidae.

(1) Chrysomelidae. There are about 18,000 species of Chrysomelidae known, they are found nearly everywhere except in the Hawaiian Islands, where there is only a single species; and even this has apparently been introduced quite recently. Chrysomelidae live on foliage, and the Hawaiian Islands are doubtless well adapted to sustain them, so that the absence of this great family has an important significance.

(2) Bruchidae. A family of about 700 species, of very little importance in this connection. The species live in seeds and are carried about by commerce. A few specimens have been found at Honolulu.

(3) Cerambycidae. One of the important families of Coleoptera, consisting of upwards of 12,000 species. Fifty-four have been discovered in the Hawaiian Archipelago, of which number forty-five are precinctive, while nine have been found elsewhere. These nine species belong to as many different genera; the individuals do not differ in the islands to any appreciable extent from those found elsewhere. Owing to their comparative lack of interest they have however been but little collected. There is nothing in their distribution that throws any light on the origin of the Hawaiian fauna. The forty-five precinctive species of Cerambycidae belong to two very distinct categories. First there are single species of two genera of Prionini. Each of the genera to which they belong has a wide distribution; the Hawaiian forms are not closely allied to any of the external forms; they are in fact rather more distinct than is usual in their genera, so that there is no indication of special affinity with species of any other locality. The forty-three precinctive species of Cerambycini are totally different from the two Prionini we have discussed: they belong to three genera, very closely allied *inter se*, and form a special group or tribe—Plagithmysides—peculiar to the islands, distinguished by the wings having no transverse fold. They seem to be nearest allied to the genera *Neoclytus* and *Euryscelis*, which are found in North and Central America and the Greater Antilles. They are in appearance the most remarkable of the Hawaiian Coleoptera and must be considered as a very highly specialised group of Cerambycidae. They are remarkable in their habits<sup>1</sup>.

Thus there is a very great distinction between these Plagithmysides and the non-precinctive Cerambycidae found in the islands; but the two endemic Prionini occupy as it were an intermediate place in their characters. These latter may be compared with the *Corvus hawaiiensis* amongst the birds, while the Plagithmysides appear to be analogous with the Drepanidae.

<sup>1</sup> See on this point Perkins, Ent. Mag. xxxii. p. 190, and P. Cambridge Phil. Soc. ix. p. 373.

## § 2. Systematic account of the Coleoptera Phytophaga.

## Fam. CHRYSOMELIDAE.

## EPITRIX Foudr.

(1) *Epitrix parvula* Fabr.

*Crioceris parvula* Fabr., Syst. El. 1. p. 468.

HAB. Oahu, Waianae mts.; Molokai. On "poha" or "cape gooseberry"—a plant which has no precinctive insect attached to it.

Mr Jacoby has examined some of our specimens of this insect, and informs me that they are not to be distinguished from *E. parvula*, a species widely distributed in Central America and the Antilles. The species was not found by Mr Blackburn and has probably been recently introduced.

## Fam. BRUCHIDAE.

## BRUCHUS L.

*Bruchus*, sp.

Species of this family are doubtless occasionally carried to islands with peas and beans, or other seeds. Mr Perkins has brought back two or three specimens found at Honolulu.

## Fam. CERAMBYCIDAE.

## Subfam. PRIONINI.

## PARANDRA Latr.

(1) *Parandra puncticeps* Sharp.

*Parandra puncticeps* Sharp, Tr. Ent. Soc. London, 1878, p. 202.

Rare, of nocturnal habits, chiefly found in the month of September, in several islands.

HAB. Kauai, 4000 ft. May, July, September, and October, Perkins.—Oahu, in "*Acacia falcata*" in the mountains, Blackburn.—Molokai, September 1893, Perkins.—Hawaii; Kona, July and September, Perkins.

This species exhibits a great deal of variation in the form and proportions of the prothorax, epistome, mandibles, etc. and there may possibly be more than one form in the islands. The material before me is not sufficient to decide as to this, owing to the development of the individual being subject to much variation; but the varieties appear to be to some extent located in different islands.

ÆGOSOMA Serv.

(1) *Aegosoma reflexum* Karsch.

*Aegosoma reflexum* Karsch, Berlin. ent. Zeitschr. xxv. 1881, p. 7, Pl. I. fig. 11.

HAB. Kauai, in July, Perkins.—Mau; Grove Ranche, Karsch; Haleakala, Perkins.—Hawaii; Kona and Kilauea, Perkins.

This species is common in the larval state, in wet or dry, decayed wood, and is also found in trees that are not entirely dead. The imago is rare, being nocturnal, and only occasionally attracted by light.

Subfam. CERAMBYCINI.

Group OEMIDES.

XYSTROCERA Serv.

(1) *Xystrocera globosa* Olivier.

*Ceramix globosus* Oliv., Ent. iv. 67, p. 27, p. xii, fig. 81.

HAB. Oahu; Honolulu (Perkins). No doubt recently introduced. The species is widely distributed outside the islands, and its occurrence in Honolulu has no special interest.

Group HESPEROPHANIDES.

ASTRIMUS Sharp.

(1) *Astrimus hirtus* Fairm.

*Stromatium hirtum* Fairm., Rev. Zool. 1860, p. 50.

(n. syn.) *Astrimus obscurus* Sharp, Tr. Ent. Soc. 1878, p. 204.

HAB. Oahu; Honolulu, Blackburn.

This was no doubt introduced, and it is doubtful whether it has become naturalized or has died out. It was not met with by Mr Perkins. The species is widely distributed, having been found in Siam, Fiji, and the Philippine Islands as well as in Tahiti. Mr Gahan considers *Gelonaetha* Thoms. to be the same genus as *Astrimus* Sharp. I was formerly of the opinion that *Stromatium hirtum* was a different species, but I now accept Mr Gahan's identification of the two.

Group *CALLIDIOPSIDES*.

## CERESIUM Newman.

(1) *Ceresium simplex* Gyll.

*Stenocorus simplex* Gyll. in Schönherr Syn. Ins. App. 1, 3, p. 178.

*Ceresium simplex* Sharp, Tr. Ent. Soc. London, 1878, p. 203.

HAB. Oahu; Honolulu, Blackburn, Perkins; Waialua, Perkins.—Molokai, Perkins.—Maui; Wailuku, Perkins.

The species is widely distributed in the Pacific islands, but the record of it as occurring in New Zealand (*Callidium zelandicum* Blanchard, Voyage Pole sud, iv. p. 272, Pl. XVII. fig. 4) was probably erroneous; Blanchard's figure does not appear to represent this species. It probably occurs on all the islands where the introduced Acacia—*Prosopis*, sp. ?—is found. It comes freely to light and has been noticed by Mr Perkins on all the islands except Lanai, though I have mentioned above only localities that have been specially noted.

## CURTOMERUS Steph.

(1) *Curtomerus pilicornis* Fab.

*Callidium pilicorne* Fab., Ent. Syst. 1. 2, p. 327.

*Curtomerus luteus* Steph., Ill. Brit. Ent. iv. p. 249.

*Sotenus setiger* Sharp, Tr. Ent. Soc. London, 1878, p. 205.

HAB. Oahu; Honolulu, Blackburn, Perkins.—Also seen on Maui at Lahaina. The species is no doubt liable to be carried about, having been found on one occasion in England. Other localities are South America, the W. India islands, and Florida.

Group *CLYTIDES*.

## CLYTUS Laich.

(1) *Clytus crinicornis* Chevr.

*Clytus crinicornis* Chevr., Ann. Soc. Ent. France, 1860, p. 460.

HAB. Oahu; Blackburn, Perkins.—Kauai; Perkins.—Molokai, Perkins.—Abundant all over the islands, on the introduced Acacia, *Prosopis*, sp. This is a Central American species.

Group *PLAGITHMYSIDES*.

The difficulty of distinguishing the three genera of *Plagithmysides* has considerably increased in consequence of the discovery of additional forms. The characters distinguishing *Clytarlus* from *Plagithmysus* are, that in the former genus the hind legs are clubbed and possess a long slender basal stalk. A sexual difference in the form of the legs is constant in *Clytarlus* inasmuch as the femora of the female are less clubbed than they are in the male (Plate VI. figg. 2 and 3). On the other hand in the large majority of the species of *Plagithmysus* there is very little difference in the legs of the two sexes, and the femora are never abruptly clubbed, and with a long thin basal stalk. The females of *Plagithmysus funebris*, *arachnipes* and *cristatus* possess however much more slender legs than their males, and therefore considerably approach *Clytarlus*. The female of *Clytarlus pennatus*, has the legs but little clubbed, and therefore there is but little difference between it and the females of the three species of *Plagithmysus* mentioned.

The male of *Plagithmysus cristatus* approximates in the form of the legs to *Callithmysus*. Thus this species is as it were the central point of the group, its male approaching *Callithmysus*, while its female comes near to *Clytarlus*.

It is also desirable to mention, in connection with the extraordinary reduction in size of the abdomen in this group, that this character is subject in the females of the same species to great variation. This is probably in connection with the growth of the ovaries. Some of the females have the abdomen very small, while in others, of the same sex and species, it is of the size normal in Coleoptera.

Mr Perkins has observed that the extraordinarily complex stridulating organs of these insects are brought into play during breeding, and that very frequent coupling occurs, and this to an extent that is almost unknown otherwise in insects; the *Plagithmysides* are extremely active and are apparently both polyandrous and polygamous. He has also suggested that the size of the abdomen influences the stridulating. So that all the observations that have been made tend to show that the unequalled complexity of the stridulating organs is correlative with the unusual system of copulation and probably plays an important part in it.

## CLYTARLUS Sharp.

*Clytarlus* Sharp, Ent. Mo. Mag. Oct. 1896, p. 238.

*Clytarlus* (pars) Sharp, Tr. Ent. Soc. London, 1879, p. 102.

All the species of *Clytarlus*, except *C. abnormis*, are attached to one of the two *Acacias*, *Sophora chrysophylla* and *Acacia koa*. They are rare and difficult to obtain. The material before me is not adequate for the satisfactory elucidation of these very difficult insects.

(1) *Clytarlus filipes* Sharp.

*Clytarlus filipes* Sharp, Tr. Dublin Soc. (2) III. 1885, p. 196.

This species has the punctuation of the upper surface denser and finer than in the allies. It is readily distinguished, so far as the male is concerned by the peculiar structure of the dorsal plate of the genital segment, which is unusually large and very deeply notched, so that the two angles project as a sort of forceps at the tip of the body. (Plate VI. fig. 1 a.)

HAB. Hawaii; Mauna Loa, "on Acacia sp." Blackburn: Kona and Kilauea in August and September; Kau, the half-way house, Sepr. Perkins. Apparently rare, we having received only 15 examples. Attached to *Sophora chrysophylla*.

(2) *Clytarlus mediocris*, sp. nov.

Minor, fusco-niger, depressus, opacus, albido-vestitus, elytris plus minusve conspicue transversim fasciatis, antennis pedibusque fusco-testaceis, femoribus basibus pallidis. Long.  $4\frac{1}{2}$ — $6\frac{1}{2}$  millim.

(Plate VI. figs. 1 and 1 b.)

Closely allied to *C. filipes*, but with a shorter stalk to the hind femora, and with the terminal dorsal plate of the male much less deeply excised.

HAB. Maui; a series of 38 specimens was found on Haleakala, 3000—5000 ft. May 1896. Attached to *Sophora chrysophylla*.

(3) *Clytarlus fragilis* Sharp.

*Clytarlus fragilis* Sharp, Tr. ent. Soc. London 1881, p. 534; Tr. Dublin Soc. (2) III. 1885, Pl. V. fig. 48.

HAB. Oahu; Palolo Valley, November, Blackburn: Waianae mountains, February 1896, and April 1892; beaten from dead branches of Koa, Perkins. Apparently very rare, only four specimens having been obtained. On *Acacia koa*.

(4) *Clytarlus debilis*, sp. nov.

Minor, subdepressus, testaceo-brunneus, in elytris subfasciatus, dense punctatus, pedibus ex parte majore testaceis, femoribus posterioribus clava abrupta. Long. ♀ 9 millim.

Closely allied to *C. fragilis*, but with the club of the hind femora rather longer,

and the punctuation of the elytra denser; the punctuation on the brown band behind the scutellum denser and finer. The antennae are rather long, yellow, but little thicker at the tip. The pronotum is transversely evenly convex without median or lateral crests, there being a single ante-median, and two smaller post-median transverse elevations. The punctuation on the apical parts of the elytra is obsolete; the colour of the hairs forming the obscure elytral fasciae is yellow rather than white; the pubescence on the femora is long, and that on the under surface of the body is long and scanty. The stalk of the hind femur is very pallid and long, the club is abrupt, brown. Only five abdominal segments can be seen in the male, and the hind-margins of the dorsal and ventral plates of the fifth are broad and nearly straight.

Only two specimens of the male sex have been found.

A third specimen, from Mauna Loa 17. VII, 92, is I have no doubt the female; it is much larger, and has much less abruptly clubbed femora.

HAB. Hawaii; Mauna Loa (W.) Sepr. 1892, 4000 ft.; Hualalai, 5, VIII, 92, 5000 ft. On *Acacia koa*.

(5) *Clytarlus obscurus*, sp. nov.

Minor, rufo-obscurus, vel fuscus, albido-pubescens, in elytris subfasciatus, antennis pedibusque testaceis, femoribus clava fusca. Long.  $4\frac{1}{2}$ — $6\frac{1}{2}$  millim.

Var. Antennis pedibusque ex parte majore nigris.

This is an excessively variable species in the colour of the elytra, legs and antennae, in the length of the white hairs, and in the fasciae of the elytra; it also varies considerably in the elongation of the legs; the variation in size seems to be less than it is in some other species. The thorax usually appears somewhat depressed longitudinally on each side of the middle, so that the middle appears slightly crested, but the transverse elevations on the middle are very small. The legs bear a very distinct, fine long pubescence; the hind femora have a long basal stalk yellow in colour, and a darker, moderately long and abrupt club, which is much thicker and more abrupt in the male than it is in the female. The genital segment of the male is simple. The punctuation in this species is less dense and fine than in *C. filipes* and *mediocris*, and the simple genital segment of the male clearly distinguishes *C. obscurus* from both those species. The paler varieties closely resemble *C. fragilis* and *C. debilis*, but may be separated therefrom by the less abrupt club of the femora, and by the darker colour.

HAB. Kauai; in several localities at a height of about 3000 feet, Perkins; nearly fifty specimens. On *Acacia koa*.

(6) *Clytarlus modestus* Sharp.

*Clytarlus modestus* Sharp, Tr. ent. Soc. 1879, p. 104.

HAB. Maui; Haleakala, 4—5000 ft. in April and May, "on *Acacia falcata*," Blackburn; Haleakala, 5000 ft. May, Perkins. On *Acacia koa*.

(7) *Clytarlus claviger*, sp. nov.

Secundum sexum diversus. Mas, rufus, albido-pubescentis, elytris fere nudis, in medio longitudinaliter breviter albido-signatis, femoribus abrupte clavatis, clava nigra. Fem., fusca, albido-pubescentis, antennis pedibusque testaceis, his gracilibus, clava fusca, gracili. Long. ♀  $7\frac{1}{2}$  millim.

This is closely allied to *C. modestus*. The thorax is a little cristate along the middle. The punctuation of the elytra is dense and fine, and leaves the surface a little shining.

HAB. Hawaii; Kilauea, June 1895. On *Acacia koa*.

Although only two males and one female have been obtained, and the two individuals of the male sex are very different in appearance, yet I have little doubt that they belong to one species, and are distinct from *C. modestus*. The male is readily distinguished by the black femoral club, and the female by its larger size and darker colour. The individual of the female sex is very different from the males.

(8) *Clytarlus laticollis*, sp. nov.

Rufo-testaceus, parum pubescens; pedibus minus elongatis, femoribus clava rufa, elongata; thorace densissimè punctato, medio late obtuseque elevato; elytris fortiter punctatis, medio plagis obsolete albido-pubescentibus. Long. 7.75 millim.

Only one specimen—a male—has been obtained. The species has the clubbed legs of *Clytarlus*, but the slender stalk is less elongate than in the normal *Clytarlus*, being in fact only as long as the club. Thorax broad and short, extremely densely punctured, almost without pubescence, with a broad elevation—rather than a crest—along the middle, and with five or six transverse elevations on this. Elytra much narrowed behind, strongly punctured at the base, obsolete at the tip, with very little pubescence but with a small divided mark of scanty white hairs on the middle.

HAB. Maui; Haleakala, 5000 ft. May 1896, Perkins. On *Acacia koa*.

(9) *Clytarlus abnormis*, sp. nov.

Rufus, pectore fusco; pedibus minus elongatis; thorace densissime punctato, supra inaequali, haud cristato; elytris dense, subtiliter punctatis, singulo posterius ad suturam linea pubescentiae albescente. Long. 9.5 millim.

Only one specimen—a male—has been received of this distinct species; the legs are formed much as in *C. laticollis*, but in several other respects the two species are very distinct. The thorax is not like that of any other species; it is very densely punctured above, and has no transverse elevations or scabrosities along the middle, but has an obtuse conical tubercle in front, and a broad obscure elevation behind; the surface is also more prominent on each side, so that the dorsum is very uneven. The elytra are rather shining; the line of pubescence along the suture of each extends from the tip to a little in front of the middle, and there are a few additional pallid hairs on the outside of each line where it ends. The club of the hind femora is elongate and very gradual.

HAB. Hawaii; Oloo, September 1896. Probably attached to *Metrosideros* or *Straussia*; not to *Acacia*, as there are none growing in the locality of its occurrence.

(10) *Clytarlus pennatus* Sharp.

*Clytarlus pennatus* Sharp, Tr. ent. Soc. London 1881, p. 532.

(Plate VI. fig. 2 ♂, fig. 3 ♀.)

The specimen originally described was a male. Both sexes vary much in size; the female is more slender, and the legs are much thinner and bear but little pubescence. A fine series has now been obtained; the variation is considerable as regards colour, size (8—12½ millim.) and pubescence, but is nothing like so great as it is in several species of *Plagithmysus*.

HAB. Maui; Haleakala, Blackburn; Haleakala, 5000 ft. February and May, Perkins. On *Acacia koa*. Mr Blackburn originally met with this species "on the same tree as *Proterhinus lecontei*." *C. pennatus* and *P. lecontei*, according to Mr Perkins' observations, live on different species of trees, so that the earlier record was probably based on a mere accidental occurrence.

(11) *Clytarlus nodifer*, sp. nov.

Fuscus, vel testaceus, dense albido-pubescentis, elytris vel fasciis interruptis duabus, vel maculis quatuor denudatis; pedibus testaceis minus elongatis; maris femoribus abrupte clavatis, clava fusca dense albido-vestita; feminae clava gracili fusca, parum dense albido-setosa; tibiis apice fusco. Long. 6—12 millim.

Allied to *C. pennatus*, but with shorter legs, and more abrupt club to the posterior femora. Thorax strongly cristate, with an abrupt anterior vertical elevation, and a well-marked posterior elevation bearing two carinae. The colour of the elytra varies, it is usually blackish, but is sometimes yellow along the outer margins; the white pubescence is more dense in the male than in the female; the denuded spaces are densely and finely punctured. The femoral club is very dark, in abrupt contrast to the pallid stalk, and it is variegated with white pubescence which is much more extensive in the male than it is in the female; in the latter sex the club is only slender, and is not abrupt.

HAB. Hawaii, Kona, 3000 ft. March 1896. A small series of eleven specimens, unfortunately much broken. Attached to *Acacia koa*.

(12) *Clytarlus longipes*, sp. nov.

Gracilis, dense subtiliter punctatus, opacus; mas rufus, elytris parce albido-vestitis, ante medium fascia angulata denudata, pedibus testaceis, femoribus clava elongata rufa; femina supra fusca, thorace plus minusve evidenter rufo-vittato, elytris tenuiter albido-vestitis, haud signatis; pedibus fuscis, femoribus basi testacea. Long. 6—8½ millim. (Plate VI. fig. 4 ♂.)

This species exhibits considerable difference between the sexes. The male to a certain extent reminds one of *Plagithmysus* both in form and colour, while the female is extremely similar to certain females of *C. obscurus*. The thorax is scarcely at all cristate, but has a well-marked elevation in front, and two behind the middle, it is very densely punctate, and has very little pubescence; it is red in the male, black, obscurely striped with red in the female. The elytra are finely, very densely punctured, quite dull. In the male they are red, with an angular space covered with white pubescence about the scutellum, and also with the apical half bearing a good deal of white pubescence. In the female they are nearly black, red only at the basal margin, and there is white pubescence scantily distributed all over them and not forming a pattern. The legs are very different in the two sexes; in the male the middle femora are shaped as in *Plagithmysus*, but the hind legs are those of *Clytarlus*, with a rather long club: in the female the middle and hind legs are long and slender, with long slender clubs to the femora.

This species was found in sufficient numbers to make it probable that the sexual distinctions are fairly constant. It appears to have been found in company with *C. obscurus*, and some of the females of the two are so similar that comparison of the form and length of the legs is necessary to distinguish the most similar examples; while between the males of the two species there is but little resemblance.

HAB. Kauai; thirty specimens. On *Acacia koa*.

(13) *Clytarlus annectens*, sp. nov.

Gracilis, rufus, dense punctatus, elytris in dimidio apicale guttis minutissimis albidis; pedibus basi antennisque flavis: femoribus posterioribus clava elongata, suboblonga. Long. 7.5 millim.

Only one individual, a male, has been found of this species which might be placed with as much propriety in *Plagithmysus* as in *Clytarlus*. The thorax is not crested along the middle, but there is a slight anterior elevation, and numerous minute irregular scabrous elevations behind it: the sculpture is excessively dense and fine and there is almost no pubescence. The elytra are much narrowed behind, and are densely and rather closely punctured: there are some excessively minute spots of white hairs on the apical part near the suture, and also a few below the shoulder. There is a dense white pubescence on the sides of the breast. The middle legs have a long club and a rather short but slender stalk; on the hind legs the stalk is longer and slender, so that I refer the species to *Clytarlus* rather than to *Plagithmysus*.

HAB. Kauai, 1894. On *Acacia koa*.

## PLAGITHMYMUS Motsch.

*Stenopterus?* Motschoulsky, Bull. Soc. Moscou, 1845, p. 85.

*Plagithmysus*, id. op. cit. Pt. II. 1845, p. 41; Sharp, C. R. Soc. ent. Belgique, 1885, p. lxxiv; id. Ent. Mo. Mag. 1896, p. 237.

*Ænemonia* (erroneously), Motschoulsky, Etudes ent. 1852, p. 76.

*Neoclytus* (pars), Horn, Tr. Amer. ent. Soc. v. p. 150.

*Clytarlus* Sharp, Tr. ent. Soc. London, 1878, pp. 206 and 208.

*Clytarlus* (pars), id. op. cit. 1879, p. 102.

Mr Perkins has obtained fine series of this genus, enabling me to feel pretty certain that the species are fairly distinct, and can be readily recognised notwithstanding their being in many cases very closely allied. No species has been found on two islands. Apparently each species is confined to one kind of tree. Nine of the species are attached to one or other of the precinctive Acacias. Closely allied species are attached in certain cases to the same species of tree, but it would seem that they are in this case geographically separated. *P. blackburni* and *P. darwinianus* are both attached to *Sophora chrysophylla*, and both occur on the island of Hawaii, but they have not been found in the same locality there. Closely allied species (*P. darwinianus*, *varians* and *lamarckianus*) live in the same locality but are attached to different trees.

(1) *Plagithmysus vitticollis* Sharp.

*Plagithmysus vitticollis* Sharp, Ent. Mo. Mag. xxxii. 1896, p. 240.

(Plate VI. fig. 5; ♀.)

HAB. Hawaii, Kilauea, August 1895. On Akala (*Rubus* sp.) Perkins.

Var. *longulus* Shp. l. c.

HAB. Hawaii, Oloa.

Mr Perkins has now procured a fair series of the variety *longulus*. None of the individuals have any signs of being red on the elytra; the thoracic vittae are less definite, the lateral yellow patch being considerably less extensive and there are few or no white hairs on the hind feet. One or two of the individuals are however intermediate in these respects, so that it is probable that both var. *longulus* and the typical form belong to one species which has a slightly different variation in the two localities. As the two forms of the species live on different trees, it would be possible to infer that we have in this case a species in process of dividing into two.

(2) *Plagithmysus permundus*, sp. nov.

Gracilis, niger, thorace nigerrimo, vittis albidis angustis perdiscretis; elytris dense punctatis, signaturis irregularibus albido-ochraceis ubique ornatis; femoribus basi flava, tibus tarsisque rufo-obscuris, tarsis posterioribus, dense albido-hirsutis. Long. 12 millim. (Plate VI. fig. 6.)

A very distinct species, remarkable on account of the very definite white stripes on the jet-black thorax, and by the peculiar irregular but very definite pallid marks on the elytra, which along the suture are more confluent than elsewhere so as to form a pair of much broken irregular lines; the white tarsi, in contrast with the dark tibiae, are also remarkable. The antennae are thin and long. The hind and middle legs are very long, but not very thick. The under surface is black, and very definitely marked with patches of pale sulphureous scales; the posterior aspect of the hind coxæ has a very definite white patch on it. The femora are sparingly clothed with very short white hairs. The sexes apparently differ very little.

HAB. Kauai, 2000 ft. Feb. 1897: nine examples, Perkins. This feeds on the same tree—*Bobea* sp.? as *P. vitticollis* var. *longulus*, and *Callithmysus hirtipes*. The tree is called "ahakea" by the natives.

(3) *Plagithmysus newelli* Sharp.

*Plagithmysus newelli* Sharp, Ent. Mo. Mag. xxxii. 1896, p. 240.

(Plate VI. fig. 7.)

HAB. Maui; Brother Matthias Newell, a single example.

(4) *Plagithmysus concolor* Sharp.

*Plagithmysus concolor* Sharp, t. c. p. 241.

(Plate VI. fig. 8; ♀.)

HAB. Kauai; on "Ohia-ha," = *Eugenia*, sp. Perkins; Kaholuamano 4,000 ft. G. C. Munro. This species varies but little. The series of 27 specimens sent by Mr Munro differ but little in colour and markings, and range in length between 8½—18 millim.

(5) *Plagithmysus solitarius* Sharp.

*Plagithmysus solitarius* Sharp, t. c. p. 241.

HAB. Oahu, Nuau Valley, 2000 ft., October 1892; Perkins. Unique.

(6) *Plagithmysus cuneatus* Sharp.

*Plagithmysus cuneatus* Sharp, t. c. p. 241.

(Plate VI. fig. 9; ♀.)

HAB. Oahu, Kaala 1000 ft., March 1893; Perkins. Mr Perkins is unfortunately not acquainted with the name of the tree on which this species was found.

(7) *Plagithmysus finschi* Har.

*Clytarlus finschi* Harold, Mitt. München. ent. Ver. iv. 1880, p. 166; Karsch, Berlin. ent. Zeitschr. xxv. 1881, p. 8, Pl. I. fig. 13.

*Plagithmysus finschi* Sharp, Ent. Mo. Mag. 1896, p. 242.

HAB. Maui, Olinda, Dr Finsch; 4000 ft., Blackburn; Haleakala 4000 ft., May; Perkins. On *Acacia koa* (Perkins). According to Blackburn on "*A. falcata*," but this gentleman appears to have erroneously called *A. koa*, *A. falcata*.

(8) *Plagithmysus funebris* Sharp.

*Plagithmysus funebris* Sharp, l. c. p. 273.

(Plate VI. fig. 10; ♂.)

HAB. Maui, Haleakala in May, and Sept.—Oct. Perkins. On *Sophora chrysophylla*.

(9) *Plagithmysus pulverulentus* Motsch.

*Stenopterus pulverulentus* Motsch., Bull. Mosc. 1895, i. p. 85, Pl. I. f. 12.

*Plagithmysus pulverulentus* Motsch., Bull. Mosc. 1845, ii. p. 41, Pl. VI. f. 7;

Sharp, Ent. Mo. Mag. xxxii. 1896, p. 242.

*Clytarlus robustus* Sharp, Tr. ent. Soc. 1878, p. 206.

HAB. Oahu, both ranges; on *Acacia falcata*, Blackburn (erroneously); Perkins, on *A. koa*.

(10) *Plagithmysus diana*, sp. nov.

Nigerrimus, dense regulariter griseo-ornatus: thorace subgloboso, griseo, nigro trivittato: elytris griseis, arcis denudatis nigris, ad suturam lineis latis discretis ante medium leniter divergentibus pallide pubescentibus, ante lineas has plaga angulariter nigro-pubescente. Long. 13 millim.

(Plate VI. fig. 11.)

An extremely distinct, beautifully, though soberly, ornamented species, with the sides of the thorax more strongly rounded than they are in any other species of the genus. There is a slight longitudinal carination of the middle of the thorax. The legs are entirely black even at the base, the posterior are elongate, but less incrassate than in most other species. The sexes appear to be very similar.

HAB. Kauai, 4000 ft., July, 1896. Eight examples; on *Pelea* sp.

(11) *Plagithmysus collaris*, sp. nov.

Niger, elytris, antennis pedibusque rufo-obscuris, his femoribus extrorsum tibiisque plus minus nigricantibus; pube pallide sulphurea ornatus; elytris densissime punctatis, singulo linea pubescente pallida antierius versus latus divergente, ante lineas plaga nigro-velutina, basi rugosa, parcellissime sulphureo-pubescente. Long.  $8\frac{1}{2}$ —16 millim. Mas, prothorace ad latera densissime punctato. Fem., prothorace ad latera plus minus late laevigato.

(Plate VI. fig. 13; ♂.)

This is a very distinct species, somewhat similar to *P. bishopi* and *P. vicinus*. There are no definite thoracic stripes, but the thorax is broadly cristate and scabrous along the middle, and there are distinct lateral elevations; it is a good deal constricted at the base. The elytra are dark red, and remarkable on account of their dense punctation.

HAB. Maui; Haleakala. The larva of this species was found in October, 1896, feeding in the wood of *Pelea* sp.; by carrying this wood to Honolulu Mr Perkins obtained a series of 20 specimens in the following December.

(12) *Plagithmysus bishopi* Sharp.

*Plagithmysus bishopi* Sharp, Ent. Mo. Mag. xxxii. 1896, p. 242.

(Plate VI. fig. 12.)

HAB. Hawaii; Kilauea, 4000 ft., August 1895, and 1896. On *Pelea* sp. (Perkins).

*Plagithmysus bishopi* var. *gracilis*, Sharp, *l. c.* The unique individual of this variety was found on another tree resembling "pua" but with lighter, smoother bark.

(13) *Plagithmysus vicinus* Sharp.

*Plagithmysus vicinus* Sharp, *l. c.* p. 243.

HAB. Hawaii; Mauna Loa, 3000 ft., October 1892; Perkins.

Undoubtedly a distinct species. On *Pelea* sp., but not the same species as that to which *P. bishopi* is attached.

(14) *Plagithmysus bilineatus* Sharp.

*Plagithmysus bilineatus* Sharp, *l. c.* p. 243.

(Plate VI. fig. 14; ♀.)

HAB. Hawaii; Kilauea, also in the Kona and Puna districts. On the "Ohia lehua" tree, *Metrosideros polymorpha*, Perkins.

Besides being found in more than one locality this species was obtained in plenty. The variation in size (from 9—20 millim. long) is considerable, but in respect of colour it is less than in some other species. Some specimens are considerably blacker than others; but the blackness shews itself chiefly on the elytra. The hind legs are sometimes much more broadly tinted with black towards the tips than they are in others, and this is in nearly all cases correlative with a greater extension of the black colour on the wing-cases. The head and thorax remain red in the whole of the series before me.

(15) *Plagithmysus lanaiensis* Sharp.

*Plagithmysus lanaiensis* Sharp, *l. c.* p. 244.

HAB. Lanai; Halepaakai, 3000 ft., July 1894, Perkins. Probably (but only inferentially) attached to *Metrosideros polymorpha*, this being the predominant tree in the locality of capture.

(16) *Plagithmysus perkinsi* Sharp.*Plagithmysus perkinsi* Sharp, *t. c.* p. 244.

(Plate VI. fig. 15; ♀.)

HAB. Hawaii; Mauna Loa, in two localities, June and July. On *Myoporum*, or bastard sandal tree.(17) *Plagithmysus varians* Sharp.*Plagithmysus varians* Sharp, *t. c.* p. 245 (excl. var.  $\gamma$ ).HAB. Hawaii; Mauna Loa, Kilauea; Perkins. On *Acacia koa*.

This has been found in greater plenty than any other species and I have been able to examine about 200 individuals. The variation in the colour of the legs is of considerable interest. The extreme base of the femora being always yellow, the other parts vary. It may be said that the normal colour of the rest of the femur is black, but there are many specimens in which the apical third is bright red: all the intermediates between this state and the black form occur. The black and the red colours are not sharply delimited in these cases. There are two or three specimens in which the black colour is nearly entirely absent. And there is another, apparently very rare, variety, of an opposite character, in which the black colour is absent from the middle but present at the tips. There are only two or three examples of this variety known; and they resemble in this character *P. lamarckianus* rather than *P. darwinianus*. Though the black colour may be absent from either the tip or the middle it is never completely absent from both, there being no individual with quite red legs, though the black pigmentation is in a few cases but slight. In consequence of this deficiency these individuals bear a resemblance to *P. darwinianus* (in which species the legs are red). But these specimens do not approach *P. darwinianus* in other respects.

The former var.  $\gamma$  of *P. varians* is now *P. lamarckianus*.(18) *Plagithmysus darwinianus* Sharp.*Plagithmysus darwinianus* Sharp, *t. c.* p. 271.

(Plate VI. fig. 16; ♂.)

HAB. Hawaii; Kilauea, in August. On the "Mamane" tree *Sophora chrysophylla*, Perkins. In this species the legs never become black, but in some individuals—especially when the size is large—the red is somewhat darker, showing a very imperfect condition of blackness, analogous with that exhibited on the apical part of the femur

in some of the intermediate varieties connecting the forms of *P. varians*. In *P. darwinianus* the colour is however uniformly distributed.

It should be noticed that the red-leggedness of *P. darwinianus* is not due to mere deficiency of black pigmentation as compared with *P. varians*; for the black pigmentation of the wing-cases is much more extensive and decided than it is in even the darkest varieties of *P. varians*.

(19) *Plagithmysus lamarckianus*, sp. nov.

Rufo-flavus, antennis pedibusque rufis, femoribus basi flava, apice plus minus late nigricante; thorace vel nigro vel rufo, sat conspicue albido-vittato; elytris flavescensibus, dense punctatis, dorso late longeque nigro, singulo ad suturam linea albido-pubescente antierius versus latus divergente. Long. 9—15 millim.

*Plagithmysus varians*, var.  $\gamma$ , Sharp, *t. c.* p. 245.

Var.  $\alpha$ , femoribus rufis.

This species is somewhat doubtfully distinct from *P. darwinianus*. The pubescence of the under surface and of the legs is less elongate, the antennae are slightly thinner and usually darker in colour towards the tip, and the legs are usually more or less broadly black. As minor distinctions we may mention that the elytra are usually broader at the base, and are there never distinctly marked with white hairs; their black portions and the white lines on them are usually a little more extensive; the thoracic crest is a little more elevated on its posterior part.

HAB. Hawaii; Kilauea, August 1896, on the "mamake" or paper-mulberry. Although this lives in the same locality as *P. darwinianus* it frequents different trees, being attached to the Urticaceous trees, *Pipturus albidus*, and *Urera sandwicensis*. I have seen 33 specimens; the varieties with entirely red femora are very similar to *P. darwinianus*, and it is possible that it may prove that the two forms are not distinct species when more specimens are obtained. There were several specimens of *P. lamarckianus* in the series I originally referred to *P. darwinianus*, and I am indebted to Mr Perkins for directing my attention to the fact that there are probably two distinct forms.

(20) *Plagithmysus albertisi* Sharp.

*Plagithmysus albertisi* Sharp, Ent. Mo. Mag. xxxiii. 1897, p. 12.

(Plate VI. fig. 17; ♂.)

HAB. Oahu; West Honolulu, Feb. 25th, 1874; Signor d'Albertis. There is reason to fear that this species may now be extinct.

(21) *Plagithmysus pulvillatus* Karsch.

*Clytarlus pulvillatus* Karsch, Berlin. ent. Zeit. xxv. 1881, p. 9, Pl. I. f. 14.

HAB. Maui; "Grove Ranche," Karsch; Haleakala, 5000 ft., Perkins. We have received only three individuals, and the species was described by Karsch on one female. It is one of the least attractive species, being remarkable for its uniform colour and freedom from definite ornamentation as well as for the very dense sculpture of the elytra. The species is probably verging on extinction owing to the destruction in this locality of the forest tree it inhabited. Insects are no longer to be found at Grove Ranche; but Mr Perkins procured his examples about 2000 ft. directly above its situation, on *Metrosideros polymorpha*.

(22) *Plagithmysus blackburni* Sharp.

*Clytarlus blackburni* Sharp, Tr. Dublin Soc. (2) III. 1885, p. 195, Pl. V. f. 47.

*Plagithmysus blackburni* Sharp, Ent. Mo. Mag. 1896, p. 271.

HAB. Hawaii; found by Mr Blackburn [on "*Acacia falcata*"] on Mauna Loa in May; by Mr Perkins at Kona in the autumn, on *Sophora chrysophylla*. The only variation that occurs in the colour of the legs is the one that I have mentioned as being so rare in *P. varians*.

(23) *Plagithmysus sulphureus* Sharp.

*Plagithmysus sulphureus* Sharp, Ent. Mo. Mag. xxxii. 1896, p. 271.

(Plate VI. fig. 17; ♂.)

HAB. Hawaii; Kilauea, July 1895. The name of the tree to which this species is attached is unfortunately not known.

Since *P. lamarckianus* has been distinguished from *P. varians*, it should be mentioned that *P. sulphureus* is allied to the former more than to the second of these species.

(24) *Plagithmysus speculifer* Sharp.

*Plagithmysus speculifer* Sharp, t. c. p. 272.

HAB. Maui; head of the Jao Valley, June 1894. Unique. Food-tree unknown.

(25) *Plagithmysus aestivus* Sharp.

*Plagithmysus aestivus* Sharp, t. c. p. 272.

HAB. Molokai; in June and August, Perkins. On *Metrosideros polymorpha*.

(26) *Plagithmysus aequalis* Sharp.

*Plagithmysus aequalis* Sharp, Ent. Mo. Mag. 1896, p. 273.

HAB. Kauai; Mr Perkins procured a very large series of this species at Makaweli, January and February 1897, on *Acacia koa*. And I have also seen a few specimens from Waimea and Koholuamano.

This species is dimorphic as regards the colour of the legs, which are either red or black without intermediate states. The individuals with red legs are very numerous. Specimens with red thorax are very rare. The chief variations in these respects are as follows.

Var.  $\beta$ , pedibus capiteque rufis.

Var.  $\gamma$ , pedibus, capite thoraceque rufis.

I have not before me any specimens in which the legs are black without the head being so, but it is probable that such specimens occur, and, if so, would form var.  $\alpha$ .

Four individuals found in April 1895 form a variety with shorter thorax, having more rounded sides, with more white pubescence on the upper surface, and the posterior femora a little differently shaped. One of the two originally described females is a very peculiar individual and may perhaps belong to another species.

(27) *Plagithmysus munroi*, sp. nov.

Rufo nigroque variegatus; elytris rufis, singulo posterius plaga nitida nigricante, fere aequaliter ubique albido-guttulatis; thorace albido vittato, femoribus basi flava. Variat thorace femoribusque rufis, vel nigris. Long. 11—12 millim.

(Plate VI. fig. 19; ♀.)

Closely allied to *P. aequalis*, but with the elytra nearly evenly spotted all over with white flecks of pubescence, there being however a small area in front of the middle densely and finely punctured. There is no definite spot of white on the mesothoracic episterna. The hind legs are very long, the femora moderately thick, and there is extremely little difference between the sexes.

HAB. Kauai. We are indebted to G. C. Munro, Esq., for the discovery of this species: he obtained six specimens of it in July 1897, 2000 ft. above Waimea.

(28) *Plagithmysus arachnipes* Sharp.

*Plagithmysus arachnipes* Sharp, t. c. p. 274.

(Plate VI. fig. 20; ♀.)

HAB. Kauai. May 1895. Perkins. On *Acacia koa*.

Both sexes of this species may be readily distinguished from *P. aequalis* by the longer, slender basal part of the femora: as this part is pallid yellow in colour, the discrimination of the two species is easy, though apparently the two are closely allied.

(29) *Plagithmysus cristatus* Sharp.

*Clytarlus cristatus* Sharp, Tr. ent. Soc. London, 1878, p. 207.

*Plagithmysus cristatus* Sharp, Ent. Mo. Mag. 1896, p. 274.

(Plate VI. fig. 21; ♂.)

HAB. Oahu; Honolulu, Blackburn; on *Acacia koa*, Perkins.

In this species the hind femora are peculiar in shape, being much like what they are in *Callithmysus*. The legs are much more slender in the female than they are in the male. The specimen supposed to be *Clytus attenuatus* Boisd. in the collection of the British Museum is, as Mr Gahan surmised, a female of this species. Boisdual's name has however no sufficient claim to validity, as will be seen from his description, repeated here on p. 115.

CALLITHMYSUS Sharp.

*Callithmysus* Sharp, Ent. Mo. Mag. xxxii. 1896, p. 238.

(1) *Callithmysus microgaster* Sharp.

*Clytarlus microgaster* Sharp, Tr. ent. Soc. 1879, p. 103; Tr. Dublin Soc. (2), III. 1885, Pl. V. fig. 46.

HAB. Oahu; near Honolulu, 2000 ft., in June, very rare; Blackburn.

*Callithmysus microgaster* var. ? *hirtipes*, var. nov. Tibiis posterioribus minus elongatis, usque basin densissime pubescentibus.

HAB. Oahu: one individual on the ridge leading from the head of Pauoa Valley to the peak called Konahuanui, Oct. 31st, 1892. On *Bobea* sp.

Subfam. LAMIINI.

Group ACANTHOCINIDES.

LAGOCEIRUS Thoms.

(1) *Lagocheirus obsoletus* Thoms.

*Lagocheirus obsoletus* Thoms, Class. Longic. 1860, p. 10.

*Lagocheirus araneiformis* var., Sharp, Tr. ent. Soc. London, 1878, p. 210.

HAB. Oahu. Apparently confined, so far as this archipelago is concerned, to the

island of Oahu. This form is now considered to be a distinct species, though it is extremely close to the S. American insect with which it was previously identified—as a small form—by the late Mr Bates and myself. Gahan considers that *L. longipennis* Bates is a mere synonym of *L. obsoletus*. The form is widely distributed, having been found in Loo Choo islands, Tahiti, the W. Indies, and Mexico.

Group *NIPHONIDES*.

*PROSOPLUS* Blanch.

(1) *Prosoplus bankii* Fabr.

*Lamia bankii* Fabr., Syst. Ent. p. 176.

*Micracantha insularis* Pascoe, Tr. ent. Soc. London (2), v. 1859, p. 40.

*Micracantha nutans* Sharp, Tr. ent. Soc. 1878, p. 209.

HAB. On the introduced Acacia, *Prosopis* sp. Probably on all the islands. Mr Perkins, knowing it not to be native, procured but few examples. The species is very widely diffused, having been found in Madagascar, Port Essington, Tondano, Amboyna. *L. bankii* was described as found at the Cape of Good Hope. The identification is due to an examination of the Banksian type in the collection of the British Museum made by Mr Gahan. The genera *Prosoplus* and *Micracantha* are considered by him to be one and the same.

Group *APOMECCYNIDES*.

*APOMECCYNA* Serv.

(1) *Apomeccyna pertigera* Thoms.

*Mecynapus pertigera* Thoms. Physis, 1. 6, p. 160.

HAB. Oahu. In a garden, Honolulu, November 1896, Perkins. Kauai, July 1897, Munro. The species comes from E. India and China.

Group *PTERICOPTIDES*.

*OOPSIS* Fairm.

(1) *Oopsis nutator* Fabr.

*Lamia nutator* Fabr., Mant. 1. p. 142.

*Stasilea curvicornis* Karsch, Berlin. ent. Zeitschr. xxv. p. 8, Plate I. fig. 12.

HAB. Probably on all the islands. Abundant at low elevations. Widely distributed in Polynesia, and found in Australia.

## § 3. Bibliographic List (arranged chronologically).

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[P. 485. "*Clytus attenuatus*, Dejean. Fuscus; thorace cristato, albido lineato; elytris apice valde attenuatis, albido subvariegatis; subtus ferrugineus. Nouvelle Hollande. Collection de M. Dejean. Cet insecte n'est point un vrai *Clytus*, il devra probablement former un nouveau genre." The specimen in Dejean's collection shows this to be *Plagithmysus cristatus* ♀. D. S.]
  2. MOTSCHOUJSKY, V. DE. Remarques sur la collection de Coléoptères russes de Victor de Motschoulsky. Bull. Soc. Moscou, xviii. 1845, Pt. I. pp. 3—127, Plates I.—III.  
P. 85, description of *Stenopterus pulverulentus*, Pl. I. fig. 2. Said to be from California.
  3. ——. Observations sur le Musée entomologique de l'Université impériale de Moscou. *Op. cit.* 1845, Pt. II. pp. 332—388, Plates I., VII.  
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  4. ——. Études entomologiques, 1852, p. 76.  
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Two n. spp. of *Clytarlus*. Indicates, without naming, three genera.
  7. HAROLD, E. VON. Einige neue Coleopteren. Mith. München. ent. Ver. iv. 1880, pp. 148—171.  
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- F. H. II.

11. SHARP, D. Note on the genus *Plagithmysus* Motsch. C.R. Soc. ent. Belgique, 1885, pp. lxxiv—lxxvi.  
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13. —. Supplement. *Op. cit.* xxxiii. 1897, p. 12.  
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Stridulation and habits of *Plagithmysus* (as *Clytarus*).
15. —. Notes on some Hawaiian Insects. P. Cambridge Phil. Soc. ix. 1897, pp. 373—380.  
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## II. COLEOPTERA RHYNCHOPHORA, PROTERHINIDAE, HETEROMERA AND CIOIDAE.

By R. C. L. Perkins.

### COLEOPTERA RHYNCHOPHORA.

#### Fam. CURCULIONIDAE.

##### § 1. General Remarks on the Curculionidae<sup>1</sup>.

THE Curculionidae are represented by 137 species, and of these no less than 132 are at present only known from the islands. It is probable however that of the others some will be found to be not truly indigenous, so that we will first briefly review the various tribes with respect to these doubtfully indigenous forms. Of the Otiorhynchini the species of *Rhyncogonus* are all peculiar to the islands, and the only one to which any suspicion can attach is *R. vestitus*, which in many respects is very different to, and indeed less remarkable than the others. It is the only species which frequents the low lands, and is found upon plants which are known elsewhere, whereas the others are all attached to the forest trees or plants which are themselves peculiar to the islands. Still on the whole we are disposed to consider it indigenous. The solitary species of *Pantomorus* on the other hand is certainly an introduced species, as we have found it in gardens in Honolulu, and on Maui it has increased to such an extent as at times to be injurious. The Cyladini are represented only by one species of *Cylas* known to occur elsewhere, and which is attached to a common coast species of *Ipomoea*. No doubt this beetle is a natural immigrant.

The Cryptorhynchini have 20 species of *Acalles*, certainly all indigenous, and two other species representing each a different genus. Both appear to be allied to *Acalles*, the one indeed closely allied, and there is no reason to doubt that both are indigenous.

The Calandrini have three species of *Calandra*, two being widely distributed outside the islands. The third is a remarkable species and is attached to cactus and banana, and although not known elsewhere it may well have been imported, and cannot safely be considered indigenous, nor even a natural immigrant. Besides these a single species of *Sphenophorus*, the well-known cane-borer of the sugar-planters, is known elsewhere, and is either an importation by man or a natural immigrant.

<sup>1</sup> For remarks on the Proterhinidae and other groups see subsequent pages.

The Cossonini are the most extensive and important representatives of the Curculionidae. The 46 species of *Oodemas* and the 10 of *Heteramphus* may be at once dismissed as being all indigenous, and the same may be said of the three allied species of *Anotheorus*, and the same number of *Nesotocus*. The 17 species of *Dryophthorus* are a varied assemblage and might be distributed in two or three genera, but there is no reason to suppose that any of them will be found elsewhere. The unique example which represents the genus *Orothreptes* and the hardly less rare species for which we have made the genus *Deinocossus* are almost certainly indigenous, for they are mountain forms, attached to indigenous trees. The latter indeed appears to have already formed to some extent distinct races on several of the islands. The species for which the genus *Dysonma* is formed must also be considered indigenous, the unique example having been found by sifting dead leaves on the boggy summit of the Kauai mountains. Other two genera now described, each for a single species—*Thallatodora* and *Haloxenus*—are both found on the coast in logs of driftwood. It is probable that both will be found elsewhere, being natural immigrants. The two species of *Pseudohus* must both be excluded from the indigenous weevils; one is found freely in banana and cactus in company with *Calandra remota*, the other has been found in and near Honolulu only, and on one of these occasions in boards of foreign wood, which formed the floor of a room. The *Phloeophagosoma* is abundant in decaying wood of *Aleurites* at low elevations, in company with *Pentarthrum obscurum*, and both these species I have little doubt occur outside the islands. It may be noted that the *Aleurites* or candle-nut-tree produces but very few indigenous insects, and such as frequent it are mostly polyphagous species, and although the tree now forms in many localities a large part of the lower forest, I suspect that it has been comparatively but a short time in the islands, and was very probably brought there by the natives when they settled in the country. Another species of *Pentarthrum* found on the lowlands near Honolulu must also be considered as foreign. The third species of this genus is very different in appearance and structure to the others, and is truly indigenous, being confined to the mountain forests, where it is attached solely to the tree-ferns, which are so conspicuous a feature of these forests. Thus the species which in my opinion are foreign amount to 13, and are distributed in no less than nine genera, and it may be remarked that those Cossonini, which we consider as foreign, although they have not yet been obtained elsewhere, are all small and obscure insects such as have been little collected in most countries.

The indigenous Curculionidae on the other hand with their 123 species are distributed in 13 genera, which represent three tribes only—Otioryhynchini, Cryptorhynchini, and Cossonini. The genus *Rhyncogonus*, which was established by Sharp for the members of the first tribe, is not peculiar to the islands, and has since been found in New Zealand and other of the Pacific islands (*vide* Ent. Mo. Mag. 1899, p. 56).

The Cryptorhynchini have two genera peculiar, each with only one species

known, but the great majority of the species belong to the widely distributed genus *Acalles*.

Of the Cossonini, *Oodemus*, *Heteramphus*, *Anotheorus*, *Nesotocus*, *Dysomma*, *Deinocossonus*, and *Orothreptes* are all genera peculiar to the islands, and it is probable that some members of the genus *Dryophthorus* will at some time be separated as distinct, while the rest will remain in that or be placed in very closely allied genera. The indigenous *Pentarthrum* is a remarkable insect, very different to the two foreign exponents of the genus, but said to be allied to New Zealand forms (Sharp, Tr. ent. Soc. Lond. 1878, p. 25). Thus nine of the 13 genera of indigenous Curculionidae are peculiar to the islands, while *Rhyncogonus* with its numerous species probably originated in the Pacific region and will be found to be widely distributed therein. With regard to *Acalles* Sharp has remarked (Tr. Dublin Soc. 1885, p. 269) that it "is one of the most frequent components of insular faunae, being very richly represented in New Zealand, Polynesia, and the Atlantic islands."

**Distribution** of genera and species in the islands. Of the six genera which contain each but a single species, the two Cryptorhynchids, *Hyperomorpha* and *Chaenosternum*, have both been found on Oahu alone, and the Cossonideous genera *Dysomma* and *Orothreptes* are peculiar, the first-named to Kauai, the latter to Hawaii, whereas *Deinocossonus* is probably to be found on all, since it has been taken on Kauai and Hawaii at either end of the group as well as on the intermediate island of Oahu, and the indigenous *Pentarthrum* is likewise ubiquitous. It must however be remembered that all the above-named insects, excluding the *Pentarthrum*, are excessively rare and difficult to procure, so that more extended observations might show that those apparently peculiar to one island also occur on some of the others. *Nesotocus* has been found alive on Kauai, Maui and Hawaii, and fragments also on Molokai, so that it is no doubt of general distribution, but *Anotheorus* is wanting on Hawaii, its range being from Kauai to Maui. The distribution of *Heteramphus* is similar to that of *Anotheorus*, except that whereas we failed to collect the latter on Molokai, so *Heteramphus* was not found on Lanai, but both are found on the neighbouring island of Maui. The extensive genera *Oodemus* and *Dryophthorus* are ubiquitous over the group, as also is *Acalles*, but *Rhyncogonus* apparently becomes scarcer on the windward islands, and is altogether absent from Hawaii.

The species of the genus *Rhyncogonus*, excepting only *R. sordidus*, which was found alive on Lanai and in fragmentary condition on Molokai, are confined each one to a single island, and of the 19 species Kauai has no less than nine, Oahu four, Molokai three, Lanai and Maui two each, whilst Hawaii, as has been remarked, has none.

Of the 20 species of *Acalles* the three islands, Kauai, Oahu and Hawaii have each four species, and Maui and Lanai three each, while one species is found throughout the

group, and another has occurred on three of the intermediate islands. These figures are however subject to correction, for the Hawaiian species of *Acalles* are excessively difficult to collect, and some of them exhibit considerable variability, so that it is neither certain that all the species described are certainly distinct, nor that the forms from different islands assigned to a single species are really identical. The species of *Dryophthorus* appear to be less restricted in their distribution; Kauai has six, Oahu two, and Hawaii one peculiar species, but the remaining eight are found on two or more of the islands; three indeed are found throughout the group.

The extensive genus *Oodemus* has no less than 46 species, and is most richly represented on Kauai, which has 18 species peculiar to it. Oahu and Maui each have just half as many peculiar, whilst Hawaii, Lanai and Molokai have respectively three, two and one. The remaining four species occur on two or more of the islands, but neither of them is found on Kauai.

*Heteramphus* would appear to have its head-quarters on Oahu, where are five of the ten known species, and these five are all peculiar to it; Maui has three species peculiar, and Molokai and Kauai each have one; that on the latter island would have to be separated generically were it not connected by the Oahuan *H. hirtellus* with the more usual forms. Three of the Oahuan species are usually found in company on *Astelia veratroides*, but would appear to be of extremely restricted range within that island, since they are not to be found in many places where the plant is extremely abundant, nor have we found any species attached to the *Astelia* on the other islands, the Molokai form having been obtained from wet moss, and the others from wet decaying logs. No species of this genus has been found on the large island of Hawaii.

*Anotheorus* has one species quite peculiar to Kauai, Oahu likewise has one, but it is very closely allied to the Maui form, and as both vary, I have some doubt as to their being distinct. A single example from Lanai agrees best with the Maui species.

The extraordinary genus *Nesotocus* has one species peculiar to Kauai and one to the Western range of mountains on Maui, the third has been taken both on Haleakala, the Eastern division of this island, and also on Hawaii.

The remaining indigenous species have been sufficiently referred to above under the genera to which they belong.

The percentage of the indigenous species of Curculionidae peculiar to the several islands is given in the table.

	Species peculiar to.	Total number of species found upon.	Percentage of species peculiar to.
Kauai	41	48	85
Oahu	27	39	69
Molokai	4	16	25
Maui	18	31	58
Lanai	6	19	31
Hawaii	9	20	45

These figures fully show the remarkable character of the Kauai fauna in this family of Coleoptera. Not only is it considerably the richest in species, but the percentage of peculiar species is much higher than is the case with any other island. Moreover the species themselves are in many cases highly remarkable, as compared with those of the same genus on the other islands. Thus in *Oodemas*, *O. longirostre*, *O. costatum*, *O. striatum*, *O. pulchrum*, are species of the most highly evolved form, each in its own particular direction. So also the Kauai species of *Rhyncogonus* form a remarkable series. These facts suggest the probability that the ancestors of the now existing fauna of Curculionidae may, at least to a large extent, have first gained a footing on this island, possibly at a time when some of the more recent islands were not adapted for the mode of life of these creatures, or possibly even before these islands existed at all. This suggestion is strengthened by a consideration of the condition of the weevils on the other islands; thus Oahu comes second both in number of species and in the percentage of those peculiar to it, and it is noteworthy that a number of the most remarkable forms are found in what yet remains of the once fine forest of the Waianae range, itself one of the oldest portions of the whole group of islands. Very different is the case with Hawaii, which from its large size, lofty mountains, and very varied climate, as well as its position at the end of the series of islands, might be expected to have a large number of remarkable forms. This however is not the case, for it is not only altogether wanting in *Rhyncogonus*, *Heteramphus* and *Anotheorus*, but it possesses but three or four species of *Oodemas*, and these of the most commonplace forms. In the group we are now considering the condition of the fauna of the big island contrasts curiously with its Aculeate Hymenoptera, which are both richly represented and remarkable; indeed it is not necessary to go beyond the order of Coleoptera to see a similar contrast, for the indigenous Cerambycidae are well represented there and some of the forms are amongst the most remarkable of those found in the group.

**Variation.** We have already when dealing with the Aculeate Hymenoptera, Neuroptera and Orthoptera remarked on the variability of so many of the island species. Not less remarkable is this in the case of the Curculionidae. Mr Blackburn in describing the species of *Oodemas* notes that their variability in certain points is embarrassing to the describer, and with a large collection this becomes so much so, that in many cases it is almost impossible to write a description which will apply in all respects to every individual specimen. This variability too is not confined to superficial and trivial characters, but affects those which are considered of decided importance for the separation of species. Even structures which are almost always constant vary in some species, as for example parts of the prosternum in some species of *Oodemas*. We may observe that there is no doubt as to the examples which exhibit this variability belonging to the same species, and we are excluding from consideration such a species as *O. multiforme* of Hawaii, which may possibly include several allied and variable species; but is more

probably one which is now in the process of becoming divided into several, the division not yet being complete. Some of the species of *Rhyncogonus* too are variable, as also are those belonging to the genera *Dryophthorus* and *Heteramphus*, and there is no doubt that many of the species of *Acalles* will prove to be equally so, when they have been collected in numbers sufficient for an investigation on this point.

The Curculionidae of the islands are as a whole remarkably isolated. The *Rhyncogoni* of the Otiiorhynchini and the solitary indigenous species of *Pentarthrum* and *Orothreptes* all probably originated in the Pacific islands, for the latter appears to be most allied to the New Zealand *Sericotrogus*, although this alliance is by no means close. The very important Cossonideous genera *Oodemus*, *Anotheorus*, *Heteramphus* and *Nesotocus*, on the other hand, are of quite uncertain origin, no near ally to any of these forms having been found elsewhere. Indeed great as are the differences between the first three of these genera it would appear that they are at least as closely connected *inter se* as they are with anything outside the islands. Thus some of the species of *Oodemus*, entirely different as they are in facies, do make some approach to *Heteramphus*, while *Anotheorus* and *Oodemus* appear to be more nearly allied.

Wollaston remarks that metallic colouring is of rare occurrence in the Cossonini, so that it is worthy of note that no less than 49 species, in fact all the members of the genus *Oodemus* and *Anotheorus*, are so coloured. The extreme similarity in colour and clothing between the very diverse genera *Orothreptes* and *Deinocossonus*, is quite extraordinary, both being clothed with a golden pubescence, in which they greatly resemble the New Zealand *Sericotrogus*, although *Deinocossonus* does not even belong to the same section of the Cossonini as the other two.

## § 2. Systematic account of the Curculionidae.

### Tribe OTIORHYNCHINI.

#### RHYNCOGONUS Sharp.

##### (1) *Rhyncogonus nitidus*, sp. nov.

Niger, nitidus, supra fere glaber. Caput cum pronoto laeve, et distincte punctatum. Elytra nitida, seriatim punctata. Abdominis segmentum ventrale apicale ♂-is latum, opacum, pubescens, densissime punctatum, apice truncato, ♀-ae nitidum, parcius pubescens, apice angusto, subacuto. Long. 12—17 mm. (Plate VII, fig. 1.)

Black, smooth, and shining, often with a small spot of pale pubescence on each side of the thorax at the base, the ♀ generally larger and more robust than the ♂.

Head and thorax distinctly and rather finely punctured, the punctures of unequal size; second joint of the antennae rather longer than the third. Elytra shining, each with about 12 rows of punctures dorsally, more strongly attenuate towards the apex in the ♀ than in the ♂, and in the former sex with the edges flattened for some distance from the shoulders. Abdomen beneath coarsely punctured at the base, and widely depressed in the ♂, finely punctured and but little depressed in the ♀. Apical ventral segment of the ♂ dull, finely and densely punctured, pubescent but not very densely so, the apex very broad and subtruncate. In the ♀ this segment is shining, clothed with inconspicuous, and very short pubescence, subtriangular and narrowly rounded at the apex.

HAB. Kauai Mountains (3000 ft.).

(2) *Rhyncogonus funereus*, sp. nov.

Niger, subnitidus, supra haud pubescens. Caput strigosum et punctatum. Prothorax dense rugoso-punctatus. Elytra grosse punctata. Antennarum articulus secundus tertio multo brevior. ♂. Long. 12.5 mm.

Black, with the surface shining, and coarse sculpture. Head strongly strigose, and punctured. Second joint of the antennae much shorter than the third. Thorax strongly and densely rugosely punctured, its sides hardly rounded, subparallel. Elytra shining, subdepressed, without pubescence, coarsely punctured, the interstices narrow, irregular. Posterior femora with a transverse spot of pale pubescence outwardly about the middle; tibiae, tarsi and apex of the rostrum with fine pubescence.

HAB. Oahu, Waianae mountains. A single ♂, found dead and somewhat mutilated, beneath bark.

(3) *Rhyncogonus squamiger*, sp. nov.

Niger, nitidus, antennis, tibiis, tarsisque rufescentibus. Caput cum prothorace tenuiter pubescens. Elytra squamulis pallidis, plus minusve seriatim dispositis, vestita. Antennarum articulus secundus tertio multo longior. ♀. Long. 14 mm. (Plate VII. fig. 2.)

Black and shining, the antennae and all the tibiae and tarsi of an obscure reddish colour. Head with a thin clothing of short pale hairs which become scale-like, and form a pale mark around the inner and posterior margins of the eyes, rugosely punctured. Antennae with the first joint of the funiculus very long, considerably longer than the second, the club unusually long and slender, its terminal evidently longer than its basal joint. Thorax with sparse pubescence above, but forming a rather denser line along each side, as wide as long, its sides rather strongly rounded, the surface shining and

closely punctured. Elytra with regular rows of very closely-set punctures, the interstices narrow, and very smooth and shining; along the striae there are rows of minute pale scales for the most part placed singly, but in places, especially at the shoulders, and towards the apex of the elytra, forming more or less dense patches.

HAB. Kauai Mountains near Lihue (3000 ft.); 1 ♀ taken.

(4) *Rhyncogonus stygius*, sp. nov.

Niger, capite strigoso et punctato. Antennarum articulus secundus et tertius subaequilongus. Elytra opaca, pube inconspicua et brevissima vestita, seriatim punctata, interstitiis tuberculis minutissimis, rare dispositis, munitis. Long. 12.5—15 mm. (Plate VII. fig. 3.)

Black, the antennae, tibiae, and tarsi sometimes with a reddish tinge. The head is strigose and punctured, the antennae have the second and third joints nearly equal in length, the apical joint of the club is evidently shorter than its basal one. The thorax is densely punctured, and has a small pale pubescent spot on each side at the base. The elytra are quite dull, each with about a dozen regular rows of punctures dorsally, and clothed with an excessively short pubescence, usually hardly visible without close examination, but in some examples sufficient to give the surface a slightly greyish appearance. The interstices are furnished with minute scattered tubercles, which are slightly less dull than the general surface. The intermediate and posterior femora have a distinct patch of pale pubescence outwardly.

HAB. Kauai, Halemanu (4000 ft.).

(5) *Rhyncogonus minor*, sp. nov.

Niger, parum nitidus, capite pubescentia pallida parcius vestito. Antennarum articulus secundus tertio vix longior. Prothorax utrinque linea pubescentiae pallidae continua ornatus. Elytra, humeris et parte apicali exceptis, haud pubescentia. ♀. Long. 10.5 mm.

In general sculpture this species bears a strong resemblance to the preceding, but it is a much smaller insect and it is comparatively less elongate. The pubescence of the elytra is confined to some scanty patches at the extreme base, and a very sparse clothing on the apical portion. Their surface is evidently less dull, and except towards the sides and apex there are no evident minute tubercles on the interstices. Their form is different, for they are much more suddenly narrowed to the apex, the narrowing beginning only about one-third of their length from the apex. The front of the head is evidently more pubescent, and there is a wide and distinct stripe of pubescence on

each side of the thorax from base to apex. In the ♀ (the only sex obtained), the dorsal edges of the elytra are very evidently flattened for a considerable distance from the base. The puncturation of the whole insect, allowing for the difference in size, does not materially differ from that of *R. stygius*.

HAB. Kauai Mountains (4000 ft.); 1 ♀ taken.

(6) *Rhyncogonus molokaiensis*, sp. nov.

Niger, subnitidus, antennis pedibusque saepe rufescentibus. Caput circa basim dense subtilius punctatum. Antennarum articulus tertius secundo vix brevior. Prothorax dense (nec grosse) punctatus, macula utrinque ad basim pubescente ornatus. Elytra subnitida, fere glabra. Long. 9.5—12 mm.

Black, and somewhat shining, the legs and antennae more or less of an obscure red colour. The head is closely and finely punctured at the base, the second joint of the antennae subequal to, or rather longer than, the third. Thorax densely, but not coarsely, punctured; the punctures, however, are much larger and stronger than those at the base of the head. There is a very distinct smooth median dorsal line extending from base to apex, and a small spot of pale pubescence on each side at the base. The elytra are not very dull, and are almost without pubescence, and the surface is slightly roughened by delicate corrugations proceeding from the punctures. In both sexes the two apical segments of the abdomen beneath are clothed with pubescence, which is very dense on the apical one. The other segments have only very sparse and minute hairs. In the ♂ the apical segment is broad and truncate, in the ♀ narrow and somewhat pointed at the apex, as is usual throughout the genus.

HAB. Molokai, mountains (3000 ft.); rare.

(7) *Rhyncogonus dubius*, sp. nov.

Niger, vix nitidus, elytris vix evidenter pubescentibus, ♂ praecedenti cognatissimus, capite circa basim haud dense punctato, elytris magis corrugatis, distinguendus. ♂. Long. fere 10 mm.

I have seen only a single ♂ of this species, which is closely allied to that of *R. molokaiensis*, but apparently distinct. The front of the head (including the rostrum) is by no means densely punctured, and at the base the punctures are larger and much more sparing. The smooth dorsal line on the thorax is much more definite, and the surface of the elytra less smooth, owing to the stronger corrugations.

HAB. Molokai, Kalae (1700 ft.); 1 ♂ taken.

(8) *Rhyncogonus freycinetiae*, sp. nov.

Niger, subnitidus, elytris vix pubescentibus, capite circa basim minus dense punctato. Prothorax latus, trans medium evidentiter latior quam longior, lateribus linea pubescentiae continua ornatis. Elytra subnitida, interstitiis laevioribus. Abdominis segmentum tertium ventrale ♀ aequae ac quartum pubescens. ♀. Long. 11 mm. (Plate VII. fig. 4.)

Female black, and somewhat shining, in general appearance very like that of *R. molokaiensis*. From that species it may easily be distinguished by the less close puncturation of the base of the head; the much wider and more depressed thorax, with continuous lateral lines of pubescence. The ventral surface of the hind body is also more pubescent, the third segment hardly less clothed than the fourth.

HAB. Oahu, Halemano (2000 ft.); 1 ♀ taken at the bases of the leaves of *Freycinetia*.

(9) *Rhyncogonus blackburni* Sharp.

*Rhyncogonus blackburni* Sharp, Tr. Dublin Soc. III. (Ser. II.) p. 177.

HAB. Oahu, mountains near Honolulu (Blackburn); 1 ♂ in the same locality (2000 ft.).

(10) *Rhyncogonus koebeli*, sp. nov.

Niger, haud nitidus, antennis pedibusque rufescentibus. Caput sublaeve, sparsim punctatum. Prothorax subtilissime pubescens, densissime rugoso-punctatus, lateribus fortiter rotundatis. Elytra peropaca, parcissime pubescentia, apicibus liberis. ♂. Long. 11 mm. (Plate VII. fig. 5.)

Dull blackish, the antennae and all the legs dull reddish. Head smooth and shining, sparsely punctured, the eyes very little prominent. Second joint of the antennae rather longer than the third, the basal joint of the club longer than the apical. Thorax very finely pubescent, densely rugosely punctured, its sides strongly rounded. Elytra dull, with very little pubescence, the puncturation somewhat irregular, their apices free, subdivergent. All the femora clothed with very short pubescence, that on the tibiae longer. Apical ventral segment of the hind-body widely truncate at the apex, densely clothed with pale pubescence. The species is very remarkable for the condition of the eyes, which are much less prominent than in any other.

HAB. Oahu, mountains near Honolulu (2000 ft.); 1 ♂ taken by Mr A. Koebele, whilst collecting with me.

(11) *Rhyncogonus kauaiensis*, sp. nov.

Niger, vel plus minusve rufescens, capite et corpore toto subtiliter griseo-vel rufo-pubescente. Caput strigosum et punctatum. Prothorax dense punctatus, utrinque vitta pubescente ornatus. Elytra vix opaca, subtiliter pubescentia. Long. 10—13 mm.

Colour varying from black to reddish brown. The male generally much depressed, the ♀ more convex, but neither sex is constant in this respect. Head more or less strigose and punctured, clothed all over with fine pale hairs, which form a denser line around the inner margins of the eyes. Thorax densely punctured, clothed with fine pubescence like that of the head, and on each side with a line of dense pale pubescence. Elytra usually more or less shining, but much duller in some examples than others, clothed with fine grey or reddish pubescence, the series of punctures for the most part distinct, but towards the sides becoming more or less confused, and the surface more or less rough, often tuberculate. The pseudepipleural region of the elytra always with conspicuous patches or spots of dense pubescence.

HAB. Kauai (4000 ft.); 15 examples taken. Apparently a very variable species.

(12) *Rhyncogonus sordidus*, sp. nov.

Niger, vel subrufescens, opacus, subtiliter pubescens, capite punctato. Prothorax dense nec grosse punctatus. Elytra opaca, pubescentia, seriatim punctata, lateribus maculis pubescentibus haud ornatis. ♂♀. Long. 10—12 mm.

The colour of this species varies from black to obscure red. The front of the head and rostrum is almost without pubescence, the puncturation of the latter is usually not very close and it shows little or no trace of longitudinal strigosity, its surface is more or less flattened or depressed. The thorax is densely, but not coarsely, punctured, more or less impressed near the base, clothed with very short and fine pubescence, and with a line of denser and rather longer hairs on each side, but even in fresh examples these lines are obscure. The elytra have a very fine pubescence, which is more conspicuous in the ♀, and of a reddish colour. Their surface is dull, but not rough, and the punctures towards the sides remain quite distinct, although the series may be more or less confused. On their deflexed portion there is no trace of spots or lines of dense pubescence, such as are found in the preceding species. In the ♂ the apical ventral segment only of the hind-body is densely hairy, the others but sparsely so, the two basal more or less strongly impressed.

HAB. Lanai, mountains (3000 ft.). A short and rather variable series taken. The relative length of the second and third joints of the antennae appears to vary, as also the puncturation of the insect. Fragments of a *Rhyncogonus* found on Molokai are probably referable to this species. In one spot these were very abundant, but the species had no doubt been extinct (so far as that particular locality is concerned) for years, the vegetation consisting only of small stunted bushes.

(13) *Rhyncogonus lanaiensis*, sp. nov.

Forma, facieque praecedentis; ♂ oculis fortiter prominentibus, abdominis segmentis ventralibus tribus apicalibus dense pubescentibus distinguendus. ♂. Long. 11.5 mm. (♀ ? 14 mm.)

Extremely like the preceding, but distinct by the strongly prominent eyes. The ♂ also differs in having the three apical ventral segments of the hind-body densely pubescent, and the head somewhat strigose, as well as punctured. The first joint of the funiculus of the antennae is considerably longer than the second.

A single ♀ probably belongs to this species. It differs from the preceding in its larger size, more prominent eyes, and the rather more pubescent ventral segments of the hind-body.

HAB. Lanai (2000—3000 ft.); 1 ♂ and 1 ♀.

(14) *Rhyncogonus lahaina*, sp. nov.

Nigricans, pubescentia pallida vestitus, pedibus antennisque rufescentibus; ♂ thorace densissime punctato, interstitiis nitidis. Elytra pubescentia, sensim ad apices attenuata. ♂. Long. 10.5 mm.

Blackish, the antennae, tibiae, tarsi, and more or less of the femora, red. The surface of the rostrum (♂) is somewhat smooth, punctured, but not strigose, and with a scanty short pubescence. The antennae have the first joint of the funiculus evidently longer than the second. The sides of the prothorax are rounded, its surface smooth and shining between the dense punctures, and clothed with short fine pubescence, which at the sides becomes longer and coarser, and forms a somewhat indefinite lateral band on each side. The elytra are dull, and on each there are five or six lines of pale pubescence, which are not very distinct, and due to the fact that the interstices are alternately more densely or more sparsely clothed. The puncturation is distinct throughout, but the second and third series originate at some distance from the base of the elytra.

HAB. Maui, mountains behind Lahaina (3000 ft.); 1 ♂ taken.

(15) *Rhyncogonus depressus*, sp. nov.

Niger, densius pallido-pubescentis; ♂ fortiter depressus. Rostrum pubescentia tectum, strigoso-punctatum. Pronotum cum elytris pubescens, nitidum; elytra seriatim punctata, tuberculisque minutis asperula. Long. 10.5—13.5 mm. (Plate VII. fig. 6.)

Black, the whole insect clothed with somewhat dense pale pubescence, which is rather in the form of very fine elongate scales, and to a large extent conceals the surface, which is shining. The head in front is strigose and punctured; the prothorax densely punctured, the sides not at all strongly rounded, the surface shining, and with a smooth narrow dorsal line, the sides more densely pubescent than the general surface. The elytra in the ♂ are much depressed, with closely-set series of punctures, the surface where not hidden by the pubescence, shining, and roughened with small tubercles. All the legs clothed with pubescence, that on the front tibiae, as well as that of the scape of the antennae, longer and more conspicuous than that of most of the species. The single ♀ which probably belongs to this species is much less depressed, and has a shorter club to the antennae, its middle joint being not longer than wide, and the joints themselves less distinct.

HAB. Kauai, Halemanu (4000 ft.); 3 ♂ and 1 ♀.

(16) *Rhyncogonus vittatus*, sp. nov.

Niger, antennis pedibusque saepe plus minusve rufescentibus. Caput cum pronoto squamulis pallidis vestitum. Elytra tuberculis nitidis asperula, fasciis longitudinalibus pallidis ornata. ♂ ♀. Long. 10—11 mm. (Plate VI. fig. 7.)

Black, the antennae and legs often more or less red or piceous. The ♂ is very strongly flattened or depressed, the ♀ sometimes of more convex form. The head is strigose and punctured, but the surface is for the most part concealed by the covering of scales and hairs. The sides of the prothorax are but little rounded, and slightly convergent in front, the surface densely punctured and concealed by the pale squamous pubescence. The elytra have each about six distinct longitudinal bands, formed of minute pale scales, the spaces between these bands being sparsely clothed with similar scales. The surface is roughened by shining tubercles, and the puncturation much obscured. All the legs and the antennae are clothed with pale hairs. In both sexes the entire ventral surface of the hind-body is conspicuously pubescent, but the basal segments are less densely clothed than the apical.

HAB. Kauai, mountains (3000 ft.); not common.

(17) *Rhyncogonus tuberculatus*, sp. nov.

Minor, haud nitidus, totus pubescens, nigro-piceus, antennis pedibusque rufescentibus. Caput strigosum. Elytra tota fusco-pubescentia, seriatim punctata, tuberculis rare dispositis munita, apicibus haud liberis. ♂ ♀. Long. 8.5—9 mm.

A small species, entirely clothed with fuscous pubescence, the ♂ strongly depressed. Head strigose; antennae with the first joint of the funiculus subequal to the second; in

the ♂ these joints are unusually short, and either of them is only about the length of the basal joint of the club. The sculpture of the prothorax is largely concealed by the pubescence, its surface is roughened by minute tubercles, and the puncturation is indistinct. The elytra are seriatly punctured, and entirely covered with pubescence, which shows no tendency to form lines, and are united to the extreme apex. There are very distinct tubercles sparsely scattered over the surface, many of which terminate in a single short bristle. The apical ventral segment of the hind-body in the ♂ is of a reddish colour, densely pubescent, and truncate at the apex. The rest of the ventral surface is conspicuously, but less densely, pubescent.

HAB. Kauai, Halemanu (4000 ft.); 1 ♂ 1 ♀ taken.

(18) *Rhyncogonus sylvicola*, sp. nov.

Minor, niger, vix nitidus, pubescens, prothorace subelongato, rugoso-punctato. Elytra ad basim prothorace latiora, tuberculis rare dispositis munita, apicibus breviter liberis. ♀. Long. 9—9.5 mm.

Allied to the preceding, but blacker in colour, and the surface less dull. The prothorax is evidently longer, and its puncturation, which is dense and rugose, is distinct. The elytra have scattered tubercles much as in that species, but they are evidently wider at the base, so that the humeral angles stand out somewhat from the hind angles of the prothorax, and their extreme apices are free.

HAB. Kauai, Halemanu (4000 ft.); 2 ♀ taken.

(19) *Rhyncogonus vestitus* Sharp.

*Rhyncogonus vestitus* Sharp, Tr. Dublin Soc. III. 1885, p. 177.

(Plate VII. fig. 8.)

HAB. Maui. Very abundant on the sandhills between the mountains of East and West Maui, but not found elsewhere.

PANTOMORUS Schönherr.

(1) *Pantomorus olindae*, sp. nov.

Nigricans, squamis pallidis vestitus. Capitis pars praeantennalis longitudinaliter impressum, post hanc linea impressa mediali sat distincta. Antennarum articulus secundus tertio multo brevior. Oculi fortiter convexi. Pronotum pallidis squamis celatum, lateribus parum rotundatis. Elytra substriata, striis confertim punctatis,

squamis pallidis necnon postice setulis pallidis brevissimis vestita, lateribus fuscosquamosis. Abdominis segmenta ventralia subtilissime rugulosa, vix evidenter punctata. Long. (cum rostro) 8—8.5 mm.

This species is found in Honolulu, and is sometimes very abundant at Makawao and Olinda, Maui, and is found as high up as 5000 ft. on Haleakala. It differs from *Pantomorus* proper in having the antennal scrobes less deep and less definitely marked posteriorly.

HAB. Oahu and Maui; no doubt an imported species.

Tribe *CYLADINI*.

*CYLAS* Latr.

(1) *Cylas turcipennis* Boh.

*Cylas turcipennis* Boh. Sch. Gen. Curc. I. p. 369.

HAB. Oahu and Maui; coast.

Tribe *CRYPTORHYNCHINI*.

*ACALLES* Schönherr.

(1) *Acalles lateralis* Sharp.

*Acalles lateralis* Sharp, Tr. Dublin Soc. III. 1885, p. 178.

(Plate VII. fig. 9, ♂.)

HAB. Oahu etc. The typical specimens are from Oahu; I have taken others which must be referred to this species, on Kauai, Molokai, Maui, and Hawaii. Very scarce. The insects of this genus are with one or two exceptions extremely difficult to procure, being generally taken singly, and in very different conditions as regards the covering of scales; this, added to the fact that they are certainly variable in colour, size etc., makes a comparison of allied forms very difficult. It is quite possible that there are several species very closely allied to *A. lateralis*, the number and condition of the examples taken making it impossible to decide on this point. The single pair taken on Kauai are very large (5 mm. excl. rostr.), the male has the prothorax wider and more strongly constricted in front, and the prominences caused by the unevenly raised interstices of the elytra are more strongly developed. The ♀ has the rostrum black, the thorax wider, and the prominences on the elytra stronger than those of typical *A. lateralis*.

(2) *Acalles humeralis*, sp. nov.

Minor, haud latus, squamis pallidis (griseis vel subferrugineis) vestitus, antennis rostroque plus minusve rufescentibus. Pronotum totum squamis pallidis vestitum, medium sulcatum, antice constrictum, ♂-is sat latum, trans medium vix minus latum quam longum, ♀-ae fortiter elongatum, lateribus minus fortiter rotundatis. Elytra squamis pallidis vestita, ad humeros utrinque macula nigra distincta ornata, striis distinctis, obscurius punctatis, interstitiis omnibus convexis, secundo (praecipue ♂) fortiter inaequaliter elevato.

♂ ♀ Long. (rostr. excl.) 3—3.5 mm.

Allied to *A. lateralis* but quite distinct.

HAB. Maui, Haleakala (4500 ft.); one pair taken together.

(3) *Acalles callichroma*, sp. nov.

Haud latus, niger, rostro, antennis, tarsis, tibiis et tibiis antice parte apicali, rufis. Rostris basis squamis albescentibus, caput ferrugineis ornatum. Pronotum elongatum, antice constrictum, medium sulcatum, squamis ferrugineis nigrisque variegatum. Elytra ad basim plaga magna nigra ornata, post hanc fascia transversa pallida, ad latera dilatata, tum fascia transversa nigricante, parte apicali pallide squamosa, maculis nigris ornata; interstitiis primo et tertio haud convexis, secundo fortiter interrupte elevato, partibus elevatis squamis nigris erectis densissime vestitis, quarto, quinto et sexto elevatis, striis haud evidenter punctatis.

♀ Long. rostr. excl. 3.5 mm. (Plate VII. fig. 10.)

HAB. Hawaii, Kilauea, July 1895; one example taken.

(4) *Acalles melanolepis*, sp. nov.

Haud brevis, niger, antennis, rostro, tarsisque rufescentibus. Caput cum pronoto nigro-squamosum, hoc vitta laterali albidia utrinque ornato. Pronotum angustum, elongatum, antice minus fortiter constrictum, obscurius longitudinaliter sulcatum, sulco medio plagam laeviore elongatam rubricolorem ferente. Elytra nigro-squamosa, post media macula albidia, trans suturam posita, ornata, interstitio 2° et 4° sat evidenter nec fortiter elevatis, squamis erectis vestitis, 1° et 3° parum convexis, striis obscure punctatis. Femora omnia nigro-squamosa, squamisque suberectis albidis conspersa, maculis vel cingulis pallidis carentia. Long. (rostr. excl.) circa 3 mm. (Plate VII. fig. 11.)

In this species the elytra except for the well-marked transverse white spot, beyond the middle, are nearly entirely clothed with black scales, but there is an indication of an obscure paler area on each side extending from behind the shoulders towards the suture. The sides as seen from above are simply rounded from the shoulders, and not at all irregular. The second and fourth interstice are evidently more strongly raised than the first and third, the first being hardly, and the third but little convex. The second is slightly unevenly raised, and is densely clothed with erect black scales at the base and again just before the region of the transverse white spot, which accentuate the appearance of inequality. The most conspicuous feature of the species is the smooth red lanceolate space lying between the inner ridges of the prothorax, and the entirely black appressed scales of the femora.

HAB. Hawaii. A single example taken at Kilauea.

(5) *Acalles frater*, sp. nov.

Praecedenti simillimus, nigro-squamosus, rostro rufo, antennis, tarsisque testaceis. Pronotum squamis ferrugineis supra maculatum, sulco medio plagam rubram haud ferente. Elytra plaga ferrugineo-squamosa fasciam latam formante ornata, apice squamis ferrugineis variegato. Femora media distincte pallide cingulata. Long. (rostr. excl.) circa 3 mm.

Very closely allied to *A. melanolepis*, but the thorax is without the red smooth lanceolate area between the inner ridges, and is ornamented above with ferruginous spots, and the elytra have a large lateral band of similarly coloured scales, extending from behind the shoulders, and forming a wide transverse fascia which is less distinct towards the suture; their apex is also variegated with paler scales. All the femora have a pale band of appressed scales at the base and another about the middle.

A single example from Molokai is very similar to the above but the pale scales of the thorax and elytra are greyish, the transverse fascia of the latter less defined, the antennae, rostrum and tarsi much less clearly coloured, and the thorax evidently shorter. The difference in the latter respect is probably sexual, but I suspect that the two forms are distinct, though very closely allied.

HAB. Maui, Haleakala (5000 ft.); one example. Var. on Molokai (4000 ft.); one example.

(6) *Acalles koeae*, sp. nov.

Haud brevis, rostro piceo, antennis tarsisque rufescentibus. Rostris basis cum capite antico pallide squamosa. Pronotum angustum, elongatum, antice constrictum, postice angustatum, longitudinaliter sulcatum, sulco medio obsolete carinato, squamis

fulvescentibus depressis, erectisque nigris vestitum. Elytra in parte basali squamis albescentibus vestita, nigro variegata, post hanc fascia transversa nigra, maculaque alba trans suturam posita, apice fulvo-squamoso; interstitiis 2° et 4° minus fortiter elevatis, 1° et 3° haud convexis, striis (squamis haud remotis) impunctatis. Femora nigro-squamosa, media pallide notata. Long. (rostr. excl.) 3 mm.

This prettily marked species appears to be quite distinct. The prothorax is clothed with appressed scales of a fulvous colour, and black erect ones along the two inner ridges. The basal half of the elytra is covered with pale squamosity of a whitish and pale brown colour, variegated with black markings, which are most extensive about the shoulders, and are partly formed by the basal elevation of the second and fourth interstices, which are there covered with dense erect black scales. A little behind the middle of the elytra there is a complete transverse black fascia, which posteriorly encloses a pure white trans-sutural spot. The first and third interstices are flat, not perceptibly convex, the second and fourth are elevated but by no means strongly so, and apparently unevenly, though this appearance is partly at least due to the erect setae which are placed on them at the base and about the middle of the elytra, and give them an appearance of being more elevated than is really the case. The sides of the elytra are simply and regularly rounded from the shoulders, the striae show no visible puncturation without the removal of the scales.

HAB. Hawaii. A single example beaten from *Acacia koa* at an elevation of about 5000 ft. in Kona.

(7) *Acalles innotabilis*, sp. nov.

Minus brevis, piceo-niger, rostro, antennis, tarsisque rufescentibus. Caput plus minusve pallide squamosum. Pronotum angustum, elongatum, obscurius longitudinaliter sulcatum, antice minus fortiter constrictum, squamis pallidis fusciscentibus vestitum. Elytra ex majore parte cum pronoto concoloria, squamisque nonnullis erectis nigris, maculaque albida postice trans suturam posita, ornata, humeris rotundatis, striis omnibus grosse punctatis, interstitio 2° subinaequaliter elevato, 1° et 3° subconvexis, 4°, 5°, 6° sat distincte subaequaliter elevatis. Tibiarum apices pallide squamosi. Long. (rostr. excl.) 3.2 mm.

HAB. Kauai. A single example taken in the lower forest (about 2500 ft.).

(8) *Acalles leptothorax*, sp. nov.

Niger, rostro, antennis, tarsisque rufis, haud latus, sat elongatus, squamis pallidis nigrisque intermixtis variegatus. Rostrum post antennas squamis pallidis vestitum. Pronotum elongatum, lateribus leviter, fere aequaliter, rotundatis, antice haud subito

angustatum vel constrictum, antice setis nonnullis erectis nigris, et ubique squamis nigris albidisque variegatim vestitum, supra vix evidenter sulcatum vel inaequale. Elytra squamis albidis nigrisque variegatim vestita, interstitiis convexis, 2° parum fortiter inaequali, striis parum distincte punctatis, lateribus sat aequaliter rotundatis. Femora nigra plus minus distincte albido-cingulata, tibiis nigro-squamosis, apices versus (circa  $\frac{1}{3}$ — $\frac{1}{2}$  longitud.) squamis pallidis vestitis, ibique rufescentibus. Long. circa 3 mm. (Plate VII. fig. 12.)

Remarkable for the very narrow long prothorax, which is quite evenly rounded at the sides. The extreme apex of the elytra is covered with pale scales, in front of which is a wide band of black squamosity enclosing a quadrate pale trans-sutural spot, which itself is dark in the centre. In front of this the elytra are variegated with black and pale scales intermixed.

HAB. Kauai. A single example was taken at Halemanu (4000 ft.).

(9) *Acalles decoratus* Blackburn.

*Acalles decoratus* Blackb., Tr. Dublin Soc. III. 1885, p. 180.

HAB. "Lanai, 2000 ft." "A single specimen" (Blackburn).

(10) *Acalles mauiensis* Blackburn.

*Acalles mauiensis* Blk., t. c. pp. 179, 181, 254.

HAB. Maui. "A single specimen beaten from *Aleurites triloba*, at an elevation of about 4000 ft. on Haleakala." (Blackburn.)

The specimen referred to on p. 181, t. c. is said, p. 254, t. c., to be probably a distinct species.

(11) *Acalles angusticollis* Sharp.

*Acalles angusticollis* Sharp, Tr. Dublin Soc. III. 1885, p. 179.

HAB. Maui, Haleakala (Blackburn), where I have myself taken a single example. Minute examples taken on Oahu (var. *minor*, Shp.) by Mr Blackburn are probably distinct, and almost agree with abraded specimens taken by myself on Lanai.

(12) *Acalles duplex* Sharp.

*Acalles duplex* Sharp, t. c. p. 178.

(Plate VII. fig. 13, ♂; fig. 14, ♀.)

HAB. Oahu. Widely distributed on the island. Varies greatly in size, the females apparently not being always of diminutive size as compared with the males.

(13) *Acalles ignotus* Blackburn.

*Acalles ignotus* Blackb. *t. c.* p. 180.

HAB. Oahu. A single example (Blackburn).

(14) *Acalles lanaiensis*, sp. nov.

Valde convexus, pallide squamosus, rostro piceo, antennis tarsisque rufescentibus. Caput cum pronoto squamis pallidis vestitum. Pronotum sat latum, antice fortius constrictum, medium postice distincte sulcatum. Elytra pallide squamosa, plaga humerali utrinque saepe nigra, angulis humeralibus sat distinctis, fere rectis, interstitio 2° plus minusve inaequaliter elevato, tertio quartoque elevatis, illo angulos humerales formante, striis obscure punctatis. Long. (rostr. excl.) vix 3 mm.

Apparently allied to *Acalles duplex*, Shp., but much smaller and the sculpture of the elytra much less strongly pronounced.

HAB. Lanai Mountains; several examples taken.

(15) *Acalles chlorolepis*, sp. nov.

Brevior, robustus, griseo-squamosus, rostro, antennis, tarsi, tibiis et apicibus plus minusve rufescentibus. Caput griseo-squamosum; antennarum articulo tertio brevi. Pronotum haud latum, squamis griseis depressis, paucisque erectis nigricantibus vestitum, longitudinaliter 5-sulcatum, lateribus minus fortiter rotundatis. Elytra griseo-squamosa, apicem versus utrinque plaga nigricante, interstitiis 2° et 4° sat fortiter inaequaliter elevatis, 1° et 3° vix vel haud convexis, striis internis obscure punctatis, angulis humeralibus sat distinctis. Femora nigro-squamosa, squamis erectis griseis conspersa. Long. (rostr. excl.) vix 3 mm.

HAB. Kauai (4000 ft.); two or three examples taken.

(16) *Acalles nigripennis*, sp. nov.

Sat latus, antennis tarsisque rufescentibus, rostro rufopiceo. Caput pallide squamosum. Pronotum basi latum, antice fortiter constrictum, squamis pallidis vestitum, postice fortius sulcatum. Elytra tota nigro-squamosa, lateribus haud aequaliter rotundatis, interstitiis 2° et 4° subfortiter nec aequaliter elevatis, striis obscure punctatis. Femora omnia ubique pallide squamosa. Long. (rostr. excl.) 3 mm. (Plate VII. fig. 15.)

The elytra have the second interstice rather strongly raised, rather more strongly at the base and at about their middle than between these points; the third is hardly convex; the fourth strongly and unevenly raised, forming the humeral angles; the fifth and sixth are also more or less unevenly raised, the latter in dorsal aspect forming the lateral outline of the elytra behind the shoulders, which owing to the form of this interstice has an angulate appearance, instead of being regularly rounded from the base.

HAB. Lanai, a single example taken in the mountains.

(17) *Acalles tuberculatus*, sp. nov.

Piceus, rufopiceus, vel rufescens, minus brevis, rostro, antennis tarsisque rufescentibus, squamis pallidis nigrisque vestitus, squamis erectis elongatis et gracilibus. Pronotum haud latum, plus minusve evidenter longitudinaliter 5-sulcatum, sulco medio tuberculo elongato laevi munito, antice fortius constrictum, squamis ex majore parte nigris vestitum. Elytra squamis nigris pallidisque variegata, striis obscure punctatis, interstitiis 2° et 4° aequaliter, 6° inaequaliter elevato, humeris prominulis. Long. 2.75—3 mm.

This species is very distinct by the smooth tubercle situated about the centre of the prothorax, and the form of the erect scales, which are longer and more slender than those of other species. The elytra have their humeral angles somewhat acute and prominent, the 2nd and 4th interstices moderately strongly, and evenly raised, the 6th is somewhat strongly raised a short distance behind the shoulders, and forming the outline of the elytra in dorsal aspect, gives it at that point an appearance of being angulated. One example has the elytra nearly entirely clothed with pale scales. Most of them are for the most part or entirely denuded.

HAB. Hawaii; Kona (4000 ft.). About 10 examples found under small logs.

(18) *Acalles pallidicollis*, sp. nov.

Minus brevis, niger, rostro piceo, tarsis antennisque rufescentibus. Caput rostrisque basis squamis pallidis vestita. Pronotum totum pallide squamosum, elongatum, antice constrictum, obscurius sulcatum. Elytra squamis pallidis nigrisque variegata, basi apiceque ex majore parte nigris, media parte pallide squamosa, obscure nigro fasciata, striis internis obscure grosse punctatis, interstitiis 2° et 4° fortius, primo et tertio his levius elevatis. Femora omnia pallide vestita, nigro-cingulata, squamis erectis pallidis. Long. (rostr. excl.) 3.25 mm.

HAB. Kauai, above 2000 ft. One example taken.

(19) *Acalles monticola*, sp. nov.

Minus brevis, pallide squamosus, rostro piceo, antennis basi rufescentibus. Caput cum basi rostri squamis depressis erectisque pallidis vestitum. Pronotum elongatum, antice constrictum, obscurius 5-sulcatum, squamis pallidis depressis, nonnullisque nigris erectis vestitum. Elytrorum pars basalis squamis pallidis vestita, nigro-punctata, post media plaga transversali nigricante, quae maculam albidam, trans suturam positam, continet, apice pallido; interstitiis 2°—6° fortius aequaliter convexis, striis obscure grosse punctatis. Femora omnia pallide squamosa, media parte late nigrocincta. Tibiae ad basim nigro-squamosae. Long. (rostr. excl.) 3;5 mm.

In this species all the interstices of the elytra are raised, except the first, which is only slightly convex. There is very little difference between the convexity of the other interstices, that of the 3rd being slightly less than the 2nd and 4th.

HAB. Oahu. A single example taken in the Waianae mountains.

(20) *Acalles oahuensis*, sp. nov.

Minus brevis, pallide squamosus, rostro antennisque rufis. Caput squamis pallidis depressis, nigrisque erectis, vestitum. Pronotum elongatum, antice subfortiter constrictum, 5-sulcatum, lateribus rotundatis, squamis pallidis nigrisque variegatum, aliisque erectis nigris vestitum. Elytra squamis pallidis vestita, plaga magna basali nigra, fasciisque post media duabus irregularibus transversis ornata, leviter striata, striis parum distincte punctatis, interstitiis 2°, 4°, et 6° aequaliter elevatis, 1°, 3° et 5° haud convexis. Femora cum tibiis ex majore parte squamis nigris vestita. Long. (rostr. excl.) 3 mm.

A very distinct species, each of the elytra with three very well-marked longitudinal costae, which continue the three ridges on either side of the thorax. The alternate interstices are not at all raised or convex.

HAB. Oahu. A single example taken in the Waianae mountains (2000 ft.).

## CHAENOSTERNUM Blackburn.

(1) *Chaenosternum konanum* Blackburn.

*Chaenosternum konanum* Blackb., Tr. Dublin Soc. III. 1885, p. 181.

HAB. Oahu. One example taken near Honolulu (Blackburn).

## HYPEROMORPHA Blackburn.

(1) *Hyperomorpha squamosa* Blackburn.

*Hyperomorpha squamosa* Blackb., *t. c.* p. 182.

HAB. Oahu. A single example taken in wet moss in the Pausa valley (Blackburn). I have not met with this, or the preceding genus.

## Tribe CALANDRINI.

## SPHENOPHORUS Schönherr.

(1) *Sphenophorus obscurus* Boisd.

*Calandra obscura* Boisd. Voy. Astr. II. p. 448; Fairm. Rev. Zool. 1849, p. 474.  
The various islands.

HAB. A destructive species in the fields of sugar-cane, well-known as the 'cane-borer.' Also on banana in the mountains and sometimes found under rocks. The species has probably a wide distribution outside the Archipelago, though very little has been written about it.

## CALANDRA Clairville.

(1) *Calandra remota* Sharp.

*Calandra remota* Sharp, Tr. Dublin Soc. III. 1885, p. 183.

HAB. Oahu (Blackburn). Maui; in banana stems; common.

(2) *Calandra oryzae*, L.

*Calandra oryzae* Linn., Amaen. Acc. VI. p. 395.

HAB. All the islands; in food.

(3) *Calandra linearis* var. *striata* Thunb.

*Calandra linearis* var. *striata* Thunb. Nov. Act. Ups. VII. p. 112.

HAB. Oahu; in decaying tamarinds (Blackburn).

## Tribe COSSONINI.

## DROPHOTHORUS Schönherr.

(1) *Dryophthorus squalidus* Sharp.

*Dryophthorus squalidus* Sharp, Tr. Ent. Soc. London, 1878, p. 22.

HAB. Common throughout the islands in the mountains.

This abundant species is extremely variable in size, the smallest examples are less than four, the largest more than six, mm. in length. All the interstices of the elytra

are covered with a cinereous bloom. The apical portion of the rostrum in the ♀ (from the insertion of the antennae to the apex) is impunctate, or at the most has a few excessively feeble and fine punctures.

(2) *Dryophthorus distinguendus*, sp. nov.

Niger, piceus, vel rufescens, haud robustus, grosse punctatus. Rostri ♂-is pars anterior opaca, rugoso-punctata, ♀-ae nitida, subtilius sat distincte fere ad apicem punctata. Oculi sat magni. Pronotum densissime punctatum, antice fortiter constrictum. Elytra satis profunde sulcata, sulcis confertim grosse punctatis, interstitiis haud cinereo-sericeis, subtilissime punctulatis, et brevissime pallide setulosis. Long. (rostr. incl.) 4—5.5 mm.

This species greatly resembles *D. squalidus* Shp., and is often found in company with that species, but is certainly distinct. The interstices of the elytra are never covered with the whitish bloom as in that species, and the minute punctures which they bear give rise to short pale-coloured setae. The ♀ is readily distinct from that of *D. squalidus* by the fact that the rostrum has an evident, though not coarse, puncturation on its anterior shining portion. Like most of the Hawaiian species this varies considerably, but it is by no means improbable that I have included more than one species under the above name. The raised apical margin of the elytra is continuous with the sixth interstice as in *D. squalidus*.

HAB. Found on all or nearly all the islands of the group.

(3) *Dryophthorus peles*, sp. nov.

Niger, robustus, grosse punctatus. Rostri ♀ pars praeantennalis nitida, subtiliter sat evidenter punctata. Pronotum latum, grosse punctatum, antice fortiter constrictum. Elytra fortiter seriatim punctata, interstitiis distinctissime punctulatis, brevissime pallide setulosis, haud cinereo-sericeis, margine apicali elevato cum interstitio sexto continuo. Long. (rostr. incl.) 6—6.5 mm.

This species somewhat resembles *D. distinguendus*, but it is altogether larger and more robust. The interstitial puncturation of the elytra is larger, and more distinct and definite than in most of the species. The punctures in each row are closely set, and the spaces dividing one from another are more than usually convex, grooved on each side where they meet the interstices. This convexity gives them a strongly marked knob-like appearance in certain aspects. The whitish bloom seen in *D. squalidus* is entirely absent, but the interstitial punctures bear excessively minute pale setae. The interstices themselves are all of nearly similar height, and the sixth is confluent with the elevated apical side-margin.

HAB. Hawaii. Kilauea (June 1895). Half-a-dozen examples, no doubt obtained in a batch, as they stand under the same number. The species appears to me to be most closely allied to *D. nesiotetes*.

(4) *Dryophthorus nesiotus*, sp. nov.

Niger, robustus, statura magna. Rostri pars praecantennalis ♀ nitida, haud, vel vix evidenter, punctata. Pronotum latissimum, antice fortissime constrictum, fortiter dense punctatum. Elytra seriatim fortiter punctata, interstitiis cinereo-sericeis, tuberculis minutis, sat distinctis, munitis. Long. (rostr. incl.) 6—7.75 mm. (Plate VII. fig. 16.)

This species also belongs to the group in which the elevated apical margin is continuous with the sixth interstice of the elytra. The interstices themselves (except in very much rubbed examples), have a distinct ashy covering. The formation of the spaces between the punctures in each row on the elytra is nearly similar to that in *D. peles*. The present species is distinct by its large size, the distinct minute asperities with which the interstices are set, and their ashy covering.

HAB. Kauai mountains (4000 ft.).

(5) *Dryophthorus gravidus* Sharp.

*Dryophthorus gravidus* Sharp, Tr. Ent. Soc. London, 1878, p. 22.

To this species I refer a great number of examples taken on Molokai, Lanai, Maui, and Hawaii. The differences between the extremes are so great that they do not appear, when examined together, to be even very closely allied species, but after examining the whole series from the various localities, I am forced to consider all to belong to one variable form. Minute individuals appear to be always distinguishable from *D. squalidus* etc. by the shorter and wider elytra, differences in puncturation etc. Some examples from Maui are very remarkable, the punctures on the elytra becoming distorted and tending to become obsolete, the elytra themselves being laterally compressed. A similar tendency is also seen in some specimens from other islands. The elytra are much more narrowed posteriorly in some examples than in others. The puncturation of the prothorax varies in the size and density of the punctures; those on the elytra also are variable. There is a decided tendency towards the sculpture of the elytra exhibited by *D. crassus* Shp. in some Maui individuals.

HAB. Oahu (Blackburn); all the islands to windward of Oahu.

(6) *Dryophthorus crassus* Sharp.

*Dryophthorus crassus* Sharp, Tr. Ent. Soc. London, 1878, p. 23.

HAB. Oahu and Maui (Blackburn). I have taken it singly near Honolulu, but not elsewhere, unless some of the examples from Maui, included under *D. gravidus*, should be referred to this species.

(7) *Dryophthorus homoeorhynchus*, sp. nov.

Niger, vel piceus, haud robustus, rugoso-punctatus. Rostrum utriusque sexus (apice extremo excepto), opacum, rugoso-punctatum. Pronotum densissime rugoso-punctatum, antice fortissime constrictum. Elytra sat profunde sulcata, sulcis grosse punctatis, interstitiis punctulatis, punctis setas brevissimas pallidas, satis conspicuas, ferentibus. Long. (rostr. incl.) 4.5—6 mm. (Plate VII. fig. 17; fig. 17a, head and rostrum of ♀; fig. 17b of ♂.)

This species, although the elevated apical margin appears rather continuous with the sixth than the fourth interstice of the elytra, evidently belongs to the group of *D. declivis*, from which it is also separated at once by the fact that there is little difference in the elevation of the interstices, whereas in that species the second, fourth and sixth are very noticeably more elevated than the others. From those species of the group of *D. squalidus* which it somewhat resembles, the female is distinguished at once by the dull apical half of the rostrum, with its rugose puncturation, and the ♂ by the more outstanding pterygia, so that the rostrum is more widened about the point of insertion of the antennae. The sexes are easily known by the more slender rostrum of the female.

HAB. Kauai mountains (2000—4000 ft.).

(8) *Dryophthorus declivis* Sharp.

*Dryophthorus declivis* Sharp, Tr. Ent. Soc. London, 1878, p. 23.

(Plate VII. fig. 18.)

This is a very distinct species easily known by the costate 2nd, 4th and 6th interstices of the elytra, the two latter uniting to form the strongly raised apical side-margin. These interstices vary somewhat in the amount of elevation, but it is always very apparent. The female has the rostrum more slender than the ♂, less widened at the insertion of the antennae, but the dull surface and rugose puncturation to near the apex is common to both sexes.

HAB. Oahu, Molokai, Hawaii. Not so common as many of the species.

(9) *Dryophthorus modestus* Sharp.

*Dryophthorus modestus* Sharp, Tr. Ent. Soc. London, 1878, p. 23.

The sexual distinctions in this species are similar to those exhibited by the sexes in *D. homoeorhynchus* and *D. declivis*. It varies considerably in size and the elevation of the apical margin, the connection between which and the fourth interstice is rather less manifest in some examples than others.

HAB. Oahu, Maui, and Hawaii.

(10) *Dryophthorus pusillus* Sharp.

*Dryophthorus pusillus* Sharp, *l. c.* p. 24.

HAB. Oahu (Blackburn); in stems of the tree-fern. I have never met with this species.

(11) *Dryophthorus oahuensis*, sp. nov.

Species minima, minus lata, rufescens, capite nigricante. Rostrum ( $\delta$ ) latum, rugosum, et opacum. Pronotum antice fortiter constrictum, grosse rugoso-punctatum. Elytra seriatim grosse punctata, interstitiis omnibus distinctis, 2° et 4° quam 3° et 5° paullo fortius elevatis, 6° ad apicem declivem fortissime carinato-elevato. Long.  $\delta$  (rostr. incl.) 2.7 mm.

The rostrum is rather short and broad, the pterygia strongly outstanding. The eyes are feebly faceted. The puncturation of the prothorax is coarse and rugose but apparently shallow. All the interstices of the elytra are distinct, but not wide, the second and fourth a little more raised than the third and fifth, and not interrupted, the sixth alone forms the extremely strongly elevated apical side-margin. The species is very distinct.

HAB. Oahu. A single example ( $\delta$ ) taken in the Waianae mountains (3000 ft.).

(12) *Dryophthorus kauaiensis*, sp. nov.

Species minima, rufescens. Caput ( $\delta$ ) cum rostro rugoso-punctatum, squamosum. Pronotum dense grossissime rugoso-punctatum, antice constrictum. Elytra sat grosse seriatim punctata, interstitio 2°, 4° et 6° haud interrupte carinato-elevatis, tertio sub-obsolete. Long.  $\delta$  vix 3 mm.

This species is allied to *D. oahuensis*, but it is a little larger, and abundantly distinct by the sculpture of the elytra, the sharply carinate form of the second and fourth interstices readily separating the two. The apical margin is formed by the sixth interstice, which is strongly raised towards the apex. In *D. pusillus* Shp., which is a small species, the fourth interstice is continuous with that margin, as also is the case with *D. modestus* Shp. Both in *D. kauaiensis* and the preceding species the eighth interstice forms a part of the lateral outline towards the base of the elytra, in dorsal aspect. In the present species indeed it is rather strongly raised.

HAB. Kauai. A single  $\delta$  taken in the mountains (4000 ft.).

(13) *Dryophthorus insignis* Sharp.

*Dryophthorus insignis* Sharp, *t. c.* 1878, p. 24.

(Plate VII. fig. 19.)

I have examined numerous specimens which I refer to this species from the islands of Oahu, Maui, and Hawaii. It also is found on the other islands. The examples from the islands specified do not altogether agree, but as the series from each locality exhibits some variation I see no means of separating them as distinct forms. Certainly in the majority of cases the Oahuan examples can be distinguished by the more imperfect eyes, but there is evident individual variation in this respect. The Maui form has the raised interstices of the elytra always very strongly broken, and the eyes are more developed. In specimens from Hawaii the eyes are well-developed, convex and a little prominent. From the other islands I have seen only odd specimens.

HAB. Found under bark of trees in the mountains of all the islands.

(14) *Dryophthorus insignoides*, sp. nov.

Piceus, vel plus minusve rufescens, sat grosse punctatus. Oculi mediocres. Rostri (♀) pars praecantennalis nitida, rugoso-punctata. Pronotum elongatum, antice fortiter constrictum, obscurius grosse punctatum. Elytra seriatim grosse punctata, interstitio 2° et 4° inaequaliter carinato-elevatis, setis vestitis, primo sat distincto. Long. (rostr. incl.) 4—4.75 mm.

The general sculpture of this species is as in *D. insignis* Shp., from which it is readily distinguished by the distinct first interstice of the elytra, the carinae of which are less strongly elevated. All the raised interstices (i.e. 2nd, 4th and 6th) bear erect setae, and the second and fourth are evidently interrupted or uneven. The third and fifth interstices are generally more or less distinct. The eyes are fairly well developed. The rostrum of the female on the part in front of the antennae has the surface shining, and is strongly and rugosely punctured, in the ♂ this part is dull and covered with squamosity.

HAB. Kauai mountains. Single examples from other islands, Molokai, Lanai, and Oahu, do not altogether agree with the typical specimens, but are too close to separate without the examination of a fair series.

(15) *Dryophthorus brevipennis*, sp. nov.

Praecedenti simillimus, statura minore, elytris brevioribus distinguendus. Long. 3—3.75 mm.

Very similar to the preceding but a decidedly smaller insect. The second, fourth

and sixth interstices of the elytra are more or less raised and bear fine setae, but the elevations are feeble. The other interstices are quite distinct. The elytra themselves are decidedly shorter than in *D. insignoides*, the rostrum in the ♀ is more finely and less rugosely punctured than in that species. In a strict dorsal aspect of the elytra the acute 8th interstice always forms a portion of their lateral outline near the base.

HAB. Kauai mountains (4000 ft.).

(16) *Dryophthorus fuscescens*, sp. nov.

Haud latus, statura minore, fuscescens. Oculi minimi. Pronotum antice fortiter constrictum, grossius punctatum. Elytra seriatim grossius punctata, interstitiis cunctis sat distinctis, secundo quartoque inaequaliter distincte carinato-elevatulis, cumque sexto, setis brevissimis vestitis. Long. 3.5 mm.

A small and very distinct species, with unusually small eyes, which consist of comparatively few coarse facets. The rostrum of the ♀ is closely, coarsely and rugosely punctured between the smooth apex and the line of insertion of the antennae, and is hardly shining. In the ♂ the sculpture of the rostrum is entirely concealed, and this may possibly be the case with the ♀ when alive, but the covering is removed in the single example of this sex.

HAB. Kauai (4000 ft.); 2 ♂ and 1 ♀ taken.

(17) *Dryophthorus verticalis*, sp. nov.

Piceus, subrobustus. Rostris (♀) pars praeantennalis nitida, fortiter distincte punctata. Oculi sat magni. Pronotum grossius punctatum, antice fortiter constrictum. Elytra seriatim grosse punctata, interstitiis sat distinctis, secundo quartoque inaequaliter elevatis et setulosis, postice fortissime declivia, fere verticalia. Long. (rostr. excl.) 3—vix 4 mm. (Plate VII. fig. 20.)

The male of this species is at once distinguished from any other of the section by its short robust form as seen in dorsal view, the elytra becoming wider at the base of the posterior declivity than they are across the shoulders. Posteriorly they are strongly vertical and of slightly recurved form. The female is less remarkable but it is more robust and larger than the allied species. The rostrum is shining and strongly punctured. In both sexes the sinuation of the 6th interstice of the elytra causes the 8th to be distinctly visible in dorsal aspect, so that it evidently forms part of the lateral outline. The second and fourth interstices are unevenly raised, or carinate, and setulose.

HAB. Kauai mountains (4000 ft.).

## THALLATODORA, gen. nov.

Corpus subgracile, fusiformi-ovale, rugoso-sculpturatum. Rostrum elongatum, ad insertionem antennarum fortissime curvatum, sive geniculatum, parte praeantennali fortius dilatata. Antennae longe ante medium rostrum insertae, scapo elongato, funiculo capituloque una conjunctis haud minus longo, funiculi 5-articulati articulo secundo sequentibus evidenter longiore, capitulo brevi, robusto. Oculi subrotundi, fortiter prominentes, in rostro, a capite distantes, siti. Pronotum elongatum, antice constrictum, elytris angustius. Scutellum vix discernendum. Tarsi breves, articulo tertio bilobato, lobis parvis. Corpus totum subtus dense ac grosse punctatum; coxae posteriores late, intermediae his minus late, anteriores intermediis minus late separatae, haudquaquam tamen contiguae. Metasternum sat longum. Abdominis pars basalis (sc. segmentum 1 et 2, quae parum distincte sunt divisa), mesosterno una cum metasterno haud minus longa.

(1) *Thalattodora insignis*, sp. nov.

Piceo-nigra, tarsis antennisque rufescentibus, opaca. Rostrum rugosum. Pronotum elongatum, antice constrictum, lateribus parum fortiter rotundatis, grosse denseque rugoso-punctatum. Elytra profunde striata, striis grosse confertim punctatis, interstitiis asperis, punctulatis, setis brevissimis pallidis, uniseriatim dispositis. Long. (rostr. incl.) 3.5 mm. (Plate VIII. fig. 1; 1a, antennae.)

HAB. Lanai. A single example taken under logs on the coast.

## PENTARTHURUM Wollaston.

(1) *Pentarthrum prolixum* Sharp.

*Pentarthrum prolixum* Sharp, Tr. Ent. Soc. London, 1878, p. 25.

HAB. Found on all the islands, living on tree-ferns. Varies greatly in size.

(2) *Pentarthrum obscurum* Sharp.

*Pentarthrum obscurum* Sharp, *l. c.*

HAB. Oahu. Abundant in dead wood up to an elevation of 2000 ft. Often in company with *Phloeophagosoma* and *Pseudolus*.

(3) *Pentarthrum blackburni* Sharp.*Pentarthrum blackburni* Sharp, l. c.

HAB. Oahu. Near Honolulu (Blackburn). I did not meet with this species.

## OROTHREPTES, gen. nov.

Subfusiformis, haud gracilis, totus pube aurea vestitus. Rostrum elongatum, levius curvatum, lateribus parallelis. Oculi magni convexi. Antennae breves, robustae, fere ad medium rostrum insertae, scapo minus longo, funiculo 5-articulato, articulo primo brevi, caeteris transversis, capitulo elongato. Pronotum latum, antice subconstrictum. Tarsi breves, sat robusti, articulo tertio late bilobato. Coxae omnes sat late separatae, sed posteriores et intermediae multo latius quam anteriores. Metasternum longum. Elytra pronoto evidenter latiora. Scutellum patens.

Perhaps most nearly allied to *Sericotrogus* Woll., but differing greatly in its much less narrow and elongate form, the less strongly curved rostrum, the pterygia being not in the least outstanding, the larger but less prominent eyes, short wide prothorax, shorter metasternum, and in many other respects. The lobes of the tarsi are very largely developed, the apical joint is somewhat stout.

(1) *Orothreptes callithrix*, sp. nov.

Rufotestaceus, totus aureo-pubescens. Rostrum opacum, subtilissime punctatum, lateribus parallelis. Pronotum sat latum, antice subconstrictum, densissime grossius punctatum, lateribus rotundatis. Elytra profunde striata, striis haud distincte punctatis, interstitiis confuse crebreque rugoso-punctatis. Long. (rostr. incl.) circ. 4.25 mm. (Plate VIII. fig. 2 ; 2a, antenna).

HAB. Hawaii. A single example taken in the Kona district (3000 ft.)

## DEINOCOSSONUS, gen. nov.

Forma subcylindrico-fusiformi, totus pube demissa vestitus. Rostrum latum, breve, a capite parum distincte divisum, medium postice longitudinaliter sulcatum, ad insertionem antennarum subangustatum, ibique utrinque tuberculo munitum. Oculi permagni, convexiusculi, a pronoto distantes. Antennae ad apices oculorum insertae, ab apice rostri distantes, funiculo 7-articulato, articulo primo caeteris, qui omnes sunt brevissimi, longiore, capitulo sat robusto. Pronotum subelongatum, antice angustatum.

Elytra ac pronotum aequae lata. Scutellum conspicuum. Tarsorum articulus tertius sat latus, bilobatus. Uncus tibiaram anteriorum apicalis validus. Femora robusta. Coxae omnes late separatae. Metasternum satis longum. Abdomen subtus pubescens, fortiter punctatum.

A genus, the species of which is of small size, and apparently without any allied form known from elsewhere. It is very remarkable for the short wide rostrum, the very large, but not prominent eyes, and the dense covering of golden pubescence. In the testaceous colour, and the clothing, these insects have an extraordinary resemblance to the insect, for which I have made the genus *Orothreptes*, but that has a totally different form of rostrum, and a 5-jointed funiculus, and differs in many other respects. Probably in habits the two are identical.

*Deinocossonus* is a form of excessive rarity, or at least very difficult to procure, and the pubescence is so easily removed, that I have been unwilling to subject the few specimens taken to much manipulation.

(1) *Deinocossonus nesiotus*, sp. nov.

Angustus, testaceus, aureo-pubescens, capite rostroque nigris. Pronotum dense, nec profunde punctatum, inter puncta subtilissime rugulosa. Elytra striata, striis obscurius, plus minusve evidenter punctatis, interstitiis obscure punctulatis, et pubescentibus. Femora anteriora supra testacea, parte inferiore nigricante. Long. (rostr. incl.), 2.5—vix 3 mm. (Plate VIII. fig. 3; 3a, antenna.)

Var. *α*. elytrorum striis haud evidenter punctatis, rostri parte apicali testacea.

Var. *β*. rostro et capite nigris, femora omnia cum tibiis nigricantia.

HAB. Oahu. Two examples taken together at an elevation of 3000 ft. on Kaala mountain. Var. *α*. Kauai, 4000 ft.; Oahu, Waianae mountains. Var. *β*. Hawaii. One specimen at Kilauea.

HALOXENUS, gen. nov.

Corpus elongatum, gracile, fusiforme, haud pubescens. Rostrum latum, breve subunicum (sc. lateribus ad apicem evidenter convergentibus), a capite minus distincte divisum. Oculi rotundi, latissime separati, a pronoto sat distantes. Antennae paullo ante medium rostrum insertae, funiculi 7-articulati articulo primo robusto, caeteris longiore, secundo caeterisque brevissimis, capitulo sat magno, apice acuminato. Pronotum elongatum antice angustatum, vix constrictum. Pedes sat robusti; tarsi breves, articulo tertio parvo, haud evidenter bilobato, articulo ultimo elongato, caeteris conjunctis haud minus longo. Metasternum perlongum. Coxae omnes late separatae. Elytra elongata, angusta, lateribus parallelis. Scutellum patens.

This genus comes nearest to *Eutornus* Woll., but has the rostrum narrowing to the apex, and the point of insertion of the antennae is different.

(1) *Haloxenus immigrans*, sp. nov.

Piceus, vel rufopiceus, subnitidus, elongatus, gracillimus. Rostrum basim versus dense sat fortiter, ad apicem subtiliter punctatum. Pronotum fortiter punctatum, antice sensim nec fortiter angustatum. Elytra striata, striis sat grosse punctatis, circum suturam subtilissime punctulata. Long. (rostr. incl.) circ. 3 mm. (Plate VIII, fig. 4.)

HAB. Molokai and Lanai coasts. Not rare under logs of drift-wood.

PSEUDOLUS Sharp.

(1) *Pseudolus longulus* Boheman.

*Rhyncolus longulus* Boh., Eug. Res. p. 149.

HAB. Oahu and Maui. Abundant, and no doubt inhabits other of the islands, at low elevations. On *Cactus*, *Aleurites*, *Musa*, &c.

(2) *Pseudolus hospes*, sp. nov.

Niger, gracilis, elongatus, subnitidus. Rostrum confertim punctatum, parte pra antennali fortius dilatata. Pronotum elongatum, fortiter crebre punctatum, antice fortiter constrictum. Elytra striata, striis grosse confertim punctatis, interstitiis punctulatis, setas minimas pallidas ferentibus, et transversim subtilissime rugulosis. Tarsorum articulus tertius, secundo evidenter latior, bilobatus, lobis parvis. Long. 6.5 mm.

HAB. Oahu. Four examples taken, two in Honolulu and two a short distance outside.

This species has only been met with near Honolulu, and I suspect it has been introduced. Generically it appears to be somewhat intermediate between *Pseudolus* and *Phloeophagosoma*.

PHLOEOPHAGOSOMA Wollaston.

(1) *Phloeophagosoma tenuis* Gemm.

*Rhyncolus tenuis* Gemm. Mun. Cat. VIII. p. 2667.

*Rhyncolus gracilis* Boh. Eug. Res. p. 149.

HAB. Oahu, up to 2000 ft.; common. Hawaii, in Kona (2000—3000 ft.).

## NESOTOCUS, gen. nov.

Forma subfusiformi, statura magna. Rostrum cylindricum, perlongum, maris rugose sculpturatum, saepissime spinulosum, feminae parte praeantennali laevi, nitida, impunctata. Oculi magni, convexiusculi, a pronoto sat distantes. Antennae longissimae, graciles, maris paullo ante vel fere ad medium rostrum, feminae longe post medium insertae, funiculo ( $\delta$ ) perspicue piloso, 7-articulato, articulis basalibus fortissime elongatis, capitulo elongato, subfusiformi. Pronotum antice fortiter angustatum, truncato-conicum. Scutellum patens. Pedes longissimi, femoribus anterioribus  $\delta$  gracilioribus,  $\text{♀}$  robustioribus et magis incrassatis, tarsorum articulo primo et secundo elongatis, tertio late bilobato, articulo ultimo gracili elongato, apicem versus crassiore, unguiculis longis et curvatis. Coxae anteriores (necnon etiam intermediae et posteriores) late separatae. Metasternum sat longum, postice subangulariter emarginatum, medium longitudinaliter impressum vel sulcatum. Abdominis segmentum primum ventrale secundo paullo longius, tertium una cum quarto hoc paullo brevius, segmentum apicale  $\delta$  latius  $\text{♀}$  minus late rotundatum. Elytra et pronotum pube pallida decorata, hoc et illis subaequilatis.

There is apparently no known ally to the three remarkable insects for which the above genus is formed. They all live in the wood of the tree *Cheirodendron*, and, I believe, of another tree which has a considerable resemblance to that genus. In superficial appearance the three species almost exactly resemble one another, and this is rather that of Eirrhiniini than Cossonini.

(1) *Nesotocus munroi*, sp. nov.

Niger, pubescentiae pallidae maculis ornatus, antennis tarsisque nonnunquam rufescentibus. Rostrum  $\delta$  (saltem in exemplis majoribus), rugoso-sculpturatum, utrinque serrato-spinosum, in exemplis parvis vix plus quam simpliciter punctatum,  $\text{♀}$  parte praeantennali laevi impunctato. Antennae  $\delta$  evidenter propius ad apicem rostri quam ad oculos,  $\text{♀}$  longe post medium rostrum insertae. Pronotum sat dense punctatum, antice fortiter angustatum, conico-truncatum. Elytra striata, striis parum fortiter punctatis, apicem versus compressa. Long. (rostr. incl.),  $\delta$  majoris 21 mm.,  $\delta$  minoris 12.5 mm.;  $\text{♀}$  15 mm.

Ill-developed males have the front femora more incrassate than large examples, tending to resemble the  $\text{♀}$  in this respect, as also to some extent in the smoother rostrum.

HAB. Hawaii, Maui. Various localities on Hawaii (2000—4000 ft.); Kohala, Kau, Puna; Haleakala on Maui. This species was given to me, soon after my arrival in the islands, by Mr G. C. Munro, who obtained specimens in the Kohala mountains, and I have named it after this excellent ornithologist. A fragment (elytra and sternum) found in the mountains of Molokai may belong to this species, but the pubescence is more deeply yellow.

(2) *Nesotocus newelli*, sp. nov.

Praecedenti cognatissimus. Differt statura majore, antennarum scapi apice magis incrassato, funiculo densius longiusque piloso, articulo secundo pro primo magis elongato. ♂. Long. 26 mm.

The single ♂ of this species I believe to be distinct from *N. munroi*, and not merely a very large and finely developed example of that species. Besides the characters given above the apical joint of the *funiculus* of the antennae is nearly equal to the basal portion of the club, which is clothed with sub-erect hairs (the apical portion being densely covered with appressed pubescence). In *N. munroi* the apical joint of the funiculus is very greatly shorter than the basal portion of the club.

HAB. Maui. A single example has been taken by Bro. Matthias Newell in the Iao valley.

(3) *Nesotocus kauaiensis*, sp. nov.

Praecedentibus simillimus, niger, pubescentia flava ornatus. Differt ♂ antennis haud propius ad apicem rostri quam ad oculos insertis, ♀ rostri parte postantennali minus fortiter denseque punctata. Long. 13—16.5 mm. (Plate VIII. fig. 5.)

The ♂ of this species is very distinct from either of the preceding, by the different point of insertion of the antennae, this being nearly equidistant from the eyes and apex of the rostrum. The ♀ is much more difficult to separate, but the basal portion of the rostrum appears to be smoother, and more finely and less closely punctured. In fresh examples the pubescence is decidedly more deeply yellow, and that on the elytra is rather more extensive.

HAB. Kauai (4000 ft.).

## DYSOMMA, gen. nov.

Corpus sat gracile, cylindrico-fusiforme, haud pubescens. Rostrum elongatum, leviter curvatum, pronoto longitudine subaequale, parte praeantennali basali parte sat latiore. Oculi parvi, subobsoleti. Antennae longe ante medium rostrum insertae, funiculi 7-articulati articulo basali elongato, secundo bis longiore, hoc tertio longiore, capitulo elongato-ovali. Pronotum magnum, elongatum, elytris latius, antice fortiter angustatum, vix constrictum. Uncus tibiaram anticarum apicalis validus. Tarsi breviores, articulo tertio parvo, lobis brevissimis. Unguiculi graciles, breves. Coxae omnes late separatae, metasterno longo. Abdominis segmentum basale inter coxas posteriores antice rotundatim productum. Elytra angustiora, lateribus subparallelis. Scutellum patens.

(1) *Dysonma sylvicola*, sp. nov.

Elongatus, sat gracilis, colore castaneo, subnitidus. Rostrum subrugoso-punctatum, setis brevissimis paucis vestitum. Pronotum dense aequaliter punctatum. Elytra pronoto angustiora, striata, striis confertim punctatis, interstitiis uniseriatim punctulatis. Long. (rostr. incl.) 5 mm. (Plate VIII. fig. 6.)

HAB. Kauai. A single example taken in the mountains (4000 ft.).

## HETERAMPHUS Sharp.

(1) *Heteramphus filicum*, sp. nov.

Latus, niger, opacus, tarsiis antennisque rufescentibus. Pronotum latum, antice angustatum, vix constrictum, creberrime punctatum, brevissime pubescens, dorso juxta basim haud, vel vix evidenter, impresso. Elytra seriatim punctata, interstitiis usque ad basim parcius sed distincte pallido-pubescentibus. Long. (rostr. incl.) 8—9 mm. (Plate VIII. fig. 7.)

Closely allied to *H. wollastoni* Shp., but at once distinguished by the much more densely punctured thorax, which is clothed with a short minute pubescence, and lacks the basal impression of the allied species. The pale hairs on the interstices of the elytra are not confined to the apical portion, but extend to the extreme base.

HAB. Oahu, in the mountains. Attached to the tree-fern; only a few examples taken, the species being much more difficult to procure than *H. wollastoni*.

(2) *Heteramphus wollastoni* Sharp.

*Heteramphus wollastoni* Sharp, Tr. Dublin Soc. III. 1885, p. 188.

HAB. Oahu. Common in the mountains, but local. Lives at the bases of the leaves of *Astelia veratroides*.

(3) *Heteramphus foveatus* Sharp.

*Heteramphus foveatus* Sharp, l. c.

HAB. Oahu. Common in the same localities as, and in company with, *H. wollastoni*.

(4) *Heteramphus haleakalae*, sp. nov.

Piceus vel rufo-piceus, rostro, antennis pedibusque rufescentibus. Rostrum rugoso-punctatum, parte postantennali carinatim compressa. Pronotum subgrosse (antice quam postice minus dense) punctatum, sat elongatum, minus latum, dorso juxta basim leviter vel vix evidenter impressum. Elytra sat elongata, striata, striis parum fortiter nec confertim punctatis, parce usque ad basim pubescentia. Long. (rostr. incl.) 6—7 mm.

The general appearance and form of this species is that of *H. foveatus* Shp., but it is easily distinguished by the fact that it is more elongate, both the prothorax and elytra being narrower, and the former has only a shallow, sometimes hardly perceptible, impression near the base, and the punctures of the elytral striae are finer and more feeble. It is also very closely allied to the following species.

HAB. Maui, Haleakala (5000 ft.); three examples; taken from dead logs.

(5) *Heteramphus frater*, sp. nov.

Piceus vel rufo-piceus, rostro, antennis pedibusque plus minusve rufescentibus. Rostrum rugoso-punctatum, parte postantennali carinatim compressa. Pronotum grosse punctatum, postice juxta basim profunde foveatum. Elytra minus lata, usque ad basim parce pubescentia, striis minus fortiter punctatis. Long. (rostr. incl.) 6—7 mm.

Somewhat intermediate between *H. haleakalae* and *H. foveatus*, the base of the prothorax having a strong round impression. It is a narrower and more elongate insect than *H. foveatus*, and has the striae of the elytra less strongly punctured. From *H. haleakalae* it differs in the strong impression on the prothorax, and in the fact that the shoulders of the elytra are capable of being more closely applied to the base of the prothorax. The two examples taken do not agree well together, the one being more bulky than the other, and having the thoracic puncturation coarser, while the punctures of the striae of the elytra are finer and less closely placed. The smaller example has no impression on the apical ventral segment of the hind-body, whereas in the larger this segment is distinctly impressed, as is also the case with all the individuals of the preceding species.

HAB. Maui, Haleakala (5000 ft.); very rare.

(6) *Heteramphus molokaiensis*, sp. nov.

Piceus, antennis, rostro pedibusque plus minusve rufescentibus. Rostrum distincte punctatum, parte postantennali carinatim compressa. Pronotum angustum, elongatum, antice angustatum, vix grosse punctatum, parum evidenter pubescens. Elytra pronoto

paullo latiora, angustula, vix evidenter pubescentia, apicem versus rarissime setosa, striis obscurissime obsolete punctatis. Long. (rostr. incl.) 5 mm. (Plate VIII. fig. 8.)

Most nearly allied to *H. haleakalae*, but at once distinguished by its much more slender and elongate form.

HAB. Molokai mountains (4000 ft.). A single example taken out of wet moss in June 1893.

(7) *Heteramphus cylindricus* Sharp.

*Heteramphus cylindricus* Sharp, *t. c.* p. 189.

(Plate VIII. fig. 9 large form; fig. 10 small form.)

HAB. Oahu; common, at the bases of the leaves and in the stems of *Astelia*. Varies greatly in size, some examples being much larger and more robust than others.

(8) *Heteramphus hirtellus* Sharp.

*Heteramphus hirtellus* Sharp, *l. c.*

HAB. Oahu. A single example was taken by Mr Blackburn in the mountains near Honolulu. I have never met with this species.

(9) *Heteramphus kauaiensis*, sp. nov.

Piceus, sat latus, nitidus, rostri parte basali, pronoto, elytrisque, dense pallide setosis. Rostrum apicem versus dilatatum, nitidum, et subtiliter punctatum. Pronotum sat latum, nitidum, dense grosseque punctatum, juxta basim obsolete impressum, linea dorsali laevi. Elytra brevia, nitida, striis grosse confertim punctatis, interstitiis setis longis flavescentibus vestitis. Long. (rostr. incl.) 5.5 mm. (Plate VIII. fig. 11.)

This remarkable species is allied to *H. hirtellus* Shp., the rostrum, viewed from in front, being widened at some distance before the insertion of the antennae on the basal side, owing to the long outstanding pterygia. Its form is much the same as in *H. foveatus*, but it might reasonably be considered as the type of another genus.

HAB. Kauai. A single example taken on the high plateau.

(10) *Heteramphus nivicola*, sp. nov.

Nigro-piceus, opacus (capite cum pronoto absente), elytris apices versus setas nonnullas ferentibus. Elytra distinctissime striata, striis remote nec grosse punctatis, interstitiis haud convexis subseriatim rugoso-punctatis. Metasternum grosse punctatum.

Abdominis segmentum basale subtile nitidum, grosse et remote punctatum, segmentum 2<sup>m</sup>, 3<sup>m</sup> et 4<sup>m</sup> rugoso-punctata, segmentum apicale densius fortiter distincte punctatum. Long. ?.

The genus of the insect above described is not certain, since the head, prothorax and most of the appendages are wanting, but it is probably a true *Heteramphus*. It is easily distinguished from any of the other species, by the sculpture of the elytra and the under-parts. The former are less wide at the base and comparatively more elongate than those of *H. foveatus* (than which the species is of larger size), the striae are very distinct and are wide apart, their punctures are somewhat fine, and especially on the striae towards the sides, remote from one another, the interstices are not the least convex, and are rather largely and rugosely and somewhat seriatly punctured, so that when looked along from the apex they even appear somewhat grooved or concave. The humeral angles of the elytra are rounded off and indistinct. The abdomen beneath is shining, the basal segment remotely and very strongly punctured, the three following ones are rugosely punctate, the apical one strongly and closely, but less coarsely than the basal one.

HAB. Maui. A single example in fragmentary condition was found near the summit of Haleakala.

#### OODEMAS Bohem.

##### (1) *Oodemias olindae* Blackburn.

*Oodemias olindae* Blackburn, Ent. Mo. Mag. XVII. p. 199.

(Plate VIII. fig. 12, ♀.)

HAB. Maui, Haleakala (5000 ft.); 1 ♂ and 1 ♀ taken. Two examples, now in the British Museum, taken by Mr Blackburn, are both ♀, and apart from sexual differences agree closely with my ♂. The ♀ taken by me is less shining, the prothorax entirely dull, and strongly punctured, but there is little doubt that it belongs to the same species. The ♂ differs from the ♀ in the shorter rostrum, and the very large second joint of the anterior and intermediate tarsi, which are hardly less wide than the third joint.

##### (2) *Oodemias longirostre*, sp. nov.

Nigrum, aenesens, elongato-ovale, nitidum. Rostrum longissimum, valde curvatum, apice fortiter dilatato, basali parte gracillima, subtiliter dense punctatum. Oculi fortiter prominentes. Prothorax nitidus, sat elongatus, subtiliter punctatus. Elytra

nitida, basi obscure marginata, antice obscure striata, striis grossius punctatis, interstitiis crebre punctulatis, postice fortiter convexis. ♀. Long. (cum rostro) 7 mm. (Plate VIII. fig. 13, ♂; 13a, anterior tarsus of ♂.)

Very distinct from any other species; most nearly allied to *O. olindae*. The excessively long slender rostrum, which is much more strongly curved, will at once distinguish it from that species. The two basal joints of the funiculus are much the same in both species.

HAB. Kauai. A single ♀ taken in the mountains (4000 ft.).

(3) *Oodemias dilatatipes*, sp. nov.

Nigroaeneum, elongatum, nitidum. Rostrum nitidum, subtiliter sat dense punctatum, apice dilatato. Oculi fortiter prominentes. Antennarum articulus secundus et tertius fortiter elongati, subaequales. Pronotum latum, antice fortiter angustatum, subtiliter punctatum. Elytra seriatim (subgrosse) punctata, interstitiis convexis, subtiliter punctatis. Tarsorum ♂ intermed. et antic. articulus secundus aequae latus ac tertius. ♂. Long. 5 mm.

Black, slightly aeneous, shining. The ♂ (the only sex obtained), has the rostrum long, strongly dilated on its apical portion, the surface shining, finely and densely punctured. The eyes are very strongly convex, and prominent. Antennae with the first joint of the funiculus long, the following hardly longer. The prothorax is wide, strongly narrowed in front, and finely punctured. Elytra shining, with rows of moderately large punctures, the interstices slightly and narrowly raised, or convex, and finely punctured. The hind portion of the elytra is of the abrupt form usual in the section, and the apical segments of the hind-body beneath are inclined to the basal part. The femora are extremely stout, and the second joint of the front and intermediate tarsi very wide.

HAB. Oahu, Waianae mountains. A single ♂ only taken. Differs from the ♂ of *O. olindae* Blk., in the shorter rostrum, the coarser puncturation of the striae of the elytra, which are not distinctly margined at the base, etc.

(4) *Oodemias nivicola* Blackburn.

*Oodemias nivicola* Blackb., Ann. Soc. Ent. Belg. XXI. p. 75.

HAB. Maui, Haleakala (4000 ft. to the summit), outside the forest. Common and very variable in size, sculpture &c. Sometimes brightly shining, often quite dull.

(5) *Oodemias costatum*, sp. nov.

Ovatum, robustum, nitide aeneum. Rostrum nitidum, subtiliter punctatum, apice subdilatato. Antennarum articulus secundus et tertius fortissime elongati, fere aequilongi. Elytra seriatim punctata, interstitiis punctulatis, a basi usque ad apicem elytrorum distinctissime costatis. Tarsorum antic. et intermed. (♂) articulus secundus maximus, articulo tertio haud minus latus. ♂. Long. 5.5 mm.

Ovate, shining, bronzy black. Rostrum shining, finely punctured, dilated at the apex. Eyes convex, subprominent. Antennae with the first two joints of the funiculus very long, subequal. Prothorax shining finely and feebly punctured. Elytra striate, the striae strongly punctured, the interstices sharply raised from base to apex, giving the elytra a ribbed appearance, and finely punctured. Second joint of the anterior and intermediate tarsi of the ♂ very large, about as wide as the apical width of the lobate third joint, and rather longer than wide.

HAB. Kauai Mountains (4000 ft.). A very distinct species, of which only a single ♂ was taken.

(6) *Oodemias longicorne*, sp. nov.

Ovatum, robustum, aeneum, nitidissimum. Rostrum sat longum, apice dilatato, nitidum, subtiliter dense punctatum. Antennae longae, funiculi articulo primo fortiter elongato, secundo hoc vel longiore. Prothorax latus, nitidus, subtiliter punctatus. Tarsorum articulus secundus anticorum et intermediorum aequae latus ac tertius, et hoc multo longior. Elytra grossius seriatim antice punctata, interstitiis obscure costato-elevatis. ♂. Long. 5 mm.

This species is closely allied to *O. costatum*, but is very distinct by the sculpture of the elytra, the interstices only showing a faint tendency to the costate form of that species.

HAB. Kauai. Four examples (all ♂), taken on the high plateau.

(7) *Oodemias punctulatissimum*, sp. nov.

Nigroaeneum, nitidum, ovale, robustum. Antennae testaceae, graciles, sat elongatae, articulo secundo brevi, tertio minus fortiter elongato, sed secundo longiore. Rostrum nitidum, apice dilatato, fortiter deflexo, subtilissime punctatum. Oculi parum prominentes. Prothorax latus, nitidus, subtilissime (vix evidenter) punctatus. Elytra nitida, antice vix evidenter, postice paullo distinctius, striata, dense punctulata, apice fere recurvo. Pedes rufotestacei; tarsorum (♂) anticorum et intermediorum articulus secundus dilatatus, tertio vix minus latus. ♂. Long. 3.5 mm.

Remarkable in its group for the unusually short second joint of the funiculus which though evidently longer than the short first joint is less elongate than in the allied species, and for the dense puncturation of the elytra, the punctures on the striae (which are hardly perceptible in front) being very little larger than those on the interstices.

HAB. Oahu, Waianae mountains; 1 ♂ taken in April 1892.

(8) *Oodemus molokaiense*, sp. nov.

Ovatum, nigroaeneum, nitidum. Rostrum dense subtilius punctatum, apice dilatato, Oculi magni, prominuli. Antennarum articulus tertius fortissime elongatus, secundo fere bis longior. Elytra minus fortiter seriatim punctata. Tarsorum (♂) anticorum articulus secundus permagnus, aequae latus ac tertius. Long. 3.5—4.5 mm.

(Plate VIII. fig. 14, ♂; fig. 14a, anterior tarsus of ♂.)

Ovate, aeneous, more or less shining, generally brightly so, of more or less robust form. The rostrum is finely and closely punctured, its apical portion evidently dilated. The eyes are large and somewhat prominent. Antennae long, slender, the second joint of the funiculus very elongate, twice, or nearly twice, as long as the first. Prothorax broad, much narrowed in front, finely punctured, obsoletely so in some examples. Elytra with rows of fine punctures, sometimes with scarcely perceptible striation in front, in others with evident striae, the interstices very finely, subobsoletely punctured. Posteriorly the elytra are vertical, almost recurved, especially in the ♂.

Second joint of the front and intermediate tarsi in the ♂ very large, as wide as the lobate third joint, and rather longer. Apical ventral segments of the hind-body in a plane inclined to that of the basal segments. Rostrum shorter than that of the ♀.

Two examples (♂, ♀) from Lanai have the elytra more strongly striated, the punctures on the striae rather larger, and the interstitial puncturation rather more developed.

HAB. Molokai (3000—4500 ft.); Lanai (2000 ft.). Rare. Allied to *O. punctulatissimum*, but readily distinguished by the longer second joint of the funiculus, and the different puncturation of the elytra. The examples from Lanai might almost pass as a distinct species.

(9) *Oodemus chrysodorum*, sp. nov.

Castaneum, nitidum, conspicue aureo-micans, ovale, elytrorum lateribus bisinuatis. Rostrum longum, apice dilatato, rugoso-punctatum, saepe longitudinaliter carinatum. Oculi perdepressi. Pronotum haud transversum, antice fortiter angustatum. Elytra (antice saltem) obscure striata, striis saepe impunctatis, vel parce subtilissime punctatis. ♂ tarsorum anticorum articulus secundus fere aequae longus ac latus, articulus tertius

lobis magnis. Antennae crassiusculae, articulo 2° et 3° aut subaequalibus aut hoc longiore. ♂ ♀. Long. 3·75—5·2 mm.

(Plate VIII. fig. 15, ♂; fig. 15a, anterior tarsus of ♂; fig. 15b, of ♀.)

This species is readily distinguished by its bright golden-brown colour, the long rostrum (especially in the ♀), which has the apex slightly but evidently widened, and the feeble sculpture of the elytra.

HAB. Maui, Haleakala (5000 ft.); lives in the stems of *Rubus macraei*.

(10) *Oodemus brunneum*, sp. nov.

Anguste ovale, nitidum, brunneum, aureo-micans. Rostrum nequaquam dilatatum, rugoso-punctatum. Oculi convexi, haud fortiter depressi. Antennae crassiusculae, funiculi articulo secundo et tertio brevissimis, hoc illo longiore. Pronotum nitidum, subelongatum, subtiliter nec dense punctatum. Tarsorum ♂ anticorum articulus secundus latior quam longior, tertio evidenter angustior. Elytra nitida antice vix evidenter striata, seriatim subtiliter punctata, interstitiis etiam punctatis. ♂. Long. 3·25 mm.

This species somewhat resembles the preceding in colour, but the rostrum, which is not widened on the apical portion, the more convex eyes, the elytra much less strongly rounded behind the shoulders, and their more distinct puncturation (the punctures of the series are slightly larger than those of the interstices), will easily distinguish it.

HAB. Molokai, mountains (3000 ft.); 1 ♂.

(11) *Oodemus cupreum*, sp. nov.

Ovale, plus minusve nitidum, cupreum. Rostrum sat longum, apice haud dilatato, subtilissime punctatum. Antennarum funiculi articuli 2 basales parum longi, subaequales. Pronotum subelongatum, antice angustatum. Elytra subtiliter striata, seriatim, nec fortiter punctata, interstitiis sat crebre punctulatis. Long. 4—5 mm.

Elongate-oval, more or less shining, the elytra reddish or piceous, and of a distinct copper colour. Legs and often the antennae reddish. Rostrum rather long, not widened towards the apex, finely and more or less sparsely punctured. The two basal joints of the funiculus of the antennae are short, stout and of about equal length. Prothorax finely punctured, rather long and much narrowed in front. Elytra more or less feebly striate, the punctures of the striae distinct, but not coarse, the interstices with a much finer but distinct and more or less dense puncturation. The lobes of the front tarsi are small in all the specimens examined, but it is uncertain whether the ♂ sex is represented.

HAB. Maui, Haleakala (5000—6000 ft.); rare.

(12) *Oodemas crassicorne* Blackburn.

*Oodemas crassicorne* Blackb. Tr. Dublin Soc. III. 1885, p. 184.

The sexual distinctions are important in this species, the second joint of the front tarsi of the ♂ being much wider than that of the ♀.

HAB. Lanai Mountains (2000—3000 ft.). Not rare.

(13) *Oodemas haleakalae*, sp. nov.

Elongato-ovale, nitidum, aenesens. Rostrum rugoso-punctatum; oculi parum convexi. Antennarum articulo secundo brevi, tertio elongato. Pronotum haud transversum, antice angustatum. Elytra antice levissime vel vix striata, lateribus bisinuatis, striis subtiliter remote punctatis, interstitiis saepe crebre punctulatis, postice (praecipue ♀) sat convexis. Tarsorum ant. ♂ articulus secundus transversus, tertius hoc multo latior, lobis magnis. Long. 3—4.5 mm.

This species is closely allied to *O. crassicorne*, Blk. It varies greatly in size, small males being only about half the bulk of the female, and in sculpture, the puncturation of the elytra being much more developed in some examples than in others. It may be distinguished from the allied species by the longer rostrum and less convex eyes, and the former is generally more rugosely punctured, especially in the female. The rostrum is generally more or less evidently widened towards the apex, and is often distinctly carinate down the middle. The interstitial puncturation of the elytra is as a rule hardly less developed than that of the striae. Towards the apex (especially in the ♀) the interstices become rather strongly convex, the fourth, fifth and sixth terminating somewhat abruptly at the same point, a character which will distinguish this species from some others of very similar appearance (e.g. *O. tardum*, Blk.).

HAB. Maui, Haleakala (5000—6000 ft.); common.

(14) *Oodemas montanum*, sp. nov.

Nigroaeneum, nitidum, ovale. Antennae crassae, scapo brevi, funiculi articulo primo elongato, crasso, secundo subaequali. Rostrum nitidum, subfortiter punctatum, apice leviter dilatato, fortius decurvato. Oculi convexi et prominuli. Pronotum sat longum, subtilissime punctatum, antice fortiter angustatum. Elytra nitida, seriatim nec grosse punctata, vix evidenter striata, interstitiis subtiliter minus dense punctatis. (Sexus ?) Long. vix 4 mm.

This species very closely resembles *O. tardum* Blackb., but the very stout

antennae, the first and second joints of the funiculus being elongate, subequal, and unusually stout, and the less punctured interstices of the elytra easily distinguish it. The single example taken is probably a ♂. The second joint of the front tarsi is short, subtruncate, and much less wide than the bilobate third joint.

HAB. Kauai. A single example taken on the high plateau in August, 1896.

(15) *Oodemus tardum* Blackburn.

*Oodemus tardum* Blackb. Tr. Dublin Soc. III. 1885, p. 184.

Several specimens taken on Haleakala I refer to this species, which in most respects very closely resembles *O. haleakalae* (q.v.). It would appear to be somewhat variable, but the material taken is quite insufficient for a proper understanding of the species.

HAB. Maui, Haleakala (4000—5000 ft.). Rare.

(16) *Oodemus obscurum* Blackburn.

*Oodemus obscurum* Blackb. Ann. Soc. Ent. Belg. XXI. p. 75.

var. *substrictum* Blackb. Ent. Mo. Mag. XVII. p. 200.

The characters afforded by the front tarsi of the ♂ are important for distinguishing this species. The lobate third joint is unusually small and the lobes short, the second joint is rather wide.

HAB. Maui, Haleakala (4000—5000 ft.); not rare.

(17) *Oodemus aequale* Blackburn.

*Oodemus aequale* Blackb. Tr. Dublin Soc. III. 1885, p. 184.

HAB. Lanai (2000—3000 ft.), where it is not rare.

(18) *Oodemus apionoides*, sp. nov.

Angustum, elongato-ovale, nigroaeneum, plus minusve nitidum. Rostrum punctatum, parte apicali levissime dilatata, prae insertione antennarum sat evidenter decurvata. Antennarum articulus secundus brevis, robustus, tertius huic subaequalis, vel paullo longior. Pronotum elongatum antice sensim angustatum. Elytra subtilissime striata, striis grossius remote punctatis, interstitiis parce (saepe subobsolete) punctatis. Tarsorum anticorum (♂) articulus secundus brevis, rotundus, tertius hoc multo latior, lobis parum magnis. ♂♀. Long. 3—3.5 mm.

A rather variable species, the punctures on the striae of the elytra being decidedly coarser in some examples than others, and sometimes also more numerous, and therefore less remote. The elytra are often of a bright bronzy colour. The ♂ is shorter than the ♀, and readily distinguished by the less elongated rostrum. The striation of the elytra is always very fine and sometimes hardly discernible in front. The widening of the rostrum towards the apex is sometimes hardly perceptible, and its puncturation is variable, being decidedly rugose in some examples.

HAB. Kauai Mountains (3000—4000 ft.). Not common.

(19) *Oodemus affine*, sp. nov.

Praecedenti cognatissimum, rostro brevior, elytris fortius et confertius seriatim punctatis distinguendum. ♂. Long. 3.25 mm.

Closely allied to *O. apionoides*. The rostrum is closely punctured, the apex somewhat strongly curved downwards, and it is evidently wider than that of the preceding species. The first joint of the funiculus of the antennae is very short and stout, the second rather longer than this. The prothorax is dull and remotely punctured, its sides slightly convergent from the base to front. The elytra are shining, brassy, distinctly striate; the striae coarsely punctured, and not very remotely. The interstices are distinctly but sparsely punctured. Second joint of the front tarsi (♂) very small, transverse, lobes of the third small.

HAB. Kauai, Makaweli (2000 ft.); 1 ♂ taken.

(20) *Oodemus parallelum*, sp. nov.

Laete aeneum, nitidissimum, angustissimum. Antennarum articulus secundus brevissimus, tertius fortiter elongatus secundo bis longior. Pronotum nitidum, antice minus fortiter angustatum, subfortiter punctatum. Elytra nitidissima, subtilissime striata, striis sat fortiter nec confertim punctatis, interstitiis parce distincte punctulatis. Tarsorum anticorum ♂ articulus secundus brevis transversus, tertius hoc multo latior, lobis magnis. ♂. Long. circa 3 mm.

This is a very distinct species. Its bright bronzy colour, very narrow form, comparatively strongly punctured thorax, long second joint of the funiculus of the antennae, &c., &c., readily distinguish it.

HAB. Oahu. A single ♂ taken on Kaala (Waianae Mountains) in December, 1892.

(21) *Oodemus graciliforme*, sp. nov.

Angustum, elongato-ovale, nitide aeneum. Rostrum subnitidum, subtiliter punctatum, apice levissime dilatato, evidenter decurvato. Antennarum articulus secundus et tertius elongati, subaequales. Pronotum haud transversum, antice fortius angustatum. Elytra nitida, levissime striata, striis remote nec fortiter punctatis, interstitiis haud crebre punctulatis, apicem versus elytrorum plus minusve convexis. Tarsorum ♂ anticorum articulus secundus parvus, subrotundus, quam dimidia pars tertii vix latior, hujus lobis haud magnis. ♂♀. Long. 3·75—4·5 mm. (Plate VIII. fig. 16.)

An elongate very narrow species of moderate size and bright bronze colour. The rostrum is slightly widened towards the apex, and bent downwards from about the line of insertion of the antennae. The first and second joints of the funiculus are elongate, and subequal. The prothorax is generally shining, and varies considerably in its puncturation, which is closer and stronger in some examples than others; its form is rather long and narrow, and it is much narrowed in front. The elytra are narrow, shining, bright brass-coloured or golden, with very fine but evident striae, which are a little deeper posteriorly, where the interstices are more or less convex. The punctures on the striae are not at all coarse, and are remote; the interstitial puncturation is much finer than these, and not dense.

In the ♂ the second joint of the front tarsi is small, about as long as wide, half the width of the lobate third joint, which is transverse, and not largely developed.

This species is distinct by the very narrow elongate form, bright bronzy colour, the subequal first and second joints of the funiculus of the antennae, fine striation of the elytra, and the fine puncturation of the striae.

HAB. Kauai, Halemanu; rare.

(22) *Oodemus ramulorum*, sp. nov.

Nigroaeneum, nitidum, ovale. Rostrum haud dense subtiliter punctatum, apice levissime dilatato, decurvato. Antennarum articulus secundus brevis, robustus, tertius gracilis, elongatus. Pronotum opacum, subtilissime, nec dense, punctatum, antice angustatum. Elytra nitidissima, plus minusve cupreo-nitentia, levissime striata, striis subtiliter punctatis, interstitiis minus dense subtilissime punctulatis. Long. 3—3·75 mm.

The two examples of this small elongate-oval species were obtained from the pith-cavity of a dry twig, resting side by side. It is probable that they may be the sexes of one species, although they differ somewhat in shape &c. That which is probably the ♂ has the prothorax slightly shorter and wider, and of a dull brassy-green colour. The

elytra are black, with a copper-coloured metallic tint. The second joint of the anterior tarsi is small, the lobes of the following joint rather large. In the other example, both thorax and elytra are of a very marked copper colour, the former is rather longer, and the sides of the latter less strongly rounded.

HAB. Oahu. Mountains near Honolulu (3000 ft.); two examples taken.

(23) *Oodemias leiothorax*, sp. nov.

Nigroaeneum, nitidum, ovale. Rostrum ♂ breve, ♀ sat longum, apice haud dilatato, distincte punctatum. Antennarum articulus secundus elongatus, tertio paullo (♂) vel multo (♀) longior. Pronotum nitidum, subtilissime (vix evidenter) punctatum. Elytra nitida, levissime (vix evidenter) striata, striis subtilissime remote punctatis. Tarsorum anticorum ♂ articulus secundus brevis, subrotundus, tertius lobis parvis. ♂♀. Long. 3·5 mm. (Plate VIII. fig. 17).

Apparently a very distinct species, by its antennae, the very feeble puncturation of the thorax, and the delicacy of the series of punctures on the elytra. The metallic tint of the latter is bronze-coloured and very distinct.

HAB. Kauai. High plateau; 2 ♂, 1 ♀ taken.

(24) *Oodemias flexirostre*, sp. nov.

Ovale, nigroaeneum, nitidum. Rostrum fortiter punctatum, ante medium fortius decurvatum, apice haud dilatato. Antennarum articulus secundus et tertius subaequilongi. Pronotum nitidum, sat distincte punctatum. Elytra nitida, levissime striata, striis remote parum fortiter punctatis, interstitiis subtiliter, nec dense, punctatis. Tarsorum anticorum lobi parvi. ♂ (?). Long. 3·5 mm.

Very similar to *O. leiothorax* in most respects, but distinguished by the more strongly curved rostrum, the much more distinct puncturation of the prothorax, and the less fine punctures of the elytra.

HAB. Kauai (4000 ft.). One example.

(25) *Oodemias dubiosum*, sp. nov.

Nigroaeneum, ovatum, elytris (♂) subnitidis. Rostrum (saltem in media parte) parce punctatum, apice haud dilatato. Antennae graciliores, articulo funiculi primo et secundo subaequilongis (♂), vel hoc longiore (♀). Pronotum latum antice fortius angustatum, subtiliter punctatum. Elytra striata, striis subfortiter punctatis, interstitiis distincte punctulatis. Tarsorum anticorum ♂ lobi parvi. Long. vix 4—4·5 mm.

Three examples taken in the same locality and at the same time are referred to this species, although they do not agree very closely in some respects. I have regarded the two smaller, and partly shining, examples as ♂, the larger, which is entirely dull, as the ♀.

The rostrum is narrow, the apex not at all dilated, the puncturation sparse throughout, or at least down the centre. The antennae are slender, the first and second joints of the funiculus in the ♂ are not very elongate, subequal in length, or with the second very slightly the longer. In the ♀ the difference between them is more pronounced, the first being evidently less long than the second. The prothorax is wide, dull, or at least not brightly shining, and finely punctured. Elytra somewhat shining in the ♂, quite dull in the ♀, lightly striate in the former, much more distinctly so in the latter, in which the punctures are decidedly coarse, more so than in the ♂. The lobate third joint of the anterior tarsi is very small for the size of the species. The metallic colour is more pronounced on the elytra than on the rest of the insect, and is bronzy. The general form is rather robust, especially the ♀.

HAB. Kauai mountains (Makaweli, 3000 ft.).

(26) *Oodemus striatum*, sp. nov.

Aeneum, elongato-ovale, nitidum. Rostrum subnitidum, crasse punctatum, apice haud dilatato. Antennae crassiusculae, funiculi articulo primo secundo evidenter brevior. Pronotum sat latum, dense punctatum. Elytra nitida, basi submarginata, fortissime striata, striis confertissime grosse punctatis, interstitiis convexis, conspicue punctulatis. Tarsorum anticorum lobi sat magni. (An sexus?) Long. 4.5 mm. (Plate VIII. fig. 26.)

This is a most distinct species of a bright bronzy colour and of elegant form, the elytra narrowing very gradually to the apex at a distance not far from their base. Their strong striation, with coarse close punctures, and conspicuous interstitial puncturation, together with the shape of the insect, readily distinguishes it from all others.

HAB. Kauai. A single example taken in the mountains behind Lihue (3000 ft.).

(27) *Oodemus puncticolle*, sp. nov.

Nigroaeneum, nitidum, oblongo-ovatum. Rostrum strigoso-punctatum, apice haud dilatato. Oculi convexi. Antennarum articulus secundus brevis, tertius elongatus, illo multo longior. Pronotum sat longum, crebre distincteque punctatum. Elytra nitida, seriatim nec fortiter punctata, postice fere verticalia, apicibus late rotundatis, striis obsoletis, interstitiis crebre conspicueque punctulatis. Tarsorum anticorum articulus bilobatus parvus. (An sexus?) Long. 4 mm.

Apparently a very distinct species. The elytra are much more parallel-sided than is usual in the genus (as in *O. pulchrum*, &c.), and are comparatively widely rounded at the apex. The interstitial puncturation is very distinct, and the traces of striation are very feeble even towards the apex. The metallic colouring is not very pronounced.

HAB. Kauai, Halemanu. One example taken.

(28) *Oodemus purpurascens*, sp. nov.

Robustum, oblongo-ovatum, nitidum. Rostrum rugoso-punctatum, apice haud dilatato. Antennarum articulus secundus brevis, tertius hoc multo longior. Pronotum sat longum, subtiliter densius punctatum. Elytra nitida, metallescentia, parum distincte striata, seriatim grossius foveolatim-punctata, interstitiis plus minusve, (nonnunquam crebre), punctulatis. Tarsorum anticorum ♂ articulus tertius parvus. ♂ ♀. Long. 4—5.25 mm.

The head and thorax are black with little or no metallic colouring, the elytra are very distinctly metallic, of a dark colour inclining to purple. The interstices are very faintly, sometimes hardly perceptibly, convex, their puncturation in the single ♂ is faintly impressed and not conspicuous as in the two females examined, but of the latter one has the interstitial puncturation considerably more strongly developed than the other. The ♂ is much smaller than either of the females. The species appears to be most nearly allied to *O. puncticolle*, from which it differs in the colour, in its more robust form, coarser punctures of the elytra, which are less vertical behind, and more pointed at the apex, &c.

HAB. Kauai (4000 ft.), 2 ♀; near Makaweli (3000 ft.), 1 ♂.

(29) *Oodemus pulchrum*, sp. nov.

Elongatum, oblongo-ovatum, nitidum, laete aenescens. Rostrum ♂ breve, ♀ sat elongatum, rugoso-punctatum. Antennarum articulus secundus (praecipue ♀) fortiter elongatus, tertius hoc longior. Elytra grosse seriatim foveolato-punctata, interstitiis apicem versus subacute elevatis. Tarsorum anticorum ♂ articulus secundus brevis, haud latior quam pars dimidia art. tertii. ♂ ♀. Long. 4.75—6 mm. (Plate VIII. fig. 18.)

Shining, elongate, oblong ovate, prothorax bronze-coloured, elytra bright metallic green. Rostrum very short in the ♂, considerably longer in the female, rugosely punctured. First joint of the funiculus of the antennae elongate, very strongly so in the ♀, the second joint generally still longer, but sometimes the two are nearly equal in length. Prothorax shining, much narrowed in front, not very wide at the base. Elytra very coarsely punctured, their surface brightly shining, the sides but little rounded, giving

the insect a more parallel-sided appearance than is usual in the genus; the striae on the apical portion of the elytra are very deeply impressed, so that the interstices are narrow, strongly convex, and almost sharp. In the ♂ the second joint of the front tarsi is small, short and transverse, about half as wide as the bilobate third joint.

HAB. Kauai (4000 ft.); rare. This is an extremely distinct species by its bright metallic colour, its extremely coarse elytral punctures, and its general form. In the latter respect the following species closely resembles it.

(30) *Oodemus oblongum*, sp. nov.

Præcedenti affine, nigrum, nitidum, parum aenescens, oblongo-ovatum. Rostrum opacum, rugoso-punctatum. Antennarum articulus tertius secundo longior. Pronotum nitidum, subtiliter punctatum antice angustatum. Elytra seriatim fortiter punctata, postice striis quam præcedentis minus fortiter impressis. ♂ ♀. Long. 5·75—6·5 mm. (Plate VIII. fig. 19.)

Similar in form to the preceding, black, and only slightly aeneous. The great difference in colour separates the two at once, as well as the finer puncturation of the elytra of the present species, the punctures though less coarse being more definite in form, and the striae towards the apex are less deeply impressed, the interstices consequently standing out less sharply. The interstitial puncturation is fine, more or less dense, and very distinct.

HAB. Kauai (4000 ft.); rare.

(31) *Oodemus grande*, sp. nov.

Nigrum, robustum, ovatum, parum distincte aenescens. Antennarum articulus secundus et tertius sat elongati, subaequales, vel hoc longiore. Rostrum rugoso-punctatum. Pronotum latum, nitidum, subtiliter punctatum. Elytra nitida, seriatim et confertim fortiter punctata, interstitiis dense et distinctissime punctulatis, postice haud convexim elevatis, striis vix videndis. ♀. Long. 7 mm. (Plate VIII. fig. 20.)

A large robust elongate-oval species, black, with a slight aeneous tint. The rostrum is rugosely punctured, rather long in the ♀, the sides nearly parallel, or slightly converging from the base. The two basal joints of the funiculus are both long, subequal, or the second the longer. The prothorax is very wide at the base, strongly narrowed in front, the surface shining, finely but distinctly punctured. Elytra shining, the striation excessively feeble even to the apex, the punctures of the series moderately large and close, the interstices densely and conspicuously punctured.

HAB. Kauai (4000 ft.); 2 ♀ taken. A very distinct species distinguished by its large size, elongate basal joints of the funiculus, the rows of large punctures on the elytra and dense and distinct interstitial puncturation.

(32) *Oodemus corticis*, sp. nov.

Nigroaeneum, plus minusve nitidum, elongato-ovatum, sat robustum. Rostrum crebre punctatum, apice haud dilatato. Oculi convexi. Antennarum funiculi articulus secundus primo longior. Pronotum latum, antice fortiter angustatum. Elytra crebre punctulata, lateribus bisinuatis, punctis, quae majora sunt, seriatim dispositis, striis parum distinctis, vel obsoletis. Lobi tarsorum anticorum parum magni. ♂ ♀. Long. 5—7 mm. (Plate VIII. fig. 21.)

This species of which I have examined a great number of examples, is very variable in almost every character. The rows of larger punctures on the elytra are sometimes very distinct, with the punctures themselves closely set, sometimes much less so, and the punctures remote from one another, or even for the most part obsolete. These punctures are shallow and by no means coarse, but larger than those of the interstices, which are nearly always well developed and distinct. Most examples have the surface shining, some brilliantly so, others are nearly dull. In spite of the variation exhibited, the species by its large size, and general form, &c., is one of those most easily recognized on a casual inspection.

HAB. Lanai, Molokai mountains, and Maui on Haleakala. Very abundant under the bark of trees.

(33) *Oodemus pachysoma*, sp. nov.

Ovatum, robustum, nigroaeneum, plerumque plus minusve nitidum. Rostrum distincte punctatum, apice haud dilatato. Oculi convexi. Antennarum articulus secundus et tertius subaequilongi. Pronotum latum, antice fortiter angustatum, subtiliter punctatum. Elytra levissime vel vix striata, seriatim vix fortiter punctata, interstitiis distincte subtiliter punctatis. Tarsorum anticorum utriusque sexus lobi parum magni. ♂ ♀. Long. 4.5—6 mm. (Plate VIII. fig. 22.)

A rather distinct looking species, of robust form, and not brightly aeneous. The rostrum in the ♂ is rather short, and wide at the base, becoming narrower towards the apex. The elytra are (at least in the ♂) wide near the base, the sides being strongly rounded from the shoulders. The sculpture is variable, consisting of rows of larger punctures which are sometimes closely placed (i.e. the punctures in each row), but in other examples are decidedly irregular. The interstitial puncturation is much more dense in some examples than in others, but it is nearly always conspicuous. The lobate third joint of the anterior tarsi is unusually small for the size of the species in both sexes. The general surface is more or less shining, but there is considerable variation in this respect.

HAB. Kauai mountains (4000 ft.).

(34) *Oodemus acolosoma*, sp. nov.

Ovatum, nitidum, elytris ♂ aenescentibus, ♀ subcupreo-nitentibus. Rostrum ♂ brevius, nitidum, subtiliter punctatum, apice haud dilatato. Antennae graciles, articulis 2 basalibus funiculi elongatis, subaequilongis. Oculi convexi. Pronotum nitidum, subtiliter punctatum, antice fortiter angustatum. Elytra nitida, crebre punctulata, punctis quae majora sunt, seriatim dispositis, striis levissimis, vel obsoletis. Tarsorum anticorum lobi mediocres. ♂ ♀. Long. 4—4.5 mm.

This species is closely allied to the two preceding, but is a smaller and more shining insect. The puncturation of the elytra shows some variation, the punctures which are disposed in series being considerably coarser in some examples than in others, the density of the interstitial puncturation also varies.

HAB. Kauai, a few examples taken in the mountains at an elevation of 4000 ft.

(35) *Oodemus aenescens* Bohem.

*Oodemus aenescens* Boh., Eug. Res. p. 138, t. 2, f. 6.

(Plate VIII. fig. 23.)

HAB. Oahu and Lanai mountains. Remarkable for the extremely coarse puncturation of the base of the abdomen beneath. The length of the first and second joints of the funiculus of the antennae is a little variable, sometimes one and sometimes the other being slightly the longer.

(36) *Oodemus angustum* Blackburn.

*Oodemus angustum* Blackb., Ann. Soc. Ent. Belg. XXI. p. 75.

HAB. Oahu, Waianae mountains (Blackburn).

(37) *Oodemus halticoides* Blackburn.

*Oodemus halticoides* Blackb., Ent. Mo. Mag. XIV. p. 5.

HAB. Oahu mountains, 2000—3000 ft. (Blackburn).

(38) *Oodemus robustum* Blackburn.

*Oodemus robustum* Blackb., Ann. Soc. Ent. Belg. XXI. p. 75.

HAB. Oahu, Waianae mountains (Blackburn).

(39) *Oodemias insulare* Blackburn.*Oodemias insulare* Blackb., Ann. Soc. Ent. Belg. xxi. p. 74.

HAB. Oahu (Blackburn).

(40) *Oodemias sculpturatum* Blackburn.*Oodemias sculpturatum* Blackb., Ann. Soc. Ent. Belg. xxi. p. 74.

(Plate VIII. fig. 24.)

HAB. Maui, Haleakala (4000—5000 ft.). Not rare.

(41) *Oodemias nitidissimum*, sp. nov.

Nigroaeneum, nitidissimum, ovale. Rostrum subtiliter crebre punctatum, apice haud dilatato. Antennarum articulus secundus fortiter elongatus, tertio bis longior. Pronotum nitidissimum, subtiliter subobsolete punctatum, latum, antice fortiter angustatum. Elytra levissime (parum distincte) striata, striis remote subtiliter punctatis, interstitiis conspicue punctulatis. Long. 3.5 mm.

A very distinct species, easily known by the very long first joint of the funiculus of the antennae, the highly polished surface, and puncturation of the elytra.

HAB. Oahu, a single example taken in the Waianae mountains in April 1892.

(42) *Oodemias mauiense* Blackburn.*Oodemias mauiense* Blackb., Ann. Soc. Ent. Belg. xxi. p. 75.

(Plate VIII. fig. 25.)

HAB. Maui, Haleakala (Blackburn). I have taken this species on Molokai and Hawaii in some numbers. It varies greatly in size, and otherwise. Examples from Hawaii are generally much more shining than those from Molokai.

(43) *Oodemias borrei* Blackburn.*Oodemias borrei* Blackb., Ann. Soc. Ent. Belg. xxi. p. 75.

This species is sometimes quite brightly shining, and varies greatly in size.

HAB. Maui, Haleakala, above the forest. Commonly found in company with *O. nivicola* (from 6000—10000 ft.), attached to roots of grasses and low plants.

(44) *Oodemus konanum*, sp. nov.

Ovatum, robustum, nigroaeneum, opacum vel minus nitidum. Rostrum strigosopunctatum. Antennae graciles, minus breves, articulo funiculi primo brevi, quam secundus evidenter brevior. Pronotum basi latum, opacum (rare subnitidum) subtiliter punctatum. Elytra sat lata, subopaca, rarius nitida, grosse seriatim punctata, plerumque obscure vel vix evidenter striata, interstitiis nonnunquam convexiusculis, haud dense punctulatis. Long. 5—6 mm.

A large, wide, and robust species, generally dull, with the elytra a little shining, sometimes quite brightly so. The rostrum is so punctate as to have an appearance of longitudinal strigosity, but in some examples this is less evident. Prothorax generally quite dull from the microscopic rugulosity of the surface, finely, obscurely, and remotely punctured. In a few examples the puncturation is more evident. Elytra with series of coarse punctures, sometimes placed in evident striae, owing to the slight but evident convexity of the interstices, but the striation is vague and shallow. In many examples, however, there is little or no trace of interstitial convexity. The metasternum and base of the abdomen beneath are coarsely punctured. In spite of the variation in detail of the sculpture, this species is not difficult to recognize, by its large size and robust form, and the more or less dull surface. It is perhaps most nearly allied to *O. sculpturatum*, but that species is of shorter and more subquadrate form, and generally has the interstices of the elytra more distinctly convex.

HAB. Hawaii, Kona district (4000 ft.). About 40 examples were taken.

(45) *Oodemus multiforme*, sp. nov.

Nigroaeneum, nitidum, ovatum. Antennae sat graciles et elongatae, articulo funiculi primo minus elongato, quam secundus brevior. Elytra nitida, seriatim sat grosse punctata, interstitiis punctulatis. Long. 3—5 mm.

To the above species I refer all the specimens of *Oodemus* taken by me on Hawaii, except the series of *O. konanum* and a few specimens, which I consider a variety of that distinct species *O. mauiense*. If I am right in my conclusions, the variation exhibited by *O. multiforme* is much greater than that of any other species, so much so that the extreme forms would not only appear to be totally distinct, but not even very closely allied. When, however, a great many examples are compared, these extreme forms are so connected by intermediates, as to make it impossible to decide where any line of separation can be drawn. For this reason we have not attempted to draw up any detailed description of the species, as such could apply to but a fraction of the examples we have examined. Indeed apart from generic characters, there are probably none which do not exhibit more or less variation. The brief description given above applies to a common form of the insect, and a number of this form were taken at Kilauea,

Hawaii. The chief points of variation which we have observed are as follows. Size very variable, the largest examples being three or four times the bulk of the smallest. Form sometimes robust, sometimes narrow and elongate, to some extent the variation being probably due to sex, as it is usual in other species for the ♂ to be shorter and wider than the ♀. In some the elytra become a good deal wider either a little behind the shoulders or still further back, while in some the curve of their sides is very even and forms an almost regular continuation of that of the sides of the prothorax. The surface of the insect is normally shining, others are less so, especially anteriorly, some are rarely quite dull. The rostrum varies in sculpture, sometimes it is finely and by no means closely punctured, sometimes the puncturation is dense and rugose. The antennae, which are slender, are not extremely variable, but they are longer in some examples than in others, and there is no doubt that some have the first joint of the funicle more slender and less short than others. The prothorax varies in width and in sculpture, generally it is finely punctured, sometimes more strongly and closely, sometimes very shining and almost or quite impunctate. The elytra are rarely dull, but frequently instead of being merely seriatly punctured, they have the punctures placed in evident striae, and the individual punctures of the rows are often remote, but sometimes close and regular, even in those near to the suture. Small examples from the Kona district are often excessively shining and have the puncturation of the elytra much more sparse and irregular. The eyes which normally are a little convex in a few specimens are hardly so at all.

We have attempted the division of the species on nearly all these characters and on minute differences in the rostrum, with the result that we have found that either a number of species must be made, with very indefinite distinctions between them, or that the whole series must be considered as one very variable species, which is possibly at the present time in the process of dividing into several, the division as yet being quite incomplete. It is of course possible that extended research into the habits etc. of some of these forms might prove that the views we hold are erroneous, and that there are really several variable species.

HAB. Hawaii, taken in various localities on both sides of the island from 2000—5000 ft.

(46) *Oodemas infernum* Blackburn.

*Oodemas infernum* Blackburn, Ent. Mo. Mag. xvii. p. 199.

HAB. Hawaii, Kilauea (Blackburn). I think it doubtful whether this is not a form of the preceding species, but as Mr Blackburn in his final consideration of the species (Tr. Dublin Soc. 1885, p. 187) includes it in those, which have a long first joint to the funiculus, whereas *O. multiforme* appears to belong to those which have this joint short, I have thought it safer to consider the two distinct.

## ANOTHEORUS Blackburn.

(1) *Anotheorus montanus* Blackburn.

*Anotheorus montanus* Blackb., Ent. Mo. Mag. XIV. p. 5.

HAB. Oahu mountains, on *Acacia koa*.

(2) *Anotheorus ignavus* Blackburn.

*Anotheorus ignavus* Blackb., *op. cit.* XVII. p. 201.

HAB. Maui, Haleakala (4000—5000 ft.); var. on Lanai; rare. This species approaches very closely to the preceding, and both vary in the shape of the thorax, and it is doubtful whether they are distinct. The Maui examples are most variable, and a single specimen from Lanai agrees better with these than with the Oahuan form.

(3) *Anotheorus robustus*, sp. nov.

Nigroaeneus, robustus, antennis tarsisque plus minusve testaceis. Rostrum subtilissime punctatum. Pronotum antice angustatum, plerumque nitidum, elytris multo angustius. Elytra lata, striata, striis confertim punctatis, interstitiis creberrime punctulatis. Long. (rostr. incl.) 6—8.5 mm. Lat. (exempli minim.) 3 mm. (Plate VIII. fig. 27.)

Although this species, of which I have examined 80, or more, examples, varies greatly in size, and sometimes in sculpture, its great size distinguishes it at once, the smallest examples being of about twice the bulk of either of the preceding.

HAB. Kauai mountains; common.

## Fam. SCOLYTIDAE.

The Scolytidae are represented by twenty-six species, three only being at present known to inhabit other countries, although some of the others will no doubt ultimately be found to be likewise of foreign origin. Only three genera are represented, *Xyleborus* with 19 species being the most extensive and important. There are six species of *Hypothenemus* known, and one of *Crossotarsus*. The latter, *C. externedentatus*, is already known to occur elsewhere, as also is the *Hypothenemus eruditus*, and one of

*Xyleborus* (*X. confusus*). The greater number of the species of *Xyleborus* and *Hypothenemus* are true forest insects and are no doubt peculiar to the islands. Owing to the extreme sexual differences exhibited by the species of *Xyleborus* it is impossible in most cases to unite the sexes from a mere inspection of the specimens, so that it is probable that some of the males described will prove to belong really to females described under another name, and therefore the species will be less numerous than they appear to be. So far as is at present known most of the species of this genus are restricted each one to a single island, and of those with a wider distribution some I suspect are not truly indigenous—*X. immaturus* for example—and will prove to have been imported by man. The species assigned to *Hypothenemus* are at present very imperfectly known, and would appear to be rare insects, and it is doubtful whether, excluding *H. eruditus*, they are true members of that genus. It may be remarked that in addition to the species here enumerated a small Scolytid has been recently imported into the islands, and is said to be very injurious to certain fruit-trees in some localities, but I neglected to collect or examine this insect.

Tribe TOMICINI.

XYLEBORUS Eichh.

(1) *Xyleborus molokaiensis*, sp. nov.

Elongatus, cylindricus, piceo-niger, setis aureis elongatis postice sparsim vestitus. Elytra subopaca, sat distincte seriatim punctata, parte declivi juxta suturam utrinque tuberculis minutissimis 2 vel 3, lineariter dispositis, munita. ♀. Long. 4.25 mm.

Distinguished by its large size and dull elytra, which bear on the apical declivous portion two or three very minute tubercles on each side of and near to the suture, and placed nearly in a line with one another. From the base of each of these tubercles springs a long fine golden seta. Exterior to each of these series of tubercles may often be detected one or two other excessively minute ones on either wing-case, and the general surface of this posterior portion of the elytra under a very strong lens is minutely asperulous.

HAB. Molokai, above 4000 ft. In the wet decaying wood of *Cheirodendron*.

(2) *Xyleborus kauaiensis*, sp. nov.

*X. molokaiensi* magnitudine et forma similis, elytrorum parte postica declivi similariter tuberculis munita, sed colore testaceo vel rufo-testaceo, elytris sat evidenter nitentibus distinguendus. ♀. Long. 4 mm.

HAB. Kauai, Halemanu and above Waimea (4000 ft.). Four examples taken.

(3) *Xyleborus mauiensis*, sp. nov.

Angustus, elongatus, cylindricus, niger, antennis pedibusque testaceis. Elytra vix nitida, seriatim punctata, puncturatione minus distincta, subobsoleta, postice setis pallidis pluribus vestita, parte declivi suturam juxta tuberculis 4 vel 5 minutissimis, lineariter dispositis, utrinque munita, et ubique minutissime sat distincte asperula. ♀. Long. 3'2—3'5 mm.

Closely allied to *X. molokaiensis* but much smaller and narrower, and with the posterior declivous portion of the elytra with more numerous setae. This area has also the appearance of being covered with rows of longitudinal and very minute asperities, apparently due to the mode in which the punctures are impressed. The tubercles are very minute, and form a row on each side near the suture, in each of which rows 3 to 5 tubercles can be distinguished on careful examination. The better developed ones are usually those in the middle of the series. On either side exterior to these rows other very obscure and minute tubercles may be sometimes distinguished.

HAB. Maui, Haleakala (5000 ft.). On *Cheirodendron*.

(4) *Xyleborus hawaiiensis*, sp. nov.

Niger, antennis pedibus testaceis, haud nitidus, *X. mauiensi* cognatissimus. Elytra opaca, subobsolete seriatim punctata, parte declivi suturam juxta tuberculis minutissimis 2 vel 3 lineatim utrinque armata, pilis brevioribus parum conspicue vestita, vix asperula. ♀. Long. 3 mm.

Apparently slightly less elongate than *X. mauiensis*, but extremely similar to it in nearly all respects. It may be distinguished from that species by the decidedly less hairy apical surface of the elytra, the hairs being less evident than those on the dorsal, and the general surface of the declivous portion is moreover not distinctly covered with very minute asperities.

HAB. Hawaii, Hilo (2000 ft.); four examples taken.

(5) *Xyleborus truncatus* Sharp.

*Xyleborus truncatus* Sharp, Tr. Dublin Soc. III. 1885, p. 192.

The elytra of this species are evidently shining, and it is smaller than any of the preceding. I have seen only two examples besides the types, and they are both darker than the latter, but otherwise nearly identical.

HAB. Oahu (Blackburn). Lanai, Hawaii, in the Kona district; one from each locality.

Obs. The five species enumerated above are extremely closely allied, and almost agree together in the character of the tubercles on the apical portion of the elytra, but so far as I can decide on the scanty material examined, the various forms are readily

distinguished by the characters given. It may be noted that four of the species apparently are limited in range to one or other of the islands, while the fifth has been taken on three different islands. Of this group of species I have further seen three examples, which appear to belong to none of the forms described above, nor yet do they agree together themselves, but the material is quite insufficient for deciding as to the specific value of the characters they exhibit.

(6) *Xyleborus obliquus* Sharp.

*Xyleborus obliquus* Sharp, Tr. Dublin Soc. III. 1885, p. 192.

HAB. Oahu and Hawaii (Blackburn); I have not met with this species.

(7) *Xyleborus lanaiensis*, sp. nov.

Nigricans, parum nitidus, elongatus, cylindricus, antennis pedibusque testaceis. Elytra subtiliter minus distincte punctata, postice sat abrupte declivia, parte declivi utrinque suturam juxta tuberculis 2 fortioribus lineatim munita, et subdepressa. ♀. Long. 3·6 mm.

Readily known from any of the preceding by the stronger development of the four tubercles of the posterior declivous portion of the elytra, these tubercles being placed two in a line on each side of and near to the suture, the upper pair near the commencement of the declivity, the others near the apex. From the base of each posteriorly springs a long fine seta, directed downwards and backwards. Outwardly to these larger tubercles there are on each wing-case one or two considerably smaller ones.

HAB. Lanai 2000 ft., January 1894. Three or four examples taken.

(8) *Xyleborus simillimus*, sp. nov.

Praecedenti (*X. lanaiensis*) simillimus et cognatissimus, parte declivi elytrorum eodem modo armata. Elytra subnitida, distinctius et minus subtiliter punctata, tuberculis 2 superioribus setas breviores ferentibus. ♀. Long. 3·4 mm.

Extremely like *X. lanaiensis*, but the elytra are somewhat striate, and the punctures are decidedly larger and more distinct, the surface somewhat shining. Apical armature much as in *X. lanaiensis*, the four larger tubercles being well-developed and there are a minute pair anterior to the upper pair of these, but these may be more or less evident in the preceding species also. The setae which spring from the base of the anterior pair of the larger tubercles are evidently less developed than those in the same position on *X. lanaiensis*.

HAB. Hawaii, above Hilo (1800 ft.); two examples taken.

(9) *Xyleborus oahuensis*, sp. nov.

Nigricans, antennis pedibusque testaceis, spp. duabus praecedentibus simillimus, sed paullo major. Elytra subtilissime sed subdistincte punctata, subnitida, parte declivi depressiuscula, tuberculis 6 sat distinctis, setas longas ferentibus, armata, horum 4 anterioribus curvatim dispositis. ♀. Long. vix 4 mm.

Very like the preceding two species, having four well-developed tubercles similarly disposed on the posterior portion of the elytra, two in a line on one side and two so placed on the other side of and near to the suture. Behind the anterior tubercles on either wing-case towards the side there is another distinct tubercle, these two and the anterior pair being placed in a curve. These sublateral tubercles are well-developed but smaller than the anterior and about equal to the posterior pair in size. From the base of each of the tubercles posteriorly a long fine seta rises. There are no evident smaller tubercles in this species.

HAB. Oahu. A single example was taken in the northern part of the Koolau range, at an elevation of about 1000 ft.

(10) *Xyleborus dubiosus*, sp. nov.

Castaneus, subnitidus, pedibus antennisque testaceis. Elytra subtilissime seriatim punctata, parte declivi minus abrupta, tuberculis 2 minus fortibus lineariter dispositis utrinque juxta suturam armata, necnon latera versus utrinque tuberculis aliis minutioribus 2 vel 3 lineariter dispositis munita, setis brevioribus. ♀. Long. 3.5 mm.

The single example above characterized is a very obscure species. The four larger tubercles of the posterior declivous portion of the elytra are less strong than those of the several preceding species, yet more so than those of the series ending with *X. truncatus*. In front of the anterior pair of these there is a third pair smaller and ill-developed, and in a line with the others. They are situated close to the suture just at the beginning of the posterior declivity, and in the unique example are placed quite obliquely and not opposite the one to the other. Besides this series there is a second one of about three minute tubercles on each wing-case towards the side.

HAB. Maui. A single example was taken in the Iao valley in 1894.

(11) *Xyleborus confusus* Eichhoff.

*Xyleborus confusus* Eichhoff, Ratio, Descr. emend. Tomicinorum (1879).

*Xyleborus insularis* Sharp, Tr. Dublin Soc. III. 1885, p. 193.

HAB. Oahu and Kauai (Blackburn); Oahu (both ranges), Maui, Kauai, Hawaii. At elevations from 1500—4000 ft. above sea-level. We are indebted to Mr W. F. H. Blandford for the identification of this species.

(12) *Xyleborus rugatus* Blackb.

*Xyleborus rugatus* Blackburn, Tr. Dublin Soc. III. (1885), p. 192.

HAB. Oahu. A single specimen taken. (Blackburn.)

(13) *Xyleborus frigidus* Blackb.

*Xyleborus frigidus* Blackburn, Tr. Dublin Soc. III. 1885, p. 193.

HAB. Maui. A single specimen taken on Haleakala, 4000 ft. (Blackburn.)

(14) *Xyleborus immaturus* Blackb.

*Xyleborus immaturus* Blackburn, Tr. Dublin Soc. III. 1885, p. 193.

I have taken what is probably the ♂ of this insect. It is testaceous or rufotestaceous in colour, but otherwise bears no resemblance to the ♀. Form short and robust, the whole insect hardly twice as long as wide, longitudinally convex. Thorax very narrowly rounded, or somewhat pointed, in front, of ovate form, truncate at the base. The sculpture is very feeble, and there is none of the coarse rugosity in front such as is seen in the ♀, and the clothing there consists of shortish and inconspicuous hairs. Elytra short, rather longer than wide in dorsal aspect, rather distinctly substriate, the striae finely punctured. There are no evident tubercles on their posterior portion. Length hardly 2 mm.

HAB. Oahu and Hawaii (Blackburn); Hawaii in various localities.

(15) *Xyleborus agamus*, sp. nov.

♂ castaneus, parum elongatus, tibiis omnibus plus minus obscuratis, tarsis pallidis. Pronotum magnum, antice acuminatum, ruguloso-punctatum, anterius et latera versus pilis longis vestitum, lateribus sat fortiter rotundatis. Elytra parce pilosa, desuper visa longiora quam latiora, haudquaquam striata, obscure confuse punctata, lateribus subcompressis. ♂. Long. 2 mm.

The form of the thorax is much like that of the ♂ assigned to *X. immaturus*, but its sculpture and clothing are very different, as also is the colour of the entire insect. The elytra are different in form and sculpture, having no trace of striation, and the punctures are very feeble and indistinct.

HAB. Lanai. Two examples were taken at an elevation of 3000 ft. in Jan. 1894.

(16) *Xyleborus exsectus*, sp. nov.

Nigricans, elytrorum basi nonnunquam rufescente, pedibus antennisque rufescentibus vel testaceis. Pronotum suboblongum, antice sat profunde excisum, et in processum latum, cujus apex truncatus, productum, lateribus pilis vestitis. Elytra leviter striata, striis subtiliter punctatis, setis parce vestita, parte declivi haud tuberculata. ♂. Long. 3.2 mm.

HAB. Maui. Three examples taken on Haleakala (5000 ft.). One of these is of a testaceous colour and is no doubt immature.

(17) *Xyleborus vulcanus*, sp. nov.

♂ nigricans, elytris thoracisque basi subpiceis, pedibus testaceis, oblongus. Pronotum parum distincte sculpturatum, elytris vix latius, lateribus parallelis, setis elongatis aureis parce vestitis, anterius excisum, et in processum triangularem productum. Elytra sat elongata, rugulosa, vix evidenter punctata, parte declivi tuberculo minutissimo suturam versus utrinque munita. ♂. Long. 2.5 mm.

Much smaller than the preceding species, and very distinct by the pointed process of the pronotum. The posterior declivous portion of the elytra is somewhat abrupt, and on its upper portion on either side of the suture an excessively minute tubercle can be seen, each of which is furnished with a longish seta at its base, while some even more minute and hardly visible tubercles are placed in a transverse line with these.

HAB. Hawaii. A single example taken at Kilauea.

(18) *Xyleborus littoralis*, sp. nov.

♂ castaneus, pronoto plus minus nigricante, pedibus testaceis, oblongus. Species prima facie *X. vulcano* simillima, sed major, et minus angusta, pronoto antice fere similariter producto. Elytra substriata, grossius distincte seriatim punctata, parte declivi juxta suturam utrinque tuberculis minutissimis 2 vel 3 lineariter dispositis, aliisque paucis vel minoribus et obscuris, munita. ♂. Long. 3 mm.

Easily distinguished from *X. vulcanus* by the substriate and somewhat coarsely punctured elytra, and the more numerous and rather more developed tubercles of the posterior truncation. These tubercles form two series on each side, those nearest the suture, though very minute, being fairly distinct, those external and subparallel to these are very minute and obscure.

HAB. A single example taken at sea level on Molokai, July 1893.

(19) *Xyleborus ignobilis*, sp. nov.

Nigricans, thorace nonnunquam obscure testaceo vel piceo, antennis pedibusque testaceis. Pronotum fere ad basim rugulosum, antice setis pallidis vestitum, lateribus rotundatis haudquaquam parallelis. Elytra plus minus obsolete seriatim punctata, setis pallidis brevibus, lineariter dispositis, vestita, postice haud abrupte declivia, parte declivi tuberculis nullis munita, nec impressa. Long. 2.7 mm.

This insect bears little resemblance to any other Hawaiian species of the genus, the elytra being simply rounded off behind and not at all abrupt, nor tuberculated, but sculptured as on the dorsal surface. The prothorax becomes gradually less rough from the front margin backwards, but it is more or less asperulous or rugulose to very near the basal margin, near which the rugulosities have a somewhat concentric arrangement.

HAB. Hawaii. Three examples taken, each in a different locality, two on the windward and one on the lee side of the island (2000 ft.).

## HYPOTHENEMUS Westw.

(1) *Hypothenemus eruditus* Westw.

*Hypothenemus eruditus* Westwood, Tr. Ent. Soc. London, 1. p. 34; Sharp, *op. cit.* 1879, p. 102.

HAB. Oahu; Honolulu (Blackburn).

(2) *Hypothenemus maculicollis* Sharp.

*Hypothenemus maculicollis* Sharp, Tr. Ent. Soc. London, 1879, Pt. I. p. 101.

HAB. Oahu; mountains near Honolulu (Blackburn). I did not collect this species.

(3) *Hypothenemus griseus* Blackb.

*Hypothenemus griseus* Blackburn, Tr. Dublin Soc. III. 1885, p. 194.

HAB. Oahu; a single specimen taken on the plains near Honolulu (Blackburn).

(4) *Hypothenemus sylvicola*, sp. nov.

Minus elongatus, cylindricus, pallide testaceus, capite et pronoto plus minusve infuscatis. Pronotum subtilissime granulato-sculpturatum, parte anteriore asperata, opacum, parce pubescens. Elytra pallida, setis pallidis vestita, subtilissime vix evidenter punctata, haud evidenter striata. Long. 1.5 mm.

In colour this species must greatly resemble *H. griseus* Blk., but that species has the elytra deeply striate. In some examples the asperities of the prothorax are but few, in others they are much closer and more numerous, and I suspect that the difference is sexual. The sculpture otherwise is excessively feeble and consists of a very dense and excessively minute granulation or puncturation, not definitely distinguishable even with a very strong lens. The clothing of the elytra consists of short pale setae, which in certain aspects appear to have a linear arrangement, and also of some longer fine hairs, which are particularly noticeable at the sides about the apex.

HAB. Lanai, 2000 ft. several examples.—Kauai, 4000 ft., one example taken. The latter has the thorax entirely pale and concolorous with the elytra.

(5) *Hypothenemus insularis*, sp. nov.

Cylindricus, angustulus, sat elongatus, niger, antennarum basi pedibusque rufotestaceis. Pronotum anterius fortiter asperulum et parce setosum, posterius opacum, subtilissime granulatum (an punctulatum?). Elytra setis brevibus griseis conspicue vestita, sat elongata (circa bis longiora quam basi latiora), evidenter punctata. Long. 1—1.4 mm.

Allied to *H. ruficeps*, but very different in superficial appearance, owing to its entirely black colour. The punctures on the elytra are not so very fine, but they are ill-defined. Apparently they are more or less serially arranged, but not in the definite manner seen in the last species, in fact the puncturation appears somewhat rugose.

HAB. Kauai. Two examples were taken at Makaweli, above 2000 ft.

(6) *Hypothenemus ruficeps*, sp. nov.

Cylindricus, sat elongatus, capite et pronoto rufescentibus, elytris nigris. Pronotum anterius sat fortiter asperulum, postice opacum et parum distincte sculpturatum, parce pubescens. Elytra nitida, setis brevibus griseis sat conspicue (postice saltem) vestita, subobsolete striata, striis subgrosse punctatis. Long. 1.5 mm.

Distinct by the red head and prothorax, and black elytra. The punctures on the latter are somewhat coarse but not very definite, and are placed in subobsolete striae. The short whitish setae are dense and conspicuous on the posterior portion of the elytra, less so in front, but they have been partly abraded on this part.

HAB. Oahu; Kaala, Waianae range (2000 ft.); one example taken.

## Tribe PLATYPINI.

## CROSSOTARSUS Chapuis.

(1) *Crossotarsus externedentatus* Fairm.

*Crossotarsus externedentatus* Fairmaire, Rev. Zool. 1850, p. 51.

HAB. Oahu; Honolulu (Blackburn).—I cut a pair of this species out of a hard trunk of *Acacia koa*, at an elevation of 1000 ft. in the northern part of the Koolau range.

## Fam. ANTHRIBIDAE.

The Anthribidae are very poorly represented in the islands, only three species having occurred. Two of these species are at present not known from elsewhere, and one of them constitutes a peculiar genus, but there is little doubt that all are foreign insects, and will ultimately be found in other countries.

## ARAEOCERUS Schönherr.

(1) *Araeocerus fasciculatus* De Geer.

*Curculio fasciculatus* De Geer, Ins. v. 276, t. 16, fig. 2.

HAB. Abundant all over the islands in the mountains. The large number of constant varieties in markings, as well as the great variation in size of this species is remarkable.

(2) *Araeocerus constans*, sp. nov.

*A. fasciculato* simillimus sed statura majore, totus dense griseo-pubescent, haud variegatus, tarsis anterioribus ♂ robustioribus, et tarsis ♀ longioribus distinguendus. Long. circa 5 mm.

Very closely allied to *A. fasciculatus*, but larger than the larger examples of that species, not varying much in size, and uniformly covered with dense grey pubescence. In colour the integument is blackish and reddish fuscous, the antennae towards the base and the tibiae are more or less red. When the pubescence is removed, the pronotum is seen to be dull and very densely punctured, and the elytra bear each about ten rows of very distinct and regular punctures, the interstices having a dense shallow and very minute rugulose puncturation. Both sexes may be distinguished structurally from *A. fasciculatus* by the thicker anterior tarsi, so that the ♂ of the latter rather resembles the ♀ of the former, and these parts are longer in the ♀ of *A. constans*.

HAB. Hawaii, Kona; on the coast; found in the flowers of the white poppy.

## MAUIA Blackb.

(1) *Mauia satelles* Blackb.

*Mauia satelles* Blackburn, Tr. Dublin Soc. III. 1885, p. 195.

HAB. Maui; Wailuku valley, where one specimen was taken by Blackburn. I have not met with this species.

## Fam. PROTERHINIDAE.

This remarkable family is peculiar to the Hawaiian islands, and all the species, of which 122 are at present known, are assigned to the genus *Proterhinus*. These species exhibit so much diversity in structure that the extreme forms would appear to be certainly generically distinct, but they are so connected by intermediate forms, that it is inadvisable to attempt a further division of the genus until the species are more thoroughly known. At present, owing to the great number of the species, the close alliance between many of them, their variability, and the great sexual differences, the mere separation of the species is attended with the greatest difficulty. The figures on Plates IX. and X. will show to some extent the diversity in structure and appearance exhibited by these insects, and the specimens figured have been chosen for this purpose, rather than with a view to exhibiting the minute distinctions between closely allied species—an almost hopeless task in dealing with insects so variable both in structure and in superficial appearance.

In the Cambridge Natural History in the classification of the Coleoptera Dr Sharp leaves the Proterhinidae as well as the somewhat similar insects comprised in the family Aglycyderidae unclassified. The former have much more the appearance of Rhynchophora than the latter, since the beak is always distinct and definite in *Proterhinus*, at least in the female sex. In the ♂ however it is hardly more than a simple prolongation of the head, and only very rarely does the rostral portion attain a length greater than its width. The female beak on the other hand is in most cases elongate, and on account of its shining surface and absence of squamosity extremely definite. It is noteworthy that in a considerable number of species, which have the rostrum in the ♀ below the average in development, the rostrum of the ♂ is above the average, so that the sexual differentiation is less than usual, and I believe that these species are the more primitive, and their resemblance to the members of the Aglycyderidae is greater than that of the other forms. The Proterhinidae are however always distinct from *Aglycyderes* by the definite rostrum of the ♀, and by the structure of the tarsi which are really four-jointed, the small division at the base of the claw-joint, being a true joint and not a mere constriction as in *Aglycyderes*. With regard to the

structure of the prothorax in these insects to which considerable importance was attached by Dr Leconte, who regarded *Proterhinus* as belonging to the Rhynchophora and *Aglycyderes* as related to the Colydiidae (see quotation from a letter, Trans. Ent. Soc. Lond. 1879, Pt. I. p. 78), it may be noticed that the differentiation between the dorsal surface and flanks is much more marked in a few species than in the majority of *Proterhinus*, which, as Sharp (*l. c.* p. 80) has remarked, is also the case with the two species of *Aglycyderes*, the New Zealand species having the differentiation between the parts of the prothorax less definite than the Canarian species.

The characters which I have found most useful in the separation of the species are the nature of the clothing, the size and form of the eyes and of the lobes of the front tarsi, the condition of the humeral angles of the elytra, the shape of the prothorax, the length of the antennal joints, and the development of the club (or 3 apical joints), and the puncturation of the abdomen beneath. In few species are any of the characters constant, when a long series of examples are examined, the size of the individuals being extremely variable, and these depauperated examples often have the structures characteristic of the species much modified. For these reasons I have not found it easy to identify the numerous species hitherto described, although through the kindness of Dr Sharp I have been able to carefully examine the types of all the species described by him. The description of most of these species was drawn up from only one or two examples, and except in the case of a few of the most distinct species, such material is quite inadequate for an accurate knowledge of the species. In several cases when I have referred a species taken by myself to one already described by Dr Sharp, I have not been able exactly to match the types with any individual even in a series of specimens, and it is probable that this is due to the specimens having been captured in a slightly different locality to that whence the typical examples came, but it is of course possible that some of the species have themselves undergone slight changes during the last quarter of a century.

Of the 122 species known 8 only appear to extend their range beyond a single island, and in few, if any, of these do the examples from different islands altogether agree, while several of these species inhabit only two of the closely adjoining intermediate islands of the group. Of the species that restrict their range to a single island Kauai has 29, Oahu 28, Maui 27, Lanai 9, Molokai 9, and Hawaii 12. To facilitate the discrimination of the species I have arranged the species in seven divisions, one for each island and comprising the species peculiar to it, the seventh containing the few species which are found on more than one island.

Nearly all the species are attached to the dead or dying wood of the forest trees, and the individuals frequently congregate in small batches beneath the bark, in which the larvae feed, and they are very sluggish in their habits. Several are found in the stems of tree-ferns, and one or two are attached to smaller ferns (*Pteris* etc.), while a few live on small shrubs and woody creepers.

## A. Species insulae Kauai propriae.

(1) *Proterhinus gigas*, sp. nov.

Robustus, pallide squamosus, nigricans, antennis, pedibus elytrisque saepe plus minusve rufescentibus. Oculi magni, fortiter prominentes. Antennae graciliores, articulis elongatis, tertio quam secundus bis longiore. Pronotum inaequale, 3-impressum, rugoso-punctatum, antice constrictum, pallide squamosum, margine antico lateribusque setis curvatis vestitis. Elytra lata, squamis pallidis necnon setis erectis, sat conspicuis, vestita, basi juxta scutellum utrinque tuberculata, humeris fortiter productis. Pedes setis erectis conspicue vestiti. Abdominis segmentum primum ventrale circa medium obsoletissime, latera versus et ad basim fortiter punctatum. ♂ ♀. Long. 4—5.5 mm. (Plate IX. fig. 1, ♂.)

This large species can hardly be confused with any other, although it varies considerably in size and in other respects. The 8th joint of the antennae is sometimes a little longer, sometimes a little shorter than the 9th, and generally they are subequal. In a few examples out of a long series the 8th is considerably the shorter of the two, as is usual in most species of the genus. The surface of the elytra, except for the depression formed between the shoulders and the tubercle on either side of the scutellum, is nearly evenly convex.

HAB. Kauai (4000 ft.). Under bark of *Cheirodendron* only.

(2) *Proterhinus crassicornis*, sp. nov.

Forma, facie, et magnitudine fere praecedentis, sed antennis brevioribus, articulis multo crassioribus, abdominis segmento 1<sup>o</sup> ventrali circa medium fortiter et distincte punctato, bene distinctus. ♀.

HAB. Kauai mountains (2000—3000 ft.). Only two examples were taken, owing to the erroneous supposition that they were identical with those of the preceding species, which is found on the high plateau of the same island.

(3) *Proterhinus anthracias*, sp. nov.

Niger, vel piceo-niger, latus, antennis pedibusque saepe rufescentibus. Oculi magni, prominentes. Antennae graciliores, scapo brevi, articulo secundo tertioque una conjunctis multo brevioribus, clava gracili. Pronotum antice fortiter et abrupte constrictum (vel nonnunquam tantum angustatum), anteriusque profunde foveatum, angulis posterioribus macula pallida squamosa sat conspicue signatis. Elytra lata, maculatim squamosa,

setisque erectis et elongatis vestita, fortiter punctata, humeris productis. Abdominis segmentum primum ventrale, vel ad medium, grosse fortiterque punctatum. ♂ ♀. Long. 3—4.75 mm.

A species of wide and somewhat depressed form, rather scantily clothed with squamosity, forming in fresh examples a number of roundish spots on the elytra, which also bear pale erect setae. The scape of the antennae is not long, being evidently shorter than the two following joints united. Second joint evidently longer than wide, but very much shorter than the third. All the other joints elongate, the 8th shorter than the 9th, the latter with the two following forming the long and slender club. Eyes large and prominent. Thorax usually strongly and abruptly constricted in front, but variable in this respect. In front there is a deep and conspicuous impression, and sometimes two lateral, and one posterior (near the hind-margin about the middle) as well, but all except the anterior one may be obsolete. The posterior angles of the thorax are very clearly marked, being covered with a spot of dense pale squamosity. Elytra wide, roughly punctured, generally more or less flattened, the sides somewhat strongly rounded, the shoulders prominent. Lobes of the front tarsi only moderate in size, or even small for the size of the insect. Whole body beneath coarsely and closely punctured.

HAB. Kauai, widely distributed and not rare (2500—4000 ft.). Remarkable for its dark colour, wide form, the distinct spots of squamosity on the posterior angles of the thorax, and the clothing of the elytra, which consists of long fine erect setae, and numerous, often rather ill-defined, spots of appressed scales.

(4) *Proterhinus eugonias*, sp. nov.

Sat latus, nigricans, piceus, vel rufescens, pallide squamosus. Antennae graciles, clava sat evidenter 3-articulata. Oculi parum fortiter prominentes. Pronotum profunde 3-impressum. Elytra sat lata, convexa, parte basali depressa, minus fortiter nec dense punctata, pallide squamosa, setisque erectis parce vestita, humeris late ac fortissime productis. Segmentum abdominis primum (saltem ad medium) vix evidenter punctatum. ♂ ♀. Long. 2—3.5 mm. (Plate IX. fig. 2, ♀.)

This species is allied to *P. basalis* Sh. It varies greatly in size but is a smaller insect than the other. The form is wide and somewhat short, the colour varies from black to red. The squamous covering is of a golden or silvery colour.

Antennae moderately long, slender, generally clear red with the apical joints dark, the club distinctly formed of three joints but rather slender and elongate. Eyes moderately large, but not at all strongly prominent; no ridge between the vertex and front of head. Thorax with three very deep impressions, the anterior the largest; immediately in front of each of the posterior ones the squamosity forms a dense patch,

different to the general covering. Elytra short, seen from the side strongly convex longitudinally, with golden or greyish appressed squamosity, and sparse erect white setae, which are chiefly found towards their apex, the basal portion is transversely flattened or depressed. Humeral angles widely and extremely strongly produced. Tibiae, tarsi, and sometimes the femora, red; lobes of the front tarsi of moderate size. Basal segment of the abdomen beneath with the puncturation obsolete, at least over its middle portion. Hind coxae widely separated, the distance between them considerably greater than the length of the metasternum.

HAB. Kauai mountains (4000 ft.). Differs from *P. basalis* Sh. in the smaller average size, more strongly produced humeral angles of the elytra, their less numerous erect setae, and the patches of dense squamosity in front of the posterior impressions of the thorax. Both species vary much, but no doubt they are distinct.

(5) *Proterhinus basalis* Sharp.

*Proterhinus basalis* Sharp, Tr. Ent. Soc. London, 1879, p. 98.

I have examined a series of examples of this species. The humeral angles of the elytra are a good deal more strongly produced in some individuals than others. The squamous covering is sometimes of a ferruginous colour, but more often greyish. The shape of the thorax is variable, but usually is more or less abruptly constricted in front. The length of the insect varies from 2.5—4 mm.

HAB. Kauai mountains (2000—4000 ft.); not common, but widely distributed.

(6) *Proterhinus dubiosus*, sp. nov.

Sat latus, rufescens vel piceus, aureo-squamosus. Oculi parum fortiter prominentes. Antennarum articuli 3 apicales clavam formantes. Pronotum sat evidenter 3-impressum. Elytra lata, aureo-squamosa, minus fortiter nec dense punctata, basali parte plus minusve impressa, scutellumque juxta utrinque tuberculata, setis erectis paucis, brevibus et inconspicuis, humeris fortiter acute productis. Abdominis segmentum primum ventrale ad medium vix evidenter punctatum. ♂ ♀. Long. 2—3.2 mm.

The above characters are drawn up from typical examples, but as a matter of fact almost all the structures vary in this species, and series of individuals from different localities nearly always present more or less considerable differences. Thus in the typical examples the antennae are somewhat stout, the club distinctly of three rather wide joints. In some localities the antennae are decidedly more elongate and slender. The squamosity appears to be always of a golden colour. The thorax has three impressions and is not very densely squamose. The elytra have the humeral angles strongly

and acutely produced, their basal portion is more or less flattened or impressed (not very definitely so as in *P. basalis*), they have only a few short and inconspicuous erect setae, are rather finely and not very densely punctured, and are evenly convex transversely, except at the base. The lobes of the tarsi are of moderate size. The basal abdominal segment is hardly visibly punctured, at least on its middle portion. Examples of this species taken at low elevations (2000 ft.), differ from typical ones in all or some of the following characters. The antennae are shorter and thicker, the insect is of narrower form, the elytra have the humeral angles less produced, and are less impressed at the base, while the front tibiae are often extremely short and wide. Some of the abnormal individuals taken with typical examples however possess some of these characters.

HAB. Kauai. Common above Waimea at an elevation of 4000 ft. The examples most aberrant in one direction come from Halemanu (4000 ft.), in the other from Makaweli (2000 ft.).

(7) *Proterhinus difficilis*, sp. nov.

Rufescens vel piceus, sat latus, minus dense pallide squamosus. Antennae graciliores. Oculi haud fortiter prominentes. Pronotum minus dense squamosum, 3-impressum, antice saepe abruptius constrictum. Elytra pallide squamosa, setisque erectis brevibus sed conspicuis vestita, longitudinaliter obscure carinata, humeris productis. Abdominis segmentum primum ventrale circa medium sparsim subobsolete punctatum. ♂ ♀. Long. 2·25—3·5 mm.

In form and general appearance very similar to *P. dubiosus* but a rougher insect. The squamosity is less appressed, the erect setae of the elytra are more numerous, their puncturation is more pronounced, and the surface less even, there being traces of longitudinal ridges extending back from the shoulders. These ridges in fresh examples are rendered more distinct by the squamosity which is somewhat condensed along them. The humeral angles are less strongly produced forwards than in well-developed examples of *P. dubiosus*. The examination of a series of individuals of both species is necessary for an appreciation of the specific characters, as both vary greatly in size, and in the development of the structural characters which distinguish them.

HAB. Kauai mountains. Less common than *P. dubiosus*.

(8) *Proterhinus eulepis*, sp. nov.

Sat latus, nigricans, elytris rufescentibus, nigro-maculatis. Antennae graciles sat elongatae. Pronotum squamis appressis vestitum, angulis posterioribus distinctis, maculaque pallida squamosa signata. Elytra squamosa, setisque erectis brevioribus

pallidis vestita, minus dense punctata, humeris acutis et productis. Abdominis segmentum primum ventrale vel ad medium fortiter et distincte punctatum. ♂ ♀. Long. 2.5—3.25 mm.; var. *minor*, 1.75—2 mm. (Plate IX. fig. 3. ♂.)

This is another variable species, very closely resembling typical *P. dubiosus* in form. The antennae are slender and rather long, the three-jointed club being also slender. The thorax is covered with squamosity, and has sometimes three impressions, but the two posterior ones may be obsolete. Its hind angles are a little prominent, and rendered more distinct by bearing a spot of pale squamosity, which is more dense than that of the general surface. The elytra appear to be always red, more or less spotted with black, the black spots being free from squamosity. They are nearly evenly convex in shape, the basal tubercles near the scutellum being absent or very ill-developed, their basal margin is rather deeply and regularly emarginate, so that the shoulders are produced and acute, and are free from the base of the thorax. The erect setae are short and white, but rather conspicuous in fresh examples, especially at the sides of the elytra. The puncturation is not very dense. All the femora are strongly clavate. Beneath, the basal abdominal segment is strongly and distinctly punctured, although towards the middle the punctures are more remote than at the sides. Very small examples (var. *minor*) apparently referable to this species are not infrequent, but there appears to be no good character to separate them, unless the more obsolete puncturation of the base of the abdomen beneath should prove constant.

HAB. Kauai mountains (4000 ft.).

(9) *Proterhinus neglectus*, sp. nov.

Rufo-piceus, sat latus, elytris rufescentibus, nigro-maculatis. Antennae totae rufae, sat elongatae, sed crassiusculae, clava distincte 3-articulata. Pronotum aureo-squamosum, antice fortiter impressum, dense rugoso-punctatum, postice minus fortiter angustatum, angulis posterioribus sat distinctis. Elytra minus dense punctata, submaculatis squamosa, setisque brevibus pallidis vestita, sat lata, humeris acutis, evidenter productis. Femora omnia fortiter incrassata. ♂ ♀. Long. 2.8—3.2 mm.

This species has very much the form and general appearance of large typical examples of *P. eulepis*. In the two examples taken the anterior thoracic impression is large and distinct, the others are obsolete. The hind angles are distinct, and appear to be marked by spots of denser squamosity than that of the rest of the thorax. The elytra are nearly evenly convex, there being little or no trace of the tubercles at the base near the scutellum, but they are a little flattened transversely behind their basal margin. The humeral angles are acute and formed like those of *P. eulepis*. From that species *P. neglectus* is at once distinct by the thicker antennae, the intermediate

joints being quite stout, whereas in the other they are very slender. This seems to be the only good character to distinguish the two, and it may be observed that the specific differences between *P. gigas* and *P. crassicornis* are quite similar.

HAB. Kauai. A single pair (♂ ♀) were taken together on the high plateau in April, 1895.

(10) *Proterhinus collaris* Sharp.

*Proterhinus collaris* Sharp, Tr. Ent. Soc. London, 1879, p. 96.

This species is very similar in form and general appearance to *P. eulepis*, but may be distinguished by the unusual length of the scape of the antennae. The second joint is very short, the third elongate and slender. In the ♂ the eyes are unusually remote from the anterior margin of the thorax. The squamosity of the elytra appears to be much broken up to form roundish spots. The thorax is decidedly elongate. In their systematic catalogue Blackburn and Sharp have sunk this species as a variety of *P. nigricans*, but I cannot think the two are identical, *P. collaris* being a larger insect, and very different in general appearance, the ♂ having relatively smaller eyes, and much more remote from the thorax, while the basal joint of the antenna in the ♀ is much more elongate and more slender, than in *P. nigricans* ♀.

HAB. Kauai mountains (Blackburn). I have not met with this species, and have seen only the two types in Dr Sharp's possession, and two or three individuals in the British Museum from Blackburn's collection.

(11) *Proterhinus amaurodes*, sp. nov.

Statura parva, vel saepe minima, nigricans vel rufo-piceus. Antennae sat graciles. Pronotum dense rugoso-punctatum, parum squamosum, antice impressum, haud constrictum, lateribus rotundatis. Elytra obscure sed dense punctata, ad humeros macula pallida squamosa, et postice maculis rotundatis compluribus ornata, humeris plus minusve productis, semper acutis et distinctis, setis erectis inconspicuis et brevissimis. Tarsorum lobi parvi. Abdominis segmentum primum ventrale subfortiter punctatum. ♂ ♀. Long. 1.5—2.5 mm.

In well-developed examples this is rather a distinct little species. The squamosity of the thorax is sparse, and that of the elytra is much broken up, forming distinct spots. There is always a distinct patch extending back from the humeral angles, and a number of roundish spots on the posterior parts of the elytra. The antennae are moderately long and slender, with 3-jointed club. There is usually a distinct impression on the thorax in front, the posterior impressions being absent or nearly obsolete. The humeral

angles of the elytra are always sharp and distinct, and in well-developed examples evidently, though not strongly, produced. The lobes of the front tarsi are small. The colour of the insect is typically black, the squamosity of the elytra being placed on paler (piceous or reddish) spots, but in many examples (especially from certain localities), the whole elytra are rufo-piceous or reddish. The species appears to be allied to *P. vestitus*.

HAB. Kauai. Common generally (from 2000—4000 ft.). Often so covered with a wax-like excretion as to be only recognizable after the most careful cleaning.

(12) *Proterhinus nigricans* Sharp.

*Proterhinus nigricans* Sharp, Tr. Ent. Soc. London, 1879, p. 95.

In its typical condition this species is remarkable for the size of the basal joint of the antennae in both sexes, that of the ♂ being also considerably longer than is usual in the genus. I have not met with any examples that altogether agree with the types, but one ♂ has the antennae similarly formed, while its eyes are somewhat smaller. Others which have the eyes as in the type have the basal joint of the antennae less developed. The colour of the elytra varies from black to reddish-pitchy with black markings. The squamosity of the thorax is not dense, but the posterior angles are distinctly marked by a small dense spot of pale scales. The species is no doubt distinct, although closely allied to *P. amaurodes*, *collaris*, &c., with which it agrees in the strong puncturation of the basal ventral segment of the abdomen.

HAB. Kauai. On Waialeale, 3000 ft. (Blackburn). Makaweli (2000—3000 ft.), and behind Waimea (4000 ft.). Apparently not common.

(13) *Proterhinus binotatus*, sp. nov.

Rufescens, capite thoraceque saepe obscuratis, elytris plaga utrinque magna nigricante maculatis. Antennae nigrae articulis basalibus rufescentibus, clava haud abrupte 3-articulata. Pronotum ex majore parte parce squamosum, latera versus densius squamoso-maculatum, rugoso-punctatum, antice subimpressum. Elytra, partibus nigricantibus exceptis, pallide squamosa, setisque brevissimis, albidis, et erectis vestita, angulis humeralibus parum productis, sed distinctis, et subacutis. Pedes omnes setis brevibus erectis vestiti, lobis tarsorum anticorum magnitudine mediocribus. Abdominis segmentum primum ventrale minus distincte punctatum. ♂ ♀. Long. 2.2—2.6 mm.

This obscure species appears to be closely allied to *P. simplex* Sh. of Oahu, but it is readily distinguished from the well-developed examples of that species. The elytra

are widely red at the base, and covered with pale squamosity, generally over a sub-triangular area; behind this are two large black, or dark, lateral spots, extending nearly to the suture, and free from squamous covering; the apical portion is often more or less infuscate, and the squamosity broken up into spots.

HAB. Kauai mountains (4000 ft.); found very sparingly on several occasions.

(14) *Proterhinus scutatus* Blackb.

*Proterhinus scutatus* Blackburn, Tr. Dublin Soc. III. 1885, p. 169.

I have taken only three or four examples of this species, which mostly quite agree with those collected by Mr Blackburn. This insect is much less clothed with squamosity than most of the species, the thorax being nearly bare, and the elytra in fresh examples very little squamose, except for two longitudinal lines extending backwards from their shoulders; but the latter bear numerous short and rather thick erect setae, which are pale in colour and quite conspicuous. In structure this species closely resembles some examples of *P. simplex*, but it is no doubt distinct.

HAB. Kauai, 2500 ft. (Blackburn); (2000—4000 ft.), in the Waimea district.

(15) *Proterhinus setulosus*, sp. nov.

Ferrugineus, elongatus, angustulus, setulis erectis brevibus vestitus, elytris nonnunquam nigro-maculatis. Antennae plerumque breviores, concolores, rufae. Rostrum ♀ breve, fortiter longitudinaliter rugosum, paullo vel haud longius quam latius. Pronotum minus latum, plerumque plus minusve evidenter 3-impressum, setis appressis parce, aliisque erectis, vestitum. Elytra fortiter elongata, lateribus subparalleliis, subseriatim punctata, setis brevibus erectis vestita, vix aequaliter convexa, angulis humeralibus distinctis, paullo productis, vel fere rectis. Femora postica parum fortiter clavata, tarsorum anticorum lobis parvis. ♂ ♀. Long. 2·5—3 mm.

In its rufescent colour, elongate elytra, and the absence of squamosity, this species somewhat resembles the *P. longulus* Sh. of Oahu, and the other species allied thereto. It is however more nearly allied to *P. blackburni* Sh. &c., the second joint of the antennae in certain aspects being not much shorter (though more robust) than the third, and the short rostrum of the ♀ is coarsely sculptured. The seven or eight examples taken exhibit some variation, the antennae being decidedly less short in some than in others. The dorsal surface of the elytra is somewhat flattened, and, at least in some examples, there are traces of longitudinal raised lines.

HAB. Kauai (2500—4000 ft.); not common.

(16) *Proterhinus antiquus*, sp. nov.

Rufescens vel rufo-fuscus, angustus, elongatulus, elytris nonnunquam nigromaculatis, setis appressis albidis vel argenteis, aliisque erectis sat conspicuis, sed brevioribus, vestitis. Antennae plerumque breviores. Oculi minuti. Pronotum setis appressis, aliisque erectis, vestitum, haud latum. Elytra angusta, elongata, lateribus saepe fere parallelis, plus minusve irregulariter argenteo-vel albido-squamosa, setisque erectis brevioribus conspicue vestita, parum conspicue inaequalia. Rostrum ♀ brevissimum, sulcis longitudinalibus sat fortibus. ♂ ♀. Long. 2—2.75 mm.

Allied to *P. blackburni* Sh, but distinguished by the white or silvery appressed setae which cover parts of the elytra, the narrower form, shorter erect setae, etc.

HAB. Kauai mountains (4000 ft.); a few examples were taken on several occasions.

(17) *Proterhinus setiger*, sp. nov.

Rufescens vel rufo-piceus, setis erectis sat crebre vestitus, statura majore. Antennae graciles, articulo secundo subelongato. Oculi prominuli. Pronotum antice abrupte angustatum, setis erectis vestitum, haud squamosum, grosse denseque punctatum, lateribus haud rotundatis. Elytra haud squamosa, setis erectis perconspicue vestita, inaequalia, lineis longitudinalibus elevatis setis appressis pallidis vestitis, grosse punctata, basi arcuatum sat fortiter emarginata, humeris acute productis, lateribus parum rotundatis. Rostrum ♀ evidenter longius quam latius, longitudinaliter fortiter rugosum, lateribus basim versus levissime convergentibus. ♂ ♀. Long. vix 4 mm.

A much larger species than *P. blackburni*, to which it is evidently allied. I have seen only one ♂ and one female, and the former has the prominent lateral angles of the prothorax, which are formed by its sudden constriction in front, much more strongly developed than those of the latter, and the puncturation more distinct. Each wing-case has three raised dorsal lines, one extending back from the humeral angles, another from the basal tubercles on either side of the scutellum, while between these on each side is a third elevation which does not however reach to the basal margin of the elytra. In the ♀ the basal abdominal segment beneath is less coarsely punctate than the very coarsely and closely punctured metasternum; the apical segments are impunctate or nearly so.

HAB. Kauai (4000 ft.); 1 ♂ and 1 ♀ taken.

(18) *Proterhinus solitarius*, sp. nov.

Piceus, setis erectis ex majore parte vestitus, haud squamosus, statura majore, haud robustus. Oculi minuti. Antennae graciles, articulo secundo elongato, subclavato. Pronotum antice abrupte angustatum et impressum, dense rugoso-punctatum. Elytra

lineis elevatulis longitudinalibus inaequalia, setis erectis vestita, basi leviter emarginata, humeris acutis. Femora postica parum fortiter clavata, tarsorum lobis anticorum minutis. Rostrum ♀ brevissimum, fere aequae latum ac longum, fortiter longitudinaliter rugosum. ♀. Long. 3.5 mm.

Female in size and superficial appearance very similar to *P. setiger*, but differing in the much shorter rostrum, less deeply emarginate base of the elytra, smaller lobes to the front tarsi, etc. A single ♂ example, although taken at a higher elevation than the ♀, is probably referable to this species, since it agrees generally with the individual above described, but is entirely of a reddish colour. The lobes of the front tarsi are very minute, as in the ♀.

HAB. Kauai, a single ♀ taken at an elevation of from two to three thousand feet on the mountains. The ♂ mentioned above was taken on the high plateau of the same island.

OBS. A single ♀ with the rostrum still slightly longer than that of *P. setiger*, the elytral puncturation less definite, and the basal abdominal segment beneath very closely and coarsely punctured all over, is very probably another species, while a ♀ from Molokai will not agree with any of these. It has the rostrum very short, but less so than that of *P. solitarius*.

(19) *Proterhinus squalidus*, sp. nov.

Atropiceus vel sordide rufescens, antennis rufescentibus, setis brevibus erectis nonnullisque appressis vestitus, parum convexus. Antennae sat graciles, articulo secundo sat robusto, sed elongato, quam tertius vix brevior. Oculi minuti. Pronotum plus minusve impressum, sat latum, setis erectis brevibus, aliisque erectis, vestitum, confuse rugoso-punctatum. Elytra setis brevibus erectis, aliisque pallidis et depressis irregulariter (sive submaculatis), vestita, puncturatione parum distincta, humeris parum productis, fere rectis. Rostrum ♀ brevissimum, tarsorum lobis anticorum minutis. ♂ ♀. Long. 1.75—vix 3 mm.

Differs from *P. antiquus* in being of less narrow and elongate form, and generally in having the antennae longer and more slender. It appears to me to be really more closely allied to *P. archaeus* of Oahu, but that species has the elytra decidedly more elongate, and differs in various small points. The description given above has been made from examples from which the muddy substance, with which they are nearly always covered when captured, has been carefully removed.

HAB. Kauai mountains (2000—3000 ft.).

(20) *Proterhinus wikstroemiae*, sp. nov.

Subrobustus, nigricans vel rufo-niger, minus dense pallido-squamosus. Antennae elongatae, graciles, articulis omnibus (secundo plerumque excepto) sat elongatis, clava gracili, minus distincta. Oculi haud magni, sed fortius prominentes. Pronotum dense rugoso-punctatum, latera versus sat dense squamosum, parte reliqua nudiuscula, antice angustatum et impressum, lateribus subfortiter rotundatis. Elytra sparsim squamosa, punctata, fere aequaliter convexa, setisque albidis erectis brevibus parum conspicue vestita, angulis humeralibus fere rectis, minus distinctis. Femora sat fortiter incrassata. ♂ ♀. Long. 3—3.5 mm. (Plate IX. fig. 4, ♂.)

This species is not at all closely allied to any other found on Kauai, nor indeed is it very similar superficially to any of the other species. I have no doubt it is nearest to *P. dispar*, although it differs from that species in numerous small points. Both appear to be solely attached to the same species of poisonous shrub, and a minute examination of the structural characters leaves no doubt that the two are more nearly related than would appear to be the case on a superficial examination. Nearly all the more remarkable characters of *P. dispar* are less developed in *P. wikstroemiae*.

HAB. Kauai (4000 ft.), in various localities. Attached to *Wikstroemia foetida*.

(21) *Proterhinus serricornis*, sp. nov.

Species parva, angustula, rufo-testacea, capite obscuriore, elytris utrinque plus minus nigro-signatis. Antennae breves, robustae, articulis brevibus et latis, clava distincta nulla. Pronotum squamulis pallidis minus dense vestitum, antice impressum. Elytra angusta, pallide squamosa, setisque nonnullis brevissimis erectis et parum conspicuis vestita, humeris haud productis. ♂. Long. circa 2 mm. (Plate IX. fig. 6, ♂ antenna.)

This little species is quite distinct from any other (at least in the ♂ sex), by the form of the antennae, which are unusually stout and short. The intermediate joints are all of subrotundate form and so closely resemble the ninth and tenth that practically there is no club. The eyes and lobes of the front tarsi are both very small. In what I believe to be the ♀ of this species, the antennae are quite differently formed and by no means remarkable in structure, since they terminate in an evident three-jointed club. The intermediate joints, however, are rather less slender than in most species. The posterior femora are not very strongly clavate.

HAB. Kauai, Halemanu, May 1895; three or four examples taken.

(22) *Proterhinus laticornis*, sp. nov.

Minor, angustulus, rufescens, capite femoribusque, et nonnunquam etiam pronoto, obscurioribus, elytris circa medium utrinque nigro-maculatis. Antennae ♂ nigrae, basi rufa, ab articulo tertio vel quarto sensim usque ad apicem incrassatae, clavam quasi perelongatam formantes. Species pallide squamosa, faciem *P. serricornis* omnino habens, sed antennis longe aliter formatis, femoribus posterioribus valde incrassatis distinctissima. ♂. Long. 2—2.25 mm. (Plate IX, fig. 5, ♂.)

This minute but very remarkable species is clearly allied to *P. serricornis*, with which it agrees in colour, clothing, and shape. Probably on the average it is of rather larger size. The joints of the antennae from the fourth or fifth become gradually wider to the apex, the whole forming as it were a very gradual and elongate club. The lobes of the front tarsi are minute, and the hind femora very strongly incrassate. The female which no doubt belongs to this species is quite unlike the ♂ in its antennal characters, since the intermediate joints are comparatively slender, and there is a distinct and strongly developed 3-jointed terminal club. This sex is therefore very similar to *P. serricornis* ♀, from which it may be known by the more strongly incrassate femora.

HAB. Kauai, Halemanu (4000 ft.).

(23) *Proterhinus curhopalus*, sp. nov.

Piceus, elytris plus minusve rufescentibus nigro-vel fusco-notatis, forma fere spp. 2 praecedentium, sed plerumque colore obscuriore. Antennae ♂ graciliores, basi rufa, clavae (distinctissime 3-articulatae) articulis latis. Femora postica minus fortiter incrassata. ♂. Long. vix 2—2.2 mm. (Plate IX, fig. 7, ♂ antenna.)

Closely allied to the two preceding species, the general form and appearance being the same, the colour perhaps more obscure. The ♂ has the antennae comparatively slender, indeed more nearly resembling the ♀ of the preceding two species, and the club, consisting of three very distinct joints, is unusually developed. The eyes and tarsal lobes are small, the posterior femora not very strongly incrassate. Two females taken in company with these males are no doubt of the same species, resembling them very closely in all respects, except for the usual sexual differences in the rostrum.

HAB. Kauai, Makaweli, at an elevation of 2000—3000 ft.

(24) *Proterhinus homoeochromus*, sp. nov.

*P. eurhopalo* forma et colore simillimus, sed paullo major, et antennis longioribus, clava paullo minus abrupta, capite inter oculos latiore distinguendus. ♂ ♀. Long. 2—2.6 mm.

Very closely allied to *P. eurhopalus*, but a rather larger species with decidedly longer antennae, and the club less marked, owing to its basal joint being less short and wide. The head is also decidedly wider between the eyes in the present species.

HAB. Kauai, above Waimea (4000 ft.).

(25) *Proterhinus cognatus*, sp. nov.

Elongatus, angustus, rufescens, capite obscurato, elytris utrinque nigro- vel fusconotatis. Antennae graciles elongatae, articulis omnibus sat elongatis, clava gracili, haud abrupta. Pronotum subelongatum, antice angustatum. Elytra angusta, pallide squamosa, setisque nonnullis erectis perinconspicue vestita, basi leviter emarginata. Species forma, colore, et caeteris, *P. homoeochromo* simillimus, sed paullo major, et antennis evidenter gracilioribus et magis elongatis, clava minus distincta, distinguenda. ♂ ♀. Long. 2.6 mm.

Very closely allied to *P. homoeochromus* but of larger average size, the antennae elongate and very slender, the club decidedly more slender and less definite.

The five species described above form a very remarkable series; and although all were obtained from only a very small area of the island of Kauai, excepting perhaps the two Halemanu species, no two were found in the same locality. It is probable however that *P. serricornis* and *P. laticornis* were not actually obtained together, since two very distinct districts were collected over at Halemanu, and it is more than likely that each of these regions had its peculiar species. It may also be observed that the two species taken in the mountains behind Waimea occurred at different altitudes.

HAB. Kauai, mountains above Waimea (3000 ft.).

(26) *Proterhinus angustiformis*, sp. nov.

Angustus, fortiter elongatus, plus minusve rufescens, pallide squamosus, elytris nigro-maculatis. Antennae graciles, articulis basalibus rufis, clava vix 3-articulata, articulis duobus apicalibus praecedenti multo majoribus. Oculi minores parum fortiter prominentes. Pronotum minus latum, pallide squamosum, lateribus minus fortiter

rotundatis. Elytra rufa, nigro-maculata, pallide squamosa, setisque brevissimis erectis vestita, perelongata, humeris vix productis, sed distinctis. Femora postica minus fortiter clavata. Abdominis segmentum primum ventrale ex majore parte vix evidenter punctatum. ♂ ♀. Long. 2—2.2 mm.

A small and very narrow species remarkable for the great length of the elytra.

HAB. Kauai, Halemanu. Four or five examples taken in May 1895.

(27) *Proterhinus leptophyas*, sp. nov.

Forma elongata et angustissima, nigricans, plus minusve rufo-variegatus, antennis rufis. Oculi minuti. Antennae breves, clava vix plus quam 2-articulata. Pronotum inaequale, antice angustatum, medium longitudinaliter subsulcatum, impressionibus duabus sublateralibus distinctis aut obsoletis. Elytra perelongata, angustissima, nigra, plus minus rufo-variegata, maculis rufis tantum squamis vestitis, parte nigra nuda, dense punctata, humeris haud productis. Femora gracilia. ♂ ♀. Long. 2—2.4 mm. (Plate IX. fig. 8, ♀.)

This small species is very distinct, and remarkable for its very narrow form and extremely elongate elytra. The antennae are unusually short, and entirely of a clear red colour, as also are the tarsi, and sometimes also the tibiae. The elytra usually bear a number of pale spots, which alone are covered with squamosity, the dark parts being bare. In the darkest individuals the elytral markings are reduced to a single spot at the extreme base, and such examples have nearly the whole surface of the elytra without squamous clothing. The hind femora are not at all strongly clavate.

HAB. Kauai (4000 ft.). Probably a local species, since all the specimens obtained were taken on the same day (April 15th, 1895).

(28) *Proterhinus linearis* Blackburn.

*Proterhinus linearis* Blackburn, Tr. Dublin Soc. III. 1885, p. 169.

The unique example of this species in the British Museum is in poor condition and I cannot identify it with any of those taken by me with certainty.

HAB. Kauai (Rev. T. Blackburn).

(29) *Proterhinus maculifer*, sp. nov.

Angustulus, depressiusculus, piceus (nonnunquam nigricans vel rufescens), elytris maculis rotundatis squamiferis pallidioribus plus minusve variegatis. Oculi parvi. Rostrum ♂ haud brevissimum. Antennae graciles, breviores, clava haud abrupta.

Pronotum minus latum, antice impressum, minus dense squamoso-vestitum, lateribus parum fortiter rotundatis. Elytra angustula, maculatim squamosa, asperula et punctata (puncturatione et sculptura saepe exudatione lutosa celatis), setis erectis brevissimis nec conspicuis, angulis humeralibus plerumque fere rectis. Femora postica minus fortiter clavata, lobis tarsorum anticorum parvulis. ♂ ♀. Long. vix 2—3 mm. (Plate IX. fig. 9, ♂.)

Chiefly remarkable for its flattened, or even sub-depressed form, and generally for the narrow elytra, which bear a number of roundish squamose spots, these spots being paler in colour than the rest of the surface, whether this be red or blackish. The sculpture is generally obscure, the punctures at least being generally filled up with a muddy excretion, and not infrequently the insect has nearly the whole surface thickly covered and concealed. The antennae, which are rather short, are generally entirely of a clear red colour; the rostrum of the ♀ is also red or reddish, its surface smooth and shining, with the longitudinal grooves fine.

HAB. Kauai, common generally. Many examples taken exhibiting variation in colour, size and other respects.

#### B. Species insulae Oahu propriae.

##### (30) *Proterhinus kamptarthrus*, sp. nov.

Niger vel piceus, antennis tibiis tarsis elytrisque rufescentibus, his plerumque plus minusve nigro- vel fusco-maculatis. Antennarum articulo primo tertioque perelongatis, illo incrassato. Pronotum minus latum, 3-impressum. Elytra pallide squamosa, humeris productis. Antennarum ♂ articulus tertius subcurvatus. ♂ ♀. Long. circa 3 mm. (Plate IX. fig. 10, ♂.)

Black or piceous, with red elytra, which are usually sparsely spotted with black. Femora dark, tibiae, tarsi and antennae wholly or partly red. Eyes prominent, in the ♂ very remote from the thorax. Antennae long, extremely so in the ♂, the scape incrassate, and very elongate, second joint short, third extremely long, slightly but distinctly curved in the ♂, and perceptibly so in the ♀, club distinctly of three joints, the 9th being considerably wider at the apex than the 8th. Prothorax rather narrow, with three more or less evident impressions, rather scantily covered with pale squamosity. Elytra covered with grey appressed scales, and with sparse erect white setae posteriorly, the sides sub-parallel. The humeral angles are strongly produced, and the basal tubercles near the scutellum are present, but there is no trace of longitudinal ridges. Lobes of the tarsi by no means large.

HAB. Oahu, Waianae mountains (3000 ft.); three ♀ taken in April 1892, and two males February 1896.

(31) *Proterhinus leiorhynchus*, sp. nov.

Niger, vel piceus, antennis elytrisque rufescentibus, his nigro-maculatis, squamis pallidis vestitus. Antennae fortiter elongatae, conspicue pubescentes, articulo primo perlongo et incrassato, secundo sat elongato sed tertio brevior, 9<sup>o</sup> quam 10<sup>us</sup> vix minus lato. Pronotum distincte 3-impressum, lateribus aequaliter rotundatis. Elytra pallide squamosa, setisque erectis elongatisque sat conspicue vestita, juxta scutellum utrinque tuberculata, humeris acutis. ♀. Long. 3—3.75 mm.

This is a very distinct and somewhat large species, having the antennae unusually long. The basal joint is greatly incrassate and very long, the second is also elongate, although shorter than the third, the three apical joints form a very distinct club, the ninth at the apex being hardly less wide than the tenth, but very much more so than the long and slender joint preceding it. The rostrum is smooth and shining, the longitudinal impressed lines very fine. There is no transverse ridge between the vertex and front of the head. The eyes are prominent but not very large for the size of the insect. Thorax with the sides evenly rounded, densely punctured, and having three more or less distinct impressions. Elytra with pale squamosity, except over the black markings, and bearing elongate pale erect setae, which are quite conspicuous. The basal tubercles on either side of the scutellum are distinct, the humeral angles sharp and somewhat produced. Lobes of the tarsi somewhat small.

HAB. Oahu, Waianae mountains (3000 ft.). Four females taken in February 1896. One of these has the second joint of the antennae abnormally short. There is also slight variation in the width of the thorax, and the elytra vary greatly in length.

(32) *Proterhinus ruficornis*, sp. nov.

Totus rufescens, aut capite, pronoto, femoribusque obscuratis, elytris nigro-maculatis. Antennae rufae, sat elongatae, clava distinctissime 3-articulata, articulo 9<sup>o</sup>, quam 8<sup>us</sup>, multo latiore, et aequae lato ac art. 10. Oculi magni fortiter prominentes. Pronotum antice abrupte constrictum, et impressum, impressionibus posterioribus obsoletis. Elytra griseo-squamosa, humeris subproductis. Species haec *P. leiorhyncho* cognatissima, antennarum articulis 2 basalibus minus elongatis, oculis et tarsorum lobis paullo majoribus, pronoti impressionibus posterioribus obsoletis, distinguenda. ♂♀. Long. 3—3.5 mm.

Extremely closely allied to *P. leiorhynchus*, from which it may be distinguished by the characters given above. Also very close to *P. separandus*, of Maui and Molokai, but that species has the antennae less elongate, and differs slightly in other respects.

HAB. Oahu. A single pair were taken in cop. at an elevation of nearly 3000 ft., in the mountains near Honolulu.

(33) *Proterhinus deinops*, sp. nov.

Piceus, elytris rufescentibus, nigro-maculatis. Caput post oculos fortissime constrictum. Oculi fortissime prominentes, postice acuti. Antennarum articuli 3 apicales clavam distinctam formantes. Pronotum 3-impressum, sat elongatum. Elytra grosse et profunde punctata, basi utrinque juxta scutellum tuberculata, humeris acutis, fortiter productis. ♂♀. Long. circiter 3 mm. (Plate IX. fig. 11, ♀.)

One of the most remarkable species of the genus, having the head very strongly constricted behind the eyes, so that the front and vertex are separated by a strong ridge. The eyes themselves are excessively prominent, and are produced behind into a distinct point. The antennae are not long, the 9th joint is much wider than the 8th, so that the club is very definitely formed of three joints. The thorax is unusually long and narrow. The elytra have a deep coarse puncturation, and their humeral angles are very strongly produced, and acute. In fresh examples their red portions are covered with pale squamosity, which is absent on the black spots; the erect setae appear to be few, and not conspicuous.

HAB. Oahu, Waianae mountains, 3000 ft. Rare; 6 examples were taken in February 1896.

(34) *Proterhinus squamicollis*, sp. nov.

Haud latus, niger, piceus, vel rufescens, pallide squamosus. Antennae graciles, clava distincte 3-articulata. Oculi magni, prominentes, coniformes. Capitis vertex a fronte carinula transversa distincte separatus. Pronotum haud latum, antice fortiter angustatum, et depressum, squamis pallidis ubique dense vestitum, impressionibus duabus posterioribus sat distinctis, lateribus fortiter rotundatis. Elytra distincte punctata, subinaequalia, squamis pallidis maculatim, necnon setis elongatis pallidis conspicue vestita, basi scutellum juxta utrinque tuberculata, tuberculis albido-squamosis, humeris productis et acutis. ♂♀. Long. 2.25—3 mm.

A distinct species, and readily distinguished from the other Oahuan *Proterhini* by the following combination of characters. Eyes large, prominent, and of conical form; a distinct transverse ridge between the front and vertex of the head; prothorax densely squamose all over, much narrowed and deeply impressed in front, the sides very strongly rounded; elytra generally with more or less evident longitudinal ridges, with a tubercle on each side of the scutellar region at the extreme base, the shoulders produced, acute, and much deflexed; their squamous covering is more or less broken up to form a number of spots, and the erect setae are long, fine, and quite conspicuous.

HAB. Oahu. Widely distributed in the Koolau range, but rare. Ten or eleven examples taken at altitudes of 2000—3000 ft.

(35) *Proterhinus adelus*, sp. nov.

Elongatus, parum convexus, nigricans, vel subobscure rufescens, elytris rufis, nigro-variegatis. Antennae modice elongatae, graciles, clava distincte 3-articulata, basim versus rufae. Vertex capitis a fronte haud divisus. Oculi vix magni, sed fortiter prominentes. Pronotum minus dense squamosum, antice angustatum, et profunde impressum. Elytra basim versus subangustata, maculatim pallide squamosa, parte basali rufa, postice nigro-maculata, setis erectis parce et parum conspicue vestita, dorso parum convexo, basi leviter arcuatim emarginata, humeris distinctis. Abdominis segmentum primum ventrale fortiter ubique punctatum, suturis ventralibus sat profundis. ♂♀. Long. circiter 3 mm.

Of this apparently distinct species only a single pair, ♂ and ♀, were taken. Apart from the usual sexual differences they are very similar, except that the ♂ being somewhat abraded, has lost nearly all the curved setae from the sides of the thorax (which appears less abruptly narrowed in front), as well as the erect ones from the elytra. Otherwise it differs only in having the thorax and legs redder in colour, and the eyes slightly, but quite evidently, larger.

HAB. Oahu. A pair were taken in the Koolau range at an elevation of 2500 ft. in the winter of 1892.

(36) *Proterhinus obscuricolor*, sp. nov.

Nigricans, maculatim squamoso-vestitus, antennis pedibusque obscuricoloribus, *P. vestito* forma et magnitudine simillimus. Antennae ♀ graciles, clava minus abrupte 3-articulata. Pronotum minus dense squamosum, rugoso-punctatum, 3-impressum, impressione anteriore magis profundo et majore, antice angustatum, haud abrupte fortiterque constrictum, lateribus sat rotundatis, setisque curvatis ciliatis. Elytra maculatim squamosa, setisque pallidis erectis gracilibus conspicue vestita, basi emarginata, angulis humeralibus distinctis. ♀. Long. 2·25—3 mm.

Allied to *P. vestitus*, but differing in colour, the shape of the prothorax, &c. The elytra are black, with a somewhat vague humeral or subhumeral spot of pale squamosity, and some other roundish spots behind these; at the base they are formed much as in typical *vestitus*. A single female only of this species was taken, but there are two males in Dr Sharp's collection, which no doubt belong to the same. They differ from the ♀ in their antennae being shorter, and the club more distinct (i.e. the 9th joint is more stout in proportion to the preceding), and they are considerably

smaller, but are themselves of different size. The smaller example is a very fresh one and not quite mature, it being of a generally more pallid colour, and the legs and antennae are entirely red. These examples are marked as *P. vestitus*, var. b and var. c, and bear the number 352.

HAB. Oahu. Mountains near Honolulu, 2000—3000 ft.; 1 ♂ taken in the winter of 1892; 'mountains Oahu' (Blackburn).

(37) *Proterhinus denudatus*, sp. nov.

Elongatus, rufescens, elytris plus minusve nigro-notatis, parce aureo-squamosus. Antennae nigrae, articulis basalibus rufis, clava vix distincte 3-articulata. Oculi minus fortiter prominentes. Pronotum aequaliter, nec dense, aureo-squamosum, crebre punctatum, evidenter 3-impressum, antice haud abrupte constrictum. Elytra parce aureo-squamosa, setisque albidis brevioribus vestita, ♀ fortissime elongata, fere aequaliter convexa, humeris acute productis. ♂♀. Vix 3 mm.

In the elongate form (especially of the ♀), in the colour and clothing this species is remarkably similar to *Proterhinus detritus* from Lanai. It lacks, however, the extremely abrupt constriction of the prothorax in front, the second joint of its antennae is less short, and they themselves are only red at the base. The rostrum of the ♀ *detritus*, however, is so different, being very coarsely sulcate, that it is doubtful whether the two are in reality at all closely allied. The ♂ of the two examples examined is larger and wider, and much less elongate, than the ♀, but I suspect that this is not usually the case, but rather an individual variation. A second male, taken in the other mountain range on Oahu, I refer at present to this species as a variety, but it is very likely a distinct species. It differs in being of a more obscure red colour, with the antennae entirely red, and is as narrow and elongate as the ♀, there are traces of whitish squamosity on the elytra, their erect white setae are longer, and they are faintly impressed at the base.

HAB. Oahu. One of each sex taken in the mountains near Honolulu (2000—3000 ft.); a variety of the ♂ in the Waianae mountains.

(38) *Proterhinus compactus*, sp. nov.

Nigricans, elytris plus minusve rufescentibus. Caput cum pronoto aureo-squamosum. Antennae mediocriter graciles et elongati. Pronotum obscure 3-impressum. Elytra albido-squamosa, setisque albidis erectis brevioribus sat conspicue vestita, fortiter denseque punctata, longitudinaliter subcarinata, basi scutellum juxta utrinque tuberculata, humeris productis, minus acutis, basi thoracis adaptatis. Rostrum ♀ fortiter

longitudinaliter rugosum, ad basim distinctissime angustatum. ♂♀. Long. 2.6—2.75 mm.

Species, ut opinor, *P. difficili* (sp. Kauaiensi) cognatissima, sed forma angustiore.

Very similar to some examples of *P. difficilis* of Kauai, but distinguished by the evidently narrower elytra, which in lateral view are less convex longitudinally. The humeral angles are a good deal produced, but are not sharp, and are closely applied to the base of the prothorax, the puncturation is strong and dense. This species also bears a strong resemblance to the following (*P. platygonias*), but the deep thoracic impressions, the extremely coarsely punctured elytra, and the strong constriction of the head behind the eyes, in the latter species, will easily distinguish it.

HAB. Oahu, Waianae mountains (3000 ft.); two examples (♂ and ♀) taken.

(39) *Proterhinus platygonias*, sp. nov.

Nigropiceus, pallide squamosus, elytris plus minusve rufescentibus et nigromaculatis. Caput post oculos fortiter constrictum. Pronotum profunde 3-impressum, minus dense squamosum, grossius rugoso punctatum. Elytra inaequalia, grosse punctata, utrinque juxta scutellum tuberculata, humeris fortiter, nec acute, productis. ♀. Long. 2.5—vix 3 mm. (Plate IX. fig. 12, ♀.)

Black, the elytra reddish with black markings posteriorly, antennae red at the base or nearly altogether black. Head constricted behind the eyes, so that a ridge is formed between the vertex and front. Antennae not stout, nor long, the basal of the three terminal joints not very different to the 8th, the two terminal ones much wider, and short. Thorax very uneven owing to the three extremely deep depressions, its puncturation dense and rugose. Elytra with pale squamosity, and some rather short white erect setae, the surface uneven, the ridges which extend back from the humeral angles being evident at the base, and sometimes distinct to nearly the apex. On either side near the scutellum is a rather strong tubercle, covered with white squamosity, and between these and the shoulders the elytra are deeply impressed, as is readily seen in a lateral view. The humeral angles are strongly produced, but not very sharp, and closely applied to the base of the thorax. The puncturation is extremely coarse. Lobes of the front tarsi unusually small.

HAB. Oahu, Waianae mountains (3000 ft.). Two female examples taken in February, 1896. In one the antennae and tarsal lobes are black or nearly so, in the other (excepting the apical joints of the former) both are red. The latter example has the longitudinal ridges of the elytra less distinct, and the eyes decidedly less prominent.

(40) *Proterhinus vestitus* Sharp.

*Proterhinus vestitus* Sharp, Tr. Ent. Soc. London, 1878, p. 16. Tr. Dublin Soc. III. 1885, Pl. V. fig. 37 and 38.

Typical examples of this species have a very distinctive appearance, owing to the extremely sudden constriction of the thorax in front. I have only seen one rather small example which quite resembles the types in structure, but specimens from the Waianae range have the thorax in some cases hardly less abruptly constricted, and must be referred to the same species, although they form a well-marked local variety (*P. vestitus*, var. *heterostictus*). These examples also have the setae of the elytra and legs generally less elongate, and the black or dark markings of the elytra are more lateral in position. The species is closely allied to *P. eulcpis* but the elytra are in general less wide and short, the shoulders less produced, and the erect setae longer.

HAB. Oahu, mountains near Honolulu (Blackburn); Waianae mountains, both sides.

(41) *Proterhinus robustus* Blackb.

*Proterhinus robustus* Blackburn, Tr. Dublin Soc. III. 1885, p. 171.

Extremely close to *P. vestitus* but probably distinct. Like that species it is variable, but in its typical form it differs from typical examples of *P. vestitus*, in having the thorax but little constricted in front and less narrowed behind, the hind angles distinctly marked by a spot of pale squamosity. The elytra have shorter and less conspicuous erect setae, those on the legs being also much shorter. The basal joint of the antennae is unusually long, being fully as long as the two following joints together. Apart from the pale spots at the hind angles the thorax has very little squamosity, so that the puncturation is quite conspicuous, being very dense, and somewhat coarse. The curved setae at the sides are short and very feebly developed. I have not seen a ♂ of this species. Length 2—3 mm.

HAB. Oahu, Waianae mountains, found in the lowest forest. Only a few female examples were collected.

(42) *Proterhinus subplanatus*, sp. nov.

Nigricans, parum dense squamosus, *P. angulari* cognatissimus, antennis plerumque brevioribus, minus gracilibus, forma magis depressa (sive deplanata), distinguendus. ♂ ♀. Long. 2—2.5 mm.

A somewhat obscure species, evidently closely allied to *P. angularis*. From

typical individuals of that species it is readily distinguished by the much less conspicuous setae on the elytra, and the hardly visible curved setae at the sides of the prothorax. From the less typical examples which I have referred to *P. angularis*, it may be known by the shorter and less slender antennal joints, and its evidently flattened, or subdepressed form.

The shoulders of the elytra are formed as in *P. angularis*, and are likewise marked with pale squamosity, but as a rule less conspicuously, and the basal ventral segment of the abdomen is strongly punctate.

HAB. Oahu, Halemano (Koolau range) (2000 ft.), in January, 1893.

(43) *Proterhinus simplex* Sharp.

*Proterhinus simplex* Sharp, Tr. Ent. Soc. London, 1878, p. 17.

The examples from which this species was described, appear to me to be not only immature, but also particularly small and ill-developed specimens. Large individuals are twice the size of the specimens sent by Mr Blackburn, and altogether wider and more bulky, the colour pitchy or reddish pitchy, the elytra red, with dark markings laterally, about the middle, and extending sometimes to the suture. The squamosity is not continuous, there being an oblique spot near the shoulders of the elytra and others behind these. The setae are shorter, and less conspicuous, than those of fresh examples of *P. obscuricolor*, *vestitus* and others. The prothorax is much wider, and has the sides much more strongly rounded than in the type, and is often distinctly 3-impressed. The eyes, the tarsal lobes, and humeral angles of the elytra are often all much more developed, but all of them vary, even in the larger examples. Length 2—nearly 3 mm.

HAB. Oahu. Both mountain ranges, at elevations of 2000—3000 ft.

(44) *Proterhinus oxygenias*, sp. nov.

*P. scutato* forma facieque simillimus, colore plerumque minus obscuro, elytrorum angulis humeralibus fortius et acutius productis, distinguendus. ♂♀. Long. 2.25—2.75 mm.

This species appears to be very closely allied to *P. scutatus*, from which it differs generally by its less obscure (*i.e.* more red) colour, the less evenly rounded sides of the thorax, and the more strongly and acutely produced humeral angles of the elytra.

HAB. Oahu, mountains near Honolulu (2000 ft.). A single example taken in the Waianae range of the same island appears to be a variety of this species.

(45) *Proterhinus leptothrix*, sp. nov.

Haud latus, rufescens, elytris plus minus nigro- vel fusco-signatis. Oculi minores. Antennae mediocres, clava 2-articulata, articulo 9<sup>o</sup> vix quam 8<sup>us</sup> evidenter latiore. Pronotum parum squamosum, dense rugoso-punctatum, setisque erectis gracillimis versus latera sat conspicue vestitum, antice impressum, angulis posticis macula pallida squamosa signatis. Elytra plus minusve albido-squamosa, setis erectis gracillimis et elongatis conspicue vestita, humeris acutis, plus minusve productis. Pedes setis conspicue elongatis vestiti, tarsorum anticorum lobis parvis. ♀. Long. 2—2·5 mm. (Plate IX. fig. 13, ♀.)

A very distinct species, owing to the form of the antennae, and the extremely fine and more than usually elongate setae, which clothe the elytra and legs. The club of the antennae can hardly be considered as consisting of more than two joints, as the 9th in whatever aspect it is viewed is hardly different in form to those that precede it. A single example taken in the same locality as the ♀ above described is no doubt the ♂, as it differs only in being smaller and in the usual sexual characters, but it is a good deal abraded.

HAB. Oahu; Kaala (3000 ft.), Waianae range; 2 ♀ taken together in December, 1892, and a single ♂ in the same month but on another occasion.

(46) *Proterhinus seticollis*, sp. nov.

Praecedenti cognatissimus, sed colore obscuriore, setisque erectis elytrorum minus longis gracilibusque distinguendus. ♂ ♀. Long. 2—2·75 mm.

This species is very closely allied to *P. leptothrix*, and may possibly on the examination of a long series prove to be a form of that species. It is very easily distinguished, so far as the few examples taken are concerned, by the different clothing, the erect setae being much less elongate and slender. It is also generally of a darker colour, and superficially greatly resembles *P. scutatus*, from which it is abundantly distinct by the 2-jointed club of the antennae, the stronger longitudinal furrows of the rostrum in the ♀, the patch of white squamosity at the hind angles of the thorax, which bears conspicuous erect setae, &c.

HAB. Oahu, Waianae mountains (3000 ft.); a few examples taken on the opposite side of the range to the locality for *P. leptothrix*.

(47) *Proterhinus longulus* Sharp.

*Proterhinus longulus* Sharp, Tr. Ent. Soc. London, 1879, p. 97.

I have examined only the types, one ♂ and one ♀, of this species, which are in Dr Sharp's collection. It is very closely allied to *P. epitretus* of Lanai, and *P. ferrugineus* of Hawaii, under which species I have pointed out the characters whereby these allied forms may be distinguished.

HAB. Oahu mountains, in stems of fern (Blackburn).

(48) *Proterhinus paradoxus* Sharp.

*Proterhinus paradoxus* Sharp, Tr. Ent. Soc. London, 1879, p. 100. Tr. Dublin Soc. III. 1885, Pl. V. fig. 36.

I have never met with this species, which is evidently allied to the following (*P. oahuensis*).

HAB. Mountains near Honolulu (Blackburn).

(49) *Proterhinus oahuensis*, sp. nov.

Haud latus, nitidus, ferrugineus, setis erectis flavescentibus vestitus, haud squamosus. Antennae graciliores, articulis 2 basalibus sat robustis. Oculi parvi, a pronoto longe remoti. Pronotum subnitidum, antice fortiter impressum, impressionibus posterioribus minus distinctis. Elytra nitida, sat elongata, grosse subseriatim punctata, suturam versus utrinque oblique longitudinaliter carinata, carina quoque longitudinali ab angulis humeralibus extensa, setis erectis flavescentibus elongatis, aliisque brevioribus, conspicue vestita. Femora omnia gracilia, tibiis anticis gracillimis et elongatis, lobis tarsorum minutissimis. ♂. Long. 2.5 mm. (Plate X. fig. 4.)

This species is very distinct, and obviously allied to *P. paradoxus*, but has the elytra of different form, these not being rectangularly deflexed laterally, nor conspicuously flattened above. The shoulders are nearly rectangular, and from each a distinct carina extends backwards, and internal to these towards the suture other two of the interstices are distinctly raised and form obliquely longitudinal carinae. The basal abdominal segment beneath is very coarsely punctured and the segmental sutures are extremely deep.

HAB. Oahu, mountains near Honolulu; 1 ♂ taken in May, 1896.

(50) *Proterhinus kaalae*, sp. nov.

Piceo-niger, antennis tarsisque rufotestaceis, minutus, sat robustus. Antennae graciles, elongatae, articulo primo fortissime incrassato, clava distincte 2-articulata. Oculi parvi. Pronotum grosse punctatum, setis erectis pallidis vestitum, haud squamosum. Elytra brevia, lata, pronoto fere bis latiora, grossissime punctata, haud squamosa, setis per elongatis albidis supra sex-seriatim vestita. Femora omnia cum tibiis setis longis albidis vestita, tarsorum lobis anticorum sat magnis. ♂. Long. vix 2 mm. (Plate X. fig. 3.)

One of the smallest, but quite one of the most remarkable of all the known species. There is no squamous clothing, but the erect setae are whitish, and very long and conspicuous, and form three rows on each wing-case, those of the series next to the suture being shorter than the others. The setae in each row are distant and very regular, and of even length, not consisting of some short and some long ones intermixed, as in most of the conspicuously setae species. Similar setae clothe the legs and thorax, and the sculpture of the latter and of the elytra is very coarse. The lobes of the front tarsi are rather large for the size of the insect, the claw-joint short, not projecting very far beyond the lobes. The basal joint of the antennae is extremely wide, the intermediate joints slender, the club consisting of 2 joints only. The elytra are short and wide.

HAB. Oahu. A single ♂ was taken on Kaala in the Waianae mountains.

(51) *Proterhinus archaeus*, sp. nov.

Depressus, nigricans vel piceus, parum squamulosus, setis conspersis erectis sat conspicue vestitus. Antennae rufae, articulo secundo sat elongato sed, quam tertius, robustiore. Oculi prominuli, setigeri. Pronotum dense rugoso-punctatum, setis erectis elongatis vestitum. Elytra parum vel haud squamosa, setis erectis sparsim sed conspicue vestita, crebre confusaeque punctata, dorso deplanato vel depresso, basi utrinque subtuberculato, angulis humeralibus distinctis, fere rectis. Femora minus fortiter clavata, tarsorum anticorum lobis parvis. Abdominis segmentum primum ventrale grosse et sat crebre punctatum. Rostrum ♀ breve, vix longius quam latius, fortiter longitudinaliter rugosum. ♂ ♀. Long. 2.2—3.2 mm.

Allied to *P. blackburni* but quite distinct by its depressed or flattened form, less numerous erect setae, &c.

HAB. Oahu. Koolau range behind Waialua. A single example (var. *diversus*), taken in the same range near Honolulu, has the elytra less flattened, the thorax strongly transverse, and the erect setae of the elytra decidedly shorter. It will probably prove to be a distinct species. The typical form lives beneath the bark of *Straussia*.

(52) *Proterhinus obscurus* Sharp.

*Proterhinus obscurus* Sharp, Tr. Ent. Soc. London, 1878, p. 18.

This species was described on a single example of the female, but subsequently in Trans. Dublin Soc. Vol. III, 1885, was referred in the systematic Catalogue (p. 250) to *P. simplex* as a variety. I believe it to be distinct from that species, but both varying greatly, it becomes impossible to form an adequate description that will apply to all the individuals of each. Certainly in what I consider to be well-developed examples of the two the species are readily distinguished.

In its well-developed and typical form the ♂ of *P. obscurus* is shorter and wider than the female, and generally rather darker in colour. The antennae are moderately long, but the intermediate joints are not very slender, and the first of the three club joints is not very different to the following. The basal joint is short and very stout. Eyes but little prominent. Thorax wide and very strongly rounded at the sides, with the squamosity forming dense lateral patches, but sparser on the dorsum. There is an evident anterior impression, but the curved erect setae at the sides are altogether absent, or very indistinct. The elytra vary in colour from nearly entirely black, to a dull red with dark markings, and are rather scantily squamose, and bear, especially posteriorly, some short, pale, erect, but inconspicuous setae. The humeral angles are not acute, nor very distinct, and are sometimes quite effaced. All the femora are strongly incrassate and clavate, and the lobes of the front tarsi are moderately large.

The female is generally more slender, the thorax less wide, the elytra longer, and their colour less dark, and the squamous covering more regular.

In the Waianae mountains there is found what appears to be a dwarf form of the above species, the smallest examples of which are very minute, and most of the structural characters are accordingly modified.

HAB. Oahu. Koolau range (1500—3000 ft.); small var. in the Waianae mountains at similar elevations.

(53) *Proterhinus oscillans* Sharp.

*Proterhinus oscillans* Sharp, Tr. Ent. Soc. London, 1878, p. 18.

As I understand it, this is not a very variable species, and I have examined numerous examples that agree well enough with the types. As a rule the species is constant in colour and may be recognised easily by this. Small examples have the tarsal lobes diminished in size, and in some the humeral angles of the elytra are less indistinct than in others, and the elytra do not always become distinctly narrowed towards the base. The rostrum of the ♀ is normally very decidedly narrowed from the apex to the base. Length from 1.5 to 2.75 mm.

HAB. Oahu. Both mountain ranges. Not rare from 1500—3000 ft.

(54) *Proterhinus pachynemis*, sp. nov.

Rufescens, elytris nigrosignatis. Antennae mediocres, articulo secundo, quam tertius, haud minus longo, sed multo crassiore, clava sat evidenter 3-articulata. Pronotum latera versus sat dense squamosum, lateribus minus fortiter rotundatis. Elytra pallide squamosa, setisque pallidis erectis conspersim vestita, humeris subobscuris, haud productis. Femora antica et postica miro modo incrassata, intermediis multo crassiora. ♂. Long. 2 mm. (Plate IX. fig. 14. ♂.)

This species, which somewhat resembles *P. oscillans* or *P. obscurus*, is quite distinct by the elongate second joint of the antennae, and the extraordinarily incrassated femora, the hind femur being about twice as wide as the intermediate, which itself is more robust than in most of the species. A second and much damaged ♂, which I refer to this species, is totally different in superficial aspect, being black, with only small parts of the thorax and elytra obscurely red, and the latter less nearly parallel-sided.

HAB. Oahu. Kaala (2500 ft.), Waianae range. Two ♂ examples taken, one on the windward and the other the opposite side of the range.

(55) *Proterhinus laticollis*, Blackb.

*Proterhinus laticollis* Blackburn, Tr. Dublin Soc. III. 1885, p. 170.

(Plate IX. fig. 15, and 15a. ♂.)

The male of this species is a very remarkable insect, not only on account of its extremely wide thorax, as indicated by Blackburn in his description, and by the name which he applied to it, but still more so by the structure of the terminal joint of the front tarsi, which is unlike that of any other of the genus. This joint is so extremely shortened that it only just extends as far as the apex of the lobes of the preceding one. The antennae are more than usually elongate and slender, and the front femora very strongly incrassate, as compared with the hinder ones. In some examples the elytra are quite evidently impressed across the base, but in others no trace of this is to be detected. The ♀ of *P. laticollis*, on the other hand, is comparatively commonplace, since neither thorax nor tarsi present the peculiar features exhibited in the ♂. It is only to be recognised by its general similarity in colour, clothing, and the elongate and slender antennae. As in the ♂, the base of the elytra is sometimes sub-impressed. Length 2—2.5 mm.

HAB. Waianae mountains, Oahu. About 17 examples taken.

(56) *Proterhinus vicinus*, sp. nov.

Species parva, angustula, rufescens, capite, necnon saepe pronoto plus minusve infuscatis, elytrorum marginibus lateralibus, et nonnunquam maculis quibusdam dorsalibus, nigricantibus. Antennarum ♂ articulus basalis robustus, sed minus brevis, hoc cum sequentibus rufo, articulis apicalibus nigris, clava distincte 3-articulata. Pronotum haud latum, antice impressum, aequaliter (vix dense) squamis vestitum. Elytra angusta, lateribus saepe fere parallelis, pallide, haud maculatim, squamosa, setisque brevibus albidis erectis parce inconspicueque vestita, angulis humeralibus haud productis. Oculi et tarsorum anticorum lobi parvi. ♂ ♀. Long. vix 2—2.25 mm.

The affinities of this insect are with five of the Kauai species, *P. serricornis* and the four following, rather than with any other of the Oahuan forms. With those species it agrees in general form, colour, and clothing, as also in the very short rostral portion of the head in the ♂, and, considering its minute size, in the rather strongly developed basal joint of the antennae. It cannot however be referred to any of those species, for the antennae, which are neither long nor yet particularly slender, and of which neither the 3-jointed club, nor the intermediate joints present any special features, will agree with none of them. The sexes apparently are almost similar, except for the usual sexual differences.

HAB. Oahu. Taken only in the Waianae mountains, and not numerously.

(57) *Proterhinus pusillus* Sharp.

*Proterhinus pusillus* Sharp, Tr. Ent. Soc. London, 1879, p. 97.

This is a very minute and obscure insect, and may not improbably prove to be a depauperated form of some other species. It belongs to the most difficult and obscure section of the genus, and has no striking characters of any sort. It appears to approach closely to some varieties of *P. deceptor*, and also to minute examples of *P. obscurus*.

HAB. Oahu mountains near Honolulu, 1500—2000 ft. (Blackburn.)

## C. Species insulae Maui propriae.

(58) *Proterhinus validus* Sharp.

*Proterhinus validus* Sharp, Tr. Ent. Soc. London, 1881, p. 531.

(Plate IX. fig. 16. ♂.)

The antennae in this species are decidedly more elongate and less thick in some examples than in others. The length varies from 4—6 mm.

HAB. Maui, Haleakala (4000—5000 ft.); many examples taken on *Acacia koa*.

(59) *Proterhinus comes*, sp. nov.

Major, piceus, vel obscure rufescens, subbrunneo-squamosus, pronoto elytrisque setis erectis crebre conspicueque vestitis. Oculi sat magni, fortiter prominentes. Antennae graciles, articulo secundo brevissimo, clava gracili, elongata, 3-articulata. Pronotum antice fortiter angustatum et transversim impressum, impressionibus posterioribus rotundatis et distinctis. Elytra dense punctata, longitudinaliter subcarinata, margine basali scutellum juxta utrinque tuberculato, humeris fortiter acute productis. Pedes omnes conspicue setosi, lobis tarsorum anticorum minoribus. ♂. Long. 3·5—4 mm.

Apparently closely allied to *P. validus*, but a considerably smaller insect and of less elongate and oblong form. The antennae are quite differently formed, the intermediate joints being slender and elongate. The eyes also, and the lobes of the front tarsi, are less developed, and the longitudinal ridges of the elytra generally more obscure.

HAB. Maui. Three examples of the ♂ taken on Haleakala (4500—5000 ft.); it is probably a variable species, as these examples do not altogether agree in small points.

(60) *Proterhinus lecontei* Sharp.

*Proterhinus lecontei* Sharp, Tr. Ent. Soc. London, 1879, p. 99; Tr. Dublin Soc. III. 1885, Pl. V. fig. 42 ♀, fig. 43 ♂.

Varies greatly in size, some examples being only about half the bulk of a normal specimen. Length (excluding rostrum) 3·2—nearly 5 mm.

HAB. Maui, Haleakala (5000 ft.); not rare, but only on one species of tree, of which I neglected to obtain a specimen for identification.

(61) *Proterhinus sharpi*, sp. nov.

Ferrugineus, elytris saepe plus minusve nigricantibus, ferrugineo-squamosus. Antennae rufescentes, sat graciles. Oculi fortiter prominentes. Pronotum minus latum, dense squamoso-vestitum, 3-impressum, antice angustatum. Elytra suboblonga, lateribus subparallelis, utrinque longitudinaliter carinata, carinis postice abrupte truncatis, humeris sat fortiter productis. ♂♀. 2·6—3·75 mm. (Plate IX. fig. 17. ♂.)

In the form of the elytra this species can only be compared with *P. lecontei*, the longitudinal ridges of the elytra being well-marked and abruptly vertical behind, so that in a posterior view each appears as a strongly elevated tubercle. In

general appearance it is very different to *lecontei*, but in reality the two are really related.

Colour ferruginous, as also the squamosity, the elytra sometimes partly or even entirely black. Eyes large, strongly prominent; antennae slender, with evidently 3-jointed club, generally entirely of a clear red colour. Prothorax subelongate, densely squamose, with three well-marked impressions, at the sides with some curved suberect setae. Elytra elongate, subparallel-sided, tuberculate at the base on either side of the scutellar region, depressed between these tubercles and the produced humeral angles, flattened or even somewhat depressed dorsally between the well-marked longitudinal ridges, which terminate abruptly behind. When the elytra are reddish in colour they have a ferruginous squamosity, but when their colour is black the squamosity disappears; erect, thin setae are also scattered over the surface, especially at the sides and posteriorly. Lobes of the front tarsi somewhat large.

HAB. Maui, Haleakala (5000 ft.), in the same localities as *P. lecontei*, but with very different habits, this species being found only on a species of fern, while *P. lecontei* frequents one of the forest trees.

(62) *Proterhinus tuberculiceps*, sp. nov.

Rufescens, elytris plus minusve nigro-maculatis, antennis, pedibusque omnibus rufis. Caput inter oculos fortiter bituberculatum. Oculi fortiter prominentes. Antennae graciles, elongatae, clava distincte 3-articulata, sat elongata. Pronotum perinaequale, fortissime 3-impressum, impressione anteriore transversa, antice abrupte constrictum. Elytra longitudinaliter subcarinata, setis erectis gracillimis, sat conspicuis, vestita, humeris fortiter productis. ♂♀. Long. 3·5 mm. (Plate IX. fig. 18. ♂.)

A very distinct species, entirely reddish in colour, except for some small, and more or less inconspicuous, dark spots on the elytra. The eyes are strongly prominent, and there is a strong tubercle close to the inner margin of each. The prothorax is very uneven, the anterior impression extending right across it, while the two posterior ones are deep, but smaller, and roundish. In front the constriction is strong and abrupt, and there and at the sides the suberect, curved setae are very evident. The lobes of the front tarsi are well developed. The elytra have their shoulders strongly produced, the suture a little raised, and a sufficiently evident longitudinal ridge running backwards from the humeral angles of each. The erect setae are long, fine, and conspicuous. All the femora are strongly clavate, a little more so in the ♂ than in the ♀. The rostrum of the ♀ is only moderately long, and is smooth and shining, with the longitudinal grooves fine.

HAB. Maui, Haleakala (4000 ft.); 2 ♂, 1 ♀ taken.

(63) *Proterhinus sternalis* Sharp.

*Proterhinus sternalis* Sharp, Tr. Ent. Soc. London, 1879, p. 98.

(Plate IX. figs. 19 and 19 a. ♂.)

This species is remarkable for the great development of the eyes, and tarsal lobes, the concavity of the prosternum from the front to the base, and the unusual clothing of the intermediate tibiae, which bear long and soft hairs, instead of the usual short and stiff setae. The ridges of the elytra are quite well-marked, especially when these are observed in lateral view. Length from 2·2—2·3 mm.

HAB. Maui, Haleakala (4000—5000 ft.); not very common, only about 20 examples were taken.

(64) *Proterhinus sternalioides*, sp. nov.

Sat latus, nigricans vel rufo-niger, antennis, pedibus, elytrisque plus minusve rufescentibus, his nigro-notatis, praecedenti sp. cognatissimus. Oculi magni. Pronotum antice constrictum, fortiter 3-impressum, minus latum. Elytra subinaequalia, pallide squamosa, setisque erectis elongatis vestita, basi scutellum juxta utrinque tuberculata, humeris fortiter productis. ♂♀. Long. 2·2—3·75 mm.

This species is extremely like *P. sternalis*, which it resembles in colour, form, &c. The longitudinal ridges of the elytra are rather less pronounced, and the face of the ♂ (including the rostrum) is evidently more elongate. The rostrum of the ♀ is slightly longer, its surface slightly rugulose all over. The intermediate tibiae are clothed with shorter setae, and the lobes of the front tarsi of the ♂ are of rather different form, being rather more narrow and elongate, the whole joint having a less quadrate form. The hind coxae of the ♂ are distinctly more widely separated, and the prosternum is impressed only along its anterior margin, not longitudinally sulcate down the middle from front to base as in *P. sternalis*.

HAB. Maui, Haleakala (5000 ft.); several examples taken, probably in company with *P. sternalis*.

(65) *Proterhinus microtarsus*, sp. nov.

Atro-piceus, elytris rufescentibus, nigro-notatis, antennis pedibusque totis rufis. Antennae elongatae, graciles, articulo 1 elongato sed robusto, quam tertius longiore, caeteris elongatis, clava gracili, distinctissime 3-articulata. Oculi magni. Vertex a fronte capitis haud distinctus. Pronotum perinaequale, antice subito fortiterque constrictum. Elytra squamulosa, longitudinaliter subcarinulata (lateraliter compressa), setis

pallidis elongatis sat conspicue vestita, humeris fortiter productis. Tibiae anticae graciles, elongatae; femora omnia fortiter incrassata, lobis tarsorum anticorum minimis. ♂. Long. 3 mm. (Plate IX. fig. 20 and 20 a. ♂.)

This remarkable species is very distinct from any other. The antennae are long and slender, concolorous with the legs, of a clear rufotestaceous colour. The basal joint is elongate but rather stout, all the rest are elongate and slender, as also is the distinctly 3-jointed club. Prothorax very abruptly constricted, and transversely impressed in front, the impression deeper about the middle. The two posterior sublateral impressions are also distinct, and behind these the middle part of the thorax is seen (especially in lateral view) to be somewhat strongly elevated, the elevation subsulcate. All the femora are strongly incrassate, the front tibiae unusually long and slender, the lobes of the front tarsi excessively small for the size of the insect. Elytra subparallel-sided for their basal half, with pale squamosity, and conspicuous, very fine, erect, pale setae. Seen from the side they are somewhat compressed laterally, to form the rather obscure longitudinal ridges. Their humeral angles are strongly produced.

A female taken in the same locality as the ♂ no doubt belongs to the same species, although at first sight of very different appearance. The antennae are formed like those of the ♂, the eyes are smaller but more prominent. Rostrum short, not nearly twice as long as wide, the surface entirely rugulose. The whole insect is blackish, except the reddish tibiae and tarsi and the greater part of the antennae, the club-joints being obscure in colour. The prothorax is less elevated posteriorly than that of the ♂, and the elevated portion is not evidently sulcate. The elytra are a good deal longer, entirely black, the sides nearly parallel except at the apex. Femora strongly clavate as in the ♂, the front tibiae also long, and the lobes of the tarsi small.

HAB. Maui, Haleakala (4000 ft.); rare, only one ♂ and one ♀ having been taken.

(66) *Proterhinus megalotarsus*, sp. nov.

Nigricans, elytris rufescentibus vel piceis, pedibus antennisque saepe plus minusve rufescentibus. Oculi sat magni, subconici, fortiter prominentes. Antennae mediocres, clava distincte 3-articulata. Pronotum pallide squamosum, profunde 3-impressum, vix latum (feminae elongatum), lateribus rotundatis. Femora ♂ fortiter incrassata, lobis tarsorum anticorum magnis. Elytra pallide squamosa, setisque gracilibus erectis sat conspicue vestita, fortius (nec inaequaliter) convexa, sutura subelevata, humeris fortiter acute productis. ♂ ♀. Long. 2·8—3·25 mm.

A rather distinct species, at least in the ♂, but apparently variable, the antennae being a good deal shorter, in some examples than in others. There is no distinct ridge between the vertex and front of the head in either sex. The eyes are large, very

prominent and subconical. In the ♂ the lobes of the front tarsi are largely developed and wide, but evidently less so in the female, in which sex the rostrum is smooth and shining, with two fine longitudinal grooves. The elytra have only faint, sometimes indeed no traces of longitudinal ridges, but the suture itself is quite evidently raised.

HAB. Maui, Haleakala; a few examples taken at and below an elevation of 4000 ft.

(67) *Proterhinus hemichlorus*, sp. nov.

Nigricans, pallide squamosus, antennis pedibus elytrorumque basi plus minusve rufescentibus, *P. humerali* cognatissimus. Antennae, oculi, tarsorumque anticorum lobi, mediocres, haudquaquam insignes. Pronotum minus dense squamosum, setis curvatis parum conspicuis, 3-impressum, impressione antica transversa, duabus posticis distinctissime rotundatis. Elytra plus minusve nigricantia, plaga basali conspicue pallido-squamosa parceque nec fortiter punctata, sutura subelevata, humeris productis. Femora postica haud fortiter incrassata. ♂ ♀. Long. 1·7—2·8 mm.

A small species with rather a distinctive appearance, owing to a patch of dense pale, often nearly white, squamosity, which covers the basal third or even half of the elytra, over which part the puncturation appears sparse and feeble. The erect setae are chiefly placed on the hinder part of the elytra, but they are sparse and not very conspicuous. The femora are only moderately robust. Closely allied to *P. humeralis* but distinguished by the less developed tarsal lobes, eyes, and antennae, the less incrassate femora, and other less important characters. As in that species the elytra are without evident longitudinal ridges, and there is none between the front and vertex of the head.

HAB. Maui, Haleakala (5000 ft.); a few examples of each sex taken.

(68) *Proterhinus humeralis* Sharp.

*Proterhinus humeralis* Sharp, Tr. Ent. Soc. London, 1879, p. 96.

A rather distinct species, at least in the ♂. Apparently allied to *P. sternalioides*, but a decidedly narrower and more elongate insect. The antennae of the ♂ are rather longer and at the same time stouter than in most of the species, and the lobes of the front tarsi are strongly developed, although not to the extent of those of *P. sternalis*. In both sexes, but especially so in the ♂, the femora are more strongly incrassate than is usual, but all the specific characters of the ♀ are much less pronounced than in the ♂. There is no ridge formed between the front and vertex of the head.

HAB. Maui, Haleakala (4000—5000 ft.); I have seen only the two type specimens, and two or three others taken by myself.

(69) *Proterhinus brevipennis*, sp. nov.

Rufescens vel rufo-piceus, antennis pedibusque totis, vel ex parte, rufis, pallide squamosus, forma brevior. Antennae graciles. Oculi prominentes. Pronotum sat dense aureo-squamosum, antice fortiter angustatum, aut nonnumquam abrupte constrictum, profunde 3-impressum, medio longitudinaliter subsulcato, antice et ad latera setis curvatis suberectis, sat conspicuis, vestitum. Elytra rufescentia, pallide squamosa, parte apicali nigra vel nigro-maculata, dorso plus minusve inaequali, irregulariter punctato, setis erectis brevibus longioribusque intermixtis sat conspicuis, humeris fortiter productis. Femora minus fortiter incrassata. ♂♂. Long. 2·5—3·2 mm.

A variable species, typical examples of which are easily distinguished. The basal two-thirds of the elytra are covered with pale squamosity (except generally on some black spots), and this pale portion is often flattened or subdepressed, between the more or less evident longitudinal ridges. In well-developed examples there are also traces of transverse ridges. The puncturation has a peculiarly irregular appearance. The antennae are quite slender, clear red except at the apex, but not very long. The eyes are of moderate size and prominent, and there is more or less trace of a dividing ridge between the vertex and front of the head. The rostrum of the ♀ is finely longitudinally rugulose and dull. The femora are not very strongly clavate. The coxae are all equally widely separated, and the basal segment of the abdomen beneath has a dull and densely and minutely granulate appearance.

HAB. Maui, Haleakala (5000 ft.); about two dozen examples taken.

(70) *Proterhinus epichrysus*, sp. nov.

Rufo-niger, elytris rufescentibus, plus minusve nigro-maculatis. Antennae graciles, sat elongatae. Oculi fortiter prominentes. Frons capitis a vertice carina distincta transversa separata. Pronotum squamis pallidis aureis densius vestitum, fortiter 3-impressum, setis suberectis curvatis ad latera conspicuis. Elytra nigro-maculata, pallide squamosa, setisque albidis elongatis conspicue vestita, fortiter punctata, fere aequaliter convexa, sutura elevatula, basi scutellum juxta utrinque tuberculata, humeris fortiter acute productis. ♂♀. Long. 2·7—4 mm.

A rather large species, but very variable in size, ill-developed examples being only about one-third or one-fourth the bulk of the larger ones. The head and thorax are densely clothed with a very pale golden squamosity, the eyes are strongly prominent and usually of conical shape, the antennae elongate and slender with well-marked 3-jointed club. Thoracic impressions deep and distinct. Elytra red with black markings, coarsely punctured, the longitudinal ridges little or not at all evident, tuberculate at the base on either side near the scutellum, the humeral angles strongly produced

and acute. Their clothing consists of pale squamosity, which is not very dense, and is absent from the dark markings, and numerous elongate white, erect setae, which are conspicuous. The femora are not very stout, the lobes of the tarsi are somewhat variable in size, but never very largely developed. The rostrum in the ♀ is short, generally slightly narrowed to the apex, and the head in both sexes has a very distinct transverse ridge (rarely interrupted) between the vertex and the front. All the coxae are widely, and about equally, distant, the basal ventral abdominal segment is minutely granular, rather than punctured.

HAB. Maui, Haleakala (5000 ft.); about 40 examples were taken.

(71) *Proterhinus haleakalae*, sp. nov.

Niger, pedibus antennisque rufescentibus. Caput post oculos constrictum, his fortiter prominentibus. Antennae graciliores. Rostrum ♀ fere opacum, crebre longitudinaliter rugulosum, lateribus parallelis. Pronotum elongatum, lateribus subaequaliter rotundatis, distincte 3-impressum, impressione antica lata, duabus posticis rotundatis. Elytra elongata, parce pallide squamosa, setisque erectis albidis parcius vestita, fortiter punctata, ad basim scutellum juxta utrinque tuberculata, fere aequaliter convexa, humeris peracute fortiter productis. Femora minus fortiter clavata, subgracilia, lobis tarsorum anticorum minoribus. ♀. Long. 3.5 mm.

Only a single ♀ of this species was collected, and it appears to be most nearly related to *P. epichrysus* of the Maui species, but more closely still to *P. lanaiensis* of Lanai. In colour it is entirely black, except for the dark reddish legs and the rather more brightly coloured basal joints of the antennae. The transverse ridge between the vertex and front of the head is very distinct, the eyes are strongly prominent. The basal of the three joints of the club of the antennae is not very much more developed than the preceding, so that the club is not very distinct. The anterior impression of the elongate thorax is large and vague, the two posterior ones small, round, and definite. The elytra are long, nearly parallel-sided for more than half their length, with traces of the two longitudinal ridges, at least in certain aspects. All the femora are somewhat slender, and the lobes of the front tarsi are decidedly small for the size of the insect.

HAB. Maui, Haleakala. A single ♀ was taken on April 1st, 1894, at an elevation of about 5000 ft.

(72) *Proterhinus arhopalus*, sp. nov.

Nigricans vel piceo-niger, tibiis tarsisque obscurius rufescentibus. Oculi magni, prominentes. Antennae incrassatae, articulo primo elongato, robuste clavato, secundo elongato, subtriangulari, tertio hoc paullo longiore, 4°, 5°, 6° et 7° haud longioribus quam

lterioribus, angulis apicalibus posterioribus productis, 9°, 10° et 11° his evidenter gracilioribus. Pronotum 3-impressum, lateribus subfortiter rotundatis. Elytra subsquamosa, setisque erectis pallidis vestita, longitudinaliter subcarinata, sutura subelevata, basi scutellum juxta utrinque tuberculata, humeris acute fortiter productis. Femora antica fortiter incrassata, lobis tarsorum maximis. ♂. Long. vix 4 mm. (Plate IX. fig. 21. ♂.)

This very remarkable species cannot be confused with any other, on account of the structure of the antennae, the middle joints of which are produced at their hinder apical angles, and are actually wider than the terminal ones, which usually form the club. The front and vertex of the head are not divided by any evident ridge, the eyes are strongly prominent, and the tarsal lobes of the front feet very large. The elytra when closely examined are seen to have each a fine ridge about midway between the suture and lateral margin. These ridges are a good deal more evident in one of the examples than in the other, and the development of the antennae also is decidedly greater in one of the two specimens.

HAB. Maui, Haleakala. Two male examples taken at an elevation of 5000 ft. in October, 1896.

(73) *Proterhinus epitrachys*, sp. nov.

Niger, statura majore, antennis pedibusque nigricantibus. Antennarum articulus primus brevis et robustus, secundus vix longior quam latior, caeteris elongatis, clava elongata distinctissime 3-articulata. Oculi permagni, fortiter prominentes. Pronotum squamosum, lateribus setis conspicuis erectis curvatis vestitis, fortissime 3-impressum, medium longitudinaliter subsulcatum. Elytra variegato-squamosa, grossissime rugoso-punctata, basi scutellum juxta utrinque tuberculata, setis gracilibus erectis conspicue vestita, sutura subdepressa, humeris fortiter productis. Femora antica sat incrassata, lobis tarsorum parvis. ♂. Long. 4 mm.

A large species, with very large eyes, antennae thick at the base, but becoming slender before the club-joints, and unusually small lobes to the second joint of the front tarsi. Thorax deeply impressed in the middle in front, and this impression connected by a longitudinal groove with a postero-median impression, the two sublateral impressions very deep and distinct, and rather large, the hind angles marked by a distinct spot of white squamosity. Elytra uneven, submaculately squamose, impressed between the basal tubercle and the strongly produced humeral angle on either side, the puncturation extremely coarse and rugose, the sutural portion subdepressed. The fine erect setae of the elytra and the curved ones on the prothorax unusually conspicuous. Tibiae with the setae short and somewhat dense.

HAB. Maui. A single ♂ taken on Haleakala in April, 1894, at an elevation of less than 4000 ft.

(74) *Proterhinus separandus*, sp. nov.

Rufescens, capite, thorace (plus minusve), antennis, femoribusque obscurioribus. Capitis vertex a fronte haud divisus. Oculi magni, fortiter prominentes. Antennae subgraciles, articulo primo crasso et brevi, clava distincte 3-articulata, haud notabili. Pronotum pallide squamosum, antice abrupte constrictum et transversim impressum, impressionibus posterioribus minus distinctis, dense rugoso-punctatum. Elytra griseo-squamosa, sparsim nigro-maculata, obscurius longitudinaliter carinata, basi extrema bituberculata, humeris productis. Femora sat fortiter incrassata, lobis tarsorum anticorum sat magnis. ♂. Long. 3·2 mm.

This species is quite distinct from any other species known on Maui, but is very closely allied to the Oahuan *P. ruficornis*. The single ♂ example described above is probably somewhat abraded, but there are evident erect pale setae still remaining on the elytra. There is no trace of a ridge between the front and vertex of the head, and the eyes are very large and strongly prominent. The antennae are not very slender, their basal joint is very short and stout, the second slightly longer than wide, the third about twice as long as this, the club is distinctly formed by three joints, but is not unusually elongate or in any way remarkable. This will easily distinguish the species from the Oahuan *P. ruficornis*, which has the club very strongly developed, its basal joint being more than usually elongate, very narrow at the base and much widened at the apex. Basal segment of the abdomen beneath rather strongly punctured, evenly at the sides, the puncturation becoming obsolete about the middle. Coxae rather less widely separated than in most of the species.

HAB. Maui. A single example taken in the Iao valley in March, 1894; and one from the mountains of Molokaï in 1893 may perhaps belong to the same species.

(75) *Proterhinus maculatus*, sp. nov.

Rufescens, femoribus nigricantibus, elytris nigro-maculatis. Antennae graciles, rufae, clava vix plus quam 2-articulata. Oculi minores. Pronotum squamosum, medium sat latum, antice fortiter abrupte constrictum, fortiter 3-impressum, lateribus setis curvatis conspicue marginatis. Elytra maculatim squamosa, setisque erectis pallidis parcius vestita, linea obliqua pallide squamosa posthumerali maculisque rotundis compluribus postice ornata, basi emarginata, humeris distinctis, vel productis. Femora omnia fortiter incrassata. Abdominis segmentum primum ventrale fortiter sed minus dense punctatum. ♂♀. Long. 2·6—3 mm.

I have seen only two examples of this species, and the ♀ is so different to the ♂ in form, owing to the extreme elongation of its elytra, as at first sight to appear

to be a quite distinct species. No doubt this will prove to be a variable character, and probably common to either sex, as in many other species of the genus. The species is not closely allied to any other of those taken on Maui, but rather resembles *P. vestitus* of Oahu and its allies on Hawaii. It is remarkable for its red colour, entirely red antennae, the club of which is hardly more than 2-jointed, since (especially in the ♀) the ninth joint is but little different to the preceding, and the strongly clavate black femora in either sex. The elytra have a distinct oblique post-humeral elongate spot of pale squamosity, and several small roundish ones behind these, they are subcompressed at the sides but can hardly be said to bear longitudinal ridges. Their puncturation is close and coarse, and their form in the ♀ is very long and narrow.

HAB. Maui, Iao valley, March 1894.

(76) *Proterhinus osculans*, sp. nov.

Parum latus, piceus, rufo-piceus vel rufescens, pedibus plerumque rufis, antennis, articulo basali saepe excepto, nigris. Oculi minimi sed prominentes. Antennae graciles, clava vix plus quam 2-articulata, articulo 8° et 9° inter se simillimis (hujus apice paullo latiore). Pronotum parce squamosum, antice transversim impressum, depressionibus posticis vel absentibus vel fere obsoletis. Elytra parum squamosa, post media saepe squamositate pallida binotata, setis erectis brevioribus vestita, densissime grosse rugoso-punctata, humeris acutis et productis. Femora omnia conspiciue gracilia. ♂♀. Long. 2—2.5 mm. (Plate X. fig. 6.)

This is very unlike any of the other Maui species, and it does not indeed appear to be very closely allied to any other species of the genus. It is chiefly remarkable for the unusually slender femora, the hardly more than two-jointed antennal club (the tenth joint being much wider than the ninth, and this not very different to the preceding), and the somewhat long rostrum of the ♀, which is narrowed towards the base, the surface being entirely longitudinally rugose. The eyes are quite small, but prominent, the squamous covering of the insect is sparse, revealing the dense puncturation, the surface itself being sometimes even shining, and set with shortish erect setae. The elytra are without longitudinal ridges, their humeral angles acute and somewhat produced. Usually the entire insect is covered when captured with an exudation, which conceals all the structure, and is difficult to remove.

HAB. Maui, Haleakala (5000 ft.). About 20 examples taken.

(77) *Proterhinus leptorhynchus*, sp. nov.

Parum latus, rufescens, pronoto cum capite obscuriore, irregulariter squamosus. Oculi parvi, prominuli. Antennae basi excepta nigrae, graciles, clava vix plus quam

2-articulata. Pronotum latum, antice abrupte constrictum, densissime punctatum, impressionibus posterioribus absentibus, linea longitudinali squamositatis densae utrinque notatum, caetera parte parce squamosa, setis curvatis sat distinctis lateraliter vestitum. Femora parum fortiter clavata. Elytra irregulariter albedo-squamosa, haud inaequalia, setis perpaucis erectis albidis inconspicue vestita, basim versus sat fortiter angustata, humeris acutis. Rostrum ♀ gracile, fortius elongatum, basim versus evidenter angustatum. ♀. Long. 2·5 mm.

This species is perhaps the most closely allied to *P. osculans*, having the rostrum of the ♀ of very similar form, elongate and widening towards the apex, and also very similar antennae. The general aspect of the two is very different, the abundant short erect setae, which form the chief portion of the clothing in *P. osculans*, being almost absent in the present species, and there are numerous other distinctions. The basal abdominal segment beneath closely and strongly punctured at the sides.

HAB. Maui, Iao valley. A single ♀ example taken.

(78) *Proterhinus mirabilis*, sp. nov.

Nigricans, tibiis, lobisque tarsorum, rufescentibus. Caput post oculos subconstrictum, oculis fortiter prominentibus. Antennae elongatae, vix graciles, articulo primo fortiter clavato et elongato, secundo robusto, longiore quam latiore, tertio quartoque elongatis, lateribus fere parallelis, clavae 3-articulatae articulo basali longiore et evidenter latiore quam articulus octavus. Pronotum profunde 3-impressum, antice fortiter angustatum, pallide (latera versus densissime) squamosum. Femora antice fortissime incrassata, lobis tarsorum latis et permagnis. Elytra maculatim squamosa, setisque erectis albidis parcius vestita, rugoso-punctata, subaequaliter convexa, basi scutellum juxta utrinque tuberculata, humeris productis. ♂. Long. vix 4 mm. (Plate IX. fig. 22.)

A somewhat large species, with the lobes of the front tarsi very strongly developed. The antennae are also remarkable, the basal joints being elongate but stouter than usual, the first long and strongly clavate, the next two or three nearly parallel sided, whereas the two or three preceding the club are short and of triangular shape. The three terminal joints form a distinct club, the 9th joint being considerably wider at the apex than the preceding. The head is constricted behind the eyes, an obscure ridge being formed between the front and the vertex. The thorax is wide across the middle, but very strongly and abruptly narrowed in front, the two posterior impressions are very deep, roundish, and small, the front one wide and vague, but deepened at the middle. The pale squamosity towards the sides is very dense. The elytra have no really definite longitudinal ridges, but are nearly evenly convex, tuberculate on either side

of the scutellar region at the extreme base, the humeral angles being produced, but hardly sharp. The front femora are extremely strongly incrassata, and the white erect setae on all the tibiae are dense and conspicuous.

HAB. Maui. A single ♂ of this fine insect was taken on Haleakala at an elevation of 5000 ft. in May 1896.

(79) *Proterhinus calliphyas*, sp. nov.

Nigrescens, tibiis, tarsisque, necnon saepe parte elytrorum et fronte, et rarius antennis, rufescentibus. Oculi parvi sed prominuli. Antennae graciles, articulis duobus basalibus sat crassis, clava 3-articulata. Pronotum perinaequale, a latere visum postice elevatum, medium longitudinaliter plus minusve distincte sulcatum, latera versus densissime pallide squamosum, lateribus fortissime rotundatis. Elytra maculatim squamosa, setisque erectis albis parce vestita, paulo post basim vage, sed evidenter, depressiusculum, humeris productis. Femora omnia sat fortiter incrassata. Abdominis segmentum primum ventrale dense minute granulato-asperulum, vix punctatum. ♂ ♀. 2·2—3 mm.

Although by no means a large insect this species is rather robust in form, especially in the ♂ sex. It is very distinct from most of the other species found on Maui which have the humeral angles produced, by the form of the prothorax, which, seen from the side, has the posterior half much elevated above the anterior, by the slender antennae with the two basal joints stout, and by the rather obscure depression of the elytra a little behind the basal margin. When in fine condition the elytra are prettily maculate, and the prothorax towards the sides is very densely squamose, the middle portion much less so. The dorsal and lateral portions of the thorax are very clearly marked off, the two forming a sharp edge where they meet, and this edge is set with curved setae.

HAB. Maui, Haleakala (4000—5000 ft.); generally attached to *Alyxia*. Allied to the larger *P. mirabilis* but very distinct.

(80) *Proterhinus persimilis*, sp. nov.

Major, fusco-niger, elytris pedibusque fusco-squamosis, *P. dispari* cognatissimi. Antennae elongatae et gracillimae, articulo secundo brevissimo, tertio fortiter elongato et gracillimo, clava 3-articulata, perelongata. Oculi fortissime prominentes. Pronotum antice angustatum et impressum, impressionibus duabus posterioribus sat distinctis, rotundatis. Elytra squamosa, setisque albidis erectis parce vestita, basi scutellum juxta utrinque tuberculata, dorso sutura excepta longitudinaliter impresso, humeris leviter productis. Femora (praesertim ♂) insignissime incrassata, lobis tarsorum anticorum latis. ♂ ♀. Long. 3·5—5 mm. (Plate X. fig. 7.)

Closely allied to *P. dispar*, Sharp, of which species it might be regarded as a highly-developed local race. The ♂ is remarkable for the development of the rostrum, which is less short than usual, and the extreme thickness of the femora. The eyes are large and very prominent, the antennae long and very slender, the lobes of the front tarsi strongly developed, being unusually wide, and the joint strongly transverse. The tibiae have a clothing of somewhat fine hairs. These are also mainly the characters of *P. dispar*, but that species may be distinguished by the less elongate and slender third joint of the antennae, and indeed generally by the following joints also being shorter, and it never attains the size of the larger examples of *P. persimilis*.

HAB. Maui, Iao valley; attached to *Wikstroemia*.

(81) *Proterhinus nivicola*, sp. nov.

Totus niger, angustus, parce squamosus. Antennae nigrae, graciles, breviores, clava vix 3-articulata. Oculi minores, minus prominentes. Pronotum subelongatum, minus distincte 3-impressum, parum squamosum, sed ad angulos posteriores macula albido-squamosa signatum. Elytra angusta, fortiter punctata, parcius obscure submaculatum squamosa, setis erectis brevissimis et perinconspicuis, basi utrinque scutellum juxta distincte tuberculata, angulis humeralibus fere rectis. Femora omnia minus fortiter clavata, lobis tarsorum anticorum minutis. ♀. Long. vix 3 mm.

Only a single example of the ♀ of this species having been taken nothing is known as to its variability. It is chiefly distinguished by its general black colour and narrow elongate form, but possesses no very remarkable characters. The ninth joint of the antennae is but little different to the preceding, so that the club is apparently 2-jointed. To the characters given above it may be added that the rostrum is rather short, shining, and with the longitudinal grooves somewhat strong, and that the basal ventral segment of the hind-body is strongly and closely punctate over its whole surface. The species is of interest as being the only one found far above the limit of the true forest.

HAB. Maui, Haleakala (9000 ft.); taken not many weeks after the disappearance of a heavy fall of snow.

(82) *Proterhinus punctipennis* Sharp.

*Proterhinus punctipennis* Sharp, Tr. Ent. Soc. London, 1881, p. 530.

The examples which served for the original description of this species were large and well-developed specimens. It is, however, very variable, the development of the antennae being much less strong in some examples than in others. The puncturation of the elytra, which is in reality very coarse and close, appears much less striking in individuals in which the squamous covering is more abundant, and frequently the insect

is entirely or to a large extent covered with an exudation, which altogether conceals or very much changes the appearance of the sculpture. Generally the insect is red, with dark lateral markings on the elytra, but some examples are nearly entirely blackish or piceous, with black antennae. Small individuals with slender antennae certainly closely approach the Oahuan *P. oscillans*, but I cannot consider the two species identical. Length 2—3 mm.

HAB. Maui, Haleakala (4000—5000 ft.); upwards of seventy examples of this species have been examined.

(83) *Proterhinus epimelas*, sp. nov.

Nigricans, tibiis tarsisque et rarius femoribus rufescentibus, maculatim pallide squamosus. Oculi parvi. Antennae graciles, articulo secundo elongato, haud minus longo, vel etiam (praesertim in ♀) nonnunquam longiore quam tertius. Pronotum antice depressum, lateribus fortiter rotundatis, setisque curvatis marginatis, utrinque plaga sublaterali densissime albido-squamosa. Elytra maculatim squamosa, parcissime albido-setulosa, punctata, humeris parum distinctis. ♂♀. Long. vix 2—2·5 mm.

A small species, remarkable for its dark colour, the tibiae and tarsi alone being as a rule of a red or pitchy colour, and for the elongation of the second joint of the antennae, which is subequal to the third in length, or not infrequently decidedly the longer of the two. The prothorax is very densely squamose towards the sides, less so towards the middle. The elytra have no longitudinal ridges, but are more or less perceptibly, though vaguely, impressed transversely a little behind the base, and therefore have a slight appearance of elevation at the extreme base in the region of the scutellum. The humeral angles are obscure.

HAB. Maui, Haleakala (5000 ft.); an extensive series taken. This insect varies a good deal in size, but is never a large and often a minute species.

(84) *Proterhinus ruficollis*, sp. nov.

Rufescens, elytris nonnunquam plus minusve nigro-marginatis, supra rarius nigro-infusatis, parum dense squamosus. Antennae graciles, sat elongatae, ruficolores, articulis apicalibus nonnunquam nigricantibus. Pronotum plerumque (♂ saltem) sat latum, medium parce, latera versus densius, aureo-squamosum, vix evidenter punctatum, antice transversim impressum. Elytra irregulariter nec dense squamosa, squamis saepe maculas minus distinctas rotundatas formantibus, dense et sat distincte punctata, setis erectis evidenter vestita, angulis humeralibus haud acutis. Femora postica minus fortiter clavata, lobis tarsorum anticorum parvis. ♂♀. Long. 1·8—2·2 mm.

One of the smallest species of the genus generally remarkable for being entirely, or for the most part, of a rufescent colour. The series of over a score of individuals exhibit not a little variation, and the tendency in some of them to become very narrow and elongate in form is remarkable, although a similar tendency is observed in several other species. Certain individuals approach very closely to some varieties of *P. deceptor*, but I cannot consider the two species identical.

HAB. Maui, Iao valley. A series of examples taken in March 1894. All were obtained at the same time and place. A single example taken on Molokai perhaps belongs to this species.

D. Species insulae Lanai propriae.

(85) *Proterhinus insignis* Sharp.

*Proterhinus insignis* Sharp, Tr. Dublin Soc. III. 1885, p. 173. Pl. V. fig. 44 and 45.

This species is distinct at a glance by its large size (although it is of rather narrow form), and the very strongly elongate slender antennae of the ♂, with their exceeding long but stout basal joint. In the ♀ this joint also is extremely elongated, but less so than that of the ♂. Length 3·5—4·5 mm.

HAB. Lanai, mountains (2000—3000 ft.); rare, only about a dozen examples were taken.

(86) *Proterhinus longicornis* Sharp.

*Proterhinus longicornis* Sharp, Tr. Dublin Soc. III. 1885, p. 173.

♂ readily distinguished by the unusually long antennae, and especially of the 8th joint, which is longer than the following or basal joint of the club. The antennae of the ♀ are much shorter, but the unusual length of the 8th joint is noticeable also in this sex. The species appears to be most closely allied to *P. kamptarthrus* of Oahu, but the two are very distinct. Length 2·5—3·75 mm.

HAB. Lanai, mountains; rare, less than a score of specimens taken.

(87) *Proterhinus lanaiensis*, sp. nov.

Statura majore, suboblongus, rufo-niger, elytris plus minusve variegatis. Antennae gracillimae, rufae, apicibus nonnunquam nigris, clava distincte 3-articulata. Oculi magni, coniformes, fortiter prominentes. Caput post oculos fortiter constrictum. Pronotum dense aureo-squamosum, distincte 3-impressum, setis curvatis conspicuis. Elytra

saepe nitida, grosse punctata, plus minus irregulariter vel maculatim squamosa, setis erectis gracillimis perconspicuis crebre vestita, basi scutellum juxta utrinque tuberculata, humeris fortiter acute productis, lateribus saepe fere parallelis. ♂ ♀. Long. 3—4 mm.

When in fresh condition this species is readily distinguished by the distribution of its squamous covering, and the very conspicuous and extremely fine erect setae, with which the elytra are clothed, combined with the characters afforded by its shape, the elytra being generally of more than usually parallel form, the distinct ridge formed between the vertex and front of the head, the conical prominent eyes, the coarse puncturation, and sometimes the shining surface of the elytra. There are on these, in some examples, traces of longitudinal ridges, but they are generally indistinct. Most closely allied, I think, to *P. haleakalae*, but certainly distinct. The rostrum in the ♀ of that species is quite dull, while in *P. lanaiensis* it is, at least to a considerable extent, shining.

HAB. Lanai, 2000—3000 ft. Not common.

(88) *Proterhinus ineptus* Sharp.

*Proterhinus ineptus* Sharp, Tr. Dublin Soc. III. 1885, p. 171.

*Proterhinus integer* Sharp, l. c. p. 172, var.

An extraordinarily variable species, of which *P. integer* Sharp is no doubt a narrow and highly-developed variety. The prothorax is very variable in length and roundness, and the size of eyes, tarsal lobes, length of the antennae are all variable characters. Many of the varieties of this species occur quite constantly, and it is quite probable that some of these are in the process of becoming distinct species, but between such forms as *P. ineptus* and *P. integer* intermediate varieties certainly occur. The larger individuals attain a length of about 4 mm., the smallest I have seen is less than 2 mm. in length, but the latter is quite exceptional.

HAB. Lanai, throughout the forest, from 2000—3000 ft. Many examples (from one to two hundred) examined.

(89) *Proterhinus detritus* Sharp.

*Proterhinus detritus* Sharp, Tr. Dublin Soc. III. 1885, p. 172.

(Plate X. fig. 1.)

Of this species I have seen very few examples, the type (♂) in Dr Sharp's collection, and four or five examples taken by myself. The former is in very abraded condition. The examples in the British Museum, which are placed under this name, as

determined by Mr Blackburn, are of a quite different species, and not allied to the true *P. detritus*<sup>1</sup>. The species is remarkable for its red or pitchy red colour, very elongate elytra, the abrupt narrowing of the prothorax in front, whereby a more or less distinct angle is formed on each side, the very short second joint to the antennae, and the deep *sulci* of the rostrum of the ♀. The squamosity has not a maculate arrangement, and is very scanty on the elytra, less so on the thorax, and dense on the face, and is of a golden colour in fresh examples, in which the erect flavescens setae on the elytra are quite conspicuous.

HAB. Lanai, 2000 ft. and upwards; a very scarce species.

(90) *Proterhinus epitretus*, sp. nov.

Elongatus, ferrugineus, setis erectis sat conspicue vestitus. Antennae ferrugineae, articulo secundo minus brevi, plus minusve elongato. Pronotum minus latum, saepe subelongatum, setis appressis, aliisque curvatis et suberectis vestitum, 3-impressum. Elytra elongata, grossissime punctata, setis elongatis, erectis, et gracillimis vestita, dorso parum vel haud convexo, angulis humeralibus productis et acutis. ♂ ♀. Long. 2.75—vix 4 mm. (Plate X. fig. 2.)

On account of the character of its clothing, form, and colour, this species could only be confused with *P. detritus* Shp. of those species found in Lanai, but it is distinct from that species by the form of the prothorax, less short second antennal joint, and finer and longer erect setae of the elytra, as well as by the smoother and less strongly grooved rostrum of the ♀, &c. *P. epitretus* on Lanai represents the *P. longulus* of Oahu, from which it differs in the more extremely coarse puncturation of the elytra, and the longer and finer erect setae, and the former character will also readily separate it from *P. ferrugineus* of Hawaii. The species varies greatly in size, and considerably in the length of the antennae. Minute examples are only one-half or one-third the size of the well-developed individuals.

HAB. Lanai, mountains (2000—3000 ft.); attached to the stems of the fronds of the tree-ferns.

(91) *Proterhinus brevisformis*, sp. nov.

Sat latus, parum convexus, niger, tibiis tarsisque et nonnunquam antennis etiam et femoribus rufis, elytris maculatim squamosis. ♂ antennae fortius elongatae et graciles, clava elongata 3-articulata. Pronotum latissimum, antice sat abrupte angus-

<sup>1</sup> Since writing the above I find that three insects were sent by Mr Blackburn to Dr Sharp under the number 449, and are marked A, B, and C. One of these is the true *P. detritus*, the other two are examples of what I consider to be the commonest form of *P. angularis*, the type specimens of that species being an unusual variety. These two examples are very different to one another, one being very narrow in form, a variety which I have taken on several islands in company with the more usual one of *P. angularis*. The British Museum examples under *P. detritus* are also vars. of *P. angularis*.

tatum, ibique impressum, ad medium minus dense, latera versus densissime squamosum. Elytra post basim depressiuscula, maculatim aureo-squamosa, setis perpauca erectis parum conspicue vestita, asperula, minus distincte punctata, angulis humeralibus obscurioribus. ♂ ♀. Long. circa 2.5 mm.

This little species is quite distinct, and rather reminds one of *P. dispar*. It appears to be very constant in its general appearance, and may be at once recognized from its nearest allies by its short and wide form, very wide thorax, long, slender antennae, dark colour, and the maculate arrangement of the squamosity of its elytra. The ♀ appears to be generally more slender, and of less distinctive appearance than is the ♂, but superficially the sexes much resemble each other.

HAB. Lanai, 2000 ft. Not a common species, about a dozen examples were taken in the winter of 1894.

(92) *Proterhinus analcis*, sp. nov.

Angustulus, sordide niger, vel piceus, squamis aureis irregulariter minus dense vestitus. Antennae breviores, graciles, nigrae, basi rufa, clava parum abrupte 3-articulata. Pronotum minus latum, saepe plus minusve evidenter 3-impressum vel antice tantum impressum, lateribus minus fortiter rotundatis. Elytra subirregulariter squamosa, setisque brevissimis erectis vestita, basi scutellum juxta utrinque plus minusve tuberculata, angulis humeralibus plerumque fere rectis. ♂ ♀. Long. 1.5—2.75 mm.

Quite one of the most obscure species of the genus and generally of minute size, and chiefly distinguished by the fact that it possesses, at least so far as I can see, no notable peculiarity of structure. The antennae are shorter than in most species, generally black, with one or more of the basal joints red, sometimes entirely black. The prothorax frequently shows three impressions, and is not at all wide. The elytra are usually subtuberculate at the extreme base on each side near the scutellum, and the squamous clothing is irregular and not dense, the erect setae short. These points and the obscure colour furnish the best characters, but the insect in reality is quite unlike any other species found on Lanai, nor will it agree with any of those taken on other of the islands.

HAB. Lanai, mountains; some dozens of this species have been examined.

(93) *Proterhinus epichlorus*, sp. nov.

♂ rufescens, rarius rufo-niger, pallide, vix vel haud maculatim, squamosus. Antennae fortiter elongatae, articulo secundo elongato, quam tertius vix vel haud minus longo. Pronotum latum, subaequaliter sat dense aureo-squamosum, lateribus fortiter rotundatis.

Elytra pallide squamosa, necnon setis brevibus erectis vestita, basi scutellum juxta subelevata, angulis humeralibus obscuris. Femora sat incrassata, lobis tarsorum anticorum haud minutis. ♂ ♀. Long. vix 2—2.5 mm.

Amongst the species with indistinct humeral angles, this is chiefly remarkable for the following characters, at least in the ♂ sex. The antennae are strongly developed, the basal joint robust and somewhat long, the second elongate, and when seen in some aspects as long as, or hardly less long than, the following. The club is of three joints, but not very distinct, as the intermediate joints are generally less slender than in many species. Thorax very strongly rounded at the sides. Lobes of front tarsi fairly well developed. Elytra with the erect setae short, and at the base in the region of the scutellum a little elevated. The colour of the insect is generally rufescent, sometimes with some darker markings on the elytra, but occasional specimens are much obscured with blackish colouring.

The ♀ which I assign to these males resembles it in general appearance but appears to vary in the length of the antennal joints.

The elongation of the second antennal joint in this species calls to mind *P. epimelas* of Maui, but the superficial appearance of the two is entirely different.

HAB. Lanai (2000—3000 ft.); not rare.

#### E. Species insulae Molokai propriae.

#### (94) *Proterhinus molokaiensis*, sp. nov.

Major, elongatulus, sordide niger, elytris magna ex parte rufescentibus. Antennae subvalidae, articulo primo fortius elongato, sed robustissimo, secundo brevissimo, clava evidenter 3-articulata, sed parum conspicua. Oculi magni fortiter prominentes. Pronotum subelongatum, dense punctatum, antice subabrupte et fortiter constrictum, 3-impressum, pallide squamosum, setis curvatis suberectis anterius marginatum. Elytra et longitudinaliter et transversim subinaequalia, dorso rufescente et pallide squamoso, subdeplanato, setis erectis pallidis conspersim sed conspicue vestita, remotius punctata, basi utrinque scutellum juxta fortiter tuberculata, humeris acutis, fortiter productis. Femora fortiter incrassata, lobis tarsorum anticorum parum elongatis, sed robustis. ♂. Long. 3.5 mm.

Allied to *P. validus* of Maui, this species is quite distinct.

HAB. Molokai. A single ♂ taken in the mountains at an elevation of 3000 ft., in June 1896.

(95) *Proterhinus convexiusculus*, sp. nov.

Nigricans (nonnunquam rufescens), elytris plerumque plus minus rufescentibus, sat convexis, pallide aureo-squamosus. Oculi magni, prominentes. Pronotum pallide squamosum, forma variabili, impressionibus sat profundis (nonnunquam lutoso-repletis), medium saepe longitudinaliter subsulcatum. Elytra sat convexa, pallide aureo-vel griseo-squamosa, squamis haud remotis minus distincte punctata, angulis ipsis humeralibus fortiter acute productis, sutura elevatula, setis erectis parce conspersis. Abdominis segmentum primum ventrale subtiliter granulatim asperulum. ♂ ♀. Long. 2·6—3·5 mm.

A variable species, individuals differing a good deal in size, colour, and distribution of the squamosity, as well as in the length and thickness of the antennae, &c. I have had some doubt as to whether it can be absolutely separated from that excessively variable species *P. integer* of Lanai, but have thought it better to keep the two apart. One almost entirely black example of this species has been taken, even the antennae being entirely of that colour, and only the tarsal lobes are piceous, and this individual has the elytra covered with grey squamosity. Usually the squamous covering is co-extensive with the red colour of the wing-cases, which typically are red at the base and there squamose, the apical dark parts being nearly free from squamosity, the extent of the red colour and squamous covering varying together. In *P. convexiusculus* it may be observed there is little or no trace of a transverse ridge between the front and vertex of the head.

HAB. Molokai, mountains, generally at an elevation of about 4000 ft. Numerous examples were taken, but many of them are in indifferent condition.

(96) *Proterhinus echinoides*, sp. nov.

Nigricans, elytris rufis, nigro-signatis, tibiis tarsisque rufescentibus, antennis fere nigris, pallide squamosus. Antennae breviores, subcrassae, clava 2-articulata. Oculi magni. Pronotum minus profunde 3-impressum, medium dense, latera versus minus dense, squamis pallidis vestitum. Elytra sat fortiter et fere aequaliter convexa, squamis pallidis necnon setis multis elongatis erectisque perconspicue vestita, basi scutellum juxta utrinque tuberculata, angulis humeralibus fortiter productis. Femora omnia cum tibiis setis elongatis pallidis conspiciue vestita, tarsorum anticorum lobis sat minutis. ♂. Long. 2·5—2·7 mm.

A small species, but very easily recognized by the unusual development of the erect setae on the elytra and legs, the short stout antennae, with the club hardly more than 2-jointed, large eyes, small tarsal lobes, and nearly evenly and somewhat strongly convex elytra. One example has the antennae rather more elongate than the others.

HAB. Molokai, mountains (3000 ft.); three males taken in June 1896.

(97) *Proterhinus leucothorax*, sp. nov.

Nigro- vel rufo-piceus, pedibus antennarumque basi plus minus rufescentibus. Oculi sat magni, prominuli. Pronotum fortiter 3-impressum, setis appressis squamisque albidis dense vestitum (impressionibus 2 lateralibus densissime squamis albicantibus vestitis), medium postice subsulcatum. Elytra grossissime dense rugoso-punctata, maculis duabus albidis squamosis postice signata, ex majore parte squamis carentia, sed setulis brevibus erectis albidis sat evidenter vestita, sutura distincte elevatula, cariniformi, angulis humeralibus fortiter productis. Femora postica parum fortiter incrassata. ♂ ♀. Long. 2—2·25 mm.

One of the smallest species of those which have the humeral angles of the elytra *strongly* produced forwards. It is chiefly remarkable for the gross sculpture of the elytra which are nearly free from squamous covering, and especially for the peculiarly dense whitish clothing of the thorax. I see no trace of a transverse ridge between the front and vertex of the head in the ♂, and only the faintest trace thereof in the ♀. The species is allied to *P. innotabilis*.

HAB. Molokai. Three examples (one of which has lost most of the squamous covering) were taken at an elevation of about 4000 ft.

(98) *Proterhinus angustior*, sp. nov.

Subgracilis, nigricans, elytris plus minusve (praecipue basim versus) rufescentibus. Antennae graciliores, minus fortiter elongatae, articulis basalibus plerumque rufescentibus, clava 3-articulata. Pronotum haud latissimum, ♀ saepe angustulum, haud dense squamosum, subfortiter 3-impressum. Elytra angustiora, nigricantia, partibus pallidioribus (sc. rufescentibus) squamas pallidas ferentibus, setis erectis, elongatis, parce conspersis, sat evidenter vestita, fere aequaliter convexa, basi scutellum juxta utrinque plus minus tuberculata, sutura levissime elevata, humeris fortiter productis. Oculi parum fortiter prominentes. Femora omnia fortiter incrassata, lobis tarsorum anticorum minoribus. ♂ ♀. Long. 2·4—vix 3 mm.

The affinities of this species are evidently with *P. humeralis* of Maui, which in many respects it greatly resembles. All the femora are quite strongly incrassate, very much as in that species, but the antennae, especially those of the ♂, are much less developed, as also are the eyes and the lobes of the front tarsi. The chief variation exhibited by the seven examples taken lies in the shape of the prothorax, which is a good deal more globose in some than in others. No doubt in a long series the tendency would be to a greater elongation generally in the females, as I have observed to be the case with other species. The sides of the rostrum of the ♀ are slightly convergent from base to apex.

HAB. Molokai, mountains (3000 ft.).

(99) *Proterhinus heterotarsus*, sp. nov.

Nigricans, elytris rufis plus minusve nigro- vel fusco-notatis, tibiis, tarsis, antennisque plerumque rufis, his apicem versus nigricantibus. Antennae graciles, clava distincte 3-articulata. Pronotum aequaliter minus dense squamosum, minus fortiter 3-impressum, globosum, lateribus fortiter rotundatis. Elytra griseo-squamosa, setisque erectis pallidis conspersim vestita, basi emarginata, humeris productis et acutis. Femora sat incrassata; tarsorum anticorum articulus secundus brevissimus, fortiter transversus, lobis brevibus. Species praecedenti simillima. ♂ ♀. Long. 2—2·7 mm.

Apparently closely allied to the preceding species (*P. angustior*), but generally of less narrow form, and with the thorax more globose, the antennae rather longer and more slender, and the elytra more nearly covered with squamosity, the dark markings being reduced. The variation of both species makes it difficult to distinguish the two in description, but the tarsi appear to be constantly different in form, the lobes of the second joint of the front pair being in this species extremely short, and the whole joint very small and strongly transverse, while the rostrum of the ♀ is nearly parallel-sided, not gradually but slightly narrowed to the apex. The extent to which the humeral angles of the elytra are produced is decidedly variable.

HAB. Molokai, mountains (3000 ft.); only six or seven examples taken.

(100) *Proterhinus erythrodes*, sp. nov.

Minor, rufescens, totus fere aequaliter pallido-squamosus, elytris nonnunquam fusco- vel nigro-notatis. Antennae graciles, elongatae, clava distincte 3-articulata, rubricolores, nonnunquam articulis apicalibus nigricantibus. Oculi minores, parum prominentes. Pronotum globosum, parum distincte impressum, aequaliter pallide squamosum, lateribus fortiter rotundatis. Elytra pallide squamosa, setisque nonnullis pallidis erectis parum conspicue vestita, aequaliter convexa, basi leviter emarginata, humeris distinctis, sed vix acutis vel productis. Femora omnia cum tibiis tarsisque rufescentia (rarius obscurata), lobis tarsorum anticorum minutis. ♂ ♀. Long. 1·6—2·5 mm.

A small and obscure species, without any striking characters. The antennae are rather long and quite slender, with a distinctly 3-jointed apical club; they are often entirely of a clear red colour, but the apical joints are sometimes more or less dark. The colour of the insect is red, that of the thorax being sometimes more or less obscured, as also is the head, and the elytra often have some dark markings. The squamous covering is evenly distributed over the greater part of the surface. The elytra at the base are lightly emarginate, but the humeral angles are hardly produced, or distinctly acute. The eyes are small and the lobes of the front tarsi minute.

HAB. Molokai, mountains (3000 ft.); only nine examples of this species were taken.

(101) *Proterhinus ombrophilus*, sp. nov.

Totus niger, haud latus, squamis pallidis inaequaliter vestitus. Rostrum ♀ totum opacum, subtiliter longitudinaliter rugulosum, basim versus sensim angustatum. Antennae nigrae, breviores, clava parum distincte 3-articulata (sc. articulo 8° et 9° inter se haud multo diversis). Oculi minores, sed subprominuli. Pronotum haud dense squamosum, rugoso-punctatum, obscurius 3-impressum, lateribus minus fortiter rotundatis, et macula albida squamosa densiore signatis. Elytra haud inaequalia, basim versus haud distincte angustata, obscure punctata et ubique asperula, irregulariter (submaculatum) albido-squamosa, setis erectis brevibus et subconspicuis, basi leviter emarginata, humeris distinctis, sed minus fortiter prominulis. Femora haud fortiter incrassata, tarsis omnibus nigris. ♀. Long. 2 mm. vix superans.

This species is closely allied to the unique *P. nivicola* of Maui, with which it closely agrees in colour, clothing, form of antennae, and rostrum, as well as in the somewhat peculiar sculpture. It differs from that species at once in its much less elongate elytra, which do not exhibit the same tendency to inequality of the surface. *P. ombrophilus* has the elytra of only moderate length.

HAB. Molokai. A single example taken in the highest forest of the island, in May 1893.

(102) *Proterhinus pteridis*, sp. nov.

Elongatus, angustissimus, rufescens, elytris saepe plus minus fusco- vel nigro-maculatis. Antennae brevissimae, incrassatae, articulo primo robusto, triangulari (♀ etiam fortiter elongato), caeteris brevissimis, clava brevi tantum 2-articulata. Pronotum squamosum, saepe plus minus evidenter 3-impressum, impressione antica majore, lateribus minus fortiter rotundatis. Elytra perelongata pulchre maculatum squamosa, setisque albidis vestita, humeris haud productis. Pedes sat robusti, lobis tarsorum minutioribus. ♂ ♀. Long. 1.75—2.5 mm. (Plate IX. fig. 24. ♂.)

Although varying a good deal in the development of some of the characters, this small species by its elongate and very narrow form, its maculate elytra, and extraordinarily short and thick antennae, is one of the most remarkable and distinct species of the genus. It is I think allied to *P. navita*, which makes some approach to it in the structure of the two basal joints of the antennae.

HAB. Molokai (3000 ft.); in the leaf-stalk of a species of *Pteris*.

## F. Species insulae Hawaii propriae.

(103) *Proterhinus hawaiiensis*, sp. nov.

Nigro- vel rufo-piceus, statura majore. Antennae graciles, elongatae, articulo tertio cum sequentibus sat fortiter elongato, clava distinctissime 3-articulata, articulo 9°, quam 8<sup>as</sup>, multo longiore. Oculi permagni, fortiter prominentes. Pronotum profunde 3-impressum (impressione quarta postice plus minus distincta), setis depressis aliisque curvatis et erectis vestitum, haud latum. Elytra pallide squamosa, setisque erectis sat crebre conspicueque vestita, grosse punctata, basi scutellum juxta utrinque tuberculata, humeris productis. Femora minus fortiter incrassata, tibiis anterioribus elongatis et gracilibus, tarsorum lobis parum magnis. ♂ ♀. Long. vix 4—4.75 mm. (Plate X. fig. 8.)

Only a pair of this large species have been examined. The elytra are much more elongate in the ♀ than in the ♂, but otherwise, apart from the usual sexual differences, the two are very similar structurally. The puncturation of the elytra is apparently very coarse and rough, but is not clearly seen owing to the squamosity. The species is easily recognised by its large size, very large and prominent eyes, long slender antennae, uneven setose thorax, the elytra somewhat impressed along the suture, the more than usually elongate and slender clavate hind femora, the long slender front tibiae, and for the size of the insect the small lobes of the front tarsi. It is allied to *P. epitrachys* of Maui.

HAB. Hawaii, Kona, 3000 ft. September 1892, 1 ♀; Oloa, 2000 ft. November 1896, 1 ♂. No doubt a rare species.

(104) *Proterhinus vulcanus*, sp. nov.

Niger, tarsis antennisque plus minusve rufescentibus. Antennae sat elongatae sed crassiusculae, clava distinctissime 3-articulata (sive articulo 8°, quam 9<sup>as</sup>, multo minore). Oculi magni, fortiter prominentes. Pronotum profunde 3-impressum, pallide (sat dense) vestitum, antice (saepe abrupte) angustatum. Elytra inaequalia, dorso subdeplanato, irregulariter aut maculatim cinereo-squamosa, setis erectis pallidis sat conspicuis, basi scutellum juxta utrinque tuberculata, humeris productis. Tarsorum anticorum articulus secundus major, lobis haudquaquam parvis. Rostrum ♀ longitudinaliter rugulosum. ♂ ♀. Long. vix 3—3.25 mm.

This species appears to be allied somewhat to the *P. lecontei* of Maui, and also perhaps to the preceding species (*P. hawaiiensis*). There are distinct traces of longitudinal and transverse unevenness of the surface of the elytra, but it is much less marked than that of *P. lecontei*. The thickness of the antennae is no doubt variable,

and one ♂ has these organs evidently more elongate and more slender than those of the other examples of either sex. The general resemblance in colour and clothing between the few individuals secured is very great. It is one of the darkest species, and of rather large size.

HAB. Hawaii (3000—4000 ft.); rare, but widely distributed. Five examples only were secured in the Kona and Kau districts.

(105) *Proterhinus peles*, sp. nov.

Niger, lobis tarsorum antennisque nonnunquam rufescentibus, parce ferrugineo-squamosus. Antennae graciles, elongatae, clava distinctissime 3-articulata. Oculi magni, subconici, fortiter prominentes. Pronotum minus latum, minus profunde 3-impressum, antice subabrupte angustatum, aequaliter nec dense squamosum. Elytra subinaequalia, sparsim ferrugineo-squamosa, setisque gracillimis albis sat conspicue, nec dense, vestita, basi utrinque scutellum juxta tuberculata, humeris acute productis. Femora postica minus fortiter incrassata, lobis tarsorum anticorum magnis. ♂ ♀. Long. 2.75—3 mm.

A somewhat distinct-looking species, of dark colour and moderate size. The antennae are fairly long and quite slender, the club very well-marked, and consisting of three joints. The eyes and tarsal lobes are both large. The elytra are not much covered with squamosity, this being chiefly noticeable along the two by no means strongly marked longitudinal ridges. The suture is also a little raised. The humeral angles are produced and very acute, and the basal tubercles well marked, as also is the puncturation. The colour of the insect is black or obscure pitchy-black, the lobes of the tarsi and antennae sometimes paler. Rostrum of the female rugulose, dull, or hardly shining.

HAB. Hawaii, Kilauea (4000 ft.); 1 ♂ and 1 ♀ taken in 1895.

(106) *Proterhinus rufescens*, sp. nov.

Rufescens, capite, thorace, femoribusque, saepe obscurioribus, elytris plus minusve nigro-maculatis. Antennae minus fortiter elongatae, articulis saepe crassiusculis, nonnunquam sat gracilibus. Oculi magnitudine mediocres, prominuli. Pronotum sat fortiter 3-impressum, aequaliter subferrugineo-squamosum. Elytra rufa, nigro-maculata, subseriatim fortiter punctata, minus dense squamosa, albidis duabus postice maculis ornata, setisque albis elongatis rarius conspersa, fere aequaliter convexa, basi scutellum juxta utrinque tuberculata, humeris fortiter acute productis. Femora postica minus fortiter incrassata, lobis tarsorum anticorum magnitudine mediocribus. ♂ ♀. Long. 1.75—3 mm.

This species in its typical condition is distinct enough from any other of those taken on Hawaii. The antennae (as above indicated) vary in stoutness, and the insect varies greatly in size, while the colour is sometimes much obscured, dark varieties being occasionally found. Minute examples naturally have the eyes and other parts less developed. In general, the red colour, and strongly produced humeral angles of the nearly evenly convex elytra, which are deeply and distinctly punctured (at least in clean examples), and which have two distinct spots of whitish squamosity, one on either side of the suture towards the apex, will distinguish it from the several following species, to which it is most nearly allied. It may be observed that there is no distinct transverse ridge formed between the vertex and front of the head as in some species on the other islands, to which this is otherwise very similar in appearance.

HAB. Hawaii, Kau district (4000 ft.); 40 or more examples taken.

(107) *Proterhinus affinis*, sp. nov.

Elongatulus, minus latus, nigricans vel obscure rufescens, parte elytrorum dorsali tota vel ex majore parte rufa. Oculi magni. Antennae forma variabiles, saepius crassiusculae, nonnunquam graciles, articulo secundo brevissimo, clava distincte 3-articulata. Pronotum minus latum, vel subelongatum, minus dense pallide squamosum, plus minusve evidenter 3-impressum. Elytra irregulariter, plerumque maculatum, squamosa, dorso rufo, saepe subdepresso vel deplanato, basi utrinque scutellum juxta tuberculata, humeris distinctis, subacutis, parum productis. ♂ ♀. Long. 2·25—3·5 mm.

This variable species in the smallest examples bears a great resemblance to large ones of *P. gracilis*, but the two are certainly distinct, the eyes and tarsal lobes being normally more developed in *P. affinis*, and the antennae thicker. These latter organs, however, exhibit some variability both in stoutness and length. Examples of the species taken in Kona generally have the elytra more evenly convex, less flattened or depressed above. In those from Kau, they are, in some cases, not only distinctly flattened, but show traces of longitudinal and transverse ridges. The humeral angles are distinct, although but little produced, and the tubercles in the region of the scutellum are distinct. The hind femora are not very strongly incrassate. There is no distinct ridge between the vertex and front of the head.

HAB. Hawaii (3000—4000 ft.); about 50 examples were taken from various localities.

(108) *Proterhinus gracilis* Sharp.

*Proterhinus gracilis* Sharp, Tr. Ent. Soc. London, 1881, p. 529.

This species in its typical condition is distinct enough, by its narrow and elongate form (especially in the ♀), the slender antennae, and dark elytra, marked with red at the

base. I have assigned to it specimens of much more obscure appearance, and with the humeral angles of the elytra less produced, but it is quite possible some of these belong to another distinct species. In any case *P. gracilis* varies greatly in size, colour and length of the elytra. It is allied to the preceding species, *P. affinis*, as I have remarked under that insect.

HAB. Hawaii. Various districts and localities (3000 and 4000 ft.); a great number of examples were taken.

(109) *Proterhinus eurhynchus*, sp. nov.

Nigricans, elongatulus, elytris irregulariter pallide squamosus. Oculi magni, prominentes. Antennae subcrassae, rufescentes, clava 3-articulata. Rostrum ♂ elongatum, aequè longum ac latum, vel paullo longius, lateribus pubescentia pallida densiore marginatis. Pronotum minus latum, fortiter 3-impressum, setis appressis aliisque curvatis et suberectis vestitum. Elytra basim versus obscure rufescentia, ibique pallide squamosa, subinaequalia, basi scutellum juxta utrinque distincte tuberculata, angulis humeralibus subproductis et distinctis. ♂. Long. circiter 3 mm. (Plate X. fig. 9.)

This species is very like *P. affinis* in form and general appearance, but is of a darker colour. The antennae are quite stout, the intermediate joints being a good deal widened from the base to apex, being of elongate triangular form. The ♂ is easily known by the long rostrum, which is even a little longer than its width at the base, and is clothed at the sides with a dense outstanding pale pubescence. I cannot assign any ♀ to the two males with the above characters.

HAB. Hawaii, Kilauea; 2 ♂ taken in July 1895.

(110) *Proterhinus tarsalis* Blackb.

*Proterhinus tarsalis* Blackburn, Tr. Dublin Soc. III. 1885, p. 171.

Only three or four examples of this species were taken by me, the ♀ having the antennae a good deal more elongate, and thinner, than those obtained by Mr Blackburn. The species is a distinct one in superficial appearance, and is allied to *P. vestitus* Shp. and *P. angularis* Shp., having the basal abdominal segment closely and strongly punctured beneath, as in those species.

HAB. Hawaii, Mauna Loa, at an elevation of 6000 ft. (Blackburn); Kona (3000 ft.); a few examples taken.

(111) *Proterhinus hypotretus*, sp. nov.

Sordide niger, vel rufescens, elytris nigro-maculatis. Antennae minus fortiter elongatae, crassiusculae. Oculi minus fortiter prominentes. Pronotum minus dense squamosum, plerumque plus minusve evidenter 3- vel 4-impressum, impressione anteriore sat distincta. Elytra maculatim squamosa, macula albida humerali aliisque posterioribus subrotundatis, sat distinctis, setisque erectis gracilibus albidis conspicue vestita, basi leviter emarginata, humeris distinctis, sed parum productis. Abdominis segmentum primum ventrale dense ac fortiter punctatum. Long. 2.2—3 mm.

Allied to the preceding species, but of wider form, and differing in colour, the insect being redder. Also closely allied to *P. vestitus* of Oahu, some varieties of *P. angularis*, &c., but certainly distinct from any of these. In fresh examples the maculate arrangement of the squamosity of the elytra, and the numerous erect fine setae, are very conspicuous. The elytra themselves are usually flattened or slightly impressed along the suture, the condition of the humeral angles is very similar to that seen in the same parts of *P. vestitus*. The lobes of the front tarsi are by no means large.

HAB. Hawaii.

(112) *Proterhinus desquamatus*, sp. nov.

Ferrugineus (elytris cum capite nonnunquam obscuratis sive nigro-rufis), elongatus, parum squamosus. Antennae concolores, rufae, articulo secundo brevissimo. Pronotum parum latum vel subelongatum, parum profunde 3-impressum, subaequaliter nec dense squamulosum, angulis posticis macula squamosa densiore signatis, lateribus rotundatis. Elytra elongata, vix squamosa, setis erectis pallidis, minus elongatis, sparsim sed conspicue vestita, dense fortiterque punctata, basi emarginata, humeris acutis. Abdominis segmentum primum ventrale fortiter et distincte punctatum. ♂ ♀. Long. circiter 3 mm.

On account of its elongate narrow form, ferruginous colour, and lack (at least for the most part) of squamous covering, this species could only be compared with *P. ferrugineus*, so far as the species of Hawaii are concerned. It is distinct at once from that insect by the distinctly and strongly punctured basal segment of the hind-body beneath. Extremely closely allied to *P. detritus* of Lanai, it may be distinguished from that species by the more evenly rounded sides of the prothorax, which are not so strongly and abruptly narrowed in front, and the puncturation of the elytra is apparently rather less coarse.

HAB. Hawaii, Kona (2000—3000 ft.); rare, 2 ♂ and 1 ♀ only having been taken.

(113) *Proterhinus ferrugineus*, sp. nov.

Elongatus, ferrugineus, elytris saepe nigro-notatis, setis appressis erectisque vestitus, haud squamosus. Antennae concolores, ferrugineae. Pronotum haud latum, setis appressis, aliisque curvatis et suberectis latera versus vestitum, plus minusve evidenter 3-impersum, antice saepe abruptius constrictum. Elytra fortiter elongata, haud squamosa, setis erectis brevissimis, aliisque longioribus, conspicue et densius vestita, fortiter dense punctata, basi scutellum juxta utrinque tuberculata, angulis humeralibus productis et subacutis. Femora postica gracilia, parum fortiter clavata. Abdominis segmentum primum ventrale circa medium parum distincte punctatum, granulatim asperulum. ♂ ♀. Long. 3—4.2 mm.

Very closely allied to the Oahuan *P. longulus*, of which species it is the representative on Hawaii. Of *P. longulus* I have only seen the types in Dr Sharp's collection, but *P. ferrugineus* is no doubt on the average a larger species, and yet has the hind femora still less clavate, and also appears to differ slightly in the sculpture and clothing of the elytra, and in other small points.

HAB. Hawaii (4000 ft.). In the leaf-stems of the tree-ferns, to which *P. longulus* is also attached.

(114) *Proterhinus similis* Blackb.

*Proterhinus similis* Blackburn, Tr. Dublin Soc. III. 1885, p. 170.

Species maxime variabilis, antennis nigris vel nigrescentibus, articulis 2 basalibus haud distincte rufis, elytrorum basi saepe emarginata, sed angulis humeralibus ipsis haud acute productis, saepe minus distinctis. ♂ ♀. Long. 2—3.5 mm.

This species is so extraordinarily variable, that it would be useless to draw up any lengthy and minute description, as it would apply to but few examples. It belongs to the section in which the humeral angles themselves are not distinctly produced forwards and acute, although the base of the elytra is often emarginate. The insect is black, red, or parti-coloured, the elytra sometimes entirely covered, sometimes nearly free from squamosity, which varies in colour from golden to grey; sometimes they are maculately squamose. Often they are depressed or flattened, often evenly convex, but nearly always they appear slightly elevated at the extreme base near the scutellum, and at that point have a small area along the suture free from squamosity, even when elsewhere they are entirely covered. The antennae are exceedingly variable, short or of medium length, with the joints robust and minutely asperated, or decidedly elongate, even the second joint being sometimes somewhat long and slender, and there are various intermediate conditions. In colour they are black, even the basal joints being black or at least dark. This character readily distinguishes the species from the other species of this group (the Hawaii form of *P. deceptor*), which has the basal two joints (at least) of

the antennae clear red, and the second joint more rounded. In those examples with the longest and most slender antennae, the front tibiae are often much lengthened, and the tarsal lobes appear to be very minute, and decidedly smaller than are those of certain other forms. After the examination of a vast amount of material (consisting of hundreds of examples) I have come to the conclusion that this species is at the present time in the process of becoming differentiated into a number of distinct forms. Some of these forms indeed may already be really distinct species, but to decide whether this is the case would probably require very careful observations of the living insect in various localities.

HAB. Hawaii. Common on the mountains, especially at an elevation of about 4000 ft. The whole insect is often covered with a muddy substance.

G. Species quae duas vel complures insulas incolunt.

(115) *Proterhinus innotabilis*, sp. nov.

Nigricans vel piceus, rare rufescens, elytrorum basi plerumque rufescente et pallide squamosa. Oculi prominuli. Antennae graciliores, minus fortiter elongatae. Capitis vertex a fronte linea transversa elevata (nonnunquam fracta) divisus. Pronotum minus latum, subferrugineo-squamosum, fortiter et distincte 3-impressum. Elytra minus elongata, fortiter crebre punctata, sutura saepe elevatula, basi plerumque rufescente, ibique pallide squamosa, postice maculis duabus albidis squamosis utrinque suturam juxta saepe notata, setis erectis albidis minus fortiter elongatis sparsim vestita, ad basim utrinque scutellum juxta tuberculata (tuberculis saepe albido-squamosis), angulis ipsis humeralibus fortiter acute productis. ♂ ♀. Long. (exemplorum in insula Maui capt.) 2—3 mm.

So far as examples from Maui are concerned this is a small species, or at least only of moderate size in very largely developed individuals. It is one of the most obscure of the numerous species found on Haleakala, and is allied to *P. epichrysus* and *P. brevipennis*, but cannot be referred to either. On Molokai I have taken specimens of a *Proterhinus* exceeding like *P. innotabilis* but of larger average size, and which apparently pass from this form into one, which becomes largely different to the typical Haleakala form, and indeed in many respects approaches the Molokai species *P. convexiusculus*. These examples from Molokai are themselves a most puzzling series, and may represent more than one species, but I have not cared to consider them at present as more than varieties of *P. innotabilis*, especially as this species is itself not a little variable.

HAB. Maui, Haleakala (4000—5000 ft.), Molokai. Not rare, many examples having been taken. The examples taken on Molokai are apparently referable to the same species.

(116) *Proterhinus angularis* Sharp.

*Proterhinus angularis* Sharp, Tr. Ent. Soc. London, 1881, p. 530.

An extremely variable species, no examples of the very long series examined agreeing altogether with the original types. In the most common form the antennae are long and slender, and clothed with stiff and conspicuous setae. Thorax very variable in shape, generally rather narrow, rarely constricted in front as in the type. The anterior depression is usually deep and distinct, the two posterior ones often obsolete. The posterior angles are not distinctly marked by spots of dense squamosity. Elytra long and narrow, shoulders always produced, but not very sharp, marked with a patch of pale squamosity, and behind there are often a number of more or less distinct and roundish pale squamous spots.

Small examples are often of extremely narrow and elongate form. The dark colour, form of the humeral angles of the elytra, and patches of pale squamosity thereon, and the strongly and closely punctured basal ventral segment of the abdomen are the most constant characters. The type specimens are remarkable for the more obscure colour of the very conspicuous erect setae on the elytra, and I have only seen a few examples resembling them in this respect. Usually the longer setae are quite white, and I am by no means satisfied as to the identity of the two forms, which may be closely allied and variable but distinct species. The length varies from 2—3.5 mm.

HAB. Oahu, Molokai, Maui, Lanai, Hawaii. Generally attached to *Straussia*. Variable in each locality.

(117) *Proterhinus dispar* Sharp.

*Proterhinus dispar* Sharp, Tr. Ent. Soc. London, 1881, p. 528; Tr. Dublin Soc. III. 1885, Pl. V. fig. 41, ♀.

I have seen but few Oahuan examples of this species, but have taken it very freely on Molokai, and have also met with it on Lanai. It varies very greatly in size and otherwise, and the distinctive characters become much obscured in diminutive specimens. Some examples from Oahu have the head and thorax as well as part of the elytra of a distinct red colour, and the antennae vary from black to red. The great differences in size are not a sexual character, for of the Oahuan examples taken by me one of the females is twice as large as either of the males, and exactly the reverse is the case with the types in Dr Sharp's collection. The species is an interesting one on account of the

rather large development of the rostrum in the ♂, and in the same sex the posterior coxae are much less widely separated than in many species, much less widely than the front pair. In the ♀ the distance between the hind coxae is greater, so that it does not greatly differ from the majority of species in this respect.

HAB. Oahu, Molokai and Lanai; attached to *Wikstroemia*.

(118) *Proterhinus alyxiae*, sp. nov.

Latus, brevis, robustus, ferrugineus, pulcherrime squamosus. Antennae elongatae, articulis basalibus notabiliter robustis (secundo subquadrato), clavam versus sensim gracilescentibus, clava gracili, vix evidenter 3-articulata. Pronotum trans medium latissimum, perinaequale, antice transversim fortiter impressum, parte posteriore fortiter elevata, antice posticeque ferrugineum, caetera parte densissime pallido-squamosa. Elytra brevia, lata, submaculatum squamosa, setisque albidis erectis conspersim vestita, dorso juxta basim impresso, ibique nigricante, basi emarginata, humeris productis. Femora omnia fortiter incrassata. ♂ ♀. Long. vix 3—3.2 mm. (Plate IX. fig. 23, ♂.)

Var. *pauper*. ♂ ♀ antennis gracilioribus, ♀ statura multo minore et forma graciliore distinguenda. ♂ ♀. Long. ♂ 2.75, ♀ 2 mm.

This beautiful species, on account of its short, wide form, reminds one at first sight of some Kauai species. It is not really closely allied to these, however, but it is so to *P. calliphys* of Maui. It is distinct from that species by the accentuation of most of those characters, which render the latter remarkable. The distinction between the dorsum and flanks of the prothorax is clearly marked by the sharp edge formed at their meeting.

HAB. Molokai mountains (3000 ft.); rare, taken from stems of *Alyxia*. Four females (var. *pauper*) taken on Lanai are only half or less than half the size of the smaller Molokai examples, and have much more slender antennae. The single ♂ taken with these is about as large as the type, but its antennae are decidedly thinner.

(119) *Proterhinus navita*, sp. nov.

Haud latus, rufescens, sat dense pallide squamosus, elytris saepe plus minusve nigro-notatis. Antennarum ♂ articuli 2 basales perconspicue robusti, nigricolores; articuli sequentes graciliores; plerumque evidenter, sed minute, tuberculati, clava parum distincte 3-articulata (sive fere 2-articulata). Pronotum densius aureo-squamosum, antice plus minus impressum. Elytra aureo- vel griseo-squamosa, setisque brevissimis nonnullis erectis inconspicue vestita, angulis humeralibus obscuris. Tarsorum anticorum articulus secundus minor, lobis minoribus. ♂ ♀. Long. 1.5—3 mm.

The male of this species is distinguished chiefly by the stoutness of the two basal joints of the antennae, the first, in well-developed examples at least, being very stout and subtriangular in form, the second very short and quadrate, and their colour is black or nearly so. Normally it is a red insect, with only some fuscous or black spots on the elytra, and even these are sometimes absent, but in some examples the black colour is a good deal extended over the insect, the basal half of the elytra remaining pale. In general the ♀ resembles the ♂, but the peculiar character of the basal antennal joints is not always so pronounced. In faded examples the squamosity is grey, instead of golden.

HAB. Lanai (2000—3000 ft.); Molokai (3000 ft.).

(120) *Proterhinus debilis* Sharp.

*Proterhinus debilis* Sharp, Tr. Ent. Soc. London, 1878, p. 19.

I have not met with any examples on Oahu that agree with this species, and have only examined three or four specimens, so I do not know whether the antennae vary in structure. In its typical form it is quite distinct from any other Oahuan species. Mr Blackburn also referred some specimens taken on Hawaii to this species.

HAB. Oahu, Waianae mountains; and on Hawaii (Blackburn).

(121) *Proterhinus deceptor*, sp. nov.

Rufescens, elytris latera versus nigris vel nigro-notatis, horum angulis humeralibus haud distinctis. *P. oscillanti* simillimus, sed setis elytrorum erectis magis distinctis, et rostro ♀ evidenter minus elongato et latiore. ♂ ♀. Long. 1.75—2.25 mm.

This species is very similar in most respects to *P. oscillans*, the humeral angles of the elytra being usually very indistinct or effaced. The squamosity, which likewise has a tendency to form a number of roundish spots on the elytra, is thereon greyish or silvery rather than golden. Their erect setae in fresh examples are longer, more numerous and much more evident, and so also are those upon the legs. Usually the elytra are red, and black or infuscate only along the lateral margins, but sometimes about the middle the black colour extends inwards to form lateral spots as in *oscillans*. These distinctions alone would perhaps appear hardly sufficient for the formation of another species, were it not for the fact that the rostrum of the ♀ is decidedly shorter and wider than that of *oscillans*, and is not distinctly narrowed towards the base.

HAB. Oahu. Waianae range. Examples from slightly different localities do not altogether agree, and it is uncertain whether the series examined is really all of one species.

Obs. On Kauai a variable insect is found, which I refer to the above species. These Kauai examples are generally darker than those from Oahu, and have the elytra often entirely blackish, or only obscurely red. On Molokai or Lanai the species is again found, and the individuals again are subject to much variation. On Hawaii the individuals attain a considerably larger size than the type, and on this island form two distinct races, one found on the windward and southern parts of the island, the other in the Kona district on the west. These Kona examples are readily distinguished from the others by the more elongate and conspicuous erect setae of the elytra, and they are of smaller average size. For these two races I propose the names *P. deceptor* var. *major* and var. *konanus*.

(122) *Proterhinus blackburni* Sharp.

*Proterhinus blackburni* Sharp, Tr. Ent. Soc. London, 1878, p. 17.

*P. hystrix* Sharp, op. cit. 1881, p. 527, = var. of this species.

(Plate X. fig. 5, ♂, var. *bisignatus*.)

This species varies greatly in size, colour, form of thorax, length of elytra, &c., and I do not think the *P. hystrix* Sh. is a distinct species. On Kauai there are two well-marked varieties, the var. *eugeniae*, var. n., of somewhat robust form, the thorax with strongly prominent lateral angles in front, the erect setae of the elytra dense, and with a good deal of pale appressed clothing, which tends to form four spots, the antennae longish and slender; and the var. *bisignatus*, var. n., which a good deal resembles the preceding form, but is darker, and has the basal tubercles of the elytra conspicuously marked with white or silvery appressed setae. The sculpture and clothing of this species is often entirely concealed by a mud-like covering, and it is not improbable that I have included several distinct species under one name, for it is one of the most difficult species to study, and many of the examples taken are in indifferent condition, but supposing there are several allied species, they are certainly all variable.

HAB. Found on all the islands of the group, in the forests from 1500—4000 ft.; the var. *hystrix* on Hawaii, var. *bisignatus* peculiar to Kauai, and var. *eugeniae* on the same island, but with very similar examples on Molokai.

#### COLEOPTERA HETEROMERA.

All the Heteromera, with the exception of the Cistelidae, are probably foreign. Those that are not known at present to occur outside the islands will probably be discovered elsewhere as the study of Coleoptera progresses.

## Fam. OEDEMERIDAE.

OXACIS Leconte.

(1) *Oxaxis collaris* Shp.*Ananca collaris* Sharp, Tr. Dublin Soc. 1885, p. 169.

HAB. Oahu, Molokai, and probably all the islands on the plains. I observed this species in great numbers on the quarantine island at Honolulu, where it was crawling over shrubs covered with the scales of *Ceroplastes*.

## Fam. ANTHICIDAE.

ANTHICUS Payk.

(1) *Anthicus oceanicus* Laf.*Anthicus oceanicus* Laferté, Mon. Anth. p. 170.

HAB. Kauai, Oahu and Maui and probably all the islands; on the coast.

(2) *Anthicus mundulus* Shp.*Anthicus mundulus* Sharp, Tr. Dublin Soc. 1885, p. 168.

HAB. Oahu and Kauai (Blackburn). Salt marshes near sea-level.

## Fam. CISTELIDAE.

The Cistelidae are represented by two genera, *Cistela* with seven, and *Labetis* with three<sup>1</sup> species. The latter genus is peculiar to the islands, as are all 10 of the species of this family. All are true forest insects, and are certainly indigenous. Species of both genera have been found on Kauai and Hawaii, but not on all of the intermediate islands, so that no doubt several species are yet to be discovered. So far as is known no species of either genus extends its range to two of the islands.

<sup>1</sup> The two examples taken on Oahu by Mr Blackburn and which probably represent other two distinct species are not included in these remarks.

## CISTELA Fabr.

(1) *Cistela crassicornis* Sharp.

*Cistela crassicornis* Sharp, Tr. Dublin Soc. 1885, p. 168, Pl. IV. fig. 25.

HAB. Oahu. Mountains near Honolulu. Palolo valley (Blackburn); my single example was taken at the head of Pauoa valley, which is not far distant. It is, I have no doubt, of the ♀ sex. It has the elytra densely punctured, and I fancy that Sharp's description of the ♂ 'elytris parcius punctatis' is rather apparent than real and is due to the condition of the specimen, which is not thoroughly clean.

(2) *Cistela kauaiensis*, sp. nov.

Rufo-brunnea, ad colorem testaceum varians, capite thoraceque opacis, densissime punctatis, elytris subnitidis, suturam versus plus minusve evidenter striatis, ibique saepe impressis, sat crebre punctatis, punctis nonnullis seriatim dispositis. Long. 7.5—9 mm. Antennarum 4—4.25 mm. (Plate X. fig. 22.)

Extremely like *C. crassicornis* but larger and with very evidently longer antennae. The species agrees generally in sculpture with that species. It varies a little in the length and structure of the antennae, irrespective of sex, but even in the most highly developed ♂ the joints are elongate even towards the apex. In this sex the three which precede the apical joint are distinctly grooved beneath. The apical ventral segment in the ♂ has the apical margin somewhat raised, and this is to some extent the case in some of the ♀♀, but usually this segment in the ♂ has a more flattened or impressed form than in the other. The apical joints of the antennae in the ♀ are narrower than the ♂, and but little serrate inwardly.

HAB. Kauai 4000 ft. Not common.

OBS. Two or three examples from Lihue on the same island taken at an elevation of 3000 ft. have shorter antennae and are only of the size of the smaller individuals of *C. kauaiensis*. They are therefore somewhat intermediate between that species and *C. crassicornis* but probably are distinct from either.

(3) *Cistela nigricollis*, sp. nov.

Nigra, elytris brunneis, antennis pedibusque testaceis, capite nitido. Long. 7 mm., antenn. 3.5 mm. ♂.

Very closely allied to *C. kauaiensis*, but smaller and readily distinguished by the black head and thorax, the former in front being distinctly punctured, not very densely

and rugosely, and with the surface between the punctures distinctly shining. The joints of the antennae ( $\delta$ ) towards the apex are also rather shorter and wider.

A single example taken at Halemanu, Kauai, is larger with longer elytra and has the front of the head more closely punctured, but otherwise resembles the type. I should think it is probably a distinct species.

HAB. Kauai. High plateau (4000 ft.).

(4) *Cistela subaenescens*, sp. nov.

Nigra ( $\text{♀}$  piceo-nigra), pedibus antennisque testaceis, his apices versus obscurioribus, elytris subaeneo-micantibus. Long. circa 7 mm., antenn. circa 3 mm.

Black, or in the  $\text{♀}$  piceous, the elytra with distinct aeneous glitter. Head and thorax densely punctured. Antennae of the  $\delta$  with the terminal joints shortish, and serrate inwardly, deeply grooved beneath, less wide in the  $\text{♀}$ , testaceous at the base, becoming infusate towards the apex. Elytra shining, pubescent, aeneous, somewhat densely punctured.

HAB. Oahu, Waianae mountains (3000 ft.).

(5) *Cistela apicalis*, sp. nov.

Elongata, angustula, nigricans, antennis, pedibus et parte elytrorum apicali, testaceis, oculis permagnis. Long. 7.6 mm.

Extremely like the preceding, a little more elongate, the elytra with a very faint indication of brassy reflection in certain lights, testaceous on their apical portion, less shining, and less strongly and more obscurely punctured than in *C. subaenescens*, the antennae entirely clear testaceous, and the eyes decidedly larger.

HAB. Oahu. Two examples were taken in the mountains at Honolulu in the summer of 1896.

(6) *Cistela montana*, sp. nov.

Nigricans vel piceus, elytris aeneo-micantibus, antennis testaceis, apices versus saepe obscurioribus, antennis brevioribus, articulis apicalibus parum fortiter dilatatis. Long. 6—6.5 mm., antenn. vix 2.5 mm.

A rather smaller species than *C. subaenescens*, which it greatly resembles, and easily distinguished by the shorter antennae, which have the apical joints much less strongly dilated in the  $\delta$ . In colour and sculpture the two species are identical, and one example of a rufo-piceous colour I suspect is the  $\text{♀}$  of *C. montana*.

HAB. Kauai. Four examples were taken on the high plateau.

(7) *Cistela konaë*, sp. nov.

Fusco-brunneus, pedibus antennarumque basi testaceis, elytris nitidis, submetallicis, sat evidenter sed parum profunde striatis, crebre punctatis, punctis nonnullis seriatim dispositis, interstitiis convexiusculis. Long. circa 6 mm.

Of an obscure brownish colour, the head and prothorax darker, the face in front of the antennae and the legs testaceous. Head very densely punctured, the eyes by no means large. Prothorax nearly dull, very densely punctured, strongly transverse, truncate or slightly emarginate in front. Elytra shining, distinctly and closely punctured, with the interstices even towards the sides quite distinctly convex, so that the striation is more evident than in any other species. In the single example taken only the basal joints of the antennae remain, and these present no noteworthy characters. Perhaps most nearly allied to *C. montana*, but quite distinct from this and other species by the condition of the elytral interstices, and also apparently remarkable for the very wide prothorax, the sides of which are nearly straight and parallel for about two-thirds of their length from the base. The eyes are smaller than in most species of the genus. The single mutilated example is probably a ♀.

HAB. Hawaii, Kona, 5000 ft. A single example (mutilated) was taken from a spider's web.

LABETIS Waterhouse.

(1) *Labetis hawaiiensis*, sp. nov.

Nigra, subnitida, elytris testaceis vel brunneis, antennis (articulis basalibus exceptis) nigricantibus, pedibus testaceis. Long. 10—12 mm. Antenn. 5—7 mm.

Head black, closely punctured in front, but the surface more or less shining between the punctures. Prothorax black, the surface shining, closely punctured, with a narrow smooth median longitudinal impression, more distinct in some examples than in others, and in some there are also indefinite impressions, rendering the surface more or less uneven. Elytra varying in colour from testaceous to brownish, striate, the striae nearest the suture often deeper than the outer ones, closely punctured, the interstices conspicuously punctate, the punctures closer in some examples than in others, the surface shining. At the apex the first and second interstices are about equally convex. Anterior tibiae with the superior apical angle greatly produced (varying in development), and rounded at the apex. Abdomen beneath black, finely punctured, the apical segment very deeply impressed in the ♂, and faintly but evidently so in the ♀.

HAB. Hawaii, Kilauea; a series of over a dozen examples taken in August.

(2) *Labetis tibialis* Waterhouse.

*Labetis tibialis* Waterh., Ent. Mag. xv. p. 267.

Haud nitida, testacea, pronoto saepe fusco-testaceo, antennis plerumque testaceis, elytrorum interstitio primo et secundo apicem versus subaequaliter convexis, haud inaequaliter elevatis. Long. 10·5—12·5 mm.

Closely allied to the preceding, but easily distinguished by the dull surface, and the pale colour of the prothorax, the antennae also are pale. One example has the prothorax largely blackish, but it is pallid about the middle. Abdomen black (or nearly so) beneath. The depth of the impression of the apical ventral segment of the ♂ evidently varies.

HAB. Kauai, 4000 ft., on the high plateau. That the examples taken by Blackburn on Oahu and referred to this species are, as I suspected, distinct, has been confirmed for me by Mr Waterhouse, who kindly examined the Oahuan specimen in the British Museum. Probably the Oahuan species is very near to if not identical with my *L. hawaiiensis*. The Blackburnian collection should contain two species from Oahu, probably one from either mountain range (vide Tr. Dublin Soc. 1885, p. 248), for there is no such variation in size in the species of this genus, as that given by Blackburn for his two examples (l. c. p. 167), one of which is much smaller than the other known species of the genus, the other probably the largest.

(3) *Labetis comitans*, sp. nov.

Praecedenti cognatissima, opaca, testacea, capite pronotoque nonnunquam plus minus infuscatis, hoc saepe piceo, elytrorum interstitio secundo apicem versus fortissime convexo-elevato, primo plus minus obsoleto, abdominis segmentis ventralibus (saltem ex magna parte) pallidis. Long. 10—12·5 mm. (Plate X. fig. 21.)

Quite like the preceding in general appearance, and differing constantly, so far as I can see, only in the paler underparts of the body, and the sculpture of the elytra near their apex. In this species the second interstice is extremely convex, as also is the sutural margin, while the first interstice is little or not at all raised, and a deep groove is thereby formed between the suture and the second interstice. The elytral interstices are generally more strongly and densely punctured than in either of the preceding species, but all vary in this respect.

HAB. Kauai. Taken in company with *L. tibialis*. Of the 18 examples of *Labetis* taken in company, 8 belong to the present species, and 10 to *L. tibialis*. I can detect no variety in the least intermediate between these, and therefore must consider them distinct. Nearly all the examples of both are of the ♂ sex.

(4) *Labetis*, sp.?

HAB. Oahu. Mountains near Honolulu (Blackburn). See remarks under *L. tibialis* (ante).

(5) *Labetis*, sp.?

HAB. Oahu (? Waianae mountains), Blackburn. See remarks under *L. tibialis* (ante). This and the preceding species are stated (Tr. Dublin Soc. 1885, p. 248) to have been obtained in localities 20 miles apart.

## Fam. TENEBRIONIDAE.

## EPITRAGUS Latr.

(1) *Epitragus diremptus* Karsch.

*Epitragus diremptus* Karsch, Berlin. Ent. Zeitschr. xxv. p. 6.

HAB. Generally distributed throughout the islands.

## OPATRUM Fabr

(1) *Opatrum seriatum* Boisd.

*Opatrum seriatum* Boisd., Voy. Astr. Col. p. 252.

HAB. All the islands of the group, on the lowlands.

## PLATYDEMA Cast.

(1) *Platydema obscurum* Shp.

*Platydema obscurum* Sharp, Tr. Dublin Soc. 1885, p. 166.

HAB. Oahu. Probably characteristic of the lowlands.

## GNATHOCERUS Thunb.

(1) *Gnathocerus cornutus* Fabr.

*Trogosita cornuta* Fabr., Ent. Syst. Supp. p. 51.

HAB. Oahu, Honolulu.

## TRIBOLIUM Macl.

(1) *Tribolium ferrugineum* Fabr.

*Tenebrio ferrugineus* Fabr., Sp. Ins. 1. p. 324.

HAB. Oahu, Honolulu &c., in food.

## ALPHITOBIOUS Steph.

(1) *Alphitobius diaperinus* Panz.

*Tenebrio diaperinus* Panz., Ins. Germ. 37, 16.

HAB. Lowlands of most or all the islands.

(2) *Alphitobius piceus* Ol.

*Helops piceus* Ol., Ent. III. 58, p. 17.

HAB. Generally distributed in the islands.

(3) *Alphitobius lateralis* Boh.

*Heterophaga lateralis* Boh., Eug. Res. 1858, p. 94.

HAB. Oahu, Honolulu.—Maui. Introduced, probably from China. This species was kindly determined for me by Mr Champion.

## SCIOPHAGUS Sharp.

(1) *Sciophagus pandanicola* Fairm.

*Heterophaga pandanicola* Fairm., Rev. Zool. 1849, p. 446.

HAB. Oahu and Kauai (Blackburn).

## Fam. CIOIDAE.

The Cioidae is a family of doubtful position. They are represented by 42 species, 29 of which are referred to the genus *Cis*, and 13 to a new genus, *Apteroeis*. The members of the latter genus are the most remarkable island representatives of the family, although most of those assigned to *Cis* are themselves of peculiar facies, and very unlike the ordinary representatives of the genus. There is however no doubt that both these genera, as represented in the islands, will hereafter be further divided.

Thus in *Apterocis* some of the species e.g. *A. ephistemoides* are quite regularly convex, the prothorax being very closely adapted to and continuing the curve of the elytra. In others, e.g. *A. rufo-notatus*, *A. variegatus*, &c., the outline is not regularly convex, but is interrupted at the point of contact of the elytra and prothorax. Some of the species of this latter group closely resemble *A. ephistemoides* in general appearance, but others e.g. *A. variegatus* have a very coarse sculpture, and one (*A. hystrix*) is unique in the genus as being conspicuously clothed with erect hairs. We also notice differences in the structure of the mesosternum in front of the coxae, and in *A. variegatus* and probably in the allied *A. ornatipennis*, the metasternum is less short than is normal in the genus.

Of the species assigned to *Cis*, *C. pacificus* is the most commonplace and greatly resembles European species, and will probably be found to be not indigenous. It has some resemblance to *C. brevisformis* but to no other species, and the latter also has a very different appearance to the truly indigenous species, and I suspect may prove to be also foreign. Another species *C. alienus* may also prove to have been introduced. The remaining 26 species are all of peculiar facies, and exhibit considerable variety of form and appearance, and must be considered as peculiar to the islands. *Cis molokaiensis* (and probably *C. haleakalae*, the unique example of which could not be examined from this point) is wingless or nearly so, but we have not separated it generically on that account, because the wings of another species, *C. fallax*, are in a more or less rudimentary condition, and we are not even certain whether this species is more than a variety of the normally full-winged *C. signatus*. Besides these species, *C. mimus* and *C. diminutivus* appear to me to belong to the same group, and will probably prove to have the wings either absent or rudimentary, the abortion of the wings being accompanied, in most of the species at least, by a shortening of the metasternum. In these characters it will be seen that the insects above mentioned approach to the genus *Apterocis*, but they lack the oval and highly convex form, which is so striking a feature of the latter. Nevertheless the complex affinities between the Hawaiian species of *Cis* (excluding the doubtfully indigenous forms) and *Apterocis* render it highly probable that the latter originated in the islands, through forms somewhat similar to some of the species of *Cis*, which now inhabit them.

Some few of the species of *Cis* are found in large fungi growing externally on trees, but the greater number are attached to dead branches of trees, or found beneath dead bark, where they no doubt feed on the smaller fungi which grow in such places. Individuals of many of the species are numerous, and they are no doubt parasitised by the minute Hymenoptera of the genera *Sierola* and *Scleroderma*, which are taken in their company. We have lately bred forms (winged and wingless) allied to these Hymenoptera from the burrows of *Ennearthron*, another genus of Cioidae, in this country.

## Cis Latr.

(1) *Cis alienus* Sharp.

*Cis alienus* Sharp, Tr. Ent. Soc. London, 1879, p. 91.

This is very different to any other Hawaiian species, and is probably either a natural immigrant, or has been introduced by man. Its general appearance, the clothing of the under parts, the great length of the prosternum in front of the coxae &c., are all foreign to the true native type.

HAB. Oahu, Honolulu, mountains; two examples taken (Blackburn); Waianae mountains, several examples, Perkins. It is probably a scarce insect.

(2) *Cis pacificus* Sharp.

*Cis pacificus* Sharp, Tr. Ent. Soc. London, 1879, p. 91.

The most common-place species of the genus as represented in the islands, and probably not truly indigenous. The processes on the head of the ♂ vary greatly in development.

HAB. Throughout the islands in the mountain forests.

(3) *Cis breviformis*, sp. nov.

Parum elongatus, ferrugineus, pronoto plus minusve infuscato, pedibus antennisque rufo-testaceis, harum articulis apicalibus nigricantibus. Pronotum opacum vel minus nitidum, brevissime griseo-pubescentis, sat latum, densius subtiliter punctatum. Elytra breviuscula, griseo-pubescentia, haud maculata, parum profunde ruguloso-punctata. Long. 2 mm.

Somewhat like *Cis pacificus* in form, and quite unlike any other Hawaiian species. The thoracic puncturation is rather close and very fine, that of the elytra is larger, but shallow, rugose and irregular. Both the thorax and elytra are clothed with very short pale setae, which hardly stand out from the surface, but are quite conspicuous, and with the short form and ferruginous colour give the species a very distinctive appearance.

HAB. Molokai. Two examples taken at an elevation of above 4000 ft.

(4) *Cis nesiotes*, sp. nov.

Subcylindricus, haud fortiter convexus, pronoto aeneo, antice posticeque saepe pallescente, elytris testaceis, marginibus lateralibus fasciaque transversa circa media nigris, setulis pallidis brevissimis inconspicue vestitis. Pronotum nitidum distincte sat fortiter punctatum. Elytra grosse denseque rugoso-punctata. Pedes articuli que antennarum basales testacei, femoribus saepe antennarumque clava nigricantibus. Long. vix 2—2·5 mm.

A distinct species with the thorax always brassy or coppery, elytra pale, black along the margins and about the middle of their length with a transverse fascia, which forms two sharp angles. This fascia is sometimes broken up into detached spots. The species is chiefly remarkable for the coarse (but shallow) and very rugose puncturation of the elytra, which even on the apical portions is hardly different in character. The very short pallid setae are quite evident but not conspicuous. There are no long hairs on any part of the elytra. There is considerable variation in the puncturation of the prothorax, the punctures being very much coarser and closer in some examples than in others, and in many the surface of this part is evidently uneven.

(5) *Cis cognatissimus*, sp. nov.

Praecedenti forma et colore simillimus, pronoto aeneo, nitido distincte punctato, elytris testaceis nigro-signatis, basi grossius rugoso-punctata, setulis pallidis brevissimis vestitis, apicem versus minus dense rugoso-punctatis et laevioribus. Long. 1·7—2·25 mm.

Extremely like the preceding, and very variable in size; in some examples the median transverse fascia of the elytra is represented by two spots, but usually it forms a sharp angular mark on either wing-case just as in the preceding. The thorax is distinctly and clearly punctured, more closely in some examples than others, the surface shining. The elytra are less rugosely punctured, towards the apex a good deal smoother and the punctures less close and rugose than in *C. nesiotes*, and for this reason the two forms cannot be considered identical. The clothing is of the same character in both the species.

HAB. Kauai, Oahu, Lanai, Molokai, Hawaii, in the mountains from 2000—4000 ft.

(6) *Cis bicolor* Sharp.

*Cis bicolor* Sharp, Tr. Ent. Soc. London, 1879, p. 93; Blackburn, Tr. Dublin Soc. 1885, p. 163, Pl. IV. fig. 22.

This is a distinct species and is I believe quite distinct from *C. tabidus* Shp., which in Tr. Dublin Soc. (l. c. supra) was sunk as a variety of it, as well as from the

forms with aeneous thorax mentioned in Blackburn's note (l. c.). The latter at least in part are no doubt referable to *Cis cognatissimus* or *C. nesiotis*, or to both of these species. Usually *C. bicolor* may be distinguished at a glance from these species by its general appearance. The prothorax is black, not aeneous, and is widely pale in front and more or less so posteriorly. The elytra are testaceous with a black spot on each about the middle, and in front of these is another spot placed transversely across the suture. This transverse spot is absent in only a few examples in a long series and it is doubtful whether these are really specifically identical with the others. The elytra in very fresh specimens bear some excessively short setae rather like those of *C. cognatissimus*, but there is no trace of any long fine hairs at the sides or apex. The species is of rather elegant form owing to its convexity, and the rather rounded sides of the elytra. The chief variation is seen in the puncturation especially of the prothorax, which in some examples except at the extreme base is excessively smooth and shining and nearly impunctate, but we have taken examples distinctly punctured in company with the very finely punctured individuals. The length varies from 1.5—2.5 mm.

HAB. In the mountains of all the islands. The var. in which the trans-sutural black spot on the elytra is wanting has occurred on Kauai and Hawaii, and these individuals are above the average in size.

(7) *Cis bimaculatus* Sharp.

*Cis bimaculatus* Sharp, Tr. Dublin Soc. 1885, p. 161.

The largest Hawaiian species of the genus, but very variable in size, some examples, both from Hawaii and Maui, being only about one-third the bulk of the larger individuals. These dwarf specimens are taken in company with those of normal size. Otherwise this species exhibits little or no variation. There are no long hairs on the elytra, but excessively short pale setae are present, at least in fresh examples. Length 2.2—3.2 mm.

HAB. Maui, Haleakala.—Hawaii, at elevations of 3000—5000 ft. Not rare, about 30 examples have been examined.

(8) *Cis nigrofasciatus* Blackb.

*Cis nigrofasciatus* Blackburn, Tr. Dublin Soc. 1885, p. 162.

(Plate X. fig. 18.)

Seven examples of this species were taken and they exhibit no noteworthy variation, except that some are considerably larger than others. The setae of the elytra are excessively minute, and hardly visible even under a very strong lens. Length 2—2.7 mm.

HAB. Lanai, 2000—3000 ft. Blackburn's unique example was taken on the same island.

(9) *Cis unicus*, sp. nov.

Testaceus, nitidus, haud setosus, capite infuscato, elytris in parte basali lateraliter nigro-fuscis. Pronotum nitidum, subtilius vix dense punctatum. Elytra nitida, grossius irregulariter ruguloso-punctata. Long. 2 mm.

Closely allied to *C. nigrofasciatus*, but smaller than the smallest example of that species, and decidedly more shining. The puncturation of the elytra is coarse but shallow, somewhat rugose and irregular, the punctures appearing to differ in size. The colour of the elytra is testaceous, but the basal half is to a large extent blackish or infuscate, except along the suture, and the dark colour at a point rather beyond the middle of the length of the wing-cases extends inwards nearly to the suture, to form a vague interrupted band. I can detect no trace of setae either on the thorax or the elytra.

HAB. Hawaii. A single example was taken at Kilauea.

(10) *Cis porcatus* Sharp.

*Cis porcatus* Sharp, Tr. Ent. Soc. London, 1879, p. 92.

This minute species is easily recognized by its dark colour, very dense sculpture and short grey clothing, which however is easily abraded. The head of the ♂ is produced into strong angular processes, which vary greatly in development.

HAB. One of the commonest of the island species and of general distribution in the forests from 1500 to 4000 ft.

(11) *Cis insularis* Sharp.

*Cis insularis* Sharp, Tr. Dublin Soc. 1885, p. 164.

(Plate X. fig. 19.)

A unicolorous, or nearly unicolorous, testaceous species, with strong and very dense puncturation over the whole surface, the elytra and also the prothorax in fresh examples bearing excessively short setae. The thorax and base of elytra are sometimes infuscate, and in some the elytra are quite pallid, but there are no distinct markings. The ♂ has the front of the head produced into two processes, which, as usual, vary greatly in development. Length 2—2.7 mm.

HAB. Kauai, Oahu, Lanai, and Hawaii. Taken on most of the islands rather sparingly, and it no doubt occurs on all. It is found in the forests from 2000—4000 ft. About a score of examples were captured.

(12) *Cis chloroticus* Sharp.

*Cis chloroticus* Sharp, Tr. Dublin Soc. 1885, p. 164.

This is another normally immaculate species of a testaceous colour, the thorax and base of elytra sometimes more or less inclined to fuscous. The surface in this species is not quite glabrous, as in a profile view of the prothorax some short, fine, erect hairs can easily be detected, although they are sparsely distributed. Length 1·7—2·25 mm.

HAB. Maui, Haleakala (4000—5000 ft.); not common.

(13) *Cis simulator* sp. nov.

Elongatus, subconvexus, nitidus, testaceus, capite nigricante, pronoto saepe plus minusve infuscato, elytris utrinque nigro-maculatis, apices versus lateraliter setis gracilibus elongatis sparsim vestitis. Pronotum subremote distincte punctatum. Elytra basim versus obscure punctata, puncturatione subobsoleta. Long. 1·75—2·2 mm.

In the condition of its clothing this species resembles the following (*Cis tabidus*), the head and prothorax bearing fine, erect setae, very short on the latter, and easily abraded, the elytra at the sides towards the apex having a sparse clothing of long, fine hairs. It differs from that species in its larger average size, and more convex form, and the elytra are more pointed behind, being decidedly less parallel-sided. The insect would appear to be very constant in its general appearance, being testaceous in colour, with dark head, and two black spots at about the middle of the length of the elytra. In some examples the thorax is more or less obscured with fuscous or blackish clouding. At the base the elytra have an obscure, indefinite, and subobsolete, but rather large puncturation. In general appearance and form this species is extremely similar to *C. chloroticus*, but that insect has immaculate elytra, and is devoid of the long hairs at the sides of the elytra towards the apex.

HAB. Maui, Haleakala (5000 ft.); about a dozen examples taken.

(14) *Cis tabidus* Sharp.

*Cis tabidus* Sharp, Tr. Ent. Soc. London, 1879, p. 93.

Distinct from *Cis bicolor*, under which species it was sunk by Blackburn. It is very variable in size, colour &c. and also in the puncturation of the prothorax, which is much closer in some than others. In fresh examples the elytra bear some long fine hairs at the sides towards the apex, and even in some specimens all along the sides, as

well as some shorter erect ones on the thorax, often abraded. The prothorax varies in colour from black to testaceous, and the elytra are sometimes nearly wholly infusate, rarely entirely testaceous and immaculate. *Cis tabidus* appears to be most closely allied to the even more variable *C. setarius*, and although the colour, prothoracic puncturation &c., are normally different, still it is by no means easy to know to which of the two species certain examples should be assigned. The shape of the prothorax, length and convexity of the elytra &c. appear to vary analogously in either species.

HAB. Oahu and Kauai. Common. Most and probably all of the islands.

(15) *Cis setarius* Sharp.

*Cis setarius* Sharp, Tr. Dublin Soc. 1885, p. 162.

*Cis apicalis* Shp. *loc. cit.* = var.

*Cis concolor* Shp. *loc. cit.* p. 163 = var.

A most variable and perplexing species allied to the preceding but darker in colour, often entirely black or castaneous, generally with the anterior or both this and the posterior margin of the prothorax pale, the base of the elytra dark but more or less of the apex often pale, sometimes more than the apical half of a testaceous colour. Fine long hairs can generally be detected at the apex of the wing cases, sometimes also they form a regular but not dense clothing all along the sides, and hairs of a similar character can be detected standing erect on the prothorax. This part is usually shining, strongly but not densely punctured, and the elytra have a large and more or less indefinite puncturation at the base. In some examples the puncturation of the prothorax is extremely fine, and it appears that the species is more or less different according to the locality, but varies much in each. The length of the elytra and their convexity as well as the width of the prothorax are also variable. Length 1·2—2 mm.

HAB. Abundant on Hawaii in the mountains, and also found on the other islands including Kauai, so that it is of general distribution.

(16) *Cis calidus* Sharp.

*Cis calidus* Sharp, Tr. Dublin Soc. 1885, p. 164.

Apparently a rather variable species, the puncturation being denser and more regular both on the prothorax and elytra in some examples than in others. It also varies in size and colour, the latter being sometimes quite black and sometimes castaneous. The dense regular clothing of fine erect setae is easily abraded and then the species is not very easily distinguished from some well clothed individuals of the very variable *C. setarius*. Length 1·5—2 mm.

HAB. Kauai and Oahu. A few examples taken in the mountains.

(17) *Cis signatus* Sharp.

*Cis signatus* Sharp, Tr. Ent. Soc. Lond. 1879, p. 92.

*Cis attenuatus* Shp., Tr. Dublin Soc. 1885, p. 165 = var. of *C. signatus*.

(Plate X. figs. 20, 20 a, 20 b and 20 c.)

Extremely variable in colour. The palest examples are nearly entirely testaceous, having only two or four dark spots on the elytra, one example indeed apparently referable to this species is entirely immaculate. The darkest individuals are black with only the anterior and posterior margins of the prothorax, and two spots near the apex and one on the suture of the elytra in front of these, testaceous, so that probably entirely black examples of the species may occur. The prothorax is not infrequently of an entirely testaceous colour, and is much wider in some examples than in others. *Cis attenuatus* Shp. is no doubt a variety of this species. The puncturation of the elytra is a little stronger in some examples than is usually the case. Length vix 1.5—2.25 mm.

HAB. Taken on all the islands, commonly on Maui, Lanai and Hawaii, from 1500—5000 ft. in the mountains.

(18) *Cis roridus* Sharp.

*Cis roridus* Sharp, Tr. Dublin Soc. 1885, p. 165.

Apparently most nearly allied to *C. signatus* but differing in colour &c. and with a stronger sculpture. It varies considerably in size, but not very greatly in other respects. Length 1.6—2.2 mm.

HAB. Most, and probably all, of the islands. A series was obtained in Kona, Hawaii (4000—5000 ft.), and we have taken it on Kauai, Molokai and Lanai.

(19) *Cis kauaiensis*, sp. nov.

Testaceus, capite nigro, elytris maculis compluribus plus minusve conjunctis variegatis, setis nullis vestitus, minus fortiter convexus. Pronotum rufo-testaceum, densissime punctatum, postice evidenter utrinque subimpressum. Elytra dense fortiterque rugoso-punctata, macula nigra humerali, aliisque compluribus ad media plus minusve conjunctis, ornata, subnitida et nuda. Long. 2.6 mm.

A very distinct species somewhat allied to *C. signatus*, but more convex, with different markings, much stronger and coarser puncturation, and apparently with no trace of setae on the elytra or prothorax. Curiously enough the peculiar elytral markings are almost, if not quite, identical with those of some examples of *Apterocis variegatus* and *A. ornatipennis*. The scutellum is very distinct, and the wings are fully developed. The prothorax is very finely, but distinctly, margined at the sides, but not at all posteriorly. The surface of the elytra is distinctly shining between the dense and somewhat coarse punctures.

HAB. Kauai. A single example was taken on the high plateau (4000 ft.).

(20) *Cis molokaiensis*, sp. nov.

Niger, brevissime, sed conspicue, griseo-setulosus, pronoto antice posticeque plus minusve testaceo-signato. Pronotum latum, lateribus fortiter rotundatis, postice haud evidenter marginatum, densissime ruguloso-punctatum. Elytra densissime ruguloso-punctata, punctis ipsis vix discernendis. Metasternum breve. Abdominis segmenta ventralia punctata. Alae nullae (an rudimentariae?). Long. 1.4—2 mm.

This and the following four or five species will probably hereafter be separated generically from the other Hawaiian *Cis*. As it would appear that *Cis signatus* in certain varieties makes an approach in form to these species, we have not thought it advisable to form a new genus at present, until the question of variation in that species has been thoroughly investigated. *Cis molokaiensis* on account of its dark colour and grey setulosity somewhat resembles *C. porcatus* Shp., but it is abundantly distinct therefrom by its stronger sculpture, wider prothorax (which, however, varies in width in different specimens), and more elegant form, as well as by the shorter metasternum and the fact that the wings, if present at all, are rudimentary. There is a faint development of tubercles on the head of the ♂, but they are very small compared with those of well-developed *C. porcatus*.

HAB. Molokai. High wet forests, Sept. 1893.

(21) *Cis haleakalae*, sp. nov.

Niger, pronoti margine antico, pedibus, antennarumque basi, testaceis, praecedenti affinis sed major et latior, haud evidenter setulosus. Pronotum subtiliter densissime ruguloso-punctatum. Elytra dense ubique rugulosa, punctis ipsis haud vel vix discernendis, lateribus sat rotundatis, apicibus subacuminatis. Long. 2 mm. (Plate X. fig. 17.)

Somewhat of the form of the preceding, but with the elytra more rounded at the sides, and more pointed behind. The sculpture of the elytra is very remarkable, being of a finely strigose character. There is little doubt the species is wingless, although we have not been able to investigate this and other points of structure.

HAB. Maui. A single example on Haleakala (5000 ft.).

(22) *Cis mirabilis*, sp. nov.

Niger, ore, antennarum basi, pronoti margine antico maculaque postica, elytrorumque fascia subapicali testaceis. Pronotum fortiter densissime punctatum. Elytra convexiuscula, fortiter rugosa, et punctata, haud setosa. Long. 2 mm.

A very remarkable species of the same curious form as *C. haleakalae*, and no doubt either wingless or with only rudimentary wings, though it has not been examined in this respect. The coarse rugose sculpture of the elytra, amongst which distinct puncturation is evident, distinguish it at once.

HAB. Kauai, 4000 ft. One example captured.

(23) *Cis fallax*, sp. nov.

Testaceus, pronoto saepe medio nigricante vel fusco, elytris nigro-maculatis, *C. signato* colore similis, et eodem vestitu et puncturatione, sed forma magis convexa, elytrorum lateribus magis rotundatis, alis brevioribus, ad apices elytrorum haud extensis, distinguendus. Long. 1·5—vix 2 mm.

I have found it necessary to separate a few examples taken in company with *C. signatus* from that species, although they do not differ from certain of its varieties either in colour, clothing or sculpture. They are decidedly more convex than *C. signatus* and the sides of the elytra are more rounded, so that they often appear rather shorter and more pointed at the apex. On dissecting one of these specimens we find the wings to be less developed than those of the preceding species, and in repose they do not nearly reach to the apex of the abdomen, as is the case in the numerous examples of *C. signatus* that we have examined. For these reasons it is advisable for the present to consider the two forms as distinct species.

HAB. Oahu. Three or four examples have been taken in the Waianae mountains in company with *C. signatus*.

(24) *Cis minus*, sp. nov.

Nigricans, pedibus, antennarum basi, pronoti margine antico et postico (vel horum altero), elytrisque testaceis, his nigro-signatis; colore variabilis, nonnunquam totus testaceus, elytris nigro-notatis; *C. signato* vestitu et colore simulans, setulis brevissimis crebre ubique vestitus. Pronotum densissime punctulatum. Elytra subinaequalia, basim versus grossius rugoso-punctata. Long. 1·5—2 mm.

Like many specimens of *C. signatus* in colour and setulosity, but easily distinguished by the coarse but shallow punctures on the elytra, the surface of which is somewhat rugose and uneven, and the insect is more convex. The wings are apparently not fully developed as compared with the ordinary condition of these organs in the genus, but we have not been able to fully examine the species with regard to this point. There are normally four black spots on the dorsum of the elytra, which may be connected more or less laterally.

HAB. Maui, Haleakala (5000 ft.); three examples taken.

(25) *Cis diminutivus* Sharp.

*Cis diminutivus* Sharp, Tr. Ent. Soc. London, 1879, p. 94.

HAB. Oahu. Two examples were taken on Konahuanui by Mr Blackburn; we have not met with this species, which appears to be quite distinct.

(26) *Cis evanescens* Sharp.

*Cis evanescens* Sharp, Tr. Ent. Soc. London, 1879, p. 95.

This minute species is easily distinguished from any but the following species by the very feeble and fine, often hardly perceptible, puncturation of the prothorax. In some examples the prothoracic punctures though sparse and feeble are distinguishable, in others the surface is practically impunctate, and the surface usually dull. The elytral sculpture is also variable, but always feeble, and consists of a rugulosity of the surface rather than puncturation, and is sometimes hardly perceptible. In some examples the thorax is of a testaceous colour as is usual in the following species. The entire insect is without clothing. Length 1—1.5 mm.

HAB. Found on all the islands in the mountain forests from 2000—4000 ft.

(27) *Cis laeticulus* Sharp.

*Cis laeticulus* Sharp, Tr. Ent. Soc. London, 1879, p. 94.

Resembles *C. evanescens* for the most part in sculpture, but the elytra are, at least in most examples, decidedly more elongate, and the hinder angles of the prothorax are very slightly prominent and acute. This point of distinction between the two species is generally difficult to appreciate without separating the elytra from the thorax, but appears to be quite constant. In typical examples the prothorax is of a pallid colour and contrasts greatly with the elytra, which also are sometimes pale on their apical portion. Examples from Lanai probably referable to the same species have the elytra and thorax concolourous, or at least the latter is not much paler than the former. One of these Lanai examples, however, hardly differs from the typical examples, although the individuals were all taken in company. Length 1.2—1.5 mm.

HAB. Oahu and Lanai. Probably on all the islands but not collected on the others. If I remember rightly the species is found on withered leaves of *Freycinetia*, where it no doubt feeds on some species of fungus.

(28) *Cis longipennis* Blackb.

*Cis longipennis* Blackburn, Tr. Dublin Soc. 1885, p. 162.

HAB. Kauai. 'A single specimen was found in dry wood on the mountains.' (Blackburn.) We have not met with this species, which must be very closely allied to the following.

(29) *Cis angustiformis*, sp. nov.

Angustus, elongatus, parum convexus, fusco-niger ad colorem testaceum varians, pronoto nonnunquam testaceo, *C. laeticulo* cognatissimus, sed elytris sat evidenter longioribus distinguendus. Long. 1·2—1·5 mm.

Very closely allied to *C. laeticulus*, with which it agrees in the obsolete, or nearly obsolete, sculpture, and in having the hinder prothoracic angles a little acute and prominent. Darker examples are concolorous, except that the apices of the elytra are generally a little paler; the paler individuals have the elytra of a fusco-testaceous colour, and the prothorax rather clear testaceous, so that there is some contrast between the colour of these parts, but it is not so striking as in typical *C. laeticulus*, while the darker specimens resemble the Lanai form of this species. It cannot however be treated as a form of *C. laeticulus*, as the elytra are decidedly longer in proportion to their width, indeed the great elongation of the insect is quite remarkable.

HAB. Oahu. Seven examples were taken in company in the Waianae mountains, at an elevation of 3000 ft.

## APTEROCIS, gen. nov.

Forma ovali, fortissime transversim et longitudinaliter convexa, metasterno parum elongato, alis nullis.

Allied to *Cis* with the antennae &c. similarly formed, but of oval shape, and extremely convex longitudinally and transversely. The species are wingless and the metasternum is shorter than in *Cis*. There are no processes on the front of the head of the ♂ in any of the species known, but this sex may be known, in many of the species at least, by the presence of a tubercle on the basal abdominal segment beneath.

(1) *Apterocis ephistemoides* Sharp.

*Cis ephistemoides* Sharp, Tr. Dublin Soc. 1885, p. 165, Plate IV. fig. 21.

This species varies greatly in size and in some examples a few long hairs can be detected at the sides of the elytra. Length 1—2 mm.

HAB. Common generally in the mountains.

(2) *Apterocis vagepunctatus* Blackb.

*Cis vagepunctatus* Blackburn, *loc. cit.* p. 166.

HAB. Oahu. A single specimen in the mountains near Honolulu (Blackburn); I have not met with this species.

(3) *Apterocis lanaiensis*, sp. nov.

Nigricans, pronoto nonnunquam plus minusve piceo vel rufescente, elytrorum apice humerisque rufo-maculatis, antennarum basi pedibusque rufescentibus. Nitidus, valde aequaliter convexus, pronoto ruguloso-punctato, postice haud evidenter marginato. Elytra circa basim sparsim vage punctata. Abdominis segmenta ventralia evidenter densius punctata. Long. circa 2 mm. (Plate X. fig. 14.)

A very distinct species by the rugulose punctured prothorax, vague scattered punctures at the base of the elytra and the distinct humeral and apical red spots on the latter. The general form of the insect is like that of *Cis ephistemoides*.

HAB. Lanai. Three examples were taken on the summit of the mountains.

(4) *Apterocis montanus*, sp. nov.

Brunneus, valde aequaliter convexus, capite pronotoque nigricantibus, hoc antice posticeque pallido-marginato, antennis testaceis. Pronotum remote subtiliter subobsolete punctatum, postice levissime marginatum. Elytra basim versus obsolete punctata, vage subrugulosa, setulis brevissimis pallidis, vix videndis, ferentia. Abdominis segmenta ventralia necnon metasternum nitida et impunctata. Long. circa 2.2 mm.

*Apterocis montanus* var. *minor*, var. nov.

Minor, pronoto fere impunctato, elytris plaga vage transversa obscuriore. Long. circa 1.5 mm.

Much smaller than the typical specimens, but obtained in company with these. They differ in the nearly or quite impunctate prothorax, and the elytra have the base and apex paler than the middle portion, giving them a vague banded appearance. I can detect both sexes in these small examples and it is possible that they are really a distinct species.

Two or three examples from Molokai appear to belong to this species and in some respects unite the typical examples with the var. *minor* by the following characters:

Brown, the prothorax with some very fine remote subobsolete punctures, the base of the elytra with some very feebly impressed nearly obsolete but rather large ones. The apical portion of the elytra is of a pale testaceous colour and much paler than the brown basal portion much as in the var. *minor*.

HAB. Maui, Haleakala, 5000 ft., typical form and the var. *minor*; also on Molokai above 4000 ft. Rare.

(5) *Apterocis variabilis*, sp. nov.

Nitidus, valde aequaliter convexus, colore variabili, sed elytrorum apice extremo semper pallido. Pronoto distincte subtiliter nec dense punctato, postice haud distincte marginato. Elytra basim versus remote punctata, punctis saepe obsolete, vix videndis, nonnunquam sat distinctis sed parum profundis. Abdominis segmenta ventralia dense subtiliter punctata. Long. 1.5—2 mm.

Variable in colour, like *A. ephistemoides* in form, but of larger average size. Black with the thorax more or less piceous, the apex of the elytra pale and with a reddish spot at either shoulder sometimes united to form a transverse fascia, or entirely reddish-brown, with only the apex of the elytra paler than the general colour, the elytra being a little darker in colour in front of the pale apex, thereby rendering the paleness more distinct. Intermediates occur between the extreme forms. The dark varieties (? males) have the thorax more closely punctured, and the puncturation of the basal part of the elytra generally rather large and distinct, although shallow. In the pale forms (? females) the elytral puncturation is often hardly observable, but there is evident variation in this respect. The mesosternum in front of the middle coxae is I believe formed as in *A. ephistemoides*, so that the front pair are almost contiguous with these.

HAB. Oahu, Waianae mountains, several examples taken. In some varieties this species greatly resembles *A. lanaiensis* but the puncturation of the prothorax is not rugulose as in that species, others resemble *A. montanus*, which has the thorax much less distinctly punctate.

(6) *Apterocis hawaiiensis*, sp. nov.

Niger, nitidus, valde fere aequaliter convexus, elytrorum apice rufescente. Pronotum nitidum, subtiliter remote punctatum, postice haud evidenter marginatum. Elytra nitida, basali parte praecipue versus latera grossius remote punctata. Metasternum et abdominis segmenta ventralia dense punctata; segmentum basale ♂ tuberculatum fortiter munitum. Mesosternum breve, parte sculpturata praecoxali fortiter obliqua. Long. circa 2 mm.

The half-dozen examples of this species show no noteworthy variation in colour, but some have the puncturation of the thorax less fine, and the punctures at the base of the elytra more numerous and coarser. I suspect these differences are for the most part sexual. Very short pale and inconspicuous setae can be detected in fresh examples.

HAB. Hawaii (4000 ft.).

(7) *Apterocis rufo-notatus*, sp. nov.

Niger, nitidus, prothorace nonnunquam rufo-piceo, elytrorum apice rufescente, humerisque maculis rufis, saepe in fasciam transversam conjunctis, signatis. Pronotum fortiter minus sparsim punctatum. Elytra basim versus grosse remote punctata. Mesosternum dense sculpturatum, parte antica vix obliqua. Abdominis segmenta ventralia dense subtiliter punctata. Var. elytris nigris, haud rufo-notatis. Long. 1.5—2 mm.

Found in company with *A. hawaiiensis*, but distinguished by the general form, the prothorax and elytra not forming together such an even and continuous curve. The mesosternum in front of the coxae is so little oblique that it nearly continues the plane of the metasternum. Some examples have the thorax decidedly more finely and remotely punctured than others, the variation being analogous with that exhibited in the same parts of *A. hawaiiensis*.

HAB. Hawaii (4000 ft.). Six examples taken.—Molokai (4500 ft.). One mutilated example taken, apparently identical with those from Hawaii.

(8) *Apterocis impunctatus*, sp. nov.

Nigricans vel nigro-piceus, antennis pedibusque rufo-testaceis. Pronotum impunctatum, nitidum, postice distincte marginatum. Elytra nitida, impunctata, corpore subtus impunctato. Long. 1—1.5 mm.

In many respects very like *A. ephistemoides* but readily distinguished by its form, the outline of the thorax and elytra not forming the very even curve that is seen in that species. Posteriorly the prothorax is finely but very distinctly margined.

HAB. Oahu, Waianae mountains.—Kauai, Makaweli (2500 ft.) one very minute individual.

(9) *Apterocis variegatus*, sp. nov.

Niger, sat elongatus, ovalis, glaber, elytris testaceis, nigro-variegatis, pronoti margine antico maculaque basali, antennarumque articulis basalibus, testaceis. Pronotum densissime grosseque rugoso-punctatum, subimpressum et subinaequale, postice vix

marginatum. Elytra grosse rugoso-punctata, basim versus sulcis longitudinalibus compluribus, male definitis, inaequalia, testacea, maculis nigris plus minusve conjunctis eleganter variegata. Metasternum fortiter punctatum. Abdominis segmenta 2—5 dense subtilius punctata. Long. 2·5 mm.

Remarkable for its fusiform-ovate shape, and the excessively dense coarse sculpture. The metasternum is not so much shortened as is usual in the genus, and the mesosternum in front of the coxae is rather long, horizontal, and densely sculptured except along the narrow articulating margin. No doubt this insect and others allied to it will hereafter be separated from typical *Apterocis*, which are much more strongly convex and differ in the form of the mesosternum, but if so it will be necessary to form several new genera for this remarkable group of insects.

HAB. Maui, Haleakala (4000—5000 ft.). Rare, four examples only having been met with.

(10) *Apterocis ornatipennis*, sp. nov.

Forma, magnitudine, et colore praecedentis, sed pronoto minus dense rugoso-punctato, punctis ipsis facile distinguendis, distinctus. Long. 2—2·5 mm. (Plate X. fig. 15.)

Very closely allied to *A. variegatus*, and only differing in the sculpture of the prothorax, which is less extremely dense, and though the puncturation is very rugose the individual punctures are moderately distinct, and do not run into one another to the extent that is seen in the other species. The pale colour of the margins of the prothorax is also of greater extent, and in one example the prothorax is entirely piceous in colour.

HAB. Lanai (2000—3000 ft.); very rare, two examples only having been met with.

(11) *Apterocis strigosus*, sp. nov.

Castaneus, rufo-brunneus, vel testaceus (an immaturus?), elytris prothorace pallidioribus, latissime nigro-fasciatis, maculisque duabus nigris ad basim plerumque ornatis. Pronotum fortiter punctatum et longitudinaliter strigosum, nitidum, postice haud evidenter marginatum, margine antico pallido, et ad angulos anteriores flavo-maculatum. Elytra fortiter convexa, ad basim latiuscula, apices versus attenuata, basi grosse rugoso-punctata, setas pallidas brevissimas inconspicuas sparsim ferentia. Metasternum sat breve, fortiter punctatum. Abdominis segmenta 4 ultima distincte subtiliter punctata. Long. 1·7—2·2 mm. (Plate X. fig. 16.)

In this species the markings on the elytra are variable, the two spots at the basal

margin being sometimes connected with the wide transverse fascia, but sometimes are altogether wanting. The extreme apex of the elytra is usually dark. The mesosternum is prolonged subhorizontally in front of the coxae, almost continuing the plane of the metasternum. It is coarsely sculptured except for the very narrow front margin which is overlapped by the prosternum.

HAB. Molokai. Highest forests above 4000 ft.

(12) *Apterocis subaeneus*, sp. nov.

Praecedenti cognatissimus, sed forma paullo angustiore, prothorace nigro, subaeneo-micante, ad angulos anteriores haud flavo-maculato, distinguendus. Long. vix 2 mm.

Extremely like *A. strigosus* but a narrower insect with black slightly aeneous prothorax, which is not maculate at the front angles. The pale setae are observable on the thorax, and on the elytra they are decidedly less inconspicuous than is the case in the preceding species. A series of examples may, however, prove this to be only a variety of *A. strigosus*.

HAB. Maui. A single example taken on Haleakala at an elevation of 5000 ft.

(13) *Apterocis hystrix*, sp. nov.

Unicolor, testaceus, aut capite nigricante, ovalis, sat convexus, setis erectis elongatis dense ubique vestitus. Pronotum latum, postice haud marginatum, densissime subtiliter punctatum. Elytra dense irregulariter rugoso-punctata. Long. circa 2 mm.

Unlike any other species, in form something like *A. strigosus* and its allies, the convexity of the elytra and prothorax not forming a very strong and even curve, when viewed laterally. The elytral puncturation is dense, rugulose and indefinite, the punctures apparently not being of even size, and but shallowly impressed.

HAB. Lanai. Two examples (one mutilated) were taken on the top of the mountains.



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# FAUNA HAWAIIENSIS

VOL. II. PART IV.

## *MOLLUSCA*

E. R. SYKES.

## *EARTHWORMS*

F. E. BEDDARD.

## *ENTOZOA*

A. E. SHIPLEY.



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# FAUNA HAWAIIENSIS

OR THE

## ZOOLOGY OF THE SANDWICH (HAWAIIAN) ISLES :

Being Results of the Explorations instituted by the Joint Committee  
appointed by

THE ROYAL SOCIETY OF LONDON FOR PROMOTING NATURAL KNOWLEDGE

AND THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

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EDITED BY

DAVID SHARP, M.B., M.A., F.R.S.

SECRETARY OF THE COMMITTEE.

VOLUME II. PART IV.

*MOLLUSCA* BY E. R. SYKES : *EARTHWORMS* BY F. E. BEDDARD :

*ENTOZOA* BY A. E. SHIPLEY.

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ENTOZOA

By A. E. SHIPLEY, M.A.



## MOLLUSCA.

By E. R. Sykes,

H. S. Barber,  
U. S. National Museum,  
Washington, D. C.

WITH INTERCALATIONS ON ANATOMY

By Lt.-Col. Godwin-Austen.

*Contents.* § 1, *General remarks*, p. 271; § 2, *Systematic account*, p. 275; § 3, *Bibliographic list*, p. 400; § 4, *Alphabetical list of names placed as synonyms*, p. 407; § 5, *Alphabetical list of unidentified or erroneously recorded names*, p. 412.

THE material upon which this study of the land and fresh-water Mollusca is based, in addition to the collection formed by Mr Perkins, consists in a great measure of the collection in the British Museum (Natural History), where the bulk of Newcomb's and Pfeiffer's type-specimens are to be found. Thanks to the kindness of Prof. A. Hyatt, an examination has been made of the type-specimens of the species described by Gulick, of the genus *Leptachatina*, and now preserved at Boston. Mr D. D. Baldwin, of Maui, has also very kindly sent over a number of specimens and Mons. Ancey has lent the types of some species described by him. A collection formed in the Islands by Mr Hutchison has also been placed in my hands for examination by Mr Fulton.

Lt.-Col. H. H. Godwin-Austen, F.R.S., has enabled me to add to the interest of this work in a great degree, by very kindly dissecting some of the species and permitting me to incorporate here the results; it is hoped that he may be able to give a further account of the anatomy in the *Achatinellidae*.

To Mr Edgar A. Smith, I desire, in conclusion, to express my most grateful thanks for his unflinching help and courtesy.

## § 1. General Remarks on the Mollusca.

To the student of the Mollusca, the Hawaiian Islands fauna is probably more familiar by name than that of many better known places, owing to the occurrence there of the well-known Achatinelloid group of forms.

Tables of the distribution of the fauna are given below, but a few general remarks here may be of interest.

The Limacidae yield nothing very peculiar or very striking and the few forms peculiar to the Islands may well have been developed from introduced European ancestors.

The Zonitidae are scattered over the Islands; all are peculiar, but they are nearly related to forms found in other islands of the Pacific: similar remarks apply to the Endodontidae, one group of which (*Pterodiscus*), however, appears to be peculiar.

The presence—and that strongly contested—of only a single indigenous species of the Helicidae again indicates affinities with Polynesia.

The Pupidae as a family, have a very wide geographical range, and hence no deductions can be drawn from their presence; it should be noted that here—if the identification be correct—the fauna includes a species not peculiar to the Islands.

With reference to the Achatinellidae it may at once be noted that several divisions of the family may be made. First, the brightly coloured forms which fall into the genus *Achatinella* proper and which are replaced in the Southern Pacific Islands by the genus *Partula*. The metropolis of distribution of all these forms seems to be Oahu, save in the case of the subgenus *Partulina* when Maui and Molokai appear to divide the honour. No species has been found on Kauai and only two on Hawaii at the other end of the group. Species have been described by authors upon coloration and band-formations; in my opinion numbers even of the 'species' here admitted will prove, when their anatomy is carefully investigated, to be varying forms of one common species. Consider, for example, such a shell as *Tachea nemoralis* dealt with in the same manner as the Hawaiian forms have been! Still, even when reductions are made, the fauna will remain remarkable for its numerical strength in species.

Secondly, passing through *Perdicella* and *Newcombia*, confined to the islands of Molokai and Maui, we come to the second great division, typified by *Leptachatina* and *Amastra*. Here, while the metropolis again seems to be Oahu, Kauai, the oldest island geologically considered, ranks well with the rest.

Thirdly, passing through the interesting and recently described *Thaanunia* of Oahu, we come to *Carelia*, which is confined to Kauai save for one subfossil species on the Island of Niihau (the only mollusc on that island).

Fourthly, we have the little group of *Auriculella* and *Frickella*, which leave the impression that they are linking forms between *Achatinella* and *Tornatellina*, and, again, belong in the main to Oahu. It should be borne in mind, as illustrating the peculiarity of the fauna, that only about half a dozen out of, approximately, 330 species of Achatinellidae are found on more than one island, and indeed some of these may be due to errors of identification. In our present state of knowledge a faunal list is largely influenced by the 'personal equation' of the writer.

From the residue of the fauna but little is to be learnt; the development of *Succinea* appears abnormal and further research will probably reduce the so-called 'species' of this group.

The following general conclusions may, however, be drawn :

1. The Molluscan fauna is nearly related to that of the Polynesian islands, and shows hardly any trace of continental influence, Asiatic or American.
2. The species are nearly always confined to one island ; but it is very doubtful if, as has been stated, "each valley has its peculiar species."
3. When the genera found are confined to the islands, the majority of living species usually occur on Oahu.

I give below tables of distribution ; but, owing to the fauna being so restricted in distribution, have not added percentages of peculiar species.

(1) Families Limacidae, Zonitidae, Endodontidae, Helicidae, Pupidae.

Species peculiar to one Island.

	Limacidae.	Zonitidae.	Endodontidae.	Helicidae.	Pupidae.	Total.
Kauai		3	8			11
Oahu		7	3		4	14
Molokai		1	1			2
Lanai	1	2				3
Maui	1	5	2			8
Hawaii	1	3	1	1	2	8

Species occurring in more than one Island.

Limacidae. Two species (*L. gagates* and *Agriolimax laevis*) are found elsewhere, and may have been introduced. One species is common to Kauai and Maui, one to Maui and Hawaii, and one to Kauai, Oahu, and Maui.

Zonitidae. One species common to Kauai, Oahu, and Maui ; one to Oahu, Molokai, and Lanai ; and one, respectively, to Kauai and Maui, Maui and Oahu.

Philomycidae. One found in Kauai, Oahu, and Hawaii, and one in Oahu only ; these species, however, are not peculiar to the Hawaiian fauna.

Endodontidae. Two species are common to Kauai and Oahu ; one, respectively, to Kauai and Lanai, Maui and Oahu, Lanai and Oahu, Lanai and Molokai ; while three are of uncertain habitat.

Helicidae. One species—introduced—in Kauai and Oahu.

Pupidae. One in Kauai, Oahu, and Hawaii ; one, respectively, in Kauai and Oahu, Oahu and Hawaii ; further, a single species is found outside the Islands.

(2) Achatinellidae. In view of their interesting characters I have here dealt with the distribution by genera.

Species occurring in only one Island.

	ACHATINELLA group.											
	<i>Achatinella s.s.</i>	<i>Bulinella</i>	<i>Partulina</i>	<i>Achatinellastrum</i>	<i>Peridilla</i>	<i>Newcombia</i>	<i>Anastra</i>	<i>Leptachatina</i>	<i>Thaamonia</i>	<i>Carelia</i>	<i>Auriculella</i> and <i>Fricillella</i>	Total.
Kauai							7	15		8	1	31
Oahu	17	19	1	29			40	33	1		10	150
Molokai			9	2	3	8	15	3			2	42
Lanai			3				12	5				20
Maui			16	3	5	1	17	4			1	47
Hawaii			2				3	7			1	13

The only forms of Achatinellidae found on more than one island are in the genera *Leptachatina* and *Auriculella*; in the former one species is said to be found on Kauai and Oahu, and two on Maui and Oahu; in the latter similar notes occur with regard to Oahu and Maui, Molokai and Lanai, Maui and Molokai, and (doubtfully) Oahu and Hawaii.

Further a single subfossil species of *Carelia* is recorded from Niihau; and the following are of uncertain habitat: *Bulinella* 1, *Partulina* 3, *Achatinellastrum* 1, *Anastra* 7, *Leptachatina* 6, and *Auriculella* 2.

(3) The residue of the fauna.

Species occurring in only one Island.

	<i>Ternatellina</i>	STENOZYRIDAE	<i>Succinea</i>	LIMNAEIDAE	<i>Melania</i>	<i>Palaudastrea</i>	<i>Helicina</i>	<i>Neritina</i>	Total.
Kauai	3		3	2					8
Oahu	1		2	3	1	1	3		11
Molokai									0
Lanai	1		1						2
Maui	3		4	1	1				9
Hawaii	2	1	12	1					16

Species occurring in more than one Island.

*Tornatellina*. One species, said to be found in Oahu, occurs in the Tonga Islands. Two species are common to Kauai and Oahu, one to Hawaii and Oahu, and one to Kauai, Oahu, and Hawaii.

Stenogyridae. *Opeas junceus* is said to be found in all the Islands, and both this and *O. prestoni* (Hawaii) occur elsewhere. One species is of uncertain habitat.

*Succinea*. Two species in Oahu, Molokai, and Hawaii; one in Lanai, Oahu, and Maui; one in Kauai and Hawaii, one in Maui and Molokai.

Limnaeidae. One species in 'all the Islands'; one in Kauai and Oahu, one in Oahu and Maui; three of uncertain habitat.

*Melania*. One common to Kauai, Oahu, Maui, and Molokai; one to Kauai and Oahu; one to Kauai and Molokai; one of uncertain habitat.

*Helicina*. One common to Kauai, Oahu, Lanai, and Molokai; one to Maui and Lanai.

*Neritina*. One common to Maui, Oahu, and Hawaii; two of uncertain habitat. Two said to be found in 'all the Islands.'

These three tables show that Kauai has 50 species peculiar to it, Oahu 175, Molokai 44, Lanai 25, Maui 64, Hawaii 37.

## § 2. Systematic account of the fauna.

Fam. LIMACIDAE.

*Amalia* Moquin-Tandon.

*Amalia* M.-T. Hist. Moll. France, 1855, II. p. 19 [first species *Limax gagates*, Drap.].

*Milax* Gray, Cat. Pulm. Brit. Mus. 1855, p. 174 [has the same type; there are, also, older names supposed to be identical, but founded on erroneous characters or improperly described].

While dealing with slugs it may be convenient to note that Semper has recorded a species stated to be very near *Limax tenellus* Nilsson; further Dr Cooper is said to have seen a species of *Janella* from these islands, but I have been unable to trace his note from the reference given (see Collinge, P. Malac. Soc. London, II. p. 50).

(1) *Amalia babori* Collinge.

*Amalia babori* Collinge, P. Malac. Soc. London, II. (1897), p. 294.

HAB. Maui, at 5000 ft., Haleakala.—Hawaii, 2000 to 4000 ft., Olaa to Kilauea (Perkins).

(2) *Amalia gagates* Draparnaud.

*Limax gagates* Draparnaud, Tabl. Moll. France, 1801, p. 100; Hist. Moll. France, 1805, p. 122, pl. IX. figs. 1, 2.

*Amalia gagates* Drap., Collinge, P. Malac. Soc. London, II. p. 49.

HAB. Maui (Perkins).

## AGRIOLIMAX Mörch.

*Agriolimax* Mörch, J. Conchyl. XIII. (1865), p. 378.

As to the correct name for this genus, see Cockerell and Collinge, Conchologist, II. pp. 199, 200.

(1) *Agriolimax bevenoti* Collinge.

*Agriolimax bevenoti* Collinge, P. Malac. Soc. London, II. (Nov. 1897), p. 295.

HAB. Kauai, at 4000 ft.—Oahu, 2000 ft., Honolulu.—Maui, 5000 ft., Haleakala (Perkins).

(2) *Agriolimax globosus* Collinge.

*Agriolimax globosus* Collinge, P. Malac. Soc. London, II. (April 1896), p. 47.

HAB. Hawaii, Mauna Loa (Perkins).

(3) *Agriolimax laevis* Müller.

*Limax laevis* Müller, Hist. Vermium, II. (1774), p. 1.

*Agriolimax laevis* Müller, Collinge, P. Malac. Soc. London, II. p. 295.

HAB. Kauai, at 2000 ft., Lihue.—Maui, 5000 ft., Haleakala (Perkins).

(4) *Agriolimax perkinsi* Collinge.

*Agriolimax perkinsi* Collinge, P. Malac. Soc. London, II. (April 1896), p. 47.

HAB. Lanai, at 2000 ft. (Perkins).

(5) *Agriolimax* (?) *sandwichiensis* Souleyet.

*Limax sandwichiensis* Souleyet, Voy. Bonite, Zool. II. (1852), p. 497, pl. XXVIII. figs. 8—11 [animal and shell].

HAB. Hawaiian Islands (?).

It seems uncertain whether this be really Hawaiian, or even accurately represented; see Collinge, P. Malac. Soc. London, II. p. 46.

## Fam. ZONITIDAE.

## GODWINIA, n. gen.

This new genus is proposed for the *Vitrina caperata* of Gould, which has, of recent years, usually been placed in *Helicarion*; it will be seen from the valuable anatomical notes of Lt.-Col. Godwin-Austen that there are differences which separate the species from that genus. Probably the *Vitrina tenella* of Gould also belongs here. The types of *Helicarion* Férussac (Tabl. Moll. 1821, pp. xxxi, 24) appear to have been the Australian forms *freycineti* and *cuvieri*.

(1) *Godwinia caperata* Gould.

*Vitrina caperata* Gould, P. Boston Soc. II. (1847), p. 181; U. S. Explor. Exped. Moll. 1856, pl. 1. fig. 9.

*Helix newcombi* Pfeiffer, P. Zool. Soc. London, 1854 (Jan. 1855), p. 51; Reeve, Conch. Icon. *Helix*, pl. CLXXXIX. fig. 1321.

Plate XII. figs. 6—12.

HAB. Kauai (Gould, Perkins).—Oahu (Pfeiffer).

Very possibly the habitat of 'Oahu' is a mistake.

"The animal is dark, with a rather broad pale pallial margin; foot with a well defined central area beneath; the specimen was so much contracted that the mucous gland could not be decisively made out; from analogy, however, one should be present. There are no shell-lobes, the mantle-edge is curved and well defined. The right dorsal lobe is small, and the left lobe is long, narrow, and continuous.

"The visceral sac has three coils. The buccal mass has a strong, broad, muscle on the lower posterior side; the oesophagus is short, leading into a very capacious stomach; the salivary gland is in one compact, rounded mass. Jaw solid, dark sienna in colour, with a very straight cutting edge; odontophore long and narrow, with a few large median teeth; at first sight these centrals appear to be simple and straight-sided in form, and they are very nearly so, but closer examination shows that the centre and adjoining teeth have very small notches on the outer side; these are not cusps. The laterals are all curved and aculeate. The dental formula is:

$$18-5-1-5-18$$

$$23-1-23$$

Unfortunately the generative organs were not seen by me, all this portion being lost during dissection, as will sometimes occur in these small species.

"It will be seen from the above characters that this species cannot be placed in the Helicarionidae—the absence of shell-lobes forbids this. Aculeate laterals are hardly ever met with even in the genera of Zonitidae possessing shell-lobes; I can only recall one species, *Macrochlamys castaneolabiata*. The solid jaw, divided foot, and, in all probability, the presence of a mucous gland place it in the Zonitidae. In so many points is it distinct from any of the Indian and Malayan forms that I am acquainted with that I the more regret that the generative organs have still to be made out" (H. H. Godwin-Austen).

(2) *Godwinia* (?) *tenella* Gould.

*Vitrina tenella* Gould, P. Boston Soc. II. 1847, p. 181; U. S. Explor. Exped. *Moll.* 1856, pl. 1. fig. 10.

HAB. Kauai (Gould).—Maui, Haleakala, 5000—9000 ft. (Perkins).

The specimens found by Mr Perkins appear to be identical with Gould's species, which, so far as I can trace, has not been rediscovered on Kauai. In fresh specimens the lip is margined with black.

VITREA Fitzinger.

*Vitrea* Fitz., Beitr. Landeskund. Oesterr. III. p. 99.

Fitzinger's type, as I understand him, was *diaphana* Studer.

Until the anatomy of these Hawaiian species is known, I can suggest no better reference than to the present genus.

(1) *Vitrea lanaiensis* Sykes.

*Vitrea* (?) *lanaiensis* Sykes, P. Malac. Soc. London, II. (1897), p. 298.

Plate XI. figs. 43, 44.

HAB. Lanai, mountains behind Koele (Perkins).

(2) *Vitrea molokaiensis* Sykes.

*Vitrea* (?) *molokaiensis* Sykes, P. Malac. Soc. London, II. (1897), p. 298.

Plate XI. figs. 45, 46.

HAB. Molokai, forest above Pelekunu (Perkins).

(3) *Vitrea pauxillus* Gould.

*Helix pusillus* Gould, P. Boston Soc. II. 1846, p. 171 [*non H. pusilla*, Lowe, 1831].

*Helix pauxillus* Gould, U. S. Explor. Exped. *Moll.* p. 40, pl. III. fig. 46.

*Hyalinia baldwini* Ancy, Bull. Soc. Malac. France, VI. 1889, p. 192; Sykes, P. Malac. Soc. London, III. pl. XIII. figs. 1—3.

HAB. Maui (Gould); West part of Maui (Ancy); Haleakala, 5000 feet (Perkins). See, for a note on the synonymy, P. Malac. Soc. London, II. p. 298.

## PSEUDOHYALINA Morse.

The original type was, I gather, *Helix exigua* Stimpson.

(1) *Pseudohyalina kawaiensis* Pfeiffer.

*Helix kawaiensis* Pfeiffer, P. Zool. Soc. London, 1854 [1855], p. 52; Reeve, Conch. Icon. *Helix*, sp. 1256.

HAB. Kauai (Pfeiffer).—Maui and Oahu (Baldwin).

I follow M. Ancy in the generic reference, as I do not know how, at present, the nomenclature may be bettered.

## MICROCYSTINA Mörch.

Type *Nanina rinki*, Mörch.

(1) *Microcystina* (?) *cryptoportica* Gould.

*Helix cryptoportica* Gould, P. Boston Soc. II. (1846), p. 20; U. S. Explor. Exped. *Moll.*, pl. v. fig. 72.

HAB. Oahu (Pease, Baldwin).

I place this here as the description states "columella valde intorta."

## MICROCYSTIS Beck.

For a discussion as to the type, see P. Malac. Soc. London, II. pp. 130—2.

(1) *Microcystis chamissoi* Pfeiffer.

*Helix chamissoi* Pfeiffer, P. Zool. Soc. London, 1855, p. 91; Bland and Binney, Ann. Lyc. New York, x. p. 338, pl. xv. fig. 3 (jaw and radula; copied in Ann. New York Ac. III. pl. xvii. fig. O).

HAB. Kauai, Waioli and Haena (Baldwin); Makawele and Mountains above Waimea (Perkins).

Bland and Binney give "W. Maui" on the authority of Newcomb, but this seems very dubious; Mons. Ancey gives Oahu, but I think this must be an error. The figures in the *Manual of Conchology* (Vol. II. pl. xxxviii. figs. 74—6) are not good.

## PHILONESIA, gen. nov.

Recently<sup>1</sup>, I discussed the genus *Microcystis* Beck, and expressed the opinion that these small Zonitoid forms so characteristic of the Hawaiian Islands, and scattered over the Islands of the Central Pacific, could not be placed in that genus. I, further, referred them to *Macrochlamys*, stating that "whether our small forms are in accord with the typical group of this genus anatomically, remains to be proved; but, conchologically, they only appear to differ in size."

Specimens of a form which I refer to the unfigured *Microcystis baldwini* Ancey, and which were collected by Mr Perkins, contained the animal, and Lt.-Col. Godwin-Austen has most kindly made an examination of it. His full report will be found on p. 281, but I may here summarize it by saying that this species does not belong to *Macrochlamys* at all, and the query I suggested has been answered. He points out its affinity to *Sitala* and *Kaliella* and here it is interesting to note that Mr Perkins found a species in the Hawaiian Islands that I have referred to the latter genus.

Under these circumstances, and as the shells are distinct by the conchological characters of the columella from both *Microcystina* and *Lamprocystis*—anatomically, also, from the former—I have ventured to create a new genus and propose to take *Microcystis baldwini* Ancey, as the type. Probably the bulk of the Hawaiian Zonitoid forms belong to this group.

(1) *Philonesia abeillei* Ancey.

*Microcystis abeillei* Ancey, Bull. Soc. Malac. France, vi. (1889), p. 199.

HAB. Molokai (Ancey); Mapulehu (Baldwin); wet forest above Pelekunu (Perkins).—Oahu, Waianae Mts. (Perkins).—Lanai (Perkins).

All the specimens are young, but I cannot sever them from this species.

<sup>1</sup> P. Malac. Soc. London, II. p. 130.

(2) *Philonesia baldwini* Ancey.

*Microcystis baldwini* Ancey, Bull. Soc. Malac. France, VI. (1889), p. 204. Plate XII. figs. 1—5.

HAB. Oahu and west part of Maui (Ancey); Head of Panoa Valley, Nuuanu, and Honolulu Mts. (Perkins).

"The animal is brown; spotted and splashed with pure white (Plate XII. fig. 1 a) on the integument which covers the branchial chamber and visceral sac, these markings shew clearly through the transparent shell and give it a very pretty, mottled appearance. The extremity of the foot is truncated; with a mucous gland. In the specimen examined the foot (Plate XII. fig. 2) is very much contracted, but there is every indication that a small lobe overhangs the mucous gland. The foot, which is regularly segmented, has a central area (Plate XII. fig. 2 a); the pallial margin appears unusually broad, but this is deceptive and due to the extreme lateral contraction undergone; the two grooves above are similarly widened. The mantle edge has a well-developed, tongue-like, right shell lobe near the respiratory orifice, with an indistinct, narrow, left shell lobe. The right dorsal lobe is black and well developed, the left paler and moderately broad. Tentacles black.

"Plainly seen through the shell were four embryonic shells, lying one behind the other in the uterus, in various stages of development. The enveloping integument is transparent and so thin that the small shells, being comparatively heavy bodies, very readily break away, and the spermatophore adjacent was not made out.

"The odontophore has a formula of

$$30 : 9 : 1 : 9 : 30$$

$$39 : 1 : 39.$$

"The basal plates of the central teeth are quadrate in outline. The central tooth is tricuspid, the side cusps basal, blunt; the central point with convex sides. The median teeth have a blunt cusp only on the outer basal side, the ninth tooth is a narrower basal plate and is intermediate in form, the next eighteen being curved and bicuspid; the most interesting character is seen at this part of the row, for all the succeeding and outermost teeth are tricuspid, occasionally with even four points. The radula is remarkable for the similarity of the outermost teeth to those of *Kaliella barrakpurenensis*<sup>1</sup>; those of *Sitala attega* and *S. infula*<sup>2</sup> should also be compared, in which latter the pectiniform teeth are seen on the whole length of the row. The present shell shows an approach to *Kaliella* in a few of the outermost laterals, but it

<sup>1</sup> Land and F. W. Moll. India, 1. pp. 19, 20, pl. v. fig. 11.

<sup>2</sup> Tom. cit. pl. VIII. figs. 1 e & 2 e, after Stoliczka.

must be noted that the median teeth have a single outer cusp, while *Kaliella* has both outer and inner cusps; this latter characteristic is, however, not present in *Sitala*. *Kaliella* has few teeth in the row, *Sitala* many; 33 : 1 : 33, 153 : 1 : 153, respectively. A more important link with the genus *Sitala* is displayed by the presence of right and left shell lobes, which *Kaliella* does not possess; the close parallel lines of contraction across the right shell lobe shew that it has considerable extension in life. Stoliczka also mentions in *Sitala infula* the swollen uterus and the advanced state of development of the ova; pointing to similar embryonic stages in these molluscs. Yet another character is in common, namely, the absence of any amatorial organ. The male organ of the present species is also slightly different; I am unable, having only one specimen to dissect, to examine this in section.

"The jaw is very thin and delicate, and so colourless that its detection and extraction are very difficult. It has a well defined central projection on the cutting edge.

"The generative organs (Plate XII. figs. 3, 3a) cannot be described so fully as one would wish, owing to the expanded state of the uterus. The hermaphrodite duct and albumen gland were perfect: and the male portion thence complete. The prostate—as it is called by Semper, shewn in his figure of *Microcystis myops* as a loose fringe-like set of convolutions—appears in this species as a closely packed and thickened mass of oblong form, flattened on one side, where the oviduct would be lying attached if perfect. The vas deferens is given off at the anterior end. The penis is a thickened muscular tube, broad and bulbous below, tapering upwards to where the very short thickened retractor muscle is given off: the vas deferens at this point has three sharp convolutions; seen with transmitted light a short, sharp, 'kink' occurs in the bulbous portion near the generative aperture.

"The sculpture of the shell, magnified about thirty times, presents a very fine, regular, slightly wavy, longitudinally striated surface; this striation is strongest near the suture, becoming finer outwards. There are about 11 striae to .003 inch. The most advanced embryonic shell consists of  $2\frac{1}{4}$  whorls, the sculpture is well shewn on it.

"The point now to be solved is whether we are to retain this species in *Microcystis*. Mr Sykes regards *M. ornatella* as the type of the genus; this was also the opinion of H. Nevill. Further Mr Sykes goes on to say 'Now these small Zonitoids [*i.e.* those of the Hawaiian Islands] hardly fit into the same genus as this species and therefore some other generic title is required for them.' The anatomy now described, shews, for many reasons, that the shell cannot be placed in *Macrochlamys* as Mr Sykes, guided by the shell characters, proposed. In my opinion it is undoubtedly close to *Kaliella*, still closer to *Sitala*, and yet there are sufficient differences in the generative organs to separate this Hawaiian form from both. If we take the shell alone into account, the sculpture presents one character, *viz.* fine, close longitudinal striation, not found in the Indian species of *Sitala*, in which the general surface is smooth, with spiral liration.

<sup>1</sup> P. Malac. Soc. London, II. 1896, p. 131.

The sculpture of *Kaliella* is finer and transverse to the whorl, so differs still more. It therefore may become necessary, if this shell be generally distinct from *M. ornatella*, to create a new genus.

"When we consider the immense area on the Equatorial belt over which *Kaliella*, *Sitala*, and this allied form are distributed, it appears that they fall naturally into a subfamily of their own which may be called the SITALINÆ, Godwin-Austen, *nom. nov.*; one that is sufficiently distinct from the Durgellinæ on the one hand, with which they are associated over a large portion of their range, and from the Macrochlaminae on the other, where the area of association is more restricted and the differences in the animal much greater." (H. H. Godwin-Austen.)

(3) *Philonesia cicercula* Gould.

*Helix cicercula* Gould, P. Boston Soc. II. (1846), p. 171; U.S. Explor. Exped. *Moll.* pl. v. fig. 73.

HAB. Hawaii (Gould); Kohala (Perkins).

var. *boettgeriana* Ancey.

*Microcystis cicercula* var. *boettgeriana* Ancey, Bull. Soc. Malac. France, VI. p. 206.

HAB. Hawaii, Kona (Ancey).

(4) *Philonesia exaequata* Gould.

*Helix exaequata* Gould, P. Boston Soc. II. (1846), p. 171; U.S. Explor. Exped. *Moll.* pl. v. fig. 61.

*Helix disculus* Pfeiffer, Zeitschr. für Malak. VII. 1851, p. 68 [*non* Deshayes].

*Helix obtusangula* Pfeiffer, *l. c.* p. 153.

*Nanina discus* Pfeiffer, Tryon, Man. Conch. Ser. II. Vol. II. p. 114.

HAB. Kauai (Gould, Perkins).

(5) *Philonesia hartmanni* Ancey.

*Microcystis hartmanni* Ancey, Bull. Soc. Malac. France, VI. (1889), p. 198.

HAB. Oahu (Ancey); Kalaikoa (Baldwin).

(6) *Philonesia indefinita* Ancey.*Microcystis indefinita* Ancey, Bull. Soc. Malac. France, vi. (1889), p. 203.

HAB. Maui, east part (Ancey); Makawao (Baldwin).

(7) *Philonesia lymanniana* Ancey.*Microcystis lymanniana* Ancey, Mem. Soc. Zool. France, vi. (1893), p. 329.

HAB. Oahu, Waialae (Ancey).

(8) *Philonesia oahuensis* Ancey.*Microcystis oahuensis* Ancey, Bull. Soc. Malac. France, vi. (1889), p. 202.

HAB. Oahu (Ancey); Halemano (Perkins).

I refer, with some doubt, a single specimen found by Mr Perkins, to this unfigured species.

var. *depressiuscula* Ancey.*M. oahuensis* var. *depressiuscula* Ancey, *t. c.* p. 203.

HAB. Oahu (Ancey).

(9) *Philonesia perlucens* Ancey.*Microcystis perlucens* Ancey, Bull. Soc. Malac. France, vi. (1889), p. 207.

HAB. Maui, east part (Ancey).

(10) *Philonesia perkinsi* Sykes.*Macrochlamys perkinsi* Sykes, P. Malac. Soc. London, II. (1896), p. 126.

Plate XI. figs. 41, 42.

HAB. Lanai.—(?) Oahu, a single specimen (Perkins).

(11) *Philonesia platyla* Ancey.*Microcystis platyla* Ancey, Bull. Soc. Malac. France, vi. (1889), p. 196; Sykes,

P. Malac. Soc. London, III. pl. XIII. figs. 13—15.

HAB. Oahu (Ancey); Waianae Mts. (Baldwin, Perkins).

(12) *Philonesia plicosa* Ancey.

*Microcystis plicosa* Ancey, Bull. Soc. Malac. France, vi. (1889), p. 200.

HAB. Oahu (Ancey); Palolo (Baldwin).

(13) *Philonesia sericans* Ancey.

*Microcystis sericans* Ancey, P. Malac. Soc. London, III. (1899), p. 268.

HAB. Hawaii, Olaa (Ancey).

(14) *Philonesia subrutila* Mighels.

*Helix subrutila* Mighels, P. Boston Soc. II. (1845), p. 19.

HAB. Oahu (Mighels, &c.).—Mr Baldwin gives Kauai, but I doubt this; the species is unknown to me.

(15) *Philonesia subtilissima* Gould.

*Helix subtilissima* Gould, P. Boston Soc. II. (1846), p. 177; U.S. Explor. Exped. Moll. pl. v. fig. 62.

Unknown to me; from the figure I am not certain of its generic position.

HAB. Maui (Gould).

(16) *Philonesia turgida* Ancey.

*Microcystis turgida* Ancey, Bull. Soc. Malac. France, VII. (1890), p. 339; Sykes, P. Malac. Soc. London, III. pl. XIII. figs. 5—7.

HAB. Maui (Ancey); Makawao (Baldwin); Mts. at 4000 ft. (Perkins).—A specimen found on Lanai by Mr Perkins, may belong to a variety.

Obs. The *Helix misella* of Férussac has been recorded with a query from the islands, but does not really belong to their fauna.

## KALIELLA Blanford.

Type the group of *Helix barrakporensis* Pfr.

(1) *Kaliella konaensis* Sykes.

*Kaliella konaensis* Sykes, P. Malac. Soc. London, II. p. 299.

Plate XI, fig. 33.

A remarkable little shell which seems to fall between *Kaliella* and *Trochoconulus*.

HAB. Hawaii, Mt. Kona, at 3000 ft. (Perkins).

## Fam. PHILOMYCIDAE.

## TEBENNOPHORUS Binney.

*Tebennophorus* Binn., J. Boston Soc. IV. 1844, p. 171 (Type *Limax carolinensis*, Bosc).

(1) *Tebennophorus bilineatus* Benson.

*Inciliaria bilineata* Benson, Ann. Nat. Hist. IX. 1842, p. 486.

*Philomycus bilineatus* Benson, Martens, Preuss. Exped. Ost-Asien, Mollusca, p. 16, pl. v. fig. 1.

*Tebennophorus australis* Bergh?, Collinge, P. Malac. Soc. London, II. p. 50.

*Tebennophorus striatus* Hasselt, Collinge, *l. c.* p. 295.

HAB. Oahu, Mount Tantalus, Honolulu at 2000 ft.—Kauai, Lihue at 2000 ft.—Hawaii, Oloa at 2000 ft. (Perkins).

See Collinge, J. Malac. VII. 1900, p. 80.

(2) *Tebennophorus striatus* Hasselt.

*Meghimatum striatum* Hasselt, Bull. Sci. Nat. Geol. III. 1824, p. 82.

*Tebennophorus striatus* Hasselt, Collinge, P. Malac. Soc. London, II. p. 50.

HAB. Oahu, Mount Tantalus (Perkins).

## Fam. ENDODONTIDAE.

## ENDODONTA Albers.

*Endodonta* Alb., Die Heliceen, 1850, p. 89 (first species *Helix lamellosa*, Fér.);  
*Op. cit.* Ed. 2, 1860, p. 90 ("typus *Helix lamellosa*, Fér.").

(1) *Endodonta apiculata* Ancey.

*Endodonta apiculata* Ancey, Bull. Soc. Malac. France, VI. (1889), p. 189.

HAB. Kauai, Dr Newcomb (Ancey).

(2) *Endodonta lamellosa* Férussac.

*Helix lamellosa* Férussac, Hist. Moll. I. p. 369, pl. LI. A, fig. 3; Quoy and Gaimard, Voy. Freycinet, Zool. p. 469. Pfeiffer, Conchylien-Cabinet, *Helix*, p. 197, pl. c. figs. 6—8.

*Helix fricki* Pfeiffer, P. Zool. Soc. London, 1858, p. 21, pl. XL. fig. 3.

According to Mörch (J. Conchyl. XIII. p. 395) this species "dépose ses œufs dans l'ombilic."

The teeth or lamellæ seem to be variable; some specimens shew traces of a second tooth in the upper portion of the outer lip, thus having nine teeth in all. Considerable variation is also shewn in the relative proportions of height and breadth, and in the width of the umbilicus.

HAB. Oahu (Pease, Ancey); Waianæ Mts. and Konahuanui (Baldwin); Mt. Kaala.—Lanai Mts. behind Koele (Perkins).

(3) *Endodonta laminata* Pease.

*Helix laminata* Pease, Amer. J. Conch. II. (1866), p. 292.

According to the diagnosis this differs from the last by being spirally sculptured as well as transversely ribbed, thereby becoming decussated. The teeth appear to be identical in number and position and I believe it will, eventually, only prove to be a local race.

Tryon (Man. Conch. Ser. 2, III. p. 70) considered it to be a form of *E. cavernula*, Hombr. and Jacq., stating "I have before me two trays of shells named *Helix laminata* Pease, from the 'Sandwich Is.,' one of them from the describer, which undoubtedly represent the same species." Since the two forms differ, from the diagnoses, so widely in the armature, there must, I think, be some error.

HAB. Kauai (Pease); Kahiliwi to Haena (Baldwin).

Sub-genus THAUMATODON Pilsbry.

(4) *Endodonta (Thaumatodon) contorta* Férussac.

*Helix contorta* Férussac, Hist. Moll. I. p. 10, pl. LI. A, fig. 2.

*Helix intercarinata* Mighels, P. Boston Soc. II. (1845), p. 18.

Specimens found by Mr Perkins, and which I refer to this species, appear to shew considerable variation and may be divided as follows :

A. Six specimens, fairly typical in shape and size, but only one is furnished with five palatal teeth, the others having four.

B. One specimen, darker in colouration, the colour markings being very distinct, palatal teeth five, these being remarkably incrassated.

C. A long series (from Makaweli), larger, slightly more strongly sculptured and very variable in colouration, sometimes the dark brown colour predominating, at others a greenish yellow. All appear to have four palatal teeth only.

HAB. Oahu (various authors).—Kauai (Perkins).

(5) *Endodonta (Thaumatodon) hystricella* Pfeiffer.

*Helix hystricella* Pfeiffer, P. Zool. Soc. London, 1859, p. 25.

The original examples of this unfigured species, referred to as in Mus. Cuming, do not appear to be now in the British Museum. Two specimens found by Mr Perkins agree well with Pfeiffer's diagnosis and dimensions ; they also accord in the number of teeth.

HAB. Kauai (Pease).—Oahu, Kaala (Perkins).

(6) *Endodonta (Thaumatodon) nuda* Ancey.

*Endodonta (Thaumatodon) nuda* Ancey, P. Malac. Soc. London, III. (1899), p. 268, pl. XII. fig. 1.

HAB. Hawaii, Olaa (Ancey).

(7) *Endodonta (Thaumatodon) ringens* Sykes.

*Endodonta (Thaumatodon) ringens* Sykes, P. Malac. Soc. II. (1896), p. 126.

Plate XI. figs. 39, 40.

In describing this species, I referred to it as having four teeth within the outer lip ; perhaps it would be more correct to say "one basal tooth and three within the

outer lip." The ribs appear to be at varying distances apart. The Molokai specimens appear to belong to a large variety.

HAB. Lanai Mountains, behind Koele.—Molokai in wet forest above Pelekunu (Perkins).

(8) *Endodonta (Thaumatodon) rugata* Pease.

*Helix rugata* Pease, Amer. J. Conch. II. (1866), p. 291.

HAB. Maui (Pease).

Sub-genus NESOPHILA Pilsbry.

The following table may assist in separating the species of *Nesophila*.

A. Parietal lamellæ absent.—*E. capillata* Pease.

B. Parietal lamella single.—*E. decussatula* Pease; *E. elisæ* Ancey; *E. jugosa* Mighels; *E. lanaiensis* Sykes; *E. stellula* Gould.

C. Parietal lamellæ two.—*E. binaria* Pfeiffer; *E. hystrix* (Mighels MS.) Pfeiffer; *E. paucicostata* Pease.

D. Parietal lamellæ several.—*E. baldwini* Ancey; *E. distans* Pease; *E. tiara* Mighels.

(9) *Endodonta (Nesophila) baldwini* Ancey.

*Charopa baldwini* Ancey, Bull. Soc. Malac. France, VI. (1889), p. 176.

Mons. Ancey also records a white variety.

HAB. Hawaiian Islands (Ancey).

(10) *Endodonta (Nesophila) binaria* Pfeiffer.

*Helix binaria* Pfeiffer, P. Zool. Soc. London, 1856, p. 33.

I am unable to trace the type of this species, which should have passed with Cuming's collection into the British Museum.

HAB. Kauai (Pease).

(11) *Endodonta (Nesophila) capillata* Pease.

*Helix capillata* Pease, Amer. J. Conch. II. (1866), p. 292.

HAB. Kauai (Pease).

(12) *Endodonta (Nesophila) decussatula* Pease.*Helix decussatula* Pease, Amer. J. Conch. II. (1866), p. 291.

HAB. Molokai (Pease); Mountains at 4000 ft. (Perkins).

Mr Baldwin gives "Kauai" as the habitat, but, since he marks it as a species he has not seen, I think there is probably some error.

(13) *Endodonta (Nesophila) distans* Pease.*Helix distans* Pease, Amer. J. Conch. II. (1866), p. 290.

HAB. Kauai (Pease).

(14) *Endodonta (Nesophila) elisae* Ancey.*Pityis elisae* Ancey, Bull. Soc. Malac. France, VI. (1889), p. 180.

Unknown to me.

HAB. ? Hawaiian Islands (Ancey).

(15) *Endodonta (Nesophila) hystrix* (Mighels MS.) Pfeiffer.*Helix hystrix* Pfeiffer, Symb. Hist. Hel. III. p. 67; Gould, U. S. Explor. Exped. Moll. pl. IV. fig. 52\*.*Helix setigera* Gould, P. Boston Soc. I. p. 174 [nec Sowerby].It is, of course, not the *Helix hystrix* of Cox, an Australian species.

HAB. Oahu (authors); Mount Kaala, Oahu (Perkins).

(16) *Endodonta (Nesophila) jugosa* Mighels.*Helix jugosa* Mighels, P. Boston Soc. II. (1845), p. 19.*Helix rubiginosa* Gould, P. Boston Soc. II. (1846), p. 173; U. S. Explor. Exped. Moll. pl. IV. p. 49.

The two forms were first united by Pease<sup>1</sup>, who stated that the synonymy was accepted by Gould; recently Mons. Ancey<sup>2</sup> has revived *E. rubiginosa* as a species, referring to it some shells from Oahu. In this state of conflict I have followed Pease, considering that he and Gould were in the best position to form an opinion.

HAB. Kauai, Waioli to Kapaa (Baldwin); Kauai (Perkins, etc.).

<sup>1</sup> J. Conchyl. XIX. (1870), p. 95.<sup>2</sup> Bull. Soc. Malac. France, VI. (1889), p. 179.

(17) *Endodonta (Nesophila) lanaiensis* Sykes.

*Endodonta (Nesophila) lanaiensis* Sykes, P. Malac. Soc. London, II. (1896), p. 127.  
Plate XI. figs. 37, 38.

Specimens from Kauai which I refer to this species are strongly hispid in the young state, but with age the hairs appear to be rubbed off; none of those from Lanai are very young, and only traces of hairs can be seen. The species appears to be near *E. decussatula*, but it almost lacks decussation and is darker in colour; the interstices of the ribs are closely, finely, striate. Save for the presence of a parietal lamella, the Kauai specimens approach Pease's diagnosis of *E. capillata*.

HAB. Lanai Mountains, behind Koele.—Kauai, Makaweli, on *Dracaena* and *Cheirodendron* (Perkins).

(18) *Endodonta (Nesophila) paucicostata* Pease.

*Helix paucicostata* Pease, J. Conchyl. XVIII. (1870), p. 395.

*Helix filocostata* Pease, P. Zool. Soc. London, 1871, p. 454.

HAB. Kauai (Pease).

(19) *Endodonta (Nesophila) stellula* Gould.

*Helix stellula* Gould, P. Boston Soc. I. (1844), p. 174; U. S. Explor. Exped.  
*Moll.* pl. IV. fig. 52†.

HAB. Maui (Gould).

(20) *Endodonta (Nesophila) tiara* Mighels.

*Helix tiara* Mighels, P. Boston Soc. II. (1845), p. 19; Kuster, Conch.-Cab. *Helix*,  
pl. CXXV. figs. 9—11.

According to Mons. Ancey<sup>1</sup> this species possesses several parietal lamellæ; if so, the character has been omitted from the various diagnoses.

HAB. Kauai (various authors).

(21) *Endodonta (Nesophila)*, sp.

Two interesting little specimens with a depressed spire were found on Molokai by Mr Perkins, the exact habitat being "Forest above Pelekunu"; they have 4—4½ whorls, with two parietal lamellæ and no teeth within the other lip, but appear not to be adult.

HAB. Molokai.

<sup>1</sup> Bull. Soc. Malac. France, VI. p. 175.

## PTERODISCUS Pilsbry.

Type, *P. wesleyi* Sykes.

(1) *Pterodiscus digonophorus* Ancey.

*Patula digonophora* Ancey, Bull. Soc. Malac. France, vi. (1889), p. 171; Sykes, P. Malac. Soc. London, III, pl. XIII, figs. 9—11.

HAB. Oahu (Ancey); Waianae Mts. (Baldwin).

(2) *Pterodiscus petasus* Ancey.

*Pterodiscus petasus* Ancey, P. Malac. Soc. London, III, (1899), p. 268, pl. XII, fig. 4.

HAB. Oahu, Waianae Mts. (Ancey).

(3) *Pterodiscus wesleyi* Sykes.

*Endodonta (Pterodiscus) wesleyi* Sykes, P. Malac. Soc. London, III, (1896), p. 127.  
*Endodonta (Pterodiscus) alata* Pfeiffer, Pilsbry, Man. Conch. (2) IX, p. 36, pl. IV, fig. 44 [nec *Helix alata*, Pfeiffer].

HAB. Hawaiian Islands.

The following two species, placed in this group by Mr Pilsbry<sup>1</sup>, with the habitat of Hawaiian Islands, are unknown to me. They were originally described from "Islands of the Central Pacific" by Pease: the first has been recorded from Tahiti, but never again found there, and Mons. Ancey has suggested a Hawaiian origin; the second has been localized as from (?) Lanai. They are *Helix prostrata* and *H. depressiformis* (P. Zool. Soc. London, 1864, p. 670).

## Fam. HELICIDAE.

## PAPUINA von Martens.

*Papuina* Mart., Die Heliceen, Ed. 2, 1860, p. 166 (type *Helix lituus*, Lesson).

(1) *Papuina barnaclei* Smith.

*Helix (Merope?) barnaclei* Smith, Ann. Nat. Hist. (4) XX, p. 242.

I am informed that careful search has been made, in the neighbourhood indicated, but that no trace of the species can be found. At present, bearing in mind on the one

<sup>1</sup> Man. Conch. (2) IX, p. 36.

hand the improbability of a species of *Papuina* occurring in Hawaii, and on the other the positive statement of the original collector, I can but include it, with this note of warning.

HAB. Hawaii, eight miles from Kailua (Smith).

EULOTA Hartmann.

*Eulota* Hart., Erd- und Susswasser Gasteropoden, p. 179 (type *Helix fruticum*, Müll.). The date usually given is 1842, but the title-page of the copy in the British Museum bears that of 1840.

(1) *Eulota similaris* Férussac.

*Helix similaris* Férussac, Prodrôme, 1822, p. 47 (*nom. sol.*); Hist. Moll. I. p. 171, pl. xxv. B, figs. 1—4, xxvii. A, figs. 1—5.

A widely scattered species; presumably not indigenous.

HAB. Kauai (Pilsbry).—Oahu, Tantalus (Perkins).

The following have been described under the term *Helix* and recorded from the Islands.

*Helix fornicata* Gould, P. Boston Soc. II. (1846), p. 172.

Supposed to come from Kauai. Tryon notes<sup>1</sup>: "In the corrigenda to the Mollusca of the Wilkes Exploring Expedition, Dr Gould states that the only specimen was lost, and *H. tongana* Quoy, figured by the artist for this species."

*Helix sandwichensis* Pfeiffer, P. Zool. Soc. London, 1849, p. 128.

Appears to be the young of a South American *Systrophia*.

*Helix exserta* Pfeiffer, P. Zool. Soc. London, 1856, p. 32.

Only a fragment of the type remains; it has never been figured.

Fam. PUPIDAE.

PUPA Draparnaud (1801).

*Pupa* Drap., Tabl. Moll. France, pp. 32, 56 (first species *Turbo muscorum* L.); 1805, Hist. Moll. France, p. 59.

There appears to be a *Pupa* of Lamarck of even date (Syst. anim. sans Vert. p. 88) with *Turbo uva* as type; also, through the kindness of Mr Sherborn, I have

<sup>1</sup> Man. Conch. (2), III. p. 27.

examined the *Muscum Boltenianum*, Ed. 1. 1798, and Bolten proposed *Pupa* (p. 110) for *Voluta flammea* and *V. solidula*. The first species belongs to *Actacon* (1810) and the second is the type of *Solidula* (1807). If, therefore, Bolten's names are to be used, *Pupa* Drap. cannot stand unless it prove to be the same as *Pupa* Humphrey, 1797 (*Mus. Calonianum*).

An excellent study of the Pupidae of Oceania has been written by Dr Boettger; the attention of subsequent authors does not appear to have been sufficiently directed to this paper.

(1) *Pupa acanthinula* Ancy.

*Pupa acanthinula* Ancy, Mem. Soc. Zool. France, v. (1892), p. 709.

HAB. Oahu, Makiki (Ancy).

(2) *Pupa admodesta* Mighels.

*Pupa admodesta* Mighels, P. Boston Soc. II. (1845), p. 19; Boettger, Conch. Mittheil. 1. p. 58, pl. XII. fig. 15.

HAB. Oahu (Mighels).

(3) *Pupa bacca* Pease.

*Pupa bacca* Pease, P. Zool. Soc. London, 1871, p. 462.

HAB. Hawaii, Kalapana (Pease).

(4) *Pupa costata* Pease.

*Pupa costata* Pease, P. Zool. Soc. London, 1871, p. 462.

HAB. Hawaii (Pease).

(5) *Pupa lyonsiana* Ancy.

*Pupa lyonsiana* Ancy, Mem. Soc. Zool. France, v. (1892), p. 713.

HAB. Oahu, Punahou (Ancy).

(6) *Pupa lyrata* Gould.

*Pupa lyrata* Gould, P. Boston Soc. 1. (1843), p. 139; Boettger, Conch. Mittheil. 1. p. 61, pl. XII. fig. 17.

*Pupa striatula* Pease, P. Zool. Soc. London, 1871, p. 461.

*Pupa magdalenae* Ancy, Mem. Soc. Zool. France, v. (1892), p. 716.

I follow Dr Boettger in placing *P. striatula* with *P. lyrata*, and have added *P. magdalenae*, since the character of two parietal teeth, on which Mons. Ancey lays special stress, is found in some undoubted specimens of *P. lyrata*.

HAB. Hawaii (Pease).—Oahu (Baldwin); Palaina (Ancey).

(7) *Pupa mirabilis* Ancey.

*Pupa mirabilis* Ancey, Bull. Soc. Malac. France, VII. (1890), p. 339.

HAB. Oahu (Ancey).

(8) *Pupa newcombi* Pfeiffer.

*Pupa newcombi* Pfeiffer, P. Zool. Soc. London, 1852 [1854], p. 69; Kuster, Conch.-Cab. *Pupa*, pl. XX. figs. 23, 24.

*Pupa costulosa* Pease, P. Zool. Soc. London, 1871, p. 462.

HAB. Hawaii (Pease, Baldwin).—Oahu and Kauai (Baldwin) [sed quaere, E.R.S.].

var. *seminulum* Boettger.

*Pupa newcombi* var. *seminulum* Boettger, Conch. Mittheil. I. p. 58, pl. XII. fig. 14.

HAB. Probably Hawaii (Boettger).

(9) *Pupa pediculus* Shuttl. var. *nacca* Gould.

*Vertigo nacca* Gould, P. Boston Soc. VIII. (1862), p. 280.

Dr Boettger has pointed out that this is only a form of *P. pediculus*, Shuttleworth (Bern. Mittheil. 1852, p. 296), and barely of varietal rank. The typical form appears not to be found in the Hawaiian Islands.

HAB. Hawaii (Gould).

(10) *Pupa perlonga* Pease.

*Pupa perlonga* Pease, P. Zool. Soc. London, 1871, p. 462; Boettger, Conch. Mittheil. I. p. 60, pl. XII. fig. 16.

Only two specimens, which I refer here with some hesitation, since the teeth are rather obscure.

HAB. Oahu (Pease).—Kauai, Makaweli (Perkins).

## Fam. ACHATINELLIDAE.

The various species of this family form probably one of the most puzzling groups of land-shells known: numerous 'species' have been described, founded almost entirely on shell colouration or banding, and this, bearing in mind such protean forms as *Tachea nemoralis* or *Polymita picta*, is a course which often leads to endless trouble. At present, such genera as *Achatinella* s. s. and *Achatinellastrum* are in utter confusion, and any attempt at a list of species simply reflects the general view of the writer and cannot be regarded as authoritative.

Of recent years some species have been described, based on shell-colouration combined with that of the mantle, but it should be remembered that some malacological characteristics are frequently as liable to variation as are conchological ones. The severance of species by consideration of habitat is, again, not a necessarily certain guide, since one species of mollusc may range widely, while at different points of its range, local variations may occur.

The history of the Achatinellidae in literature commences with Dixon's description of *Turbo apexfulva*; subsequently stray species were described by various authors, but no serious attempts were made at their study until about 1850-60, when Newcomb and Pfeiffer added greatly to our knowledge. To Mr Gulick, in 1858, we owe large additions to the catalogue—so far as names go—but his views of species were somewhat too narrow, and he described many trifling variations as species, mainly on the ground of geographical range. Later, Pease did useful work and gave a catalogue of the family. Dr Hartman, in 1888, listed the known forms in a similar way. Of recent years Mr Baldwin has done the chief work on the group, and his very valuable catalogue has been of great assistance.

Numerous genera and sections have been described, almost all on purely conchological grounds, and so variable are the forms that linking species are easily found. Still they prove useful in the arrangement of species and therefore have been admitted in this work.

A list of them arranged in chronological order may be of use.

- 1828. *Achatinella* Swainson, Q. J. Sci. Lit. and Arts, p. 81.
- 1847. *Leptachatina* Gould, P. Boston Soc. II. p. 201.
- 1854. *Partulina* Pfeiffer, Malak. Blatt. I. p. 114.
- 1854. *Newcombia* Pfeiffer, t. c. p. 117.
- 1854. *Bulinella* Pfeiffer, t. c. p. 119.
- 1854. *Laminella* Pfeiffer, t. c. p. 126.
- 1854. *Achatinellastrum* Pfeiffer, t. c. p. 133.
- 1854. *Labiella* Pfeiffer, t. c. p. 142.

1855. *Cavelia* H. & A. Adams, Gen. Rec. Moll. II. p. 132.  
 1855. *Amastra* H. & A. Adams, *t. c.* p. 137.  
 1855. *Auriculella* Pfeiffer, Malak. Blatt. II. p. 3.  
 1855. *Frickella* Pfeiffer, *t. c.* p. 3.  
 1860. *Apex* Martens, Die Heliceen, p. 248.  
 1870. *Eburnella* Pease, P. Zool. Soc. London, 1869, p. 647.  
 1870. *Perdicella* Pease, *t. c.* p. 649.  
 1875. *Carinella* Pfeiffer, Novit. Conch. IV. p. 116.  
 1899. *Thaanumia* Ancey, P. Malac. Soc. London, III. p. 269.  
 1899. *Baldwinia* Ancey, *t. c.* p. 270.

Mr Pilsbry's remark, that the use of Férussac's term *Helicteres* "would open the door to an endless series of vagaries in nomenclature," appears to me to be thoroughly justified; for the converse view see Pease, P. Zool. Soc. London, 1862, p. 3. The *Achatinella* of Schlüter (1838) appears to be a mixture of *Ferussacia* and allied groups.

Our knowledge of the anatomy is due primarily to Bland and Binney, who pointed out that the Achatinellidae may be divided into two main groups based on the characters of the radula and jaw; also that *Cavelia*, while it agrees in the radula with the *Leptachatina* and *Amastra* group, differs in the characters of the jaw. Heynemann has also written on the subject, and recently notes have been published by Messrs Gwatkin, Pilsbry and Suter. Mr Pilsbry has recently<sup>1</sup> stated with reference to *Partula* and *Achatinella* that "these forms have no relations with the Bulimulidae and Achatinidae, with which conchologists associate them, but lie at the base of the terrestrial pulmonate tree."

The classification here adopted is:

Genus *Achatinella*. Subgen. *Achatinella* s. s. (Syn. *Apex*.) *Bulimella*. *Partulina*. (Syn. *Baldwinia*.) *Achatinellastrum*. (Syn. *Eburnella*.)

Genus *Perdicella*.

Genus *Newcombia*.

Genus *Amastra*. Subgen. *Amastra* s. s. *Laminella*. *Amastrella*, n. subgen. *Kauaia*, n. n. [*Carinella*, Pfr., nec Sby.]

Genus *Leptachatina*.

Genus *Thaanumia*.

Genus *Carclia*.

Genus *Auriculella*.

Genus *Frickella*.

<sup>1</sup> Ann. nat. Hist. IV. (1899), p. 156.

## ACHATINELLA s. str.

Synonym. *Apex* von Martens.

Well has Dr Hartman remarked, that the species of this group "are involved in almost inextricable confusion." Our ignorance of the animal in most forms, combined with the fact that authors have described frequently from single specimens, or from series of two or three, entirely at present prevents one ascertaining the true specific limits.

In the one or two instances where I have attempted 'lumping,' the results are due to a long series of specimens in which I have been unable to arrive at a definite break between the one 'species' and the other.

The conclusions I have drawn are founded on Newcomb's and Pfeiffer's type specimens; specimens compared with Gulick's types; further a few of the types described by Mr Smith; and, finally, the specimens collected by Mr Perkins and a collection formed by Mr Hutchison.

All the species of this group are confined to the Island of Oahu.

(1) *Achatinella albospira* Smith.

*Apex albospira* Smith, P. Zool. Soc. London, 1873, p. 77, pl. x. fig. 8.

Unknown to me; it has been united by Dr Hartman with *A. turgida* Newc. [= *A. cestus* Newc.].

HAB. Oahu, Ewa.

(2) *Achatinella apexfulva* Dixon.

*Turbo apex fulva* Dixon, Voyage round the world, 1789, p. 344, figd. on an unnumbered plate.

*Turbo lugubris* Chemnitz, Conch.-Cab. xl. 1795, p. 278, pl. ccix. figs. 2059, 2060.

*Cochlogena (Helicteres) lugubris* Chemnitz, Férussac, Prodrôme, p. 60, no. 431.

*Monodonta seminigra* Lamarck, Hist. Nat. Anim. sans Vert. vii. (1822), p. 37.

*Achatinella pica* Swainson, Zool. Ill. Moll. ser. II. pl. xcix. fig. 1.

HAB. Oahu, Kawaiiloa (Baldwin).

Dixon was thoroughly binomial, as a reference to his work will show: his figures are good, and the only point that can be made against the utilization of his name is that it appeared in three words. This, probably, was a printer's error, or a slip, as other names in the same work are proper, and suitable descriptions are given.

(3) *Achatinella apicata* (Newcomb MS.) Pfeiffer.*Achatinella apicata* Pfeiffer, P. Zool. Soc. London, 1855 [1856], p. 210.

HAB. Oahu, Halemano (Perkins).

var. *polymorpha*, Gulick.*Apex polymorpha* Gulick, P. Zool. Soc. London, 1873, p. 81, pl. x. fig. 5.

HAB. Oahu, Wahiawa, Kalaikoa, Ahonui (Gulick); Kawailoa Gulch, and above Ewa (Perkins).

var. *vespertina* Baldwin.*Achatinella (Apex) vespertina* Baldwin, P. Ac. Philad. 1895, p. 219 [shell and animal], pl. x. fig. 14.

HAB. Oahu, Kawailoa (Baldwin); from a ridge between Waala and Kawailoa Gulches (Perkins).

var. *alba*, var. *n.*

Shell snow-white, save for the peristome being margined with lilac, similar tinting appearing on the columella plait, and inside the outer lip at its junction with the body-whorl of the shell.

HAB. Oahu, near head of Kawailoa Gulch (Perkins).

A fine series of this species. It appears to be distinct from *A. swiftii* Newc. [= *A. cestus* Newc. var.], to which Newcomb subsequently referred it, and the type of which I have examined. The shell is larger, different in form, and more polished, the ground colouring darker, and the banding not so conspicuous in the typical form: the protoconch is in general brown, and but rarely white. The prevailing tint is brown, sometimes becoming black with a white area below the suture, rarely altogether snow-white. A few, from near Kawailoa, are tinted with lilac on an ashy ground, occasionally having a chestnut sutural line; these form a passage to *A. vespertina* Baldwin, in which the lilac tint has changed to cream-colour. This latter is the only form in which the animal appears to have been noticed.

(4) *Achatinella bicolor* (Gulick) Pfeiffer.*Achatinella bicolor* Pfeiffer, Mon. Hel. Viv. iv. 1859, p. 529.Near, apparently, to *A. cookei* Baldwin.

HAB. Oahu, Lehui (Pfeiffer).

(5) *Achatinella cestus* Newcomb.

*Achatinella cestus* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 132, pl. xxii. fig. 8.

*Achatinella turgida* Newcomb, *tom. cit.* p. 134, pl. xxii. figs. 10, 10 a.

HAB. Oahu, Palolo and Ewa (Newcomb); Ewa and Halemano (Perkins).

var. *swiftii* Newcomb.

*Achatinella swiftii* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 133, pl. xxii. fig. 9; Ann. Lyc. New York, vi. p. 325 [animal].

*Achatinella (Achatinellastrum) valida* Pfeiffer, P. Zool. Soc. London, 1855, p. 6, pl. xxx. fig. 24.

*Apex flavidus* Gulick, *op. cit.* 1873, p. 80, pl. x. fig. 1.

*Apex tuberosus* Gulick, *tom. cit.* p. 81, pl. x. fig. 3.

*Apex liliaceus* Gulick, *tom. cit.* p. 79, pl. x. fig. 4.

*Apex turbiniformis* Gulick, *tom. cit.* p. 81, pl. x. fig. 7.

HAB. Oahu, Ewa (Newcomb); as *A. flavidus*, Kalaikoa and Ahonui (Gulick); as *A. tuberosus*, Kalaikoa, Ahonui, Wahiwawa and Halemano (Gulick); as *A. turbiniformis*, Kalaikoa and Lehui (Gulick).

var. *forbesiana* Pfeiffer.

*Bulimella forbesiana* Pfeiffer, P. Zool. Soc. London, 1855, p. 5, pl. xxx. fig. 16.

*Apex gulickii* Smith, *loc. cit.* 1873, p. 78, pl. ix. fig. 19 [non 17].

HAB. Oahu as *A. gulickii*, Kalaikoa, Ahonui and Waialei (Smith).

The type form has the bands interrupted; in the variety *swiftii* they are continuous and almost confluent, recalling a dwarf *A. lugubris*. From the variety *swiftii*, given a fair number of specimens, we may pass by slight variations up to a nearly white shell with hardly a trace of banding. One specimen is light yellow and almost unmarked except the latter half of the last whorl, which is strongly banded with dark brown (Plate XI. figs. 6, 7). The general brown colouring is more persistent in the variety than in the typical form. The variety *forbesiana* is somewhat more elongate and slightly differently banded and coloured.

(6) *Achatinella cookei* Baldwin.

*Achatinella (Apex) cookei* Baldwin, P. Ac. Philad. 1895, p. 220, pl. x. fig. 15 [shell and animal]; Suter, *t. c.* p. 239 [radula].

HAB. Oahu, Waiau (Baldwin).

(7) *Achatinella decora* Férussac.

*Cochlogena (Helicteres) decora* Férussac, Prodrôme, 1822, p. 60, no. 430.

*Turbo lugubris sinistrorsus* Chemnitz, Conch.-Cab. xi. 1795, p. 307, pl. cccxiii. figs. 3014, 3015.

*Achatinella perversa* Swainson, Quart. Journ. Sci. &c. i. 1828, p. 84; Zool. Ill. 1833, ser. II, pl. xcix. fig. 2; Newcomb, Ann. Lyc. New York, vi. 1858, p. 309 [animal].

*Achatinella concidens* Gulick, Ann. Lyc. New York vi. 1858, p. 234, pl. viii. fig. 54.

HAB. Oahu, Halemano, Waimea.

var. *leucophaea* Gulick.

*Apex leucophaeus* Gulick, P. Zool. Soc. London, 1873, p. 82, pl. ix. fig. 16.

HAB. Oahu, Waialei.

var. *neglecta* Smith.

*Apex neglectus* Smith, P. Zool. Soc. London, 1873, p. 78, pl. ix. fig. 22.

*Apex coniformis* Gulick, *tom. cit.* p. 81, pl. ix. fig. 17.

HAB. Oahu, Wahiawa, Kalaikoa, Ahonui, Halemano (Smith, Gulick).

var. *versicolor* Gulick.

*Apex versicolor* Gulick, P. Zool. Soc. London, 1873, p. 80, pl. ix. fig. 18.

HAB. Oahu, Ahonui, Kalaikoa.

var. *innotabilis* Smith.

*Apex innotabilis* Smith, P. Zool. Soc. London, 1873, p. 78, pl. ix. fig. 23.

HAB. Oahu.

subspecies *mustelina* Mighels.

*Achatinella mustelina* Mighels, P. Boston Soc. II. 1845, p. 21; Reeve, Conch. Icon.

*Achatinella*, pl. III. fig. 21; Newcomb, Ann. Lyc. New York, vi. p. 313 [animal].

HAB. Oahu, Waianae, Kaala.

var. *leucorraphe* Gulick.

*Apex leucorraphe* Gulick, P. Zool. Soc. London, 1873, p. 79, pl. x. fig. 2.

HAB. Oahu, Kalaikoa.

var. *cinerosa* Pfeiffer.

*Achatinella (Bulimella) cinerosa* Pfeiffer, P. Zool. Soc. London, 1855, p. 2, pl. xxx. fig. 5.

HAB. Oahu.

It is with much diffidence that the above 'lumping' has been attempted. While not very difficult as a general rule to identify single specimens, I have been unable to divide the long series of specimens which, partly collected by Mr Perkins and partly by Mr Hutchison, have passed through my hands. Shape, colour, and form, seem to be as nothing, and one passes by infinitesimal graduations from one so-called species to another. True it is that the animals are said to differ in colour, but this alone is not, in my opinion, sufficient for a specific character; even if it be so, it can, in general, only avail the field naturalist, and not the Museum student.

The variety *neglecta* Smith is not really so greenish as represented in the original figure; fig. 23 on the same plate gives a better idea of the real colour.

Férussac appears to have confounded more than one distinct form under his *decora*; the name has therefore been here used for the species he first referred to.

(8) *Achatinella dolium* Pfeiffer.

*Achatinella (Bulimella) dolium* Pfeiffer, P. Zool. Soc. London, 1855, p. 5, pl. xxx. fig. 15.

HAB. Molokai (Baldwin).

I fancy this habitat must be wrong and that the species really belongs to Oahu; the shell is very close to *A. hanleyana* Pf., and may prove to be only a colour variety.

(9) *Achatinella hanleyana* Pfeiffer.

*Achatinella (Bulimella) hanleyana* Pfeiffer, P. Zool. Soc. London, 1855, p. 202.

Related to the form of *A. lorata* described as *A. nobilis*, and may prove to be an extreme variety.

HAB. Oahu.

(10) *Achatinella lorata* Férussac.

*Helix* (*Cochlogena*) *lorata* Férussac, Prodrôme, 1822, p. 60.

*Achatina lorata* Férussac, Deshayes, Hist. Moll. II. p. 193, pl. CLV. figs. 9—11.

*Achatinella lorata* Férussac, Newcomb, Ann. Lyc. New York, IV. p. 310 [animal];

Semper, Reis. im Philippinen, Landmollusken, pl. XVI. fig. 23 [anatomy].

*Achatinella alba* Nuttall, Jay, Cat. Shells, Ed. III. 1839, p. 58 [*nomen solum*].

*Achatinella pallida* Nuttall, Jay, *loc. cit.*; Reeve, Conch. Icon. *Achatinella*, sp. 2.

*Achatinella* (*Bulimella*) *nobilis* Pfeiffer, P. Zool. Soc. London, 1855, p. 202.

*Achatinella ventrosa* Pfeiffer, *op. cit.* 1855, p. 6, pl. XXX. fig. 20.

Non *A. lorata* Férussac, Reeve, Conch. Icon. *Achatinella*, sp. 6.

A very variable shell, with or without colour bands, and, occasionally, pure white.

HAB. Oahu (various authors); Manoa to Halawa (Baldwin); Nuuanu, Head of Panoa Valley, Mount Tantalus (Perkins).

(11) *Achatinella multilineata* Newcomb.

*Achatinella multilineata* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 138, pl. XXII. fig. 23.

*Achatinella* (*Bulimella*) *monacha* Pfeiffer, *op. cit.* 1855, p. 3, pl. XXX. fig. 9.

HAB. Oahu, Waianae Mountains (Baldwin); Koolau poko (Newcomb). Dr Hartman referred this species, apparently by error, to Maui.

(12) *Achatinella napus* Pfeiffer.

*Achatinella* (*Achatinellastrum*) *napus* Pfeiffer, P. Zool. Soc. London, 1855, p. 5, pl. XXX. fig. 19.

*Achatinella* (*Bulimella*) *concavospira* Pfeiffer, *op. cit.* 1859, p. 30.

*Apex leucozonus* Gulick, *op. cit.* 1873, p. 83, pl. X. fig. 6.

HAB. Oahu.

I regret to be unable to agree with Newcomb that *A. napus* is the same as *A. pulcherrima* Swainson. *A. concavospira* seems to be only an elongate variety; the types of both species are in the British Museum (Natural History).

(13) *Achatinella ovum* Pfeiffer.

*Achatinella* (*Achatinellastrum*) *ovum* Pfeiffer, P. Zool. Soc. London, 1856, p. 334.

HAB. Oahu.

(14) *Achatinella pulchella* Pfeiffer.

*Achatinella (Achatinellastrum) pulchella* Pfeiffer, P. Zool. Soc. London, 1855, p. 6, pl. xxx. fig. 2.

A small species, very variable in colour, with a blunt apex, and somewhat depressed in form.

HAB. Oahu, mountains behind Ewa (Perkins).

(15) *Achatinella sordida* Newcomb.

*Achatinella sordida* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 139, pl. xxiii. fig. 27.

Some specimens run very close to *A. decora* Fér.

HAB. Oahu, Lihue (Newcomb).

(16) *Achatinella swainsoni* Pfeiffer.

*Achatinella (Bulinella) swainsoni* Pfeiffer, P. Zool. Soc. London, 1855, p. 4, pl. xxx. fig. 13.

Newcomb suggested that this might be only a form of *A. sordida*; it appears, however, to be distinct, being broader, brown in general coloration, and having a brown, in place of a white lip. It is a little doubtful, from its form, if it be correctly placed in this group, but the sections are very artificial.

HAB. Oahu.

(17) *Achatinella vittata* Reeve.

*Achatinella vittata* Reeve, Conch. Icon. *Achatinella*, 1850, sp. 9.

*Achatinella simulans* Reeve, loc. cit. sp. 15.

*Achatinella (Achatinellastrum) globosa* Pfeiffer, P. Zool. Soc. London, 1855, p. 7, pl. xxx. fig. 25.

*Apex albofasciatus* Smith, op. cit. 1873, p. 78, pl. ix. fig. 21.

*Apex tumefactus* Gulick, tom. cit. p. 82, pl. ix. fig. 20.

*Helix decora* Férussac, Quoy and Gaimard, Voy. Uranie et Phys. 1824, Zool. p. 478 [nec *H. decora* Fér. 1822 = *A. perversa* Swainson].

*Achatina decora* Férussac, Deshayes, Hist. Moll. ii. pt. 2, p. 191, pl. clv. figs. 5, 7.

*Achatinella decora* Férussac, Newcomb, Ann. Lyc. New York, vi. p. 307 [animal].

? ? *Achatinella vestita* Mighels, P. Boston Soc. ii. 1845, p. 20.

HAB. Oahu, Waheawa, Halemano, Nuuanu Valley, &c.

var. *cinerea*, n. var.

Banding almost black on the last whorl, ash coloured on the whorl above, the upper whorls tinted with pale brown banding above the suture, replaced by an almost black line at the apex.

HAB. Oahu, Nuuanu (Perkins).

Having examined the types of the first five species mentioned in the above synonymy, I am unable to separate them specifically; with a fair series of specimens the forms shade one into another. The variety is noteworthy for its banding being ashy and almost black, while in the typical form it is red-brown in various patterns. If *A. vestita* be really this species it takes precedence in date: I have never seen a specimen.

subgen. BULIMELLA Pfeiffer.

*Bulimella* Pfeiffer, Malak. Blätt. 1 (1854), p. 119 (as section of *Achatinella*, first species *A. rosea* Swainson).

(18) *Achatinella* (*Bulimella*) *abbreviata* Reeve.

*Achatinella abbreviata* Reeve, Conch. Icon. *Achatinella*, sp. 19; Newcomb, Ann. Lyc. New York, vi. p. 317 [animal].

*Achatinella bacca* Reeve, loc. cit. sp. 45; Newcomb, loc. cit. p. 318 [animal].

*Achatinella nivosa* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 132, pl. XXII. fig. 6.

*Achatinella* (*Achatinellastrum*) *clementina* Pfeiffer, P. Zool. Soc. London, 1855 [Feb. 1856], p. 205.

HAB. Oahu, Palolo and Konahuanui (Baldwin); Niu (Newcomb); Head of Kawailoa Gulch (Perkins).

The specimens found are of a puzzling form, shewing links between *clementina* and *colorata*.

The animal, as described by Newcomb, seems to vary a good deal in colour.

(19) *Achatinella* (*Bulimella*) *ampla* Newcomb.

*Achatinella ampla* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 137, pl. XXII. fig. 19.

Mr Baldwin considered this a synonym of *A. colorata* Rve.; the only specimen I have seen is the type, which is somewhat injured, and I incline to place it near *A. abbreviata* Rve.

HAB. Oahu, Koolau (Newcomb).

(20) *Achatinella* (*Bulimella*) *bulimoides* Swainson.

*Achatinella bulimoides* Swainson, Brand's Journ. 1828, p. 85; Zool. Illustr. ser. 2, II. pl. CVIII. fig. 1; Reeve, Conch. Icon. *Achatinella*, sp. 8; Heynemann, Malak. Blätt. XIV. (1867), p. 146, pl. I. fig. 2 [anatomy].

*Achatinella obliqua* Gulick, Ann. Lyc. New York, VI. p. 245, pl. VIII. fig. 63.

*Achatinella oomorpha* Gulick, *l. c.*, p. 246, pl. VIII. fig. 64.

*A. obliqua* was united with this species by Newcomb; Mr Baldwin, however, gives it as distinct. This latter view may be correct, but the two forms are very closely related.

HAB. Oahu, Kahana (Gulick); Kawailoa (Baldwin).

(21) *Achatinella* (*Bulimella*) *byronii* Wood.

*Helix byronii* Wood, Index Test. Suppl. p. 22, pl. VII. fig. 30.

*Achatinella melanostoma* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 132, pl. XXII. fig. 7.

*Achatinella limbata* Gulick, Ann. Lyc. New York, VI. p. 252, pl. VIII. fig. 70.

*Achatinella mahogani* Gulick, *l. c.*, p. 254, pl. VIII. fig. 72.

*Achatinella pulcherrima* Swainson, Zool. Ill. pl. CXXXIII. fig. 2; Gwatkin, P. Ac. Philad. 1895, p. 238 [radula].

HAB. Oahu, Ewa (Newcomb); Ahonui, Kalaikoa (Gulick); Panoa Valley, Halemano, and ridges between Opaepala and Kawailoa Gulches (Perkins).

var. *recta* Newcomb.

*Achatinella recta* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 143, pl. XXIII. fig. 45.

*Bulimella multicolor* Pfeiffer, *op. cit.* 1855, p. 4, pl. XXX. fig. 11 [*pars, non* fig. 11 a].

HAB. Oahu, Waialua (Newcomb); Halemano and Nuuanu Valley (Perkins).

var. *nympha* Gulick.

*Achatinella nympha* Gulick, Ann. Lyc. New York, VI. p. 251, pl. VIII. fig. 69.

HAB. Oahu, Ahonui, Wahiawa, Halemano, Kawailoa, Waimea (Gulick); Halemano (Perkins).

The variation is, as usual in the group, very great. A long series collected by Mr Hutchison, added to those of Mr Perkins, has led me to be unable to form any definite break between the various described species which are here placed as varieties. *A. pulcherrima* appears to be a large race in which the colouring has been broken into bands. *A. multicolor* and *A. recta* are, I think, only dwarf varieties. The sinistral shell figured by Pfeiffer (*loc. cit.* pl. xxx. fig. 11a) as a variety of *A. multicolor* belongs really to *A. oviformis*. *A. nympa* seems a small, elongate, almost colourless variety, with a white lip.

(22) *Achatinella (Bulimella) decipiens* Newcomb.

*Achatinella decipiens* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 153, pl. xxiv. fig. 68; Ann. Lyc. New York, vi. p. 332 [animal].

*Achatinella viridans* Pfeiffer, Mal. Blätt. 1854, p. 121 [nec Mighels, fide Newcomb].

*Achatinella planospira* Pfeiffer, P. Zool. Soc. London, 1855, p. 3, pl. xxx. fig. 8.

*Achatinella herbacea* Gulick, Ann. Lyc. New York, vi. p. 233, pl. viii. fig. 52.

*Achatinella scitula* Gulick, *t. c.* p. 241, pl. viii. fig. 61.

HAB. Oahu, Kahana (Newcomb, Baldwin); Koolauloa (Hartman); Waimea, Kawailoa, Hakipu (Gulick).

(23) *Achatinella (Bulimella) faba* Pfeiffer.

*Achatinella (Bulimella) faba* Pfeiffer, P. Zool. Soc. London, 1859, p. 30.

HAB. Hawaiian Islands.

I cannot trace this species in the Brit. Mus.; it seems not to have been recognized by any recent author.

(24) *Achatinella (Bulimella) glabra* Newcomb.

*Achatinella glabra* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 139, pl. xxii. fig. 25.

*Achatinella fricki* Pfeiffer, *op. cit.* 1855, p. 3, pl. xxx. fig. 7.

*Achatinella platystyla* Gulick, Ann. Lyc. New York, vi. p. 196, pl. vi. fig. 25.

*Achatinella wheatleyi* Newcomb, MS.

HAB. Oahu, Kawailoa to Hauula (Baldwin); Koolau poko (Newcomb); Kawaiawa (Hartman); Kawailoa (Gulick and Perkins).

Only two dead specimens. I think *A. fricki*, which Newcomb placed with *A. ovata*, really belongs here; fig. 7 a, however, belongs to *A. ovata*. The determination of *A. wheatleyi* is from specimens so named in the Brit. Mus.

(25) *Achatinella (Bulimella) elegans* Newcomb.

*Achatinella elegans* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 149, pl. xxiv. fig. 57.

HAB. Oahu, Hauula (Newcomb); Hauula and Kaipapau (Baldwin).

(26) *Achatinella (Bulimella) luteostoma* Baldwin.

*Achatinella (Bulimella) luteostoma* Baldwin, P. Ac. Philad. 1895, p. 217, pl. x. figs. 7, 8 [with a note on the animal].

HAB. Oahu, Palolo to Niu (Baldwin).

(27) *Achatinella (Bulimella) lymaniana* Baldwin.

*Achatinella (Bulimella) lymaniana* Baldwin, P. Ac. Philad. 1895, p. 219, pl. x. figs. 12, 13.

HAB. Oahu, Waianae mountains (Baldwin).

(28) *Achatinella (Bulimella) lyonsiana* Baldwin.

*Achatinella (Bulimella) lyonsiana* Baldwin, P. Ac. Philad. 1895, p. 218, pl. x. figs. 9—11 [with note on animal]; Suter, *t. c.* p. 239, pl. xi. fig. 52 [radula].

HAB. Oahu, Konahuanui mountain (Baldwin).

(29) *Achatinella (Bulimella) ovata* Newcomb.

*Achatinella ovata* Newcomb, Ann. Lyc. New York, vi. p. 22 [May, 1853]; *T. c.* p. 324 [animal]; P. Zool. Soc. London, 1853, p. 130, pl. xxii. fig. 2.

*Bulimella candida* Pfeiffer, P. Zool. Soc. London, 1855, p. 2, pl. xxx. fig. 4.

*Achatinella phaeozona* Gulick, Ann. Lyc. New York, vi. p. 215, pl. vii. fig. 40.

*Achatinella spadicea* Gulick, *t. c.* p. 247, pl. viii. fig. 65.

*Achatinella lorata* Reeve, Conch. Icon. *Achatinella*, sp. 6 [nec Férussac].

HAB. Oahu, Kahana, Waianae (Newcomb); Kawaihoa (Baldwin); as *A. phaeozona*, Keawaawa, Kailua, Olomana (Gulick); as *A. spadicea*, Kahana (Gulick); Hauula to Kahana (Baldwin).

Gulick's two species are unknown to me. I follow Newcomb in placing them here; Mr Baldwin has, however, given them rank as species.

(30) *Achatinella (Bulimella) oviformis* (Newcomb) Pfeiffer.

*Achatinella oviformis* Pfeiffer, P. Zool. Soc. London, 1855, p. 208.

*Achatinella multicolor* Pfeiffer, *t. c.* p. 4, pl. xxx. fig. 11 a [nec fig. 11, which equals *A. byronii*, var.].

HAB. Oahu (various authors).

(31) *Achatinella (Bulimella) rosea* Swainson.

*Achatinella bulimoides* var. *rosea* Swainson, Brand's Journ. 1828, p. 85.

*Achatinella rosea* Swainson, Zool. Illustr. ser. 2, pl. cxxiii. fig. 1; Reeve, Conch. Icon. *Achatinella*, sp. 28; Newcomb, Ann. Lyc. New York, vi. p. 309 [animal].

*Bulimella rosea* Swainson, Hartman, P. Ac. Philad. 1888, p. 30, pl. 1. fig. 4.

A good series, including some varieties approaching *A. ovata*.

HAB. Oahu, Wahiawa to Kawailoa (Baldwin); Waialua (Hartman); Halemano (Perkins).

(32) *Achatinella (Bulimella) rotunda* Gulick.

*Achatinella rotunda* Gulick, Ann. Lyc. New York, vi. p. 249, pl. viii. fig. 67.

This form has, with much doubt, been allowed specific rank. In this I have followed Mr Baldwin; Newcomb considered it a variety of *A. ovata*.

HAB. Oahu, Kaawa and Kahana (Gulick); Head of Kawailoa (Perkins).

(33) *Achatinella (Bulimella) rugosa* Newcomb.

*Achatinella rugosa* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 138, pl. xxii. fig. 22.

*Achatinella corrugata* Gulick, Ann. Lyc. New York, vi. p. 248, pl. viii. fig. 66.

*Achatinella torrida* Gulick, *t. c.* p. 250, pl. viii. fig. 68.

I strongly suspect that this will prove to be only a roughened form of *A. byronii* Wood.

HAB. Oahu, Ewa (Newcomb): as *A. corrugata*, Hakipu (Gulick); Kahana (Baldwin); as *A. torrida*, Kahana, Kaawa, Waikane, Waiolu (Gulick).

(34) *Achatinella* (*Bulimella*) *sowerbyana* Pfeiffer.

*Bulimella sowerbyana* Pfeiffer, P. Zool. Soc. London, 1855, p. 4, pl. xxx. fig. 14.

var. *fuscobasis* Smith.

*Bulimella fuscobasis* Smith, P. Zool. Soc. London, 1873, p. 77, pl. ix. fig. 15.

I think Mr Smith's species is only a colour variety.

HAB. Oahu (type form, authors); Mount Kaala (variety, Smith).

(35) *Achatinella* (*Bulimella*) *taeniolata* Pfeiffer.

*Achatinella taeniolata* Pfeiffer, P. Zool. Soc. London, 1846, p. 38; Reeve, Conch. Icon. *Achatinella*, sp. 7.

*Achatinella rubiginosa* Newcomb, P. Zool. Soc. London, 1854 [1855], p. 154, pl. xxiv. fig. 69.

*Bulimella macrostoma* Pfeiffer, P. Zool. Soc. London, 1855, p. 2, pl. xxx. fig. 6.

Newcomb was of opinion that *A. macrostoma* was identical with *A. rutila*, but, after examining the type, I prefer to place it here.

HAB. Oahu, Palolo (Newcomb); Niu to Palolo (Baldwin).

(36) *Achatinella* (*Bulimella*) *vidua* Pfeiffer.

*Bulimella vidua* Pfeiffer, P. Zool. Soc. London, 1855, p. 3, pl. xxx. fig. 10.

Newcomb placed this as a synonym of *A. ovata*; Mr Baldwin regarded it as a distinct species. The columellar plait is very small in the specimens in the Brit. Mus.

HAB. Oahu (Baldwin, &c.).

(37) *Achatinella* (*Bulimella*) *viridans* Mighels.

*Achatinella viridans* Mighels, P. Boston Soc. II. (1845), p. 20; Newcomb, P. Zool. Soc. London, 1854, p. 310 [animal].

*Achatinella radiata* Pfeiffer, P. Zool. Soc. London, 1845 [1846], p. 89; Reeve, Conch. Icon. *Achatinella*, sp. 35.

*Achatinella subvirens* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 136, pl. xxii. fig. 18.

*Achatinella rutila* Newcomb, t. c. p. 138, pl. xxii. fig. 21; Op. cit. 1854, p. 310 [animal]; Ann. Lyc. New York, vi. p. 326 [animal].

HAB. Oahu, Niu (Newcomb); Palolo, Niu, Konahuanui (Hartman); Nuuanu to Waialae (Baldwin); Nuuanu, Waialae (Perkins).

subgen. *PARTULINA* Pfeiffer.

*Partulina* Pfeiffer, Malak. Blätt. 1. 1854, p. 114.

Pfeiffer had no fixed type for his section, but the species all belong to one group, and I would suggest that his first-named, *A. virgulata* Migh., be treated as the type.

Pease, in his review of the genus in 1869, did not alter the grouping, so far as regards *Partulina*.

Mons. Ancey has recently (P. Malac. Soc. London, III. 1899, p. 270) proposed to place *P. physa* Newc., and its allies, in a new subgenus *Baldwinia*.

(38) *Achatinella (Partulina) anceyana* Baldwin.

*Achatinella (Partulina) anceyana* Baldwin, P. Ac. Philad. 1895, p. 223, pl. x. fig. 16; Gwatkin, t. c. p. 238 [radula].

HAB. Maui, Makawao (Baldwin).

(39) *Achatinella (Partulina) aptycha* Pfeiffer.

*Achatinella (Newcombia) aptycha* Pfeiffer, P. Zool. Soc. London, 1855 [March], p. 1, pl. xxx. fig. 1.

HAB. Hawaiian Islands. Probably from Maui.

(40) *Achatinella (Partulina) compta* Pease.

*Partulina compta* Pease, J. Conchyl. xvii. 1869, p. 175.

Curiously enough some specimens collected on Maui, and sent to me by Mr Baldwin, exactly agree with a specimen from Molokai presented by Pease to the British Museum under this name.

HAB. Molokai (Pease); Kawela (Baldwin)—Maui (Baldwin).

(41) *Achatinella (Partulina) confusa* nom. nov.

*Achatinella physa* Newcomb, P. Boston Soc. v. 1855, p. 218; Amer. J. Conch. ii. 1866, p. 214, pl. xiii. fig. 10.

*Achatinella (Partulina) physa* Newcomb, Baldwin, P. Ac. Philad. 1895, p. 225 [animal].

Nec *A. physa* Newcomb, 1854, q. v. (p. 316).

An inspection of the figures and descriptions given by Newcomb (P. Zool. Soc. London, 1853, p. 152, pl. xxiv. fig. 64, and as given above) will, I think, show that he was confusing two species, under the belief that the first description related only to a young specimen. It therefore becomes necessary to restrict his name to the species he first referred to, which unfortunately appears to be the same as *A. hawaiiensis* Baldwin, and to rename the other form, which, it is to be regretted, is the species universally known as *A. physa*. It may be noted that the habitat originally given by Newcomb agrees with that of Hamakua given by Mr Baldwin for his *A. hawaiiensis*, whilst Kohala is a different, but adjoining, district.

HAB. Hawaii, Kohala (Newcomb).

(42) *Achatinella (Partulina) crassa* Newcomb.

*Achatinella crassa* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 155, pl. xxiv. fig. 71.

HAB. Lanai (Newcomb); near Koele (Perkins).

(43) *Achatinella (Partulina) dolei* Baldwin.

*Achatinella (Partulina) dolei* Baldwin, P. Ac. Philad. 1895, p. 221, pl. x. figs. 17, 18; Suter, t. c. p. 238, pl. xi. fig. 55 [radula].

Belongs to the group of *A. tappaniana* C. B. Ad.; specimens, precisely similar to some kindly sent me by Mr Baldwin, were identified by Mr Gulick as a variety of his *A. fasciata* (= *tappaniana*).

HAB. Maui, Honomanu (Baldwin).

(44) *Achatinella (Partulina) dubia* Newcomb.

*Achatinella dubia* Newcomb, Ann. Lyc. New York, vi. p. 23 (May, 1853); P. Zool. Soc. London, 1853 [1854], p. 152, pl. xxiv. fig. 65.

HAB. Oahu, among stones, and Waianae on bushes (Newcomb); Makaha Valley, Waianae Mts (Perkins).

(45) *Achatinella (Partulina) dwightii* Newcomb.

*Achatinella dwightii* Newcomb, Ann. Lyc. New York, vi. p. 145 (Oct. 1855); Amer. J. Conch. II. p. 213, pl. XIII. fig. 9; Gwatkin, P. Ac. Philad. 1895, p. 238 [radula].

Closely related, apparently, to some of the varieties of *A. redfieldi* Newc.

HAB. Molokai, Kamalo (Baldwin); Mountains (Perkins).

(46) *Achatinella (Partulina) fusioidea* Newcomb.

*Achatinella fusioidea* Newcomb, Ann. Lyc. New York, vi. p. 144 (Oct. 1855); Amer. J. Conch. II. 1866, p. 213, pl. XIII. fig. 8.

HAB. Maui, Haleakala (Newcomb).

(47) *Achatinella (Partulina) gouldi* Newcomb.

*Achatinella gouldi* Newcomb, Ann. Lyc. New York, vi. p. 21 (May 1853); P. Zool. Soc. London, 1853 [1854], p. 129, pl. XXII. fig. 1.

*Achatinella talpina* Gulick, Ann. Lyc. New York, vi. p. 212, pl. VII. fig. 38 (Dec. 1856).

*Achatinella myrrhea* Gulick, Pfeiffer, Mon. Helic. Viv. IV. p. 517.

HAB. Maui, on Tutui trees, Wailuku Valley (Newcomb); Wailuku (Gulick).

(48) *Achatinella (Partulina) grisea* Newcomb.

*Achatinella grisea* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 153, pl. XXIV. fig. 66.

HAB. Maui, Makawao (Newcomb, &c.).

(49) *Achatinella (Partulina) hayseldeni* Baldwin.

*Partulina hayseldeni* Baldwin, Nautilus, x. p. 31, July 1896.

Plate XI. fig. 2.

Belongs to the group of *A. variabilis* Newc.

HAB. Lanai (Baldwin); Lanaihale, near highest point of Mountains (Perkins).

(50) *Achatinella (Partulina) horneri* Baldwin.

*Achatinella (Partulina) horneri* Baldwin, P. Ac. Philad. 1895, p. 224, pl. x. figs. 20, 21, 22; Gwatkin, t. c. p. 238 [radula].

HAB. Hawaii, Hamakua (Baldwin).

(51) *Achatinella (Partulina) lignaria* Gulick.

*Achatinella lignaria* Gulick, Ann. Lyc. New York, vi. p. 209, pl. vii. fig. 35 (Dec. 1856).

HAB. Maui, Wailuku (Gulick).

var. *crocea* Gulick.

*Achatinella crocea* Gulick, t. c. p. 211, pl. vii. fig. 36 (Dec. 1856).

I think *A. crocea* is only a variety; both were placed by Newcomb as synonyms of his *A. terebra*.

HAB. Maui, Waihee (Gulick).

(52) *Achatinella (Partulina) marmorata* Gould.

*Achatinella marmorata* Gould, P. Boston Soc. II. p. 200 (1847); U. S. Explor. Exped. Moll. fig. 94; Newcomb, Ann. Lyc. New York, vi. p. 311 [animal]; Gwatkin, P. Ac. Philad. 1895, p. 238 [radula].

*Achatinella adamsi* Newcomb, Ann. Lyc. New York, vi. p. 19 (May, 1853); P. Zool. Soc. London, 1853 [1854], p. 137, pl. xxii. fig. 20 (as *A. adamsii*).

*Achatinella induta* Gulick, Ann. Lyc. New York, vi. p. 207, pl. vii. fig. 34 (Dec. 1856).

The synonymy of this species is difficult; Newcomb united two other forms described by Gulick from a different district of Maui; Mr Baldwin on the other hand regards them as species. For the present I have left them, with some hesitation, specific rank; they are *A. ustulata* and *A. plumbea*.

HAB. Maui, Haleakala (Gould); Makawao (Newcomb, Baldwin); Wailuku (Gulick).

(53) *Achatinella (Partulina) mighelsiana* Pfeiffer.

*Achatinella mighelsiana* Pfeiffer, Mon. Hel. Viv. II. p. 238; Newcomb, Ann. Lyc. New York, vi. p. 319 [animal]; Gwatkin, P. Ac. Philad. 1895, p. 238 [radula]; Reeve, Conch. Icon. *Achatinella*, sp. 40.

The typical form is a whitish shell with a single black band at the periphery; this single band is occasionally split into two smaller ones. Some lovely varieties were collected by Mr Perkins, which may be tabulated as follows:

(a) White and bandless.

(β) Bandless, of a rich orange hue with strigations of a slightly darker shade, tubercle white.

(7) One-banded, the whitish shell tinted with yellow, ashy, or slaty strigations. A few are white above the band, yellowish below, and show traces of a second band in the umbilical area.

(8) Two- and even three-banded, ground-colouring white, tinted faintly with ashy strigations, shell not quite so attenuate.

HAB. Molokai, Kalae (Baldwin); the Mountains (Perkins).

(54) *Achatinella (Partulina) morbida* Pfeiffer.

*Achatinella (Bulinella) morbida* Pfeiffer, P. Zool. Soc. London, 1859, p. 30.

HAB. ?Oahu.

The only authority I am aware of for the exact habitat is Mr Baldwin, who gives Oahu, but he marks it as one of the species he has not seen.

(55) *Achatinella (Partulina) mucida* Baldwin.

*Achatinella (Partulina) mucida* Baldwin, P. Ac. Philad. 1895, p. 222, pl. x. fig. 23.

A series of about 60 specimens. It is generally of an ashy colour with a dark zone at the periphery; smaller colour lines are also present in most specimens. The brown stain at the base of the columellar plait is also noteworthy.

HAB. Molokai, Makakupaia (Baldwin); Makakupaia, and Mountains of Molokai (Perkins).

(56) *Achatinella (Partulina) nivea* Baldwin.

*Achatinella (Partulina) nivea* Baldwin, P. Ac. Philad. 1895, p. 222, pl. x. fig. 19.

HAB. Maui, Makawao to Huelo (Baldwin).

(57) *Achatinella (Partulina) perdix* Reeve.

*Achatinella perdix* Reeve, Conch. Icon. *Achatinella*, sp. 43 (1850); Newcomb, Ann. Lyc. New York, vi. p. 317 [animal]; Gwatkin, P. Ac. Philad. 1895, p. 238 [radula].

*Achatinella undosa* Gulick, Ann. Lyc. New York, vi. p. 205, pl. vii. fig. 33 (Dec. 1856).

*A. undosa* was wrongly placed by Clessin (Nom. Helic. Viv. p. 305) as a synonym of *A. radiata* Gould.

HAB. Maui, Lahaina (Baldwin); Olinda at 4000 ft. (Perkins).

(58) *Achatinella (Partulina) physa* Newcomb.

*Achatinella physa* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 152, pl. xxiv. fig. 64.

*Achatinella (Partulina) hawaiiensis* Baldwin, P. Ac. Philad. 1895, p. 225, pl. x. figs. 24—26; Gwatkin, t. c. p. 238 [radula].

Nec *A. physa* Newc. subsequently.

See for notes on the synonymy under *A. confusa* Sykes.

HAB. Hawaii, Mauna Kea (Newcomb); Hamakua (Baldwin).

(59) *Achatinella (Partulina) plumbea* Gulick.

*Achatinella plumbea* Gulick, Ann. Lyc. New York, vi. p. 213, pl. vii. fig. 39.

HAB. Maui, Kula (Gulick).

(60) *Achatinella (Partulina) porcellana* Newcomb.

*Achatinella porcellana* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 146, pl. xxiii. fig. 47.

In appearance recalling a dwarf specimen of *A. terebra* Newc. of W. Maui; only known to me from the type.

HAB. E. Maui (Newcomb).

(61) *Achatinella (Partulina) proxima* Pease.

*Helicter proximus* Pease, P. Zool. Soc. London, 1862, p. 6.

*Partulina proxima* Pease, Hartman, P. Ac. Philad. 1888, p. 27, pl. i. figs. 1, 2.

*Achatinella proxima* Pease, Gwatkin, l. c. 1895, p. 238 [radula].

A fine series. A variety is interesting as showing a link towards *A. theodorei* Baldwin; it is much more slender and smaller than the typical form, generally lighter in colour, and the colour-markings are much finer in pattern. It was found with the typical form.

HAB. Molokai, Waikolu (Baldwin); Kahanui, and mountains of Molokai (Perkins).

(62) *Achatinella (Partulina) pyramidalis* Gulick.

*Achatinella pyramidalis* Gulick, Ann. Lyc. New York, vi. p. 204, pl. vii. fig. 32 (Dec. 1856).

Newcomb regarded this as a variety of *A. perdix* Reeve; not having seen specimens which unite them I have left it as a species. Clessin (Nom. Helic. Viv. p. 306) placed it—erroneously—under *A. marmorata* Gould.

HAB. Maui, Lahaina (Gulick); Huelo (Baldwin); Waihee (Perkins).

(63) *Achatinella (Partulina) radiata* Gould.

*Achatinella radiata* Gould, P. Boston Soc. II. 1845, p. 27.

*Bulimus gouldi* Pfeiffer, Zeitsch. für Malak. 1846, p. 116.

*Partula densilineata* Reeve, Conch. Icon. *Partula*, sp. 9.

HAB. ? Maui (Baldwin).

The specimens in the British Museum are labelled "Oahu", but probably this is erroneous and Maui is the correct habitat.

(64) *Achatinella (Partulina) redfieldi* Newcomb.

*Achatinella redfieldi* Newcomb, Ann. Lyc. New York, vi. (May 1853), p. 22; t. c.

p. 325 [animal]; P. Zool. Soc. London, 1853 [1854], p. 131, pl. xxii. fig. 5;

Gwatkin, P. Ac. Philad. 1895, p. 238 [radula].

The long series collected by Mr Perkins has given me considerable difficulty. Newcomb originally gave both Maui and Molokai, Clessin (Nom. Helic. Viv. p. 306) gave Molokai and Kauai (the latter being obviously wrong), and Mr Baldwin gives Mapulehu, Molokai. I think Maui was a slip, due to confusion with the very closely allied *A. splendida*, and that *A. redfieldi* is really a Molokai shell. Next arises the question of what the typical form may be; Newcomb states that the shell is either plain or banded on the third whorl *only*, while he gives six as the number of whorls, the shell figured being banded (as *A. splendida*) on all the whorls. The forms I refer to this species are:

a. Typical (Plate XI. fig. 15). Varies from nearly white to chestnut, sometimes being particoloured.

HAB. Makakupaia, Molokai (Perkins).

β. Light to dark fawn colour, banded with brown, the lip being sometimes white. This is the form figured by Newcomb.

HAB. Molokai, towards or above Kamalo (Perkins).

γ. Lip white, shell chestnut, a white band at the periphery and often a smaller one above it, upper whorls finely tessellated. (Plate XI. fig. 16.)

HAB. Molokai, Makakupaia and Kamalo (Perkins).

(65) *Achatinella (Partulina) rufa* Newcomb.

*Achatinella rufa* Newcomb, Ann. Lyc. New York, vi. p. 21 (May 1853); t. c. p. 324 [animal]; P. Zool. Soc. London, 1853 [1854], p. 130, pl. xxii. fig. 3.

HAB. Molokai, Kalae (Baldwin); mountains (Perkins).

Dr Hartman gave, erroneously, Maui for this shell. The figure is not good, being too elongate and too highly coloured: a pale variety exists.

(66) *Achatinella (Partulina) splendida* Newcomb.

*Achatinella splendida* Newcomb, Ann. Lyc. New York, vi. p. 20 (May, 1853); P. Zool. Soc. London, 1853 [1854], p. 131, pl. xxii. fig. 4.

*Achatinella baileyana* Gulick, Ann. Lyc. New York, vi. p. 202, pl. vii. fig. 31 (1856).

*Achatinella solida* Gulick, Pfeiffer, Mon. Helic. Viv. iv. p. 516.

HAB. Maui, Wailuku (Newcomb, &c.); Lahaina and Wailuku (Baldwin).

(67) *Achatinella (Partulina) tappaniana* C. B. Adams.

*Achatinella tappaniana* C. B. Adams, Contrib. to Conch. p. 126 (1850) [with var. *dubiosa*].

*Achatinella eburnea* Gulick, Ann. Lyc. New York, vi. p. 199, pl. vi. fig. 28; Gwatkin, P. Ac. Philad. 1895, p. 238 [radula].

*Achatinella ampulla* Gulick, t. c. p. 200, pl. vii. fig. 29.

*Achatinella fasciata* Gulick, t. c. p. 201, pl. vii. fig. 30.

*Achatinella tuba* Gulick, Pfeiffer, Mon. Helic. Viv. iv. p. 523.

HAB. Maui, (as *A. tappaniana*) Lahaina (Baldwin); (as *A. eburnea*) Honuaua (Gulick); (as *A. ampulla* and *A. fasciata*) Honukawai (Gulick).

(68) *Achatinella (Partulina) terebra* Newcomb.

*Achatinella terebra* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 144, pl. xxiii. fig. 40.

*Bulimella attenuata* Pfeiffer, P. Zool. Soc. London, 1855 [March], p. 4, pl. xxx. fig. 12.

*Achatinella corusca* Gulick, Pfeiffer, Mon. Helic. Viv. iv. p. 525.

*Achatinella perforata* Gulick, Pfeiffer, pag. cit.

HAB. Maui; W. Maui (Newcomb); Wailuku (Hartman); Honokowai (Baldwin).

(69) *Achatinella (Partulina) tessellata* Newcomb.

*Achatinella tessellata* Newcomb, Ann. Lyc. New York, vi. (May, 1853), p. 19; t. c. p. 327 [animal]; P. Zool. Soc. London, 1853 [1854], p. 139, pl. xxiii. fig. 26; Gwatkin, P. Ac. Philad. 1895, p. 238 [radula].

A very fine series. The forms found at Pelekunu are generally dextral and of large size; recalling in shape and colouring *A. virgulata*, but as they possess the mottled colouring of the earlier whorls, so characteristic of the present species, I have placed them here.

HAB. Molokai, Kalae to Waikolu (Baldwin); Pelekunu, Makakupaia, Kahanui, &c. (Perkins).

(70) *Achatinella (Partulina) ustulata* Gulick.

*Achatinella ustulata* Gulick, Ann. Lyc. New York, vi. p. 211, pl. vii. fig. 37.

Nec *A. ustulata* Newcomb MS.; fide Pfeiffer, Malak. Blätt. i. p. 136 (= *A. colorata* Reeve).

HAB. Maui, Beautiful Valley (Gulick); Lahaina (Baldwin).

(71) *Achatinella (Partulina) variabilis* Newc.

*Achatinella variabilis* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 154, pl. xxiv. fig. 70.

*Achatinella fulva* (Newcomb) Pfeiffer, loc. cit. 1855 [1856], p. 208.

*Achatinella lactea* Gulick, Ann. Lyc. New York, vi. 1858, p. 198, pl. vi. fig. 27 [bad].

HAB. Lanai (Newcomb, &c.); windward side on ridges facing Maui, above Waiapaa, behind Koele, and Lanaihale (Perkins).

var. *semicarinata* Newc.

*Achatinella semicarinata* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 156, pl. xxiv. fig. 76.

From an examination of the very fine series collected by Mr Perkins, I think Newcomb was quite right in placing *A. fulva* and *A. lactea* in the synonymy. The former is a straw-coloured form without banding and the latter a white form with a reddish-brown stain in the interior of the aperture. Mr Baldwin remarks that *A. variabilis* is 'invariably dextral,' but sinistral specimens, typical in every other respect, were found by Mr Perkins. In placing *A. semicarinata* as a variety I have been guided by the great difficulty I found in endeavouring to separate this form from *A. fulva*, the type specimens of which shew traces of the carina.

Mr Perkins remarks that 'the broader form with ridge more raised' is 'from higher elevations': it appears to be gradually replaced by the form *fulva* at lower altitudes and this latter shades into *A. variabilis* (typical).

HAB. Lanai (Newcomb, &c.); mountains (Perkins).

(72) *Achatinella (Partulina) virgulata* Mighels.

*Partula virgulata* Mighels, P. Boston Soc. II. 1845, p. 20.

*Achatinella virgulata* Mighels, Reeve, Conch. Icon. *Achatinella*, sp. 3; Newcomb, Ann. Lyc. New York, vi. p. 312 [animal]; Gwatkin, P. Ac. Philad. 1895, p. 238 [radula].

*Bulinus rohri* Pfeiffer, Zeitsch. f. Malak. 1846, p. 115.

*Bulinus insignis* Mighels, Reeve, Conch. Icon. *Achatinella*, sp. 3.

HAB. Molokai, Kaluaaha to Halawa (Baldwin); Mapulehu and mountains (Perkins).

It is a very variable species and the following, which I take to be a variety, is perhaps worthy of note.

var. *a*. Either entirely white or slightly tinted with brown on the last whorl; mouth varying from dusky to white; the spiral black line on the upper whorls either present or absent.

HAB. Molokai, Pelekunu (Perkins).

subgen. *ACHATINELLASTRUM* Pfeiffer.

*Achatinellastrum* Pfr., Malak. Blätt. I. (1854), p. 133 (first species *A. venulata* Newc.).

(73) *Achatinella* (*Achatinellastrum*) *augusta* Smith.

*Achatinella augusta* Smith, P. Zool. Soc. London, 1873, p. 74, pl. ix, fig. 7.

Dr Hartman referred this shell, as *A. augusta*, to *A. fulgens* Newc.

HAB. Oahu, Waialae, Waialupe, Palolo (Smith).

(74) *Achatinella* (*Achatinellastrum*) *bella* Reeve.

*Achatinella bella* Reeve, Conch. Icon. *Achatinella*, sp. 17; Newcomb, Ann.

Lyc. New York, vi, p. 316 [animal]; Gwatkin, P. Ac. Philad. 1895, p. 238 [radula].

Pease (P. Zool. Soc. 1869, p. 652) united the species, I think erroneously, with *A. polita* Newc.

HAB. Molokai (various authors and Perkins); Kalae to Waikolu (Baldwin).

(75) *Achatinella* (*Achatinellastrum*) *bilineata* Reeve.

*Achatinella bilineata* Reeve, Conch. Icon. *Achatinella*, sp. 22.

*Achatinella johnsoni* Newcomb, P. Zool. Soc. London, 1854, p. 147, pl. xxxiii, fig. 50.

*Achatinella aplustre* Newcomb, t. c. p. 147, pl. xxxiii, fig. 51.

HAB. Oahu, Koolau (Newcomb); Manoa to Nuuanu (Baldwin).

(76) *Achatinella* (*Achatinellastrum*) *buddii* Newcomb.

*Achatinella buddii* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 155, pl. xxiv, fig. 73.

*Achatinella pexa* Gulick, Ann. Lyc. New York, vi, p. 197, pl. vi, fig. 26.

*Achatinella plumata* Gulick, t. c. p. 217, pl. vii, fig. 41.

*Achatinella caesia* Gulick, t. c. p. 234, pl. viii, fig. 53.

*Achatinella fuscozona* Smith, P. Zool. Soc. London, 1873, p. 76, pl. ix, fig. 9.

I follow Mr Baldwin in uniting Mr Smith's species, with which I am unacquainted. Dr Hartman (P. Ac. Philad. 1888) places it (on p. 32) amongst the synonyms of *A. buddii*; possibly this may be a slip as further on (p. 33) he leaves it specific rank, remarking 'this may be a good species, though it approaches very near to *A. fuscolineata*, Smith,' a comparison which appears to me inaccurate.

HAB. Oahu, Palolo (Newcomb); Niu, Wailupe, Waialae, Palolo, Kailua, and Waimea (Gulick); Makiki, Palolo (Smith).

(77) *Achatinella* (*Achatinellastrum*) *casta* Newcomb.

*Achatinella casta* Newcomb, P. Zool. Soc. London, 1853, p. 134, pl. xxii. fig. 12.

*Achatinella juncea* Gulick, Ann. Lyc. New York, vi. p. 230, pl. vii. fig. 49.

*Achatinella cognata* Gulick, t. c. p. 240, pl. viii. fig. 60.

*A. cognata* is only known to me from the description: I incline to think Newcomb was right in suppressing it as a species; Mr Baldwin, however, considers it distinct.

HAB. Oahu, Ewa (Newcomb, Baldwin); Kalaikoa, Wahiawa, Halemano, Haikipu, and Waikane (Gulick); above Ewa (Perkins).

(78) *Achatinella* (*Achatinellastrum*) *cervina* Gulick.

*Achatinella cervina* Gulick, Ann. Lyc. New York, vi. p. 241, pl. viii. fig. 62.

Newcomb placed it as a variety of *A. ovata*; Mr Baldwin, on the other hand, gives it rank as a species and places it in *Achatinellastrum*. If the specimens in the Brit. Mus. are correctly identified, it is very close to *A. buddii* Newc.

HAB. Oahu, Kahana (Gulick).

(79) *Achatinella* (*Achatinellastrum*) *colorata* Rve.

*Achatinella colorata* Reeve, Conch. Icon. *Achatinella*, sp. 18; Newcomb, Ann.

Lyc. New York, vi. p. 316 [animal].

HAB. Oahu, Ahuimanu (Hartman); Kalihi (Baldwin).

(80) *Achatinella* (*Achatinellastrum*) *concolor* Smith.

*Achatinella concolor* Smith, P. Zool. Soc. London, 1873, p. 75, pl. ix. fig. 1.

Dr Hartman considered it to be a form of *A. colorata* Rve.

HAB. Oahu, Ewa (Smith).

(81) *Achatinella* (*Achatinellastrum*) *cucumis* Gulick.

*Achatinella cucumis* Gulick, Ann. Lyc. New York, vi. p. 225, pl. vii. fig. 45.

HAB. Oahu, Kalihi (Gulick); Kalihi to Moanalua (Baldwin); Kaliua (sic) (Hartman).

(82) *Achatinella (Achatinellastrum) cuneus* Pfeiffer.

*Achatinella (Achatinellastrum) cuneus* Pfeiffer, P. Zool. Soc. London, 1855, p. 205.

Newcomb considered this a form of *A. decipiens*; Dr Hartman appears to have been in some confusion, as he placed it (P. Ac. Philad. 1888) at p. 29 under *A. decipiens*, and at p. 30 under *A. viridans*. I have seen a long and characteristic series found on the Island of Oahu by Mr Hutchison.

HAB. Oahu (authors); Halawa (Baldwin); mountains behind Ewa (Perkins).

(83) *Achatinella (Achatinellastrum) curta* Newc.

*Achatinella curta* Newcomb, P. Zool. Soc. London, 1853, p. 144, pl. XXIII. fig. 43.  
*Achatinella undulata* Newcomb, P. Boston Soc. v. (1855), p. 219; Amer. J. Conch. II. (1866), p. 216, pl. XIII. fig. 15; Pfeiffer, P. Zool. Soc. London, 1855, p. 208.

*Achatinella dimorpha* Gulick, Ann. Lyc. New York, VI. p. 236, pl. VIII. fig. 56.

*Achatinella albescens* Gulick, t. c. p. 237, pl. VIII. fig. 57.

*Achatinella contracta* Gulick, t. c. p. 239, pl. VIII. fig. 59.

*Achatinella rhodoraphe* Smith, P. Zool. Soc. London, 1873, p. 75, pl. IX. fig. 10; Gwatkin, P. Ac. Philad. 1895, p. 238 [radula].

*Achatinella pygmaea* Smith, P. Zool. Soc. London, 1873, p. 75, pl. IX. fig. 11.

HAB. Oahu, Waiialua (Newcomb); various localities (Gulick); Halemano, Waipio, &c. (Smith); between Kawailoa and Waala gulches, generally between Kawailoa and Halemano, Waimea (Perkins).

(84) *Achatinella (Achatinellastrum) delta* Gulick.

*Achatinella delta* Gulick, Ann. Lyc. New York, VI. p. 231, pl. VIII. fig. 50.

Newcomb considered *A. delta* to be a more banded variety of *A. curta* Newc.; from the material I have seen I incline, with doubt, to leave them distinct.

HAB. Oahu, Kalaikoa, Halemano, &c. (Gulick).

(85) *Achatinella (Achatinellastrum) diluta* Smith.

*Achatinella diluta* Smith, P. Zool. Soc. London, 1873, p. 75, pl. IX. fig. 14.

It is near to, but seems distinct from, *A. ligata* Smith, with which Dr Hartman placed it.

HAB. Oahu, probably (Smith).

(86) *Achatinella (Achatinellastrum) ernstina* Baldwin.

*Achatinella (Achatinellastrum) ernstina* Baldwin, P. Ac. Philad. 1895, p. 217, pl. x. figs. 5, 6 [animal described].

HAB. Oahu, Nuuanu Valley (Baldwin).

(87) *Achatinella (Achatinellastrum) formosa* Gulick.

*Achatinella formosa* Gulick, Ann. Lyc. New York, vi. p. 235, pl. viii. fig. 55.

HAB. Oahu, Waimea (Gulick).

(88) *Achatinella (Achatinellastrum) fulgens* Newc.

*Achatinella fulgens* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 131, pl. xxii. fig. 24.

HAB. Oahu, Niu (Newcomb); Waialua, south-east end (Hartman).

(89) *Achatinella (Achatinellastrum) germana* Newcomb.

*Achatinella germana* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 151, pl. xxiv. fig. 61.

HAB. Maui, Makawao (Newcomb).

(90) *Achatinella (Achatinellastrum) juddii* Baldwin.

*Achatinella (Achatinellastrum) juddii* Baldwin, P. Ac. Philad. 1895, p. 216, pl. x. figs. 3, 4.

HAB. Oahu, Halawa (Baldwin).

(91) *Achatinella (Achatinellastrum) lehuiensis* Smith.

*Achatinella lehuiensis* Smith, P. Zool. Soc. London, 1873, p. 76, pl. ix. fig. 4.

I have not seen the species, but it appears from the figure to be near *A. zonata* Gulick; Dr Hartman has suggested that it is a form of *A. multicolor* Pfr. (= *oviformis* Pfr.).

HAB. Oahu, Lehui (Smith).

(92) *Achatinella (Achatinellastrum) ligata* Smith.

*Achatinella ligata* Smith, P. Zool. Soc. London, 1873, p. 76, pl. IX. fig. 13.

*Achatinella bellula* Smith, t. c. p. 77, pl. IX. fig. 8.

I fancy these two forms are only varieties of one species; they approach *A. nympha* Gulick.

HAB. Oahu, Waimolu (Smith); Panoa and Nuuanu (Baldwin); ridges round Nuuanu, Waimea, and beyond head of Panoa Valley (Perkins).

(93) *Achatinella (Achatinellastrum) livida* Swainson.

*Achatinella livida* Swainson, Zool. Ill. pl. CVIII. fig. 2.

*Achatinella emmersonii* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 156, pl.

XXIV. fig. 74.

*Achatinella viridans* Reeve, Conch. Icon. *Achatinella*, sp. 25 [nec Mighels].

*Achatinella reevei* C. B. Adams, Contrib. to Conch. 1850, p. 128.

*Achatinella consanguinea* Smith, P. Zool. Soc. London, 1873, p. 73, pl. IX. fig. 3.

Nec *A. livida* Pfeiffer, P. Zool. Soc. London, 1845, p. 89 [= *A. vulpina* Fér.].

According to Dr Hartman, Mr Smith's species is probably a variety of *A. colorata*; from the specimens I have seen, I think it rather belongs here.

HAB. Oahu, Waialua (Newcomb, Baldwin); Ahuimanu (Smith).

(94) *Achatinella (Achatinellastrum) longispira* Smith.

*Achatinella longispira* Smith, P. Zool. Soc. London, 1873, p. 73, pl. IX. fig. 5.

Placed by Dr Hartman as a synonym of *A. vulpina*, but the present species is much more slender in form; I should be inclined rather to refer it to the group of *A. olivacea*.

HAB. Oahu, Halawa, Ahuimanu (?) (Smith).

(95) *Achatinella (Achatinellastrum) multizonata* Baldwin.

*Achatinella (Achatinellastrum) multizonata* Baldwin, P. Ac. Philad. 1895, p. 215, pl. x. figs. 1, 2 [animal described].

The shells collected by Mr Perkins from 'round Nuuanu' are in no sense typical of this species, they appear to be forms shewing links between it and *A. bellula* Smith (= *ligata* Smith); indeed the two may prove to be forms of one variable species.

HAB. Oahu, Nuuanu Valley (Baldwin); ridges round Nuuanu and Waimea (Perkins).

(96) *Achatinella* (*Achatinellastrum*) *nattii* Baldwin and Hartman.

*Achatinella nattii* Baldwin and Hartman in Hartman, P. Ac. Philad. 1888, p. 34, pl. 1, fig. 3 [as *nealii* in explanation of plate]; Gwatkin, l. c. 1895, p. 238. [radula].

HAB. Maui, Makawao to Honomu (Baldwin).

(97) *Achatinella* (*Achatinellastrum*) *olivacea* Reeve.

*Achatinella olivacea* Reeve, Conch. Icon. *Achatinella*, sp. 20.

*Achatinella prasina* Reeve, l. c. sp. 27.

HAB. Oahu, Manoa to Nuuanu (Baldwin); Nuuanu and Mt. Tantalus (Perkins).

(98) *Achatinella* (*Achatinellastrum*) *papyracea* Gulick.

*Achatinella papyracea* Gulick, Ann. Lyc. New York, vi. p. 229, pl. vii, fig. 48.

HAB. Oahu, Kalaikoa, Ahonui, Wahiawa (Gulick).

(99) *Achatinella* (*Achatinellastrum*) *polita* Newcomb.

*Achatinella polita* Newcomb, Ann. Lyc. New York, vi. p. 24 (1853, May); t. c. p. 328 [animal].

Pease considered this to be identical with *A. bella*.

HAB. Molokai (Newcomb); Kaluaaha to Halawa (Baldwin).

(100) *Achatinella* (*Achatinellastrum*) *producta* Reeve.

*Achatinella producta* Reeve, Conch. Icon. *Achatinella*, sp. 13; Newcomb, Ann. Lyc. New York, vi. p. 315 [animal]; Bland and Binney, Ann. Lyc. New York, x. p. 336, pl. xv, figs. 2, 4 [radula and anatomy].

*Achatinella venulata* Newcomb, P. Zool. Soc. London, 1854, p. 146, pl. xxiii, fig. 48.

*Achatinella hybrida* Newcomb, t. c. p. 147, pl. xxiii, fig. 52.

*Achatinella dunkeri* (Cuming MS.) Pfeiffer, op. cit. 1855, p. 208.

HAB. Oahu, Koolau (Newcomb, Hartman); Manoa to Nuuanu (Baldwin).

(101) *Achatinella* (*Achatinellastrum*) *saccata* Pfeiffer.

*Achatinella* (*Achatinellastrum*) *saccata* Pfeiffer, P. Zool. Soc. London, 1859, p. 30.  
Unknown to me.

HAB. Hawaiian Isles (Pfeiffer); Oahu (?) (Baldwin).

(102) *Achatinella* (*Achatinellastrum*) *solitaria* Newcomb.

*Achatinella solitaria* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 150,  
pl. XXIV. fig. 60.

HAB. Oahu, Palolo (Newcomb).

(103) *Achatinella* (*Achatinellastrum*) *trilineata* Gulick.

*Achatinella trilineata* Gulick, Ann. Lyc. New York, VI. p. 226, pl. VII. fig. 46.

HAB. Oahu, Palolo, Waialae, Wailupe, and Niu (Gulick).

(104) *Achatinella* (*Achatinellastrum*) *versipellis* Gulick.

*Achatinella versipellis* Gulick, Ann. Lyc. New York, VI. p. 224, pl. VII. fig. 44.

HAB. Oahu, Kailua (Gulick).

(105) *Achatinella* (*Achatinellastrum*) *vulpina* Férussac.

*Helix vulpina* Férussac, Voy. Freycinet, Zool. p. 447, pl. LXVIII. figs. 13, 14;  
Souleyet, Voy. Bonite, Zool. II. p. 508, pl. XXIX. figs. 3, 4 [animal].

*Achatina vulpina* Férussac, Deshayes, Hist. Moll. II. pt. 2, p. 193, pl. CLV. fig. 1.

*Achatinella vulpina* Reeve, Conch. Icon. *Achatinella*, sp. 29.

*Achatinella castanea* Reeve, I. c. sp. 24.

*Achatinella adusta* Reeve, I. c. sp. 30.

*Achatinella virens* Gulick, Ann. Lyc. New York, VI. p. 254, pl. VIII. fig. 73 (1858).

*Achatinella fuscolineata* Smith, P. Zool. Soc. London, 1873, p. 75, pl. IX. fig. 2.

*Achatinella livida* Pfeiffer, P. Zool. Soc. London, 1845, p. 89 [nec Swainson].

HAB. Oahu, Palolo (Baldwin); Kailua, Palolo, Halawa (Smith); Manoa to Nuuanu (Baldwin); Nuuanu Valley and Mt. Tantalus (Perkins).

var. *stewarti* Green.

*Achatina stewarti* Green, Contrib. Macl. Lyc. Philad. i. (1827, July), p. 47, pl. iv. figs. 1—4.

*Achatinella stewarti* Green, Reeve, Conch. Icon. *Achatinella*, sp. 26.

*Achatinella pulcherrima* Reeve, l. c. sp. 23, fig. a [nec Swainson].

*Achatinella tricolor* Smith, P. Zool. Soc. London, 1873, p. 70, pl. ix. fig. 6.

HAB. Oahu (various authors); Heia (Smith); Nuuanu and Mt. Tantalus (Perkins).

var. *crassidentata* Pfeiffer.

*Achatinella (Achatinellastrum) crassidentata* Pfeiffer, P. Zool. Soc. London, 1855, p. 6, pl. xxx. fig. 23.

*Achatinella diversa* Gulick, Ann. Lyc. New York, vi. p. 220, pl. vii. fig. 42 (1856, Dec.).

*Achatinella varia* Gulick, t. c. p. 222, pl. vii. fig. 43.

*Achatinella analoga* Gulick, t. c. p. 227, pl. vii. fig. 47.

HAB. Oahu, Halawa (Baldwin); Halawa, Palolo, Waialae and Wailupe (Gulick); Waialae and Nuuanu (Perkins).

var. *liliacea* Pfeiffer.

*Achatinella (Achatinellastrum) liliacea* Pfeiffer, P. Zool. Soc. London, 1859, p. 31.

HAB. Oahu (Baldwin).

The difficulty of arriving at a satisfactory dividing line between *A. vulpina* and *A. producta* is very great. As at present arranged, *A. vulpina* is the brown shell, var. *stewarti* the greenish coloured form, var. *crassidentata* the parti-coloured, and var. *liliacea* the bandless variety; all the above being sinistral. *A. producta* on the other hand is reserved for the larger and, usually, dextral form.

(106) *Achatinella (Achatinellastrum) wailuaensis*, sp. nov.

Testa dextrorsa, subperforata, nitida, turrita, solidula, levissime striata, alba, lineis castaneis picta, apud peripheriam zona alba, in sutura linea nigro-castanea notata; anfr. 5—5½, regulariter crescentes, convexi; apertura auriformis; margine columellari plica fusca mediocri munita, margine dextro acuto, callo parietali tenuissimo. Long. 15.5, alt. 8.4 mill. Plate XI. fig. 19.

A pretty little shell of the group of *A. bella* Reeve, of Molokai. A variety also occurred (Plate XI. fig. 20) in which the banding is almost obsolete, save in the suture of the earliest whorls and in one strong dark band below the periphery.

HAB. Maui, Wailua (Perkins).

(107) *Achatinella* (*Achatinellastrum*) *zonata* Gulick.

*Achatinella zonata* Gulick, Ann. Lyc. New York, vi. p. 237, pl. viii. fig. 58.

*Achatinella glauca* Gulick, t. c. p. 232, pl. viii. fig. 51.

United by Newcomb with *A. trilineata* Gulick; it appears however to have much flatter whorls, and I follow Mr Baldwin, with some little doubt, in restoring it to specific rank. According to Newcomb, *A. glauca* is a synonym of *A. livida* Swain., but specimens in the Brit. Mus. "named from Gulick's type" as a variety, lead me to place it here.

HAB. Oahu, Waimea, Pupukea, Waialei, Kahuku, Hauula, and Kaawa (Gulick); above Ewa (Perkins).

The following appears to be only a manuscript name:

*Achatinellastrum olesonii* Baldwin, Cat. Shells Hawaiian Islands, 1893, p. 5.

HAB. Oahu, Nuuanu.

## PERDICELLA Pease.

*Perdicella* Pease, P. Zool. Soc. London, 1869, p. 649.

Pease, unfortunately, having named no type, it becomes necessary to select one and I propose to take *A. helena* Newc. The species come from Maui and Molokai.

(1) *Perdicella fulgurans*, sp. nov.

Testa subperforata, dextrorsa, ovato-turrita, nitida, sub lente lineis spiralibus confertim sculpta, albida, strigis fulgurantibus castaneis elegantissime picta, sutura modice impressa, apice obtusulo; anfr.  $5\frac{1}{2}$ , plano-convexi, ultimis  $\frac{2}{3}$  longitudinis testae aequans; apertura ovato-pyriformis, intus lilacina; peristoma margine dextro simplici, columellari subreflexo; plica columellaris torta, subprominens, mediocris, rapide ascendens. Long. 16; lat. 8; long. apert. 8.1; lat. apert. 4.9 mill. (Plate XI. fig. 5.)

This very pretty shell is akin to *P. zebrina* Pfr., but may be readily separated from it by its greater size, by being much broader in proportion to the length, and by the colour-pattern being finer in design and more zigzag. The protoconch is brown, then becoming paler with a dark shade near the sutural line. It is the *Partulina zebrina* Pfr. of Mr Baldwin's valuable catalogue.

HAB. E. Maui, Makawao to Huelo (Baldwin); Maui (Hutchison).

(2) *Perdicella helena* Newcomb.

*Achatinella helena* Newcomb, Ann. Lyc. New York, vi. (May, 1853), p. 27; P. Zool. Soc. London, 1853 [1854], p. 151, pl. xxiv. fig. 63.

HAB. Molokai, on Ti-tree (Newcomb); Kamalo to Kalae (Baldwin); Kalae and Makakupaia (Perkins).

(3) *Perdicella mauiensis* (Newcomb) Pfeiffer.

*Achatinella mauiensis* (sic, err. typ.) (Newcomb) Pfeiffer, P. Zool. Soc. London, 1855 [1856], p. 207; Newcomb, Amer. J. Conch. II. p. 217, pl. XIII. fig. 16.

HAB. Maui, Makawao to Huelo (Baldwin).

(4) *Perdicella minuscula* Pfeiffer.

*Achatinella* (*Newcombia*) *minuscula* Pfeiffer, P. Zool. Soc. London, 1858, p. 22.

HAB. Maui, Lahaina (Baldwin).—Molokai Mts. at 4000 feet (Perkins).

Both these habitats can hardly be correct; I suspect the former may be an error of identification.

(5) *Perdicella ornata* Newcomb.

*Achatinella ornata* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 149, pl. xxiv. fig. 55.

HAB. Maui; E. Maui (Newcomb); Lahaina (Baldwin).

(6) *Perdicella theodorei* Baldwin.

*Achatinella* (*Partulina*) *theodorei* Baldwin, P. Ac. Philad. 1895, p. 226, pl. x. fig. 27.

HAB. Molokai, Kawela (Baldwin); Makakupaia and the mountains (Perkins).

(7) *Perdicella zebra* Newcomb.

*Achatinella zebra* Newcomb, Ann. Lyc. New York, vi. p. 142 [Oct. 1855].

Placed by Dr Hartman, in his list, both in *Achatinellastrum* and *Laminella*!

HAB. E. Maui (Newcomb).

(8) *Perdicella zebrina* Pfeiffer.

*Newcombia zebrina* Pfeiffer, P. Zool. Soc. London, 1855 [1856], p. 202.

HAB. E. Maui (Baldwin as *P. zebrina* Newc.).

## NEWCOMBIA Pfeiffer.

*Newcombia* Pfeiffer, Malak. Blätt. i. 1854, p. 117; Pease, P. Zool. Soc. London, 1869, p. 649.

Pfeiffer's list of species was very heterogeneous and included shells of diverse groups, his first species being *A. helena* Newcomb; fortunately Pease in 1869 properly confined the group to the shells it is now used for.

Two sections may be formed: I. Spirally lirate; *N. lirata*, etc. II. Nearly smooth, usually more elongate; *N. cumingi*, etc.

(1) *Newcombia canaliculata* Baldwin.

*Achatinella* (*Newcombia*) *canaliculata* Baldwin, P. Ac. Philad. 1895, p. 226, pl. x. figs. 28, 29; Gwatkin, t. c. p. 238 [radula].

HAB. Molokai, Halawa (Baldwin).

(2) *Newcombia cinnamomea* Pfeiffer.

*Achatinella cinnamomea* Pfeiffer, Malak. Blätt. iv. 1857, p. 230.

*Achatinella* (*Newcombia*) *cinnamomea* Pfeiffer, P. Zool. Soc. London, 1858, p. 22.

*Newcombia cinnamomea* Pfeiffer, Gwatkin, P. Ac. Philad. 1895, p. 238 [radula].

Conchologically this is very close to *N. cumingi* Newc.

HAB. Molokai, Mapulehu (Baldwin); Makakupaia and the mountains (Perkins).

(3) *Newcombia cumingi* Newcomb.

*Achatinella cumingi* Newcomb, Ann. Lyc. New York, vi. 1853, p. 25; P. Zool. Soc. London, 1853 [1854], pl. xxiv. fig. 59.

HAB. Maui, Haleakala (Newcomb); Lahaina and Makawao (Baldwin).

(4) *Newcombia gemma* Pfeiffer.

*Achatinella gemma* Pfeiffer, Malak. Blätt. iv. 1857, p. 323.

*Achatinella* (*Newcombia*) *gemma* Pfeiffer, P. Zool. Soc. London, 1858, p. 22.

Akin to *N. lirata* Pfr., but the sculpture is almost obsolete.

HAB. Molokai Mts. (Perkins).

(5) *Newcombia plicata* (Mighels MS.) Pfeiffer.

*Achatinella plicata* Pfeiffer, Mon. Helic. Viv. II. 1848, p. 235; Newcomb, Ann. Lyc. New York, VI. 1858, p. 312 [animal]; Reeve, Conch. Icon. *Achatinella*, sp. 44.

*Bulinus liratus* Pfeiffer, P. Zool. Soc. London, 1851 [1853], p. 261.

I cannot trace the supposed description by Mighels in P. Boston Soc. as *Bulinus plicatus*.

HAB. Molokai, Kalae (Baldwin); Mountains (Perkins).

(6) *Newcombia perkinsi* Sykes.

*Newcombia perkinsi* Sykes, P. Malac. Soc. London, II. 1896, p. 130. (Plate XI. fig. 36.)

HAB. Molokai Mts. (Perkins). A fine series of this handsome shell.

(7) *Newcombia pfeifferi* Newcomb.

*Achatinella pfeifferi* Newcomb, Ann. Lyc. New York, VI. p. 25 (May, 1853); P. Zool. Soc. London, 1853 [1854], p. 150, pl. XXIV. fig. 58.

*Bulinus newcombianus* Pfeiffer, P. Zool. Soc. London, 1851, p. 261 [Dec. 1853].

HAB. Molokai, Kaluaaha (Baldwin).

(8) *Newcombia philippiana* Pfeiffer.

*Achatinella philippiana* Pfeiffer, Malak. Blätt. IV. 1857, p. 89.

HAB. Molokai, Makakupaia (Baldwin).

(9) *Newcombia sulcata* Pfeiffer.

*Achatinella sulcata* Pfeiffer, Malak. Blätt. IV. 1857, p. 231.

*Achatinella* (*Newcombia*) *sulcata* Pfeiffer, P. Zool. Soc. London, 1858, p. 22.

*Newcombia sulcata* Pfeiffer, Gwatkin, P. Ac. Philad. 1895, p. 238 [radula].

HAB. Molokai, Pohakupili (Baldwin).

## AMAstra H. and A. Adams.

*Amastra* H. and A. Adams, Genera of Recent Mollusca, II. p. 137.

Type: the group of *A. magna* Ad.

This large genus may for convenience be subdivided into groups somewhat in the following manner; perhaps the large first section might be more broken up, though I think no sectional name will prove necessary.

## subgen. AMAstra (s. str.).

(1) *Amastra affinis* Newcomb.

*Achatinella affinis* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 142, pl. XXIII, fig. 35.

*Achatinella* (*Laminella*) *goniostoma* Pfeiffer, P. Zool. Soc. London, 1855, p. 203.

*Amastra rustica* Gulick, P. Zool. Soc. London, 1873, p. 84, pl. x. fig. 17.

Dr Hartman has suggested that *A. rustica* may equal *A. variegata* Pfr., an Oahu species.

HAB. E. Maui, Kula (Newcomb, Gulick).

(2) *Amastra albolabris* Newcomb.

*Achatinella albolabris* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 149, pl. XXIV, fig. 56.

*Achatinella nucleola* Reeve, Conch. Icon. *Achatinella*, sp. 39 [non Gould].

One young specimen I refer to this species. See a note under *A. subrostrata* Pfr.

HAB. Oahu, Waianae Mts. (Newcomb, Perkins); Kapalama and Kalihi (Baldwin).

(3) *Amastra amicta* Smith.

*Amastra amicta* Smith, P. Zool. Soc. London, 1873, p. 86, pl. x. fig. 20.

Dr Hartman notes that this species "may equal *petricola*"; it appears to me quite distinct.

HAB. Hawaiian Islands (Smith).

(4) *Amastra assimilis* Newcomb.

*Achatinella assimilis* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 148, pl. XXIII. fig. 53.

*Amastra assimilis* Newcomb, Gwatkin, P. Ac. Philad. 1895, p. 238 [radula].

*Achatinella deshayesii* Morelet, Bull. Soc. Hist. Nat. Moselle, 1857, p. 27 [pars].

It has been suggested that this is a variety of *A. nubilosa* Mighels, but the present species is a more slender shell with much flatter whorls.

HAВ. W. Maui (Newcomb).

(5) *Amastra aurostoma* Baldwin.

*Amastra aurostoma* Baldwin, Nautilus, x. (July, 1896), p. 31.

HAВ. Lanai (Baldwin).

(6) *Amastra badia* Baldwin.

*Amastra badia* Baldwin, P. Ac. Philad. 1895, p. 230, pl. XI. fig. 40.

HAВ. Oahu, Ewa (Baldwin).

(7) *Amastra biplicata* Newcomb.

*Achatinella biplicata* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 156, pl. XXIV. fig. 75.

*Achatinella deshayesii* Morelet, Bull. Soc. Hist. Nat. Moselle, 1857, p. 27 [pars]; Pease, P. Zool. Soc. London, 1869, p. 652.

Morelet's original series, now in the British Museum, consists of three specimens, one belonging to this species, and two to *A. assimilis* Newc.; his diagnosis however refers to a form with only one columellar plait. From Mr Perkins' long series, it appears that the upper plait is variable and sometimes becomes obsolete; in one specimen, which has received an injury, both plaits are dwarfed so as to show only as a slight thickening of the columella.

HAВ. Lanai (Newcomb); Waiapaa and Koele (Perkins).

(8) *Amastra breviata* Baldwin.

*Amastra breviata* Baldwin, P. Ac. Philad. 1895, p. 231, pl. XI. figs. 45, 46.

HAВ. Oahu, Palolo and Halawa (Baldwin).

(9) *Amastra citrea* Sykes.

*Amastra citrea* Sykes, P. Malac. Soc. London, II. (1896), p. 129.

Plate XI. fig. 4.

HAB. Molokai (Hutchison).

(10) *Amastra conicospira* Smith.

*Amastra conicospira* Smith, P. Zool. Soc. London, 1873, p. 86, pl. x. fig. 10.

Dr Hartman places this in the synonymy of *A. assimilis* Newc.; I have never seen the present species, but from the figure it appears distinct.

HAB. Hawaiian Islands (Smith).

(11) *Amastra conifera* Smith.

*Amastra conifera* Smith, P. Zool. Soc. London, 1873, p. 85, pl. x. fig. 11.

HAB. E. Maui, Kula (Smith).

(12) *Amastra cornea* Newcomb.

*Achatinella cornea* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 141, pl. xxiii. fig. 32.

HAB. Oahu, below Kaala (Perkins).

Newcomb appears not to have noted the exact habitat; the type-tablet in the British Museum is, however, labelled 'Oahu.'

(13) *Amastra crassilabrum* Newcomb.

*Achatinella crassilabrum* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 141, pl. xxiii. fig. 31.

HAB. Oahu, Waianae (Newcomb, &c.).

(14) *Amastra cylindrica* Newcomb.

*Achatinella cylindrica* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 134, pl. xxii. fig. 11; Ann. Lyc. New York, vi. p. 325 [animal].

HAB. Oahu, Waianae (Newcomb).

(15) *Amastra decorticata* Gulick.

*Amastra decorticata* Gulick, P. Zool. Soc. London, 1873, p. 84, pl. x. fig. 14.

Dr Hartman has united this with *A. ellipsoidea* of Gould, from Maui, but a glance at Gould's figures would have shewn him their distinctness.

HAB. Oahu, Kawailoa, Halemano, and various localities (Gulick); ridges of Nuuanu (Perkins).

(16) *Amastra durandi* Ancey.

*Amastra durandi* Ancey, Naturaliste, 1897, p. 178.

HAB. Oahu (Ancey).

(17) *Amastra ellipsoidea* Gould.

*Achatinella ellipsoidea* Gould, P. Boston Soc. II. (1847), p. 200; U. S. Explor. Exped. Moll. pl. VII. fig. 96.

A species unknown to me: Newcomb united it with his *A. pupoidea*, but it appears not to be so produced in form.

HAB. Maui (Gould).

(18) *Amastra elliptica* Gulick.

*Amastra elliptica* Gulick, P. Zool. Soc. London, 1873, p. 83, pl. x. fig. 15.

HAB. Oahu, Waialei, Kahuku, Hauula, Kawailoa (Gulick); Waianae (Hartman).

Two specimens, collected by Mr Perkins on "Waianae Mts. Oahu," may belong to a large, incrassate variety.

(19) *Amastra extincta* Pfeiffer.

*Achatinella (Laminella) extincta* Pfeiffer, P. Zool. Soc. London, 1855 [1856], p. 204.

? ? *Leptachatina hartmani* (Newc. MS.) Hartman, P. Ac. Philad. 1888, p. 54.

I fancy that the new name given by Dr Hartman, on the ground that recent examples had been found, was due to an error of identification. Specimens submitted to me under the name of *A. extincta* by Mr Baldwin appear to be only a form of *A. similaris* Pease.

HAB. Oahu, subfossil (Pfeiffer).

(20) *Amastra flavescens* Newc.

*Achatinella flavescens* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 151, pl. XXIV, fig. 62.

HAB. Hawaii (Newcomb).

Dr Hartman gives also "Wanoa, Oahu (Newcomb)," but this must be an error.

(21) *Amastra frosti* Ancey.

*Amastra frosti* Ancey, Mem. Soc. Zool. France, v. (1892), p. 719; Sykes, P. Malac. Soc. London, III, pl. XIII, fig. 12.

Mons. Ancey has also described (P. Malac. Soc. London, III, p. 269, pl. XII, fig. 11) a variety *unicolor*.

HAB. Oahu, Waianae (Ancey).

(22) *Amastra grayana* Pfeiffer.

*Achatinella (Laminella) grayana* Pfeiffer, P. Zool. Soc. London, 1855 [1856, Feb.], p. 204.

A single specimen. Dr Hartman has suggested that this is a form of *A. magna*, but I have not seen linking specimens. It is marked with spiral bands, due probably to the periostracum.

HAB. Oahu (Clessin, Nomencl. Helic. Viv. 1881); ? Oahu (Baldwin).—Lanai, Lanaihale, a ground shell (Perkins).

(23) *Amastra humilis* Newcomb.

*Achatinella humilis* Newcomb, Ann. Lyc. New York, VI, (Oct. 1855), p. 143; Amer. J. Conch. II, (1866), p. 211, pl. XIII, fig. 4.

HAB. Molokai, Kalae (Newcomb); Makakupaia and the mountains (Perkins).

(24) *Amastra inflata* Pfeiffer.

*Achatinella (Laminella) inflata* Pfeiffer, P. Zool. Soc. London, 1855 [Feb. 1856], p. 203.

HAB. Oahu (Clessin, Nomencl. Helic. Viv.); Koolauloa (Baldwin).

(25) *Amastra intermedia* Newcomb.

*Achatinella intermedia* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 135.  
pl. XXII. fig. 13.

HAB. Oahu, Waianae (Newcomb); ridges of Nuuanu, and Waianae Mts. below Kaala (Perkins).

A long series.

(26) *Amastra irregularis* Pfeiffer.

*Achatinella irregularis* Pfeiffer, P. Zool. Soc. London, 1855 [Feb. 1856], p. 205.

HAB. Hawaiian Islands (Pfeiffer).

(27) *Amastra lineolata* Newcomb.

*Achatinella lineolata* Newcomb, Ann. Lyc. New York, VI. (1853), p. 29; P. Zool. Soc. London, 1853 [1854], p. 140, pl. XXIII. fig. 29.

HAB. Hawaii (Newcomb).

The habitat 'Maui,' originally given, seems to have been a slip.

(28) *Amastra longa* Sykes.

*Amastra longa* Sykes, P. Malac. Soc. London, II. (Oct. 1896), p. 129.  
Plate XI. fig. 35.

HAB. Lanai (Newcomb); windward side, apparently extinct (Perkins).

(29) *Amastra luctuosa* Pfeiffer.

*Achatinella (Laminella) luctuosa* Pfeiffer, P. Zool. Soc. London, 1855 [Feb. 1856],  
p. 204.

*Laminella luctuosa* Pfeiffer, Bland and Binney, Ann. Lyc. New York, x. pp.  
335—6 [jaw and radula].

HAB. Oahu, Waialea (Baldwin).

(30) *Amastra magna* C. B. Adams.

*Achatinella magna* C. B. Adams, Contrib. to Conch. p. 125, 1850; Newcomb, Ann. Lyc. New York, vi. (1858), p. 319 [animal].

*Achatinella baldwini* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 155, pl. xxiv. fig. 72.

I have seen a good series of this handsome shell.

HAB. Lanai (Newcomb); behind Koele (Perkins).

(31) *Amastra malleata* Smith.

*Amastra malleata* Smith, P. Zool. Soc. London, 1873, p. 85, pl. x. fig. 18.

Mr Baldwin has united this with *A. affinis* Newcomb; I have not seen a specimen, but, from the figure and description, they appear distinct.

HAB. E. Maui, Kula (Smith).

(32) *Amastra mastersi* Newcomb.

*Achatinella mastersi* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 153, pl. xxiv. fig. 67; Ann. Lyc. New York, vi. p. 332 [animal].

*Laminella mastersi* Newcomb, Bland and Binney, Ann. Lyc. New York, x. p. 335, pl. xv. figs. 7, 9—11 [jaw and radula].

*Amastra mastersi* Newcomb, Gwatkin, P. Ac. Philad. 1895, p. 239 [radula].

*Achatinella rubens* Pfeiffer, Malak. Blätt. 1854, p. 129 [nec Gould, fide Newcomb].

HAB. Maui (Newcomb); ? Haleakala at 5000 feet (Perkins).

Two, apparently immature, specimens, which I refer here with some hesitation.

Four specimens from "Molokai Mts." appear to me to be very close to this species.

(33) *Amastra melanosia* Newcomb.

*Achatinella melanosia* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 144, pl. xxiii. fig. 41.

HAB. Hawaii (Newcomb).

(34) *Amastra modesta* C. B. Adams.

*Achatinella modesta* C. B. Adams, Contrib. to Conch. 1850, p. 128.

*Achatinella punila* Gulick, Clessin, Nom. Helic. Viv. 1881, p. 313.

HAB. Hawaiian Islands (Adams).—Molokai (Hartman, Baldwin).

(35) *Amastra moesta* Newcomb.

*Achatinella moesta* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 157, pl. xxiv. fig. 77.

*Achatinella obscura* Newcomb, t. c. p. 157, pl. xxiv. fig. 78.

According to Pease (P. Zool. Soc. London, 1869, p. 651), and he is followed by Dr Hartman (P. Ac. Philad. 1888, p. 47), these two forms are one species. Probably this is correct.

HAB. Lanai (Newcomb).

(36) *Amastra mucronata* Newcomb.

*Achatinella mucronata* Newcomb, Ann. Lyc. New York, vi. (May 1853), p. 28; P. Zool. Soc. London, 1853 [1854], p. 146, pl. xxxiii. fig. 49.

*Achatinella (Laminella) fusiformis* Pfeiffer, P. Zool. Soc. London, 1855, p. 5, pl. xxx. fig. 18.

HAB. Molokai (Newcomb, Baldwin).

Newcomb, in his later paper, gave the locality of 'Maui,' but probably this is a slip due to the fact that he was, as he subsequently stated, unable to see the proofs. Two specimens, collected on Molokai by Mr Perkins, appear to belong to a dwarf race.

(37) *Amastra nana* Baldwin.

*Amastra nana* Baldwin, P. Ac. Philad. 1895, p. 232, pl. xi. figs. 48, 49 [with animal]; Gwatkin, t. c. p. 239 [radula].

HAB. Maui, Makawao at 4000 feet (Baldwin).

(38) *Amastra nigra* Newcomb.

*Achatinella nigra* Newcomb, P. Boston Soc. v. (Sept. 1855), p. 219; Amer. J. Conch. II. (1866), p. 210, pl. xiii. fig. 3.

According to Clessin (Nomencl. Helic. Viv. 1881, p. 311) *A. globosa*, Gulick nec Pfeiffer, is a synonym.

HAB. E. Maui (Newcomb).

(39) *Amastra nubilosa* Mighels.

*Achatinella nubilosa* Mighels, P. Boston Soc. II. (1845), p. 20; Reeve, Conch. Icon. *Achatinella*, sp. 1; Newcomb, Ann. Lyc. New York, vi. p. 312 [animal].

*Achatinella nubilosa* Gould, U.S. Explor. Exped. Moll. pl. VII. fig. 95.

HAB. Molokai (Newcomb); Kalae (Baldwin).

It has been suggested, but I think erroneously, that this species comes, in reality, from Oahu.

(40) *Amastra nucula* Smith.

*Amastra nucula* Smith, P. Zool. Soc. London, 1873, p. 85, pl. x. fig. 19.

HAB. Lanai ? (Smith).

(41) *Amastra peasei* Smith.

*Amastra peasei* Smith, P. Zool. Soc. London, 1873, p. 86, pl. x. fig. 13.

HAB. Hawaiian Islands (Smith).—Oahu ? (Baldwin).

(42) *Amastra pellucida* Baldwin.

*Amastra pellucida* Baldwin, P. Ac. Philad. 1895, p. 231, pl. XI. figs. 41, 42 [with animal].

HAB. Oahu, Waianae Valley (Baldwin).

(43) *Amastra petricola* Newcomb.

*Achatinella petricola* Newcomb, Ann. Lyc. New York, vi. (Oct. 1855), p. 143; Amer. J. Conch. II. (1866), p. 211, pl. XIII. fig. 6.

*Achatinella (Laminella) umbilicata* Pfeiffer, P. Zool. Soc. London, 1855 [Feb. 1856], p. 205.

*Amastra umbilicata* Pfr., Hartman, P. Ac. Philad. 1888, p. 50, pl. I. fig. 11.

HAB. Molokai (Newcomb); Mapulehu (Baldwin).

(44) *Amastra porphyria* Newcomb.

*Achatinella porphyria* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 136, pl. XXII. fig. 16.

*Achatinella (Laminella) grossa* Pfeiffer, P. Zool. Soc. London, 1855 [Feb. 1856], p. 204.

HAB. Oahu, Waianae (Newcomb).

(45) *Amastra porphyrostoma* Pease.

*Amastra porphyrostoma* Pease, J. Conchyl. xvii. (1869), p. 172; Hartman, P. Ac. Philad. 1888, p. 48, pl. 1. fig. 6.

HAB. Oahu (Pease).

(46) *Amastra pullata* Baldwin.

*Amastra pullata* Baldwin, P. Ac. Philad. 1895, p. 228, pl. xi. figs. 31, 32; Gwatkin, t. c. p. 239 [radula].

*Amastra umbrosa* Baldwin, t. c. p. 229, pl. xi. figs. 36, 37; Gwatkin, t. c. p. 239 [radula].

After an examination of the long series collected by Mr Perkins I have been unable to sever these two species. The animals are said to differ in colour, and they are said to inhabit different districts; conchologically they seem to shade into one another, and the radula appears to be identical. Probably they will prove to be local races.

HAB. Molokai, Kamalo (Baldwin, as *A. umbrosa*); Waikolu (Baldwin, as *A. pullata*); Kamalo and Makakupaia Mts. (Perkins).

(47) *Amastra pupoidea* Newcomb.

*Achatinella pupoidea* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 144, pl. xxiii. fig. 42.

The colouring is somewhat exaggerated in the figure. See also a note under *A. ellipsoidea* Gould.

HAB. E. Maui (Newcomb).

(48) *Amastra pusilla* Newcomb.

*Achatinella pusilla* Newcomb, Ann. Lyc. New York, vi. (Oct. 1855), p. 144; Amer. J. Conch. ii. (1866), p. 211, pl. xiii. fig. 5.

*Achatinella pulla* (Newcomb) Pfeiffer, P. Zool. Soc. London, 1855 [Feb. 1856], p. 209.

HAB. Lanai (Newcomb).

(49) *Amastra reticulata* Newcomb.

*Achatinella reticulata* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 148,  
pl. xxiv. fig. 54.

*Achatinellastrum conspersa* Pfeiffer, P. Zool. Soc. London, 1855 [March], p. 7,  
pl. xxx. fig. 26.

HAB. Oahu, Waianae (Newcomb).

(50) *Amastra rubens* Gould.

*Achatinella rubens* Gould, P. Boston Soc. II. (1845), p. 27; Newcomb, Ann. Lyc.  
New York, VI. p. 314 [animal]; Reeve, Conch. Icon. *Achatinella*, sp. 42,  
pars b [fide Newcomb].

HAB. Oahu, W. Mts. (Newcomb); Kaala (Baldwin).

(51) *Amastra rubicunda* Baldwin.

*Amastra rubicunda* Baldwin, P. Ac. Philad. 1895, p. 229, pl. xi. fig. 38 [with  
animal]; Suter, t. c. p. 240, pl. xi. figs. 54 [jaw], 56 [radula].

HAB. Oahu, Konahuanui Mt. (Baldwin).

(52) *Amastra rubida* Gulick.

*Amastra rubida* Gulick, P. Zool. Soc. London, 1873, p. 84, pl. x. fig. 12.

HAB. Oahu, Kahuku (Gulick).

(53) *Amastra sericea* Pfeiffer.

*Achatinella (Laminella) sericea* Pfeiffer, P. Zool. Soc. London, 1859, p. 31.

HAB. Hawaiian Isles (Pfeiffer).—? Oahu, Waialua (Baldwin). Unknown to me.

(54) *Amastra simularis* Hartman.

*Amastra simularis* Hartman, P. Ac. Philad. 1888, p. 252, pl. xiii. fig. 7.

*Amastra simularis* Hartman, Gwatkin, op. cit. 1895, p. 239 [radula].

HAB. Molokai (Hartman, Perkins); Mapulehu (Baldwin).

var. *roseotincta* Sykes.

*A. similaris* Hartman, var. *roseotincta* Sykes, P. Malac. Soc. London, II. p. 130.

Plate XI. fig. 3.

HAB. Molokai mountains (Perkins).

Varieties under the names of *maura* and *semicarnea* have recently been described by Mons. Ancey (P. Malac. Soc. London, III. p. 270, pl. XIII. figs. 8, 16).

(55) *Amastra solida* Pease.

*Amastra solida* Pease, J. Conchyl. XVII. (1869), p. 173.

HAB. Oahu (Pease).

(56) *Amastra spirizona* Férussac.

*Helix* (*Cochlogena*) *spirizona* Férussac, Prodrome, no. 433.

*Achatina spirizona* Fér., Hist. Moll. II. pt. 2, p. 196, pl. CLV. figs. 14, 15.

*Achatinella spirizona* Fér., Newcomb, Ann. Lyc. New York, VI. p. 307 [animal].

*Achatinella acuta* Swainson, Quart. J. Sci. Lit. Arts, I. (1828), p. 84; Zool.

Illustr., ser. 2, pl. XCIX. fig. 3.

*Achatinella batica* Mighels, MS.

HAB. Oahu, Waianae Mts. (Baldwin); Waianae Mts. below Kaala on lee side, and Halemano (Perkins).

var. *nigrolabris* Smith.

*Amastra nigrolabris* Smith, P. Zool. Soc. London, 1873, p. 85, pl. x. fig. 9.

HAB. Oahu, Wahiawa, Kalaikoa, Waimea (Smith); Halemano (Perkins).

var. *rudis* Pfeiffer.

*Achatinella rudis* Pfeiffer, P. Zool. Soc. London, 1855, p. 5 (pars).

*Laminella alba* Pfeiffer, t. c. p. 203.

*Newcombia chlorotica* Pfeiffer, t. c. p. 203.

HAB. Oahu.

*A. nigrolabris* Smith, is, in my opinion, only a broader variety, in which the light band below the suture is wider: in a box of specimens from Halemano forms are found showing a graduation from it to the typical form. It is possible that *A. rudis* may be a distinct species, but I fancy it is only a paler colour variety. Mr Perkins notes that he found the species "mostly on dead branches of trees, covering itself with mucus to which débris of bark and wood stick, and therefore very well concealed."

(57) *Amastra subrostrata* Pfeiffer.

*Achatinella* (*Laminella*) *subrostrata* Pfeiffer, P. Zool. Soc. London, 1859, p. 31.

HAB. Hawaiian Islands (Pfeiffer).—? Oahu (Baldwin).

Dr Hartman suggests that this is the same as *A. albolabris* Newc.; it may possibly be an elongate variety, but I doubt it.

(58) *Amastra tenuilabris* Gulick.

*Amastra tenuilabris* Gulick, P. Zool. Soc. London, 1873, p. 83, pl. x. fig. 16.

HAB. Oahu (Gulick, with some doubt).

Dr Hartman remarks that from "a comparison of types" this is a synonym of *A. flavescens* Newc. I have, equally, examined the types, and this species differs in being stumpier, with a larger mouth, and more shouldered whorls.

(59) *Amastra tenuispira* Baldwin.

*Amastra tenuispira* Baldwin, P. Ac. Philad. 1895, p. 232, pl. xi. fig. 51.

HAB. Oahu, Kaala Mt. (Baldwin).

(60) *Amastra textilis* Férussac.

*Helix* (*Heliciteres*) *textilis* Férussac, Voy. Freycinet, Zool., p. 482.

*Achatinella textilis* Férussac, Binney, Ann. Lyc. New York, xi. p. 190, pl. xiv. fig. G [radula].

*Amastra textilis* Férussac, Hartman, P. Ac. Philad. 1888, p. 50, pl. i. fig. 8.

*Achatinella microstoma* Gould, P. Boston Soc. II. (1845), p. 28.

*Achatinella ventulus* Férussac, Reeve, Conch. Icon. *Achatinella*, sp. 31; Pfeiffer in Conch.-Cab. *Achatinella*, p. 287, pl. LXVII. figs. 12, 13 [nec Férussac].

HAB. Oahu (Baldwin, Hutchison, &c.).

A single specimen from Nuuanu, Oahu, appears to be a varietal form.

(61) *Amastra transversalis* Pfeiffer.

*Achatinella* (*Laminella*) *transversalis* Pfeiffer, P. Zool. Soc. London, 1855 [Feb. 1856], p. 204.

United by Newcomb with *A. reticulata*, but appears distinct.

HAB. Oahu, Keawaawa (Baldwin).

(62) *Amastra tristis* Férussac.

*Helix (Heliciteres) tristis* Férussac, Voy. Freycinet, Zool. p. 482, pl. LXVIII. figs. 6, 7.

*Achatinella tristis* Férussac, Reeve, Conch. Icon. *Achatinella*, sp. 37; Pfeiffer in Conch.-Cab. *Achatinella*, pl. LXVII. figs. 10—11 [not good].

*Achatinella fuliginosa* Gould, P. Boston Soc. II. (1845), p. 28.

HAB. Oahu, Palolo (Hartman); Nuuanu to Palolo (Baldwin).

(63) *Amastra turritella* Férussac.

*Helix (Cochlogena) turritella* Férussac, Prodrôme, No. 434; Voy. Freycinet, Zool. p. 481.

*Achatina turritella* Fér., Hist. Moll. II. pt. 2, p. 196, pl. CLV. fig. 13; Souleyet, Voy. Bonite, Zool. II. p. 509, pl. XXXIX. figs. 7—8 [animal].

*Achatinella turritella* Fér., Newcomb, Ann. Lyc. New York, VI. p. 307 [animal].

? *Helix (Cochlogena) luteola* Férussac, Voy. Freycinet, Zool. p. 480.

? *Achatina luteola* Fér., Hist. Moll. II. pt. 2, p. 196, pl. CLV. fig. 12.

? *Laminella luteola* Fér. (sic), Hartman, P. Ac. Philad. 1888, p. 42.

*Achatina oahuensis* Green, Contrib. Macl. Lyc. Phil. I. (1827), p. 49, pl. IV. fig. 5.

*Achatinella inornata* Mighels, P. Boston Soc. II. (1845), p. 21.

Newcomb states that he was unable to trace the type of *A. luteola*, and apparently it is lost: Pease (P. Zool. Soc. London, 1869, p. 652) united it with *A. turritella*, and probably this will prove to be correct.

HAB. Oahu (authors); Kalihi to Palolo (Baldwin); ridges of Nuuanu Valley (Perkins).

(64) *Amastra undata* Baldwin.

*Amastra undata* Baldwin, P. Ac. Philad. 1895, p. 230, pl. XI. fig. 39.

HAB. Oahu, Nuuanu (Baldwin).

(65) *Amastra uniplicata* Hartman.

*Amastra uniplicata* Hartman, P. Ac. Philad. 1888, p. 50, pl. I. fig. 7.

HAB. Molokai (Hartman).

(66) *Amastra variegata* Pfeiffer.

*Achatinella variegata* Pfeiffer, Zeitschr. für Malak. 1849, p. 90; Conch.-Cab.

*Achatinella*, p. 282, pl. LXVII. figs. 14, 15.

*Amastra rubens*, Reeve, pars, Conch. Icon. *Achatinella*, fig. 42 a [fide Newcomb].

*Achatinella decepta* C. B. Adams, Contrib. to Conch. 1850, p. 127.

HAB. Oahu, head of Boothes Valley (Hartman); Waianae (Baldwin).

(67) *Amastra ventulus* Férussac.

*Helix (Helicteres) ventulus* Férussac, Voy. Freycinet, Zool. p. 481.

*Achatinella ventulus* Férussac, Newcomb, Ann. Lyc. New York, vi. p. 306  
[animal].

*Achatinella melampoides* Pfeiffer, P. Zool. Soc. London, 1851 [Dec. 1853], p. 262;  
Pfeiffer in Conch.-Cab. *Achatinella*, p. 288, pl. LXVII. figs. 8, 9.

*Achatinella (Amastra) manoaensis* Newc., Clessin, Nom. Helic. Viv. 1881, p. 311.  
May prove to be a *Leptachatina*.

HAB. Oahu, Nuuanu to Palolo (Baldwin); Panoa Valley and ridges of Nuuanu  
(Perkins).

(68) *Amastra violacea* Newcomb.

*Achatinella violacea* Newcomb, Ann. Lyc. New York, vi. (1853, May), p. 18;

P. Zool. Soc. London, 1853 [1854], p. 135, pl. XXII. fig. 14.

*Achatinella gigantea* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 136, pl.  
XXII. fig. 17.

These two species have been united by Pease and Dr Hartman, the latter remarking "The only example of *gigantea* ever found is in the British Museum. It probably equals a large example of *A. violacea*, Newc." Probably the locality of Maui, given by Newcomb, was an error, as his specimen appears to be only an elongate form of the Molokai shell. This varies very much in size and shape, as may be seen from the following:

Alt. 34; diam. 16; alt. ap. 15; lat. ap. 9.5 mill.

" 31; " 12; " " 11.5; " " 7 "

" 31; " 15; " " 13; " " 9 "

Mr Baldwin has left *A. gigantea* in his list as a Maui shell, but the fact that this diligent collector has marked it as a shell unknown to him, lends confirmation to the view that it does not really come from that island.

HAB. Molokai, Haleakala (Newcomb); Mapulehu to Halawa (Baldwin); Halawa and Pelekunu (Perkins).—? Maui as *A. gigantea*, Haleakala (Newcomb).

subgenus LAMINELLA Pfeiffer.

*Laminella* Pfr., Malak. Blätt. I. 1854, p. 126.

Pfeiffer's original group was very heterogeneous, as was that of Pease under this name (P. Zool. Soc. London, 1869, p. 648); the latter author also proposing *Perdicella* for a portion of the group. I would propose to select *A. gravida* Fér., the old and well-known species, as the type.

(69) *Amastra (Laminella) alexandri* Newcomb.

*Achatinella alexandri* Newcomb, P. Calif. Ac. III. (1865), p. 182; Amer. J. Conch., II. (1866), p. 216, pl. XIII. fig. 14.

HAB. West Maui, at 7500 feet (Newcomb); top of West Maui (Baldwin).

(70) *Amastra (Laminella) citrina* (Mighels MS.) Pfeiffer.

*Achatinella citrina* Mighels, Pfeiffer, Mon. Helic. Viv. II. (1848), p. 234; Reeve, Conch. Icon. *Achatinella*, sp. 33; Newcomb, Ann. Lyc. New York, VI. p. 312 [animal].

Pease united (P. Zool. Soc. London, 1869, p. 652) this species with *A. venusta*. Conchologically, they differ in the periostracum, shape of whorls, &c., while, from the descriptions given by Newcomb, the animals are distinct in colouration.

HAB. Molokai, Kalae to Waikolu (Baldwin); Molokai (Perkins).

(71) *Amastra (Laminella) concinna* Newcomb.

*Achatinella concinna* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 157, pl. XXIV. fig. 79.

Newcomb's type was a bandless dextral shell. In the very fine series collected, both dextral and sinistral forms occur; black bands are either absent or present, and, in the latter event, vary from one to even four in number.

HAB. Lanai (Newcomb, &c.); Koele side of highest point, side of highest point furthest from Koele, near Koele at 3000 feet (Perkins).

(72) *Amastra (Laminella) depicta* Baldwin.

*Laminella depicta* Baldwin, P. Ac. Philad. 1895, p. 228, pl. XI. figs. 33—5 [animal described].

A very fine series, shewing a range of colour from pale yellow to rich orange, tinged with crimson; it is sometimes dextral, but sinistral forms predominate.

HAB. Molokai, Kamalo (Baldwin); mountains, and above Pelekunu (Perkins).

(73) *Amastra (Laminella) elongata* Newcomb.

*Achatinella elongata* Newcomb, Ann. Lyc. New York, vi. (May, 1853), p. 26.

*Achatinella acuta* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 142 [nec Swainson].

The figure given in P. Zool. Soc. London (l. c.) under this name does not (fide Newcomb) represent the present species, but *A. soror*. Dr Hartman gives 'Makawao, Maui' as the habitat, but this must be an error; further he unites the species, erroneously in my opinion, with *A. hutchinsonii* Pease.

HAB. Oahu, Lehue (Newcomb); Waianae Mts (Baldwin).

(74) *Amastra (Laminella) erecta* Pease.

*Laminella erecta* Pease, J. Conchyl., xvii. (1869), p. 174.

Close to *A. micans* Pfeiffer.

HAB. Maui (Pease).

(75) *Amastra (Laminella) farcimen* Pfeiffer.

*Achatinella (Laminella) farcimen* Pfeiffer, P. Zool. Soc. London, 1856, p. 334. nec *Amastra farcimen*, Pfeiffer, Hartman, P. Ac. Philad. 1888, p. 46, pl. i. fig. 5.

Dr Hartman states that his figure is "typical"; this is obviously incorrect as the type is a sinistral specimen, of considerable size, while the figure represents a smaller, dextral, shell of another group. What species his shell may belong to, I am unable to determine, but it appears to possess no columellar plait.

HAB. Maui (Newcomb, fide Pfeiffer).

(76) *Amastra (Laminella) fraterna* Sykes.

*Amastra fraterna*, Sykes, P. Malac. Soc. London, ii. (Oct. 1896), p. 129.

Plate XI. fig. 23.

HAB. Lanai, mountains behind Koele (Perkins).

(77) *Amastra (Laminella) gravaida* Férussac.

*Helix gravaida* Férussac, Voy. Freycinet, Zool. p. 478, pl. LXVIII. figs. 4, 5.

*Achatina gravaida* Férussac, Deshayes, Hist. Moll. ii. p. 192, pl. CLV. figs. 3, 4.

*Achatinella gravaida* Fér., Newcomb, Ann. Lyc. New York, vi. p. 307 [animal].

*Achatinella suffusa* Reeve, Conch. Icon. *Achatinella*, sp. 11.

*Achatinella dimondi* C. B. Adams, Contrib. to Conch. 1850, p. 126 (with var. *lata*).

The specimen described by Reeve does not now appear to exist in the Brit. Mus. collection.

HAB. Oahu, Kalihi to Niu (Baldwin); Nuuanu (Perkins).

(78) *Amastra (Laminella) helvina* Baldwin.

*Achatinella (Laminella) helvina* Baldwin, P. Ac. Philad. 1895, p. 227, pl. XI, fig. 30 [shell, animal, and anatomy]; Gwatkin, t. c. p. 239 [radula].

Some specimens, given to Mr Perkins by Mr O. Meyer, are broader and have more periostracum, forming a link towards *A. picta*.

HAB. Molokai, Ohia Valley, near Kaluaaha (Baldwin); Molokai (Perkins).

(79) *Amastra (Laminella) hutchinsonii* Pease.

*Helicter hutchinsonii* Pease, P. Zool. Soc. London, 1862, p. 7.

*Amastra hutchinsonii* Pease, Hartman, P. Ac. Philad. 1888, p. 45, pl. I, fig. 9.

Dr Hartman suggests, I think erroneously, that this is a synonym of *A. elongata* Newc.

HAB. Maui (Pease).

(80) *Amastra (Laminella) micans* Pfeiffer.

*Achatinella (Laminella) micans* Pfeiffer, P. Zool. Soc. London, 1859, p. 31.

*Amastra micans* Pfeiffer, Hartman, P. Ac. Philad. 1888, pl. I, fig. 10.

Dr Hartman's figure is not very good.

HAB. Oahu (Baldwin, Hutchison).

(81) *Amastra (Laminella) picta* Mighels.

*Achatinella picta* Mighels, P. Boston Soc. II. (1845), p. 21; Newcomb, Ann. Lyc. New York, VI, p. 311 [animal]; Reeve, Conch. Icon. *Achatinella*, sp. 36; Pfeiffer, Conch.-Cab. *Achatinella*, p. 284, pl. LXVIII, figs. 28, 29 [not very good]; Bland and Binney, Ann. Lyc. New York, X, p. 335, pl. XV, fig. 6 [jaw].

*Achatinella picta* Pfeiffer, P. Zool. Soc. London, 1845 [1846], p. 90.

HAB. Maui, Lahaina and Makawao (Baldwin); Haleakala, at 4000 feet, and Iao Valley (young shells) (Perkins).

var. *bulbosa* Gulick.

*Achatinella bulbosa* Gulick, Ann. Lyc. New York, vi. (1858), p. 253, pl. VIII, fig. 71.

Newcomb placed *A. bulbosa* as a synonym; it appears to me to be of varietal rank, and to differ in being larger and in the whorls being more flattened. I fancy the species will prove to be variable, as Mr Perkins' shells are more slender than the series in the Museum. Specimens sent by Mr Hutchison as from 'Maui' are still more slender, and may possibly prove to be distinct. Mighels gave, by error probably, 'Oahu.'

HAB. E. Maui, Honuaua and Kula (Gulick).

(82) *Amastra (Laminella) remyi* Newcomb.

*Achatinella remyi* Newcomb, Ann. Lyc. New York, vi. (Oct. 1855), p. 146; Amer. J. Conch. II. (1866), p. 215, pl. XIII, fig. 13.

HAB. Lanai (Newcomb).

Only known to me from the original series in the Brit. Mus.; Pfeiffer (P. Zool. Soc. London, 1855, p. 207) gave Hawaii as the habitat, but probably this was an error.

(83) *Amastra (Laminella) sanguinea* Newcomb.

*Achatinella sanguinea* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 135, pl. XXII, fig. 15; Ann. Lyc. New York, vi. p. 326 [animal].

*Laminella ferussaci* Pfeiffer, P. Zool. Soc. London, 1855 [1856], p. 203.

HAB. Oahu, Lehui (Newcomb); Waianae and Halemano (Baldwin); Halemano, Kawaihoa, and Makaha Valley (dead) (Perkins).

(84) *Amastra (Laminella) soror* Newcomb.

*Achatinella soror* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 143, pl. XXIII, fig. 38 [also fig. 36, sub nom. *A. acuta*].

HAB. Maui (Newcomb).

The additional locality of Lanai given, subsequently, by Newcomb, really, I think, refers to my *A. fraternæ*.

(85) *Amastra (Laminella) straminea* Reeve.

*Achatinella straminea* Reeve, Conch. Icon. *Achatinella*, sp. 38; Newcomb, Ann. Lyc. New York, vi. p. 318 [animal].

HAB. Oahu, Panoa to Palolo (Baldwin); Nuuanu (Perkins).

(86) *Amastra (Laminella) tetrao* Newcomb.

*Achatinella tetrao* Newcomb, P. Boston Soc. v. (1855), p. 219; Ann. Lyc. New York, vi. p. 334 [animal]; Amer. J. Conch. II. (1866), p. 214, pl. XIII. figs. 11, 12.

From the fine series collected it appears that the ground-colouring, under the zigzag periostracum, varies considerably. Shades of crimson or rich orange predominate, but occasionally the colour is confined to a band below the suture, the rest of the shell being whitish.

HAB. Lanai (Newcomb); mountains and behind Koele (Perkins).

(87) *Amastra (Laminella) venusta* Mighels.

*Achatinella venusta* Mighels, P. Boston Soc. II. (1845), p. 21; Newcomb, Ann. Lyc. New York, VI. p. 311 [animal]; Reeve, Conch. Icon. *Achatinella*, sp. 32; Binney, Ann. Lyc. New York, XI. p. 191, pl. XIV. fig. D.

HAB. Molokai, Mapulehu (Baldwin); mountains (Perkins).  
Mighels gave, but erroneously, 'Oahu' as the locality.

(88) *Amastra (Laminella) villosa* Sykes.

*Amastra villosa* Sykes, P. Malac. Soc. London, II. (1896), p. 129.  
Plate XI. fig. 24.

The specimen here figured is not the one whose measurements were given in the original diagnosis, but a slightly smaller shell whose periostracum is better preserved.

HAB. Molokai (Perkins).

## subgenus AMASTRELLA, n. subgen.

This name is proposed for a group of rotund, generally incrassated, small forms, which have been usually placed in *Amastra*. I take as the type *A. rugulosa* Pease. They are nearly all natives of Kauai, but a few species are found on other islands.

(89) *Amastra* (*Amastrella*) *anthonii* Newcomb.

*Achatinella anthonii* Newcomb, P. Calif. Ac. II. (1861), p. 93; Amer. J. Conch. II. (1866), p. 210, pl. XIII. fig. 2.

HAB. Kauai (Newcomb).

(90) *Amastra* (*Amastrella*) *antiqua* Baldwin.

*Amastra antiqua* Baldwin, P. Ac. Philad. 1895, p. 233, pl. XI. fig. 47.

HAB. Oahu, Ewa (Baldwin, as fossil).

(91) *Amastra* (*Amastrella*) *carinata* Gulick.

*Amastra carinata* Gulick, P. Zool. Soc. London, 1873, p. 83.

*Achatinella obesa* var. *agglutinans* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 143, pl. XXIII. fig. 39 a.

This appears to be specifically distinct from *A. obesa* Newc.

HAB. W. Maui, Wailuku (Gulick).

(92) *Amastra* (*Amastrella*) *cyclostoma* Baldwin.

*Amastra cyclostoma* Baldwin, P. Ac. Philad. 1895, p. 234, pl. XI. fig. 53 [animal and shell].

HAB. Kauai, Makaweli (Baldwin).

(93) *Amastra* (*Amastrella*) *nucleola* Gould.

*Achatinella nucleola* Gould, P. Boston Soc. II. (1845), p. 28.

*Achatinella brevis* Pfeiffer, P. Zool. Soc. London, 1845 [1846], p. 90.

HAB. Kauai (Newcomb); Hanalei (Baldwin).—? Oahu, Manoa Valley (Clessin, Nomenc. Helic. Viv.).

I feel doubtful as to this last locality: the *A. nucleola* Gould, of Reeve, is *A. albolabris* Newc. (cf. p. 333).

(94) *Amastra (Amastrella) obesa* Newcomb.

*Achatinella obesa* Newcomb, Ann. Lyc. New York, vi. (May, 1853), p. 24; t. c. p. 329 [animal]; P. Zool. Soc. London, 1853 [1854], p. 143, pl. xxiii. fig. 39; Binney, Ann. Lyc. New York, xi. p. 191, pl. xiv. fig. H [radula and jaw].

HAB. Maui, Makawao and Kula (Baldwin); Haleakala (Newcomb).

(95) *Amastra (Amastrella) rugulosa* Pease.

*Amastra rugulosa* Pease, P. Zool. Soc. London, 1869, p. 649 (nom. sol.); J. Conchyl. xviii. (1870), p. 95; Crosse, l. c. xxiv. (1876), p. 99, pl. i. fig. 4.

var. *similaris* Pease.

*Amastra similaris* Pease, P. Zool. Soc. London, 1869, p. 649 (nom. sol.).

*Amastra rugulosa* var. *similaris* Pease, J. Conchyl. xviii. (1870), p. 96.

Mr Perkins' specimens are small but otherwise agree with some presented by Pease to the British Museum. I have seen specimens collected by Mr Hutchison as from Oahu, but think there must be an error as to the locality.

HAB. Kauai (Pease, type and var.); Kapaa (Baldwin); Lihue (Perkins).—E. Maui, Kula (Hartman) [? an error].

(96) *Amastra (Amastrella) sphaerica* Pease.

*Amastra sphaerica* Pease, P. Zool. Soc. London, 1869, p. 649 (nom. sol.); J. Conchyl. xviii. (1870), p. 94; Crosse, l. c. xxiv. (1876), p. 98, pl. i. figs. 5, 5a.

HAB. Kauai (Pease).

The habitat is given as "Lanai" by both Mr Baldwin and Dr Hartman, but I know not on what authority.

(97) *Amastra (Amastrella) vetusta* Baldwin.

*Amastra vetusta* Baldwin, Cat. Shells Hawaiian Islands, 1893, p. 10 (nom. sol.); P. Ac. Philad. 1895, p. 233, pl. xi. fig. 50.

HAB. Oahu, near the base of Punchbowl Hill, Honolulu, fossil (Baldwin).

subgen. KAUAIA, nom. nov.

*Carinella* Pfr. (1875) nec Sowerby (1839).

The type of Pfeiffer's group is *A. kauaiensis* Newc.: the subgeneric name was used first by Sowerby for a different group of Molluscs. Whether *A. alata* and *A. heliciformis* really belong here I am not clear.

(98) *Amastra (Kauaia) alata* Pfeiffer.

*Helix alata* Pfeiffer, P. Zool. Soc. London, 1856, p. 33.

I have elsewhere (P. Malac. Soc. London, II. p. 127) pointed out that all authors have overlooked the fact that this shell has a columellar plait. It is, in my opinion, not a Helicoid at all, but belongs to an aberrant group of *Amastra*. The columellar plait does not ascend rapidly into the shell, but stands almost horizontally, and has no final 'knob.' The single specimen found by Mr Perkins measures diam. max. 8; alt. 4; alt. apert. 3 mill.

HAB. Lanai (Pfeiffer); Mts. behind Koele (Perkins).

(99) *Amastra (Kauaia) heliciformis* Ancey.

*Amastra heliciformis* Ancey, Bull. Soc. Malac. France, VII. (1890), p. 340.

HAB. Oahu, Waianae (Ancey).

(100) *Amastra (Kauaia) kauaiensis* Newcomb.

*Achatinella kauaiensis* Newcomb, Ann. Lyc. New York, VII. (April, 1860), p. 145; Amer. J. Conch. II. (1866), p. 209, pl. XIII. fig. 1.

*Achatinella (Carinella) kauaiensis* Newc., Pfeiffer, Novit. Conch. IV. p. 115, pl. CXXVI. figs. 8—11.

A good series, principally however dead shells, of this almost extinct species. Mr Perkins notes that one specimen was found "with embryonic shells in mouth."

HAB. Kauai (authors); Halemanu (Baldwin); Makaweli at 2000 ft. and Halemanu at 4000 feet (Perkins).

(101) *Amastra* (*Kauaia*) *knudseni* Baldwin.

*Amastra knudseni* Baldwin, P. Ac. Philad. 1895, p. 234, pl. XI, figs. 43, 44.

HAB. Kauai, Halemanu (Baldwin, Perkins). A single specimen of this very fine species.

The following appear to be only MS. names: *Amastra ferruginea* Baldwin, Cat. Shells Hawaiian Islands, 1893, p. 9 (nom. sol.). Hab. Oahu, Ewa and Waianae (Baldwin).—*Amastra testudinea* Baldwin, t. c. p. 10. HAB. Oahu, Ewa (Baldwin).

## LEPTACHATINA Gould.

*Leptachatina* Gould, P. Boston Soc. II. p. 201; type *Achatinella acuminata* Gould.

It is frequently difficult to draw the line between this group and *Amastra*, and perhaps such species as *A. melampoides* Pfr. (= *A. ventulus* Fér.) may eventually be transferred to *Leptachatina*.

Pfeiffer proposed *Labiella* (Malak. Blätt. I. 1854, p. 142) for the group with an incassated lip, such as *A. labiata* Newc., and perhaps it may, conchologically, form a convenient section.

The species are principally from Oahu, but an elongate and generally striate group characterizes the older Islands, such as Kauai.

(1) *Leptachatina accincta* Mighels.

*Achatina accincta* (err. typ.) Mighels, P. Boston Soc. II. (1845), p. 20; Reeve, Conch. Icon. *Achatina*, sp. 101.

nec *Achatinella accincta* Gould, U.S. Explor. Exped. Mollusca, pl. VII, fig. 97.

*Achatinella granifera* Gulick, Ann. Lyc. New York, VI. (1856), p. 185, pl. VI, fig. 13; Sykes, P. Malac. Soc. London, III. pl. XIV, fig. 5.

*Achatinella* (*Leptachatina*) *margarita* Pfeiffer, P. Zool. Soc. London, 1855, p. 206.

Gulick admitted (P. Zool. Soc. London, 1873, p. 91) the identity of his species with Pfeiffer's. If Mighels' dimensions and description are accurate, I think the above identification will prove correct. The shell figured by Gould does not appear to be Mighels' species. See also a note under *L. grana* Newc.

HAB. Oahu (Mighels, Pfeiffer); Keawaawa (Gulick).

(2) *Leptachatina acuminata* Gould.

*Achatinella acuminata* Gould, P. Boston Soc. II. (1847), p. 200; U. S. Explor. Exped. Mollusca, pl. VII. fig. 100.

Plate XII. figs. 13, 13 a.

The type of the genus; the radula is figured from a dissection by Lt.-Col. H. H. Godwin-Austen, F.R.S.

HAB. Kauai (Gould); Hanalei (Baldwin); Kaholuamano (Perkins).

(3) *Leptachatina antiqua* Pease.

*Leptachatina antiqua* Pease, P. Zool. Soc. London, 1869, p. 651 (nom. sol.);

J. Conchyl. XVIII. (1870), p. 94; Crosse, J. Conchyl. XXIV. p. 98, pl. III. fig. 6.

*Leptachatina antiquata* Pease, J. Conchyl. XVIII. (1870), p. 87 [err. typ.].

HAB. Kauai (Pease); Mana (Baldwin).

(4) *Leptachatina approximans* Ancey.

*Leptachatina approximans* Ancey, Naturaliste, 1897, p. 222.

HAB. Waianae, Oahu (Ancey).

(5) *Leptachatina arborea*, n. sp.

Testa ovato-oblonga, turrata, tenuis vel tenuiuscula, dextrorsa, cornea, longitudinaliter levissime striatula; anfr. 6—7, plano-convexi, ultimus  $\frac{5}{8}$  altitudinis testae aequans; sutura bene impressa; apertura quadrato-ovata, margine dextro subincrassatulo, columellari verticali, incrassato, reflexo, plica parva vix conspicua munito. Alt. 8; diam. 3.6 mill. Plate XI. fig. 21.

The plica is very inconspicuous; the colour becomes lighter in adult specimens, and then the polished, transparent gloss disappears and the shell becomes of a straw colour. Over thirty specimens were collected by Mr Perkins; they vary slightly in shape, a few being broader in proportion to the length, and having more inflated whorls. Mr Baldwin sends me the following note: "It is found on the Candle-nut tree (*Aleurites moluccana*), among the leaves of the Bird-nest fern (*Asplenium nidus*), sometimes at a height of 30 or 40 feet. All the other known species of *Leptachatina* are terrestrial—under rocks or on dead leaves and decaying wood."

HAB. Hawaii, Kona at 4000 feet (Perkins); Olaa, Hilo (Baldwin).

(6) *Leptachatina balteata* Pease.

*Leptachatina balteata* Pease, P. Zool. Soc. London, 1869, p. 651 (nom. sol.); J. Conchyl. xviii. (1870), p. 91; Crosse, l. c. xxiv. (1876), p. 96, pl. iv. fig. 4.

Four, apparently immature, specimens; they approach this species very closely save that they do not possess the colour band, and the last whorl measures just over, rather than under, half the length of the shell. As the species is only known to me from description and figure, I think it safer to refer them here with a query than to describe them.

HAB. Kauai (Pease); Wahiawa (Baldwin); at 4000 feet (Perkins).

(7) *Leptachatina brevicula* Pease.

*Leptachatina brevicula* Pease, J. Conchyl. xvii. (1869), p. 169.

Only known to me from the description. The specimens, while slightly larger than the dimensions stated by Pease, agree well with the proportions given. The plait, which he states is "*valida, fere transversa*," seems to vary much in size and prominence.

HAB. Kauai (Pease); Kaholuamano, and at 4000 feet (Perkins).

(8) *Leptachatina (Labiella) callosa* Pfeiffer.

*Achatinella (Labiella) callosa* Pfeiffer, P. Zool. Soc. London, 1856 [1857], p. 334.

Only known to me from the unique type in the British Museum.

HAB. Oahu (Pfeiffer).

(9) *Leptachatina cerealis* Gould

*Achatinella cerealis* Gould, P. Boston Soc. II. (1847), p. 201; U. S. Explor.

Exped. Mollusca, pl. vii. fig. 99; Hartman, P. Ac. Philad. 1888, pl. i. fig. 13.

Two specimens only, which, if not this species, are probably undescribed.

HAB. Oahu, Waianae (Gould); Waianae Mts. below Kaala (Perkins).

(10) *Leptachatina chrysallis* Pfeiffer.

*Achatina chrysallis* Pfeiffer, P. Zool. Soc. London, 1855, p. 99.

This species has been united with *L. obtusa* Newc., by Mr Baldwin, but appears to me to be quite distinct; the habitat he gives of 'Wahiawa to Kawailoa, Oahu' probably really refers to *L. obtusa*.

HAB. Hawaiian Islands (Pfeiffer).

(11) *Leptachatina cingula* Mighels.

*Achatinella cingula* Mighels, P. Boston Soc. II. (1845), p. 21.

*Leptachatina cingula* Mighels, Hartman, P. Ac. Philad. 1888, pl. 1. fig. 14.

*Achatinella (Leptachatina) dimidiata* Pfeiffer, P. Zool. Soc. London, 1855, p. 205.

The *L. cingula* Mighels is unknown to me; I quote the following from Mr Hartman, "*Achatinella dimidiata* Pfeiffer, equals *cingula* Migh. in coll. Newcomb *ex Auct.* The figure of this shell in Chemnitz [i.e. Conch.-Cab. *Bulimacea*, pl. LXVII. figs. 5—7] does not represent the species, but equals an *Amastra*."

HAB. Oahu (Mighels, Pfeiffer); Halemano, Kawailoa Gulch (Perkins).

(12) *Leptachatina clausina* Mighels.

*Bulimus clausinus* Mighels, P. Boston Soc. II. (1845), p. 20.

*Leptachatina clausiana* (sic) Mighels, Hartman, P. Ac. Philad. 1888, p. 52.

Unknown to me.

HAB. Hawaii (Mighels).

(13) *Leptachatina columna* Ancey.

*Leptachatina columna* Ancey, Naturaliste, 1889, p. 266; Sykes, P. Malac. Soc. London, III. pl. XIII. fig. 18.

Near *L. chrysallis* Pfr.

HAB. Oahu (Ancey).

(14) *Leptachatina compacta* Pease.

*Labiella compacta* Pease, J. Conchyl. XVII. (1869), p. 172.

The specimens appear to agree with Pease's description; the species has not been figured.

HAB. Maui (Pease); E. Maui (Baldwin); Haleakala, at 5000 feet (Perkins).

(15) *Leptachatina conicoides*, sp. nov.

Testa conico-ovata, imperforata, dextrorsa, tenuiuscula, cornea, apud suturas crenulata; anfr. 6, ultimus  $\frac{2}{3}$  altitudinis testae aequans; sutura subimpressa; apertura subverticilis, sinuato-oblonga, margine dextro sub-incrassatulo, columellari reflexo,

adnato, plica obliqua, parva, compressa munito, marginibus callo tenui junctis. Alt. 7.5; diam. 3.5 mill.

Plate XI. fig. 26.

A somewhat conic shell, in which, when adult, the columella plait becomes inconspicuous. One adult and three young specimens.

HAB. Molokai (Perkins).

(16) *Leptachatina convexiuscula*, sp. nov.

Testa turrata, elongata, gracilis, tenuiuscula, dextrorsa, brunneo-cornea, laevis, polita, nitida, apice obtusulo; anfr.  $6\frac{1}{2}$ , convexi, turgiduli, ultimus  $\frac{9}{16}$  altitudinis testae aequans; sutura bene impressa; apertura pyriformis, margine columellari sinuato, plica minima munito, marginibus callo tenuissimo junctis. Alt. 8; diam. 2.8 mill.

Plate XI. fig. 11.

A shell of the group of *L. exilis* Gulick, but with more inflated whorls, slightly more tapering towards the apex, and the mouth not so drawn out to the right. Three specimens.

HAB. Oahu, Waiolani (Perkins).

(17) *Leptachatina corneola* Pfeiffer.

*Achatinella corneola* Pfeiffer, P. Zool. Soc. London, 1845 [1846], p. 90.

*Achatinella corneola* Pfeiffer, Reeve, Conch. Icon. *Achatinella*, sp. 4.

HAB. Oahu? (Baldwin); Oahu, one young specimen (Hutchison).

(18) *Leptachatina coruscans* Hartman.

*Leptachatina coruscans* Hartman, P. Ac. Philad. 1888, p. 52, pl. 1. fig. 16.

A variable shell in thickness and colouration.

HAB. Molokai (Hartman); Kamalo (Baldwin); Kapanui, Kolamaula, and at 4000 ft. (Perkins).

(19) *Leptachatina costulata* Gulick.

*Achatinella costulata* Gulick, Ann. Lyc. New York, VI. (1856), p. 177, pl. VI. fig. 5; Sykes, P. Malac. Soc. London, III. pl. XIV. fig. 4.

Newcomb united this shell with *L. semicostata* Pfeiffer, but Gulick's type is much more slender than that species, the mouth is of a different shape, and other minor differences exist, all leading me to regard it as a good species.

HAB. Oahu, Pupukeya, Waimea, and Kawailoa (Gulick).

(20) *Leptachatina costulosa* Pease.

*Leptachatina costulosa* Pease, P. Zool. Soc. London, 1869, p. 651 (nom. sol.);

J. Conchyl. XVIII. (1870), p. 90; Crosse, l. c. XXIV. p. 96, pl. III. fig. 4.

HAB. Kauai (Pease); Waimea and Kealia (Baldwin).

(21) *Leptachatina crystallina* Gulick.

*Achatinella crystallina* Gulick, Ann. Lyc. New York, VI. (1856), p. 186, pl. VI. fig. 14.

Newcomb united this species with his *L. nitida*.

HAB. Oahu, Mokuleia. Kamoo, Waialua (Gulick).

(22) *Leptachatina emerita*, sp. nov.

Testa elongata, subcylindrica, imperforata, dextrorsa, cornea vel hyalina vel flava, tenuiuscula, sub lente longitudinaliter tenuiter striata, apice obtusulo; anfr.  $6\frac{1}{2}$ , plano-convexi, ultimus  $\frac{2}{3}$  altitudinis testae fere aequans; sutura impressa, marginata; apertura ovata, margine dextro sub-incrassatulo, columellari sub-reflexo, plica parva inconspicua ascendente munito. Alt. 8; diam. 3.5 mill.

Plate XI. fig. 10.

Variable in colour, shading from brown to a hyaline tint; adult specimens lose their gloss and become of a straw-yellow. The columellar plait is small and inconspicuous.

HAB. Molokai, Kalamaula, and at 4000 feet (Perkins).

(23) *Leptachatina exilis* Gulick.

*Achatinella exilis* Gulick, Ann. Lyc. New York, VI. (1856), p. 188, pl. VI. fig. 16 [bad]; Sykes, P. Malac. Soc. London, III. pl. XIV. fig. 18.

*Leptachatina cylindrata* Pease, J. Conchyl. XVII. (1869), p. 168; P. Zool. Soc. London, 1869, p. 650 (nom. sol.).

Remarkable though the distribution may be, I am unable, after a comparison of Gulick's type with specimens of *L. cylindrata* presented by Pease to the British Museum, to sever these two species.

HAB. Oahu, Keawaawa (Gulick).—Kauai (Pease); at 4000 feet (Perkins).

(24) *Leptachatina extensa* Pease.

*Leptachatina extensa* Pease, P. Zool. Soc. London, 1869, p. 651 (nom. sol.);  
J. Conchyl. xviii. (1870), p. 92.

Four specimens, agreeing fairly well with Pease's diagnosis, are referred to this species.

HAB. Kauai (Pease); Kaholuamano (Perkins).

(25) *Leptachatina fumida* Gulick.

*Achatinella fumida* Gulick, Ann. Lyc. New York, vi. (1856), p. 181, pl. vi. fig. 9;  
Sykes, P. Malac. Soc. London, iii. pl. xiv. fig. 15.

Newcomb united this with his *L. vitrea*, but they appear to me to be quite distinct.

HAB. Oahu, Waialei, Pupukea, Waimea, Kawailoa, Halemano (Gulick).

(26) *Leptachatina fumosa* Newcomb.

*Achatinella fumosa* Newcomb, P. Zool. Soc. London, 1853 [1854, Nov.], p. 140,  
pl. xxiii. fig. 28.

HAB. Oahu, Manoa (Newcomb); Kawailoa Gulch (Perkins). Only a single specimen.

(27) *Leptachatina fusca* Newcomb.

*Achatinella fusca* Newcomb, Ann. Lyc. New York, vi. (1853), p. 28; P. Zool.  
Soc. London, 1853 [1854, Nov.], p. 145, pl. xxiii. fig. 44.

HAB. Oahu, Manoa (Newcomb).

(28) *Leptachatina fuscula* Gulick.

*Achatinella fuscula* Gulick, Ann. Lyc. New York, vi. (1856), p. 180, pl. vi. fig. 8.

HAB. Oahu, mountain forests of Mokuleia (Gulick).

(29) *Leptachatina glutinosa* Pfeiffer.

*Achatinella (Laminella) glutinosa* Pfeiffer, P. Zool. Soc. London, 1855 [1856, Feb.], p. 204.

*Achatinella lacrima* Gulick, Ann. Lyc. New York, VI. (1856, Dec.), p. 176, pl. VI. fig. 4; Sykes, P. Malac. Soc. London, III. pl. XIV. fig. 10.

HAB. Oahu, Lihue, Kalaikoa, Wahiawa, Halemano, Peula (Gulick); Waianae Mts., below Kaala (Perkins). Only a single specimen.

(30) *Leptachatina gracilis* Pfeiffer.

*Achatinella (Achatinellastrum) gracilis* Pfeiffer, P. Zool. Soc. London, 1855, p. 6, pl. XXX. fig. 22.

*Achatinella elevata* (Newcomb) Pfeiffer, t. c. [1856, Feb.], p. 209.

*Achatinella subula* Gulick, Ann. Lyc. New York, VI. [1856, Dec.] p. 191, pl. VI. fig. 19; Sykes, P. Malac. Soc. London, III. pl. XIV. fig. 16.

Gulick's species appears to be a bandless and slightly more attenuate variety.

HAB. Oahu (various authors); Palolo Valley (Gulick); Kaala (Baldwin); Waianae Mts., below Kaala, lee side (Perkins).

(31) *Leptachatina grana* Newcomb.

*Achatinella grana* Newcomb, Ann. Lyc. New York, VI. (1853), p. 29; P. Zool. Soc. London, 1853 [1854], p. 146, pl. XXIII. fig. 46.

*Leptachatina grana* Newcomb, Bland and Binney, Ann. Lyc. New York, X. p. 336 [radula].

The types of this species have met with an accident and are entirely broken. Newcomb believed that *L. granifera* Gulick [= *L. accincta* Mighels] was a synonym, but I feel doubtful of this.

HAB. Maui, Makawao (Newcomb); Haleakala, at 5000 feet (Perkins).

(32) *Leptachatina guttula* Gould.

*Achatinella guttula* Gould, P. Boston Soc. II. (1847), p. 201; U. S. Explor. Exped. Mollusca, pl. VII. fig. 98.

*Achatinella gunmea* Gulick, Ann. Lyc. New York, VI. (1856), p. 182, pl. VI. fig. 10; Sykes, P. Malac. Soc. London, III. pl. XIV. fig. 1.

*Achatinella fragilis* Gulick, t. c. p. 183, pl. VI. fig. 11; Sykes, t. c. pl. XIV. fig. 2.

Newcomb united—I think correctly—the two Gulickian species with Gould's; Mr Baldwin has, however, in his 'Catalogue' allowed them specific rank.

HAB. Oahu, Mokuleia, Lihue, Punaluu, Hauula, Halemano (Gulick).—Maui (Gould).

(33) *Leptachatina imitatrix*, sp. nov.

Testa elongata, turrata, imperforata, dextrorsa, tenuiuscula, flavido-cornea, sub lente longitudinaliter minute striata; anfr.  $6\frac{1}{2}$ , plano-convexi, ultimus  $\frac{4}{5}$  altitudinis testae aequans; sutura impressa; apertura elongato-ovalis, margine dextro arcuato, acuto, columellari incrassatulo, reflexo, plica minima, inconspicua munito, marginibus callo tenui junctis. Alt. 7; diam. 2.6 mill.

Plate XI. fig. 9.

Only a single specimen. It recalls *L. exilis* of Gulick, but is more conic—i.e. the upper whorls are narrower in proportion—and is of a light straw-yellow. The columellar plait is deeply-seated and inconspicuous.

HAB. Hawaii, Mauna Loa at 4000 feet (Perkins).

(34) *Leptachatina impressa* Sykes.

*Leptachatina impressa* Sykes, P. Malac. Soc. London, II. (1896), p. 127.

Plate XI. fig. 8.

HAB. Lanai, Mountains behind Koele (Perkins).

(35) *Leptachatina isthmica* Ancey.

*Leptachatina isthmica* Ancey, P. Malac. Soc. London, III. (1899), p. 270; Sykes, t. c. pl. XIII. fig. 20.

HAB. Maui, Sand Hills between East and West Maui, subfossil (Ancey).

(36) *Leptachatina konaensis*, sp. nov.

Testa elongato-ovata, imperforata, dextrorsa, tenuiuscula, cornea vel pallide cornea, longitudinaliter tenuiter striata, apice obtusulo; anfr. 6, planati, ultimus  $\frac{5}{8}$  altitudinis testae aequans; sutura impressa, marginata; apertura sinuato-ovata, columella arcuata, margine dextro intus subcalloso, columellari subreflexo, plica mediocri ascendente munito. Alt. 8; diam. 4 mill.

Plate XI. fig. 13.

Akin to *L. simplex* Pease, but is much more swollen and inflated. Six specimens.

HAB. Hawaii, Kona at 4000 feet (Perkins).

(37) *Leptachatina (Labiella) labiata* Newcomb.

*Achatinella labiata* Newcomb, Ann. Lyc. New York, vi. (1853), p. 27; P. Zool. Soc. London, 1853 [1854], p. 141, pl. xxiii. fig. 33; Gwatkin, P. Ac. Philad. 1895, p. 239 [radula].

*Achatinella lagena* Gulick, Ann. Lyc. New York, vi. (1856), p. 175, pl. vi. fig. 3; Sykes, P. Malac. Soc. London, III. pl. xiv. fig. 9.

*Achatinella dentata* Pfeiffer, P. Zool. Soc. London, 1855, p. 7, pl. xxx. fig. 27.

I follow Newcomb in including Gulick's species, but the latter's type does not fully shew the thickening on the columellar wall, nor the denticle on the outer lip.

HAB. Oahu, Lehui (Newcomb); Halemano, Wahiawa, Kalaikoa (Gulick); Mount Kaala (Perkins).

(38) *Leptachatina laevis* Pease.

*Leptachatina laevis* Pease, P. Zool. Soc. London, 1869, p. 651 (nom. sol.); J. Conchyl. xviii. (1870), p. 91; Crosse, l. c. xxiv. (1876), p. 96, pl. iv. fig. 6.

HAB. Kauai (Pease); Waimea (Baldwin).

(39) *Leptachatina leucochila* Gulick.

*Achatinella leucochila* Gulick, Ann. Lyc. New York, vi. (1856), p. 173, pl. vi. fig. 1; Sykes, P. Malac. Soc. London, III. pl. xiv. fig. 12.

Newcomb united this with *L. pyramis* Pfr.; I think it is quite distinct specifically.

HAB. Kauai (Gulick).

(40) *Leptachatina lineolata* Newcomb.

*Achatinella lineolata* Newcomb, Ann. Lyc. New York, vi. (1853), p. 29; P. Zool. Soc. London, 1853 [1854], p. 140, pl. xxiii. fig. 29.

The real habitat seems somewhat uncertain; Newcomb originally gave Maui, subsequently Hawaii, which is more probably correct.

HAB. Maui (Newcomb and Hartman).—Hawaii (Newcomb and Baldwin).

(41) *Leptachatina lucida* Pease.

*Leptachatina lucida* Pease, J. Conchyl. xviii. (1870), p. 93.

HAB. Kauai (Pease); Kealia (Baldwin).

(42) *Leptachatina marginata* Gulick.

*Achatinella marginata* Gulick, Ann. Lyc. New York, vi. (1856), p. 179, pl. vi. fig. 7.

United by Newcomb with *L. succincta* Newc., but the present species is smaller and more slender.

HAB. Oahu, Kalaikoa (Gulick).

(43) *Leptachatina nitida* Newcomb.

*Achatinella nitida* Newcomb, Ann. Lyc. New York, vi. (1853, May), p. 29; P. Zool. Soc. London, 1853 [1854], p. 140.

*Leptachatina nitida* Newcomb, Bland and Binney, Ann. Lyc. New York, x. p. 336, pl. xv. fig. 8 [radula].

The figure given by Newcomb (P. Zool. Soc. London, 1853, pl. xxiii. fig. 30) apparently has been taken by error from some other shell, and does not represent this species. The form found by Mr Perkins appears to be a variety.

HAB. E. Maui (Newcomb).—Maui and Oahu (Hartman).—Oahu, Mt Kaala (Perkins).

(44) *Leptachatina obsoleta* Pfeiffer.

*Spiraxis obsoleta* Pfeiffer, P. Zool. Soc. London, 1856, p. 335.

A species of the group of *L. sandwicensis*. Mr Perkins found a single young shell on 'Haleakala at 5000 feet,' Maui, which may be the young of this species.

HAB. ? Oahu (Baldwin).

(45) *Leptachatina obtusa* (Newcomb) Pfeiffer.

*Achatinella obtusa* Newcomb, Pfeiffer, P. Zool. Soc. London, 1855 [1856], p. 209.

Mr Baldwin has suggested that this species is identical with *L. chrysallis* Pfeiffer, but I cannot agree with him.

HAB. Hawaiian Islands.—? Oahu (Baldwin).

(46) *Leptachatina octogyrata* Gulick.

*Achatinella octogyrata* Gulick, Ann. Lyc. New York, vi. (1856), p. 190, pl. vi. fig. 18; Sykes, P. Malac. Soc. London, III. pl. xiv. fig. 7.

Newcomb placed it as a synonym of *L. obclavata*, Pfr. [= *L. sandwicensis* Pfr.].

HAB. Oahu, Palolo Valley (Gulick).

(47) *Leptachatina oryza* Pfeiffer.

*Achatinella* (*Leptachatina*) *oryza* Pfeiffer, P. Zool. Soc. London, 1855 [1856, Feb.], p. 206.

*Achatinella triticea* Gulick, Ann. Lyc. New York, vi. (1856, Dec.), p. 184, pl. vi. fig. 12; Sykes, P. Malac. Soc. London, III. pl. xiv. fig. 8.

HAB. Oahu, subfossil (Pfeiffer); Keawaawa (Gulick).

(48) *Leptachatina (Labiella) pachystoma* Pease.

*Labiella pachystoma* Pease, J. Conchyl. xvii. (1869), p. 171.

I am not sure if this be a true *Labiella*.

HAB. Kauai (Pease).

(49) *Leptachatina perkinsi* Sykes.

*Leptachatina perkinsi* Sykes, P. Malac. Soc. London, II. (1896), p. 128.

Plate XI. fig. 30.

HAB. Lanai, Mts. behind Koele (Perkins).

(50) *Leptachatina petila* Gulick.

*Achatinella petila* Gulick, Ann. Lyc. New York, vi. (1856), p. 189, pl. vi. fig. 17; Sykes, P. Malac. Soc. London, III. pl. xiv. fig. 14.

United by Newcomb with *L. fusca* Newc., but appears to me to be quite distinct.

HAB. E. Oahu, Koko (Gulick).

(51) *Leptachatina pyramis* Pfeiffer.

*Achatinella pyramis* Pfeiffer, P. Zool. Soc. London, 1845 [1846], p. 90; Reeve, Conch. Icon. *Achatinella*, sp. 41 [good].

Appears from its form to be an Oahu species, and I am not sure that Pease's localization will prove correct.

HAB. Kauai (Pease).

F. H. II.

(52) *Leptachatina resinula* Gulick.

*Achatinella resinula* Gulick, Ann. Lyc. New York, VI. (1856), p. 174, pl. VI. fig. 2 ;  
Sykes, P. Malac. Soc. London, III. pl. XIV. fig. 11.

HAB. Oahu, Kawailoa, Waialei, and other localities (Gulick).

(53) *Leptachatina saccula* Hartman.

*Achatinella (Leptachatina) saccula* Hartman, P. Ac. Philad. 1888, p. 55, pl. 1.  
fig. 15.

HAB. Hawaiian Islands (Hartman).

(54) *Leptachatina sandwicensis* Pfeiffer.

*Achatina sandwicensis* Pfeiffer, P. Zool. Soc. London, 1846 [May], p. 32.

*Achatinella (Leptachatina) obclavata* Pfeiffer, Op. cit. 1855 [July], p. 98.

*Leptachatina octavula* Paetel, Clessin, Nomenc. Helic. Viv. 1881, p. 316.

Pfeiffer placed his *Achatina sandwicensis* in the synonymy of *L. accincta* Mighels ; the above identification is from an examination of Pfeiffer's types.

HAB. Oahu (Pfeiffer) ; Waianae Mts. (Perkins). One young specimen only.

(55) *Leptachatina saxatilis* Gulick.

*Achatinella saxatilis* Gulick, Ann. Lyc. New York, VI. (1856), p. 187, pl. VI.  
fig. 15 ; Sykes, P. Malac. Soc. London, III. pl. XIV. fig. 17.

*Leptachatina saxatilis* Gulick, Hartman, P. Ac. Philad. 1888, p. 55.

HAB. Oahu, Mokuleia (Gulick).

(56) *Leptachatina sculpta* Pfeiffer.

*Achatina sculpta* Pfeiffer, P. Zool. Soc. London, 1855 [1856], p. 211.

HAB. Oahu (Pfeiffer) ; (Hutchison, one specimen).

(57) *Leptachatina scutilus* Mighels.

*Bulinus scutilus* Mighels, P. Boston Soc. II. (1845), p. 20.

HAB. Oahu (Mighels).

(58) *Leptachatina semicostata* Pfeiffer.

*Achatinella* (*Leptachatina*) *semicostata* Pfeiffer, P. Zool. Soc. London, 1855 [1856, Feb.], p. 206.

Dr Hartman remarks (P. Ac. Philad. 1888, p. 55) "Dr Newcomb thinks it questionable if this species be not a synonym of *L. fusca* Newc."; it is quite distinct.

HAB. Hawaiian Islands (Pfeiffer).

(59) *Leptachatina semipicta* Sykes.

*Leptachatina semipicta* Sykes, P. Malac. Soc. London, II. (1896), p. 128.

Plate XI. fig. 12.

HAB. Lanai, Mts. behind Koele (Perkins).

(60) *Leptachatina simplex* Pease.

*Leptachatina simplex* Pease, P. Zool. Soc. London, 1869, p. 651 (nom. sol.); J. Conchyl. XVII. 1869, p. 170.

Dr Hartman notes (P. Ac. Philad. 1888, p. 55) that "Examples *L. nitida* Newc. (coll. Newc.) and *L. simplex* Pse. (coll. Pse.) are similar." There must be some error here, as specimens presented by Pease to the British Museum are quite distinct from *L. nitida* Newc.; further, Newcomb's species does not come from Hawaii.

HAB. Hawaii (Pease); Kona, at 3000—4000 feet (Perkins).

(61) *Leptachatina smithi* Sykes.

*Leptachatina smithi* Sykes, P. Malac. Soc. London, II. (1896), p. 128.

Plate XI. fig. 29.

HAB. Lanai, Mts. behind Koele (Perkins).

(62) *Leptachatina stiria* Gulick.

*Leptachatina stiria* Gulick, Ann. Lyc. New York, VI. (1856), p. 194, pl. VI. fig. 2.

HAB. Oahu, Halemano, Peula, Kawailoa (Gulick).

(63) *Leptachatina striata* Newcomb.

*Tornatellina striata* Newcomb, P. Calif. Ac. II. (1861), p. 93.

From the description this appears to be close to *L. lucida* Pease.

HAB. Kauai (Newcomb).

(64) *Leptachatina striatella* Gulick.

*Achatinella striatella* Gulick, Ann. Lyc. New York, VI. (1856), p. 178, pl. VI. fig. 6;

Sykes, P. Malac. Soc. London, III. pl. XIV. fig. 19.

United by Newcomb with *L. fusca* Newc., but appears to me to be distinct.

HAB. Oahu, Keawaawa (Gulick).

(65) *Leptachatina striatula* Gould.

*Achatinella striatula* Gould, P. Boston Soc. II. (1845), p. 28.

*Achatinella clara* Pfeiffer, P. Zool. Soc. London, 1845 [1846, Jan.], p. 90; Reeve, Conch. Icon. *Achatinella*, sp. 5.

A nice series, shewing both the form with the sutural band and the unicolorous variety.

HAB. Kauai (various authors); Makaweli, Kaholuamano, Lihue, and at 4000 ft. (Perkins).

(66) *Leptachatina succincta* Newcomb.

*Achatinella succincta* Newcomb, P. Boston Soc. V. (1855), p. 220; Amer. J. Conch. II. (1866), p. 213, pl. XIII. fig. 7.

*Leptachatina succinata* Newcomb, Hartman, P. Ac. Philad. 1888, p. 55 (err. typ.).

HAB. Oahu, Ewa (Newcomb); Halemano (Perkins). One specimen only.

(67) *Leptachatina supracostata*, sp. nov.

Testa elongata, turrita, imperforata, dextrorsa, tenuis, cornea, polita; anfr. 8, ultimus  $\frac{1}{2}$  longitudinis testae fere aequans, primi apud suturas subcostulati, reliqui fere laeves; sutura impressa, marginata, linea spirali notata; apertura lunata, columella sub-arcuata; margine dextro sub-incrassatulo, columellari sub-reflexo, plica minima oblique torta munito. Alt. 6.3; diam. 2 mill.

Plate XI. fig. 22.

Only two specimens. It belongs to the group of *L. exilis* Gulick; is inconspicuously costulate below the suture, the sculpture gradually fading out, until the last whorl hardly shews any marking beyond the lines of growth. There is a faint spiral line just below the suture.

HAB. Lanai, Mts. behind Koele (Perkins).

(68) *Leptachatina tenebrosa* Pease.

*Labiella tenebrosa* Pease, P. Zool. Soc. London, 1869, p. 651 (nom. sol.).

*Leptachatina tenebrosa* Pease, J. Conchyl. XVIII. (1870), p. 92; Crosse, l. c. XXIV. (1876), p. 96, pl. III. fig. 5.

HAB. Kauai (Pease); Wahiawa (Baldwin); Kaholuamano, and at 4000 feet (Perkins).

(69) *Leptachatina tenuicostata* Pease.

*Leptachatina tenuicostata* Pease, J. Conchyl. XVII. (1869), p. 170.

HAB. Hawaii (Pease).—Oahu (Baldwin).

I feel doubts as to the accuracy of the last locality, as Mr Baldwin marks it as a species he has not seen.

(70) *Leptachatina terebralis* Gulick.

*Achatinella terebralis* Gulick, Ann. Lyc. New York, VI. (1856), p. 193, pl. VI. fig. 21; Sykes, P. Malac. Soc. London, III. pl. XIV. fig. 3.

HAB. Oahu, Kawaihoa (Gulick); Waianae Mts., below Kaala (Perkins).

(71) *Leptachatina teres* Pfeiffer.

*Achatinella (Leptachatina) teres* Pfeiffer, P. Zool. Soc. London, 1855 [1856], p. 206.

Near *L. obtusa* Newcomb.

HAB. Hawaiian Islands.

(72) *Leptachatina turgidula* Pease.

*Labiella turgidula* Pease, P. Zool. Soc. London, 1869, p. 651 (nom. sol.).

*Leptachatina turgidula* Pease, J. Conchyl. XVIII. (1870), p. 89; Crosse, l. c. XXIII. (1876), p. 96, pl. IV. fig. 5.

HAB. Kauai (Pease); Halemanu (Baldwin); Makaweli (Perkins). Five specimens.

(73) *Leptachatina turrata* Gulick.

*Achatinella turrata* Gulick, Ann. Lyc. New York, VI. (1856), p. 192, pl. VI. fig. 20;  
Sykes, P. Malac. Soc. London, III. pl. XIV. fig. 6.

United by Newcomb with *L. obclavata* Pfr. [= *L. sandwicensis* Pfr.], but *L. turrata* is a broader and stouter shell, of a darker colour.

HAB. Oahu, Lihue (Gulick).

(74) *Leptachatina vana* sp. nov.

Testa pyramidato-conica, dextrorsa, imperforata, tenuiuscula, brunneo-cornea, nitida, sub lente obsolete longitudinaliter striata, sutura marginata; anfr. 8, lente accrescentes, ultimus  $\frac{5}{8}$  altitudinis testae aequans; apertura pyriformis, margine dextro acuto, columellari sub-reflexo, sinuato, plica mediocri munito, marginibus callo tenuissimo junctis. Alt. 7.8; diam. 3.9 mill. Plate XI. fig. 27.

Four specimens of a brownish-horny, pyramidal shell, which has no striking characteristics.

HAB. Oahu, Mt. Kaala (Perkins).

(75) *Leptachatina vitrea* Newcomb.

*Achatinella vitrea* Newcomb, P. Zool. Soc. London, 1853 [1854], p. 142, pl. XXIII. fig. 34.

HAB. Oahu, Manoa (Newcomb).

(76) *Leptachatina vitreola* Gulick.

*Achatinella vitreola* Gulick, Ann. Lyc. New York, VI. (1856), p. 194, pl. VI. fig. 23.

*Achatinella parvula* Gulick, t. c. p. 195, pl. VI. fig. 24; Sykes, P. Malac. Soc. London, III. pl. XIV. fig. 13.

Both were united by Newcomb with his *L. grana*; they appear to me to be quite distinct from that species.

HAB. Hawaiian Islands (Gulick); W. Maui (Baldwin for *L. parvula*).

## THAANUMIA Ancey.

*Thaanumia omphalodes* Ancey.

*Thaanumia omphalodes* Ancey, P. Malac. Soc. London, III. (1899), p. 269, pl. XII. fig. 8.

The type, and only, species.

HAB. Oahu, Waianae Mountains (Ancey).

## CARELIA H. and A. Adams.

*Carelia* H. and A. Adams, Genera of Recent Mollusca, II. (Feb. 1855) p. 132.

This interesting genus, confined to Kauai save for one species on the Island of Niihau, was described by Messrs H. and A. Adams, with no named type.

The anatomy has been described by Binney, P. Ac. Philad. 1876, p. 185, who points out that it agrees in general with the *Amastra* group, but differs in having a costate jaw.

(1) *Carelia bicolor* Jay.

*Achatina bicolor* Jay, Cat. Shells, Ed. III. (1839), p. 119, pl. VI. fig. 3.

*Carelia bicolor* Jay, Binney, P. Ac. Philad. 1876, p. 185, pl. VI. [anatomy].

*Achatina adusta* Gould, P. Boston Soc. II. (1845), p. 26.

*Carelia adusta* Gould, var. *angulata* Pease, J. Conchyl. XVIII. (1870), p. 403.

*Achatina fuliginea* Pfeiffer, P. Zool. Soc. London, 1852 [1854], p. 66; Conch-

Cab. *Achatina*, p. 267, pl. XLIII. figs. 21, 22.

HAB. Kauai (various authors).

(2) *Carelia cochlea* Reeve.

*Achatina cochlea* Reeve, Conch. Icon. *Achatina*, sp. 5.

The spiral sculpture is nearly obsolete in some specimens; I have seen one measuring 61 mill. in length.

HAB. Kauai (various collectors).

(3) *Carelia cumingiana* Pfeiffer.

*Spiraxis cumingiana* Pfeiffer, P. Zool. Soc. London, 1855, p. 106, pl. XXXII. fig. 1.

HAB. Kauai (Pfeiffer, &c.).

(4) *Carelia dolei* Ancey.

*Carelia dolei* Ancey, Mem. Soc. Zool. France, vi. (1893), p. 328.

HAB. Kauai, Hanalei (Ancey); Haena, subfossil (Baldwin).

(5) *Carelia glutinosa* Ancey.

*Carelia glutinosa* Ancey, Mem. Soc. Zool. France, vi. (1893), p. 324.

HAB. Probably Kauai. Unknown to me.

(6) *Carelia olivacea* Pease.

*Carelia olivacea* Pease, Amer. J. Conch. II. (1866), p. 293.

*Carelia variabilis* Pease, J. Conchyl. xviii. (1870), p. 402 [with var. *viridis*];  
P. Zool. Soc. London, 1871, p. 473.

I do not quite follow why Pease described *C. variabilis*, when, in the same paper, he stated that it and *C. olivacea* were varieties of one species.

HAB. E. Kauai (Pease).

(7) *Carelia paradoxa* Pfeiffer.

*Spiraxis paradoxa* Pfeiffer, P. Zool. Soc. London, 1853, p. 128.

Differs from all others known to me in its strongly granulated surface.

HAB. Kauai.

(8) *Carelia sinclairi* Ancey.

*Carelia sinclairi* Ancey, Mem. Soc. Zool. France, v. (1892), p. 720.

HAB. Niihau, subfossil (Ancey).

(9) *Carelia turricula* Mighels.

*Achatina turricula* Mighels, P. Boston Soc. II. (1845), p. 20.

*Carelia turricula* Mighels, Kobelt, J. B. Malak. Ges. II. (1875), p. 225, pl. VII.  
fig. 1.

*Achatina obeliscus* Reeve, Conch. Icon. *Achatina*, sp. 129.

*Achatina newcombi* Pfeiffer, P. Zool. Soc. London, 1851 [1853], p. 262.

HAB. Kauai, Hanalei (Baldwin, Perkins).

## AURICULELLA Pfeiffer.

*Auriculella* Pfeiffer, P. Zool. Soc. London, 1855, p. 1; Mal. Blätt. II. p. 3.

The type appears to be the *Partula auricula* Fér.

(1) *Auriculella ambusta* Pease.

*Auriculella ambusta* Pease, J. Conchyl. xvi. (1868), p. 345.

Probably the locality suggested by Mr Baldwin is correct.

HAB. Oahu? (Baldwin).

(2) *Auriculella auricula* Fér.

*Partula auricula* Férussac, Prodr. p. 66, no. 6; Voy. de Freycinet, Zool. p. 486.

*Auricula owaihiensis* Chamisso, Nov. Act. Leop. xiv. (1829), p. 639, pl. xxxvi. fig. 1.

*Auricula sinistrorsa* Chamisso, tom. cit. p. 640, pl. xxxvi. fig. 2 [spec. juv.].

*Partula dumartroyi* Souleyet, Rev. Zool. v. (1842), p. 102.

*Bulinus armatus* Mighels, P. Boston Soc. II. (1845), p. 19.

This species varies greatly in size and shape; it is generally unicolorous, varying, from nearly white, through shades of yellow and green, to brownish green; a few specimens have a single brown band.

HAB. Oahu, Mount Tantalus, Mount Kaala, Halemano, Head of Kawaiiloa Gulch (Perkins).

(3) *Auriculella brunnea* Smith.

*Auriculella brunnea* Smith, P. Zool. Soc. London, 1873, p. 88, pl. x. fig. 23; Gwatkin, P. Ac. Philad. 1895, p. 238 [radula].

Two Lanai specimens have a single darker band at the periphery; others are unicolorous.

HAB. Molokai and Lanai (Smith); Molokai, Kalamaula, also Lanai, behind Koele (Perkins).

(4) *Auriculella cerea* Pfeiffer.

*Achatinella cerea* Pfeiffer, P. Zool. Soc. London, 1855, p. 2, pl. xxx. fig. 21.

Pease has suggested (J. Conchyl. xvi. p. 343) that this is identical with *A. petitiiana* Pfeiffer; he is not improbably correct, but I have only seen the single type specimen.

HAB. Molokai (Nevill, fide specimens from Newcomb).

(5) *Auriculella chamissoi* Pfeiffer.

*Achatinella (Auriculella) chamissoi* Pfeiffer, P. Zool. Soc. London, 1855, p. 98.

HAB. Oahu (Baldwin).—Hawaii (fide tablet in Brit. Mus.).

(6) *Auriculella crassula* Smith.

*Auriculella crassula* Smith, P. Zool. Soc. London, 1873, p. 88, pl. x. fig. 22.

*Auriculella ponderosa* Ancey, Bull. Soc. Malac. France, vi. (1889), p. 225.

HAB. Maui, Makawao (Baldwin); Iao Valley, Olinda, and Haleakala at 4000 feet (Perkins).

(7) *Auriculella diaphana* Smith.

*Auriculella diaphana* Smith, P. Zool. Soc. London, 1873, p. 87, pl. x. fig. 25.

*Auriculella patula* Smith, tom. cit. p. 88, pl. x. fig. 24.

HAB. Oahu, various localities (Smith); Mount Tantalus, and head of Panoa Valley (Perkins).

(8) *Auriculella expansa* Pease.

*Auriculella expansa* Pease, J. Conchyl. xvi. (1868), p. 343, pl. xiv. fig. 8.

HAB. Hawaiian Islands (Pease).—Probably Maui (Ancey).—Kauai (Baldwin).

(9) *Auriculella lurida* Pfeiffer.

*Tornatellina castanea* Pfeiffer, Mon. Helic. Viv. III. (1853), p. 524.

*Achatinella (Auriculella) lurida* Pfeiffer, Mon. Helic. Viv. iv. p. 570.

Pfeiffer re-named the species, apparently to avoid confusion with *Achatinella castanea* Reeve.

HAB. Maui? (Baldwin).—Oahu, Mount Tantalus (Perkins).

(10) *Auriculella newcombi* Pfeiffer.

*Balea newcombi* Pfeiffer, P. Zool. Soc. 1852 [1854], p. 67.

*Achatinella obeliscus* Pfeiffer, Malak. Blätt. II. (1855), p. 166.

HAB. Molokai, Kalamaula (Perkins).

(11) *Auriculella obliqua* Ancey.

*Auriculella obliqua* Ancey, Mem. Soc. Zool. France, v. (1892), p. 721; Sykes, P. Malac. Soc. London, III. p. 275, pl. XIII. fig. 17.

Appears to be very near *A. ambusta* Pease.

HAB. Oahu, Waianae Mts. (Baldwin).

(12) *Auriculella perkinsi* sp. nov.

Testa subperforata, elongato-conica, brunnea aut corneo-brunnea, linea brunnea ad peripheriam saepe notata, nitida; anfr. 6—6½, planiusculi, ultimus ⅔ altitudinis testae aequans; apertura auriformis, intus brunnea, margine parietali lamina obliqua intrante, columellari lamina volvente munitis; peristoma leviter reflexum, incrassatum. Alt. 8; lat. 4 mill.

Plate XI. figs. 17, 18.

var. *a.* Magis elongata et tenuior, flavida, peristomate albido.

I cannot identify this species with any of the numerous varieties of *A. auricula*, and therefore describe it. It is very variable in colour, shading from rich brown to light yellow: when brown the band—if present—is yellowish, and conversely. The lip varies in colour from dark brown to white. It is a fairly thin shell and appears to be common.

HAB. Oahu, ridges round Nuuanu, and Mount Tantalus (Perkins).

(13) *Auriculella petitiiana* Pfeiffer.

*Tornatellina petitiiana* Pfeiffer, Zeitsch. Malak. IV. (1847), p. 149; Kuster, Conch.-Cab. *Tornatellina*, p. 153, pl. XVIII. figs. 24, 25.

HAB. Hawaiian Islands.

See a note under *A. cerea*.

(14) *Auriculella perpusilla* Smith.

*Auriculella perpusilla* Smith, P. Zool. Soc. London, 1873, p. 87, pl. x. fig. 26.  
HAB. Oahu, Kahalu (Smith).

(15) *Auriculella pulchra* Pease.

*Auriculella pulchra* Pease, J. de Conchyl. xvi. (1868), p. 346, pl. xiv. fig. 6.

Specimens presented by Pease to the British Museum under this name do not quite agree with his diagnosis, and his figure appears to have been drawn from a variety which he notes, and not the type form. I have followed the identified specimens; possibly it is a variable species, or an error may have occurred in translating his paper.

HAB. Oahu (authors); Mount Tantalus and Mount Kaala (Perkins).

(16) *Auriculella tenella* Ancey.

*Auriculella tenella* Ancey, Bull. Soc. Malac. France, vi. (1889), p. 232.

HAB. Oahu, Waianae (Ancey).

(17) *Auriculella tenuis* Smith.

*Auriculella tenuis* Smith, P. Zool. Soc. London, 1873, p. 87, pl. x. fig. 27.

Mons. Ancey has described (Bull. Soc. Malac. France, vi. p. 230) a var. *solida*.

HAB. Oahu, various localities (Smith).

(18) *Auriculella triplicata* Pease.

*Auriculella triplicata* Pease, J. de Conchyl. xvi. (1868), p. 346.

HAB. Maui (Hartman).—Oahu, Tantalus and Panoa (Baldwin).

(19) *Auriculella uniplicata* Pease.

*Auriculella uniplicata* Pease, J. de Conchyl. xvi. (1868), p. 344, pl. xiv. fig. 7.

HAB. Maui (Pease); West Maui (Baldwin).—Molokai, Kalamaula, and above Pelekunu (Perkins).

(20) *Auriculella westerlundiana* Ancey.

*Auriculella westerlundiana* Ancey, Bull. Soc. Malac. France, VI. (1889), p. 218; Sykes, P. Malac. Soc. London, III. p. 275, pl. XIII. fig. 21.

HAB. Hawaii, Kona, and Waimea (Ancey); Kona at 3000 feet, and Olaa (Perkins).

## INSUFFICIENTLY KNOWN OR ERRONEOUSLY RECORDED SPECIES.

The following appear to be only manuscript names: *jucunda* Smith; *solida* Gulick; *solidissima* Smith (confer Ann. Lyc. New York, x. pp. 331—2).

*Bulinus pumicatus* Mighels, P. Boston Soc. II. p. 19.

HAB. Oahu.

Probably this is really an *Auriculella*; I am totally unacquainted with it.

*Partula pusilla* Gould, P. Boston Soc. II. p. 197; U. S. Explor. Exped. Mollusca, pl. VII. fig. 90.

This species has been referred to *Auriculella*, and consequently a Hawaiian habitat has been suggested for it; it is really, however, a *Tornatellina* and was described from Metia [= Mata].

## FRICKELLA Pfeiffer.

*Frickella* Pfeiffer, P. Zool. Soc. London, 1855, p. 2; Mal. Blätt. II. p. 3.

*Frickella amoena* Pfeiffer.

*Achatinella* (*Frickella*) *amoena* Pfeiffer, P. Zool. Soc. London, 1855, p. 2, pl. XXX. fig. 3.

This aberrant species appears to be a link between *Achatinella* and *Tornatellina*. The single young shell, found by Mr Perkins, does not quite agree with the type, as the whorls are flatter, but I am unable to sever it specifically.

HAB. Oahu, Konahuanui (Baldwin); Halemano (Perkins).

## TORNATELLINIDAE.

## TORNATELLINA Beck.

Beck (Index Moll. 1837, p. 80) proposed this name as a subgenus of *Achatina*, and placed in it four species, all of them undiagnosed. Pfeiffer in 1841 (Symb. Hist. Helic. pt. 2, p. 5) diagnosed the genus and gave (p. 130) a list of species. Previously to this Anton had proposed (1839) *Strobilus*, but in considering his claims it should be borne in mind that *Strobila* had twice previously been used in Zoology.

The Hawaiian species appear to be but little understood: the only attempt at figuring them was made by Gould, whose six figures, under one name, represent three different species.

I have endeavoured to avoid the creation of synonyms by a careful study of the descriptions and measurements given by the various authors. The habitat in the case of these very small shells is not always reliable, as they are very liable to be transported with plants, &c.

(1) *Tornatellina baldwini* Ancey.

*Tornatellina baldwini* Ancey, Bull. Soc. Malac. France, vi. (1889), p. 238.

HAB. Oahu, Tantalus (Ancey); Waianae Mts. (Perkins).—Kauai (Baldwin).

(2) *Tornatellina compacta* sp. nov.

Testa perforata, ovata, brunneo-cornea, nitidula, tenuis; spira curta, apice obtusulo; anfr. 5—5½, lineis incrementi bene notati, convexiusculi, regulariter et lente crescentes, sutura bene impressa; apertura ovato-pyriformis, lamina unica pygmaea volventi. interdum praedita; peristoma simplex, margine columellari reflexo et expanso. Alt. 2·2, diam. 1·2 mm.

Plate XI. fig. 1.

A compressed, compact little form, the aperture measuring about  $\frac{2}{3}$  of the length; the whorls are somewhat convex.

HAB. Hawaii, Mauna Loa at 2000 feet, on hilo grass (Perkins).

(3) *Tornatellina confusa* sp. nov.

*Pupa peponum* Gould, P. Boston Soc. II. (1847), p. 197; U. S. Explor. Exped. Mollusca, pl. VII. figs. 104 a—c.

See for remarks under *Tornatellina peponum* Gould; this is the edentulous form figured by him.

HAB. Kauai, Makaweli (Perkins).

(4) *Tornatellina cylindrica* sp. nov.

Testa elongata, cylindrica, cornea, perforata; anfr. 5—5½, convexiusculi, striatuli, ultimus rotundatus,  $\frac{2}{3}$  altitudinis testae aequans, sutura impressa; apertura ovata vel lunaris, lamellam in pariete gerens; columella incrassata, albida, contorta, interdum denticulo mediocri munita. Alt. 2·2, lat. vix 1 mm.

Plate XI. fig. 28.

This species may be distinguished from the true *T. pepouum*, by its smaller size and more slender shape.

HAB. Oahu, Waianae Mts. (Perkins).—Kauai, Makaweli, one specimen (Perkins).

(5) *Tornatellina dentata* Pease.

*Tornatellina dentata* Pease, P. Zool. Soc. London, 1871, p. 460.

I identify Mr Perkins' specimens with some doubt; if not this species they belong to no other recorded Hawaiian form.

HAB. Hawaii (Pease); Puna (Baldwin); Kona at 3000 feet (Perkins).

(6) *Tornatellina euryomphala* Ancy.

*Tornatellina euryomphala* Ancy, Bull. Soc. Malac. France, vi. (1889), p. 239.

Not found by Mr Perkins; I have specimens from another source, without indication as to which island they come from.

HAB. W. Maui (Ancy).

(7) *Tornatellina extincta* Ancy.

*Tornatellina extincta* Ancy, Bull. Soc. Malac. France, vii. (1890), p. 341.

HAB. Central Maui, subfossil (Ancy).

(8) *Tornatellina gracilis* Pease.

*Tornatellina gracilis* Pease, P. Zool. Soc. London, 1871, p. 460.

A single shell, found by Mr Perkins, agrees well with Pease's description and measurements, save that Pease speaks of the shell being sometimes spirally sulcate, while Mr Perkins' specimen shews traces of a single spiral thread at the periphery.

HAB. Kauai (Pease).—? Hawaii, Kona at 3000 feet (Perkins).

(9) *Tornatellina newcombi* Pfeiffer.

*Tornatellina newcombi* Pfeiffer, P. Zool. Soc. London, 1856, p. 335.

I am not quite clear if the localities are to be relied on; the figure given by Gould (as *T. peponum*, U. S. Explor. Exped. Moll. pl. vii. fig. 104 *e*) does not, I think, represent this species, as has been suggested.

HAB. Maui and Oahu (Ancey).—Kauai, Oahu, and Maui (Baldwin).

(10) *Tornatellina oblonga* Pease.

*Tornatellina oblonga* Pease, P. Zool. Soc. London, 1864, p. 673; Binney, Ann. Lyc. New York, xi. p. 190 [radula].

*Tornatellina bacillaris* Mousson, J. Conchyl. xix. (1871), p. 16, pl. iii. fig. 5.

*Tornatellina oblongata* Pease, Clessin, Nom. Helic. Viv. 1881, p. 343 (err. typ.).

Unknown to me as Hawaiian; it was described from the Tonga Islands.

HAB. Oahu, Manoa (Ancey).

(11) *Tornatellina peponum* Gould.

*Pupa peponum* Gould, P. Boston Soc. II. (1847), p. 197; U. S. Explor. Exped. Mollusca, pl. vii. figs. 104, 104 *d*.

Gould has undoubtedly confused three species under this name: which it therefore becomes necessary to restrict to one of his forms. I propose that it should be used for the shells figured by him as fig. 104 and fig. 104 *d*; namely the slender species with a parietal lamina and no columellar tooth: of this I have Hawaiian specimens.

The next form, that figured as figs. 104 *a-c*, has no parietal lamina, and equally no teeth on the columella; this has been found by Mr Perkins on Kauai, and is here named *T. confusa*.

The third form, figured as fig. 104 *e* (enlargement of mouth only) is a shell nearly related to *T. euryomphala*, Ancey; it is not, I think, *T. newcombi*.

HAB. Hawaii, Hilo, also Oahu (Gould).

(12) *Tornatellina perkinsi*, sp. nov.

Testa elongato-pyramidalis, subperforata, cornea, sub lente striatula; anfr. 7, planiusculi, lente accrescentes, sutura subimpressa; apertura ovata, lamellam sat minutam in pariete gerens; columella incrassata, albidula, plicis duabus inconspicuis praedita. Alt. 3, lat. 1.2 mm.

Plate XI. fig. 14.

Its most noteworthy features are the very elongately pyramidal shape, flattened whorls, and the two inconspicuous plicae on the columella, the upper one being more deeply seated than the lower.

HAB. Kauai, Kaholuamano at 4000 feet (Perkins).

(13) *Tornatellina trochoides* sp. nov.

Testa profunde perforata, cornea, pyramidalis, pellucida, fere laevis; spira conoidea, apice acutiusculo; anfr.  $7-7\frac{1}{2}$ , regulariter lenteque accrescentes, planiusculi, ultimus ad peripheriam subcarinatus, sutura impressa; apertura quadrato-ovata, superne angulata, laminam conspicuam validam in pariete gerens; columella brunnea, incrassata, plicis duabus munita. Alt. 4, lat. 2 mm.

Plate XI. fig. 31.

Closely related, apparently, to *T. umblicata* Ancey; but differs from it in the relative proportions of height and breadth.

HAB. Lanai Mountains (Perkins).

(14) *Tornatellina umblicata* Ancey.

*Auriculella umblicata* Ancey, Bull. Soc. Malac. France, vi. (1889), p. 232.

*Tornatellina umblicata* Ancey, Mém. Soc. Zool. France, v. p. 721.

HAB. Maui, Lahaina (Ancey).

Fam. STENOgyRIDAE.

OPEAS Albers.

*Opeas* Albers, Die Heliceen, 1850, p. 175; Martens, Die Heliceen, Ed. 2, 1860, p. 265 (type *Bulinus goodalli* Miller).

(1) *Opeas junceus* Gould.

*Bulinus junceus* Gould, P. Boston Soc. II. (1847), p. 191; U. S. Explor. Exped. Moll. pl. VII. fig. 87.

HAB. Hawaiian Islands (Gould); all the islands (Baldwin).—Oahu, Waianae Mts. (Perkins).

(2) *Opeas prestoni* Sykes.

*Opeas prestoni* Sykes, P. Malac. Soc. London, III. (1898), p. 73, pl. v. fig. 4.

A long series, which I am entirely unable to sever from the shell recently described by me from Ceylon. The whole genus, however, is notorious for having been discovered in widely separated localities, and probably this species has been transported with plants.

HAB. Hawaii, Kawailoa, Mauna Loa at 1500 feet (Perkins).

(3) *Opeas pyrgiscus* Pfeiffer.

*Bulimus pyrgiscus* Pfeiffer, P. Zool. Soc. London, 1861, p. 24; Malak. Blätt. 1861, p. 15; Novit. Conch. III. p. 425, pl. xcvi. figs. 10—12.

This form does not seem to have been found in recent years.

HAB. Hawaiian Islands (Pfeiffer).

*Opeas striolata* Pease, is recorded as Hawaiian by Nevill (Handlist Ind. Mus. pt. I. 1878, p. 166); it appears to be a manuscript name only.

## CAECILIOIDES (Blainville) Herrmannsen.

(1) *Caecilioides baldwini* Ancey.

*Caecilianella baldwini* Ancey, Mem. Soc. Zool. France, v. (1892), p. 718.

I have followed Mr Smith (J. Conch. vi. pp. 341—342) as to the generic name.

HAB. Oahu, Manoa (Ancey).

## Fam. SUCCINEIDAE.

## SUCCINEA Draparnaud.

*Succinea* Draparnaud, Tabl. des Moll. 1801, p. 55 (first species *S. amphibia* Drap.).

The large number of unfigured species described from the Hawaiian Islands renders the identification of specimens belonging to this puzzling group by no means an easy task.

Pease proposed (J. Conchyl. XVIII. 1870, p. 89) the genus *Catinella* for *Succinea rubida*; also the genus *Truella* (P. Zool. Soc. London, 1871, p. 459) for *S. elongata*. I have thought it best to leave all the forms in *Succinea*, and have listed the species in alphabetical order.

Two species collected by Mr Perkins still await identification; they are not improbably new, but so many of the described species are unknown to me that I consider it safer to leave them for the present. One is from Honolulu and Waianae Mts. in Oahu, with a dwarf variety from the mountains of Molokai at 4000 feet; the other from Kau, Hawaii: both belong to the group of *S. canella* Gould.

(1) *Succinea aurulenta* Ancey.

*Succinea aurulenta* Ancey, Bull. Soc. Malac. France, VI. (1889), p. 242; Sykes, P. Malac. Soc. London, III. p. 275, pl. XIII. fig. 4.

HAB. Hawaii, North Kona (Baldwin); Kona at 3000 feet (Perkins).

(2) *Succinea baldwini* Ancey.

*Succinea baldwini* Ancey, Bull. Soc. Malac. France, VI. (1889), p. 250.

The specimens are identified from the description alone.

HAB. Maui, Lahaina (Baldwin); Haleakala at 9000 feet (Perkins).

(3) *Succinea bicolorata* Ancey.

*Succinea bicolorata* Ancey, P. Malac. Soc. London, III. (1899), p. 271, pl. XII. fig. 2.

HAB. Hawaii, Waimea (Ancey).

(4) *Succinea caduca* Mighels.

*Succinea caduca* Mighels, P. Boston Soc. II. (1845), p. 21; Gould, U. S. Explor. Exped. Mollusca, pl. II. fig. 30.

HAB. Oahu, Waianae Mts. (Baldwin).—Molokai Mts. (Perkins).—Lanai Mts. (Perkins).

(5) *Succinea canella* Gould.

*Succinea canella* Gould, P. Boston Soc. II. (1847), p. 184; U. S. Explor. Exped. Mollusca, pl. II. fig. 20; Bland and Binney, Ann. Lyc. New York, x. p. 338 [jaw and radula].

Mons. Ancey has named (Bull. Soc. Malac. France, VI. pp. 245—7) varieties *crassa*, *obesula*, *mamillaris*, and *lucida*.

HAB. Maui, Lahaina (Baldwin).—Molokai and Maui (Ancey).—Maui, Haleakala at 5000 feet; Molokai Mountains (Perkins).

(6) *Succinea casta* Ancey.

*Succinea casta* Ancey, P. Malac. Soc. London, III. (1899), p. 272, pl. XII. fig. 10.  
 HAB. Hawaii, Olaa (Ancey).

(7) *Succinea cepulla* Gould.

*Succinea cepulla* Gould, P. Boston Soc. II. (1847), p. 182; U. S. Explor. Exped. Mollusca, pl. II. fig. 15.

*Succinea fragilis* Souleyet, Voy. Bonite, Zool. II. (1852), p. 501, pl. XXVIII. figs. 18—20 [shell and animal: nec *S. fragilis* King].

*Succinea souleyeti* Ancey, Bull. Soc. Malac. France, VI. (1889), p. 255.

The synonymy given here and under *S. rotundata* has been arrived at from a careful comparison of the original descriptions and figures, and a study of the identifications made by Pfeiffer amongst the specimens in the British Museum. The shell figured by Reeve (Conch. Icon. *Succinea*, fig. 69), purporting to be Hawaiian, under the name of *S. fragilis* King, is not the present species.

HAB. Hawaii (Gould, &c.).—Oahu, Tantalus, Head of Panoa Valley (Perkins).—Molokai Mountains (Perkins).

(8) *Succinea cinnamomea* Ancey.

*Succinea cinnamomea* Ancey, Bull. Soc. Malac. France, VI. (1889), p. 247.  
 Plate XI. fig. 32.

HAB. Oahu, Waianae Mts. (Baldwin); Mount Kaala (Perkins).

(9) *Succinea delicata* Ancey.

*Succinea delicata* Ancey, Bull. Soc. Malac. France, VI. (1889), p. 243.

HAB. East Maui (Ancey); Kula (Baldwin).

(10) *Succinea elongata* Pease.

*Succinea elongata* Pease, J. Conchyl. XVIII. (1870), p. 96.

A single specimen was found by Mr Perkins; the species was only known to me by the description. Authors refer to a *S. elongata* Beck, but I have failed to trace the reference.

HAB. Kauai (Pease); Waimea (Baldwin); Kaholuamano (Perkins).

(11) *Succinea explanata* Gould.

*Succinea explanata* Gould, U. S. Explor. Exped. Mollusca, p. 13, pl. II. fig. 31.

HAB. Kauai (Gould); North side (Baldwin).

(12) *Succinea garrettiana* Ancey.

*Succinea garrettiana* Ancey, P. Malac. Soc. London, III. (1899), p. 272, pl. XII. fig. 7.

HAB. Hawaii, Rainbow Falls, Hilo (Ancey).

(13) *Succinea inconspicua* Ancey.

*Succinea inconspicua* Ancey, P. Malac. Soc. London, III. (1899), p. 273, pl. XII. fig. 9.

HAB. Hawaii, Waimea (Ancey).

(14) *Succinea konaensis* Sykes.

*Succinea konaensis* Sykes, P. Malac. Soc. London, II. (1897), p. 299.

Plate XI. fig. 34.

HAB. Hawaii, Mount Kona at 4000 feet (Perkins).

(15) *Succinea lumbalis* Gould.

*Succinea lumbalis* Gould, P. Boston Soc. II. (1847), p. 183; U. S. Explor. Exped. Moll. pl. II. fig. 18.

HAB. Hawaii, Mauna Kea (Baldwin).—Kauai (Gould); Makaweli, and above Waimea at 4000 feet (Perkins).

The specimens from 'above Waimea' have a more drawn out spire, but only belong, I think, to a varietal form.

(16) *Succinea lutulenta* Ancey.

*Succinea lutulenta* Ancey, Bull. Soc. Malac. France, VI. (1889), p. 244.

HAB. Maui (Ancey); Ulupalakua (Baldwin).

(17) *Succinea mauiensis* Ancey.

*Succinea mauiensis* Ancey, Bull. Soc. Malac. France, VI. (1889), p. 248.

HAB. Maui (Ancey); Makawao (Baldwin); Haleakala at 5000 feet (Perkins).

(18) *Succinea newcombiana* Garrett.

*Succinea newcombiana* Garrett, P. Calif. Ac. 1. (1857), p. 103.

A species closely related to *S. cepulla* and *S. rotundata*, but, if my identification of the latter is correct, this is smaller, the mouth is rounder, and the last whorl not so much inflated.

HAB. Hawaii, district of Waimea (Garrett); Kohala Mountains (Perkins).

(19) *Succinea protracta* sp. nov.

Testa tenuis, aureo-rufa vel pallide-cornea, lineis incrementi obliquis bene notata; spira producta, apice acutulo, mamillato; anfr.  $3\frac{1}{2}$  convexi, sutura bene impressa discreti, rapide accrescentes: apertura ovato-pyriformis, fere recta; peristoma simplex, tenue, margine columellari arcuato, haud plicato. Long. 12.7, diam. maj. 6; alt. ap. 8, lat. ap. 5 mm.

Plate XI, fig. 25.

Belongs to the group of *S. aurulenta* Ancey, but is much more elongate and slender, and the suture is more impressed. A single white specimen from 'Mauna Loa at 3500' feet I also refer to this species.

HAB. Hawaii, Kau (Perkins).

(20) *Succinea punctata* Pfeiffer.

*Succinea punctata* Pfeiffer, P. Zool. Soc. London, 1854 [May, 1855], p. 297; Reeve, Conch. Icon. *Succinea*, fig. 29.

The specimens from Kohala Mts. are young and have the spire slightly more depressed, but appear to belong to this form. The white spots shewn in Reeve's figure are much exaggerated: most specimens have a few blotches of a paler tint, but I have seen none regularly spotted in the way the artist has represented them.

HAB. Hawaii (Pfeiffer); Kohala Mountains, Olaa Puna, and Kona at 3000 feet (Perkins).

(21) *Succinea rotundata* Gould.

*Succinea patula* Mighels, P. Boston Soc. II. (1845), p. 21 [nec *S. patula* Brug., nec King].

*Succinea rotundata* Gould, P. Boston Soc. II. (1847), p. 182; U. S. Explor. Exped. Moll. pl. II. fig. 14 [shell and animal].

*Succinea newcombi* Pfeiffer, P. Zool. Soc. London, 1854 [May, 1855], p. 297; Novit. Conch. I. pl. IX. figs. 3—5; Reeve, Conch. Icon. *Succinea*, fig. 61.

HAB. Oahu (Gould, &c.).—Molokai (Pfeiffer).—Hawaii, Kohala (Perkins).

See the remarks under *S. cepulla*, which species seems to be, like the present one, widely scattered over the islands.

(22) *Succinea rubella* Pease.

*Succinea rubella* Pease, P. Zool. Soc. London, 1871, p. 460.

The coloration of this species is very variable, and some specimens are found of a straw-colour; it appears to be close to *S. canella* Gould.

HAB. Lanai (Pease); Mountains (Perkins).

(23) *Succinea rubida* Pease.

*Succinea rubida* Pease, J. Conchyl. XVIII. (1870), p. 97.

HAB. Kauai (Pease); North side (Baldwin).

(24) *Succinea thaanumi* Ancey.

*Succinea thaanumi* Ancey, P. Malac. Soc. London, III. (1899), p. 273, pl. XII. fig. 3.

HAB. Hawaii, Olaa (Ancey).

(25) *Succinea venusta* Gould.

*Succinea venusta* Gould, P. Boston Soc. II. (1847), p. 186; U.S. Explor. Exped. Moll. pl. II. fig. 25.

HAB. Hawaii, Mauna Kea (Baldwin); Kona at 3000 feet, and Olaa Puna (Perkins).

The specimens from Kona are whitish and slightly more shouldered.

(26) *Succinea vesicalis* Gould.

*Succinea vesicalis* Gould, P. Boston Soc. II. (1847), p. 183; U.S. Explor. Exped. Moll. pl. II. fig. 17.

The figure given by Reeve (Conch. Icon. *Succinea*, fig. 85) does not represent this species.

HAB. Hawaii, Mauna Kea (Gould); Kau, and Mauna Loa at 2000 ft. (Perkins).

(27) *Succinea waianaensis* Ancey.

*Succinea waianaensis* Ancey, P. Malac. Soc. London, III. (1899), p. 273, pl. XII. fig. 12.

HAB. Oahu, Waianae Mts. (Ancey).

## SPECIES INSUFFICIENTLY KNOWN OR ERRONEOUSLY RECORDED.

*Succinea aperta* Lea. Unknown to me; it has been doubtfully referred to *S. rotundata*.

*Succinea approximata* Shuttleworth, Reeve, Conch. Icon. *Succinea*, fig. 27. Apparently really refers to the West Indian *S. approximans*.

*Succinea pudorina* Gould, Reeve, Conch. Icon. *Succinea*, figs. 43, 75.

Two apparently distinct species are figured by Reeve under this name; he records it, I think erroneously, from the 'Sandwich Islands.'

The following appear to be only manuscript names.

*S. apicalis* Ancey, Makawao, Maui.

*S. tenerrima* Ancey, Hilo, Hawaii.

## Fam. LIMNAEIDAE.

## LIMNAEA Lamarck.

*Limnaea* Lamarck, Mém. Soc. Hist. Nat. Paris, 1799, p. 75 (type *Helix stagnalis* L.).

The name *Limnaea* appears to have been used as early as 1791 by Poli for the animals of *Unio*, *Anodonta* and *Chama*; but his work is so peculiar, that I feel doubts if this can be regarded as preoccupying the name for a genus.

The question whether these forms—when sinistral—belong to *Physa* or *Limnaea*, has for long proved to be a difficult one. Gould, when describing his *Physa reticulata*, remarked "its form is so much that of a reversed *Limnaea* that I am almost tempted to consider it one." Pease, in his review of the Hawaiian species, stated that he was "confident," having examined the animals of several hundred specimens, that there was no species of *Physa* in the Islands. He also remarked that sinistral and dextral specimens of the same species may be found together. Prof. E. von Martens, in 1866, expressed the view, here adopted, that these Hawaiian forms were really sinistral species of *Limnaea*.

As shewing how little the literature has been studied, I may remark that as late as 1889 Mr Cooke (P. Zool. Soc. London, 1889, p. 142), when pointing out the affinities with *Limnaea* of the so-called *Physae* of Australia, notes that "Tryon mentions, but I have failed to trace on what authority, that sinistral *Limnaeas* occur in the Sandwich Islands."

Mighels described (P. Boston Soc. II. p. 21) two species, *producta* and *umbilicata*, as *Physae*: according to Pease the types were destroyed by fire and, as the species are unidentifiable from the diagnoses only, I have omitted them.

(1) *Limnaea aulacospira* Ancey.

*Limnaea aulacospira* Ancey, Naturaliste, (2) XI. (Dec. 1889), p. 290; Sykes, P. Malac. Soc. London, III. pl. XIII. fig. 19.

HAB. Maui (Ancey); Haleakala at 5000 feet, and Iao Valley (Perkins).

(2) *Limnaea binominis*, nom. nov.

*Physa sandwichensis* Clessin, Conchylien-Cabinet, *Physa*, p. 342, pl. XLVIII. fig. 7 (1886).

nec *Limnaea sandwichensis* Philippi.

HAB. Hawaiian Islands (Clessin).—Oahu, Mts. near Honolulu (Perkins).

(3) *Limnaea compacta* Pease.

*Limnaea compacta* Pease, Amer. J. Conch. VI. (1870), p. 6, pl. III. fig. 4.

*Limnaea ambigua*, Pease, t. c. p. 6, pl. III. fig. 5.

*Physa flavida* Clessin, Conchylien-Cabinet, *Physa*, p. 364, pl. LI. fig. 9 (1886).

HAB. Oahu (Pease).—(as *L. ambigua*) Kauai, Kapaa (Baldwin).—(as *L. compacta*) all the Islands (Baldwin).

(4) *Limnaea hartmanni* Clessin.

*Physa hartmanni* Clessin, Conchylien-Cabinet, *Physa*, p. 371, pl. LIV. fig. 9 (1886).

HAB. Hawaii (Clessin).

Some catalogues give a *Limnaea hartmanni* of Studer and of Charpentier, but I cannot trace a described *species* of that name; there appears to be a variety of *L. ovatus* Drap bearing the name.

(5) *Limnaea moreletiana* Clessin.

*Physa moreletiana* Clessin, Conchylien-Cabinet, *Physa*, p. 341, pl. XLVIII. fig. 3 (1886).

Unknown to me, but from the figure I think it may be a form of *L. turgidula* Pease. It appears not to be the *Limnaea moreletiana* Gassies, of Adams (Gen. Rec. Moll. II. p. 253).

HAB. Hawaiian Islands (Clessin).

(6) *Limnaea naticoides* Clessin.

*Physa naticoides* Clessin, Conchylien-Cabinet, *Physa*, p. 341, pl. XLVIII. fig. 5 (1886).

HAB. Hawaiian Islands (Clessin).

(7) *Limnaea oahuensis* Souleyet.

*Limnaea oahuensis* Souleyet, Voy. Bonite, Zool. II. (1852), p. 527, pl. XXIX. figs. 38—41 [with animal]; Reeve, Conch. Icon. *Limnaea*, sp. 90.

*Limnaea affinis* Souleyet, Voy. Bonite, Zool. II. p. 528, pl. XXIX. figs. 42—44.

*Limnaeus sandwichensis* Philippi, Arch. Naturg. II. (1845), p. 63; Kuster, Conchylien-Cabinet, *Limnaea*, p. 26, pl. IV. figs. 25, 26.

*Limnaea volutata*, Gould, P. Boston Soc. II. (1847), p. 211; U. S. Explor. Exped. Moll. pl. IX. fig. 142.

I defer to Pease's experience and unite Souleyet's two species; though, from the figures, I should have regarded them as distinct. It is not the *Limnaea affinis* of Beck.

HAB. Oahu (Souleyet, Pease, &c.).—Oahu and Maui (Baldwin).

(8) *Linnaea peasei* Clessin.

*Physa peasei* Clessin, Conchylien-Cabinet, *Physa*, p. 339, pl. XLVII. fig. 8 (1886).

Judging from specimens received by the British Museum from the Morelet collection, the figure is by no means good.

HAB. Hawaiian Islands (Clessin).

(9) *Linnaea reticulata* Gould.

*Physa reticulata* Gould, P. Boston Soc. II. (1847), p. 214; U. S. Explor. Exped. Moll. pl. IX. fig. 140; Sowerby, Conch. Icon. *Physa*, fig. 56; Clessin, Conch.-Cab. *Physa*, p. 330, pl. XLVI. fig. 4.

*Linnaea reticulata* Gould, Pease, Amer. J. Conch. VI. p. 5.

Neither Sowerby nor Clessin appears to have been aware of Gould's published description of this species.

HAB. Kauai (Pease).

(10) *Linnaea rubella* Lea.

*Lymnaeus rubellus* Lea, Tr. Amer. Phil. Soc. IX. (1843), p. 12.

*Linnaea rubella* Lea, Pease, Amer. J. Conch. VI. p. 5, pl. III. figs. 1—3.

Pease was of opinion that this might prove to be a variety of *L. oahuensis* Soul.

HAB. Oahu (Lea).—Kauai (Pease); Mts. between Lihue and the sea, also Wailua river (Perkins).

(11) *Linnaea turgidula* Pease.

*Linnaea turgidula* Pease, Amer. J. Conch. VI. (July, 1870), p. 5, pl. III. fig. 3.

HAB. Oahu (Pease).

## ERINNA A. Adams.

*Erinna newcombi* A. Adams.

*Erinna newcombi* A. Adams, P. Zool. Soc. London, 1855, p. 120; H. and A. Adams, Gen. Rec. Moll. II. p. 644, pl. CXXXVIII. fig. 9; Bland and Binney, Ann. Lyc. New York, X. p. 349 [jaw and radula]; Binney, P. Ac. Philad. 1874, p. 54, pl. V. figs. 7—10 [jaw and radula].

HAB. Kauai, Hanalei River (Baldwin, &c.). H. and A. Adams give as locality "Henata River, Kami."

See also a note on the genus by Dr Jousseume, Rev. Mag. Zool. (3) II. (1874), p. 25.

## ANCYLUS, Geoffroy.

*Ancylus* Geoffroy, Traité sommaire des coquilles,.....aux environs de Paris, 1767, p. 122 [type apparently *A. lacustris*].

*Ancylus sharpi* sp. nov.

Testa pygmaea, convexiuscula, hyalino-flavida; apertura elongato-elliptica, apice obtusulo. Long. 2; lat. 1.1; alt. .8 mill.

Plate XII, figs. 14, 14 a.

An insignificant little form with no striking characters; there being no other species recorded from the Islands, I venture to give these shells a name; they are probably not adult.

HAB. Oahu, on pali, head of Nuuanu Valley (Coll. Dr B. Sharp, commisit H. A. Pilsbry).

## Fam. MELANIIDAE.

## MELANIA Lamarck.

The genus appears to have been first put forward by Lamarck in 1799 (Mém. Soc. Hist. Nat. Paris, p. 75) and to have been also characterised by him in 1801 (Syst. An. sans Vert. p. 91). In both cases the species named by him was *Melania amarula* Lam., which is therefore the type.

(1) *Melania baldwini* Ancey.

*Melania baldwini* Ancey, P. Malac. Soc. London, III. (July, 1899), p. 273, pl. XII, fig. 6.

HAB. Maui, Lahaina (Ancey).

(2) *Melania indefnita* Lea.

*Melania indefnita* Lea, P. Zool. Soc. London, 1850, p. 187; Reeve, Conch. Icon. *Melania*, fig. 56; Brot, Conch.-Cab. *Melania*, pl. XXIII, fig. 7.

*Melania newcombii* Lea, Pease, Amer. J. Conch. VI. p. 6 [nec Lea, fide Brot].

HAB. Oahu (Pease).

The Philippine specimens in coll. Cuming seem identical with some from Oahu, named *M. newcombii* by Pease.

(3) *Melania kauaiensis* Pease.

*Melania kauaiensis* Pease, Amer. J. Conch. vi. (July 1870), p. 7, pl. III, fig. 6.

HAB. Kauai (Pease).—Molokai, Pelekunu (Perkins).

Probably the species of *Melania* are scattered over the various islands and not confined to any single locality; *M. mauiensis*, for example, has been found on Maui, Molokai, Kauai, and Oahu.

(4) *Melania mauiensis* Lea.

*Melania mauiensis* Lea, P. Ac. Philad. VIII. (1857), p. 145; Brot, Conch.-Cab.

*Melania*, p. 322, pl. XXXIII, figs. 7, 8, 8 a.

HAB. Maui (Lea).—Maui, Oahu, Kauai (Pease).—Maui, Molokai (Brot).—Molokai, in taro patches, Pelekunu (Perkins).

Large specimens were found on Molokai by Mr Perkins, exact spot not recorded, and a small race, kindly identified for me by the late Dr Brot, on Pelekunu. *Melania tahitensis* Pease MS. is stated by Brot to be a synonym. Schepman (Notes Leyden Mus. XIV. p. 158) has recorded the present species from the Island of Soemba.

(5) *Melania newcombii* Lea.

*Melania newcombii* Lea, P. Ac. Philad. VIII. (1857), p. 145; Brot, Conch.-Cab.

*Melania*, p. 213, pl. XXIV, figs. 2, 2 a.

*Melania contigua* Pease, Amer. J. Conch. vi. (July 1870), p. 7.

I follow Brot in uniting *M. contigua* Pease; he also places *M. oahuensis* Pease MS. and *M. paulla* Dunker MS. in the synonymy.

HAB. Oahu (Lea); In stream in mountain gulch near Honolulu (Perkins).—Kauai (Pease).

(6) *Melania verreauxiana* Lea.

*Melania verreauxiana* (sic) Lea, P. Ac. Philad. VIII. (1857), p. 144.

*Melania verreauxiana* Lea, J. Ac. Philad. n. s. VI. pl. XXII, fig. 27; Brot, Conch.-Cab. *Melania*, p. 32, pl. IV, fig. 2.

Unknown to me and may not really be Hawaiian. Dr Brot considered it might be a form of *M. largillierti* Phil.

HAB. Hawaiian Islands (Lea).

## Fam. PALUDESTRINIDAE.

## PALUDESTRINA D'Orbigny.

*Paludestrina porrecta* Mighels.

*Paludina porrecta* Mighels, P. Boston Soc. II. (1845), p. 22.

HAB. Oahu (Mighels).

## Fam. HELICINIDAE.

## HELICINA Lamarck.

In 1799 (Mém. Soc. Hist. Nat. Paris, p. 77) the genus was described but no type or species named; in 1801 (Syst. An. sans Vert. p. 94) the only species named was *Helicina neritella* Lam., which may be taken as the type. Lamarck refers for a figure to Lister (Hist. Conch. fig. 59), and this illustration appears to represent a *Helicina*, though it is hard to be certain whether it be *H. neritella* or not.

(1) *Helicina laciniosa* Mighels.

*Helicina laciniosa* Mighels, P. Boston Soc. II. (1845), p. 19; Gould, U. S. Explor. Exped. Moll. pl. VII. fig. 108.

A very variable shell in size and coloration; it appears to be always more compact and elevated than *H. sandwichiensis*.

HAB. Oahu (Mighels).—Kauai (Baldwin).—Lanai, behind Koele; also Kalamaula, Molokai; Kaala, Oahu; and between Lihue and the sea, Kauai (Perkins).

(2) *Helicina magdalenae* Ancey.

*Helicina magdalenae* Ancey, Bull. Soc. Malac. France, VII. (1890), p. 342.

*Helicina constricta* Pfeiffer, P. Zool. Soc. London, 1848, p. 120; Conch.-Cab.

*Helicina*, p. 22, pl. VII. fig. 37—9 [both relate to his variety only].

Pfeiffer's typical form came from 'Otaheite' and appears to belong to a different species to his variety, which seems to be identical with this. Possibly forms may be found linking *H. magdalenae* to *H. uberta*.

HAB. Oahu, Tantalus (Ancey).

(3) *Helicina rotelloidea* Mighels.

*Helicina rotelloidea* Mighels, P. Boston Soc. II. (1845), p. 19; Pfeiffer, Conch.-Cab. *Helicina*, p. 23, pl. III. fig. 40—3.

*Helicina bronniiana* Philippi, Zeitsch. Malak. IV. (1847), p. 124.

HAB. Oahu (Mighels, &c.).

(4) *Helicina sandwichiensis* Souleyet.

*Helicina sandwichiensis* Souleyet, Voy. Bonite, Zool. II. (1852), p. 529, pl. xxx. figs. 1—5.

nec ? *H. sandwichiensis* Sowerby, Thes. Conch. III. pl. cclxx. figs. 173—4.

A variety "β" has been recorded by Pfeiffer as from the Loyalty Islands; probably this is an error. See Crosse, J. Conchyl. XLII. p. 405.

HAB. Oahu, Waianae Mts. (Baldwin); at and below Kaala (Perkins).

(5) *Helicina uberta* Gould.

*Helicina uberta* Gould, P. Boston Soc. II. (1847), p. 202; U. S. Explor. Exped. Moll. pl. VII. fig. 114.

HAB. Maui and Oahu (Gould).—Oahu, below Kaala (Perkins).

## SPECIES DOUBTFUL OR ERRONEOUSLY RECORDED.

*Helicina antoni* Pfeiffer. Originally recorded without locality; subsequently Pfeiffer gave the Hawaiian Islands and the Gambiers. It really appears to come from Honduras, and the Hawaiian habitat is probably erroneous, these supposed Hawaiian specimens belonging, as undoubtedly the Gambier Island shells do, to *H. pazi* Crosse (J. Conchyl. XIII. p. 221, pl. VI. fig. 8).

*Helicina crassilabris*, Philippi. It has been suggested by Pfeiffer that this is Hawaiian, but it really comes from Venezuela or the Caribbean Region.

*Helicina fulgora* Gould, originally described from Manua, Samoa Islands; it has also been noted, but, I think, erroneously, from the Hawaiian Islands.

*Helicina pisum* Philippi. I think "Sandwich Is." must have been a mistake and possibly refers to Vate or Sandwich I.: it may be a slip for Savage I., from which specimens, inseparable from this, undoubtedly do come. This appears not to be the *H. pisum* Hombr. and Jacq., which equals *H. tahitensis* Pease.

## Fam. NERITIDAE.

## NERITINA Lamarck.

I have not seen the first Edition of the 'Philosophie Zoologique' (1809) in which this genus is said to occur, but in the second edition (1830) the name appears in French only, with no diagnosis or named species (Vol. i. p. 321). However in his 'Hist. An. sans Vert.' it is duly given in Latin with named species (Vol. vi. pt. 2, p. 182). The first is *N. perversa* Gmel., which is the type of Montfort's *Velates* (1810) under the more correct name of *V. conoidea*, but the others belong to *Neritina* as we understand it to-day.

(1) *Neritina cariosa* Gray.

*Nerita cariosa* Gray, Wood, Index Test. Suppl. *Nerita* fig. 9 (1828).

*Neritina sandwichensis* Deshayes, An. sans Vert. Ed. 2, VIII. (1838), p. 579.

*Neritina convexa* Nuttall, Jay, Cat. Shells, Ed. 3, 1839, p. 66 (nom. sol.).

*Neritina nuttalli* Recluz, Rev. Zool. 1841, p. 276; Souleyet, Voy. Bonite, Zool. II. pl. xxxiv. figs. 43—46.

*Neritina solidissima* Sowerby, Thes. Conch. II. p. 541, pl. cxvi. fig. 573.

I have not sufficient material to determine whether the large synonymy given by Tryon (Man. Conch. x.) is fully justified. Prof. von Martens (Conch.-Cab. *Neritina*) expressed the opinion (p. 276) that *Neritina cariosa* Gray does not really belong here, but is a form of *N. mauritii*: this has been dealt with by Mr Smith (P. Zool. Soc. London, 1884, p. 275).

HAB. Hawaiian Islands (various authors).—Maui and Oahu (Baldwin).—Hawaii, Hilo (Smith).

(2) *Neritina granosa* Sowerby.

*Neritina granosa* Sowerby, Tank. Cat. App. p. xi. (1825); Conch. III. *Neritina* fig. 6.

*Neritina papillosa* Jay, Cat. Shells, Ed. 2, 1839, pl. iv. fig. 11.

*Neripteron gigas* Lesson, Rev. Zool. 1842, p. 187.

HAB. All the Islands (Baldwin).—Molokai, Pelekunu (Perkins).

(3) *Neritina lugubris* Philippi.

*Neritina lugubris* Philippi, Abbild. Conchylien, I. pt. 2, p. 20, pl. I. fig. 9 (1845).

This has been placed as a synonym of *N. cariosa*, but from the description and figure it seems to be distinct.

HAB. Hawaiian Islands (Philippi).

(4) *Neritina neglecta* Pease.

*Neritina neglecta* Pease, P. Zool. Soc. London, 1860, p. 435.

HAB. Hawaiian Islands (Pease).

(5) *Neritina vespertina* Nuttall.

*Neritina vespertina* Nuttall, Jay, Cat. Shells, Ed. 3, 1839, p. 66 (nom. sol.);

Reeve, Conch. Icon. *Neritina*, sp. 61.

? *Neritina sandwichensis* Desh., Reeve, Conch. Icon. sp. 82 [nec Deshayes].

HAB. All the Islands (Baldwin).

In conclusion I may call attention to three species, attributed to the Islands, which do not really belong to their fauna.

*Partula terrestris* Pease. Apparently a manuscript name; it has appeared in Paetel's 'Catalog' and in the Mon. Helic. Viv. (Vol. VIII. p. 209) with the habitat of 'I. Sandwich.' According to Dr Hartman, it is a synonym of *P. approximans* Pease, from Raiatea.

*Spiraxis sandwichensis* was described by Pfeiffer (P. Zool. Soc. London, 1856, p. 335) as from the Hawaiian Islands. It appears to me to be a form of the *Bulinus lactifluus* of Pfeiffer, described from Chili, and I feel no doubt the Hawaiian habitat is erroneous.

*Bulinus kauaiensis* was described by Pfeiffer in the same volume (p. 332). It is probably also Chilian and very close to *Bulinus albicans* Brod.; but I am not quite sure of the identity, as the shell is slightly more succineiform.

Finally, it may be noted that a specimen of *Viviparus chinensis* Gray, doubtless imported for food, was collected by Mr Perkins at "Wailuku," Maui.

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§ 4. List of named forms which are placed in this work as varieties or synonyms.

	PAGE
<i>acuta</i> Newcomb ( <i>Ach.</i> ) = <i>elongata</i> Newcomb ( <i>Amastra</i> ) . . . . .	349
<i>acuta</i> Swainson ( <i>Ach.</i> ) = <i>spirizona</i> Fér. ( <i>Amastra</i> ) . . . . .	344
<i>adamsi</i> Newcomb ( <i>Ach.</i> ) = <i>marmorata</i> Gould ( <i>Ach.</i> ) . . . . .	314
<i>adusta</i> Reeve ( <i>Ach.</i> ) = <i>vulpina</i> Fér. ( <i>Ach.</i> ) . . . . .	327
<i>adusta</i> Gould ( <i>Ach.</i> ) = <i>bicolor</i> Jay ( <i>Carelia</i> ) . . . . .	373
<i>affinis</i> Souleyet ( <i>Limnaea</i> ) = <i>oahuensis</i> Souleyet ( <i>Limnaea</i> ) . . . . .	392
<i>alba</i> Nuttall ( <i>Ach.</i> ) = <i>lorata</i> Fér. ( <i>Ach.</i> ) . . . . .	303
<i>albescens</i> Gulick ( <i>Ach.</i> ) = <i>curta</i> Newcomb ( <i>Ach.</i> ) . . . . .	323
<i>albida</i> Pfeiffer ( <i>Amastra</i> ) = <i>spirizona</i> Fér., var. ( <i>Amastra</i> ) . . . . .	344
<i>albofasciatus</i> Smith ( <i>Apex</i> ) = <i>vittata</i> Reeve ( <i>Ach.</i> ) . . . . .	304
<i>ambigua</i> Pease ( <i>Limnaea</i> ) = <i>compacta</i> Pease ( <i>Limnaea</i> ) . . . . .	391
<i>ampulla</i> Gulick ( <i>Ach.</i> ) = <i>tappaniana</i> Adams ( <i>Ach.</i> ) . . . . .	318
<i>analoga</i> Gulick ( <i>Ach.</i> ) = <i>vulpina</i> Fér., var. ( <i>Ach.</i> ) . . . . .	328
<i>aplustre</i> Newcomb ( <i>Ach.</i> ) = <i>bilineata</i> Reeve ( <i>Ach.</i> ) . . . . .	321
<i>armatus</i> Mighels ( <i>Bulimus</i> ) = <i>auricula</i> Fér. ( <i>Auric.</i> ) . . . . .	375
<i>attenuata</i> Pfeiffer ( <i>Bul.</i> ) = <i>trebra</i> Newcomb ( <i>Ach.</i> ) . . . . .	319
<i>bacca</i> Reeve ( <i>Ach.</i> ) = <i>abbreviata</i> Reeve ( <i>Ach.</i> ) . . . . .	305
<i>baeillaris</i> Mousson ( <i>Tornat.</i> ) = <i>oblonga</i> Pease ( <i>Tornat.</i> ) . . . . .	382
<i>baileyana</i> Gulick ( <i>Ach.</i> ) = <i>splendida</i> Newcomb ( <i>Ach.</i> ) . . . . .	318
<i>baldwini</i> Ancey ( <i>Hyalinia</i> ) = <i>pauxilla</i> Gould ( <i>Vitrea</i> ) . . . . .	279
<i>baldwini</i> Newcomb ( <i>Ach.</i> ) = <i>magna</i> Adams ( <i>Amastra</i> ) . . . . .	339
<i>bellula</i> Smith ( <i>Ach.</i> ) = <i>ligata</i> Smith ( <i>Ach.</i> ) . . . . .	325
<i>brevis</i> Pfeiffer ( <i>Ach.</i> ) = <i>nucleola</i> Gould ( <i>Amastra</i> ) . . . . .	353
<i>brunniana</i> Philippi ( <i>Helicina</i> ) = <i>rotelloidea</i> Mighels ( <i>Helicina</i> ) . . . . .	397
<i>bulbosa</i> Gulick ( <i>Ach.</i> ) = <i>picta</i> Mighels, var. ( <i>Amastra</i> ) . . . . .	351
<i>caesia</i> Gulick ( <i>Ach.</i> ) = <i>buddii</i> Newcomb ( <i>Ach.</i> ) . . . . .	321
<i>candida</i> Pfeiffer ( <i>Bul.</i> ) = <i>ovata</i> Newcomb ( <i>Ach.</i> ) . . . . .	308
<i>castanea</i> Reeve ( <i>Ach.</i> ) = <i>vulpina</i> Fér. ( <i>Ach.</i> ) . . . . .	327
<i>chlorotica</i> Pfeiffer ( <i>Newcombia</i> ) = <i>spirizona</i> Fér., var. ( <i>Amastra</i> ) . . . . .	344
<i>cinerosa</i> Pfeiffer ( <i>Ach.</i> ) = <i>decora</i> Fér., var. ( <i>Ach.</i> ) . . . . .	302
<i>clara</i> Pfeiffer ( <i>Ach.</i> ) = <i>striatula</i> Gould ( <i>Leptach.</i> ) . . . . .	370
<i>clementina</i> Pfeiffer ( <i>Ach.</i> ) = <i>abbreviata</i> Reeve ( <i>Ach.</i> ) . . . . .	305
<i>cognata</i> Gulick ( <i>Ach.</i> ) = <i>casta</i> Newcomb ( <i>Ach.</i> ) . . . . .	322
<i>concaospira</i> Pfeiffer ( <i>Ach.</i> ) = <i>napus</i> Pfeiffer ( <i>Ach.</i> ) . . . . .	303
<i>concidens</i> Gulick ( <i>Ach.</i> ) = <i>decora</i> Fér. ( <i>Ach.</i> ) . . . . .	301
<i>coniformis</i> Gulick ( <i>Ach.</i> ) = <i>decora</i> Fér., var. ( <i>Ach.</i> ) . . . . .	301
<i>consanguinea</i> Smith ( <i>Ach.</i> ) = <i>livida</i> Swainson ( <i>Ach.</i> ) . . . . .	325
<i>conspersa</i> Pfeiffer ( <i>Ach.</i> ) = <i>reticulata</i> Newcomb ( <i>Amastra</i> ) . . . . .	343
<i>contigua</i> Pease ( <i>Melania</i> ) = <i>newcombi</i> Lea ( <i>Melania</i> ) . . . . .	395
<i>contracta</i> Gulick ( <i>Ach.</i> ) = <i>curta</i> Newcomb ( <i>Ach.</i> ) . . . . .	323
<i>convexa</i> Nuttall ( <i>Neritina</i> ) = <i>cariosa</i> Gray ( <i>Neritina</i> ) . . . . .	398
<i>corrugata</i> Gulick ( <i>Ach.</i> ) = <i>rugosa</i> Newcomb ( <i>Ach.</i> ) . . . . .	309

	PAGE
<i>corusca</i> Gulick ( <i>Ach.</i> ) = <i>terebra</i> Newcomb ( <i>Ach.</i> ) . . . . .	319
<i>costulosa</i> Pease ( <i>Pupa</i> ) = <i>newcombi</i> Pfeiffer ( <i>Pupa</i> ) . . . . .	295
<i>crassidentata</i> Pfeiffer ( <i>Ach.</i> ) = <i>vulpina</i> Fér., var. ( <i>Ach.</i> ) . . . . .	328
<i>crocea</i> Gulick ( <i>Ach.</i> ) = <i>lignaria</i> Gulick, var. ( <i>Ach.</i> ) . . . . .	314
<i>cylindrata</i> Pease ( <i>Leptach.</i> ) = <i>exilis</i> Gulick ( <i>Leptach.</i> ) . . . . .	361
<i>decepta</i> Adams ( <i>Ach.</i> ) = <i>variegata</i> Pfeiffer ( <i>Amastra</i> ) . . . . .	347
<i>densilineata</i> Reeve ( <i>Partula</i> ) = <i>radiata</i> Gould ( <i>Ach.</i> ) . . . . .	317
<i>dentata</i> Pfeiffer ( <i>Ach.</i> ) = <i>labiata</i> Newcomb ( <i>Leptach.</i> ) . . . . .	365
<i>deshayesi</i> Morelet, pars ( <i>Ach.</i> ) = <i>assimilis</i> Newcomb ( <i>Amastra</i> ) . . . . .	334
<i>deshayesi</i> Morelet, pars ( <i>Ach.</i> ) = <i>biplicata</i> Newcomb ( <i>Amastra</i> ) . . . . .	334
<i>dimidiata</i> Pfeiffer ( <i>Ach.</i> ) = <i>cingula</i> Mighels ( <i>Leptach.</i> ) . . . . .	359
<i>dimondi</i> Adams ( <i>Ach.</i> ) = <i>gravida</i> Fér. ( <i>Amastra</i> ) . . . . .	350
<i>dimorpha</i> Gulick ( <i>Ach.</i> ) = <i>curta</i> Newcomb ( <i>Ach.</i> ) . . . . .	323
<i>disculus</i> Pfeiffer ( <i>Helix</i> ) = <i>exaequata</i> Gould ( <i>Philonesia</i> ) . . . . .	283
<i>discus</i> Pfeiffer ( <i>Helix</i> ) = <i>exaequata</i> Gould ( <i>Philonesia</i> ) . . . . .	283
<i>diversa</i> Gulick ( <i>Ach.</i> ) = <i>vulpina</i> Fér., var. ( <i>Ach.</i> ) . . . . .	328
<i>dumartrouyi</i> Souleyet ( <i>Partula</i> ) = <i>auricula</i> Fér. ( <i>Auriculella</i> ) . . . . .	375
<i>dunkeri</i> Pfeiffer ( <i>Ach.</i> ) = <i>producta</i> Reeve ( <i>Ach.</i> ) . . . . .	326
<i>eburnea</i> Gulick ( <i>Ach.</i> ) = <i>tappaniana</i> Adams ( <i>Ach.</i> ) . . . . .	318
<i>emersonii</i> Newcomb ( <i>Ach.</i> ) = <i>livida</i> Swainson ( <i>Ach.</i> ) . . . . .	325
<i>fasciata</i> Gulick ( <i>Ach.</i> ) = <i>tappaniana</i> Adams ( <i>Ach.</i> ) . . . . .	318
<i>ferussaci</i> Pfeiffer ( <i>Lam.</i> ) = <i>sanguinea</i> Newcomb ( <i>Amastra</i> ) . . . . .	351
<i>filocostata</i> Pease ( <i>Helix</i> ) = <i>paucicostata</i> Pease ( <i>Endodonta</i> ) . . . . .	291
<i>flavida</i> Clessin ( <i>Physa</i> ) = <i>compacta</i> Pease ( <i>Limnaea</i> ) . . . . .	391
<i>flavidus</i> Gulick ( <i>Apex</i> ) = <i>cestus</i> Newcomb ( <i>Ach.</i> ) . . . . .	300
<i>forbesiana</i> Pfeiffer ( <i>Bul.</i> ) = <i>cestus</i> Newcomb ( <i>Ach.</i> ) . . . . .	300
<i>fragilis</i> Gulick ( <i>Ach.</i> ) = <i>guttula</i> Gould ( <i>Leptach.</i> ) . . . . .	363
<i>fragilis</i> Souleyet ( <i>Succinea</i> ) = <i>cepulla</i> Gould ( <i>Succinea</i> ) . . . . .	386
<i>frickii</i> Pfeiffer ( <i>Ach.</i> ) = <i>glabra</i> Newcomb ( <i>Ach.</i> ) . . . . .	307
<i>frickii</i> Pfeiffer ( <i>Helix</i> ) = <i>lamellosa</i> Fér. ( <i>Endodonta</i> ) . . . . .	287
<i>fuliginea</i> Pfeiffer ( <i>Ach.</i> ) = <i>bicolor</i> Jay ( <i>Carelia</i> ) . . . . .	373
<i>fuliginosa</i> Gould ( <i>Ach.</i> ) = <i>tristis</i> Fér. ( <i>Amastra</i> ) . . . . .	346
<i>fulva</i> Pfeiffer ( <i>Ach.</i> ) = <i>variabilis</i> Newcomb ( <i>Ach.</i> ) . . . . .	319
<i>fuscolineata</i> Smith ( <i>Ach.</i> ) = <i>vulpina</i> Fér. ( <i>Ach.</i> ) . . . . .	327
<i>fuscozona</i> Smith ( <i>Ach.</i> ) = <i>buddii</i> Newcomb ( <i>Ach.</i> ) . . . . .	321
<i>fusififormis</i> Pfeiffer ( <i>Ach.</i> ) = <i>mucronata</i> Newcomb ( <i>Amastra</i> ) . . . . .	340
<i>gigantea</i> Newcomb ( <i>Ach.</i> ) = <i>violacea</i> Newcomb ( <i>Amastra</i> ) . . . . .	347
<i>gigas</i> Lesson ( <i>Neripteron</i> ) = <i>granosa</i> Sby. ( <i>Neritina</i> ) . . . . .	398
<i>glauca</i> Gulick ( <i>Ach.</i> ) = <i>zonata</i> Gulick ( <i>Ach.</i> ) . . . . .	329
<i>globosa</i> Pfeiffer ( <i>Ach.</i> ) = <i>vittata</i> Reeve ( <i>Ach.</i> ) . . . . .	304
<i>goniostoma</i> Pfeiffer ( <i>Ach.</i> ) = <i>affinis</i> Newcomb ( <i>Amastra</i> ) . . . . .	333
<i>gouldii</i> Pfeiffer ( <i>Bulimus</i> ) = <i>radiata</i> Gould ( <i>Ach.</i> ) . . . . .	317
<i>granifera</i> Gulick ( <i>Ach.</i> ) = <i>accincta</i> Mighels ( <i>Leptach.</i> ) . . . . .	356
<i>grossa</i> Pfeiffer ( <i>Ach.</i> ) = <i>porphyria</i> Newcomb ( <i>Amastra</i> ) . . . . .	341
<i>gulickii</i> Smith ( <i>Apex</i> ) = <i>cestus</i> Newcomb ( <i>Ach.</i> ) . . . . .	300
<i>gummea</i> Gulick ( <i>Ach.</i> ) = <i>guttula</i> Gould ( <i>Leptach.</i> ) . . . . .	363
<i>hartmani</i> Newcomb ( <i>Leptach.</i> ) = ? <i>extincta</i> Pfeiffer ( <i>Amastra</i> ) . . . . .	336
<i>hawaiiensis</i> Baldwin ( <i>Ach.</i> ) = <i>physa</i> Newcomb ( <i>Ach.</i> ) . . . . .	316
<i>herbacea</i> Gulick ( <i>Ach.</i> ) = <i>decipiens</i> Newcomb ( <i>Ach.</i> ) . . . . .	307

	PAGE
<i>hybrida</i> Newcomb ( <i>Ach.</i> ) = <i>producta</i> Reeve ( <i>Ach.</i> ) . . . . .	326
<i>induta</i> Gulick ( <i>Ach.</i> ) = <i>marmorata</i> Gould ( <i>Ach.</i> ) . . . . .	314
<i>innotabilis</i> Smith ( <i>Apex</i> ) = <i>decora</i> Fér., var. ( <i>Ach.</i> ) . . . . .	301
<i>inornata</i> Mighels ( <i>Ach.</i> ) = <i>turritella</i> Fér. ( <i>Amastra</i> ) . . . . .	346
<i>insignis</i> Reeve ( <i>Ach.</i> ) = <i>virgulata</i> Mighels ( <i>Ach.</i> ) . . . . .	320
<i>intercarinata</i> Mighels ( <i>Helix</i> ) = <i>contorta</i> Fér. ( <i>Endodonta</i> ) . . . . .	288
<i>johnsoni</i> Newcomb ( <i>Ach.</i> ) = <i>bilineata</i> Reeve ( <i>Ach.</i> ) . . . . .	321
<i>juncea</i> Gulick ( <i>Ach.</i> ) = <i>casta</i> Newcomb ( <i>Ach.</i> ) . . . . .	322
<i>lacrima</i> Gulick ( <i>Ach.</i> ) = <i>glutinosa</i> Pfeiffer ( <i>Leptach.</i> ) . . . . .	363
<i>lactea</i> Gulick ( <i>Ach.</i> ) = <i>variabilis</i> Newcomb ( <i>Ach.</i> ) . . . . .	319
<i>lagena</i> Gulick ( <i>Ach.</i> ) = <i>labiata</i> Newcomb ( <i>Leptach.</i> ) . . . . .	365
<i>leucophaeus</i> Gulick ( <i>Apex</i> ) = <i>decora</i> Fér., var. ( <i>Ach.</i> ) . . . . .	301
<i>leucorraphe</i> Gulick ( <i>Apex</i> ) = <i>decora</i> Fér., var. ( <i>Ach.</i> ) . . . . .	302
<i>leucozonus</i> Gulick ( <i>Apex</i> ) = <i>napus</i> Pfeiffer ( <i>Ach.</i> ) . . . . .	303
<i>liliacea</i> Pfeiffer ( <i>Ach.</i> ) = <i>vulpina</i> Fér., var. ( <i>Ach.</i> ) . . . . .	328
<i>liliaceus</i> Gulick ( <i>Apex</i> ) = <i>cestus</i> Newcomb ( <i>Ach.</i> ) . . . . .	300
<i>limbata</i> Gulick ( <i>Ach.</i> ) = <i>byronii</i> Wood ( <i>Ach.</i> ) . . . . .	306
<i>liratus</i> Pfeiffer ( <i>Bulimus</i> ) = <i>plicata</i> Pfeiffer ( <i>Newcombia</i> ) . . . . .	332
<i>livida</i> Pfeiffer ( <i>Ach.</i> ) = <i>vulpina</i> Fér. ( <i>Ach.</i> ) . . . . .	327
<i>lugubris</i> Chemn. ( <i>Turbo</i> ) = <i>apexfulva</i> Dixon ( <i>Ach.</i> ) . . . . .	298
<i>lurida</i> Pfeiffer ( <i>Ach.</i> ) = <i>castanea</i> Pfeiffer ( <i>Auriculella</i> ) . . . . .	376
<i>luteola</i> Fér. ( <i>Helix</i> ) = ? <i>turritella</i> Fér. ( <i>Amastra</i> ) . . . . .	346
<i>macrostoma</i> Pfeiffer ( <i>Ach.</i> ) = <i>taeniolata</i> Pfeiffer ( <i>Ach.</i> ) . . . . .	310
<i>magdalenae</i> Ancey ( <i>Pupa</i> ) = <i>lyrata</i> Gould ( <i>Pupa</i> ) . . . . .	294
<i>mahogani</i> Gulick ( <i>Ach.</i> ) = <i>byronii</i> Wood ( <i>Ach.</i> ) . . . . .	306
<i>manoensis</i> Newcomb ( <i>Ach.</i> ) = <i>ventulus</i> Fér. ( <i>Amastra</i> ) . . . . .	347
<i>margarita</i> Pfeiffer ( <i>Ach.</i> ) = <i>accincta</i> Mighels ( <i>Leptach.</i> ) . . . . .	356
<i>melampoides</i> Pfeiffer ( <i>Ach.</i> ) = <i>ventulus</i> Fér. ( <i>Amastra</i> ) . . . . .	347
<i>melanostoma</i> Newcomb ( <i>Ach.</i> ) = <i>byronii</i> Wood ( <i>Ach.</i> ) . . . . .	306
<i>microstoma</i> Gould ( <i>Ach.</i> ) = <i>textilis</i> Fér. ( <i>Amastra</i> ) . . . . .	345
<i>monacha</i> Pfeiffer ( <i>Ach.</i> ) = <i>multilineata</i> Newcomb ( <i>Ach.</i> ) . . . . .	393
<i>multicolor</i> Pfeiffer, pars ( <i>Bul.</i> ) = <i>byronii</i> Wood, var. ( <i>Ach.</i> ) . . . . .	306
<i>multicolor</i> Pfeiffer, pars ( <i>Bul.</i> ) = <i>oviformis</i> Pfeiffer ( <i>Ach.</i> ) . . . . .	309
<i>mustelina</i> Mighels ( <i>Ach.</i> ) = <i>decora</i> Fér., subsp. ( <i>Ach.</i> ) . . . . .	301
<i>myrrhea</i> Gulick ( <i>Ach.</i> ) = <i>gouldi</i> Newcomb ( <i>Ach.</i> ) . . . . .	313
<i>nacca</i> Gould ( <i>Pupa</i> ) = <i>pediculus</i> Shuttlw., var. ( <i>Pupa</i> ) . . . . .	295
<i>neglectus</i> Smith ( <i>Apex</i> ) = <i>decora</i> Fér., var. ( <i>Ach.</i> ) . . . . .	301
<i>newcombi</i> Pfeiffer ( <i>Helix</i> ) = <i>caperata</i> Gould ( <i>Godwinia</i> ) . . . . .	277
<i>newcombi</i> Pfeiffer ( <i>Ach.</i> ) = <i>turricula</i> Mighels ( <i>Carelia</i> ) . . . . .	374
<i>newcombi</i> Pfeiffer ( <i>Succinea</i> ) = <i>patula</i> Mighels ( <i>Succinea</i> ) . . . . .	389
<i>newcombianus</i> Pfeiffer ( <i>Bulimus</i> ) = <i>pfeifferi</i> Newcomb ( <i>Newcombia</i> ) . . . . .	332
<i>nigrolabris</i> Smith ( <i>Amastra</i> ) = <i>spirizona</i> Fér., var. ( <i>Amastra</i> ) . . . . .	344
<i>nivosa</i> Newcomb ( <i>Ach.</i> ) = <i>abbreviata</i> Reeve ( <i>Ach.</i> ) . . . . .	395
<i>nobilis</i> Pfeiffer ( <i>Ach.</i> ) = <i>lorata</i> Fér. ( <i>Ach.</i> ) . . . . .	393
<i>nucleola</i> Reeve ( <i>Ach.</i> ) = <i>albolabris</i> Newcomb ( <i>Amastra</i> ) . . . . .	333
<i>nuttalli</i> Récluz ( <i>Neritina</i> ) = <i>cariosa</i> Gray ( <i>Neritina</i> ) . . . . .	398
<i>nympha</i> Gulick ( <i>Ach.</i> ) = <i>byronii</i> Wood, var. ( <i>Ach.</i> ) . . . . .	306
<i>oahuensis</i> Green ( <i>Achatina</i> ) = <i>turritella</i> Fér. ( <i>Amastra</i> ) . . . . .	346
<i>obclavata</i> Pfeiffer ( <i>Ach.</i> ) = <i>sandwicensis</i> Pfeiffer ( <i>Leptach.</i> ) . . . . .	368

	PAGE
<i>obeliscus</i> Reeve ( <i>Achatina</i> ) = <i>turricula</i> Mighels ( <i>Carelia</i> ) . . . . .	374
<i>obeliscus</i> Pfeiffer ( <i>Ach.</i> ) = <i>newcombi</i> Pfeiffer ( <i>Auriculella</i> ) . . . . .	377
<i>obliqua</i> Gulick ( <i>Ach.</i> ) = <i>bulimoides</i> Swainson ( <i>Ach.</i> ) . . . . .	306
<i>obscura</i> Newcomb ( <i>Ach.</i> ) = <i>moesta</i> Newcomb ( <i>Amastra</i> ) . . . . .	340
<i>obtusangula</i> Pfeiffer ( <i>Helix</i> ) = <i>exaequata</i> Gould ( <i>Philonesia</i> ) . . . . .	283
<i>octavula</i> Paetel ( <i>Leptach.</i> ) = <i>sandwichensis</i> Pfeiffer ( <i>Leptach.</i> ) . . . . .	368
<i>oomorpha</i> Gulick ( <i>Ach.</i> ) = <i>bulimoides</i> Swainson ( <i>Ach.</i> ) . . . . .	306
<i>owaihiensis</i> Chamisso ( <i>Auric.</i> ) = <i>auricula</i> Fér. ( <i>Auriculella</i> ) . . . . .	375
<i>pallida</i> Nuttall ( <i>Ach.</i> ) = <i>lorata</i> Fér. ( <i>Ach.</i> ) . . . . .	303
<i>papillosa</i> Gray ( <i>Neritina</i> ) = <i>granosa</i> Sby. ( <i>Neritina</i> ) . . . . .	398
<i>parvula</i> Gulick ( <i>Ach.</i> ) = <i>vitrea</i> Gould ( <i>Leptach.</i> ) . . . . .	372
<i>patula</i> Smith ( <i>Auric.</i> ) = <i>diaphana</i> Smith ( <i>Auric.</i> ) . . . . .	376
<i>perforata</i> Gulick ( <i>Ach.</i> ) = <i>terebra</i> Newcomb ( <i>Ach.</i> ) . . . . .	319
<i>perversa</i> Swainson ( <i>Ach.</i> ) = <i>decora</i> Fér. ( <i>Ach.</i> ) . . . . .	301
<i>peva</i> Gulick ( <i>Ach.</i> ) = <i>buddii</i> Newcomb ( <i>Ach.</i> ) . . . . .	321
<i>phaeozona</i> Gulick ( <i>Ach.</i> ) = <i>ovata</i> Newcomb ( <i>Ach.</i> ) . . . . .	308
<i>pica</i> Swainson ( <i>Ach.</i> ) = <i>apexfulva</i> Dixon ( <i>Ach.</i> ) . . . . .	298
<i>planospira</i> Pfeiffer ( <i>Ach.</i> ) = <i>decipiens</i> Newcomb ( <i>Ach.</i> ) . . . . .	307
<i>platystyla</i> Gulick ( <i>Ach.</i> ) = <i>glabra</i> Newcomb ( <i>Ach.</i> ) . . . . .	307
<i>plumata</i> Gulick ( <i>Ach.</i> ) = <i>buddii</i> Newcomb ( <i>Ach.</i> ) . . . . .	321
<i>polymorpha</i> Gulick ( <i>Ach.</i> ) = <i>apicata</i> Pfeiffer, var. ( <i>Ach.</i> ) . . . . .	299
<i>ponderosa</i> Ancey ( <i>Auric.</i> ) = <i>crassula</i> Smith ( <i>Auric.</i> ) . . . . .	376
<i>prasina</i> Reeve ( <i>Ach.</i> ) = <i>olivacea</i> Reeve ( <i>Ach.</i> ) . . . . .	326
<i>pulcherrima</i> Swainson ( <i>Ach.</i> ) = <i>byronii</i> Wood ( <i>Ach.</i> ) . . . . .	306
<i>pulcherrima</i> Reeve ( <i>Ach.</i> ) = <i>vulpina</i> Fér., var. ( <i>Ach.</i> ) . . . . .	328
<i>pulla</i> Pfeiffer ( <i>Ach.</i> ) = <i>pusilla</i> Newcomb ( <i>Amastra</i> ) . . . . .	342
<i>pumila</i> Gulick ( <i>Ach.</i> ) = <i>modesta</i> Adams ( <i>Amastra</i> ) . . . . .	339
<i>pusillus</i> Gould ( <i>Helix</i> ) = <i>pauzillus</i> Gould ( <i>Vitrea</i> ) . . . . .	279
<i>pygmaea</i> Smith ( <i>Ach.</i> ) = <i>curta</i> Newcomb ( <i>Ach.</i> ) . . . . .	323
<i>radiata</i> Pfeiffer ( <i>Ach.</i> ) = <i>viridans</i> Mighels ( <i>Ach.</i> ) . . . . .	310
<i>recta</i> Newcomb ( <i>Ach.</i> ) = <i>byronii</i> Wood, var. ( <i>Ach.</i> ) . . . . .	306
<i>reevei</i> Adams ( <i>Ach.</i> ) = <i>livida</i> Swainson ( <i>Ach.</i> ) . . . . .	325
<i>rhodoraphie</i> Smith ( <i>Ach.</i> ) = <i>curta</i> Newcomb ( <i>Ach.</i> ) . . . . .	323
<i>rohri</i> Pfeiffer ( <i>Bulimus</i> ) = <i>virgulata</i> Mighels ( <i>Ach.</i> ) . . . . .	320
<i>rotundata</i> Gould ( <i>Succinea</i> ) = <i>patula</i> Mighels ( <i>Succinea</i> ) . . . . .	389
<i>rubens</i> Pfeiffer ( <i>Ach.</i> ) = <i>mastersi</i> Newcomb ( <i>Amastra</i> ) . . . . .	339
<i>rubiginosa</i> Gould ( <i>Helix</i> ) = <i>jugosa</i> Mighels ( <i>Endodonta</i> ) . . . . .	290
<i>rubiginosa</i> Newcomb ( <i>Ach.</i> ) = <i>taeniolata</i> Pfeiffer ( <i>Ach.</i> ) . . . . .	310
<i>rudis</i> Pfeiffer ( <i>Ach.</i> ) = <i>spirazona</i> Fér., var. ( <i>Amastra</i> ) . . . . .	344
<i>rustica</i> Gulick ( <i>Amastra</i> ) = <i>affinis</i> Newcomb ( <i>Amastra</i> ) . . . . .	333
<i>rutula</i> Newcomb ( <i>Ach.</i> ) = <i>viridans</i> Mighels ( <i>Ach.</i> ) . . . . .	311
<i>sandwichensis</i> Clessin ( <i>Physa</i> ) = <i>binominis</i> Sykes ( <i>Linnaea</i> ) . . . . .	391
<i>sandwichensis</i> Philippi ( <i>Limnaca</i> ) = <i>oahuensis</i> Souleyet ( <i>Limnaca</i> ) . . . . .	392
<i>sandwichensis</i> Deshayes ( <i>Neritina</i> ) = <i>cariosa</i> Gray ( <i>Neritina</i> ) . . . . .	398
<i>scitula</i> Gulick ( <i>Ach.</i> ) = <i>decipiens</i> Newcomb ( <i>Ach.</i> ) . . . . .	307
<i>semicarinata</i> Newcomb ( <i>Ach.</i> ) = <i>variabilis</i> Newcomb, var. ( <i>Ach.</i> ) . . . . .	320
<i>seminigra</i> Lamarck ( <i>Monodonta</i> ) = <i>apexfulva</i> Dixon ( <i>Ach.</i> ) . . . . .	298
<i>setigera</i> Gould ( <i>Helix</i> ) = <i>hystrix</i> Pfeiffer ( <i>Endodonta</i> ) . . . . .	290
<i>similaris</i> Pease ( <i>Amastra</i> ) = <i>rugulosa</i> Pease, var. ( <i>Amastra</i> ) . . . . .	354

	PAGE
<i>simulans</i> Reeve ( <i>Ach.</i> ) = <i>vittata</i> Reeve ( <i>Ach.</i> ) . . . . .	304
<i>sinistrorsa</i> Chamisso ( <i>Auric.</i> ) = <i>auricula</i> Fér. ( <i>Auric.</i> ) . . . . .	375
<i>solida</i> Gulick ( <i>Ach.</i> ) = <i>splendida</i> Newcomb ( <i>Ach.</i> ) . . . . .	318
<i>solidissima</i> Sby. ( <i>Neritina</i> ) = <i>cariosa</i> Gray ( <i>Neritina</i> ) . . . . .	398
<i>souleyeti</i> Ancey ( <i>Succinea</i> ) = <i>cepulla</i> Gould ( <i>Succinea</i> ) . . . . .	386
<i>spadicea</i> Gulick ( <i>Ach.</i> ) = <i>ovata</i> Newcomb ( <i>Ach.</i> ) . . . . .	308
<i>stewarti</i> Green ( <i>Achatina</i> ) = <i>vulpina</i> Fér., var. ( <i>Ach.</i> ) . . . . .	328
<i>striatula</i> Pease ( <i>Pupa</i> ) = <i>lyrata</i> Gould ( <i>Pupa</i> ) . . . . .	294
<i>subula</i> Gulick ( <i>Ach.</i> ) = <i>gracilis</i> Pfeiffer ( <i>Leptach.</i> ) . . . . .	363
<i>suffusa</i> Reeve ( <i>Ach.</i> ) = <i>gravida</i> Fér. ( <i>Amastra</i> ) . . . . .	350
<i>swiftii</i> Newcomb ( <i>Ach.</i> ) = <i>cestus</i> Newcomb, var. ( <i>Ach.</i> ) . . . . .	300
<i>talpina</i> Gulick ( <i>Ach.</i> ) = <i>gouldi</i> Newcomb ( <i>Ach.</i> ) . . . . .	313
<i>torrida</i> Gulick ( <i>Ach.</i> ) = <i>rugosa</i> Newcomb ( <i>Ach.</i> ) . . . . .	309
<i>tricolor</i> Smith ( <i>Ach.</i> ) = <i>vulpina</i> Fér., var. ( <i>Ach.</i> ) . . . . .	328
<i>triticea</i> Gulick ( <i>Ach.</i> ) = <i>oryza</i> Pfeiffer ( <i>Leptach.</i> ) . . . . .	367
<i>tuba</i> Gulick ( <i>Ach.</i> ) = <i>tappaniana</i> Adams ( <i>Ach.</i> ) . . . . .	318
<i>tuberosus</i> Gulick ( <i>Apex</i> ) = <i>cestus</i> Newcomb ( <i>Ach.</i> ) . . . . .	300
<i>tumefactus</i> Gulick ( <i>Apex</i> ) = <i>vittata</i> Reeve ( <i>Ach.</i> ) . . . . .	304
<i>turbiniiformis</i> Gulick ( <i>Apex</i> ) = <i>cestus</i> Newcomb ( <i>Ach.</i> ) . . . . .	300
<i>turgida</i> Newcomb ( <i>Ach.</i> ) = <i>cestus</i> Newcomb ( <i>Ach.</i> ) . . . . .	300
<i>umbilicata</i> Pfeiffer ( <i>Ach.</i> ) = <i>petricola</i> Newcomb ( <i>Amastra</i> ) . . . . .	341
<i>umbrosa</i> Baldwin ( <i>Amastra</i> ) = <i>pullata</i> Baldwin ( <i>Amastra</i> ) . . . . .	342
<i>undosa</i> Gulick ( <i>Ach.</i> ) = <i>perdix</i> Reeve ( <i>Ach.</i> ) . . . . .	315
<i>undulata</i> Newcomb ( <i>Ach.</i> ) = <i>curta</i> Newcomb ( <i>Ach.</i> ) . . . . .	323
<i>valida</i> Pfeiffer ( <i>Ach.</i> ) = <i>cestus</i> Newcomb, var. ( <i>Ach.</i> ) . . . . .	300
<i>varia</i> Gulick ( <i>Ach.</i> ) = <i>vulpina</i> Fér., var. ( <i>Ach.</i> ) . . . . .	328
<i>variabilis</i> Pease ( <i>Carelia</i> ) = <i>olivacea</i> Pease ( <i>Carelia</i> ) . . . . .	374
<i>ventrosa</i> Pfeiffer ( <i>Ach.</i> ) = <i>lorata</i> Fér. ( <i>Ach.</i> ) . . . . .	303
<i>venulata</i> Newcomb ( <i>Ach.</i> ) = <i>producta</i> Reeve ( <i>Ach.</i> ) . . . . .	326
<i>versicolor</i> Gulick ( <i>Apex</i> ) = <i>decora</i> Fér., var. ( <i>Ach.</i> ) . . . . .	301
<i>respertina</i> Baldwin ( <i>Ach.</i> ) = <i>apicata</i> Pfeiffer, var. ( <i>Ach.</i> ) . . . . .	299
<i>vestita</i> Mighels ( <i>Ach.</i> ) = ? <i>vittata</i> Reeve ( <i>Ach.</i> ) . . . . .	304
<i>virens</i> Gulick ( <i>Ach.</i> ) = <i>vulpina</i> Fér. ( <i>Ach.</i> ) . . . . .	327
<i>viridans</i> Reeve ( <i>Ach.</i> ) = <i>livida</i> Swainson ( <i>Ach.</i> ) . . . . .	325
<i>volutata</i> Gould ( <i>Limnaca</i> ) = <i>oahuensis</i> Souleyet ( <i>Limnaca</i> ) . . . . .	392
<i>whatelyi</i> Newcomb ( <i>Ach.</i> ) = <i>glabra</i> Newcomb ( <i>Ach.</i> ) . . . . .	307

## § 5. List of unidentified, or erroneously recorded, forms.

	PAGE
<i>antoni</i> Pfeiffer ( <i>Helicina</i> ) . . . . .	397
<i>aperta</i> Lea ( <i>Succinea</i> ) . . . . .	390
<i>apicalis</i> Ancey ( <i>Succinea</i> ) . . . . .	390
<i>approximata</i> Shuttlw. ( <i>Succinea</i> ) . . . . .	390
<i>crassilabris</i> Philippi ( <i>Helicina</i> ) . . . . .	397
<i>exserta</i> Pfeiffer ( <i>Helix</i> ) . . . . .	293
<i>ferruginea</i> Baldwin ( <i>Amastra</i> ) . . . . .	356
<i>fornicata</i> Gould ( <i>Helix</i> ) . . . . .	293
<i>fulgora</i> Gould ( <i>Helicina</i> ) . . . . .	397
<i>kauaiensis</i> Pfeiffer ( <i>Bulimus</i> ) . . . . .	399
<i>olesonii</i> Baldwin ( <i>Achatinella</i> ) . . . . .	329
<i>pisum</i> Philippi ( <i>Helicina</i> ) . . . . .	397
<i>pudorina</i> Gould ( <i>Succinea</i> ) . . . . .	390
<i>punicatus</i> Mighels ( <i>Bulimus</i> ) . . . . .	379
<i>pusilla</i> Gould ( <i>Partula</i> ) . . . . .	379
<i>sandwichensis</i> Pfeiffer ( <i>Spiraxis</i> ) . . . . .	399
<i>sandwichensis</i> Pfeiffer ( <i>Helix</i> ) . . . . .	293
<i>striolata</i> Pease ( <i>Opeas</i> ) . . . . .	384
<i>tenerrima</i> Ancey ( <i>Succinea</i> ) . . . . .	390
<i>terrestris</i> Pease ( <i>Partula</i> ) . . . . .	399
<i>testudinea</i> Baldwin ( <i>Amastra</i> ) . . . . .	356

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## THE EARTHWORMS OF THE HAWAIIAN ARCHIPELAGO.

By Frank E. Beddard, M.A., F.R.S., Prosector and Vice-Secretary of the  
Zoological Society of London.

SOME of the specimens which I have received from the Hawaiian archipelago have been already described by me<sup>1</sup>. Since the publication of that paper Mr Perkins has sent a second series of bottles containing a large number of fresh individuals. In the present memoir upon the earthworm fauna of this part of the world I deal with the entire series of specimens and attempt to give a complete account of all the earthworms which have been described from the Hawaiian islands, whether they are or are not contained in the collections which I have myself examined. The collections made by Mr Perkins consist of so many individuals that they probably present a very fair specimen of the Oligochaetous fauna of Hawaii. It is therefore permissible to point out what appear to me to be justifiable deductions from the material examined. The fact that the second set of specimens contained hardly anything that was not in the first set supports my contention that I have been able to study a very representative collection.

Dr Michaelsen<sup>2</sup> in criticising my previous paper upon this subject advanced the opinion that there are no truly indigenous worms in these oceanic islands. I myself pointed out the absence of really peculiar forms, a general feature of oceanic islands and which at least argues their comparatively short existence. Dr Michaelsen attributes the entire earthworm fauna to transference by man. A further study of the matter inclines me to agree with him.

There are many species of Lumbricidae contained in the collections which I have examined; and the list which I gave originally can be increased. But the subject does not demand, I believe, more than a mere list of the species. They are clearly to be regarded as importations due to man.

<sup>1</sup> On some Earthworms from the Sandwich Islands, &c. P. Z. S. 1896, pp. 194-211.

<sup>2</sup> Oligochaeten von den Inseln des Pacific. Zool. Jahrb. Syst. XII. 1899, p. 211.

## ALLOLOBOPHORA Savigny.

- (1) *Allolobophora putris* Hoffm. (This apparently is the same as Kinberg's "*Hypogaeon havaicum*.")
- (2) *A. foetida* (Savigny).
- (3) *A. caliginosa* (Savigny).
- (4) *A. nordenskioldii* Eisen.
- (5) *A. limicola* Michaelsen.
- (6) *A. rosea* (Savigny).

## PONTOSCOLEX Schmarda.

*Pontoscolex hawaiiensis* Beddard, P. Z. S., 1896, p. 196.

The ubiquitous genus *Pontoscolex* occurs in the Hawaiian archipelago. I formed a new species for the representatives of this genus which were collected by Mr Perkins chiefly on the ground that the dorsal vessel was usually double for a certain extent. Dr Michaelsen has criticised my conclusion; and it may be that he is right. In any case the genus and species which are at least hard to distinguish from the South American *P. corethrus* occur in the most widely separated regions of the globe. Dr Eisen however<sup>1</sup> has lately commenced a detailed study of this genus, so that the matter of the specific identity or difference of the specimens of *Pontoscolex* found scattered over the world had better be left alone for the present.

## AMYNTAS Kinberg.

The main earthworm inhabitants of this archipelago belong to the genus *Amyntas* as I think (following Michaelsen<sup>2</sup>) it should now be called. The much better name *Perichaeta* was used for a Dipteran genus before it was applied to an earthworm; and it appears to me, in spite of the ingenious protest of Horst<sup>3</sup>, that there is no way of escaping from the conclusion that a name once used cannot be resuscitated. One unrecognisable species "*Perichaeta corticis*" has been described by Kinberg<sup>4</sup>. The remaining species are the following:—

- (1) *Amyntas peregrinus* Fletcher.

*Perichaeta peregrina* Fletcher, Proc. Linn. Soc. N. S. W. (2), 1. p. 969.

*Perichaeta molokaiensis* Beddard, P. Z. S. 1896, p. 201.

*Perichaeta floweri* Benham, Journ. Linn. Soc. xxvi. p. 217.

<sup>1</sup> Researches in American Oligochaeta, &c. P. Calif. Ac. Sci. (3), 11. p. 87.

<sup>2</sup> Terricolon von verschiedenen Gebieten der Erde. JB. Hamb. wiss. Anst. xvi. Beiheft 2.

<sup>3</sup> Zool. Anzeig. 1890, p. 6.

<sup>4</sup> Annulata nova. Öfv. k. Svensk. Ak. Förh. 1866.

Michaelsen has suggested that the species which I described in my preliminary paper as *Perichaeta molokaiensis*, is really identical with Fletcher's *Perichaeta peregrina*, or is at least to be regarded as a "fragliches synonym." At the time that I described that species I was not so convinced as I am now of the unimportance of size as a distinguishing characteristic of species of this genus. Fletcher described his species as being 19 cm. in length, i.e. nearly double the length of the individuals of "*Perichaeta molokaiensis*" examined by myself. Moreover Fletcher has not given any details about the clitellar setae, beyond stating that they are present. This again is a matter which is apparently not of such importance as I thought; that is to say, the same species may have setae upon one, two or three or perhaps even none of the clitellar segments.

There can I think be no doubt as to the identity of Benham's "*Perichaeta floweri*" with the present species. Benham states that there are 12 setae between the male pores, which is the number given by Fletcher. I counted 15 in my specimens. But the difference is clearly negligible. Benham particularly mentions the clitellar setae as being present on segment 16 only, a state of affairs which I found also. None of the three forms comprised in the present species possess copulatory papillae; hence it is now probably to be taken as a character of this species. In this as in all other points I can detect no differences between the descriptions of Benham and of myself. We are clearly dealing with the same species, which being with very great probability—almost amounting to certainty—identical with that described as "*Perichaeta peregrina*" by Fletcher, must bear that name. I now give for the sake of others who may doubt this identification a description of my specimens.

The two individuals of this species which I have examined were 103 and 81 mm. respectively in length. The former specimen possessed 88 segments, the latter 93.

The prostomium is small and continued by grooves on to the first half of the first segment.

The dorsal pores commence upon segments 10, 11, and are visible upon the clitellum.

The clitellum occupies the usual segments, 14—16, and has few setae upon its last segment.

The male pores are not prominent and are separated by 15 setae.

I observed no genital papillae.

The first septum separates segments 4, 5; none are thickened specially.

The gizzard occupies the usual segments which are not divided by septa.

The intestine begins in 15; the caeca are present and not large.

The sperm sacs are large and occupy segments 11, 12.

The spermiducal glands extend from segments 17—21 or 22; they are broken up into lobes which have to some extent a relation to the segmentation of the gland. The curved duct communicates directly with the exterior and not through the intermediary of a terminal dilated sac.

The spermathecae are four pairs in 6—9. The pouch is sharply marked off from the long duct. The diverticulum ending in an oval dilatation is about as long as the duct part of the main pouch.

HAB. Molokai and Mauna Loa.

(2) *Amyntas heterochaeta* Mich.

*Perichaeta heterochaeta* Michaelsen, Abhandl. nat. Vereins Hamb. xi. p. 6.

*P. indica* Michaelsen, Arch. f. Naturg. 1892, p. 33; nec *P. indica* Horst, Vermes in Midden Sumatra, iv. p. 4.

It is rather a curious fact that the non-identity of the worm which has been called by many persons, including myself, *Perichaeta indica* with the species described by Dr Horst under that name in the memoir quoted above has not been noticed. In that memoir Dr Horst distinctly figures a terminal sac ("Kopulationstasche") to the duct of the "prostate" gland. His figures of "Eine *Perichaeta* von Java"<sup>1</sup> on the other hand do not show this duct with such a terminal swelling and refer to the species which has since been called *Perichaeta indica*. It is clear that the proper name to refer to this specimen of Dr Horst must be Dr Michaelsen's name of *Perichaeta heterochaeta*, in which no such copulatory pouch is mentioned and which in other respects agrees with the worm which has everywhere received the name of *Perichaeta indica*. If it were certain, which it is not, that M. Vaillant described only one species under the name of *Perichaeta cingulata*, then that would have to be the name for the species described by Horst, for it agrees in the presence of the terminal sac where the male gland opens on to the exterior, and in some other points.

Dr Michaelsen would include as synonymous with this species my *Perichaeta nipponica*; I think that that species may be synonymous. But that is a matter which I shall enter into on a future occasion.

I now think that I was wrong in differentiating the species *P. perkinsi*. Dr Michaelsen, chiefly for the reason that he received an example from Ceylon with papillae near to the male pores, identified my species with the one called here *Amyntas heterochaeta*. I should mention however that the fact that the union of the vas deferens with the male duct is not until near to the external orifice appears to characterise at least the individual which I examined. I found in glycerine preparation of two examples of undoubted "*indica*" that there was the more general union shortly after the duct emerged from the gland.

Dr Michaelsen and I myself have called attention to the variability which this species exhibits in the presence and number of the anterior papillae and in the presence or absence of the glandular part of the male terminal apparatus. Among the very

<sup>1</sup> Nederl. Arch. f. Zool. iv.

numerous examples which I have examined from the Sandwich Islands I find the following state of affairs with regard to these variable structures. In 22 examples there were no glands at all; 13 had glands; in 26 specimens the glands were either small and on both sides or only present and small or well developed on one side. The proportions seem to show that the gland is disappearing. As to the head papillae—there were none at all in 24; in 14 there were three pairs on 7, 8; in 3 there were pairs on 7, 8, 9; in one there were pairs on 8, 9; in 10 there was a pair on 8; in one there were pairs on 6, 7, 8; in 52 there were various degrees of asymmetry, sometimes none being present on one side.

Examples of the species were obtained on Maui, Mauna Loa Hawaii, Halemanu Kauai, Kilauea Hawaii, Olaa Hawaii, Haleakala Maui, Iao valley Maui, Honolulu in imported earth from China.

(3) *Amyntas hesperidum* Beddard.

*Perichaeta hesperidum* F. E. Beddard, Proc. Zool. Soc. 1892, p. 169.

*Perichaeta sandvicensis* Id., *ibid.* 1896, p. 203.

In my earlier paper upon this species founded upon the first gathering of Hawaiian worms I instituted a new species for some smallish worms from several islands of the archipelago. I have since re-examined the two original specimens of *Amyntas hesperidum* which I have still by me, and have compared them with some fresh individuals undoubtedly belonging to the same species but coming from Hong Kong. The result is that I have to make one or two slight corrections in my earliest account of *A. hesperidum*. I thought that I had noted a small terminal muscular bursa in that species; but on again studying the specimens and comparing them carefully with others I find that what I took to be this distinctive structure was only the commencement of the thick investing layers of the spermiducal gland duct as it traverses the body wall. There is in fact no terminal bursa. In all the specimens the spermathecae, though lying in segments 7 and 8, as I correctly stated, open backwards, i.e. in the inter-segmental furrows 7, 8; 8, 9, as I also stated. I now find that this is also the case with *Perichaeta sandvicensis*. The spermathecae as a rule lie in the 7th and 8th segments but open at the posterior margins of those segments. In both worms the diverticulum is coiled and the spermiducal gland has a rather sinuous duct which passes rather forwards on its way from the gland to the exterior. In short I can detect no differences at all between the individuals which I have referred to two species. The older name must clearly have the priority and thus I must term these Sandwich Island worms *Amyntas hesperidum*, inapt though the name undoubtedly is.

This is a prevalent species in the gatherings from the islands. In my preliminary account of the Sandwich Island worms I recorded it from Mauna Loa, Lanai, Hawaii

and Molokai. I have seen in the second collection forwarded to me additional specimens from Mauna Loa. I can thus improve somewhat upon my original description of this species. It is a smallish slender worm measuring up to 100 mm. in length with a diameter of about 3 mm. The number of segments is curiously constant in the individuals which I selected for counting. In two the number was 105, in a third 104. The lengths of these specimens varied somewhat—from 82 through 98 to 100 mm. It is interesting to note the constancy of the number of segments. The differences in length are of course not sufficient to be of importance and are to be accounted for by the different degrees of contraction of the individuals.

The dorsal pores commence between segments 11, 12, and are visible upon the clitellum.

The setae of a given series of segments number as follows: 1. 21; 5. 33; 12. 52; 16. 53. The setae of the first two segments are small; those of the next four are stronger, after which segments they again diminish in size.

The clitellum is sharply marked off from the segments adjacent to it and both commences and ends with its own proper segments. I could not discover any setae upon it.

Neither could I find anywhere upon the body of the worms genital papillae. The male pores are upon the usual segment; they are slightly expanded transversely and have therefore an eye-like outline. They are fairly conspicuous; in one case the end of the spermiducal gland duct was protruded for a little way. The two pores are separated by 18 setae.

There are three fairly stout intersegmental septa in front of the gizzard which are bound to each other by numerous muscular threads in the usual way; after the gizzard come two strong septa to the anterior of which the gizzard itself is bound at its posterior end by at least five muscular straps. In a specimen from Lanai septum 8/9 was present but thin.

The gizzard has the usual position that it has in this genus. The intestinal caeca are present, but are small and simple; they occupy not more than two segments.

The last of the "hearts" is in segment 13.

The two pairs of sperm sacs are in segments 11, 12; the sperm reservoirs as also usual in segments 10, 11; of the latter the anterior pair are sometimes larger than the posterior

The spermiducal glands are much incised and occupy not more than three segments. Their muscular duct is longish and curved and is unprovided with a terminal copulatory dilatation. As to the form of the spermiducal glands it is often possible to use their characteristics as apparently valid specific distinctions. But it is necessary to be accurate in their delineation and cautious as to laying too much stress upon certain features in distinguishing species, as is shown by the present species. In most of those which I examined the gland had a somewhat ear-like form, the lower

margin curving upwards and forwards like the lobe of the ear. But in one example the gland was quadrangular though only occupying four segments and deeply incised in correspondence therewith.

The spermathecae are two pairs and lie in segments 7 and 8, but open on 7, 8; 8, 9. The oval pouch has a moderately long duct to which is appended a small twisted diverticulum which is sometimes longer and sometimes shorter.

We can extract from the foregoing the following definition of the species:

Size small, 100 mm.; number of segments 105. Dorsal pores from 11, 12.

Number of setae per segment up to 53. Clitellum 14—16, without setae.

No papillae. Septum 8/9 missing. Caeca present. Last heart in 13.

Sperm sacs 11, 12. Spermiducal glands not very large; duct without end sac.

Spermathecae 7, 8, with twisted tubular diverticulum.

*Remarks.* Dr Michaelsen has put forward grounds for believing that this species is really Dr Horst's *Amyntas annulata*. I myself suspected a possible identity. Dr Horst's original description of *annulata*, written some years ago when there was no difficulty in distinguishing from each other the very few species of the genus at that time known, was hardly complete enough for present requirements. He gives me moreover by letter good reasons for denying the identity.

Nor is there much change required to derive this form from the prevalent *Amyntas hawayanus*. I desire again to refer in connection with this possibility to a species described by myself some years since as *Perichaeta hesperidum*. That species, two individuals, arrived together with a form which I shall refer to here, *barbadensis*. The worm differs however from *barbadensis* (I have satisfied myself by a renewed examination) in a number of points. The clitellum begins and ends sharply at the boundary lines of segments 13, 14, and 16, 17, and has no setae. The spermathecae are in segments 8, 9, or at any rate open on to the boundary lines 7, 8; 8, 9. The pouches differ from those of *hawayanus* in having much coiled diverticula; the duct of the spermiducal gland thins towards its end, is longish and rather curved and has not really a terminal bulbous as I said in my original description. I have since met with other examples of the same worm from Hong Kong in a bottle containing also examples of *barbadensis*. I have examined four of these, all that I had. They have no setae on the clitellum, which commences and ends "sharply." The length is from 80—100 mm. There are no genital papillae nor are there setae upon any segment of the clitellum. The last heart is in segment 13 as is usual; the caeca are quite normal in position and present no special features of interest. The sperm sacs have a constricted-off free end as in so many forms. The spermathecae are two pairs and lie in 8 and 9 or at least open in the intersegmental grooves 7, 8; 8, 9. The diverticulum of the pouches is only of moderate length—not so long or not longer than the pouch—and is more or less

closely coiled. The duct of the spermiducal gland is directed rather forward, as is so often the case in *barbadensis*, and is rather curved, especially at the end, where it is distinctly thinner. This thin termination was not observable in one individual in which the male pores had the appearance of being somewhat everted. These worms are undoubtedly my *hesperidum*.

It is interesting to find from three distant parts of the world specimens of a worm associated with a form from which they can be easily derived, by a reduction of the number of spermathecae, and by an emphasising of the slightly coiled diverticulum of the parent (?) form, by the loss of genital papillae and setae on the clitellum. The coincidences are at least noteworthy.

If we are to assume that the migration of the genus *Amyntas* from the Oriental region is due always to the interference of man, it is most peculiar that they should have been exported in lots of corresponding species. I do not however at present do more than emphasise the facts which are as has been stated above.

(4) *Amyntas hawayanus* Rosa.

*Perichaeta hawayana* Rosa, Ann. k. k. Hofmus. Wien, 1891, p. 396.

*Perichaeta bermudensis* Beddard, P. Z. S. 1892, p. 160

*Perichaeta barbadensis* Beddard, *ibid.* p. 167.

*Perichaeta morrissi* Beddard, *ibid.* p. 166.

*Perichaeta mauritiana* Beddard, *ibid.* p. 170.

*Perichaeta mandhorensis* Michaelsen, Arch. f. Naturg. 1892, p. 241.

*Perichaeta pallida* Michaelsen, *ibid.* p. 227.

*Perichaeta amazonica* Rosa, Atti R. Ac. Torino, 1894, p. 4.

*Perichaeta cupulifera* Fedarb, Proc. Zool. Soc. 1898, p. 445.

The collection contains a considerable number of examples of *A. hawayanus*. These show so many variations that I believe myself to be able to justify the above rather formidable list of synonyms, which are a little more extensive than the list given by Dr Michaelsen<sup>1</sup> in a recent paper. My original description of *Perichaeta bermudensis* was published when I was unaware of Dr Rosa's *Perichaeta hawayana*, though his publication<sup>2</sup> seems to antedate mine. I was led in my "Monograph of the Oligochaeta" to adhere to my species *bermudensis* on account of the fact that Dr Rosa did not mention in his description the larger size of the setae upon the anterior segments, nor the presence of setae upon the last segment of the clitellum. The number of papillae in the neighbourhood of the male pores seemed too to be different in the two series of worms from Hawaii and from the Bermudas. In the series of specimens in the

<sup>1</sup> Die Terricolen des Madagassischen Inselgebietes. Abh. senck. naturf. Ges. 1897, p. 234.

<sup>2</sup> Die exotischen Terricolen, &c. Ann. k. k. Hofmus. Wien 1891, p. 396.

collection made by Mr Perkins I find the following variations in structure, from what may perhaps be regarded as the typical organisation of this species. The number of the papillae in the neighbourhood of the male pores varies; I have found only one or two, three or four; Rosa says two or three. In one example however I found six of these papillae on each side.

The number of the papillae therefore does not allow of a separation of *hawayanus* and *bermudensis*.

The setae upon the anterior segments are larger than those which follow; in one example segments 4—7 were furnished with these larger setae. This was originally one of the reasons for separating *bermudensis* from *hawayanus*.

The clitellum was described by Rosa to stop short at the middle or thereabouts of the 16th segment. I have observed both this arrangement and that generally found in *bermudensis*, i.e. that the clitellum does not commence accurately at the beginning of the 14th segment while it stops short as in the typical *hawayanus*. In one example the clitellum was exactly coincident with segments 14—16.

The clitellum has usually setae upon its last segment, i.e. the 16th of the body. There are ten to fifteen of these setae. In two examples I could see no setae anywhere upon the clitellum. This seems to have been the case with the individuals examined by Rosa. *A. bermudensis* appears to always have setae upon this segment.

A feature not yet recognised in the worms which I referred to the species *bermudensis* was found in two examples of *hawayanus*. In one of them there was a pair of papillae anterior in position lying on the 7th segment near to its posterior end and the orifices of the spermathecae. In a ripe individual there was but one of these papillae, that of the right side. This fact will be seen presently to bear upon the identity of the present species with others hitherto supposed to differ specifically from it. As to internal characters the caecum of the intestine has not always the series of short outgrowths on the under surface that has been described for this species and for *bermudensis*. The spermiducal gland is generally long, occupying segments 17—22 about. Sometimes the duct is given off at the top when the gland commences in segment 17. In one specimen the gland was much abbreviated and lay only in 18, 19 on one side and 17, 18 on the other. This looks like a commencing loss of the gland which is known to occur in some other species, e.g. *Amyntas heterochaeta*. The spermathecae seem always to lie in segments 6, 7, 8. In one example they were particularly large; but, as this individual had no other features which seemed to remove it from the species, the difference in size (the pouches were as large as the gizzard) does not seem to be more than a variation to be neglected for systematic purposes.

The size of *Amyntas hawayanus* varies to some extent. The greatest and least lengths which I observed were 150 and 69 mm. The number of segments varied between 97 and 73.

Next as to the identity of *Amyntas hawayanus* with *A. barbadensis*—the original

specimens of the latter were described by me from Kew Gardens, where they had been received from Barbados. In the collection of Sandwich-Islands worms before me there are a number of specimens of this species found at Honolulu in earth imported from China. Of these I have examined seven individuals.

Their size presents no difficulty for identification. They vary from 99 to 140 mm. The clitellum occupies segment 14 to about the middle of segment 16. In two specimens I found setae to be limited to the 16th segment; in the others there were setae on all the clitellar segments, but very few on 14 and 15. In one specimen the numbers on the three segments beginning with 14 are 8, 3, 15; in another 2, 2, 10. These figures agree broadly with my previous observations upon this species.

In several cases I found that the setae upon the anterior segments of the body are as in *Amyntas hawayanus* larger than those posteriorly. Segments 3—8 appeared to be thus distinguished.

The arrangement of the genital papillae is as follows:

There are either two or three in the neighbourhood of the male pores, sometimes only one. They lie either in an oblique row or in the case where there are two, one behind the other. There is in fact no difference here from the conditions which obtain in *hawayanus*.

In addition to these posteriorly placed genital papillae there are anterior papillae. One individual had a pair on segment 7; another a median papilla on the same segment. There is here again no practical difference from *A. hawayanus*.

As to internal characters the prevalent number of spermathecae is three pairs situated as are those of *A. hawayanus*. In one specimen only were there but two pairs of these organs placed in segments 6, 7. The sperm sacs often, but not always, show a constriction near to the free end, by which a small "knob" is divided off from the rest of the sac. As in *A. hawayanus* there are at least often two pairs of egg sacs in segments 13, 14. The spermiducal glands are long, occupying segments 17—21, as in *A. hawayanus*, and as in that species there is no terminal "Kopulationstasche" into which the duct of the gland opens. A character which seems to be peculiar to these worms is the occasional duplication of the dorsal vessel. I found this in four out of seven examples; the doubling commenced at the 20th segment or thereabouts, and the tube became single again about the 25th. The doubling was complete, the two halves not uniting at the septa where they traversed those plates. Of these variable characters there are only three which do not seem to occur in examples which have been referred to *A. hawayanus* and *A. bermudensis*. These are: setae upon segments 14, 15; occasional doubling of dorsal vessel; knob-like processes of sperm sacs; the presence of only two pairs of spermathecae. Were these or some of these characters united invariably together we might indeed separate the specimens as a different species; but they do not. The one example with spermathecae in 6 and 7 only had, it is true, no

marked difference in size between the anterior and the posterior setae found elsewhere among the examples; and it had a median papilla upon the 7th segment, this segment being occupied in others by a pair of similar papillae. These characters however do not always coincide, for in my original paper describing the species *Perichaeta barbadosensis*, I recorded the fact that in an individual with two pairs of spermathecae there was a single median papilla upon the 7th segment, as well indeed as another occupying a similar place in the 18th. To make a species of this worm we must characterise it by the two pairs of spermathecae and the median anterior instead of paired anterior papillae, as well as by the greater uniformity in the size of the body setae generally. In view of the variations which occur in individuals which no one would thus separate it seems to be unreasonable at least in the meantime to do this.

I may perhaps be allowed to point out that I was justified on the facts as originally known in making a new species for these worms. They then differed as far as was known from *Perichaeta hawayana* in having setae upon all segments of the clitellum, in possessing anterior as well as posterior genital papillae, and finally by generally having but two pairs of spermathecae.

I shall now consider the probable identity of these forms with *Perichaeta morrissi*. This species was originally distinguished from its allies by the following assemblage of anatomical features: small size, 52 mm. with however 93 segments; two pairs of spermathecae in 6, 7; median papillae in 7, 8; glandular bodies in the neighbourhood of the male pores were not seen to open by papillae; but such glands are usually associated with papillae. Rosa<sup>1</sup> described later examples of what appears to be the same species. His examples were larger (up to 80 mm.); setae present on all of the segments instead of only 16; clitellum occupying the whole of segments 14—16 instead of stopping towards the middle of 16; glands near male pores; in one example a median papilla upon 18 was noted; others showed variation in the anterior papillae, in one a median papilla on 6 and a pair on 7 closely approximated in the middle line with a more lateral pair on the same segment and a median papilla on 8. Another had median papillae on 6—8; a third one only on 7. Dr Rosa also found, though it was in a rudimentary condition, the septum separating segments 8, 9.

I have been able to compare with these descriptions some worms from Hong Kong among my stores of *Oligochaeta*. I examined many of these which I refer to the same species.

One was 93 mm. long; two papillae lay by each male pore, and on 7 there were three papillae, one median and two lateral. Setae were present on all segments of the clitellum. In other characters I found no differences from *Perichaeta morrissi* as described.

In a second individual of 80 mm. length there were also two pores in the neigh-

<sup>1</sup> Lombrichi raccolti a Sumatra &c. Ann. Mus. civ. Genova ser. 2a xvi. p. 516.

bourhood of the male pores, but side by side, instead of one in front of the other. Setae of clitellum only on 16.

In a third there was but one papilla to each male pore, and the setae on the clitellum were limited to 16. None of these latter had any anterior genital papillae. A fourth example was 94 mm. in length, with setae only on the last segment of clitellum; the sperm sacs as in the species generally in segments 11, 12, but provided with the small terminal knobs such as I have just referred to in *Perichaeta barbadensis*. The spermathecae appeared to be in 7, 8, instead of 6, 7. In all the prostates were long and had no terminal bulb. I need not enumerate in detail the various arrangements of the genital papillae in these examples from Hong Kong; but I may state generally that they varied excessively in this particular. There were often two to four papillae on the 18th segment between the male pores; it was very general to find a pair of papillae on segment 19 corresponding in position to the male pores on the foregoing segment. I observed a median papilla on each of segments 6—8 in one individual; one was anomalous by reason of the fact that the 7th segment had no less than six papillae arranged in an irregular line along the middle of that segment. The spermathecae were as a rule two pairs in 6, 7. But this character was not absolutely fixed. One specimen had an additional spermatheca in the 8th segment, but on the right side only. In this individual moreover the generally missing septum 8 was present, a circumstance which Rosa has stated for *Perichaeta morrisi*. Among the same worms there were three specimens of rather larger size. One of these was 135 mm. long and was the largest. It has 90 segments. In it the papillae were as much reduced as they ever are in this species. The larger worms with the fewer papillae and three pairs of spermathecae I consider to be the more typical *hawayanus*. In this individual (to resume) the sperm sacs had constricted apices; the spermathecae three pairs in 6—8. One papilla only to inside of male pore; setae on 16, those of segments 3—7 about enlarged. Obviously the same as this, but a little smaller, was a worm with two papillae by male pore and a single median one on 7. These larger specimens have the duct of the spermiducal gland bent into an U-shape; in the smaller and more papillated worms the duct is usually slightly curved more in the direction of a large semicircle. If we are to accept this as a species we can find no character not found in examples of the forms already treated of, except that the two pairs of spermathecae may be a segment further behind. This seems to be hardly enough as a character whereby to separate the species.

With regard to the identity of *Perichaeta mauritiana* I must chiefly refer to Dr Michaelsen. I may observe however that in the position of the spermathecae and the presence of setae upon one segment only of the clitellum, this supposed species agrees with an individual which I found myself unable to definitely distinguish from the form which I have called *Perichaeta morrisi*.

In two individuals which I refer to this species, and which are not the same that

formed the basis of my original description of the species, I found the following characters. The length of one was 76 mm. There are a row of four papillae to the inside of each male pore. The setae on segments 3—7 are particularly strong. I found setae on the last segment of the clitellum, i.e. 16. The sperm sacs have a constricted extremity. The spermiducal glands are long, extending through segments 17—22. The spermathecae are in segments 6—8; on one side of the body was an additional pouch in segment 9. A second individual was much the same, but had only three papillae by each male pore and no traces of an additional spermatheca. In my original description of *Perichaeta mauritiana* I described only two pairs of spermathecae in segments 7, 8. I cannot now lay my hands on that specimen. I may however observe that a renewed examination of one of the worms which I originally referred to *barbadensis*, seems to have its two pairs of spermathecae in 7, 8, and not as I stated in 6, 7. In any case the difference does not seem to me to be important. With the present species will have to be merged I think *Perichaeta cupulifera*. There are at least no differences of great importance to distinguish that form from Dehra Dun. There is to be seen the same kind of range in the variability of the papillae which are from as small a number as only one in front of and behind each male pore to twelve or so in the neighbourhood of those pores.

Dr Michaelsen thinks that his *Perichaeta pallida* is not to be confused with *Perichaeta hawayana*. He bases this distinction upon the fact that in *pallida* the anterior setae are not much enlarged, as they are in *hawayana*, and that the male pores are more closely approximated. As to the former it would be necessary to separate from *barbadensis* one of the individuals which I have described above as belonging to that "species" if this opinion is correct. There is at least quite as much reason for uniting this species with the series concerning which the present remarks are offered, as for including Rosa's *P. amazonica*. Rosa says nothing about the increased size of the anterior setae. The fact that the clitellum has none will not I hope, after the remarks contained in the present paper, be considered as sufficient to discriminate the species.

In Dr Michaelsen's description of *Perichaeta mandhorensis* there are no salient points which serve to discriminate it from the present species. It has larger setae on segments 2—9; the caeca have the crenated appearance below that is at least often found in *hawayana*. There is one papilla near each male pore; the three spermathecae occupy the same segments; the spermiducal glands are without the terminal sac. The sperm sacs are divided (as in some individuals of the present species) by a constriction. There is in short nothing of importance in the description which warrants a separation.

(5) *Amyntas schmardae* Horst.

*Megascolex schmardae* Horst, Notes Leyd. Mus. 1883, p. 194.

*Perichaeta trityphla* Beddard, P. Zool. Soc. 1896, p. 205.

*Perichaeta vesiculata* Goto and Hatai, Annot. Zool. Japon. III, p. 21.

It is rather curious that in an appendix to my account of the earthworms of the Sandwich Islands I should have described from Barbados a species which I regarded as new and described as *Perichaeta trityphla*. Curious since I have subsequently found many specimens of this worm in gatherings from Honolulu at 2000 feet of altitude and also in earth imported from Hong Kong. I think that Michaelsen<sup>1</sup> is probably right in identifying my *trityphla* with the long known species *schmardae*. But at the same time it must be borne in mind that the condition of the caeca, which I thought to be distinctive of *trityphla*, has not been described in the original specimens of *schmardae*. These caeca, I may say, vary in number from three to six on each side, and the two sides are not always symmetrical in this respect. The occurrence of such caeca seems to mark the species as a native of Japan—one of the most prominent characteristics of the species of that island being the frequent complication of the caeca. I think that there can be no doubt that *Perichaeta vesiculata* of Goto and Hatai is the same species. There is positively no feature in their rather short description of the so-called *vesiculata*, which does not fit in with the facts observed in the anatomy of *schmardae* and *trityphla*.

<sup>1</sup> Oligochaeten von den Inseln des Pacific. Zool. Jahrb. Syst. XII, p. 224.

ENTOZOA<sup>1</sup>.

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THE Hawaiian Archipelago or the Sandwich Islands are separated by some 2350 miles from the mainland and by about the same distance from any other group of inhabited islands. Hence, as might be expected, their fauna is highly specialized, and although we know very little about the Entozoa of this island group, two at least of the forms described, living within the bodies of birds characteristic of the country, are new and up to the present time have not been recorded from elsewhere.

But although the Hawaiian Archipelago is so far from other lands it is a much frequented spot. Since the Spaniards first found it, before the visits in 1778 of Captain Cook, it has by degrees become one of the meeting places of the world. Its position "at the cross-roads of the North Pacific" on the line of the great marine trade-routes between Northern America, Japan, China and Australia has attracted to its harbours men of all nations, so that, like Singapore, it has a most mixed population. And man has brought not only his own parasites with him but has imported his domesticated cattle with their entozoa.

What little I have been able to find out about the human parasites in the Sandwich Islands I owe to a paper by Dr A. Lutz<sup>2</sup>, and as the parasites he mentions are well known and almost cosmopolitan I have said little about them, still they should be mentioned in a Fauna Hawaiïensis, for though probably the majority of them have been introduced and may not be endemic, this is not certainly the case and is susceptible of no proof.

<sup>1</sup> I have much pleasure in thanking Prof. E. Ray Lankester for permission to reprint matter and figures from the Quarterly Journal of Microscopical Science; Mr Shipley has availed himself of this permission in his communication. EDITOR.

<sup>2</sup> Centrbl. Bakter. XIII. 1893, p. 126.

## I. NEMATODA.

The following Nematodes are recorded by Dr Lutz :—

(1) *Ascaris lumbricoides* L.

This was found with *Ancylostoma duodenale* but also—and this was especially the case in children—alone. It is said to be very common among the poorer inhabitants.

(2) *Trichocephalus dispar* Rud.

This was determined only from eggs which passed from the intestine. It appeared to be widely distributed but not in very great numbers.

(3) *Oxyurus vermicularis* L.

Observed in one white family who had become infected through an adopted child. It is a very common parasite among the poor.

(4) *Strongyloides intestinalis* Bavery.

This parasite was observed in company with *Ancylostoma duodenale*, but in the larval state. It apparently produced no special symptoms, and Dr Lutz repeats his doubts as to its being the cause of the so-called Cochinchina-diarrhoea.

(5) *Ancylostoma duodenale* Dubini.

The anaemia and accompanying troubles due to the presence of this parasite are very common in the Hawaiian Archipelago. Dr Lutz found it only amongst the Portuguese, employed for the most part in the sugar plantations and careless about their supply of drinking water. These Portuguese came not from Europe but from Madeira and the Azores and it seems probable that they brought their parasites with them. Dr L. F. Alvarez of the "Hospital for the Treatment of Leprosy" tells me that this entozoon is very common amongst the Portuguese labourers of the city of Hilo and its neighbourhood in the Island of Hawaii. It produces a very severe form of anaemia.

(6) *Sclerostomum armatum* Dies.

This parasite was found in the Horse and at least in one district was the cause of the death of the host.

(7) *Filaria immitis* Leidy.

Found in the heart of dogs. It is widely spread through the Pacific Islands<sup>1</sup>.

<sup>1</sup> Shipley, P. Cambridge Soc. VIII. 1892—5, p. 211.

## II. PLATYHELMINTHES.

## A. TREMATODA.

(1) *Distoma clavatum* Rud.

Found in the stomach of the *Coryphaena hippuris*. Several other unidentified species of Trematode were met with in other fish.

(2) *Distoma hepaticum*<sup>1</sup> L.

The presence of this parasite caused a veritable epizootic amongst the cattle on many of the islands of the Hawaiian Archipelago. Horses, though to a less extent, and wild swine are also said to have suffered. Dr Lutz was successful in cultivating the embryos of the Fluke, and he also succeeded in finding and observing the development of the Redia in the fresh-water snail *Limnaeus pereger*. In his second paper<sup>1</sup> Dr Lutz gives the opinions of certain distinguished conchologists on the species of water snails which he found infected with the larvae of *Distoma*. These Molluscs seem to afford matter for a considerable amount of disagreement and the reader is referred to this paper for the details of the subject. Dr Alvarez, to whose kindness I am indebted for several details in this paper, tells me that this Fluke sometimes attacks man.

## B. CESTODA.

(1) *Drepanidotaenia hemignathi*<sup>2</sup> Shipley.

## Plate XIII.

The specimens of this tapeworm, of which I received but ten, are all small; they vary in length from 10 mm. to 22 mm. The head is very small; immediately behind it, there being practically no neck, the body begins to broaden out, and in some specimens the proglottides attain a width of 2 mm. The segmentation of the body commences immediately behind the head, and is very well marked a little further back. The posterior border of each segment overlaps the succeeding one with a prominent edge or rim; this is well shown in longitudinal section (fig. 6). The number of segments varies from some fifty to sixty to over a hundred. The measurements given above are about the average, but, as is well known, tapeworms are extremely extensible animals, and this to a great extent diminishes the value of figures quoted in reference to their size. In some of my specimens the body is stretched, and the length of the segments equals one-half or even two-thirds of their breadth, but in the commoner forms the segments are very short and broad, sometimes eight or ten times as broad as long. They are flattened, as is seen in transverse section, and sometimes, especially towards

<sup>1</sup> Centrbl. Bakter. ix. 1892, p. 783, and xiii. 1893, p. 320.

<sup>2</sup> The description of this species is reprinted (with certain alterations) from the Quart. J. Micr. Sci. xi. 1898, p. 613.

the posterior end, the whole body is hollowed so that each segment is curved. The most posterior segments, which are crowded with embryos well advanced in their development, are rounder, less flattened, longer, and they readily broke off.

I was not able to detect any genital pore on the exterior even with the aid of powerful lenses, but sections (figs. 4 and 6) and stained mounted specimens show that it is on the same side of the body in all the segments.

The head of the tapeworm bears four suckers, and in the midst of them is the rostellum (figs. 3, 8 and 9). The shape of the head is very various: in some cases the suckers are, as it were, hunched up and lie at each corner of a square, the lateral diameter of which does not exceed the dorso-ventral (fig. 8); in other specimens the head is not separated from the body by a deep constriction, but is flattened and spread out (fig. 7), so that the lateral suckers are separated from one another by a space considerably wider than that which lies between the dorsal and the ventral suckers.

The rostellum is minute and sunk in a pit (fig. 3); it bears a wreath of ten hooks. In all the specimens which I cut into sections, and I think in the others as well, the rostellum was retracted, the points of the hooks folded in against the axis of the rostellum, and not reaching so far forward as the mouth of the pit. When the animal is fixed to the mucous membrane of its host this rostellum is doubtless protruded from its sheath, and the hooks are divaricated. Certain muscle-fibres which run from the base of the rostellum, and lose themselves in the parenchyma, probably serve to retract it.

The hooks are slightly curved, and the projection which corresponds with the inner fork of the more triradiate hooks of other genera is hardly, if at all, marked (fig. 2). Measuring in a straight line from the base to the tip the hooks are 18—23 $\mu$  in length, thus corresponding pretty closely with those of *Drepanidotaenia tenuirostris* which, according to Railliet<sup>1</sup>, measure 20 to 23 $\mu$ , and to those of *D. lanceolata*, which measure 25 to 31 $\mu$ .

The four suckers present no peculiarities; they are deeply cupped, with a small orifice to their lumen, but probably they are capable of considerable change of form (fig. 9). They are probably retracted by some muscle-fibres which cross one another and run into the parenchyma.

The segmentation of the body begins immediately behind the suckers; at first the segments are very short, but they gradually increase in size throughout the first three-quarters of the length of the body. For the last quarter the segments are crowded with embryos; they become in this region much narrower, more cylindrical in shape, and longer, and are very easily broken off. The posterior free edge of the segments of the anterior two-thirds of the body is sharp, and may overlap the segment behind, or may stand out clearly from it.

The water-vascular system is well developed; on each side of the body are two longitudinal canals,—one, the ventral, much bigger than the other, or dorsal. The

<sup>1</sup> Traité de Zoologie médicale et agricole, Paris, 1895.

lining of the former seems to be a structureless cuticle with no cells especially related to it, but the wall of the dorsal vessel is surrounded by a number of small deeply stained cells (fig. 4). I did not see any communication between the vessels of one side, but the larger vessels communicate as usual, one with another, by a transverse vessel running from side to side along the posterior border of each segment. In the head the vessels all communicate. In some of the better preserved sections such structures as are depicted in fig. 10 were seen: these may or may not be flame-cells; they look rather like them. No valves were seen in the course of the vessels.

The lateral nerve-cords are well marked, lying externally to the ventral excretory canals; they fuse together in the head, forming a ganglion which is indicated in fig. 3. No traces of the nerve-ring described by Tower<sup>1</sup> as running round the posterior end of each segment of *Moniezia*, or of the secondary nerves described by the same observer, were to be seen. But these, if present, probably require fresh material and special methods of preservation to make them manifest. Special nerve-cells, described below, are scattered through the parenchyma of the body.

The histology—at least in some specimens—could be fairly well made out, and agrees roughly with what Blochmann has described in *Ligula monogramma*<sup>2</sup>. The whole body is covered by a cuticle, the outer fifth of which stains more deeply than the remainder. Within this, with a high power, a number of dots or knobs become visible (fig. 10). These are the swollen terminations of certain strands or processes of the ectoderm cells. The cells themselves, as Blochmann has shown, lie removed to some distance from the cuticle they secrete, but are in contact with it by means of the above-mentioned processes ending in the knobs.

The ectoderm cells are not all at one level, but on the whole form a fairly well-marked layer. Each cell is fusiform in shape, and produced into two or three processes, which project both peripherally and centrally. They contain large and well-marked nuclei. Neither the cells nor their processes are laterally in contact; they are separated one from another to varying extents by the intrusion of some of the parenchymatous network which makes up so much of the body of a Cestode.

This parenchyma consists of a meshwork which permeates everywhere the body of the tapeworm, surrounding all the organs, and often, as is the case with the ectoderm and the muscles, passing in between their constituent cells. In the spaces of the meshwork there is believed to be a fluid. The meshwork itself is secreted and nourished by certain large star-shaped cells which are irregularly scattered through the parenchyma, and which give off processes in all directions (fig. 10).

Round the generative glands this parenchymatous network becomes condensed, the spaces disappear, and it forms a close sheath to the ovary, testis, &c. At the posterior end of each segment it is also somewhat condensed, and in section presents

<sup>1</sup> Zool. Anz. vol. XIX. 1896, p. 323.

<sup>2</sup> Die Epithelfrage bei Cestoden und Trematoden, Hamburg, 1896.

the appearance of a well-marked double line, which is very characteristic, and is well shown in fig. 6.

Scattered amongst the parenchyma are certain faintly stained cells which seem to be bipolar, and which differ from the cells of the parenchyma both in shape and in their powers of absorbing the staining reagents. These I take to be nerve-cells which are in communication with the nerve-fibres of the lateral cords. The latter are entirely devoid of any nerve-cells on their course.

Muscle-fibres are scattered through the substance of the body, and one set of longitudinal muscles are most definitely arranged. This layer is situated just below the epidermis in the anterior part of the segment, but as the latter increases in size posteriorly, the cylinder of muscle-fibres, which retains the same diameter throughout, comes to lie more deeply in the tissues. These muscles, like the nervous system and excretory canals, run from segment to segment; some of them, if not all, end in the cuticle, where it is most bent in at the posterior end of each segment. Laterally the fibres are not in contact, being separated by considerable intervals. Their regular arrangement is shown in fig. 5.

In the posterior segments, which are so ripe that the slightest touch breaks them off, the parenchyma has undergone considerable degeneration, the cells are less clear, and the spaces of the meshwork are larger and more irregular.

The generative organs begin to arise very early in the series of segments. Already in the eighth or tenth segment clusters of cells are segregating, and their deep staining shows that they belong to the gonads. In the sexually ripe segments the ovary is centrally placed, and is supported on each side by a lobe of the testis. From the latter a fine vas deferens leads into an extensive vesicula seminalis, which is as a rule crowded with spermatozoa; from this a muscular duct leads to the unilateral genital pore. I was unable to make out the details of the penis, and similarly I failed to detect any yolk-gland amongst the female genitalia.

The vagina leads at once into a large receptaculum seminis, whose walls were strengthened by a series of cuticular-looking rings, whose cut ends are shown in figs. 4 and 6. This communicates both with the oviduct and with the uterus. The latter presents no special points of interest; in the posterior segments it contains the typical three-hooked larvae, each segment containing at least one hundred and probably more.

### Classification.

In his paper on taenias in birds, Dr Fuhrmann<sup>1</sup> remarks that of the 240 odd species of tapeworm described from avian hosts, only twenty-one have been studied anatomically; the remainder are but little more than names, and probably many of the names are of doubtful validity.

<sup>1</sup> Rev. Suisse Zool. tome III. 1895—6, p. 433.

A certain amount of order has been introduced into this mass of material by the establishment of certain sub-groups, and by the giving of a new generic name to the members of these subdivisions; thus in 1891 Blanchard and Railliet<sup>1</sup> established the genus *Davainea*; in 1892 Railliet<sup>2</sup> suggested two new generic names, *Drepanidotaenia* and *Dicranotaenia*, for certain tapeworms inhabiting, for the most part, domestic birds. These are characterised chiefly by the nature of the hooks. In the following year Diamare<sup>3</sup> founded the genus *Cotugnia*, in which the generative organs are double and have two pores, but which is distinct from the genus *Dipylidium* of Leuckart. All these genera are characteristic avian tapeworms, and are, with but very few exceptions, confined to birds.

There is little doubt that the tapeworm which I have described above from the intestine of *Hemignathus procerus* corresponds with a *Drepanidotaenia* of Railliet<sup>4</sup>, who defines his genus as follows:

“Tapeworms provided with a simple crown of uniform hooks, which are usually few in number; the outer limb (manche) of the forked base of the hooks is much longer than the inner (garde), which is always slight; the point is directed backwards when the rostrum is withdrawn. The majority live in the intestines of aquatic birds. Their larva is a Cysticeroid, and is found encysted in the bodies of small fresh-water Crustacea.”

Railliet describes eight species of *Drepanidotaenia*; in one of these the genital pores are on alternate sides of the body in successive segments; the remaining seven species are unilateral in this respect, but they fall into two groups,—one, with three species, in which the number of hooks is eight; and the other, with four species, in which the number of hooks is ten.

It is to this latter group that we must add the tapeworm from *H. procerus*. The four species *D. anatina*, *D. sinuosa*, *D. setigera*, and *D. tenuirostris* differ *inter se* in several respects, but perhaps the simplest way of determining the species is by measuring their hooks. Of these four species, *D. hemignathi* most nearly resembles *D. tenuirostris*, which occurs in certain of the ducks; it differs, however, markedly in size, being when mature about  $\frac{1}{3}$  to  $\frac{1}{2}$  the length of the last named. It resembles *D. tenuirostris* in the length of its hooks in the head, which in the latter are 20—23  $\mu$ , in the former are 18 to 23  $\mu$ ; but whereas the hooks of the embryo are about the same length in the new species, i.e. about 20  $\mu$ , in *D. tenuirostris* they are but 7  $\mu$ . The neck is short, not long as in the last-named species, and the eggs are small, about 40—50  $\mu$  in diameter, and spherical in shape, not cylindrical as Krabbe<sup>5</sup> figures them, with a length of 85  $\mu$ . The hooks also differ in shape; those of *D. tenuirostris* have a much more strongly

<sup>1</sup> Mém. Soc. Zool. France, tome iv. 1891, p. 420.

<sup>2</sup> Ibid. tome xvii. 1892, p. 115.

<sup>3</sup> Boll. Soc. Napoli, ser. I, vol. vii. 1893, p. 9.

<sup>4</sup> Traité de Zoologie médicale et agricole, Paris, 1895, p. 298.

<sup>5</sup> Danske Selsk. Skr. viii. 1870, p. 249.

developed process corresponding with the inner limb of the forked base than occurs in *D. hemignathi*.

The species, which I named after its host, may be characterised as follows :

(1) *Drepanidotaenia hemignathi* Shipley.

*D. hemignathi* Shipley, Quart. J. Micr. Sci. XL. p. 620.

Length 1—2·2 centimetres; breadth, in the middle of the body, 2 millimetres. Head flattened and compressed, rostrum with a crown of ten hooks; each hook 18—23  $\mu$  in length, and with but a slight trace of the inner limb of the forked base. Neck short. The first segments are short, but they very soon (eighth or tenth) show traces of reproductive organs. Genital pore unilateral. The posterior limit of each segment is sharply defined, and forms an angle of about 45 degrees with the sides. Egg spherical, diameter about 40—50  $\mu$ . The three pairs of embryonic hooks measure about 20  $\mu$  each in length.

HAB. *Hemignathus procerus*, Sandwich Islands: in the intestine.

(2) Mr Perkins has also given me two or three specimens of a tapeworm from a *Loxops*, sp. This bird, like the *Hemignathus*, is a member of the family Drepanidae, which is confined to the Sandwich Islands. Unfortunately the specimens are without their head, and I am unable to identify them. They differ markedly from the *Drepanidotaenia* described above.

(3) *Echinococcus* ?.

*Echinococcus* is mentioned by Dr Lutz as occurring occasionally amongst cattle killed for the market.

(4) *Taenia crassicolis* Rud.

This cysticercus larva of this species was found by Dr Lutz in *Mus decumanus*.

(5) *Taenia solium* L.

The entozoon is said to be very uncommon, but is occasionally met with.

### III. ACANTHOCEPHALA.

(1) *Apororhynchus hemignathi*<sup>1</sup> Shipley.

In the summer of 1894 I received from Mr Perkins seven small parasites which he had noticed adhering lightly to the skin around the anus, but beneath the skin, of a species of bird, *Hemignathus procerus*, which he collected in the island of Kauai. Each

<sup>1</sup> Quart. J. Micr. Sci. xxxix. p. 207 and XLII. p. 361.

of these parasites was divided into three regions,—a head, a collar, and a trunk; and, in fact, they have an almost ludicrous resemblance to a young *Balanoglossus* with one or two gill-slits (figs. 11, 12, and 13). On investigating their anatomy it at once became evident that the animals belonged to the group Acanthocephala, and, further, that they differed from the other members of the group in the absence of what is perhaps their most characteristic organ,—from which, indeed, they take their name—the hooked proboscis or introvert. Careful inspection failed to reveal any trace of a scar or mark where the introvert might have been broken off; and although in the absence of hooks and introvert sheath, &c., the anterior part of the body which I have called the head is as unlike the typical introvert as possible, still in its relation to the lemnisci and to the ligament it occupies the position of that organ, and until we can get further information I think the best plan is to regard this part of the body as equivalent to the eversible part of more normal forms.

The second of the three regions into which the body is externally divided is shorter than the head and smaller in diameter; it may be termed the collar. The third or posterior region, which may be called the trunk, is the longest and the most slender of the three; behind it tapers to a point where the orifice of the genital duct is situated, and this end of the animal is always a little turned up (figs. 11, 12, 13, 17 and 23). The exterior of the collar and trunk are smooth or lightly wrinkled, but the head is covered with a number of small depressions or pits which give it a very characteristic appearance, and which are well seen in sections. The head is attached to the collar by a narrow neck, which is surrounded and concealed by the edge of the collar. This is obvious in sections (figs. 15 and 23). All the specimens were somewhat shrivelled and apparently distorted. The largest measured 3.5 mm. in length, the smallest 2.5 mm.; had they been fully distended they would probably have been 1 to 1.5 mm. longer. The body-cavity of the head is continuous with that of the neck, and the latter opens freely into the cavity of the trunk (fig. 23). The first-named space is by far the largest. The lumen of the collar region is reduced by the great thickness of the walls of this part of the body, and both here and in the trunk much of the internal space is occupied by the lemnisci and the reproductive organs.

The skin is one of the most characteristic features of the Acanthocephala, and as far as I know is only paralleled by that of the Nematodes, but it possesses certain features not found in the last-named group. The whole body is covered by a thin cuticle which does not vary much in thickness in the different regions of the body, and which is invaginated a short distance into the genital pore. Beneath this is the true epidermis, or subcuticle as it is called; this has in my specimens the usual structure met with in the group so well described by Hamann, and consists of a matrix of a fibrillar nature, the fibrils being as a rule arranged radially, in which are embedded a certain number of amoeboid nuclei (figs. 16 and 20). This tissue is much thicker in the region of the collar than elsewhere, and it is thicker in the trunk than in the head. It is pierced

in all directions by a series of tubes or lacunae which have no definite lining, but which seem to be mere splits in the fibrillar matrix. The lacunae—except in the head—have a general circular direction which is very well marked in the trunk region where each runs into a lateral longitudinal split (figs. 20 and 24). They contain a small amount of coagulum, the remnant of the fluid which circulates in them; during life this fluid, in other species, holds in suspension fat and coloured oil globules. If these are present in my species they must have been dissolved out in the processes which precede embedding. The circular lacunae of the trunk not only communicate with one another by means of the two longitudinal lateral lacunae (figs. 20 and 24), but they open into one another by numerous small branches which have an oblique or longitudinal direction. In the head the lacunae have a general longitudinal course; they are not, however, straight, but twist in and out between the pits on the surface; they anastomose freely (fig. 14). Thus in a transverse section of the head the lacunae appear as round holes more or less uniformly arranged in the skin, and the same effect is produced by a longitudinal section of the trunk.

In the collar region the subcuticular tissue is much thickened, and the lacunar system forms a single more or less definite ring which gives off numerous branching anastomosing twigs (fig. 15).

Although the above account attempts to give the general course of the lacunae in the skin, it should be mentioned that there is considerable irregularity in the arrangement, and one is almost inclined to believe that the canals do not remain permanent, but that they sometimes close up and new ones appear. As they have no lining of any kind, such a closing would leave no trace.

As Schneider<sup>1</sup>, Hamann<sup>2</sup>, and Kaiser<sup>3</sup> have shown in the species investigated by them, the lacunar system of the introvert is completely shut off from that of the neck—if it be present—and of the trunk, by a fold inwards of the cuticle which cuts the subcuticular tissue in two. I have not been able to find any such cuticular ring in the species in question, but the state of preservation of my specimens does not allow me to say definitely that it does not exist.

The lemnisci are two elongated sac-like prolongations of the subcuticular tissue which are attached anteriorly to the skin at the junction of the head and collar. They extend backwards to the extreme posterior end of the body, and are slightly bent so that a longitudinal section may cut them in two or three places (fig. 23). Histologically they are composed of the same substance as the subcuticle in direct continuity with which they arise, and they are traversed by a similar system of canals. Physiologically they seem, as Hamann suggests, to act as reservoirs for the fluid of the canal system of the introvert; when the fluid they contain is forced into the spaces of the introvert the latter is everted. It is withdrawn again into the body by special muscles. In most

<sup>1</sup> Arch. Anat. 1868, p. 584.

<sup>2</sup> Die Nematelminthen, Heft 1 and 2, Jena, 1891 and 1895.

<sup>3</sup> Bibl. Zool. Heft 7, 1892, p. 1.

species the canal system of the lemnisci opens into that of the introvert in front of the cuticular ring, and is thus completely independent of that of the trunk. If we assume that the head of my species corresponds with the introvert of other forms which have lost its introvert sheath, the lemnisci open into the same region of the skin as they do in other Acanthocephala.

The nuclei of the subcuticle and of the lemnisci are very remarkable; they correspond in structure with those described by Hamann in *Neorhynchus clavaceps*, in which species according to this observer both the skin and the lemnisci retain in the adult their embryonic condition. As in *Neorhynchus* the number of nuclei is very small, some twelve to twenty seem to suffice for the whole of the subcuticle, and perhaps two to four for each lemniscus. The structure of the nucleus shows a most striking resemblance to an amoeba with rather short pseudopodia (figs. 16, 20, and 23). No single nucleolus can be detected, but numerous chromatin particles are present, and in some a distinct vacuole can be observed. These nuclei are scattered about in a most irregular fashion; not one may be seen in a number of consecutive sections, and then perhaps three or four may appear, and from their large size persist through several sections. The nuclei lie, as a rule, embedded in the substance of the subcuticle; more rarely they are found in the lacunae. Although there is no proof, one is tempted to believe that the nuclei wander through the subcuticle and lemnisci in an amoeboid manner, and that the small number of nuclei which are found in these tissues is compensated for partly by the large size of each, but more especially by their mobility. Similar amoeboid nuclei undoubtedly move about, fuse with one another, and undergo fission in the subcuticle of the larval forms of *Neorhynchus clavaceps*.

Within the subcuticle and completing the skin on the inner side, is a layer of circular muscles, and still more internally a layer of longitudinal muscles (figs. 16 and 25). The muscles of these layers are but a single fibre thick, and they are not very uniformly present. The circular layer is most complete in the region of the trunk, and I have figured a section to show this (fig. 22). The longitudinal layer is even less definite, but scattered fibres can be detected here and there (figs. 16 and 25). Each fibre appears to be spindle-shaped, and in the circular muscles has the striated portion only on its outer face, forming a thin band; the inner half of the fibre consists of vacuolated strands of protoplasm in which is a nucleus. The longitudinal layer of muscles alone is continued over the lemnisci (figs. 19 and 24). These muscles are not covered on their inner side by any layer of epithelial cells, neither does any such layer cover the ligament, but both tissues lie freely exposed to the fluid of the body-cavity.

In the more typical Acanthocephala the anterior end of the body terminates in a hollow eversible portion provided with rows of hooks whose number and shape have a certain systematic value. This introvert can be withdrawn, not into the general body-cavity, but into the cavity of the introvert sheath, which is shut off from the general body-cavity by a double (Echinorhynchidae) or a single (Neorhynchidae) wall. The

extrusion of the introvert is believed to be effected by fluid being forced into its lacunae by the lemnisci. It is retracted by special muscles attached to the inside of its tip; besides these, other retractor muscles run from the outside of the introvert sheath, and these serve to retract the whole sheath and its contents into the trunk. The chief nerve ganglion lies as a rule on the posterior end of the introvert sheath, usually in the middle line, but in the Gigantorhynchidae it is placed to one side. From the posterior end of the introvert sheath, and having its origin between its two walls when they are present, the ligament runs backward, traversing the body cavity, and ending in the funnel-shaped internal opening of the oviduct in the female and in the vas deferens in the male.

Owing to the absence of an introvert and its sheath, the relations of the ligament in the present species is somewhat altered. It takes its origin from the anterior end of the head, and at first seems to consist of a few strands of muscular fibres which arise from the muscles of the skin (fig. 21). All my specimens but one proved to be mature females, whose ovaries had broken up into the egg masses which are characteristic of the Acanthocephala. These egg masses consist of packets of a dozen or more cells of which the peripheral layer develop into ova at the cost of the central cells which serve them as a food supply (figs. 14, 16, and 23). These packets coexisted in my specimens with ova in various stages of development, some without any egg shell, whilst others were provided with a thick deeply-staining membrane. The whole lumen of the head was crowded with these ova. In the region of the collar the ova were confined by a thin-walled membrane, and in the trunk there were two such masses of ova, which, however, seemed less mature than those lying in the head. Lying amongst the various organs in the body-cavity were a number of very finely granular masses, which I take to be the masses of spermatozoa (figs. 16 and 20). Of the complex system by means of which the ova leave the body, little could be made out beyond the fact that a well-marked funnel is present opening into the posterior end of the body-cavity of the trunk (fig. 19). I failed, however, to find a second opening near the narrow end of the funnel such as occurs in other forms, but this may have been due to the poor state of preservation. The funnel leads into a duct which opens on the posterior end of the trunk.

The testes are two in number, and lie one behind the other in the ligament, though owing to its looping both may appear in the same transverse section. The spermatozoa do not escape into the body of the male as the ova do into that of the female, but pass down a duct in the ligament which opens at the end of the body. Traces of accessory glands were seen, but the details were not clear.

The brain lies on or in the ligament just behind its point of attachment to the skin of the head (figs. 21 and 23). Owing to the disruption of the ovaries in my female specimens the ligament could not be traced very far, but in the only male it reached from one end of the body to the other. The brain consists of a few large ganglion cells with a clear homogeneous cytoplasm and deeply-stained nuclei; the divisions

between the cells were very sharp and straight (fig. 21). In the females this mass of cells lay on the ligament; in the male, on the other hand, it occupied the centre of the fibrous and muscular strands which compose that body (fig. 25). In the former I could trace no nerves leaving the brain, but in the male two nerves surrounded by muscles pass backward; these obviously correspond with the retacula of other forms.

### Classification.

Until recently the group Acanthocephala included but one genus, *Echinorhynchus*, which comprised several hundred species. Recently, however, Hamann<sup>1</sup> has pointed out that these species present certain differences which enable him to divide the group into three families, each with a corresponding genus. To these I venture to add a fourth, to include the remarkable form above described. This family may, I think, be called the Apororhynchidae, and the new genus *Apororhynchus*<sup>2</sup>, which name refers to the absence of the eversible introvert; and, inasmuch as it is convenient in naming a parasite to have some indication of its host, I think the specific name may be *hemignathi*.

If these terms be adopted, the classification of the Acanthocephala will be as follows, the characteristics of each of the first three families being taken from Hamann's papers.

I. Family ECHINORHYNCHIDAE. The body is elongated and smooth. The introvert sheath has double walls, and the introvert is invaginated into it. The nerve ganglion is in the introvert sheath, mostly embedded in it and central in position. The hook papillae are only covered with chitin at their apex, and the hooks have a process below.

Genus *Echinorhynchus*, with the characters of the family.

The vast majority of Acanthocephala belong to this family; a few may be mentioned. *E. proteus*, found in many fishes and varying in size with its host; its larval forms inhabit the Amphipod *Gammarus pulex*, and are also found in the body-cavity of numerous fresh-water fishes. *E. clavula* occurs in many fishes and in the intestine of a species of *Bufo*. *E. angustatus* is found also in fishes, with its larval form in the Isopod *Asellus aquaticus*. *E. mouiliformis* is said to attain maturity in the human intestine; its usual host is a mouse, and its larval host is the larva of a beetle, *Blaps mucronata*. *E. porrigens* invests the intestine of the orqual, and *E. strumosus* that of a seal. There are many others.

<sup>1</sup> Loc. cit. and Zool. Anz. Bd. xv. 1892, p. 195.

<sup>2</sup> In my original paper I suggested the name *Arhynchus*, but as Professor C. Wardell Styles and Professor A. Hassall have pointed out that this name is preoccupied, having been used by Dejean in 1834 for a beetle, I later (Quart. J. Micr. Sci. XLII. p. 361) suggested the name *Apororhynchus*.

II. Family GIGANTORHYNCHIDAE. Large forms, whose body is ringed and flattened during life like that of a *Taenia*. The hooks are like those of a *Taenia*, the hook-papilla being entirely covered with chitin. There are two root-like processes in each hook. The introvert is muscular, has no lumen, and the introvert cannot be retracted into it, but the whole retracts into the body-cavity. The ganglion is excentrically placed to the side, behind the middle of the so-called sheath. The body-cavity is enclosed in a structureless membrane, and is traversed by membranes stretched transversely. The lemnisci are long, coiled, with a central lacuna.

Genus *Gigantorhynchus*, with the characters of the family.

Hamann includes three species in this family—*G. echinodiscus*, *G. taenioides*, and *G. spira*; and points out that *E. gigas* agrees with them in all points but that of the external annulation. The first of the above-named species occurs in the intestine of anteaters, and has been found in *Myrmecophaga jubata* and *Cycloturus didactyla*. *G. taenioides* has been found in a species of *Cariama*, *Dicholophus cristatus*; and *G. spira* lives in the king vulture, *Sarcorhampus papa*. *E. gigas* in the adult stage occurs in the small intestine of swine, and its larval host is believed to be the grubs of *Melolontha vulgaris* and *Cetonia aurata* in Europe and of *Lachnosterna arcuata* in the United States<sup>1</sup>. It is recorded once from the human intestine.

III. Family NEORHYNCHIDAE. Sexual maturity is reached in the larval state. The introvert sheath has a single wall. A few giant nuclei only are found in the subcuticle and in the lemnisci. The circular muscles are very simply developed, and the longitudinal muscles only present in places.

Genus *Neorhynchus*, with the characters of the family.

This genus includes but two species, *N. claviceps* and *N. agilis*. They both present interesting cases of paedogenesis, the large embryonic nuclei of the young larva do not break up into numerous nuclei as they do in the commoner species. *N. agilis* is found in *Mugil auratus* and *M. cephalus*; *N. claviceps* in the Carp, *Cyprinus carpio*, its larva form according to Villot<sup>2</sup> in the fat bodies of the Neuropterous insect *Sialis niger*; it has also been found in the alimentary canal of the leech *Nephelis octocula*, and specimens of the water-snail *Limnaea* have been artificially infected with it.

IV. Family APORORHYNCHIDAE. Short forms, with the body divided into three well-marked regions,—head, collar, and trunk. The head is pitted, the collar smooth, and the trunk wrinkled, not annulated—in spirit specimens. There is no eversible introvert, and no introvert sheath, and no hooks. The sub-cuticle and the lemnisci have a few giant nuclei, and the lemnisci are long and coiled.

<sup>1</sup> C. W. Styles, Zool. Anz. xv. 1892, p. 52.

<sup>2</sup> Zool. Anz. VIII. 1885, p. 19.

Genus *Apororhynchus*, with the characters of the family.

This family in the length and curvature of its lemnisci resembles the Gigantorhynchidae, and in the persistence of the embryonic condition of the nuclei in the sub-cuticle and the lemnisci, the Neorhynchidae; but in the shape of the body, its division into three well-marked regions, the absence of eversible introvert, introvert sheath, and hooks, it stands alone, though to some extent nearer to the Neorhynchidae, in which the introvert is relatively small, the introvert sheath simple, and the number of hooks reduced, than to either of the other families.

The single species *Apororhynchus hemignathi* was found attached to the inner side of the skin in the neighbourhood of the anus of a Sandwich Island bird, *Hemignathus procerus*. This bird is a member of a family Drepanididae, which is entirely confined to the Sandwich Island group. Professor Newton tells me that it is probable that the "food of *Hemignathus* consists entirely of insects which it finds in or under the bark of trees"; hence it is probable that the second host of this parasite, if such exists, must be looked for amongst the Insecta.

(2) *Echinorhynchus campanulatus* Dies.

Found by Dr Lutz in Water-rats. This species is said to be a facultative parasite of man.

THE ZOOLOGICAL LABORATORY, CAMBRIDGE.

March, 1900.





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OR THE

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SECRETARY OF THE COMMITTEE.

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*CRUSTACEA ISOPODA* BY ADRIEN DOLLFUS :

*CRUSTACEA AMPHIPODA* BY THE REV. T. R. R. STEBBING.

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ARACHNIDA

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By THE REV. T. R. R. STEBBING, F.R.S.



## ARACHNIDA.

Par Eugène Simon.

H. S. Barber,  
U. S. National Museum,  
Washington, D. C.

## § 1. General considerations on the Arachnida.

LES patientes recherches de Mr R. C. L. Perkins nous ont fait connaître 101 espèces d'Arachnides supérieurs<sup>1</sup> des îles Sandwich, dont 77 spéciales, proportion qui ne s'observe nulle part ailleurs.

La faune de cet archipel peut donc être considérée comme fortement spécialisée et riche relativement au peu d'étendue de son territoire; elle se rattache d'une manière générale aux faunes Malaise et Australienne, avec l'absence de certaines formes tropicales très répandues telles que *Gasteracantha*, *Nephila* etc., et par contre l'adjonction de certaines formes paléarctiques et néarctiques telles que *Dysdera*, *Labulla* etc.

Les divers groupes d'Arachnides y sont très inégalement distribués: sur une quarantaine de familles que l'on admet généralement aujourd'hui dans l'ordre des *Araneae*, 28 font complètement défaut, et trois (*Sicariïdes*, *Clubionides* et *Agelenides*) n'y sont représentées chacune que par une seule espèce ubiquiste probablement introduite. Il en est de même de l'ordre des *Scorpiones* dont la seule espèce, *Iso-metrus maculatus* de Geer, n'est certainement pas autochtone; les ordres des *Pedipalpi* et des *Solifugae* font défaut.

Les familles qui dominent sont celle des *Argiopides* qui y compte 27 espèces dont 20 spéciales, appartenant en grande partie au groupe des *Tetragnatha*; celle des *Thomisides* qui y compte 25 espèces, toutes spéciales; celle des *Theridiïdes* avec 17 espèces dont 13 spéciales; celle des *Attides* avec 12 espèces dont 8 spéciales.

Il est à remarquer que les familles qui manquent sont, sauf de rares exceptions (*Ariadna*), celles dont les espèces vivent cachées dans des terriers comme les *Avicularides*, sous les pierres et les écorces comme les *Drassides* et *Clubionides*, ou celles qui filent des toiles près de terre et dans les endroits obscurs comme les *Agelenides*, tandis que les familles dominantes sont celles dont les espèces filent leurs toiles à découvert sur les plantes comme les *Argiopides* et les *Theridiïdes*, ou qui chassent leur proie au soleil comme les *Thomisides* et les *Attides*.

<sup>1</sup> Les *Opiliones* et les *Acari* ne sont pas compris dans ce mémoire.

Only one or two species of Acari have been obtained in the islands. EDITOR.

Dans chacune des familles dominantes le nombre des genres est relativement faible, mais certains genres, *Theridion*, *Tetragnatha*, *Sandalodes*, etc. sont représentés par de longues séries d'espèces voisines les unes des autres, les unes également répandues dans toutes les îles, les autres confinées dans une seule; sous ce rapport l'île la plus occidentale de Kauai nous a paru surtout intéressante.

Les genres nouveaux sont au nombre de six: le genre *Doryonychus*, voisin des *Tetragnatha*, s'en distingue par la structure toute spéciale de ses tarsi antérieurs; le genre *Syroloma* appartient à la famille des *Lycosides*; les genres *Mecaphesa*, *Proernus* (*Pterelas*), *Pagiopalus* et *Adrastidia* à celle des *Thomisides*; les trois derniers, comprenant ensemble huit espèces, doivent former dans la sous-famille des *Philodrominae* un groupe nouveau, particulier à la faune des Sandwich.

## § 2. Systematic account of the Arachnida.

Ordo ARANEAE.

Fam. SICARIIDAE.

SCYTODES Latreille.

### (1) *Scytodes marmorata* L. Koch.

*Scytodes marmorata* L. Koch, Ar. Austr. 1872, p. 292, tab. XXIV, fig. 4.

HAB. Oahu (1500 ft.), Perkins, x. 1896; Schauinsland.—Molokai and Hawaii; Schauinsland.

Espèce très répandue dans la Malaisie Orientale, l'Indo-Chine, l'Australie, et la Polynésie; déjà indiquée des Îles Sandwich (Karsch, Thorell); trouvée par le Dr Schauinsland à Hawaii, Molokai et Oahu (E. Simon).

Fam. DYSDERIDAE.

DYSDERA Latreille.

### (1) *Dysdera crocata* C. Koch.

*Dysdera crocata* C. Koch, Arachn. t. v. 1839, p. 81, fig. 392—394.

*Dysdera rubicunda* Blackwall, Spid. of Gr. Brit. p. 371.

*Dysdera interrita* Hentz, in: Boston Journ. Nat. Hist. iv. p. 223.

HAB. Hawaii: Kona.—Oahu; Schauinsland.

Trouvé antérieurement par le Dr Schauinsland à Oahu. Espèce commune à l'Europe, à l'Amérique du Nord et à l'Amérique du Sud extratropicale, sans doute introduite aux Sandwich.

## ARIADNA Audouin.

(1) *Ariadna perkinsi*, sp. nov.

♂. Long. 9.5 mm. Cephalothorax pallide fusco-rufescens, tenuiter nigro-marginatus, longe ovatus, subtilissime coriaceus et punctis impressis parvis conspersus, acute marginatus, et fovea thoracica superficiali lata impressus. Oculi subaequales, medii ovati, inter se contigui sed antice attenuati et leviter divaricati. Oculi laterales utrinque ovati, contigui, et prominuli. Oculi medii superne visi cum lateralibus lineam recurvam designantes. Clypeus verticalis, planus, subtiliter transversim striatus, oculis anticis latior. Abdomen oblongum, teretiusculum, albido-testaceum, antice vitta longitudinali postice sensim ampliata et truncata, dein maculis transversis seriatis 6 vel 7, medianis triquetris, posticis angustis et linearibus atro-violaceis, supra notatum. Chelae fusco-olivaceae, longae et attenuatae, crebre transversim striatae. Partes oris sternumque pallide fusco-rufescentia, laevia et nitida. Pedes fulvi, antichi, femoribus exceptis, paulo obscuriores. Pedes 1<sup>i</sup> paris femore curvato supra ad apicem triaculeato aculeoque interiore subapicali armato, patella mutica, tibia longa, tereti, subtus ad marginem exteriorem aculeis seriatis decem iniquis, apicali reliquis validiore et leviter uncato, ad marginem interiorem aculeis binis subapicalibus, extus aculeis lateralibus quatuor, intus aculeis lateralibus trinis armata, metatarso mutico sed longe et tenuiter piloso, cylindraceo et valde sinuoso-arcuato. Pedes-maxillares fulvi, tibia patella saltem duplo longiore crassiore et ovata, tarso parvo obtusissimo et longe piloso, bulbo subgloboso sed depressiusculo, spina longa ad basin recta ad apicem flexuoso-arcuata.

Plate XV. fig. 1.

♀. Long. 10—12 mm. A mari differt cephalothorace antice obscuriore fere nigro, chelis robustioribus nigris sublaevibus, abdomine longiore teretiusculo, maculis dorsalibus majoribus ornato, pedibus anticis robustioribus et brevioribus, apice valde infuscatis, femore 1<sup>i</sup> paris aculeis dorsalibus parvis trinis aculeisque interioribus validis et longissimis trinis armato, tibia aculeis inferioribus biseriatis 10, 11 vel 12 validis, longissimis parvisque intermixtis, armata, sed aculeis lateralibus carente, metatarso leviter curvato, haud flexuoso, subtus aculeis validis, singulariter elevatis, parvis longisque mixtis, 10—10, armato. Pedes-maxillares breves et robusti, fulvo-rufuli, tibia tarsoque nigris.

HAB. Kauai.—Lanai (2000 ft.).—Oahu; Mts. Waianae, Lolle.

De toutes les espèces de ce genre qui me sont connues *A. Perkinsi* E. Sim. se rapproche surtout d'*A. Bösenbergi* Keyserl., de la République Argentine, qui a le même dessin abdominal; elle s'en distingue tout de suite par les épines de ses tibias antérieurs beaucoup plus nombreuses et alternativement plus longues et plus petites.

## Fam. PHOLCIDAE.

SMERINGOPUS E. Simon.

(1) *Smeringopus elongatus* Vinson.*Pholcus elongatus* Vinson, Aran. Réun. etc. 1864, p. 135.*Pholcus phalangioides* Dolesch., in: Act. Soc. Ind.-Néerl. v. 1859, p. 47.*Pholcus tipuloides* L. Koch, Ar. Austr. 1872, p. 281, tab. XXIII. fig. 5.*Pholcus distinctus* Cambr., in: Linn. Soc. Journ. x. 1869, p. 380, tab. XI. figs. 28—30.*Pholcus margarita* Workman, in: Ann. Mag. Nat. Hist. 1878, p. 451, tab. XVIII. figs. 1, 2.

HAB. Oahu, Kaala Mts. (3000 ft.), March, 1893; Perkins.

Espèce répandue dans presque toutes les régions tropicales du monde. Sans doute introduite aux Sandwich.

ARTEMA Walckenaer.

(1) *Artema sisyphoides* Doleschall.

Indiqué des Sandwich par plusieurs auteurs (Thorell, E. Simon); n'y a pas été retrouvé par Mr Perkins.

## Fam. THERIDIIDAE.

ARGYRODES E. Simon.

(1) *Argyrodes argyroides* Walckenaer.*Linyphia argyroides* Walck., H. N. Ap. t. II. 1841, p. 282.*Theridion trigonium* Hentz in: Bost. Journ. N. H. vi. 1850, p. 280, tab. IX. figs. 24, 25.*Argyrodes epeirae* E. Simon, Ann. Soc. ent. Fr. 1866, p. 281, tab. I. figs. 4—7.*Argyrodes argyroides* E. Simon, Ar. Fr. t. v. 1881, p. 16.

HAB. Hawaii, Kona (3000 ft.).

Cette espèce est répandue dans la région méditerranéenne, dans presque toute l'Afrique, dans l'Asie tropicale et dans l'Amérique du Nord.

Dans l'ancien monde elle accompagne presque toujours le *Cyrtophora citricola* Forsk., dont elle est parasite, mais aux Iles Sandwich elle vit sur la toile de l'*Argiope avara* Thorell, en même temps que l'espèce suivante.

(2) *Argyrodes hawaiiensis*, sp. nov.

♂. Long. 3—4 mm. Cephalothorax subtilissime coriaceus, fusco-olivaceus, utrinque et postice fere niger, parte cephalica antice sensim elevata vix attenuata et obtusissima. Oculi quatuor antichi in lineam valde procurvam, medii paulo majores a lateralibus quam inter se multo remotiores. Oculi postici parvi, aequi, in lineam subrectam, medii inter se quam a lateralibus remotiores. Oculi quatuor medii aream multo latiore quam longiorem et postice quam antice multo latiore occupantes. Clypeus verticalis, altissimus, haud cornutus, sed incrassatus, a regione oculari depressione profunda et pilosa, valde arcuato-angulosa, discretus. Abdomen postice sensim elevatum, in tuberculum crassum haud attenuatum, apice obtuse truncatum, productum, nigricans, supra vitta latissima, linea media exili secta, et utrinque vitta vel macula magna confusa et dentata luteo-argenteolis ornatum. Chelae longae et partes oris fusco-piceae, laeves. Sternum nigro-nitidum. Pedes olivacei, tarsi cunctis, femoribus metatarsisque quatuor posticis dilutioribus et luteis. Pedes-maxillares lutei, tibia tarsoque nigricantibus, femore sat longo tereti, patella longa versus basin sensim attenuata, tibia patella plus duplo brevior paulo angustiore sed extus obtuse ampliata, tarso breviter ovato, apice oblique truncato.

HAB. Hawaii, Kona.

Cette espèce se rapproche un peu, par la structure de son bandeau, des *A. minax* Camb. (de Madagascar) et *A. affinis* Camb. (du Parana).

## ARIAMNES Thorell.

(1) *Ariamnes corniger*, sp. nov.

♀. Long. 8—10 mm. Cephalothorax longus, humilis, vix pone medium stria transversa, leviter procurva, impressus, in parte antica valde attenuatus subacuminatus, in parte altera fere parallelus, postice vix attenuatus et recte truncatus, fusco-rufescens, leviter reticulatus, vitta media angusta et integra et utrinque vitta marginali, dilutioribus et fulvis, notatus, fronte, inter oculos medios anticos, tuberculo fulvo, obtuse conico et antice oblique directo, insigniter munita. Oculi antichi in lineam subrectam, medii reliquis oculis multo majores, nigri et convexi, inter se distantes sed a lateralibus vix separati. Oculi postici, superne visi, in lineam subrectam, vix procurvam, mediocres et inter se aequales, medii inter se quam a lateralibus saltem triplo remotiores. Clypeus verticalis, leviter convexus, area oculorum angustior. Abdomen angustum, antice truncatum, postice in tuberculum, corpore toto longius, cylindraceum sed apicem versus attenuatum et subacutum, postice oblique directum et plus minus arcuatum, insigniter productum, utrinque argenteolum, supra vitta lata saepe fusco-

marginata, obscuriore, aureo vel rufulo tincta, ornatum, tuberculo utrinque saepe linea nigra abbreviata et punctata et subtus, pone mamillas, macula nigricanti ornato. Chelae, partes oris sternumque fusco-rufula vel olivacea, sternum vitta media dilutiore notatum. Pedes graciles, inter se valde inaequales, pallide lutei, femoribus patellis tibiisque (apice excepto) 1<sup>i</sup> paris fusco-rufulis, femoribus 2<sup>i</sup> paris antice, saltem ad apicem, rufulo-lineatis, femoribus tibiisque 4<sup>i</sup> paris apice minute rufulo-cinctis; tibia 1<sup>i</sup> paris metatarso saltem aequilonga femore vix brevior. Pedes-maxillares fusco-rufuli, femora dilutiora; femore gracili apice haud incrassato; tibia tereti; tarso acuminato, tibia cum patella multo longiore.

Plate XV. fig. 2.

HAB. Maui, Haleakala.—Lanai, Koele.

Cette espèce remarquable fait presque le passage du genre *Ariamnes* au genre *Rhomphaea*; elle se rattache au premier par son bandeau étroit et vertical et par sa patte-mâchoire à fémur et tibia cylindriques; mais ses pattes antérieures dont le tibia est au moins aussi long que le métatarse ressemblent davantage à celles des *Rhomphaea*. Sa région oculaire est pourvue, même chez la femelle (seul sexe connu), d'un tubercule médian conique, caractère commun à plusieurs *Rhomphaea* mais jusqu'ici étranger aux *Ariamnes*.

#### Theridion Walckenaer.

Le genre *Theridion* est représenté aux Iles Sandwich par deux espèces probablement introduites et au reste presque cosmopolites, les *Theridion rufipes* Lucas et *tepidariorum* C. Koch, et aussi par une nombreuse série d'espèces propres qui appartiennent toutes au groupe ayant pour types les *Theridion frondeum* Hentz et *rusticum* E. Sim. (cf. Hist. Nat. Ar. t. I. p. 537).

La distribution de ces espèces dans les diverses Iles de l'archipel est curieuse:

Hawaii: *Theridion praetextum* E. S., *grallator* E. S., *melinum* E. S., *rufipes* Lucas, *tepidariorum* C. Koch.

Manai: *Theridion praetextum concolor* E. S., *melinum* E. S., *campestratum* E. S., *manaiense* E. S., *haleakalense* E. S., *Perkinsi* E. S., *tepidariorum* C. K.

Oahu: *Theridion melinum* E. S.

Molokai: *Theridion posticatum* E. S., *tepidariorum* C. K.

Lanai: *Theridion posticatum* E. S., *tepidariorum* C. K.

Kauai: *Theridion Perkinsi* E. S., *kauaiense* E. S., *acutitarse* E. S.

## SYNOPSIS SPECIERUM PROPRIARUM.

1. Oculi medii antici lateralibus paulo minores. Pedes longissimi fere *Pholi* ..... *grallator*.  
 Oculi medii antici lateralibus plus minus majores vel saltem haud minores.  
 Pedes normales ..... 2.
2. Oculi antici inter se aequidistantes ..... 3.  
 Oculi medii antici a sese quam a lateralibus remotiores ..... 5.
3. Oculi postici in lineam parum procurvam, medii lateralibus paulo majores, spatio interoculari oculo multo latiore. Abdomen subtus impunctatum (♀) ..... *kauaiense*.  
 Oculi postici in lineam valde procurvam, medii a lateralibus quam inter se fere duplo remotiores, spatio oculo non multo latiore a sese distantes. Abdomen subtus, prope mamillas, minute fusco-bipunctatum ..... 4.
4. Bulbus maris dente interiore lata obtusa et subtriquetra. Plagula genitalis feminae convexa, laevis, semicircularis, antice puncto impresso, postice, in declivitate, foveola magna superficiali transversa, impressa ..... *Perkinsi*.  
 Bulbus maris dente interiore gracili acutissima et valde uncata. Plaga genitalis feminae ovato-transversa, plana, subtiliter coriacea, antice et praesertim postice transversim striata ..... *praetextum*.
5. Cephalothorax luteus, concolor. Pedes quatuor antici haud annulati. Femora 4<sup>i</sup> paris apice late nigro-annulata. Area oculorum mediorum subquadrata (♀) ..... *campestratum*.  
 Cephalothorax vitta media lata nigricanti vel olivacea notatus ..... 6.
6. Cephalothorax vitta media lata ornatus, sed linea marginali carens. Oculi medii postici lateralibus paulo majores. Oculi quatuor medii inter se subaequales. Femora 4<sup>i</sup> paris haud vel parum distincte annulata ..... 7.  
 Cephalothorax vitta media lata lineaque marginali exili nigricantibus notatus. Oculi medii postici lateralibus saltem haud majores et medii antici minores (♂ ♀) ..... 9.
7. Abdomen subtus impunctatum (♂ ♀) ..... *melinum*.  
 Abdomen subtus, prope mamillas, fusco nigrove binotatum ..... 8.
8. Abdomen subtus, prope mamillas, punctis nigris parvis binis notatum (♂ ♀).  
 Bulbus maris apophysi interiore lata brevi et subtriquetra munitus ..... *haleakalense*.  
 Abdomen subtus, prope mamillas, maculis binis nigris subquadratis notatum (♂ ♀). Bulbus maris apophysi interiore longa sat gracili recta et acuta munitus ..... *posticatum*.
9. Abdomen subtus, prope mamillas, nigricanti binotatum. Femora 4<sup>i</sup> paris apice late nigricanti-annulata. Pedum-maxillarium maris tarsus anguste ovatus et obtusus, bulbum haud superans ..... *maniense*.  
 Abdomen subtus impunctatum. Femora cuncta apice minute fusco-notata. Pedum-maxillarium maris tarsus angustissimus, longe acuminatus et bulbum superans ..... *acutitarse*.

(1) *Theridion tepidariorum* C. Koch.

*Theridion tepidariorum* C. Koch, Arachn. VIII. 1841. p. 75, figs. 647, 648.

*Theridion vulgare* Hentz, in: Bost. Journ. N. Hist. VI. p. 271.

HAB. Hawaii, Kau, Oloa.—Molokai, Koloe.—Lanai.—Maui, Haleakala.

Espèce répandue dans toutes les régions chaudes et tempérées du monde et dont l'origine est incertaine. Sans doute introduite aux Sandwich.

(2) *Theridion rufipes* Lucas.

*Theridion rufipes* Lucas, Expl. Sc. Alg. Ar. p. 263, tab. xvi. fig. 5.

*Theridion borbonicum* Vinson, Aran. Réunion. etc. 1864, p. 283, tab. xiv. fig. 6.

*Theridion luteipes* Cambr., in: Linn. Soc. Journ., x. 1870, p. 382, tab. xii. figs. 46—51.

*Theridion bajulans* L. Koch, Æg. u. Abyss. Ar. 1875, p. 21, tab. ii. figs. 4, 5.

*Theridion flavoaurantiacum* E. Simon, in: Ann. Soc. ent. Belg. C. R. Nov. 1880.

*Theridion longipes* V. Hasselt, Midd. Sumatra, etc. Ar. 1882, p. 33.

HAB. Hawaii, Kona.

Espèce répandue dans la région méditerranéenne, dans l'Asie et l'Afrique tropicales, à Madagascar, en Malaisie et en Océanie. Probablement introduite aux Sandwich.

(3) *Theridion campestratum*, sp. nov.

♀. Long. 3.5 mm. Cephalothorax pallide luteus concolor, laevis et glaber, parte cephalica setis tenuibus triseriatis munita. Oculi quatuor antici in lineam leviter procurvam, medii nigri et nigro-limbati lateralibus vix majores et inter se quam a lateralibus remotiores (spatio inter medios oculo saltem haud angustiore, inter medios et laterales fere duplo minore). Oculi quatuor postici in lineam magis procurvam, medii lateralibus majores et a lateralibus quam inter se paulo remotiores. Oculi quatuor medii inter se aequales, aream parallelam subquadratam occupantes. Abdomen subglobosum, supra albo-opacum, antice in declivitate vittis binis convergentibus, postice, supra mamillas, macula transversa laciniosa nigris notatum, subtus omnino pallide luteum. Chelae, partes oris sternumque fulvo-rufula, laevia. Pedes sat longi, femoribus tibiisque 4<sup>i</sup> paris reliquis paulo robustioribus, sat longe setosi, lutei, patellis tibiisque quatuor anticis rufulo-tinctis, pedum 4<sup>i</sup> paris femore ad apicem patellaque nigris, tibia apice anguste nigricanti-annulata. Plaga genitalis parva, fusca, simplex.

Plate XV. fig. 3.

HAB. Maui, Haleakala.

(4) *Theridion praetextum*, sp. nov.

♂. Long. 5 mm. Cephalothorax laevis et glaber sed parte cephalica setis longis triseriatis munita, luteus, vitta media fusco-olivacea, antice latissima sed postice acuminata, notatus. Oculi antici in lineam rectam, inter se fere aequidistantes, medii nigri lateralibus, albis et ovatis, majores. Oculi postici in lineam valde procurvam, medii, ovati et obliqui, a lateralibus quam inter se plus duplo remotiores. Area mediorum paulo longior quam latior et antice quam postice paulo latior. Abdomen breviter

ovatum, parce et longissime albedo-crinium, pallide testaceum, supra antice maculis nigris binis, dein utrinque nigro-punctatum, vitta media, in medio ampliata et saepe angulosa, antice lutea postice albo-opaca, ornatum, margine anteriore abdominis duriuscula, fulvo-rufula, in medio late et obtuse emarginata, utrinque lobo semicirculari, minutissime serrulato, munita, subtus regione epigasteris magna, convexa, fulvo-nitida, regione ventrali albedo-testacea, utrinque linea obliqua exili fusca, postice punctis minutis nigris binis, plerumque notata. Chelae, partes oris sternumque fulvo-rufula. Chelae longae, ad basin convexae subgeniculae, dein leviter depressae, apice attenuatae et paululum divaricatae. Pedes longi, longe et valde setosi, antici reliquis multo longiores et saltem femoribus crassiores, lutei, femoribus, patellis tibiisque anticis leviter rufescenti-tinctis, metatarsis (3<sup>is</sup> exceptis) apice minute fuscis. Pedes-maxillares sat longi, lutei, tibia, superne visa, patella saltem aequilonga, ad basin multo angustiore sed apicem versus sensim ampliata, apice obtusa et setis longissimis seriatis 5 vel 6, ad marginem, munita, tarso mediocri, subacuminato, bulbo ad marginem anteriorem processu membranaceo apice ampliato et obtuso, ad marginem anteriorem, prope medium, spina nigra longa sat angusta, acutissima et valde uncata (fere semicirculari) armata.

♀. Long. 4—6 mm. Cephalothorax pallide luteus, linea marginali carens, vitta media paulo obscuriore olivacea, antice lata evanescente et saepe obsoleta, postice attenuata notatus. Oculi antici in lineam subrectam (vix procurvam), inter se aequidistantes (sed spatii oculis mediis haud latioribus distant), medii nigri et rotundi, lateralibus albis et ovatis majores. Oculi postici in lineam sat procurvam, mediocres, aequi, medii late ovati, a lateralibus quam inter se remotiores. Area mediorum paulo longior quam latior et antice quam postice paulo latior, medii antici posticis majores. Abdomen breviter ovatum vel subglobosum, parce et longe albedo-crinium, luteo-testaceum, vitta media confusa albo-punctata, utrinque punctis fuscis inordinatis paucis et postice, in declivitate, maculis nigris binis parallelis, valde sinuosis, notatum, interdum antice maculis nigris binis convergentibus, rarius maculis dorsalibus munitum, subtus, prope mamillas, punctis nigricantibus binis minutissimis, notatum. Partes oris fusco-rufulae. Chelae, sternum, pedesque lutea, tibiis 1<sup>i</sup> paris apice leviter rufescenti-tinctis, interdum annulo fusco apicali angustissimo cinctis. Pedes robusti, longe et valde setosi. Plaga genitalis ovato-transversa, fusca, subtiliter coriacea, antice et praesertim postice tenuiter transversim striata.

Plate XV. fig. 4.

HAB. Hawaii, Kona, Kau.

VAR. *Theridion praetextum concolor*.

Cephalothorax omnino luteus, vittis carens. Abdomen pallide luteo-testaceum, vitta media albo-opaca, fere parallela, marginem anticum haud attingente atque antice punctis nigris binis supra ornatum.

HAB. Hawaii, Kau.—Maui, Haleakala.

(5) *Theridion mauianse*, sp. nov.

♂. Long. 4.5 mm. Cephalothorax fulvo-rufescens, vitta media lata fere parallela lineaque marginali exili nigricantibus, notatus, laevis et glaber, parte cephalica setis tenuibus triseriatis munita. Oculi antici in lineam rectam, medii lateralibus majores et inter se quam a lateralibus remotiores (spatio inter medios oculo circiter aequilato, inter medios et laterales fere duplo angustiore). Oculi postici inter se subaequales, in lineam procurvam, medii a lateralibus quam inter se paulo remotiores. Area mediorum circiter aequae longa ac lata et antice quam postice paulo latior. Abdomen breviter ovatum, luteo-testaceum, utrinque punctis nigris iniquis et inordinatis, in medio vitta lata dilutiore valde flexuosa, et saltem in parte apicali tenuiter albo-marginata, notatum, margine antico abdominis rufulo duriusculo, utrinque lobo semicirculari, granulis obtusis uniseriatis 5—6 armato, munito, subtus regione epigasteris haud producta, fulvo-rufula, nigro-marginata, regione ventrali late et confuse nigricanti-plagiata. Chelae fulvo-rufulae, laeves, fere parallelae, sed extus ad basin, leviter convexae. Partes oris fusco-olivaceae. Sternum fulvo-rufulum, apice utrinque tenuissime nigro-marginatum. Pedes sat longi, sat longe setosi, femoribus, praesertim anticis, robustis, fulvo-rufescentes femoribus ad basin metatarsis tarsisque dilutioribus et luteis, sed femoribus 4<sup>i</sup> paris annulo apicali lato nigricanti fulvo-lineato, et metatarsis cunctis, praesertim anticis, apice minute fusco-annulatis. Pedes-maxillares lutei, mediocres, tibia, superne visa, patella vix brevior, paulo angustior, apicem versus vix incrassata, subtus parum producta, obtusa et seriatim setosa, tarso tibia paulo longiore, sat anguste ovato sed obtuso et bulbum haud superante, bulbo ad marginem exteriorem processu membranaceo leviter lanceolato, ad marginem interiorum, prope medium, spina fusca, perpendiculari, gracili, acuta et leviter curvata, instructo.

♀. Long. 5—6 mm. Cephalothorax luteus, vitta media lata et fere parallela, postice leviter reticulata, lineaque marginali exillima antice evanescente, nigricantibus, notatus. Oculi antici magni, in lineam vix procurvam, medii lateralibus vix majores, inter se quam a lateralibus remotiores (spatio inter medios oculo latitudinem vix aequanti, inter medios et laterales fere 1/3 minore). Oculi postici in lineam vix procurvam subrectam, medii lateralibus paulo minores et a lateralibus quam inter se plus duplo remotiores (medii a sese spatio oculo angustiore distantes). Area mediorum circiter aequae longa ac lata et antice quam postice multo latior, medii antici posticis multo majores. Abdomen magnum, subglobosum, parce et longe albido-crinatum, fulvo-testaceum, supra crebre et grosse nigro-punctatum (in lateribus punctis minoribus zonas obliquas designantibus), vitta media dilutiore confusa, antice acuminata et alba, postice nigro-segmentata, ornatum, subtus prope mamillas nigricanti-biotatum. Chelae, sternum pedesque fulvo-rufescentia, partes oris, saltem ad basin, valde infuscatis, coxis 4<sup>i</sup> paris fusco-notatis, femoribus sex anticis, tibiis metatarsisque cunctis, annulo medio annuloque

apicali fusco-rufulis, femoribus 4<sup>i</sup> paris annulo medio carentibus sed annulo apicali latiore nigricanti et fulvo-lineato ornatis. Plaga genitalis simplex, nigra, transversim semicircularis.

Plate XV. fig. 11.

HAB. Maui.

(6) *Theridion haleakalense*, sp. nov.

♂. Long. 4.5 mm. Cephalothorax luteus, vitta media nigricanti, antice lata et pone oculos lineata sed postice acuminata, notatus, laevis et glaber sed parte cephalica setis longis triseriatis munita. Oculi anticis in lineam subrectam, medii nigri lateralibus vix majores, inter se quam a lateralibus remotiores (spatio inter medios oculi latitudinem vix aequanti, inter medios et laterales fere duplo angustiore). Oculi postici in lineam procurvam, medii lateralibus majores, plani et obtuse triquetri, a lateralibus quam inter se paulo remotiores. Area mediorum fere parallela et paulo longior quam latior, medii postici anticis majores. Abdomen breviter ovatum, pallide testaceum, supra grosse et inordinate albo-punctatum, utrinque punctis nigris magnis, marginem confusam designantibus, et postice in declivitate linea nigra transversa notatum, margine anteriore abdominis coriacea, rufula, utrinque lobo minute serrulato munito, subtus regione epigasteris convexa rufula, regione ventrali testacea sed postice, prope mamillas, punctis nigris binis notata. Chelae fulvo-rufulae, laeves, fere parallelae, sed ad basin leviter convexae. Partes oris infuscaetae. Sternum luteum. Pedes longi sat longe setosi, femoribus, praesertim anticis, robustis, lutei, femoribus quatuor anticis apice leviter infuscatis, femoribus 4<sup>i</sup> paris annulo apicali lato nigricanti fulvo-lineato notatis, tibiis metatarsisque annulo medio vix expresso annuloque apicali distinctiore fusco-rufulis notatis. Pedes-maxillares lutei, tibia ad basin infuscaeta, tibia, superne visa, patella saltem haud brevior, paulo angustiore, apicem versus leviter ampliata, subtus producta, obtusa et seriatim setosa, tarso tibia paulo longiore, sat anguste ovato sed obtuso et bulbum haud superante, bulbo ad marginem exteriorem processu membranaceo, ad basin lato ad apicem angustiore striato et plicato, ad marginem interiorem, pone medium, processu fusco valde compresso, brevi et lato, instructo.

♀. Long. 5 mm. Cephalothorax luteus, linea marginali carens sed vitta media lata fere parallela nigricanti, leviter reticulata et saepe antice fulvo-punctata ornatus. Oculi anticis in lineam leviter procurvam, medii lateralibus majores et a sese quam a lateralibus remotiores (spatio inter medios oculi latitudinem saltem aequanti sed spatio inter medios et laterales saltem duplo minore). Oculi postici in lineam procurvam, medii lateralibus paulo majores, obtuse triquetri, a lateralibus quam inter se paulo remotiores, sed spatio oculo paulo latiore a sese distantibus. Oculi quatuor medii inter se subaequales, aream fere parallelam et subquadrantam occupantes. Abdomen magnum.

subglobosum, parce et longe albido-crinatum, obscure fulvo-testaceum, supra crebre nigro-punctatum, antice macula longa, postice, supra mamillas, vitta abbreviata, albis, in medio vitta dilutiore lata confusa sed parce albo-punctata ornatum, subtus testaceum et prope mamillas minute fusco-bipunctatum. Chelae, sternum pedesque fulvo-rufula, partes oris valde infuscaetae. Pedes late et confuse fusco-rufulo-annulati sed femoribus 4<sup>i</sup> paris plerumque concoloribus. Plaga genitalis simplex, transversa et semicircularis, nigra, antice marginata.

Plate XV. fig. 5.

HAB. Maui, Haleakala.

(7) *Theridion perkinsi*, sp. nov.

♂. Long. 5—6 mm. Cephalothorax laevis et glaber sed in parte cephalica setis nigris tenuibus et longis triseriatis munitus, luteus, vitta media obscuriore olivacea, antice latissima et plus minus reticulata, postice angustiore notatus. Oculi antici in lineam subrectam, inter se fere aequidistantes, medii lateralibus majores. Oculi postici mediocres, aequi, in lineam valde procurvam, medii obtuse triquetri, a lateralibus quam inter se plus duplo remotiores et spatio oculo vix latiore a sese distantes. Area mediorum paulo longior quam latior et antice quam postice latior. Abdomen breviter ovatum, parce et longissime fulvo-crinatum, albido-testaceum, supra utrinque nigro-punctatum et postice subsegmentatum, vitta media dilutiore, punctos albos includente, et interdum macula media magna subquadrata alba, ornatum, subtus utrinque linea alba obliqua et postice, ante mamillas, punctis nigris binis notatum, regione epigasteris fulva, convexa et laevi. Chelae fulvo-rufulae, laeves, longae et sat angustae, in medio depressae, sed extus ad basin convexae, ungue valido et longo. Partes oris fusco-rufulae, laminae longissimae, angustae et parallelae, pars labialis latior quam longior, tertiam partem basilarem laminarum vix attingens. Pedes longi, antici posticis multo longiores, femoribus saltem anticis sat robustis, valde et longe setosi, lutei, tibiis quatuor anticis apice sensim rufulo-tinctis, tibiis 4<sup>i</sup> paris in medio atque ad apicem anguste et vix distincte annulatis, metatarsis cunctis apice minute fuscis. Pedes-maxillares longi, lutei, tibia, superne visa, patella longiore, ad basin angustiore, apicem versus sensim ampliata, subtus producta obtuse truncata atque ad marginem setis longis seriatis munita, tarso brevi, sat lato et obtusissimo, bulbo brevi, ad marginem exteriorem processu membranaceo sat angusto, apice leviter lanceolato et canaliculato, ad marginem interiorem dente nigra vel fusca magna lata, depressa, subtriquetra, sed apice breviter subacuta, armato.

♀. Long. 6—7 mm. Cephalothorax luteus, vitta media lata paulo obscuriore confusa sed reticulata ornatus, linea marginali carens. Oculi antici in lineam rectam, inter se fere aequidistantes (medii a sese quam a lateralibus vix remotiores), medii

lateralibus evidenter majores. Oculi postici aequi, in lineam sat procurvam, medii obtuse triquetri nigro-limbati, a lateralibus quam inter se multo remotiores. Area mediorum paulo longior quam latior et antice quam postice latior. Abdomen convexum, ovatum, valde et longe fulvo-setosum, albido-testaceum, supra grosse et inordinate nigro-punctatum (in lateribus punctis zonas obliquas confusas designantibus), vitta media lata alba, vel saepius in medio parce biserialim albo-punctata et postice alba ornatum, subtus prope mamillas punctis fuscis binis notatum. Pedes lutei, tibiis ad apicem leviter rufolinctis et subannulatis, metatarsis (3<sup>is</sup> exceptis) apice minute fuscis. Plaga genitalis convexa, laevis, nigricans, paulo longior quam latior, antice rotunda et foveola parva nigra impressa, postice truncata et fovea majore transversim semicirculari notata.

Plate XV. fig. 6.

HAB. Maui, Haleakala.—Kauai, Koholuamana, Waimea Mts.

(8) *Theridion kauaiense*, sp. nov.

♀. Long. 7—10 mm. Cephalothorax laevis et glaber, sed parte cephalica setis triseriatis munita, luteus, vitta media obscuriore, antice lata et confusa, prope medium angustiore, nigricanti et reticulata, notatus. Clypeus convexus. Oculi antici in lineam rectam, inter se aequidistantes (vel medii a sese quam a lateralibus paulo remotiores), medii leviter prominuli lateralibus majores. Oculi postici in lineam leviter procurvam, medii ovati lateralibus vix majores et a lateralibus quam inter se vix remotiores (a sese spatio oculo multo latiore distantes). Area quatuor mediorum saltem haud longior quam latior et antice quam postice paulo latior. Abdomen ovatum, convexum, parce et tenuiter setosum, albido-testaceum, supra vittis duabus nigris, antice posticeque convergentibus, validissime flexuoso-dentatis et saepe interruptis, et interdum linea media nodosa abbreviata, in lateribus zonis obliquis fusco nigrove punctatis, subtus sensim evanescentibus, ornatum, subtus concolor. Chelae fusco-castaneae, laeves. Partes oris apice fusco-castaneae, basi luteae. Sternum luteum laeve. Pedes longi, longe et valde setosi, fulvo-rufuli, femoribus dilutioribus, tibiis late et parum distincte fusco-rufolotriannulatis, metatarsis anticis ad basin atque ad apicem leviter infuscatis. Area genitalis utrinque crasse pilosa, in medio fovea rufula superficiali subrotunda, antice et utrinque tenuiter marginata, atque antice, prope marginem, tuberculis minutissimis binis geminatis notata, impressa.

Plate XV. fig. 7.

HAB. Kauai, Waimea Mts.

(9) *Theridion grallator*, sp. nov.

♂. Long. 4 mm. Cephalothorax laevis et glaber, sed parte cephalica setis albis tenuibus triseriatis munita, albido-testaceus, parte cephalica vittis duabus pallide olivaceis, postice convergentibus et V designantibus, notata. Clypeus latus et planus. Oculi antici in lineam leviter procurvam, medii lateralibus paulo minores et inter se quam a lateralibus paulo remotiores. Oculi postici parvi et subaequales, in lineam leviter procurvam, medii a lateralibus quam inter se vix remotiores sed spatio oculo saltem duplo latiore a sese distantes. Area mediorum magna, parallela et subquadrata. Abdomen longe oblongum, pallide luteum, macula anteriore magna albo-opaca postice emarginata, antice et utrinque tenuiter nigro-marginata, dein punctis nigris quatuor, aream quadratam designantibus, supra ornatum. Chelae, partes oris pedes sternumque albido-testacea, laevia et nitida, tibiis 1<sup>i</sup> paris apice leviter rufulo-tinctis. Pedes longissimi, fere *Pholci*, sat longe setosi. Pedes-maxillares albidii, tibia patella paulo longiore vix graciliore, apicem versus vix incrassata, subtus parum producta, truncata et seriatim longe setosa, tarso parvo et ovato, tibia vix longiore, bulbo simplici, apice biaculeato.

♀ (pullus). Long. 4.5 mm. Abdomen ovatum, macula maxima albo-opaca, postice leviter attenuata et truncata, antice vittam fulvam acute lanceolatam includente, supra fere omnino obtectum. Pedes albido-testacei, subpellucetes, femoribus tibiisque 1<sup>i</sup> paris et 4<sup>i</sup> paris apice anguste nigricanti-annulatis.

Plate XV. fig. 8.

♀ *varietas*. Abdomen in parte basali macula nigra maxima trapezoidali notatum, in parte altera maculis parvis albis biseriatis ornatum.

HAB. Hawaii, Kona.

(10) *Theridion acutilarse*, sp. nov.

♂. Long. 3 mm. Cephalothorax laevis et glaber, sed parte cephalica setis triseriatis munita, fulvo-rufescens, linea marginali exili nigricanti, vittaque media nigricanti et reticulata, antice lata postice attenuata, ornatum. Oculi antici in lineam levissime procurvam, medii leviter prominuli, lateralibus majores et inter se quam a lateralibus remotiores (spatio inter medios oculi latitudinem saltem aequanti, inter medios et laterales circiter 1/3 minore). Oculi postici, superne visi, in lineam leviter procurvam, medii lateralibus paulo majores, ovati vel obtusissime triquetri, a lateralibus quam inter se remotiores, spatio oculo haud latiore a sese distantes. Area mediorum saltem haud longior quam latior et antice quam postice latior. Abdomen breviter oblongum, parce et longe fulvo-setosum, fulvo-testaceum, plus minus albo-punctatum et maculis nigris iniquis et angulosis biseriatis, posticis saepe confluentibus et vittis binis valde dentatis

formantibus, supra ornatum, subtus antice utrinque infuscatum, regione epigasteris convexa, fulvo-rufula et nitida. Chelae fulvo-rufulae, laeves, longissimae et angustae, sed extus ad basin leviter convexae, intus longe leviter emarginatae, angulo interiore apicali dente sat gracili sed truncato armato. Partes oris sternumque fusco-olivacea. Sternum tenuiter nigro-marginatum et macula parva apicali nigricanti notatum. Pedes fulvi, sat longe setosi, femoribus, tibiis metatarsisque annulo submedio vel subbasilari (saepe obsoleto) annuloque apicali fuscis vel rufulis ornatis. Pedes-maxillares fulvi, femore sat robusto, patella longiore quam latiore parum convexa, tibia patella longiore, paulo graciliore, apicem versus leviter ampliata, subtus parum producta sed longe setosa, tarso parvo, tibia vix longiore haud latiore, apice acuminato et bulbum simplex superante.

♀. Long. 3.5—4 mm. Cephalothorax fulvo-rufescens, tenuissime, vix distincte, nigro-marginatus, parte cephalica antice leviter infuscata, postice macula triquetra nigricanti, punctos binos fulvos includente, notata. Oculi antici in lineam levissime procurvam, medii majores et inter se quam a lateralibus remotiores (spatio inter medios latitudinem oculi circiter aequanti, inter medios et laterales saltem duplo minore). Oculi postici in lineam subrectam, inter se fere aequidistantes. Area mediorum paulo latior quam longior et antice quam postice vix latior. Abdomen subglobosum, fulvo-testaceum, albo-punctatum, antice maculis binis magnis convergentibus, saepe confluentibus, dein maculis quatuor biseriatis minoribus et angulosis, postice utrinque macula majore, valde anguloso-dentata, nigris, ornatum, subtus antice utrinque infuscatum. Chelae, partes oris, sternum, pedesque fulvo-rufula, femoribus apice minute fusco-notatis, anticis subtus confuse infuscatis, tibiis metatarsisque annulo medio, saepe obsoleto, annuloque apicali, fusco-rufulis notatis. Area genitalis parva simplex et rufula.

Plate XV. fig. 9.

HAB. Kauai.

(11) *Theridion melinum*, sp. nov.

♂. Long. 3.5 mm. Cephalothorax laevis et glaber, sed parte cephalica setis longis triseriatis munita, luteus, vitta media lata obscuriore olivacea, saepe obsoleta, notatus. Oculi antici in lineam subrectam, medii nigri et rotundi, lateralibus ovatis et albis paulo majores et inter se quam a lateralibus remotiores (spatio inter medios oculo saltem haud angustiore). Oculi postici in lineam sat procurvam, medii lateralibus paulo majores et a lateralibus quam inter se paulo remotiores. Oculi quatuor medii magni, aequi, aream circiter aequae longam ac latam et antice quam postice vix latioribus occupantes. Abdomen breviter oblongum, parce tenuiter et longe setosum, luteo-testaceum, supra nigro-punctatum, macula anteriore parva maculaque media maxima et subquadrata albis ornatum, interdum vitta integra flexuosa, in medio valde dilatata et angulosa

postice sensim attenuata, ornatum, margine anteriore abdominis leviter coriacea, utrinque lobo obtuse serrato munito, subtus regione epigasteris leviter convexa, fulva, fusco-marginata, regione ventrali concolore vel in medio confuse infuscata. Chelae fulvae, laeves, ad basin leviter convexae, apice attenuatae et leviter divaricatae. Partes oris infuscae, laminae ad basin dilutiores. Sternum luteum. Pedes longi, femoribus, saltem anticis, sat robustis, longe et valde setosi, patellis quatuor anticis, tibiis prope medium, seta erecta longiore armatis, lutei, interdum concolores, rarius tibiis anticis in medio atque ad apicem, tibiis posticis ad apicem metatarsisque plus minus fusco-rufulo-annulatis. Pedes-maxillares mediocres, lutei, tibia, superne visa, patella paulo brevior et angustior, apicem versus sensim ampliata, subtus producta, obtuse truncata et setis validis et longis seriatis munita, tarso anguste ovato et obtuso, bulbo ad marginem exteriorem processu membranaceo, ad basin lato dein angusto et obliquo sed apice obtuso et tarsum paulo superante, in medio plagula fusca semicirculari, ad marginem anteriorem spina brevi, antice directa, apice obtusa et minute uncata, munito.

♀. Long. 4—4.5 mm. Cephalothorax luteus, linea marginali carens, sed vitta media fusco-olivacea, antice lata, postice sensim attenuata notatus. Oculi antici in lineam leviter procurvam, medii lateralibus vix majores et a sese quam a lateralibus remotiores (spatio inter medios latitudine oculi paulo latiore). Oculi postici in lineam procurvam, medii lateralibus paulo majores, subrotundi vel obtusissime triquetri, a lateralibus quam inter se evidenter remotiores, spatio oculo saltem haud latiore a sese distantes. Oculi medii inter se aequales, aream paulo longiorem quam latiorem et antice quam postice paulo latiore, occupantes. Abdomen subglobosum, luteo-testaceum, pictura dorsali valde variabili, plerumque punctis maculisque nigris parum regulariter biseriatis vittaque media dilutior, valde dentata, antice albo-marginata, postice valde attenuata et alba ornatum, interdum omnino nigro-punctatum et postice nigro-segmentatum, sed antice vitta transversa alba, in medio anguloso-arcuata, notatum, rarius nigrum antice arcu transverso lato, postice, in declivitate, maculis parvis binis geminatis vittaque abbreviata albis, ornatum, subtus concolor vel in medio confuse infuscatum. Chelae fulvae, partes oris infuscae. Sternum pedesque lutea, tibiis metatarsisque plus minus fusco-annulatis. Plaga genitales fusca, transversim semicircularis, ad marginem posticum foveola media minutissima nigra, punctiformi impressa.

Plate XV. fig. 10.

HAB. Hawaii, Kona, Kau.—Maui, Haleakala.—Oahu, Kaala Mts. 2000 ft., Waianae Mts.

(12) *Theridion posticum*, sp. nov.

♂. Long. 4 mm. Cephalothorax fulvo-rufescens, vitta media nigricanti, antice lata postice sensim attenuata, notatus, laevis et glaber sed parte cephalica setis longis triseriatis munita. Oculi antici in lineam rectam, medii, rotundi nigri, lateralibus, albis

et ovatis, paulo majores et inter se quam a lateralibus multo remotiores (spatio inter medios oculo saltem  $\frac{1}{3}$  latiore, inter medios et laterales fere duplo minore). Oculi postici in lineam procurvam, medii sat longe triquetri, lateralibus vix majores sed a lateralibus quam inter se remotiores. Area mediorum paulo longior quam latior et antice quam postice latior. Abdomen (valde detritum) oblongum, parce et longe setosum, nigricans, supra vitta media alba, in medio ampliata et subangulosa, ornatum. Chelae fulvae, laeves, longae et angustae, sed ad basin leviter convexae. Partes oris infuscaetae. Sternum pedesque lutea, tibiis cunctis ad basin atque ad apicem confuse infuscatis et subannulatis, femoribus 4<sup>i</sup> paris apice nigricanti-annulatis, metatarsis anticis ad basin atque ad apicem minute fuscis. Pedes longi, valde et longe setosi, antici posticis multo longiores. Pedes-maxillares mediocres, lutei, apice rufescenti-tincti, tibia, superne visa, patella vix brevior angustior sed apicem versus sensim ampliata, subtus producta, truncata et setis longis seriatis munita, tarso sat anguste ovato et obtuso, bulbo ad marginem externam processu membranaceo valde arcuato apice bifido, ramulo exteriori obtuso, interiore tenui et acuto, ad marginem internam dente nigra valida et acuta antice recte directa et apicem tarsi saltem attingente.

♀. Long. 5 mm. Cephalothorax fulvo-rufescens, linea marginali carens, vitta media lata obscuriore, antice saepe confusa, in parte thoracica nigricanti et reticulata ornatus. Oculi antici in lineam leviter procurvam, magni et subaequales, medii lateralibus vix majores, inter se quam a lateralibus remotiores, sed spatio oculi latitudinem vix aequanti a sese distantes. Oculi postici in lineam sat procurvam, medii lateralibus paulo majores, obtuse triquetri, intus recti, a lateralibus quam inter se remotiores, spatio oculo evidenter angustior a sese distantes. Oculi quatuor medii, magni et subaequales, aream antice quam postice paulo latioribus occupantes. Abdomen oblongum, parce et longe fulvo-setosum, luteo-testaceum, supra punctis nigris iniquis et inordinatis, vittas duas latas et confusas designantibus, ornatum, subtus utrinque leviter nigricanti-variatur et postice, prope mamillas, maculis binis nigris subquadratis notatum. Chelae, sternum, partes oris pedesque fulvo-rufescentia, parte labiali laminiisque intus infuscatis. Pedes sat robusti, valde et longe setosi, tibiis metatarsisque in medio atque ad apicem late rufescenti-tinctis et subannulatis. Plaga genitalis fusca, leviter coriacea plana, semicircularis vel subrotunda.

Plate XV. fig. 12.

HAB. Lanai, Koloe, 2000 ft.—Molokai.

TEUTANA E. Simon.

(1) *Teutana grossa* C. Koch.

*Theridion grossum* C. Koch, Arachn. iv. 1838, p. 112, fig. 321.

HAB. Hawaii, Kona, Kau.—Maui, Haleakala.

Espèce très répandue dans la région méditerranéenne, les îles de l'océan atlantique et l'Amérique du Sud extratropicale. Sans doute introduite aux Sandwich.

ULESANIS L. Koch.

(1) *Ulesanis oahuensis*, sp. nov.

♀. Long. 1.5 mm. Cephalothorax brevissimus, superne omnino obtectus, in medio convexus, antice posticeque valde declivis, laevis et nitidus, fusco-piceus, nigricanti-marginatus. Oculi quatuor antici inter se contigui, in lineam rectam, medii nigri lateralibus albis vix minores. Oculi postici in lineam vix procurvam, inter se anguste distantes, medii albi et leviter angulosi lateralibus paulo majores. Area quatuor mediorum longior quam latior, in medio tuberculis obtusis parvis binis et geminatis ornata. Abdomen maximum ovatum, antice posticeque rotundum, altissimum et tuberculo medio grosso et obtusissimo munitum, albido-testaceum, supra valde et fere inordinate nigricanti-reticulatum et submaculatum, subtus infuscatum. Sternum rufescens, nigro-marginatum. Pedes breves et robusti, tibiis anticis leviter clavatis, fulvo-rufescentes, femoribus tibiis metatarsisque subtus nigricanti-vittatis et apice subannulatis.

Plate XVI, fig. 11.

HAB. Oahu, Waianae.

Par son abdomen pourvu d'un seul gros tubercule médian très obtus, cette espèce se rapproche surtout de l'*Ulesanis capensis* E. Sim. de l'Afrique australe.

Fam. ARGIOPIDAE.

Subfam. LINYPHIINAE.

ERIGONE Audouin.

(1) *Erigone vagans* Audouin.

*Erigone vagans* Audouin in Savigny, Descr. de l'Égypte, 2<sup>e</sup> ed. t. XXII. p. 319, tab. 1. fig. 9.

*Neritene spinosa* Cambr., Pr. Zool. Soc. Lond., 1872, p. 292, tab. XIII. fig. 2.

*Erigone litoralis* L. Koch, Beitr. kenn. Ar. Fn. Tirols, 1868, p. 274.

*Erigone vagans* E. Simon, Ar. France, t. v. 1884, p. 530.

HAB. Maui, Haleakala.

Cette espèce, probablement introduite, a un habitat des plus vastes; elle est en effet répandue dans toute la région méditerranéenne et les îles de l'Atlantique, et a été trouvée aussi à Singapore et au Cap de Bonne-Espérance, où elle est commune.

#### MICRONETA (Menge) E. Simon.

Ce genre est représenté dans les Îles Hawaii et Maui par une espèce de forme normale, différant cependant des espèces européennes et américaines par les chélicères du mâle, pourvues en avant, près le bord interne, d'une forte dent aiguë, dirigée en bas; caractère fréquent dans le genre *Tmeticus*, mais jusqu'ici étranger au genre *Microneta*.

#### (1) *Microneta insulana*, sp. nov.

♂. Long. 2 mm. Cephalothorax nigro-castaneus, subtilissime coriaceus et opacus, sat longe ovatus, parte cephalica antice leviter elevata, parum attenuata, fronte lata. Oculi antici in lineam rectam, medii inter se contigui, a lateralibus, paulo majoribus, anguste juncti. Oculi postici in lineam subrectam, sat magni, inter se aequi, sat anguste et fere aequae distantes. Clypeus latus, verticalis, sub oculis leviter depressus. Abdomen longe ovatum, nigrum, supra antice sensim dilutius et rufescenti-tinctum. Sternum nigrum. Chelae fusco-castaneae, subtiliter coriaceae, longae, validae et convexae, sed apice valde attenuatae et leviter divaricatae, antice, pone medium et prope marginem interiorem, dente acuto armatae, marginibus sulci longis et leviter depressis, dentibus parvis paucis remotissimis munitis, ungue longo. Pedes sat longi, fulvi. Pedes-maxillares mediocres, fulvi apice infuscati, tibia patella vix brevior, extus ad apicem fere supra, apophysi brevi bifida, ramulo superiore acuto et erecto, altero acuto sed antice secundum tarsum directo, armata, tarso sat anguste ovato.

Plate XVIII. fig. 15.

HAB. Hawaii, Kona.—Maui, Haleakala.

#### CNEPHALOCOTES E. Simon.

Je rapporte avec doute à ce genre une espèce des Îles Sandwich qui diffère de ses congénères européennes par ses yeux postérieurs presque équidistants et le groupe de ses yeux médians à peine plus long que large en arrière, mais qui sous tous les autres rapports (notamment par la structure de ses organes sexuels) est très analogue

aux *C. pusillus* Menge et *curtus* E. Sim. Contrairement à ce qui a lieu dans les espèces européennes, le front du mâle, obtus et convexe, ne présente ni lobe ni impressions, et son bandeau, très haut et un peu proclive, n'en pas convexe.

Le *C. simpliciceps* E. Sim. a aussi des rapports avec le genre *Entelecara*.

Le genre *Cnephlocotes* ne renfermait jusqu'ici que sept ou huit espèces européennes dont l'une (*C. curtus* E. Sim.) a été retrouvée en Égypte; nous lui avons rapporté avec doute une espèce du Brésil, dont la femelle est seule connue.

(1) *Cnephlocotes simpliciceps*, sp. nov.

♂. Long. 1.8 mm. Cephalothorax nigro-nitidus, brevis, parte cephalica convexa et obtusa, nec gibbosa nec impressa. Oculi antici in lineam sat procurvam, medii lateralibus paulo minores et a lateralibus quam inter se paulo remotiores. Oculi postici mediocres, in lineam latiore leviter procurvam, inter se fere aequae et sat late distantes. Area quatuor mediorum multo latior postice quam antice et vix longior quam postice latior. Clypeus area oculorum tota multo latior, leviter proclivis sed planus (nec convexus nec prominulus). Abdomen oblongum, convexum, supra scuto nigro-nitido, postice truncato, fere omnino obtectum. Partes oris chelaeque nigrae. Sternum nigro-opacum, magnum, convexum, postice late truncatum et coxis posticis subglobosis latius. Pedes debiles et breves, sat breviter et fere aequaliter pilosi, fulvo-olivacei, coxis femoribus ad basin patellisque dilutioribus. Pedes-maxillares sat breves, lutei apice infuscati, patella parva nodosa, tibia patella paulo longiore multo crassiore, extus apophysibus trinis iniquis armata: apophysi superiore longa sat gracili sed obtusa apice leviter plicata, mediana brevi dentiformi, inferiore multo longiore crassa apice truncata, tarso ovato et obtuso, supra ad basin depressiusculo, bulbo ovato nigro modice complicato.

Plate XVIII. fig. 14.

HAB. Hawaii, Kona.

LABULLA E. Simon.

Le genre *Labulla* est représenté aux Iles Sandwich par deux grosses espèces qui s'éloignent des formes typiques (*L. thoracica* Wider) par certains caractères qui semblent les rapprocher des *Tetragnatha*, notamment par leurs lames-maxillaires qui, au lieu d'être arrondies, sont tronquées à l'extrémité et anguleuses au côté externe et par leurs chélicères dont les marges sont armées de dents beaucoup plus nombreuses, mais il est à noter que ce dernier caractère est variable dans le genre *Labulla*, chez *L. thoracica* Wider, en effet la marge inférieure offre quatre petites dents tandis

qu'elle n'en présente que deux chez *L. altioculata* Keyserl. et *rupicola* E. Sim. ; la disposition de ces dents est au reste la même : celles de la marge supérieure sont plus fortes et plus longues que celles de la marge inférieure comme dans tous les genres de la sous-famille des *Linyphiinae*. Leurs yeux médians postérieurs sont plus rapprochés l'un de l'autre que des latéraux, ce qui s'observe aussi, mais à un moindre degré, chez *L. altioculata* Keyserling.

(1) *Labulla graphica*, sp. nov.

♂. Long. 8.5 mill. Cephalothorax laevis, glaber, fusco-nigricans, reticulatus, vitta media lata fulvo-rufula, antice utrinque fusco-reticulata, postice attenuata et leviter dentata, ornatus, parte cephalica longa et attenuata, striis obliquis, utrinque profundis in medio evanescentibus, discreta, parte thoracica ovata, in medio late sed parum profunde canaliculata, haud striata. Oculi cuncti magni et subaequales, lineas binas subrectas designantes, medii antici et praesertim postici a lateralibus quam inter se fere  $\frac{1}{3}$  remotiores. Oculi quatuor medii aream leviter prominulam, longiorem quam latiore et antice quam postice angustiore, occupantes. Oculi laterales utrinque a sese juxta contigui. Clypeus verticalis, area oculorum mediorum circiter aequilatus. Abdomen ovatum, valde convexum, nigricans, antice latissime dilutius et albido-testaceum, utrinque vittis latis binis valde flexuoso-dentatis, saepe confluentibus, postice lineolis obliquis seriatis albido-testaceis ornatum, subtus fusco-testaceum, regione epigasteris leviter coriacea. Chelae longae, parallelae, sed apice leviter divaricatae, fusco-rufulae, in parte basali laeves sed extus tenuiter rugosae, in parte apicali crebre et minute rugosae, marginibus sulci longis, superiore dentibus quatuor parvis, obtusis et inter se distantibus, dein, pone angulum, dentibus majoribus et acutis quinque, margine inferiore dentibus parvis subaequis 8—10, 1—4 inter se distantibus, reliquis subcontiguis, armatis. Laminae fusco-rufulae, apice late et recte truncatae, cum angulo exteriori leviter prominulo et subacuto. Pars labialis nigricans, haud longior quam latior et dimidium laminarum haud superans, apice obtusa et marginata. Sternum nigricans, opacum. Pedes sat robusti et, praesertim antici, longi, longe setosi et aculeis setiformibus armati, fulvo-rufuli, femoribus annulo subapicali lato annuloque apicali minore pallide fuscis, tibiis annulo medio fusco lato annuloque apicali nigro notatis, patellis fuscis, metatarsis rufulo-tinctis in medio atque ad apicem vix distincte infuscatis. Pedes-maxillares fulvi apice fuscis, femore gracili curvato, patella parva, tibia patella saltem duplo longiore, supra ad apicem obtuse prominula, extus longe et valde nigro-setosa, tarso longe ovato, extus, prope basin, obtuse emarginato atque ad angulum inferiorem apophysi depressa acuta et antice directa armato, bulbo magno valde complicato.

♀. Long. 10—12 mill. Mari subsimilis, sed oculis quatuor anticis, antice visis, in lineam leviter recurvam, pedibus paulo brevioribus, femoribus haud vel vix distincte

annulatis, chelis robustioribus, antice setosis haud vel vix distincte rugosis, margine superiore sulci dentibus validis 6 vel 7 (1° angulari et ultimis binis minoribus) anticis trinis inter se distantibus reliquis subcontiguis, armato, pedibus-maxillaribus fulvis, apice sensim infuscatis. Area genitalis leviter convexa, postice subverticalis, in medio depressa et carinula testacea tenui divisa, utrinque fovea subrotunda vel leviter angulosa, crasse nigro-marginata, impressa.

Plate XVI. fig. 2.

HAB. Hawaii, Olaa.

(4) *Labulla torosa*, sp. nov.

♂. Long. ceph. th. long. 6 mill. Cephalothorax laevis, fulvus, antice sensim rufescenti-tinctus, parte thoracica utrinque late infuscata et reticulata, parte cephalica striis profundis obliquis sed in medio evanescentibus discreta, thoracica obtuse canaliculata haud striata. Oculi sat magni, inter se subaequales, quatuor postici, superne visi, in lineam levissime procurvam, medii a lateralibus quam inter se saltem duplo remotiores. Oculi anticī in lineam subrectam, medii lateralibus paulo minores et a lateralibus quam inter se plus triplo remotiores. Oculi medii leviter prominuli, aream longiorem quam latiore et antice quam postice angustiore occupantes. Oculi laterales utrinque a sese juxta contigui. Clypeus verticalis, area oculorum mediorum latior. Chelae fusco-rufulae, longissimae, apice attenuatae et leviter divaricatae, extus, praesertim ad apicem crebre et minute rugosae, marginibus sulci longis, superiore in parte apicali dentibus minutissimis et obtusis 4 vel 5, prope medium dentibus multo majoribus atque acutis 4 (2° paulo longiore), dein dentibus minoribus binis remotis, margine inferiore carinato, prope medium dentibus 6, parvis aequis et subcontiguis, lineam leviter arcuatam designantibus, instructis, ungue longo. Partes oris fusco-rufulae, laminae leviter inaequales, apice late truncatae cum angulo exteriori prominulo et acuto, pars labialis circiter aequae longa ac lata, valde inaequalis, apice rotunda et crasse marginata. Sternum fuscum opacum. Pedes longi, setis longis aculeisque setiformibus muniti, fulvi, patellis fusco-rufulis, tibiis in medio vix infuscatis sed annulo apicali nigricanti notatis, metatarsis apicem versus leviter infuscatis. Pedes-maxillares magni, fulvi apice nigri, femore gracili curvato, patella parva convexa, tibia patella longiore, graciliore, sed apice incrassata, longe nigro-crinata, tarso longe ovato, extus in medio valde dilatato et anguloso, intus ad basin apophysī nigra depressa acuta et antice directa, dein tuberculo rufulo lato et obtuso munito, bulbo maximo, apophysibus plurimis rufulis nigrisque insigniter instructo.

♀. Long. 12—15 mill. Cephalothorax opacus, fusco-castaneus, ad marginem obscurior, regione oculari nigra. Oculi sat magni et subaequales, quatuor postici, superne visi, in lineam leviter procurvam, medii inter se quam a lateralibus fere  $\frac{1}{2}$  remotiores, quatuor anticī, antice visi, in lineam vix recurvam, subrectam, medii

lateralibus paulo minores et a lateralibus quam inter se saltem duplo remotiores. Oculi quatuor medii leviter prominuli, aream longiorem quam latiore et antice quam postice angustiore occupantes, antici posticis paulo minores. Oculi laterales utrinque a sese juxta contigui. Clypeus area oculorum mediorum paulo latior, verticalis sed sub oculis leviter depressus. Abdomen oblongum, convexum, sat longe et tenuiter pilosum, nigricans, supra antice late dilutius et testaceum, et utrinque vittis binis obliquis testaceis, postice obsoletis, notatum, subtus in medio dilutius. Chelae longae, fusco-castaneae, opacae, minute et parce rugosae, marginibus sulci longis, superiore dentibus acutis validis inter se fere aequis (ultimis binis paulo minoribus) et fere aequidistantibus, margine inferiore dentibus multo minoribus aequis et subcontiguis 10 vel 11 armatis. Partes oris castaneae. Sternum fuscum opacum. Pedes longi et validi, longe setosi et auleis setiformibus muniti, obscure fulvo-rufuli vel castanei, tibiis in medio late infuscatis et annulo apicali nigricanti notatis, metatarsis apicem versus infuscatis. Pedes-maxillares castanei, femore patellaque dilutioribus. Vulva fere praecedentis, fovea media triquetra carinula tenui divisa et utrinque foveola crasse nigro-marginata notata.

Plate XVI. fig. 1.

HAB. Hawaii, Olaa.—Maui, Haleakala.—Molokai Mts.—Kauai, Waimea.

Subfam. *TETRAGNATHINAE*.

*DORYONYCHUS*, nov. gen.

*A. Tetragnatha* cui subsimilis est differt pedibus omnino muticis, quatuor anticis reliquis multo longioribus, tarsis onychio sat longo munitis et unguibus binis, inter se valde iniquis et dissimilibus, instructis: ungue exteriore brevi, gracili et recto dentibus parvis paucis munito, ungue interiore plus decuplo longiore, ad basin valde curvato, dein subrecto, gracili et acutissimo, subtus in parte basali dentibus obliquis seriatis, minutissimis armato, subtus in parte apicali mutico sed valde compresso et acute carinato.

L'espèce pour laquelle nous proposons ce genre ne diffère absolument des *Tetragnatha* que par la structure très remarquable de ses tarsi et de ses griffes antérieures, qui est unique dans l'ordre entier des *Araneae*.

Les tarsi des deux premières paires sont coupés, vers leur quart apical, d'une fausse articulation, formant un onychium assez long, cylindrique, garni en dessous de crins rudes, et armé à l'extrémité de deux griffes très inégales et très dissemblables; l'externe est petite, grêle, presque droite et armée de quelques petites dents, l'interne est au moins dix fois plus longue, fortement courbée à la base en forme d'agrafe, ensuite presque droite, très grêle et terminée en pointe effilée, pourvue en dessous, dans sa partie basale seulement, d'une série de très petites dents contiguës, carinulée et mutique en dessous dans toute sa partie apicale.

(1) *Doryonychus raptor*, sp. nov.

♂. Long. 10 mill. Cephalothorax angustus, longus et humilis, parte cephalica striis integris profundis discreta, parte thoracica utrinque obtuse marginata, striis radiantibus profundis depressioneque media longitudinali, antice profunda et triquetra, postice evanescente, impressa, fronte angusta et obtusa, in medio leviter prominula, pallide luteus, oculis singulariter nigro-cinctis. Oculi postici inter se aequidistantes, in lineam valde recurvam. Oculi antichi in lineam circiter aequilatam recurvam. Oculi quatuor medii inter se subaequales, aream subquadratam occupantes. Oculi laterales utrinque spatio oculo (postico) haud vel vix latiore a sese distantes, posticus antico fere duplo major. Abdomen angustum et longissimum, teretiusculum sed postice acuminatum, albido-argenteum, supra confuse aurantiaco-tinctum. Chelae luteae nitidae, sat longae et proclives, supra et extus convexae, supra in parte apicali apophysi sat brevi valida sed subacuta et arcuata munitae, margine superiore sulci dente 1° mediocri recto, dente 2°, primo paulo longiore, acuto, dein dentibus minoribus seriatim quatuor munito, margine inferiore dente 1° subapicali sat parvo, dente 2° paulo longiore, dein dentibus seriatim minutissimis (1° reliquis vix majore) 4—5 armato, ungue simplici haud dentato. Partes oris, sternum pedesque lutea, parte labiali leviter infuscata, tibiis, metatarsis tarsisque ad apicem leviter infuscatis. Sternum paululum convexum, nitidissimum. Pedes omnino mutici, quatuor antichi reliquis multo longiores, tarsis subtus ad apicem onychiisque subtus rude-pilosis. Pedes-maxillares *Tetragnathae*, graciles et longi, tibia patella multo longiore, ad basin angustiore sed apicem versus sensim ampliata, apophysi tarsali tibia circiter aequilonga, gracili et subacuta, subtus in medio angulosa, tarso gracili et longo, bulbo depressiusculo sed spina tenui et acuta vix arcuata et leviter contorta, tarso vix brevior, munito.

♀. Long. 12—15 mill. Mari subsimilis sed chelis apophysi superiore carentibus, abdomine longissimo, paulo crassiore, antice posticeque attenuato, albido-argenteo, superne aurantiaco-tincto, vulva, longe pone spiracula locata, postice plagula parva rufula ovata, fere verticali, munita.

Plate XVI. fig. 8—Plate XIX. fig. 1.

HAB. Kauai.

## TETRAGNATHA Latreille.

Le genre *Tetragnatha*, très abondant dans l'archipel, y est représenté par neuf espèces qui lui paraissent spéciales, à l'exception cependant du *T. mandibulata* Walck., qui y a peut-être été introduit.

Ces *Tetragnatha* peuvent se rapporter à trois groupes; les *T. mandibulata* W.,

*hawaiensis*, *netrix*, *Perkinsi* E. Sim.; rentrent dans le premier groupe ayant pour type le *T. extensa* L. (Hist. Nat. Ar. t. 1. p. 720), à cela près cependant, que leur première ligne oculaire, vue en dessus, est un peu plus large que la seconde; leurs pattes ne sont armées que d'épines assez courtes et peu nombreuses et le tibia de la patte-mâchoire de la femelle est mutique.

Les *T. restricta*, *kanaiensis* et *uncifera* E. Sim., qui pourraient former un groupe spécial et nouveau, ont cependant la même disposition oculaire, mais leurs pattes sont armées d'épines divergentes beaucoup plus longues et plus nombreuses, rappelant celles des *T. gracilis* Stol. et *gemmata* L. Koch; le tibia de leur patte-mâchoire chez la femelle est armé, de chaque côté, d'une longue épine divergente, enfin leur abdomen est le plus souvent rhomboédrique, plus ou moins élargi, convexe et parfois tuberculé au milieu.

Cette forme est encore exagérée dans le *T. cuneiventris* E. Sim., qui diffère de ses congénères par ses tibias et métatarses antérieurs mutiques et qui pourrait aussi devenir le type d'un groupe particulier.

Le tableau suivant résume les caractères des *Tetragnatha* des Iles Sandwich.

## SYNOPSIS SPECIERUM.

*Mares.*

1. Chelarum margo superior dente apicali magno, reliquis dentibus multo majore et antice oblique directo armatus.....*mandibulata*.  
Chelarum margo superior dente apicali parvo vel nullo .....2.
2. Chelarum margo superior dente apicali carens, dente 1° parvo et remoto, dente 2° maximo, prope medium sito .....3.  
Chelarum margo superior dente apicali parvo, ad radicem unguis sito, munitus .....5.
3. Chelarum margo superior dente 1° mediocri remoto et uncato .....*uncifera*.  
Chelarum margo superior dente 1° remoto, parvo, recto et acuto .....4.
4. Chelarum margo inferior dente apicali minutissimo et obtuso, dente 2° subapicali valido et longo armatus.....*cuneiventris*.  
Chelarum margo inferior dente apicali carens, dente subapicali sat valido armatus...*restricta*.
5. Chelarum margo superior dente apicali minutissimo obtuso subrotundo .....6.  
Chelarum margo superior dente apicali compresso truncato cariniformi et minute bifido.....7.
6. Chelarum margo inferior dente apicali parvo et obtuso, dente 2° subapicali valido longo et leviter sinuoso-arcuato, reliquis dentibus seriatis a dentibus apicalibus longe remotis .....*netrix*.  
Chelarum margo inferior dente apicali parvo et obtuso, dente 2° subapicali valido sed sat brevi et recto, reliquis dentibus seriatis a dentibus apicalibus parum distantibus .....*perkinsi*.
7. Chelarum margo superior dente 3° submedio longissimo, reliquis dentibus seriatis inter se subcontiguis sed a dente 3° remotis .....*kauaiensis*.  
Chelarum margo superior dente 3° submedio mediocri, reliquis dentibus seriatis inter se fere aequae et sat late distantibus .....*sobrina*.

*Feminae.*

1. Tibia pedum-maxillarum utrinque aculeo setiformi longo et divaricato vel seta munita. Tibiae anticae subtus aculeis tenuibus longissimis et divaricatis armatae .....2.  
Tibia pedum-maxillarum mutica. Tibiae anticae utrinque aculeis brevibus pronis 3 vel 4 armatae, rarius muticae .....4.
2. Tibiae anticae aculeis 4—4 subtus munitae. Abdomen rhomboidale .....*restricta*.  
Tibiae anticae aculeis longissimis 5—5 vel 6—6 subtus munitae .....3.
3. Chelarum margo inferior dente apicali sat valido (dentibus seriatis haud minore) armatus. Abdomen angustum et teretiusculum. Tibiae anticae aculeis longis 6—6 armatae .....*kawaiensis*.  
Chelarum margo inferior dente apicali minutissimo (dentibus seriatis multo minore) armatus. Abdomen in medio ampliatum et convexum .....*uncifera*.
4. Tibiae metatarsique antici omnino mutici. Abdomen breve supra elevatum et turbinatum .....*cuneiventris*.  
Tibiae metatarsique antici aculeati. Abdomen longum et teretiusculum .....5.
5. Chelarum unguis subtus ad basin minute dentatus, margo inferior dente apicali maximo cultriformi recto et antice directo armatus (tab. XVII. fig. 7) .....*mandibulata*.  
Chelarum unguis simplex haud dentatus .....6.
6. Chelarum margines duos dente apicali simili, longo, acuto et recto sed leviter obliquo muniti. Abdomen subtus concolor .....*netrix*.  
Chelarum margo inferior dente apicali parvo munitus. Abdomen subtus vittatum .....7.
7. Chelarum margo inferior dente apicali parvo et obtuso. Abdomen sat breve subtus vitta obscuriore confusa notatum .....*perkinsi*.  
Chelarum margo inferior dente apicali minutissimo sed acuto et antice directo armatus. Abdomen longum, vitta lata nigra tenuiter albido marginata subtus notatum .....*hawaiensis*.

(1) *Tetragnatha mandibulata* Walckenaer.

*Tetragnatha mandibulata* Walck. Apt. t. XI. 1841, p. 211.

*Tetragnatha minatoria* E. Simon, in: Ann. Soc. ent. Fr. 1877, p. 83.

*Tetragnatha leptognatha* Thorell, St. Rag. Mal. etc. t. I. 1877, p. 101 (441).

*Tetragnatha minatoria* Thorell, in: Ann. Mus. civ. Genova, 1887, p. 133.

HAB. Oahu.—Kauai (Schauinsland).—Molokai (Perkins).

Espèce très répandue dans la Malaisie orientale, l'Indo-Chine et les Philippines; décrite de l'Île Guam (Mariannes) par Walckenaer.

(2) *Tetragnatha netrix*, sp. nov.

♂. Long. 8—10 mm. Cephalothorax angustus et longus, pallide fulvo-rufescens, pilis longis albis vestitus, fovea thoracica profunda transversa sulcisque cephalicis impressus, fronte angusta. Oculi quatuor postici, superne visi, in lineam valde recurvam, quatuor antici, antice visi, in lineam paulo latiore subrectam. Oculi quatuor medii aream subquadratam occupantes, antici posticis saltem  $\frac{1}{3}$  majores. Oculi laterales utrinque aequi, spatio oculo fere duplo latiore a sese distantes. Ab-

domen longissimum, teretiusculum, apice oblique sectum et mamillas paulo superans, albido-luteum, apice punctis fuscis minutissimis quatuor notatum. Chelae longissimae, proclives, fulvo-rufulae, laeves, supra, in parte apicali, apophysi arcuata, apice minutissime bifida, armatae, margine superiore sulci dente 1°, ad radicem unguis remoto, parvo recto, antice oblique directo, dente 2° maximo, crasso sed apice sat abrupte acuto, dein dentibus acutis multo minoribus quinque, versus basin sensim minoribus et inter se fere aequidistantibus, munito, margine inferiore, ad apicem, dentibus angularibus binis, 1°, prope radicem unguis sito, minutissimo et obtuso, 2° multo majore, intus directo, leviter flexuoso et arcuato, dein dentibus parvis seriatis 5 vel 6 fere aequidistantibus, 1° et 2° reliquis paulo minoribus, armato, ungue longo, simplici haud dentato. Pars labialis fusca. Laminae, sternum pedesque lutea. Pedes longissimi, aculeis tenuibus et longis armati, tibiis anticis utrinque aculeis quatuor aculeoque dorsali submedio, metatarsis aculeis basilariibus binis aculeoque interiore tantum munitis. Pedes-maxillares ordinarii, apophysi tarsali angusta subrecta et obtusa intus, ante medium, angulosa et tuberculo rufulo obtuse truncato, munita.

♀. Long. 10—12 mm. A mari, cui subsimilis est, differt chelis paulo brevioribus et validioribus, apophysi superiore carentibus, margine superiore sulci dente apicali sat valido recto acuto et leviter retro obliquo, dein dentibus seriatis 5 vel 6, inter se anguste et fere aequae distantibus, versus basin sensim minoribus, margine inferiore dente apicali, dente marginis superioris simili, dein dentibus seriatis quinque (a dente apicali parum remotis), versus basin sensim minoribus, 1° leviter curvato, armatis. Pedes lutei, tibiis anticis aculeis sat longis utrinque trinis, metatarsis aculeis basilariibus verticillatis aculeoque submedio interiore, armatis. Pedum-maxillarium patella seta spiniformi apicali, tarsus setis similibus plurimis armati sed tibia mutica.

Plate XIX. fig. 6.

HAB. Hawaii, Olaa, Kau.

Cette espèce, qui a le facies du *T. mandibulata* Walck., s'en distingue par ses yeux latéraux antérieurs à peine plus petits que les postérieurs; chez le mâle par l'apophyse des chélicères plus éloignée de l'apex et par l'armature des marges; à la marge supérieure en effet la dent angulaire manque tandis qu'elle est très forte chez *T. mandibulata*, la première dent, assez éloignée de la base du crochet, est petite, tandis que la seconde est très développée, longue et robuste, à la marge inférieure la seconde dent angulaire est au contraire beaucoup plus longue que celle de *T. mandibulata* et d'une forme spéciale.

La femelle se distingue très facilement de *T. mandibulata* car ses chélicères manquent de la dent apicale inférieure dirigée en avant et dépassant la base du crochet, tandis que chacune de ses marges offre une dent angulaire semblable droite aiguë et un peu oblique.

Pour *T. mandibulata* voy. Pl. XIX. fig. 7.

(3) *Tetragnatha hawaiiensis*, sp. nov.

♀. Long. 10—12 mm. Cephalothorax fulvus, in medio confuse olivaceo-tinctus. Oculi antici, antice visi, in lineam recurvam. Oculi quatuor medii inter se subaequales, aream paulo longiorem quam latiore et antice quam postice angustiore, occupantes. Oculi laterales antici posticis multo minores. Abdomen longe oblongum, in medio leviter convexum, luteum, vitta foliiformi latissima, leviter flexuosa, albido-marginata et, saltem antice, linea albida tenui secta, supra ornatum, subtus vitta media lata nigricanti albido-marginata ornatum. Sternum nigricans. Chelae robustae, oblique proclives, margine superiore sulci dente angulari minutissimo et acuto serieque remotissima dentium 6, versus basin sensim minorum, munito, margine inferiore dente angulari mediocri acuto antice directo, serieque, parum remota, dentium 7—8, versus basin sensim minorum, munito. Pedes fulvo-olivacei, femoribus tibiis metatarsisque apice minute fuscis. Pedes antici sat breviter aculeati, tibiis utrinque aculeis brevibus 3 vel 4, metatarsis aculeis basilaribus binis et intus aculeis minoribus binis (2° submedio) munitis. Pedum-maxillarium patella supra ad apicem seta spiniformi, metatarsus utrinque setis similibus armati sed tibia mutica.

Plate XIX. fig. 4.

HAВ. Hawaii, Olaa, Hilo.

Cette espèce, dont le mâle est encore inconnu, est assez voisine du *T. mandibulata* Walck., dont elle se distingue cependant par l'armature des marges de ses chélicères qui manquent de la dent apicale cultiforme caractéristique. Elle se distingue de *T. netrix* E. Sim. par ses yeux latéraux antérieurs beaucoup plus petits que les postérieurs, par son abdomen marqué d'une bande noire ventrale très nette, par les épines de ses pattes beaucoup plus courtes, enfin par ses chélicères dont la marge supérieure offre une dent angulaire très petite, rudimentaire, l'inférieure une dent angulaire plus forte, obliquement dirigée en avant.

(4) *Tetragnatha perkinsi*, sp. nov.

♂. Long. 7—9 mm. Cephalothorax longus, fulvo-rufescens, fovea thoracica magna, subrotunda, sulcisque cephalicis impressus, fronte sat lata. Oculi postici, superne visi, in lineam valde recurvam, medii lateralibus paulo majores et a lateralibus quam inter se paulo remotiores. Oculi antici, antice visi, in lineam leviter recurvam, vix latiore. Oculi quatuor medii inter se subaequales, aream vix longiorem quam latiore et antice quam postice angustiore occupantes. Oculi laterales utrinque subaequales leviter prominuli et a sese parum separati, spatio interoculari oculo non

multo latiore. Abdomen cylindraceum sat breve, obscure fulvum, parce nitido-punctatum, subtus haud punctatum. Chelae fulvo-rufulae, laeves, longissimae et proclives, supra, in parte apicali, apophysi arcuata, apice minute et inaequaliter bifida, armatae, margine superiore sulci dente 1° apicali minutissimo, dente 2° remoto parvo, dente 3° remoto et submedio, multo majore et acuto, dein dentibus minoribus seriatis quatuor, versus basin sensim minoribus, armato, margine inferiore, dente apicali parvo et obtuso, dente 2° majore et compresso a praecedenti subgeminato, dein dentibus quinque mediocribus inter se fere aequidistantibus, 1° et 2° reliquis paulo minoribus, munito, ungue longo, simplici, haud dentato. Laminae fusco-olivaceae. Pars labialis nigra. Sternum obscure fulvum. Pedes longi, fulvi, minute et parum distincte rufulo-annulati, aculeis parvis paucissimis (ordinariis) armati. Pedes-maxillares fulvi, longi ordinarii, tibia patella multo longiore, ad basin angustiore sed versus apicem sensim incrassata, apophysi tarsali tibia circiter aequilonga subrecta et obtusa, subtus prope medium tuberculo rufulo truncato, cum angulo anteriore minute prominulo, munita.

♀. Long. 8—12 mm. A mari differt chelis brevioribus et validioribus, convexis, apophysi superiore carentibus, margine superiore sulci dente angulari mediocri et obtuso, dein dentibus seriatis quinque, ad apicem remotis, sed inter se appropinquatis, versus basin sensim minoribus, margine inferiore dente apicali mediocri acuto et leviter curvato, dein dentibus inter se aequidistantibus quinque, 1, 2, et 3 inter se aequis (1° leviter curvato), reliquis sensim minoribus, armatis. Abdomen sat breviter ovatum, obscure fulvum, sat crebre flavo-nitido-punctatum, subtus vitta media lata obscuriore, parum expressa, notatum, pedibus fulvis, distinctius fusco-variatis et subannulatis, sat longe setosis sed aculeis paucis mediocribus armatis, tibiis utrinque aculeis sat brevibus trinis aculeoque dorsali setiformi submedio, metatarsis aculeis basilaribus similibus plurimis aculeoque submedio munitis. Pedum-maxillarium patella seta spiniformi apicali, tarsus setis similibus plurimis armati sed tibia mutica. Vulva pone spiracula sita, postice late et recte truncata.

Plate XIX. fig. 5.

HAB. Maui, Haleakala.—Hawaii, Kilauea.

(5) *Tetragnatha sobrina*, sp. nov.

♂. Long. 6 mm. *T. perkinsi* affinis. Cephalothorax similis sed parte thoracica in medio atque ad marginem confuse infuscata et olivacea. Oculi postici, superne visi, in lineam valde recurvam, medii lateralibus paulo majores et a lateralibus quam inter se paulo remotiores. Oculi antici, antice visi, in lineam subrectam vix latiore. Oculi quatuor medii aream circiter aequae longam ac latam et antice quam postice angustiore occupantes, antici posticis paulo minores. Oculi laterales utrinque subaequales, leviter prominuli et a sese parum distantes, spatio interoculari oculo non

multo latiore. Abdomen cylindraceum, sat breve, obscure fulvum, supra parce albo-punctatum sed vitta media impunctata, antice arcubus tenuibus fuscis postice punctis nigricantibus biseriatis 5—5 ornata, notatum. Chelae fulvo-rufulae, laeves, longissimae et proclives, supra in parte apicali apophysi sat brevi, subrecta et subacuta, armatae, margine superiore sulci dente 1° apicali parvo compresso et oblique truncato, dente 2° parvo, dente 3° majore recto et acuto, dein dentibus seriatis 4 vel 5, inter se fere aequidistantibus et versus basin sensim minoribus, armato, margine inferiore dente apicali minutissimo, obtuso, subrotundo, ad radicem unguis sito, dente 2° subapicali majore et acuto, dein dentibus parvis sex, inter se fere aequidistantibus, ultimis binis reliquis minoribus, munito, ungue longo simplici, haud dentato. Laminae fusco-olivaceae. Pars labialis nigricans. Sternum pedesque fulva, femoribus anticis leviter fusco-maculatis, patellis tibiisque apice leviter infuscatis. Pedes-maxillares a praecedenti differt processu apicali tarso brevior et crassior, apophysi ad marginem inferiorem tuberculo parvo subrotundo, haud truncato et longe ante medium sito, instructa.

Plate XIX. fig. 8.

HAB. Hawaii, Kona.

*T. sobrina* E. S. est voisin de *T. perkinsi* E. Sim. dont il diffère surtout par ses yeux médians antérieurs un peu plus petits que les postérieurs, par la pointe tarsale de sa patte-mâchoire plus courte et plus épaisse, par son apophyse tarsale pourvue, au bord inférieur, bien avant le milieu, d'un petit tubercule obtus, ni tronqué ni malléiforme, enfin par l'armature des marges de ses chélicères ; à la marge supérieure en effet la dent apicale est obliquement tronquée et un peu bifide au lieu d'être conique, la 3° dent est relativement plus petite et moins reculée ; à la marge inférieure les deux dents apicales sont presque semblables dans les deux espèces, mais chez *T. sobrina* les dents sériées sont à peu près semblables entre elles, sauf les deux dernières qui sont un peu plus petites, tandis que chez *T. Perkinsi* les deux premières dents sont un peu plus petites que les autres.

(6) *Tetragnatha kauaiensis*.

♂. Long. 6 mm. Cephalothorax angustus et longus, pallide fulvo-rufescens, parte cephalica postice, thoracica ad marginem, leviter infuscatis, fovea thoracica ovata postice attenuata sulcisque cephalicis impressus, fronte angusta. Oculi quatuor postici, superne visi, in lineam valde recurvam, inter se aequales et fere aequidistantes. Oculi quatuor antici in lineam subrectam vix latiore. Oculi quatuor medii aream paulo latiore postice quam longiore et antice quam postice angustiore, occupantes, antici posticis paulo majores. Oculi laterales utrinque aequi et inter se spatio oculo non multo latiore distantes. Abdomen angustum et longum, obscure fulvum, luteo-nitido

punctatum et supra maculis fuscis paucis biseriatis notatum. Chelae longissimae et proclives, fulvo-rufulae, laeves, supra in parte apicali apophysi subrecta, apice nigra et minutissime bifida, armatae, margine superiore sulci dente apicali, ad radicem unguis sito, minutissimo compresso truncato cariniformi et minutissime bilobato, dente 2° remoto parvo, dente 3° maximo recto et acuto, dein dentibus remotis, acutis 4 vel 5, versus basin sensim minoribus, armato, margine inferiore dentibus mediocribus 8, inter se fere aequidistantibus, sed leviter iniquis, munito, ungue longo, simplici, haud dentato. Pars labialis fusca. Laminae, sternum pedesque fulvo-rufescentia. Pedes aculeis tenuibus sed longissimis instructi, metatarsis anticis ad basin aculeis longis verticillatis, et utrinque prope medium aculeo parvo armatis. Pedes-maxillares fulvi, ordinarii, apophysi tarsali tibia circiter aequilonga, angusta sed obtusa, intus, prope basin, tuberculo rufulo et obtuso munita.

♀. Long. 8 mm. A mari differt chelis brevioribus et validioribus, apophysi superiore carentibus, margine superiore sulci dente apicali mediocri acuto, dein dentibus seriatis subcontiguus sex, 1° valido reliquis sensim minoribus, margine inferiore dentibus parvis seriatis (apicali vix majore) 6—8 armato. Abdomen longum et angustum, supra flavo-aureum, subtus fulvum. Pedes longi, lutei, aculeis tenuibus longissimis et numerosis muniti, femoribus anticis utrinque aculeis longissimis fere setiformibus 6—6, tibiis subtus aculeis similibus 6—6, metatarsis ad basin aculeis verticillatis, dein (ante medium) aculeo simili munitis. Pedes-maxillares patella supra ad apicem, tibia metatarsoque utrinque aculeis divaricatis longissimis munitis.

Plate XIX. fig. 9.

HAB. Kauai, Halemanu.

(7) *Tetragnatha restricta*, sp. nov.

♂. Long. 5.5 mm. A *T. kauaiensi*, cui valde affinis est, differt cephalothorace brevioris fronte latiore, obscure fulvo-rufescenti, parte cephalica postice macula dilutiore confusa notata, oculis quatuor posticis, superne visis, in lineam valde recurvam, inter se aequalibus, mediis a lateralibus quam inter se vix remotioribus, oculis quatuor anticis, antice visis, in lineam vix latiore, subrectam, oculis quatuor mediis inter se aequis, aream evidenter latiore quam longiore et antice quam postice angustiore, occupantibus, oculis lateralibus utrinque inter se spatio oculo non multo latiore distantibus, antico postico paulo minore, abdomine paulo brevioris, antice obtuse truncato et emarginato, prope medium leviter ampliato, apicem versus longe attenuato, obscure fulvo, crebre albo-argenteo-punctato, utrinque, prope medium, leviter infuscato, subtus vitta media fulva (impunctata) notato. Chelarum margines ut in *T. kauaiensi* armati sed margo superior dente parvo apicali cariniformi carens et dente maximo (2°) paulo remotiore. Caetera fere *T. kauaiensis*.

♀. Long. 6—7 mm. A mari differt chelis brevioribus et validioribus, margine superiore sulci dente apicali parvo et acuto, dein dentibus seriatis, ab apice remotis sed inter se contiguus, quinque, 1° et 2° sat validis et inter se aequis, reliquis versus basin sensim minoribus, margine inferiore fere similiter dentato, sed serie dentium a dente apicali minus remota. Abdomen rhomboidale, in medio ampliatum et convexum, antice et praesertim postice declive et valde attenuatum, obscure fulvum, crebre albo-argenteo-punctatum. Pedes obscure fulvi, antici leviter et confuse fusco-variati, patellis anticis aculeo apicali gracili, tibia utrinque aculeis quatuor tenuibus longissimis et divaricatis, metatarsis ad basin aculeis trinis verticillatis (lateralibus longissimis, dorsali parvo) aculeoque exteriore submedio armatis. Pedum-maxillarum patella supra ad apicem tibiaeque utrinque seta longissima et divaricata armatae.

Plate XIX. fig. 10.

HAB. Hawaii, Kona.

(8) *Tetragnatha uncifera*, sp. nov.

♂. Long. 6—7 mm. Cephalothorax modice longus, fronte lata, fovea thoracica lata subrotunda, striis cephalicis profundis impressus, obscure fulvo-rufescens vel olivaceus, tenuiter nigro-marginatus, parte cephalica utrinque infusca et lineolis mediis binis fuscis exillimis et subgeminatis, antice evanescentibus, notata, oculis singulariter nigro-cinctis. Oculi postici superne visi, in lineam valde recurvam, inter se aequi et aequidistantes. Oculi antici, antice visi, in lineam vix recurvam, vix latiore. Oculi quatuor medii aream circiter aequae longam ac latam et antice quam postice angustiore occupantes, antici posticis majores. Oculi laterales utrinque leviter prominuli et a sese parum separati, spatio interoculari oculo vix latiore, anticus postico paulo minor. Abdomen longe oblongum, in medio plus minus convexum. Chelae fulvofulvae laeves, longissimae et proclives, supra in parte apicali apophysi arcuata, apice minute bifida, armatae, margine superiore sulci, dente 1°, apice longe remoto, valido sed acuto et uncato, dente 2° longiore acuto et recto, dein dentibus minoribus 5, inter se aequidistantibus et versus basin sensim minoribus, armato, margine inferiore dentibus subapicalibus binis mediocribus, 2° 1° paulo majore, dein dentibus minutissimis binis, inter se remotis, dein dentibus seriatis 6—7, vix majoribus et versus basin sensim minoribus, munito, ungue longo, simplici haud dentato. Partes oris sternumque fusca, parte labiali fere nigra. Pedes longi, obscure fulvi, patellis fuscis, femoribus tibiisque annulis fuscis mediis apicalibusque notatis, metatarsis tarsisque apice sensim infuscatis, aculeis tenuibus et longis armati, tibiis anticis aculeis inferioribus 4—4 aculeisque dorsalibus binis, metatarsis aculeis basilaribus verticillatis 2 vel 3, aculeoque submedio munitis. Pedes-maxillares lutei fusco-variati, longi, ordinarii, tibia

patella multo longiore, ad basin angustiore sed versus apicem sensim ampliata, apophysi tarsali angusta, subrecta et obtusa, intus, ante medium, angulosa et tuberculo obtuso munita.

♀. Long. 7—10 mm. A mari differt chelis brevioribus et validioribus convexis, apophysi superiore carentibus, margine superiore sulci dente angulari mediocri et obtuso, dein dentibus seriatis, ad apicem remotis sed inter se appropinquatis, 5—6, 1° et 2° validis et inter se aequis, reliquis multo minoribus, margine inferiore dente apicali parvo, dein serie dentium 6—7 validorum sed versus basin sensim minorum, armato, abdomine in medio sensim ampliato, supra convexo et saepe obtuse tuberculato, cinereo-testaceo et crebre albido-punctato, vitta foliiformi lata fusca, utrinque nigro-marginata, in medio abrupte ampliata et angulosa, postice sensim attenuata et flexuosa, supra ornato, interdum vitta obsoleta sed macula media triquetra et utrinque maculis parvis binis nigris ornata, subtus in medio confuse infuscato, regione epigasteris rufulo-tincta, pedibus distinctius fusco-annulatis, femoribus anticis utrinque aculeis 5—5, exterioribus parvis, interioribus longioribus, patellis aculeo apicali longissimo, tibiis aculeis inferioribus tenuibus sed longissimis 5—5 vel 4—5, aculeoque dorsali submedio, metatarsis aculeis basilaribus verticillatis similibus aculeoque interiore submedio instructis. Pedes-maxillares lutei fusco-annulati, patella supra ad apicem seta spiniformi longa, tibia utrinque seta simili, tarso setis plurimis munitis. Vulva pone spiracula sita, postice late et recte truncata.

Plate XIX. fig. 2.

HAB. Maui, Haleakala.—Hawaii; Kau, Kona, Mauna Loa.—Kauai.

(9) *Tetragnatha cuneiventris*, sp. nov.

♂. Long. 5—6 mm. A praecedenti differt area oculorum mediorum antice quam postice paulo angustiore et saltem haud latiore quam longiore, chelarum margine superiore dente 1° mediocri, ad apicem minus remoto, acuto et recto, haud uncatu, dente 2° 1° plus duplo longiore recto et acuto, dentibus minoribus basilaribus trinis munito, margine inferiore dente apicali minutissimo et obtuso, dente 2° multo majore acuto et recto, dente 3° minore, dente 4° singulariter sito, parvo, dentibusque basilaribus seriatis trinis armato, pedum aculeis paucis, debilibus et brevibus, metatarsis anticis, utrinque ad basin, minutissime aculeatis sed aculeo medio carentibus.

♀. Long. 7 mm. A mari differt abdomine brevioris et latioris, antice minute emarginato, in medio dilatato, altissimo et obtuse turbinato, obscure cinereo, crebre albido-punctato, prope apicem transversim nigro-notato et subvittato, postice in declivitate utrinque macula magna obliqua nigerrima et maculis mediis fuscis minoribus seriatis ornato, subtus vitta media nigricanti notato, chelis brevioribus et validioribus, subverticalibus, nitidis, obscure fulvis, antice et extus fusco-vittatis, dentibus marginum

fere praecedentis, laminis fulvis extus fusco-marginatis, parte labiali sternoque nigricantibus, pedibus fulvis, valde fusco-annulatis, femoribus anticis aculeis paucis setiformibus munitis sed reliquis articulis muticis, patellis seta apicali, tibiis setis erectis binis supra munitis. Pedum-maxillarium patella seta apicali, tarsus setis plurimis muniti sed tibia mutica.

Plate XIX. fig. 3.

HAB. Maui, Haleakala.

Subfam. ARGIOPINAE.

ARGIOPE Audouin.

(1) *Argiope avara* Thorell.

*A. avara* Thorell, Freg. Eug. Resa, in Vetensk. Akad. Handl. 1868.

*A. avara*, McCook, Amer. Spid., t. III. p. 222, tab. XIV. f. 1.

♀. Long. 18—25 mm. Cephalothorax fulvo-rufescens, longe et crebre albo-sericeo-pubescentis, clypeo leviter infusato. Area oculorum mediorum longior quam latior et antice quam postice angustior, oculi antici posticis vix majores. Oculi laterales utrinque valde prominuli et contigui, anticus ovatus postico rotundo plus duplo minor. Abdomen late ovatum, antice rotundum, postice breviter attenuatum et obtusum, superne leviter deplanatum, albido-cereolum, antice lineolis transversis binis exilibus et abbreviatis, prope medium lineis transversis integris, saepe flexuosis, postice vittis transversis 5—7, sensim latioribus, densioribus et saepe albido-punctatis, interdum confluentibus, nigerrimis decoratum, in lateribus nigrum valde albido-punctatum et maculatum, subtus regione epigasteris testacea, regione ventrali nigra, vittis binis rectis sed postice leviter divaricatis, mamillas haud attingentibus, et maculis medianis parvis binis albis notata. Sternum atrum, vitta latissima, utrinque lobata, fulvo-rufula notatum. Coxae fulvo-rufulae fusco-marginatae et variatae. Pedes robusti et longi, fusco-rufescentes, femoribus anticis subtus fere nigris, posticis confuse annulatis, sericeo-pubescentes, crebre et sat longe nigro-setosi. Tuberculum genitale profunde foveolatum, et carinula alta testacea, antice leviter canaliculata, postice sensim ampliata et plana, munitum.

♂. Long. 8—10 mm. Cephalothorax fuscus, longe et crebre albo-pilosus, versus marginem dilutior et vitta media albido-lutea, antice latissima, postice sensim angustiore, notatus. Abdomen angustum et parallelum, antice rotundum, postice breviter acuminatum, supra crebre albo-punctatum et vitta media latissima et parallela paulo obscuriore et tenuiter nigro-marginata, notatum, subtus nigricans et vittis albis binis integris ornatum, mamillis fulvo-rufulis. Sternum albido-luteum, utrinque late nigri-

canti-marginatum. Pedes obscure fulvi, femoribus, patellis tibiisque crebre nigropunctatis, metatarsis tarsisque apice leviter et sensim infuscatis, aculeis debilibus armati, metatarsis anticis aculeis basilaribus et submediis munitis sed apicalibus carentibus. Pedes-maxillares lutei, apice fuscii; patella parva nodosa supra seta longissima et erecta munita; tibia brevi et transversa, intus prominula et longe setifera; tarso longe lacinoso, supra ad basin processu magno, intus obtuse conico et rufulo, extus nigro, transversim cariniformi et bisinuoso; bulbo maximo, supra plagula rufula, clypei-formi semicirculari, tenuissime concentrice striata, ad apicem lamina styli-formi nigra, valde plicata munita.

HAB. Forma typica; Lanai, Koelc.—Hawaii; Kau, Kona.—Oahu, Waianae Mts.—Maui, Haleakala.

VAR. *A. avara kauaiensis*, subsp. nov.

Abdomen supra nigrum, antice vitta transversa lata saepe flexuoso-dentata, dein maculis octo, transversim biseriatis, quatuor anticis majoribus ovatis et saepe dentatis, albo-cereolis, supra decoratum.

HAB. Kauai Mts.

Espèce décrite des Sandwich par Thorell qui l'indique également d'Australie à Sydney (St. Rag. Mal., t. III. p. 69) et de Californie, retrouvée depuis dans l'Arizona et le Texas (McCook).

Nous avons décrit son cocon ovigère qui ressemble à celui de l'*A. bruennichi* Scopoli, d'Europe (Zool. Jahrb. 1899, p. 416).

C'est probablement de cette espèce dont le D<sup>r</sup> Karsch parle sous le nom d'*Argiope aemula* Walck. (Sitz.-Ber. Ges. Naturf. Freunde, Mai 1880, p. 77).

#### CYCLOSA Menge.

Le genre *Cyclosa* est représenté aux Iles Sandwich par deux espèces très répandues dans l'ancien et le nouveau monde, *C. oculata* et *turbinata* Walck., par une espèce *C. albisternis* E. Sim. que nous connaissions déjà des Iles Andamans et de l'Inde et par cinq espèces qui paraissent spéciales. *C. perkinsi*, *simplicicauda* et *xanthomelas* E. Sim. sont voisins des précédents et de forme normale, mais le dernier, *C. xanthomelas*, offre un style de coloration très spécial.

Les deux autres *C. olorina* et *cucurbitula* E. Simon, rentrent dans le groupe du *C. micula* Thorell, caractérisé par un abdomen brièvement ovalaire ou globuleux (cf. Hist. Nat. Ar. t. I. p. 780).

(1) *Cyclosa oculata* Walckenaer.

*Aranea oculata* Walckenaer, Fn. Par. II. 1802, p. 428.

*Epeira oculata* Walckenaer, Apt. II. 1841, p. 145.

*Cyclosa oculata* E. Simon, Ar. Fr. I. 1874, p. 41.

(?) *Epeira Walckenaeri* Keyserling, Sp. Amer. Epeiridae, 1892, p. 98, tab. v. f. 85.

(?) *Cyclosa Walckenaeri* McCook, Amer. Spid. etc. III. p. 226, tab. XVII. f. 1.

HAB. Oahu, Honolulu.

Espèce probablement introduite, dont l'habitat est fort étendu, car elle se trouve en France surtout dans les Jardins (où elle a sans doute aussi été introduite), dans l'Afrique australe, au Natal, et au Cap, dans le sud des États-Unis (MacCook), au Guatemala; je l'ai reçue aussi de la Jamaïque et de St Domingue, et je l'ai trouvée au Venezuela.

(2) *Cyclosa turbinata* Walckenaer.

*Epeira turbinata* Walck., Apt. II. 1841, p. 140.

*Epeira caudata* Hentz, J. Bost. S. VI. 1850, p. 23.

*Cyclosa turbinata* McCook, Amer. Spiders etc. III. 1893, p. 224, tab. XVII. f. 5—6.

*Epeira strangulata* L. Koch, Ar. Austr. I. p. 118, tab. IX. f. 6.

HAB. Hawaii, Kona.—Maui, Haleakala.—Kauai; Waimea, Koholuamano.

Cette espèce a, comme la précédente, un habitat très vaste: elle est répandue en Malaisie (Sumatra), aux Iles Viti (L. Koch), en Nouvelle-Calédonie et dans l'Amérique du Nord, du Canada à la Californie et à la Floride.

*Epeira camelodes* Thorell (d'Amboine) en est peut-être aussi synonyme (?).

(3) *Cyclosa albisternis* E. Simon.

*C. albisternis* E. Simon, Journ. As. Soc. Beng., LVII. 1887, p. 1, No. 3 (1888) p. 285.

HAB. Kauai.

Tout à fait semblable au type des Iles Andamans; l'espèce existe aussi dans le sud de l'Inde.

(4) *Cyclosa perkinsi*, sp. nov.

♀. Long. 5 mm. Cephalothorax niger et nitidus, parte cephalica parce albo-setosa, parte thoracica late ovata convexa, cephalica abrupte angustiore, postice sulco profundo leviter procurvo discreta. Oculi ordinarii. Abdomen oblongum, antice altum et tuberculis obtusis binis munitum, postice leviter attenuatum et declive sed apice truncatum et obtusissime trilobatum, supra plerumque cinereo-testaceum, nigropunctatum et reticulatum, pone tubera punctis nigris densioribus vittas duas confusas designantibus, subtus utrinque late albedo-plagiatum, in medio nigrum maculis albis quatuor, anticis alteris duplo majoribus subquadratis et inter se transversim late remotis. Sternum nigrum, in medio dilutius et confuse vittatum. Pedes lutei, femoribus (praesertim anticis) apice late nigricanti-annulatis et subtus in parte basali annulo multo angustiore notatis, tibiis metatarsisque in medio atque ad apicem fusco-annulatis, tarsis apice fuscis. Vulva scapo alto transverso olivaceo-nitido, utrinque obtuso, in medio leviter depresso, atque unco brevi, obtuso et linguiformi, munita.

VAR. Abdomen supra albedo-opacum, utrinque et antice, in declivitate, leviter nigro-reticulatum.

A *Cyclosa turbinata* W., cui valde affinis est, differt imprimis abdomine postice haud turbinato sed obtusissime trilobato, subtus maculis albis quatuor notato sed macula alba anteriore carente; a *C. oculata* W. differt coxis luteis, sterno in medio subvittato sed ad marginem haud maculato, maculis albis ventralibus majoribus etc.

HAB. Hawaii, Kau.

(5) *Cyclosa simplicicauda*, sp. nov.

♀. Long. 8—12 mm. Cephalothorax fulvo-olivaceus, laevis, parce albidosetosus, parte cephalica saepe antice leviter fusco-reticulata et postice plerumque lineis exilibus fuscis binis convergentibus notata, thoracica saepe utrinque et postice sensim infuscata, parte thoracica ovata, leviter convexa, impressione media, antice truncata, munita, cephalica abrupte angustiore, sat longa et convexa, sulco profundo semicirculari discreta. Oculi quatuor medii aream paulo longiorem quam latiore et antice quam postice latiore occupantes, postici anticis minores, spatio oculo plus duplo angustiore a sese distantes. Oculi laterales utrinque aequi et contigui, a mediis late distantes. Abdomen longe oblongum, plus duplo longius quam latius, antice breviter attenuatum et obtusum, postice, pone mamillas, sat longe productum, sensim attenuatum sed obtusum fere ut in *C. conica*, interdum postice haud attenuatum et obtusissime truncatum, supra albedo-testaceum, breviter sericeo-pubescent, vitta media cinerea latissima, antice inordinate et minute nigro-punctata, postice utrinque linea nigra,

valde flexuoso-dentata marginata, et punctos albos biseriatos saepe includente, notatum, utrinque, in declivitate, nigriganti-reticulatum, rarius nigrum albedo-vittatum et maculatum, subtus regione ventrali atra utrinque vitta albida recta, marginata. Chelae fulvo-nitidae, antice ad basin confuse infuscaetae. Partes oris nigrae vel fuscae, late testaceo-marginatae. Sternum inaequale, luteo-olivaceum vel albidum et fulvo-reticulatum, saepe in medio infuscatum et confuse plagiatum sed linea media dilutiore sectum. Pedes lutei, sat longe et fere aequaliter setosi, femoribus ad apicem (anticis late posticis, anguste) infuscatis et sex posticis annulo subbasilari obliquo et angusto fusco notatis, tibiis metatarsisque annulo medio parvo saepe obsolete annuloque apicali fuscis notatis, tarsis apice fuscis, femoribus anticis pluriaculeatis, patellis aculeo exteriori munitis, tibiis intus, prope medium, aculeis binis prope apicem aculeis plurimis minoribus, armatis, metatarsis muticis. Tuberculum vulvae ovato-transversum, olivaceum et nitidum, postice plagula magna cordiformi, ad marginem anticum utrinque lobo parvo nigro foveolato, atque in medio unco gracili et recto, sat longo, fulvo, apice rufulo et nitido munitum.

HAB. Hawaii.—Molokai.—Oahu.—Maui.—Lanai.

A *Cyclosa albisterni* E. Sim., cui praesertim affinis est, differt abdomine antice haud tuberculato postice simpliciter turbinato.

Plate XVI. fig. 4.

VAR. *Cyclosa simplicicauda rufescens*.

♀. Long. 6 mm. Cephalothorax fulvo-testaceus parce et longe albedo-pilosus. Abdomen fere parallelum, antice rotundum, postice haud vel vix attenuatum, parum productum et obtuse truncatum, supra fulvum vel rufescens, vitta foliiformi latissima cinerea, antice evanescente, postice tenuiter et flexuose nigro-marginata plerumque ornatum, interdum supra late nigrigans, fulvo-testaceo-marginatum et punctatum, subtus vitta atra lata, in medio leviter coarctata et albedo-marginata notatum. Sternum nigrum, interdum rufescens et antice confuse infuscatum.

HAB. Hawaii, Kona.—Molokai.

(6) *Cyclosa xanthomelas*, sp. nov.

♀. Long. 8—10 mm. Cephalothorax nigro-nitidus, parte thoracica late ovata, convexa, fovea media obtuse triquetra profunde impressa, parte cephalica abrupte angustiore, angusta et convexa, sulco semicirculari profundo discreta. Oculi quatuor medii aream antice quam postice multo latiore occupantes, postici a sese spatio oculo plus triplo angustiore distantes, antici posticis paulo majores. Oculi late-

rales a mediis sat distantes, utrinque contigui et leviter prominuli, anticus postico major. Abdomen oblongum, antice rotundum, postice, ultra mamillas, productum, leviter attenuatum sed obtusum (fere ut in *C. conica* Pallas), nigrum, breviter et parce pilosum et utrinque macula fulva maxima subtriquetra et leviter dentata ornatum. Chelae nitidae, ad basin fuscae vel nigrae, ad apicem fulvae. Partes oris nigrae, intus late luteo-marginatae. Sternum nigrum. Pedes sat longi, sat longe setosi, nigri, tibiis ad basin anguste luteo-annulatis, metatarsis tarsisque cunctis pallide luteis, metatarsis 4<sup>i</sup> paris ad apicem et saepe in medio minute fuscis, tibiis anticis aculeis setiformibus paucis munitis, sed metatarsis muticis. Pedes-maxillares lutei, femore ad apicem patellaque nigris vel fuscis. Vulvae scapum ovato-transversum fusco-nitidum, uncus rectus sat gracilis, niger sed apice leviter ampliatus et rufulus, marginem scapi paulo superans.

Plate XVI. fig. 3.

HAB. Molokai Mts.

(7) *Cyclosa olorina*, sp. nov.

♀. Long. 3.5 mm. Cephalothorax atro-olivaceus, nitidus, parte thoracica sat late ovata, convexa, fovea triquetra impressa, parte cephalica abrupte angustiore, sat lata, convexa, sulco semicirculari profundo postice discreta. Area oculorum quatuor mediorum paulo longior quam antice latior et multo latior antice quam postice, medii postici spatio oculo paulo angustiore a sese distantes. Oculi laterales utrinque contigui, a mediis sat remoti. Abdomen breviter ovatum vel subrotundum (fere *Aranei cucurbitini* Cl.), supra omnino albo-opacum praeterea atrum, in lateribus et postice inordinate albedo-punctatum, subtus antice, pone rimam genitalem, linea transversa, dein utrinque punctis 3 vel 4, lineam longitudinalem designantibus, punctisque mediis binis albidis, notatum. Chelae fulvae, antice ad basin late fusco-plagiatae. Partes oris sternumque fusca vel nigricantia, sternum utrinque, ad marginem, maculis testaceis 2 vel 3 notatum. Pedes breves, sat robusti, pallide lutei, coxis leviter infuscatis, femoribus subtus, ante medium, annulo nigricanti angusto (in femoribus 4<sup>i</sup> paris latiore) annuloque apicali latiore olivaceo (saepe in femoribus 4<sup>i</sup> paris lineato), tibiis metatarsisque annulo medio angusto annuloque apicali latiore fuscis vel olivaceis, saepe obsoletis, ornatis. Scapum vulvae ovato-transversum, fuscum et nitidum, utrinque fovea sinuosa impressum, in medio unco testaceo depresso et obtuso, marginem scapi paulo superante, munitum.

Plate XVI. fig. 5.

HAB. Hawaii, Kona.

(8) *Cyclosa cucurbitula*, sp. nov.

♀. Long. 2 mm. Cephalothorax laevis et glaber, pallide luteo-testaceus, parte thoracica in medio minute et confuse infuscata, parte cephalica brevi et convexa, sulco profundo semicirculari postice discreta. Area oculorum quatuor mediorum circiter aequae longa ac antice lata et multo latior antice quam postice, medii postici spatio oculo paulo angustiore a sese distantes. Oculi laterales utrinque contigui, a mediis sat remoti. Abdomen breviter ovatum (fere *Aranei cucurbitini* Cl.), supra omnino albo vel flavido-testaceum tenuiter et parce albo-pilosum, subtus vitta latissima, mamillas includente, atro-testacea notatum. Partes oris sternumque pallide fusco-olivacea laevia. Pedes breves, sat robusti, pallide lutei, omnino mutici. Scapum vulvae ovato-transversum, fuscum et nitidum, incisura media uncoque albo-nitido, recto, gracili, sed apice leviter incrassato obtuso et marginato, marginem scapi vix superante, munitum.

HAB. Oahu.

## ARANEUS Clerck.

(1) *Araneus nauticus* L. Koch.

*Epeira nautica* L. Koch, Aegypt. u. Abyss. Arachn. 1875, p. 17, tab. 11, f. 2.  
*Epeira pullata* Thorell, Stud. Rag. Mal. etc. 1. 1877, p. 385 (45).

Espèce abondamment répandue dans toutes les régions tropicales, en Afrique, en Asie, Malaisie, et dans l'Amérique du Sud ; sans doute introduite aux Iles Sandwich.

HAB. Oahu.—Hawaii.

(2) *Araneus emmae*, sp. nov.

♀. Long. 8—10 mm. Cephalothorax obscure fulvo-rufescens, regione oculari paulum infuscata, crasse et longe albedo-sericeo-pubescens. Area oculorum mediorum haud vel vix prominula, circiter aequae longa ac antice lata et antice quam postice multo latior, sed spatio inter posticos oculo vix angustiore, anticis posticis majores. Oculi laterales a mediis late distantes et utrinque angulum frontalem occupantes, inter se angustissime separati, anticus postico major. Clypeus oculis mediis anticis vix latior. Abdomen longius quam latius, antice attenuatum et subacuminatum, postice longius attenuatum atque obtusum, supra cinereo-albidum, parce albidocrinatum, atrum, antice utrinque linea obliqua, dentata et punctata, postice vitta folii-

formi angusta et attenuata, maculas 3 vel 4 includente, nigris ornatum, subtus regione ventrali atra, utrinque linea longitudinali, postice leviter ampliata et incurva, et secundum mamillas maculis parvis binis albis, decoratum. Chelae fuscae, apice rufescentes, albido-crinatae, margine superiore sulci dentibus quatuor, 3<sup>o</sup> reliquis majore, inferiore dentibus trinis subaequis et contiguis armatis. Partes oris fuscae, late testaceo-marginatae. Sternum fuscum plerumque antice paululum dilutius. Pedes, praesertim antici, longi, aculeis numerosis albidis subpellucetibus sed ad radicem minute fuscis, instructi, fulvi, sericeo-pubescentes, femoribus anticis apicem versus sensim infuscatis, posticis apice fusco vel nigricanti-annulatis, patellis tibiisque plus minus fusco-variatis, metatarsis tarsisque plerumque concoloribus, interdum valde nigricanti-annulatis. Vulva scapo parvo fere oblecto, postice (sub unco) plagula olivacea trapezoidali munito, unco testaceo transversim rugato, ad basin lato convexo et subtriquetro, ad apicem abrupte angustiore gracili et recto, munita.

Plate XVI. fig. 6.

Pictura abdominalis valde variabilis:

Varietas. A. Abdomine supra omnino fusco.

B. Abdomine fusco, linea alba subintegra longitudinaliter secto.

C. Abdomine fusco-cervino, antice macula media longitudinali ovata, maculis binis ovatis et obliquis cruciata, albo-opacis, postice vitta foliiformi parum expressa sed punctis nigris biseriatis notata, supra ornato.

D. Abdomine supra nigro, in parte basali macula maxima transversa albido-testacea oblecto.

E. Abdomine nigro, antice macula apicali, postice maculis seriatis 2 vel 3 albo-opacis supra decorato. Pedibus valde et late nigro-annulatis (Hawaii, Olaa).

HAB. Hawaii; Kau, Olaa.—Molokai.—Lanai, Koele Mts.—Kauai, Waimea Mts.

(3) *Araneus kapiolaniae*, sp. nov.

♀. Long. 15 mm. Cephalothorax fulvo-rufescens, parte cephalica fusca vel nigricanti, crasse sed breviter fulvo-crinitus. Area oculorum mediorum valde prominula, vix longior quam antice latior et antice quam postice multo latior, sed spatio inter posticos oculo haud latiore, antici posticis multo majores. Oculi laterales a mediis late distantes et utrinque angulum frontalem occupantes, inter se evidenter separati, anticus postico major. Clypeus oculis mediis anticis haud latior. Abdomen longius quam latius, antice breviter attenuatum et obtusum, postice longius et sensim attenuatum, supra cinereo-virescens, leviter fusco nigrove vermiculatum, antice in

declivitate oblique nigro-marginatum, dein transversim dilutius, dein maculis transversis nigerrimis albo-limbatis, series duas (5—5), postice convergentes, designantibus, anticis obliquis, reliquis recte transversis, ornatum, in lateribus valde nigricanti-reticulatum, subtus regione ventrali atra, utrinque vitta lutea, postice ampliata et incurva, marginata. Chelae nigrae, apice rufulae, parce sed valde fulvocrintae. Partes oris nigrae, intus luteo-marginatae. Sternum nigrum. Pedes, praesertim anticis, longi, aculeis fulvis, intus in tibiis et metatarsis anticis numerosis brevibus et validioribus, armati, femoribus quatuor anticis fusco-rufulis, quatuor posticis nigricantibus, cunctis ad basin luteis, patellis fulvo-rufulis fusco-variatis, tibiis fusco-rufulis, annulo subbasilari annuloque subapicali angustis fulvis, metatarsis tarsisque nigricantibus, metatarsis annulis angustis binis, tarsis (3° excepto) annulo parvo subbasilari fulvis, notatis. Vulva scapo late ovato subrotundo, fulvo sed utrinque fusco-notato, unco testaceo longo, usque ad basin sat gracili, recto et supra transversim rugato, munita.

Plate XVI. fig. 7.

HAB. Hawaii, Hilo.

#### Fam. THOMISIDAE.

##### Subfam. MISUMENINAE.

##### MISUMENA Latreille.

Ce genre est représenté aux Iles Sandwich par un certain nombre d'espèces qui peuvent se rapporter à trois groupes ou sections.

##### Sectio 1<sup>a</sup> (*Misumena oreades* E. Sim.).

Les caractères du *Misumena oreades* sont ambigus; cette espèce se rapproche en effet des *Pistius* par son front étroit, son groupe oculaire médian un peu plus long que large et plus étroit en avant qu'en arrière; d'un autre côté cependant elle se rattache au genre *Misumena* par ses tubercules oculaires très obtus, non saillants au dessus de l'œil latéral postérieur, par son aire oculaire plane, ses téguments lisses, son abdomen ovale, ni anguleux ni tronqué.

Elle est en outre remarquable par son céphalothorax longuement atténué en avant et par son bandeau un peu proclive.

(1) *Misumena oreades*, sp. nov.

♀. Long. 8 mm. Cephalothorax paulo longior quam latior, antice attenuatus, fronte sat angusta, laevis, glaber, luteo-testaceus, area oculorum semilunari albo-opaca. Oculorum lineae binae fere aequaliter recurvae. Oculi quatuor antici inter se fere aequidistantes, medii lateralibus saltem  $\frac{1}{3}$  minores, quatuor postici inter se aequales, medii a lateralibus quam inter se paulo remotiores. Area mediorum paulo longior quam postice latior et antice quam postice evidenter angustior. Abdomen sat longe oblongum, postice leviter ampliatum, omnino albido-testaceum. Chelae, partes oris sternum pedesque luteo-testacea. Pedes quatuor antici reliquis multo longiores et robustiores, tibiis aculeis pellucetibus sat brevibus sed inter se iniquis, basin articulo haud attingentibus, 4—5 vel 3—4, metatarsis aculeis, paulo longioribus, 5—6 vel 4—5, subtus instructis, sed aculeis lateralibus carentibus.

HAB. Hawaii, Kea Mts.—Oahu, Wainae.—Molokai.

Sectio 2<sup>a</sup> (*Misumena nesiotés* E. Simon).

Le *Misumena nesiotés* E. Simon, fait presque le passage des *Misumena* aux *Diaea*; sa première ligne oculaire est un peu plus recourvée que la seconde, comme celle des *Misumena* typiques, mais avec les yeux latéraux visiblement plus gros que les médians, de chaque côté son tubercule oculaire oblique est marqué, entre les yeux, d'une légère dépression.

(2) *Misumena nesiotés* E. Simon.

*M. nesiotés* E. Simon, in Zool. Jahrb. xii. 1899, p. 416.

♀. Long. 7 mm. Cephalothorax subtilissime coriaceus, setis longis paucis seriatis conspersus, fulvo-rufescens, utrinque valde nigro-variegatus et reticulatus et postice macula nigra oblique notatus (parte fulva vittam latam et parallelam designante), tuberibus ocularibus albo-opacis. Oculi antici inter se fere aequidistantes, laterales mediis vix majores. Oculi postici in lineam latiore, fere aequaliter recurvam, parvi et aequi, medii a lateralibus quam inter se paulo remotiores. Oculi quatuor medii parvi et aequales, aream subquadrata, postice quam antice vix latiore, occupantes. Abdomen vix longius quam latius, postice ampliatum et obtusum, fulvo-testaceum, nigro-plagiatum, supra antice macula parva, dein maculis binis dentatis, postice arcubus transversis, utrinque latis in medio tenuibus, subtus postice lineis fuscis binis punctatis et subgeminatis, parum distinctis, notatum. Sternum fulvum, parce nigro-setosum. Pedes quatuor antici reliquis multo longiores, obscure

fulvi, (tarsis exceptis) crebre fusco-punctati, femoribus subtus fere nigris, tibiis subannulatis. Pedes quatuor postici lutei. Tibiae quatuor anticae aculeis mediocribus fusco-pelluculentibus 6—4, metatarsi aculeis similibus 5—4 subtus instructi, sed aculeis lateralibus carentes. Vulva tuberculo fulvo parvo obtuso et subrotundo, postice excavato, munita.

VAR. Cephalothorax utrinque fulvo-rufulo haud nigro variegatus et punctatus. Abdomen albido-testaceum, postice punctis nigris grossis, maculas binas transversas confusas designantibus, notatum. Pedes fere omnino lutei, antici vix distincte fulvo-punctati.

HAB. Hawaii, Kona.—Molokai.

Sectio 3<sup>a</sup> (*Misumcna anguliventris* E. Simon).

Les espèces de ce groupe se font remarquer par leurs yeux antérieurs à-peu-près équidistants avec les latéraux plus gros que les médians, leur aire oculaire médiane environ aussi large que longue et plus étroite en avant qu'en arrière, enfin par leurs tubercules oculaires très obtus mais saillants et, de chaque côté, un peu déprimés entre les yeux.

Leur abdomen est, le plus souvent, fortement élargi et tronqué en arrière comme celui des *Thomisus*; les téguments de leur céphalothorax sont finement chagrinés comme ceux des *Xysticus*.

(3) *Misumcna nigrofrenata*, sp. nov.

♀. Long. 5 mm. Cephalothorax sublaevis, setis validis nigris paucis seriatis munitus, albo-opacus plus minusve pallide olivaceo-variatus, regione clypei intense nigra, regione thoracica postice sinuoso nigrificanti-marginata. Oculi quatuor antici in lineam valde recurvam, inter se fere aequidistantes, medii lateralibus paulo minores. Oculi quatuor postici parvi aequi, inter se fere aequidistantes. Area oculorum quatuor mediorum multo latior postice quam antice et circiter aequae longa ac postice lata. Abdomen breviter ovatum, postice ampliatum et obtusum, supra albo-opacum, in parte apicali maculis binis, inter se appropinquatis, valde biangulosis et litteram Z fere designantibus, et utrinque macula marginali majore, acute excisa, nigris decoratum, subtus nigrum. Chelae antice albae, nigro-maculatae et marginatae, interdum nigrae apice testaceae, opacae, setis spiniformibus paucis munitae. Partes oris, sternum, coxae, trochanteresque nigrae, laevia. Pedes albi, femoribus ad basin atque ad apicem minute nigro-notatis (subtus haud lineatis), tibiis quatuor anticis ad basin anguste ad apicem latissime nigris, metatarsis tarsisque ad apicem late nigris, tibiis

metatarsis tarsisque quatuor posticis ad apicem nigro-annulatis; tibiis quatuor anticis subtus in parte apicali aculeo exteriore unico, aculeis interioribus longioribus trinis, metatarsis aculeis 4—5 instructis. Pedes quatuor postici fere mutici. Pedes-maxillares nigri, tarso ad basin albo.

Plate XVII. fig. 1.

HAB. Oahu, Mountains 2000 f., Kohol.

VAR. Chelae antice nigrae. Abdomen macula anteriore parva subquadrata, maculis binis posticis, a sese confluentibus et vittam transversam, utrinque profunde et acute bifidam formantibus, supra ornatum.

HAB. Kauai; Waimea, Halemanu.

VAR. Chelae antice nigrae. Cephalothorax supra albus, vittis duabus nigris, valde laciniosis, notatus. Abdomen praecedentis. Femora antica, praesertim subtus, valde nigro-variata et guttulata.

HAB. Hawaii, Kau.

(4) *Misumena cretacea*, sp. nov.

♀. Long. 5 mm. Cephalothorax sublaevis, setis validis nigris paucis seriatis munitus, albido-opacus, leviter olivaceo-tinctus, tuberibus oculorum lineaque media frontali albidioribus, regione clypei fusco-rufulo-variata. Oculi fere praecedentis, sed laterales antici mediis saltem duplo majores. Abdomen breviter ovatum, postice ampliatum et obtusum, supra albido-opacum, antice utrinque, in declivitate, nigricanti-marginatum, subtus utrinque nigro-punctatum, in medio late nigrum. Chelae testaceae, fusco-maculatae, setis spiniformibus paucis armatae. Partes oris, sternum, coxae trochanteresque nigricantia, laevia. Pedes albidi, femoribus ad basin atque ad apicem minute nigro-notatis et subtus linea exili nigra ornatis, tibiis metatarsis tarsisque ad apicem late infuscatis et nigro-punctatis et tibiis (in parte fusca) subtus nigro-lineatis; tibiis anticis subtus, in parte apicali, aculeis nigris sat brevibus 1—2, metatarsis aculeis inferioribus, paulo longioribus 3—3, et utrinque, ad apicem, aculeo laterali minore, munitis. Pedes quatuor postici parvissime aculeati. Pedes-maxillares lutei, parce nigricanti-variati.

VAR. Cephalothorax vittis binis fuscis punctatis et dentatis notatus. Abdomen antice testaceo-cinereum et nigro-punctatum, postice albidum, macula media magna nigro-marginata, postice truncata, utrinque valde et acute bidentata, supra notatum. Femora antica valde nigricanti-punctata et maculata et subtus nigro-lineata.

HAB. Molokai, Koele.

(5) *Misumena anguliventris*, sp. nov.

♀. Long. 6—7 mm. Cephalothorax subtilissime coriaceus, parce et longe nigro-crinitus, obscure fuscus, prope marginem saepe fulvo-variatus, vitta media latissima fulva postice attenuata et truncata, lineam mediam saepe antice bifidam et utrinque lineolam abbreviatam fuscas includente notatus, regione clypei nigra. Oculi antici inter se fere aequidistantes, medii lateralibus saltem duplo minores. Oculi postici parvi, inter se aequales et fere aequidistantes. Area oculorum mediorum circiter aequae longa ac postice lata et antice quam postice vix angustior. Clypeus latus. Abdomen antice rotundum, postice valde ampliatum et utrinque obtuse angulosum, fere *Thomisi*, supra fuscum vel nigricans, vitta fulva laciniosa marginatum. Chelae nigrae, apice dilutiores et rufulae. Partes oris sternum coxaeque fusco-castanea seu nigra. Pedes quatuor antici fusco-rufuli, femoribus subtus et in lateribus nigricanti variatis et guttulatis atque in medio nigro-lineatis, patellis, tibiis metatarsisque prope basin fulvo-annulatis. Pedes quatuor postici fulvi, femoribus ad apicem fusco-annulatis. Tibiae anticae aculeis 4—5 vel 5—6, metatarsi aculeis 6—7 vel 7—7 subtus muniti sed aculeis lateralibus carentes. Pedes postici parce et debiliter aculeati. Fovea genitalis parum profunda, antice posticeque margine tenui et recto discreta.

♂. Long. 4 mm. Abdomen minus, ovatum, antice truncatum, fuscum albidoguttulatum, interdum utrinque albidum et macula media maxima nigra trapeziformi notatum. Pedes quatuor antici multo longiores, femoribus fuscis, nigro-variegatis, patellis tibiis metatarsisque nigricantibus vel fuscis annulo medio lato albidum ornatis. Pedes postici lutei, femoribus ad apicem, tibiis ad basin atque ad apicem fusco-annulatis. Tibiae metatarsisque antici aculeis inferioribus longioribus, aculeis lateralibus atque in tibiis aculeis dorsalibus armati. Pedes-maxillares fuscis, fulvo-variatis, tibia patella brevior et angustior subtus apophysi apicali parva subacuta, extus apophysi multo majore, antice, secundum tarsum, directa, valde compressa fere lamellosa, leviter sinuosa (superne excavata, inferne convexa), atque ad angulum superiorem abrupte aciculata, armata, tarso mediocri, ovato, bulbo parvo, ovato, simplici.

Plate XVII. fig. 11.

HAB. Hawaii; Kau, Kona, Kilauea.—Oahu; Wainae, Kaala.—Maui, Haleakala.—Kauai.

VAR. Cephalothorax abdomenque fusca, regione oculari dilutior. Hawaii.

VAR. Cephalothorax fere omnino fulvo-albidus, utrinque leviter fusco-reticulatus. Abdomen supra late albidum, plerumque fusco-marginatum et postice transversim fusco-reticulatum.

VAR. Abdomen fulvum, postice in declivitate, vittis transversis fuscis confusis notatum. Pedes fulvi, femoribus subtus ad apicem infuscatis. Hawaii, Kauai.

VAR. Abdomen rubro-castaneum, valde albo-opaco-variegatum et reticulatum. Pedes quatuor antici rubro-castanei, femoribus supra leviter albido-variegatis, tibiis annulo medio lato albo notatis. Kauai.

(6) *Misumena velata*, sp. nov.

♀. Long. 4—5 mm. Praecedenti valde affinis et subsimilis. Cephalothorax fusco-nigricans, vitta media lata dilutiore, antice confusa et infuscata sed linea media exillima albida, oculos haud attingente, secta, postice late albida et leviter dentata. Abdomen supra fuscum et nigro-punctatum, utrinque nigrum, postice, in declivitate, albidum, antice maculis binis subrotundis, utrinque maculis similibus binis albis, ornatum, subtus atrum utrinque leviter dilutius. Chelae antice fuscae fulvo-variatae, setis validis paucis munitae. Partes oris sternumque nigro-olivacea, sternum in medio paulo dilutius. Coxae olivaceae. Pedes quatuor antici obscure fulvo-rufuli, crebre et grosse nigro-punctati, femoribus subtus nigro-lineatis, tibiis in medio dilutioribus parcius punctatis, metatarsis tarsisque annulo medio albido notatis. Pedes quatuor postici lutei, anguste nigro-annulati. Tibiae anticae aculeis inferioribus sat longis subpellucentibus 1 (vel 2)—3, metatarsi aculeis inferioribus similibus 3—4 aculeoque laterali apicali minore, armati. Plaga genitalis plus duplo latior quam longior, fusconitida, utrinque valde attenuata et obtuse triquetra, apice minute foveolata.

♂. Long. 3—5 mm. Abdomen utrinque et postice albidum, macula dorsali maxima nigra trapeziformi ornatum. Pedes-maxillares obscure fulvi, tibia nigricanti, tibia patella brevior et angustior, subtus apophysi apicali minutissima, extus apophysi multo majore antice, secundum tarsum, directa, compressa, apice profunde et inaequaliter fissa: ramulo superiore gracillimo acuto et subrecto, inferiore leviter divaricato fulvo et obtuso, armata, tarso mediocri, ovato, bulbo parvo, simplici.

Plate XVII. fig. 12.

HAB. Molokai, Koele.

VAR. B. Cephalothorax niger, vitta media lata, oculos haud attingente, antice fusco-rufula et linea media exili obscuriore secta, postice sensim dilutiore lutea et maculis parvis binis geminatis fuscis notata, ornatus. Abdomen supra luteo-fulvum, crebre fusco-punctatum, macula maxima trapeziformi obscuriore postice truncata et utrinque nigro-bidentata notatum. Pedes quatuor antici obscure fulvo-rufuli, creberrime nigro-punctati, patellis supra, tibiis metatarsisque in medio paulo dilutioribus et confuse annulatis, tarsis fusco-rufulis ad basin atque ad apicem luteis.

HAB. Maui, Haleakala.

VAR. C. Cephalothorax atro-olivaceus, leviter testaceo-variatus, vitta lata dilu-  
tiore, antice fusco-variata et pone oculos lineata, postice maculam albidam V-magnum  
designantem, notatus. Abdomen supra albidum, macula magna nigra triquetra, antice  
acuta, postice valde et sensim ampliata, truncata et plerumque utrinque bidentata,  
ornatum. Pedes pallide lutei, femoribus anticis subtus confuse olivaceo-punctatis et  
parum distincte fusco-lineatis, tibiis ad apicem, metatarsis, ad basin atque ad apicem,  
tarsisque in medio late nigro-annulatis.

HAB. Maui, Haleakala.

### DIAEA Thorell.

#### SYNOPSIS SPECIERUM.

Femora quatuor antica subtus linea exillima nigra notata .....	<i>insulana</i> .
Femora haud lineata .....	<i>vitellina</i> .

#### *Diaea insulana* Keyserling.

*D. insulana* Keyserling, in L. Koch, Ar. Austr. II. 1889, p. 261, tab. XXIV. figs. 3—4.

♀. Long. 4—5 mm. Cephalothorax laevis, setis tenuibus paucis seriatis munitus,  
luteo-rufescens, utrinque et postice late fulvo fuscove marginatus, tuberibus ocu-  
laribus albedo-cinereis opacis, clypeo saepe tenuiter nigro-marginato. Oculi antici  
in lineam leviter recurvam, medii lateralibus plus duplo minores, a sese quam a late-  
ralibus vix remotiores. Oculi postici in lineam multo latiore, magis recurvam,  
inter se subaequales, medii a lateralibus quam inter se evidenter remotiores. Area  
quatuor mediorum circiter aequae longa ac postice lata et antice quam postice paulo  
angustior, antici posticis paulo majores. Clypeus oculis mediis anticis haud triplo  
latior. Abdomen oblongum, postice ampliatum et obtusum, pallide fulvo-testaceum,  
praesertim ad marginem albedo-reticulatum, parcissime et minute fusco-punctatum et  
plerumque postice tenuiter transversim albo-striatum, subtus nigricanti-marginatum et  
macula ventrali magna trapeziformi nigricanti notatum. Chelae, sternum pedesque  
pallide fulva, pars labialis leviter infusca. Pedes quatuor antici reliquis multo  
longiores et robustiores, femoribus subtus linea exili intense nigra semper ornatis,  
antice aculeis parvis quatuor, supra aculeis similibus binis, tibiis aculeis nigris  
tenuibus et sat longis 2—2 (rarius 3—3), metatarsis aculeis 3—4 vel 4—5 (api-  
calibus minoribus) subtus armatis, sed aculeis lateralibus carentibus. Pedes quatuor  
postici minute et parce aculeati. Area genitalis antice foveola testacea transversa,  
tenuiter marginata et carinam latam convexam et cordiformem includente, impressa,  
postice plagula nigra convexa, obtuse triquetra nigra, munita.

♂. Long. 4 mm. Cephalothorax utrinque plerumque obscurior. Abdomen minus, sat anguste oblongum, supra albidum, crebre nigro-punctatum, in medio late nigricans et postice tenuiter transversim albo-striatum. Pedes quatuor anticī multo longiores et apice graciliores, femoribus subtus plus minus distincte nigro-lineatis. Pedes-maxillares mediocres, obscure fulvi, tarso, praesertim ad basin, infuscato, tibia patella brevior et paulo angustior, subtus ad apicem apophysī parva subrotunda, extus apophysī multo longiore antice, secundum tarsum, directa, apice leviter ampliata, rotunda sed supra calcare acuto, leviter curvato instructa, tarso ovato, bulbo simplici, rotundo, disciformi, stylo circumdato.

Plate XVII. fig. 13.

HAB. Hawaii.—Molokai.—Maui.—Kauai.

VAR. B. Abdomen in medio parce nigro-punctatum, pone medium macula transversa nigra, utrinque valde bidentata et plerumque transversim albedo-striata, notatum.

HAB. Hawaii; Kona.

VAR. C. Abdomen fere praecedentis sed macula dorsali majore. Femora 1<sup>i</sup> paris antice punctis nigris paucis notata. Tibiae quatuor anticae nigricanti-biannulatae.

HAB. Hawaii; Kona, Mauna Kea.

VAR. D. Abdomen fere praecedentis sed obscurius. Cephalothorax regione frontali obscuriore et utrinque vitta fusca valde dentato-laciniosa, marginem haud attingente, notatus. Pedum quatuor anticorum femora, tibiae metatarsique grosse et inordinate nigro-punctata.

HAB. Hawaii; Kona, Kau, Olea.

VAR. E. Abdomen obscure fulvum, macula nigra magna, marginem anticum fere attingente, postice medium paulo superante, sensim ampliata, truncata et utrinque bidentata, supra ornatum. Pedum anticorum femora infuscata, subtus nigricanti-vittata, tibiae nigricanti-biannulatae.

HAB. Hawaii; Kona, Kau.—Molokai.

Cette espèce, abondamment répandue dans tout l'archipel, est très variable comme coloration, au point qu'il est difficile de rencontrer deux individus exactement semblables. Keyserling a figuré une forme très pâle.

(2) *Diaea vitellina*, sp. nov.

♀. Long. 2.5—3 mm. Cephalothorax laevis, setis tenuibus paucis seriatis munitus, fulvo-rufescens, parte cephalica, praesertim postice, dilutior, area oculorum albo-opaca. Oculi anticī in lineam vix recurvam, inter se fere aequidistantes, mediū lateralibus plus triplo minores. Oculi postici in lineam recurvam multo latiorē,

inter se subaequales, mediï a lateralibus quam inter se evidenter remotiores. Oculi mediï aequi, aream vix longiorem quam postice latiore et antice quam postice vix angustiore occupantes. Clypeus oculis mediï anticis plus quintuplo latior. Abdomen sat longè oblongum, pallide luteum, in parte prima vitta reticulata, marginem anticum haud attingente, in parte altera maculis transversis brevibus quinque uniseriatis nigris, supra ornatum. Chelae, sternum pedesque luteo-rufescentia. Pedes quatuor anticï reliquis multo longiores, tibiis aculeis sat longis pellucetibus 2—2, metatarsis 1<sup>i</sup> paris aculeis similibus 3—3 (apicalibus minoribus), metatarsis 2<sup>i</sup> paris aculeis 3—4 subtus armatis.

♂. Long. 2.5 mm. A femina differt cephalothorace utrinque, prope marginem, aculeis parvis nigris paucis consperso, pedibus anticis multo longioribus, apice gracilioribus, femoribus patellisque usque ad basin, tibiisque ad apicem rufulo-tinctis. Pedes-maxillares parvi, fulvo-rufuli, tibia patella brevior, subtus ad apicem apophysï parva obtusa, extus apophysï multo longiore, antice secundum tarsum directa, compressa, apicem versus leviter attenuata sed obtusissime truncata cum angulo inferiore rotundo, superiore calcare parvo et acuto instructo, tarso ovato, bulbo simplici rotundo-discoidali, stylo circumdato.

Plate XVII. fig. 14.

HAB. Hawaii, Kau.—Oahu, Waimea.

#### SYNAEMA E. Simon.

Le genre *Synaema* est représenté par un groupe d'espèces remarquables par leur bandeau étroit, ayant rarement plus de deux fois le diamètre des yeux médians antérieurs, par leur abdomen ovale allongé, leurs métatarses antérieurs, généralement armés en dessous de plus de deux paires d'épines mais manquant d'épines latérales sauf les apicales, enfin par leurs pattes des deux paires postérieures mutiques à l'exception d'une ou de deux très petites épines inférieures aux tibiais et aux métatarses.

#### SYNOPSIS SPECIERUM.

1. Coxae cunctae nigrae. Pedes quatuor postici lutei valde fusco-annulati .....*naevigerum*.  
Coxae quatuor anticae nigrae, quatuor posticae luteae. Pedes quatuor postici lutei .....2.
2. Tibiae anticae aculeis debilibus 4—4 vel 4—5, metatarsi aculeis 4—5 vel 4—6 subtus muniti. Pedes postici omnino lutei.....*dimidiatipes*.  
Tibiae anticae aculeis 2—2 subtus munitae. Metatarsi postici apice anguste fusco-annulati .....3.
3. Metatarsi anticï aculeis 5—5 subtus muniti .....*fronto*.  
Metatarsi anticï aculeis 2—2 subtus muniti .....*impotens*.

(1) *Synaema dimidiatipes*, sp. nov.

♀. Long. 8—9 mm. Cephalothorax fere laevis, fusco-castaneus, ad marginem posticum paulo dilutior. Oculi quatuor antici inter se fere aequidistantes, laterales mediis saltem duplo majores. Oculi medii postici lateralibus vix minores, a lateralibus quam inter se paulo remotiores. Clypeus fere laevis, oculis mediis anticis vix duplo latior. Abdomen longe ovatum, antice obtuse truncatum, nigro-opacum, parce et minute albo-punctatum, postice maculis albis parvis, valde laciniosis et biseriatis 3—3, interdum maculis majoribus, inter se confluentibus et vittam marginalem valde dentatam formantibus supra ornatum, subtus atrum, regione epigasteris dilutiore et rufula. Chelae latae, antice fere planae, nigro-nitidae, parce et longe nigro-crinatae. Partes oris, sternum coxaeque quatuor anticae, nigra, laevia. Pedes quatuor antici fusco-castanei, femoribus patellisque nigris, femoribus anticis, in parte basali, aculeis longis quatuor uniseriatis munitis, tibiis aculeis inferioribus sat debilibus 4—4, interioribus exterioribus longioribus, metatarsis aculeis robustioribus 4—5 vel 4—6 subtus armatis. Pedes postici omnino lutei, tibiis aculeis debilibus fere setiformibus 1—2 vel 2—2, metatarsis 3<sup>i</sup> paris aculeis submediis binis, metatarsis 4<sup>i</sup> paris aculeo unico subtus munitis. Fovea genitalis testacea, parva, transversa, obtuse triquetra, nitido-marginata.

Plate XVII. fig. 3.

Hawaii, Kona.

(2) *Synaema fronto*, sp. nov.

♀. Long. 8 mm. Cephalothorax supra laevis, utrinque in declivitate leviter coriaceus, nigro-castaneus. Oculi quatuor antici in lineam parum recurvam, medii inter se quam a lateralibus evidenter remotiores. Oculi quatuor postici inter se fere aequidistantes. Area oculorum quatuor mediorum fere parallela et multo latior quam longior. Abdomen longe oblongum, supra atrum, utrinque, praesertim postice, obscure fulvo-variatum, vitta media lata albo-opaca abbreviata, in medio coarctata, ad apicem minute dentata, supra ornatum. Chelae, partes oris, sternumque nigra. Pedes quatuor antici nigro-castanei, tibiis subtus aculeis debilibus 2—2, metatarsis aculeis paulo robustioribus 5—5 subtus armatis. Pedes quatuor postici fulvi, metatarsis apice minute infuscatis, tibiis metatarsisque aculeis submediis parvis binis subtus munitis.

A praecedenti, cui subsimilis est, differt imprimis area oculorum mediorum fere parallela et multo latiore quam longiore et tibiis quatuor anticis aculeis 2—2 tantum armatis.

HAB. Oahu, Waianae Mts.

(3) *Synaema impotens*, sp. nov.

♀. Long. 5.5—6 mm. Cephalothorax nigro-castaneus, fere laevis. Oculi medii antici lateralibus plus duplo majores et inter se quam a lateralibus paulo remotiores. Oculi postici fere *S. dimidiatipedis*. Clypeus oculis mediis anticis plus duplo latior. Abdomen longe oblongum, nigrum, ad marginem anticum maculis binis geminatis, in parte apicali maculis parvis laciniosis triseriatis, decoratum. Chelae, sternum et partes oris nigro-nitida, chelae antice parcae et valde crinitae. Pedes quatuor antici nigricantes, patellis tibiisque supra ad apicem anguste albo-marginatis, femoribus antice aculeis longis trinis uniseriatis, tibiis aculeis 2—2 longis et tenuibus, apice setiformibus, metatarsis aculeis similibus 2—2, subtus armatis. Pedes quatuor postici lutei, metatarsis ad apicem anguste fusco-annulatis, tibiis aculeo medio, metatarsis 3<sup>i</sup> paris aculeo medio aculeoque apicali, metatarsis 4<sup>i</sup> paris aculeo medio, subtus munitis.

HAB. Hawaii, Kona.

(4) *Synaema naevigerum*, sp. nov.

♀. Long. 5—6 mm. Cephalothorax subtilissime coriaceus, niger, tuberibus ocularibus minute rufulo-notatis. Oculi medii antici lateralibus plus duplo minores, inter se quam a lateralibus vix remotiores. Oculi postici inter se fere aequidistantes, medii lateralibus vix minores. Clypeus leviter coriaceo-rugatus, oculis mediis anticis plus duplo latior. Abdomen longe oblongum, nigro-opacum, antice maculis binis geminatis utrinque et postice punctis inordinatis, interdum confluentibus et vittam marginalem dentatam formantibus, albis, supra decoratum. Chelae, partes oris, sternum coxaeque cunctae nigra et laevia. Pedes quatuor antici nigro-nitidi, patellis tibiisque ad apicem albo-marginatis, tarsis ad basin anguste rufulis, femoribus antice aculeis 3 vel 4 uniseriatis, tibiis aculeis exterioribus binis, interioribus longioribus 3 vel 4, metatarsis aculeis paulo robustioribus 3—3 subtus armatis. Pedes quatuor postici lutei, articulis cunctis ad apicem tibiisque ad basin fusco nigrove annulatis, tibiis 3<sup>i</sup> paris aculeis debilibus binis, tibiis 4<sup>i</sup> paris aculeo unico, metatarsis aculeo simili submedio subtus armatis. Fovea genitalis testacea, parva, ovato transversa, nitido-marginata.

♂. Long. 4 mm. A femina differt abdomine minore, pedibus anticis longioribus, aculeis tibiarum et metatarsorum tenuibus fere setiformibus. Pedes-maxillares parvi, fuscii; patella convexa; tibia patella paulo brevior et angustior, subtus ad apicem apophysi nigra minutissima et truncata, extus apophysi longa, antice, secundum tarsum

directa, extus convexa, apice abrupte angustiore et acutissima; tarso breviter ovato, supra convexo; bulbo simplici, rotundo, discoidali.

Plate XVII. fig. 2.

VAR. Abdomen supra nigrum, minute et parum regulariter albo-punctatum et vitta latissima alba, postice dentata, omnino cinctum (Molokai).

VAR. Abdomen nigerrimum, vitta lata albo-opaca, in parte secunda utrinque valde bilobata et apice acuminata, supra ornatum.

HAB. Hawaii; Kau, Kona.—Molokai.

MECAPHESA, gen. nov.

Cephalothorax paulo longior quam latior, parte cephalica antice leviter acclivi fronte mediocri. Oculi postici inter se subaequales, in lineam valde recurvam, medii a lateralibus quam inter se evidenter remotiores. Oculi antici in lineam multo angustiore, fere aequaliter recurvam, inter se fere aequidistantes, medii lateralibus saltem duplo minores. Area quatuor mediorum parallela, paulo longior quam latior. Clypeus angustus. Tegumenta coriacea, setis simplicibus acutis paucis instructa. Caetera fere *Oxyptilae*.

Ab *Oxyptila* praesertim differt oculorum linea antica postica aequaliter recurva, ab *Heriaco* differt oculorum linea postica multo magis recurva, clypeo angusto, tegumentis parcius et brevius setosis.

(1) *Mecaphesa cincta*, sp. nov.

♀. (pullus) long. 3 mm. Cephalothorax paulo longior quam latior, utrinque ample rotundus, antice valde attenuatus, fronte haud declivi sat angusta et truncata, crebre coriaceus et setis validis paucis seriatis munitus, niger, utrinque parce et vix distincte rufulo-variegatus. Oculi antici in lineam angustam valde recurvam, medii lateralibus plus duplo minores, inter se quam a lateralibus vix remotiores. Oculi postici in lineam latioream valde (fere aequaliter) recurvam, medii lateralibus vix minores, a lateralibus quam inter se fere  $\frac{1}{2}$  remotiores. Oculi medii inter se aequi, aream parallelam, longiorem quam latioream, occupantes. Clypeus oculis mediis anticis vix duplo latior, ad marginem setis spiniformibus fulvis uniseriatis instructus. Abdomen antice rotundum, postice valde ampliatum et obtuse truncatum, supra atrum, postice in declivitate transversim fulvo-striatum, vitta marginali lata albidata dentata et parce nigro-punctata omnino cinctum, subtus fulvo-testaceum. Chelae nigrae, apice luteae, subtiliter coriaceae et parce crinitae. Partes oris sternumque nigra. Coxae quatuor anticae fusco-olivaceae, quatuor posticae luteae. Pedes lutei, quatuor

antici valde nigricanti-punctati et maculati, tibiis in parte apicali nigricantibus, metatarsis fuscis sed prope basin fulvo-annulatis. Pedes quatuor postici articulis cunctis, tarsis exceptis, apice anguste sed intense nigro-annulatis. Tibiae anticae aculeis fulvis longis sed iniquis, suberectis 4—4 vel 5—5, metatarsi aculeis similibus (apicalibus minoribus) 5—5 subtus instructi. Pedes postici fere mutici.

HAB. Maui, Haleakala.

(2) *Mecaphesa semispinosa*, sp. nov.

♀. Long. 4 mm. Cephalothorax subtilissime coriaceus, fulvo-rufescens, utrinque fuscus et leviter fulvo-variatus, linea media exillima alba sectus, tuberculis ocularibus obscure cinereis, parte cephalica antice levissime acclivi. Oculi antichi in lineam sat angustam, valde recurvam, inter se fere aequidistantes, laterales mediis fere triplo majores. Oculi postici inter se aequi, in lineam multo latiore, valde (fere aequaliter) recurvam, medii a lateralibus quam inter se fere  $\frac{1}{3}$  remotiores. Oculi medii inter se subaequales (postici anticis vix majores), aream parallelam, longiorem quam latiore occupantes. Clypeus oculis mediis anticis saltem duplo latior, ad marginem setis uniseriatis munitus. Abdomen antice rotundum, postice valde ampliatum et obtuse truncatum, omnino fusco-rufescens. Chelae coriaceae, partes oris sternumque fusco-rufescentia. Pedes fulvo-rufuli, antichi posticis paulo obscuriores, tibiis aculeis fulvis validis et suberectis 3—3, partem apicalem articuli tantum occupantibus, metatarsis aculeis similibus 3—3 (apicalibus minoribus) subtus instructis. Pedes postici fere mutici. Plaga genitalis fulvo-nitida, convexa, obtuse triangularis, fovea subrotunda, crasse marginata et plagulam parvam longam includente, impressa.

Plate XVII. fig. 4.

HAB. Hawaii, Mauna Kea.

Subfam. *PHILODROMINAE*

PROERNEAE.

Les espèces assez nombreuses qui représentent aux Iles Hawaii la sous-famille des *Philodrominae* se distinguent toutes des *Philodromus* ordinaires par leurs chélicères, dont la marge supérieure au lieu d'être transverse et arrondie est longuement oblique, garnie d'une série très dense de longs crins incurvés et armée de deux dents coniques (la 1<sup>ère</sup> plus forte que la 2<sup>e</sup>) éloignées de la base du crochet qui est plus long que celui des *Philodromus*. Ces caractères indiquent que ces espèces font le passage des *Thomisides* aux *Clubionides*, particulièrement au groupe des *Sparassus*.

Nous avons déjà indiqué (Zool. Jahrb. 1899, p. 418) les rapports des *Proernea*

(*Pterelas*) et des *Psellonus* et nous avons même proposé de les rapprocher dans un même groupe, mais la découverte de types nouveaux (*Pagiopalus*, *Adrastidia*) faisant graduellement le passage des *Proernus* aux *Philodromus* nous fait penser aujourd'hui que ces araignées se rattachent plus intimement à la sous-famille des *Philodrominae* dans laquelle elles doivent cependant former un groupe spécial.

Les *Proernus* et genres voisins diffèrent des *Psellonus* par leurs pièces buccales beaucoup plus courtes, construites comme celles des *Thomisides* ordinaires, par leur céphalothorax plus ou moins épais et leurs chélicères semblables dans les deux sexes, jamais divergentes.

## PROERNUS, nom. nov.

*Pterelas* E. Simon, in Zool. Jahrb., 1899, p. 418 (nom. praecoc.<sup>1</sup>).

## SYNOPSIS SPECIERUM.

1. Metatarsi quatuor antici usque ad basin crebre scopulati. Tibia pedum-maxillarium maris apophysi parva, apice minute et fere aequaliter bidentata, armata .....2.
- Metatarsi quatuor antici, apice excepto, haud scopulati. Tibia pedum-maxillarium maris apophysi parva, apice inaequaliter bidentata, dente superiore inferiore multo minore, armata .....*velox*.
2. Metatarsi quatuor antici aculeis basilariis trinis tantum muniti .....3.
- Metatarsi quatuor antici aculeis inferioribus 3—3 usque ad apicem armati .....*aculeatus*.
3. Tibiae 2<sup>i</sup> paris subtus, usque ad basin, aculeis parvis 3—3 armatae. Tibiae metatarsique postici aculeati .....*Schauinslandi*.
- Tibiae 2<sup>i</sup> paris subtus, in parte apicali, aculeis interioribus binis aculeoque exteriori unico tantum munitae. Metatarsi postici aculeati sed tibiae posticae muticae.....*castaneus*.

(1) *Proernus schauinslandi* E. Simon.

*Pterelas schauinslandi* E. Simon, in Zool. Jahrb., 1899, p. 418.

♂. Long. 12 mm. Cephalothorax fulvo-rufescens, parte cephalica antice sensim infuscata, postice lineolis abbreviatis fuscis trinis, media recta alteris divaricatis, notata, breviter fulvo-pubescentis et setis nigris parvis spiniformibus conspersus. Abdomen sat breve, antice obtuse truncatum, postice leviter ampliatum et obtusum, supra nigricans, antice paulo dilutius et confuse testaceo-variaturum, crebre et breviter fulvo-pubescentis, subtus dilutius et cinereo-albido-pilosum. Chelae fusco-rufulae, attenuatae et parum convexae, antice opacae, transversim rugatae et setis spiniformibus inordinatis conspersae. Partes oris, sternum pedesque fulvo-rufescentia, patellis tibiis metatarsisque

<sup>1</sup> *Pterelas*, Guérin, in Mag. Zool. vi. 1836, cl. 7, pl. 20.

quatuor anticis fusco-castaneis. Pedes 1<sup>i</sup> paris tibiis subtus aculeis brevibus 3—3 atque extus aculeis lateralibus trinis minoribus, metatarsis aculeis binis inferioribus aculeoque laterali exteriori subbasilaribus, armatis. Pedes 2<sup>i</sup> paris subtus similiter aculeati, sed aculeis lateralibus carentes. Pedes quatuor postici minute et parce aculeati. Pedes-maxillares mediocres, fulvi, patella intus tarsoque obscurioribus; tibia patella paulo longiore et paulo graciliore, tereti, extus apophysii apicali nigra parva et obtusa, sed apice minutissime bidentata, armata; tarso mediocri, ovato, tibia vix longiore; bulbo parvo et ovato, simplici.

Cephalothorax long. 5·3 mm., lat. 5·5 mm. Abdomen long. 7 mm. Pedes I long. 19·8 mm.; Pedes II long. 25 mm.; Pedes III et IV long. 14 mm.

Plate XVII. fig. 6.

HAB. Oahu: Koolau range (Perkins, x. 1892).

(2) *Proernus aculeatus*, sp. nov.

♂. Long. 12 mm. Cephalothorax pallide fulvo-testaceus, parte cephalica antice sensim infuscata et rufescenti-tincta. Abdomen sat longum, depressum, antice obtuse truncatum et leviter emarginatum, supra punctis impressis longis et obliquis 3—3 munitum, fulvo-testaceum, sericeo-pubescent, postice utrinque puncto nigro minutissimo notatum. Chelae fusco-castaneae, transversim leviter rugatae et setis validis iniquis conspersae. Partes oris fusco-castaneae, laminae intus albido-marginatae. Sternum pedesque fulva. Pedes 1<sup>i</sup> paris tibiis subtus aculeis 3—3, exterioribus parvis interioribus majoribus, extus aculeis lateralibus trinis parvis uniseriatis atque intus aculeo laterali subapicali, metatarsis aculeis inferioribus 3—3 aculeoque laterali exteriori subbasilari armatis. Pedes 2<sup>i</sup> paris anticis multo longiores, tibiis aculeis inferioribus minutissimis 3—3, metatarsis aculeis paulo majoribus 3—3 munitis, sed aculeis lateralibus carentibus. Pedes quatuor postici parce aculeati. Pedes-maxillares ut in praecedenti.

HAB. Kauai, Koholuamano.

(3) *Proernus castaneus*, sp. nov.

♂. Long. 12 mm. Cephalothorax obscure fulvo-rufescens, regione frontali infuscata, parte cephalica postice vittis obliquis fuscis marginata, fulvo-pubescent et setis validis nigris conspersus. Abdomen sat breve, antice obtuse truncatum, postice obtusum, nigricans sed antice et subtus paulo dilutius, breviter fulvo-pubescent, punctis impressis coriaceis obliquis 3—3, supra notatum. Chelae fulvo-rufulae ad basin convexae et leviter geniculatae, vix rugatae, setis nigris validis conspersae. Partes oris sternumque fusca. Pedes obscure fulvo-ravidi, patellis tibiis metatarsisque quatuor anticis fusco-castaneis. Pedes 1<sup>i</sup> paris tibiis subtus aculeis sat brevibus 3—3 atque

extus aculeis lateralibus minoribus binis, altero submedio altero subapicali, metatarsis usque ad basin crebre scopulatis, aculeis binis inferioribus aculeoque laterali exteriori subbasilaribus armatis. Pedes 2<sup>i</sup> paris in parte apicali aculeis parvis exterioribus binis, aculeoque interiore unico subtus munitis, metatarsis ad basin biaculeatis. Pedes quatuor postici metatarsis aculeatis sed tibiis muticis. Pedes-maxillares fere ut in praecedentibus sed tibia paulo brevior.

HAB. Maui, Haleakala.

(4) *Proernus velox*, sp. nov.

♂. Long. 8 mm. Cephalothorax obscure fulvo-rufescens, linea marginali lineolisque radiantibus obscurioribus notatus, breviter sed crasse flavido-pubescentis et setis validis et longis nigris conspersus. Abdomen oblongum, antice obtuse truncatum, postice breviter attenuatum et obtusum, punctis impressis 3—3, mediis longis et obliquis, notatum, supra obscure testaceum, utrinque crebre nigricanti-punctatum et confuse marginatum, breviter et crasse fulvo-rufulo-pubescentis, subtus dilutius et luteo-pilosum. Chelae sat debiles, fusco-rufulae, apice dilutiores, vix rugatae, setis nigris conspersae. Partes oris, sternum pedesque fulvo-rufula, parte labiali, sterno antice, patellis tibiis anticis metatarsisque ad apicem leviter infuscatis. Pedes 1<sup>i</sup> paris tibia subtus aculeis gracilibus et longis 3—3, aculeo laterali interiore subapicali, aculeisque lateralibus exterioribus multo minoribus trinis, metatarsis gracilibus et longis, apice excepto, haud scopulatis, aculeis inferioribus longis 3—3, aculeisque lateralibus exterioribus minoribus binis, armatis. Pedes 2<sup>i</sup> paris anticis multo longiores, subtus similiter aculeati, sed tibiis utrinque aculeo laterali parvo tantum munitis. Pedes quatuor postici tibiis metatarsisque aculeatis. Pedes-maxillares fere praecedentium sed paulo longiores, apophysi tibiali subtus ad basin leviter emarginata, ad apicem inaequaliter bidentata, dente superiore inferiore multo minore.

Plate XVII. fig. 5.

HAB. Maui, Haleakala.

PAGIOPALUS, gen. nov.

A *Proerno* differt fronte angustiore, oculis quatuor anticis in lineam magis recurvam angustiore, mediis lateralibus majoribus et inter se quam a lateralibus remotioribus, a lateralibus anguste separatis, oculis mediis posticis a sese quam a lateralibus distantioribus, sed area quatuor mediorum, antice quam postice angustiore, paulo longiore quam latiore vel saltem haud latiore, pedum anticorum metatarsis tarsisque tenuibus, aculeis inferioribus lateralibusque longioribus et numerosioribus armatis, tarsis breviter et parce scopulatis, metatarsis haud scopulatis.

## SYNOPSIS SPECIERUM.

1. Cephalothorax fulvus, nigro-punctatus et lineatus .....2.  
Cephalothorax fulvus, nigro-variegatus, macula magna vel vitta albo-opaca supra ornatus .....3.
2. Tibiae 1<sup>i</sup> paris aculeis 4—4 subtus armatae. Plaga genitalis feminae area parva acute triquetra postice impressa. Pedes-maxillares maris longissimi .....*atomarius*.  
Tibiae 1<sup>i</sup> paris aculeis 3—3 subtus armatae. Plaga genitalis feminae area parva ovata postice impressa. Pedes-maxillares maris modice longi .....*semipunctatus*.
3. Sternum venterque pallide lutea .....*personatus*.  
Sternum venterque atra .....*nigriventris*.

(1) *Pagiopalus atomarius*, sp. nov.

♀. Long. 7—8 mm. ♂. Long. 6 mm.—Cephalothorax obscure fulvus, luteo-nitido-pubescent, fusco nigrove punctatus et lineatus, regione oculari et clypei infusca, parte cephalica seriatim punctata, lineis longitudinalibus trinis, media recta, alteris exillimis et sinuosis, postice macula angulosa V magnum formante, parte thoracica punctis parvis, in medio lineas radiantes designantibus, versus marginem majoribus densioribus et subconfluentibus, notatis. Oculi antici lineam sat angustam recurvam designantes, medii lateralibus circiter  $\frac{1}{2}$  majores et a sese quam a lateralibus plus duplo remotiores (spatio inter laterales et medios oculo angustiore). Oculi postici in lineam multo latiore, modice recurvam, medii lateralibus paulo minores et a sese quam a lateralibus circiter  $\frac{1}{2}$  remotiores. Abdomen depressiusculum, oblongum, antice obtuse truncatum et minute emarginatum, obscure testaceum, luteo-nitido-pubescent et crebre nigricanti-punctatum, prope medium maculis geminatis binis, ad apicem macula foliiformi confusa nigricantibus, notatum, subtus dilutius, minutissime et parcissime nigro-punctatum. Chelae luteae, antice maculis nigricantibus binis magnis, basali in medio dilutiore, notatae. Partes oris leviter infuscaetae. Sternum pedesque lutea. Pedes, coxis saepe exceptis, crebre nigricanti-punctati. Pedes 1<sup>i</sup> paris tibia subtus aculeis gracilibus et longis 4—4, utrinque aculeis paulo brevioribus trinis, aculeisque dorsalibus binis, metatarso aculeis inferioribus longis 3—3 et utrinque aculeis trinis (apicalibus minoribus) munitis. Pedes 2<sup>i</sup> paris anticis multo longiores, fere similiter aculeati, sed tibiis aculeis 5—5 vel 6—6 subtus munitis. Pedes quatuor postici numerose aculeati.

♀. Pedes-maxillares sat breves, lutei, nigro-punctati et subannulati. Plaga genitalis nigra rugosa, postice laevior et rotunda, striis binis, antice convergentibus, aream minutam, longe triquetram limitantibus, notata.

♂. Pedes-maxillares lutei, longissimi; femore recto, cephalothorace multo longiore;

tibia tereti subrecta, patella multo longiore, ad apicem apophysi exteriorae parva et truncata apophysique inferiore cariniformi, antice subacuta, armata; tarso brevi et angusto, bulbo simplici.

Plate XVII. fig. 7.

HAB. Hawaii, Kona.—Molokai, Koloe.—Kauai.

(2) *Pagiopalus semipunctatus*, sp. nov.

♂ ♀. Long. 5 mm. Cephalothorax circiter aequae longus ac latus, utrinque ample rotundus, fulvo-rufescens, in medio minute et parce nigro-punctatus et macula media parva triquetra notatus, ad marginem valde nigro-reticulatus et clathratus, clypeo in medio et area oculari utrinque nigris. Oculi fere praecedentis, sed medii antici lateralibus vix majores. Abdomen breve, antice obtuse truncatum et minute emarginatum, postice valde ampliatum atque obtusum, supra pallide testaceum minute et inordinate nigro-punctatum et late nigro-marginatum, antice macula parva, postice macula majore foliiformi confusa nigricantibus notatum, subtus minutissime et parcissime nigro-punctatum et macula postica nigra notatum. Chelae luteae, antice maculis nigris binis dentatis, basali in medio dilutiorae, notatae. Partes oris, sternum pedesque luteae, pars labialis leviter infuscata, sternum ad marginem minutissime nigro-notatum. Pedes parce nigro-punctati et valde nigro-subannulati. Tibiae 1<sup>i</sup> paris aculeis inferioribus gracilibus et longis 3—3 et utrinque aculeis lateralibus minoribus binis munitae sed aculeo dorsali carentes, metatarsi aculeis inferioribus 3—3 longis (apicalibus minoribus) aculeisque lateralibus muniti. Tibiae metatarsique 2<sup>i</sup> paris multo longiores, aculeis inferioribus 4—4 muniti.

♀. Pedes-maxillares lutei, femore intus, tibia metatarsoque supra ad basin nigro-notatis. Plaga genitalis antice nigra et coriacea, postice dilutior et plagula parva fulva ovata praedita.

♂. Pedes-maxillares lutei, femore intus tibiaque ad basin nigro-punctatis, modice longi, femore compresso, tibia patella longiore tereti, extus ad apicem apophysi brevi, valde compressa haud attenuata, apice recte secta et subtus ad basin minute dentata armata, torso sat longe ovato, bulbo simplici.

Plate XVII. fig. 15.

HAB. Maui, Haleakala.

(3) *Pagiopalus personatus*, sp. nov.

♀. Long. 5 mm. Cephalothorax latior quam longior, utrinque ample rotundus, obscure testaceus et breviter albo-pilosus, sed in medio late albo-opacus, regione oculari nigra linea alba divisa, clypeo nigro, regione thoracica utrinque nigricanti

sed ad marginem albo-notata, in medio lineis radiantibus nigricantibus notata. Oculi quatuor antici in lineam recurvam, medii lateralibus evidenter majores, a sese quam a lateralibus plus duplo remotiores (spatio inter laterales et medios oculo multo minore). Oculi postici in lineam multo latiore, modice recurvam, inter se subaequales, medii a sese quam a lateralibus vix  $\frac{1}{4}$  remotiores. Abdomen antice obtuse truncatum et emarginatum, postice valde ampliatum, supra nigrum, antice atque in medio late et confuse albido-vittatum, postice arcubus tenuibus transversis albis seriatis, 1° longo, reliquis parvis, ornatum, subtus albidum et albo-pubescent. Chelae antice nigrae, prope medium luteo-maculatae. Partes oris sternum pedesque lutea, parte labiali infusca, laminae extus fusco-notatis, sterno anguste nigricanti-marginato, pedibus valde punctatis et late nigro-annulatis. Pedes 1<sup>i</sup> paris tibia subtus aculeis gracilibus et longis 4—4, utrinque aculeis trinis aculeoque dorsali, metatarso aculeis inferioribus similibus 2—2 et utrinque aculeis trinis, apicalibus minoribus, munitis. Pedes 2<sup>i</sup> paris anticis multo longiores, fere similiter aculeati, sed tibia aculeis inferioribus 5—5 et metatarso aculeis inferioribus 3—3 armatis. Plaga genitalis fusca, pilosa, subrotunda, postice plagula transversa angulosa, glabra, notata.

Plate XVIII. fig. 8.

HAB. Lanai, Koele Mts.

(4) *Pagiopalus nigriventris*, sp. nov.

♀. Long. 5 mm. Cephalothorax latior quam longior, utrinque ample rotundus, obscure fulvo-rufescens et breviter albo-pilosus, utrinque valde nigro-reticulatus sed ad marginem anguste albo-cinctus, vitta media lata, oculos fere attingente, leviter dentata, antice punctos nigros, lineam transversam valde flexuosam designantes et in medio maculam nigram subrotundam includente notatus, regione clypei et oculorum nigra sed inter oculos posticos paulo dilutiore et nigro-lineata. Oculi fere praecedentis. Abdomen sat longe oblongum, antice rotundum et vix emarginatum, postice leviter et sensim ampliatum, supra nigrum, albo fulvoque pubescens, ad marginem anticum maculis binis confusis, prope medium utrinque vitta marginali abbreviata arcuata et flexuosa albidis et albo-pilosis ornatum, subtus atrum cinereo-pubescent, mamillis testaceis. Chelae antice nigrae, in lateribus et subtus testaceae. Partes oris luteae, laminae extus nigro-notatae. Sternum nigro-nitidum, ad marginem anticum testaceo-variaturum. Pedes lutei, femoribus parce tibiis metatarsisque crebre nigro-punctatis et subannulatis, aculeis gracilibus et longis, ut in praecedenti ordinatis, armati. Plaga genitalis fusca, pilosa, leviter depressa, multo longior quam latior, antice attenuata et obtusa, postice truncata et minute emarginata.

HAB. Hawaii, Kau.

## ADRASTIDIA, gen. nov.

A *Proerno* differt oculis mediis anticis lateralibus minoribus et a lateralibus quam inter se remotioribus, sed mediis posticis a sese quam a lateralibus duplo vel triplo distantioribus, area oculorum mediorum multo latiore postice quam antice et multo latiore quam longiore, abdomine sat longo, antice emarginato, postice sensim ampliato, pedum anticorum tarsis gracilibus, breviter scopulatis, metatarsis tantum ad apicem leviter scopulatis.

(1) *Adrastidia stigmatica*, sp. nov.

♀. Long. 7—8 mm. Cephalothorax obscure fulvus, breviter et crasse albo-pilosus, in medio parce in lateribus crebre nigro-punctatus, punctis densioribus lineas radiantibus designantibus, parte cephalica in medio lineolis trinis abbreviatis et postice macula magna triquetra crebre nigro-punctata, ornata, tuberibus ocularibus albidis. Abdomen multo longius quam latius, antice sat angustum et obtuse emarginatum, postice sensim ampliatum, elevatum et obtuse truncatum, obscure fulvum, albo-pubescentibus, minute et crebre nigro-punctatum, antice linea media fusca lanceolata, postice, ad apicem, maculis parvis nigris, plerumque quatuor, transversim uniseriatis, notatum, subtus pallide testaceum et albo-pilosum. Chelae luteo-testaceae, antice ad basin nigro-punctatae. Partes oris sternumque lutea, parte labiali leviter infusata, sterno tenuiter nigro-marginato et plerumque in medio minute nigro-punctato. Pedes fulvi, antici crebre et fere uniformiter nigro-punctati, postici parcius punctati, tibia metatarsoque 3<sup>i</sup> paris plerumque supra nigro-maculatis. Tibia 1<sup>i</sup> paris subtus aculeis robustis 4—5 et extus aculeis parvis binis, metatarsus aculeis inferioribus robustis 3—3, aculeis lateralibus exterioribus trinis aculeoque laterali interiore apicali, armati. Tibia metatarsusque 2<sup>i</sup> paris subtus similiter aculeati sed aculeis lateralibus carentes. Pedes quatuor postici parvissime aculeati. Pedes-maxillares lutei, femore ad apicem patellaque nigro-punctatis.

Plate XVII. fig. 10.

HAB. Hawaii, Kona.—Lanai, Koele Mts.—Maui, Haleakala.—Kauai.

Var. Abdomen laete rufescens, punctis parvis nigris albo-areolatis crebre ornatum, macula media ovata et postice vittis transversis binis nigris supra notatum.

HAB. Oahu; Kiwailou Riv., Kaala Mts.

(2) *Adrastidia nebulosa*, sp. nov.

♀. Long. 5 mm. Cephalothorax obscure fulvus, parte cephalica antice infusata, linea media exili, utrinque linea exili sinuosa vix expressa et postice macula magna acute triquetra fuscis notata, parte thoracica utrinque valde infusata et lineis fuscis

abbreviatis radiantibus notata, tuberibus ocularibus fuscis. Abdomen fere praecedentis, fulvo-testaceum, supra confuse infuscatum et lividum, in medio parcissime utrinque densius fusco-punctatum, postice in declivitate, punctis lineas obliquas parum regulares designantibus. Chelae, partes oris sternumque luteo-testacea, chelae antice ad basin fusco-maculatae. Pedes pallide fulvi, femoribus subtus crebre fusco-punctatis, supra nigricanti-variegatis et confuse triannulatis, tibiis metatarsisque, praesertim posticis, crebre fusco-punctatis, ut in praecedenti aculeati. Pedes-maxillares pallide lutei, femore ad apicem patellaque fuscis.

HAB. Hawaii, Olaa.—Maui, Haleakala.

(3) *Adrastidia longula*, sp. nov.

♀. Long. 8 mm. Cephalothorax fulvo-testaceus albo-pubescens, parte cephalica linea media lineisque lateralibus valde flexuosis et ramosis, postice convergentibus, notata, parte thoracica utrinque ad marginem valde fusco-reticulata et lineis fuscis exillimis et abbreviatis radiantibus, ornata, tuberibus ocularibus albis. Abdomen longe oblongum, antice profunde emarginatum, postice leviter et sensim ampliatus, nec angulosum nec truncatum, supra fulvo-lividum, fusco nigroque guttulatum, albo-marginatum et maculis paucis albis, vittam mediam abbreviatam designantibus, supra ornatum, subtus albido-testaceum. Chelae, partes oris, sternum pedesque pallide fulva, chelae antice fusco-maculatae, pedes supra vix distincte pallide fusco-punctati; tibiis metatarsisque 1<sup>i</sup> paris subtus aculeis 3—3 et extus aculeis lateralibus minoribus binis, tibiis metatarsisque 2<sup>i</sup> paris subtus similiter aculeatis sed aculeis lateralibus carentibus.

Plate XVII. fig. 9.

A praecedentibus differt area oculorum mediorum minus transversa, vix duplo latiore quam longiore, oculis mediis posticis a sese minus distantibus.

HAB. Maui, Haleakala.

Fam. CLUBIONIDAE.

HETEROPODA Latreille.

(1) *Heteropoda regia* Fabricius.

*H. venatoria* auct. (ex Linn.).

HAB. Hawaii, Kona.—Oahu, Wainae Mts.—Kauai.

Espèce répandue dans toutes les régions tropicales du monde.

## Fam. AGELENIDAE.

## TEGENARIA Latreille.

(1) *Tegenaria domestica* Clerck.

*Araneus domesticus* Clerck, Aran. Suec., 1757, p. 102 (ad max. part.).

*Tegenaria civilis* Walckenaer.

*Tegenaria Dohrmi* Thorell (ex Scopoli).

HAB. Hawaïi.

Espèce cosmopolite.

NOTA. Les deux familles des *Clubionides* et des *Agelenides*, qui occupent ordinairement une si grande place dans la nature, paraissent étrangères à l'archipel des Sandwich ; les deux espèces ubiquistes citées plus haut, y ont sans doute été introduites.

## Fam. LYCOSIDAE.

## Lycosa Latreille.

Ce genre est représenté par quatre espèces appartenant chacune à un groupe spécial : *L. oahuensis* Keyserl. (*L. stygialis* E. Sim.), au groupe *Alopecosa* (type *L. fabrilis* Cl.), *L. hawaiiensis* E. Sim., au groupe du *L. radiata* Latreille, *L. Kalukanai* E. Sim., au groupe *Trochosa* (type *L. ruricola* de Geer), enfin *L. Likelikeae* E. Sim. à un groupe particulier de caractères ambigus.

Deux de ces espèces, *L. Kalukanai* et *Likelikeae* E. S. sont particulières à Kauai, les deux autres sont plus largement distribuées, le *L. oahuensis* Keyserl. a même été trouvé à Laysan, en dehors de l'Archipel.

(1) *Lycosa oahuensis* Keyserling.

*L. oahuensis* Keyserling, in L. Koch, Arachn. Austr., II, 1889, p. 267, tab. XXIV, fig. 8.

*L. stygialis* E. Simon, in Ann. Soc. ent. Belg., t. XIII, 1898, p. 29.

HAB. Oahu.—Hawaïi.—Laysan.

Décrit de l'île Oahu par Keyserling ; nous le connaissons aussi de Hawaïi (Muséum de Paris), et de Laysan (Schauinsland). M. Perkins n'en a capturé qu'un seul individu dans les Montagnes de Waimea (Oahu).

(2) *Lycosa hawaiiensis* E. Simon.

*L. hawaiiensis* E. Simon, in Zool. Jahrb., 1899, p. 419.

HAB. Hawaii.—Maui.

Découvert à Hawaii (Kilauea) par le Dr Schauinsland, retrouvé en nombre par M. Perkins à Olaa et Kona (Hawaii) et à Haleakala (Maui).

Cette espèce ressemble beaucoup au *L. oahuensis* Keyserl. (*stygialis* E. Sim.); elle appartient cependant à un autre groupe, celui ayant pour type *L. radiata* Latr., ses chélicères offrant à la marge inférieure trois fortes dents subcontiguës.

(3) *Lycosa (Trochosa) kalukanai*, sp. nov.

♀. Long. 15 mm. Cephalothorax ovatus, humilis, fusco-rufescens, omnino crebre fulvo-cervino-pubescentis, facie obtusissima. Oculi quatuor antici inter se aequidistantes, medii lateralibus paulo majores, in lineam subrectam vix procurvam, latiore quam lineam 2<sup>m</sup>. Oculi ser. 2<sup>ae</sup> mediocres, spatio oculo paulo minore a sese distantes. Oculi quatuor postici, superne visi, aream multo latiore quam longiorem et postice quam antice fere duplo latiore occupantes. Clypeus oculis parvis anticis duplo latior. Abdomen oblongum, omnino crebre fulvo-cervino-pubescentis. Chelae validae, convexae, nigrae, fulvo-cinereo-crinatae, margine inferiore sulci dentibus trinis subcontiguïs, ultimo minore, armato. Partes oris nigricantes. Sternum pedesque fulvo-rufescentia, metatarsis tarsisque anticis leviter infuscatis. Pedes robusti, quatuor antici patellis muticis, tibiis subtus aculeis mediocribus 3—3 (aculeis apicalibus carentibus) aculeoque parvo laterali interiore submedio armatis, metatarsis usque ad basin crebre scopulatis, aculeis pronis 3—3, apicalibus parvis, subtus munitis. Fovea genitalis multo longior quam latior, antice leviter attenuata et obtusa, postice truncata, rufulo-marginata, carina integra canaliculata, antice angusta et attenuata, postice abrupte ampliata et trapezoidali, omnino divisa.

Plate XVIII. fig. 4.

HAB. Kauai, Halemanu.

(4) *Lycosa likelikeae*, sp. nov.

♀. Long. 25 mm. Cephalothorax ovatus, parte cephalica leviter convexa, sat angusta, fronte truncata, obscure fulvo-rufescens, supra flavido utrinque, praesertim antice, albidius pubescens, parte thoracica vittis radiantibus abbreviatis, extus ampliatis, marginem haud attingentibus, fuscis, notata. Oculi quatuor antici in lineam procurvam

angustiorem quam oculos maximos ser. 2<sup>ae</sup>, medii lateralibus saltem  $\frac{1}{3}$  majores et a lateralibus quam inter se paulo remotiores. Oculi ser. 2<sup>ae</sup> maximi, spatio oculo duplo angustiore a sese distantes. Oculi quatuor postici, superne visi, aream latiore quam longiorem et postice quam antice latiore, occupantes. Clypeus oculis anticis haud latior. Abdomen longe oblongum, postice leviter ampliatum, fulvo-testaceum, flavido-cervino-pubescent, supra parce fusco-punctatum et in parte basali maculis fuscis parvis, parum regulariter quadriseriatis, notatum, subtus lineolis binis subgeminatis pallide fuscis, abbreviatis et parum expressis, munitum. Chelae robustae et convexae, nigrae, crebre et valde sordide albido-crinatae, subtus ad marginem interiorem crebre pilosae, praeterea glabrae, in medio transversim profunde et regulariter striatae, margine superiore sulci dentibus binis, 1<sup>o</sup> altero majore, margine inferiore dentibus trinis validis aequis et contiguis, instructis. Partes oris castaneae. Sternum obscure fulvo-olivaceum. Pedes sat longi, fulvo-rufuli, versus extremitates sensim infuscati, supra leviter fusco-variati et parce flavido-pilosi, subannulati; tibiis anticis subtus aculeis longis pronis 3—3 apicalibusque minoribus, intus aculeis lateralibus binis armatis, metatarsis cum tarsis usque ad basin sat crebre scopulatis, aculeis longis et pronis 2—2 aculeoque medio apicali subtus armatis. Pedes postici numerose et valde aculeati, tarsis subtus omnino crebre setosis sed utrinque linea tenui scopulata marginatis. Fovea genitalis multo longior quam latior, parallela, antice rotunda, postice truncata, rufulo marginata et carina rufula, antice parallela, postice sat abrupte ampliata et triquetra, omnino secta.

Plate XVIII. fig. 3.

HAB. Kauai, Koholuamano.

Cette espèce remarquable pourrait former un groupe spécial dans le genre *Lycosa*, caractérisé par les yeux de la seconde ligne très gros et rapprochés l'un de l'autre, leur intervalle ayant à peine leur rayon, par les yeux antérieurs en ligne assez procurvée avec les médians plus gros et un peu plus resserrés que les latéraux. A part cela elle se rapproche surtout des espèces du premier groupe (type *L. tarentula* Rossi).

#### LYCOSELLA Thorell.

##### (1) *Lycosella spinipes*, sp. nov.

♀. Long. 6 mm. Cephalothorax laevis, fusco-olivaceus, parce fulvo-rufulo-pilosus, regione oculari utrinque late nigro-marginata, vitta media latissima, postice sensim attenuata, vittaque submarginali angusta dilutioribus, obscure fulvis et albido-luteo-pilosis decoratus. Oculi quatuor anticis in lineam valde procurvam semicircularem, inter se aequi et fere aequidistantes, laterales ab oculis maximis ser. 2<sup>ae</sup> vix separati.

Area oculorum quatuor dorsalium parallela et subquadrata. Abdomen ovatum, nigricans, obscure rufulo-pubescent, linea media integra fulva, luteo-pilosa et, pone medium, macula maxima, ovato-transversa albo-pilosa, laete decoratum, subtus fulvo-rufulo-pubescent. Chelae nigricantes, intus atque ad apicem rufescentes, parce fulvo-crinatae, margine inferiore sulci dentibus trinis subcontiguus, 1° et 2° inter se aequis, altero minutissimo, armato. Pars labialis nigricans. Laminae-maxillares, sternum, pedes-maxillares pedesque fulvo-rufula, femoribus, praesertim subtus, annulis nigricantibus binis, valde sinuoso-dentatis, ornatis, tibiis metatarsisque cunctis latissime fusco-biannulatis, tibiis anticis aculeis inferioribus tenuibus longissimis 5—5 (apicalibus reliquis minoribus), metatarsis aculeis inferioribus similibus 3—3 et utrinque aculeis lateralibus minoribus binis (exterioribus setiformibus) armatis. Plaga genitalis fusconitida semicircularis, incisura profunda, processum linguiformem fulvum includente, notata.

Plate XVI. fig. 9 and Plate XVIII. fig. 5.

HAB. Kauai, Koholuamano.—Maui, Haleakala.

(2) *Lycosella annulata*, sp. nov. \*

♀. Long. 5 mm. Cephalothorax niger, vitta submarginali angusta et sinuosa atque in parte thoracica linea media paulo dilutioribus et rufescentibus, vix expressis, notatus, pilis brevibus rubris albidisque mixtis, sat crebre vestitus. Oculi antici in lineam validissime procurvam semicircularem, medii lateralibus vix majores. Area oculorum quatuor dorsalium parallela (postice quam antice vix latior) et subquadrata. Abdomen oblongum, fuscum, fulvo-rufulo-pubescent, parce et longe albedo-crinatum, in parte basali nigro-marginatum, prope medium vitta transversa lata, postice vitta transversa angustiore et leviter sinuosa, nigris, supra ornatum. Chelae nigrae, intus atque ad apicem dilutiores et rufescentes, parce fulvo-rufulo-crinatae, margine inferiore sulci dentibus trinis, 1° et 2° inter se aequis, altero minutissimo, armato. Partes oris sternumque fusco-nigricantia. Pedes fulvo-rufuli, parce luteo-pilosi, femoribus annulis nigris trinis valde sinuosis et interruptis ornatis, tibiis cunctis metatarsisque posticis late fusco-biannulatis, tibiis anticis aculeis inferioribus 4—4, interioribus (praesertim mediis) longissimis, aculeoque laterali interiore parvo, metatarsis aculeis similibus (apicalibus minoribus) 3—3 subtus armatis, tibiis metatarsisque 2° paris subtus similiter aculeatis, sed utrinque aculeo laterali parvo munitis. Vulva tuberculo conico, obtuso nitido, nigro sed apice rufulo, munita.

Plate XVI. fig. 10.

HAB. Oahu, Honolulu.

## SYROLOMA, gen. nov.

A *Trabaca*, cui affinis est, differt cephalothoracis facie humiliore et obtusiore, oculorum linea antica recurva, latiore quam linea secunda, oculis mediis a lateralibus quam inter se plus duplo remotioribus, oculis ser. 2<sup>ae</sup> paulo minoribus, tarsis pedum fasciculo parvo setarum claviformium sub unguibus munitis.

Ce nouveau genre, propre aux Iles Sandwich, se rapproche du genre *Trabaca* par les yeux médians de la première ligne beaucoup plus rapprochés l'un de l'autre que des latéraux, mais il s'en éloigne par le front très obtus et arrondi comme celui des *Trochosa*, par la première ligne oculaire plus large que la seconde dont les yeux sont relativement plus petits, enfin par la structure des tarsi qui est exceptionnelle pour la famille des Lycosides; ces tarsi offrent en effet, au dessous des griffes supérieures, de petits fascicules de poils spatulés analogues à ceux des Clubionides et masquant la griffe inférieure.

Le genre *Syroloma* peut être considéré comme formant un lien entre les Lycosides et certains Clubionides, particulièrement les *Ctenus* et les *Miturga*.

(1) *Syroloma major*, sp. nov.

♂. Long. 13 mm. Cephalothorax fusco-castaneus fere niger, parte cephalica postice late dilutiore et rufescenti, sed punctis parvis fuscis 4 vel 6 biseriatis notata, utrinque fere glaber, sed linea marginali exili fulvo-pilosa cinctus, supra vitta media latissima crebre albido-cinereo-pilosa ornatus. Abdomen ovatum, fusco-testaceum, fulvo-sericeo-pubescentis et nigro-crinatum, in parte basali maculis parvis binis subgeminatis, dein lineolis transversis tenuibus, postice utrinque macula parva nigricantibus, notatum. Chelae validae, ad basin convexae, nigrae, parce fulvo-pilosae, longe nigro-crinatae, margine superiore sulci dentibus trinis, medio reliquis duplo majore, inferiore dentibus trinis, ultimo reliquis minore, armatis. Partes oris nigrae, laminae intus dilutiores, pars labialis longior quam latior, apice leviter attenuata et truncata. Sternum sat anguste ovatum, fusco-testaceum, parce pilosum et crinitum. Pedes fulvo-rufuli, fulvo-sericeo-pilosi, longe et tenuiter hirsuti, annulis fuscis angustis et sinuosis cincti, tibiis metatarsisque anticis valde infuscatis, longe et numerose aculeati, tibiis anticis subtus aculeis 4—4 aculeoque laterali interiore, metatarsis subtus aculeis 3—3, apicalibus reliquis minoribus et utrinque aculeis lateralibus binis (altero submedio, altero apicali), armatis. Pedes-maxillares rufuli, tarso, saltem ad basin, nigricanti, mediocres et graciles; femore leviter curvato supra ad apicem aculeis 1—3 armato; patella longiore quam latiore; tibia patella circiter aequilonga, vix graciliore, leviter curvata et longe

crinita; tarso tibia cum patella simul sumptis brevior, tibia non multo latiore, apice acuminato et subtus longe crinito; bulbo nigro, subrotundo, parum complicato.

♀. Long. 17—18 mm. A mari differt abdomine majore, sat longe ovato, supra nigricanti sed vitta media latissima, leviter sinuosa et postice utrinque acute coarctata rufescenti et crebre albido-cinereo-pilosa, ornato, subtus obscure fulvo-testaceo, pedibus brevioribus. Vulva fulvo-nitida, semicircularis, fovea subrotunda, antice carinulam postice plagulam parvam trapezoidalem includente, impressa.

Plate XVIII. fig. 1.

HAB. Hawaii, Kona.—Kauai, Halemanu.

(2) *Syroloma minor*, sp. nov.

♂. Long. 8—9 mm. Cephalothorax nigricans, in medio vix dilutior, parce fulvo-pilosus, linea marginali fulvo-pilosa cinctus, parte cephalica maculis mediis binis obliquis, parte thoracica linea longitudinali abbreviata albidius pilosis, ornatus. Abdomen nigricans postice dilutius, rufulo-variatus et fulvo-cinereo-pubescentis, antice linea longitudinali, postice punctis biseriatis albo-pilosis, supra ornatum. Chelae robustae, nigrae, ad basin et extus fulvo-pilosae, et, praesertim intus, valde uigro-crinitae, marginibus sulci ut in praecedenti. Partes oris nigrae, laminae ad apicem saepe dilutiores et rufescentes. Sternum nigro-nitidum. Pedes fulvo-rufescentes, fusco vel castaneo-annulati, femoribus annulis trinis angustis et sinuosis (altero submedio alteris binis subgeminatis subapicalibus), tibiis annulo basali angusto apicali que latiore, metatarsis annulo medio annuloque apicali, notatis, tibiis anticis aculeis inferioribus 3—4 vel 4—4 longis, sed apicalibus minoribus et utrinque aculeis lateralibus plurimis, metatarsis aculeis inferioribus 3—3 et utrinque lateralibus binis armatis. Pedes-maxillares fere praecedentis sed tarso paulo latiore, fulvo-rufescentes, femore biannulato, tarso fusco-castaneo vel nigro.

♀. Long. 8 mm. Cephalothorax obscure fuscus vel nigricans in medio dilutior, fulvo-pubescentis, linea marginali vitta que media lata sed postice attenuata albidius pilosis, ornatus. Abdomen oblongum, atrum, antice plus minus fulvo-variatus, postice abrupte dilutius et fulvum, albido fulvoque pubescens, antice linea longitudinali alba sed postice sensim rufulo-pilosa, prope medium lineolis transversis arcuatis albido-pilosis, supra ornatum. Sternum nigricans. Pedes ut in mari sed breviores.

Plate XVIII. fig. 2.

HAB. Molokai.—Maui, Haleakala.—Kauai, Halemanu.

## Fam. ATTIDAE.

## BAVIA E. Simon.

(1) *Bavia acriceps* E. Simon.

*Bavia acriceps* E. Simon, in Ann. Soc. ent. Fr., 1877, p. 61.

*Acompse suavis* L. Koch, Ar. Austr., p. 1146, tab. XCIX, fig. 6, 7.

HAB. Oahu, Kaala Mts.

Espèce répandue dans toute la Malaisie, l'Australie et la Polynésie.

## HASARIUS E. Simon.

(1) *Hasarius adansonii* Audouin.

*Attus Adansonii* et *tardigradus* Aud. in Savigny, Descr. de l'Égypte, 2<sup>e</sup> ed. xxii, p. 169, 170, tab. vii, f. 8—f. 13.

*Salticus striatus* Lucas, in Rev. Mag. Zool., 1853, p. 521.

*Attus capito* Lucas in Barker Webb et Berthelot, H. N. Canaries, An. Art., p. 27, tab. vii, fig. 8.

*Salticus citus* O. P. Cambr., in Zoologist, 1863, p. 8561.

? *Salticus ruficapillus* Dolesch., in Act. Soc. Ind.-Neerl., v. 1859, p. 13, tab. II, fig. 3.

*Attus nigrofuscus* Vinson, Aran. Réun. Maur. Madag., 1864, p. 59, tab. x, fig. 8.

*Eris niveipalpis* Gerstaecker, in C. Decken's Reisen in Ost-Afrika, III, 2, 1873, p. 477.

*Salticus scabellatus* Butler, in Ann. Mag. Nat. Hist., 1876, p. 441.

? *Salticus acutus* Blackwall, in Proc. R. Irish Acad., 2. ser., III, p. 3, tab. 1, f. 2.

*Plexippus ardelio* Thorell, Studi Rag. Mal. etc., 1, 1877, p. 602 (262).

*Hasarius Adansonii* Thorell, id., IV, 1892, p. 426.

? *Hasarius Garretti* Keyserling in L. Koch, Ar. Austr., 1882, p. 1289, tab. cx, fig. 4.

HAB. Hawaii, Kona.—Oahu, Honolulu.

Espèce répandue dans toutes les régions chaudes de l'Ancien Monde ; introduite aux Sandwich.

## PLEXIPPUS C. Koch.

(1) *Plexippus paykulli* Audouin.

*Attus Paykulli* Aud. in Savigny, Descr. de l'Égypte, 2<sup>a</sup> ed. xxii, p. 172, tab. vii, f. 22.

*Attus ligo* Walck., H. N. Apt. 1, 1837, p. 426.

*Plexippus ligo* C. Koch, Arachn. xiii, 1846, p. 107, fig. 1168—1169.

*Sallicus Vaillanti* Lucas, Expl. sc. Alg., Zool. 1, 1848, p. 136, tab. v, fig. 2.

*Attus africanus* Vinson, Aran. Réun. Maur. Madag., 1864, p. 52, tab. x, fig. 3.

*Euophrys delibuta* L. Koch, in Verh. z. b. G. Wien, 1865, p. 874.

*Hasarius Paykulli* E. Sim., Ar. Fr. iii, 1876, p. 79.

*Menemerus Paykulli* Thorell, St. Rag. Mal. etc. iii, 1881, p. 501.

*Plexippus Paykulli* Thorell, id., iv, 1892, p. 372.

HAB. Kauai, Makaweli 2000 ft. vi. 1894, Perkins.

Espèce répandue dans toutes les régions chaudes du monde; introduite aux Sandwich.

## MOLLIKA G. et E. Peckham.

(1) *Mollica microphthalmus* L. Koch.

*Jotus microphthalmus* L. Koch, Arachn. Austr., 1, p. 1246, tab. cvii, f. 2—3.

HAB. Oahu, Honolulu.

Décrit de Tahiti; trouvé depuis dans plusieurs îles de la Polynésie.

## SANDALODES Keyserling.

*Mopsus* Keyserl. in L. Koch, Ar. Austr. 1, 1882, p. 1330 (non *Mopsus* Karsch).

*Sandalodes* Keyserl., loc. cit., p. 1476 (nota).

*Thyene* E. Simon, in Bull. Soc. Zool. Fr., x, 1885 (*T. semicuprea*).

Les trois espèces précédentes ont sans doute été introduites aux Sandwich; les Attides autochtones rentrent tous dans le genre *Sandalodes*, proposé par Keyserling pour deux espèces australiennes, qu'il avait d'abord rapportées à tort au genre *Mopsus* de Karsch. Mais les *Sandalodes* des Sandwich sont plus petits que les espèces typiques, ils manquent chez le mâle de crête frontale, et les caractères du genre s'y affaiblissent graduellement, depuis les *S. pubens* et *validus* qui ressemblent encore au *S. albobarbatum* Keyserl. jusqu'au *S. cruciatus* E. Sim. qui a le faciès d'un *Leius*.

## SYNOPSIS SPECIERUM.

1. Chelae antice, praesertim ad basin, creberrime et inordinate fulvo alboque barbatae .....2.
- Chelae antice pilis longis albis seriatis, lineas designantibus, ornatae .....3.
2. Pili oculorum albi .....*albociliatus*.
- Pili oculorum rubri vel fulvo-rufuli .....*pubens, canosus, validus*.
3. Pili oculorum albi .....*seniculus*.
- Pili oculorum fulvo-rufuli .....*verecundus, navatus, cruciatus*.

(1) *Sandalodes pubens*, sp. nov.

♂. 7—8 mm. Cephalothorax crassus, leviter ovatus, antice utrinque, pone oculos laterales, convexus, niger, pilis simplicibus crassis, longis et pronis, fulvo-ravidis crebre vestitus, parte thoracica vittis dorsalibus latis binis lineaque marginali exili albido-luteo-pilosis ornata. Pili oculorum fulvo-ravidi. Clypeus fere glaber, oculis mediis saltem duplo angustior. Oculi quatuor antici in lineam sat recurvam, laterales a mediis anguste separati. Area oculorum dorsalium evidententer latior postice quam antice. Oculi parvi ser. 2<sup>m</sup> ab oculis posticis quam ab anticis saltem  $\frac{1}{3}$  remotiores. Abdomen oblongum, supra ravidopubescens, parce et longissime albo nigroque crinitum, antice vitta marginali lineisque medianis binis arcuatis, postice linea media exili abbreviata et utrinque vittis obliquis binis latis albido-pilosis ornatum, subtus fuscum, breviter et parce luteo-pilosum. Chelae robustae, rugosae et transversim rugatae, nigrae, crasse et dense fulvo-ravidopilosae et intus longe albo-crinatae, sed apice subglabrae, marginibus sulci longis, superiore dentibus binis subgeminatis remotis, 1° 2° duplo majore, inferiore dente mediocri, armatis, ungue longo, ad basin crasso. Partes oris nigrae, laminae ad apicem paulo dilutiores et rufescenti-tinctae, extus ad angulum leviter dilatatae et convexae sed obtusae. Sternum fuscum. Pedes albo-pubescentes, longe nigro alboque hirsuti, fulvo-ravidi, femoribus, praesertim anticis, valde infuscatis fere nigris, metatarsis tarsisque dilutioribus; pedes 1<sup>i</sup> paris reliquis robustiores, femore compresso, tibia subtus aculeis mediocribus 3—3, interioribus exterioribus paulo majoribus, metatarso aculeis similibus 2—2 munitis, sed aculeis lateraliibus carentibus; pedes 2<sup>i</sup> paris tibia aculeis inferioribus 3—3 aculeoque laterali inferiore subapicali armata, patella intus uniaculeata; pedes quatuor postici valde aculeati, inter se longitudine subaequales (pedes 3<sup>i</sup> paris, saltem femore et patella, paulo longiores). Pedes-maxillares fulvo-rufuli, graciles et longi; femore curvato; patella tereti, plus duplo longiore quam latiore; tibia patella longiore, graciliore et tereti, utrinque, praesertim intus, longissime nigro-crinata, extus ad apicem apophysi nigra, simplici et subrecta, antice, secundum tarsum, directa armata; tarso tibia brevior, anguste ovato, apice attenuato sed obtuso; bulbo simplici disciformi, intus stylo gracili, subrecto, marginato.

♀. Long. 8 mm. Cephalothorax niger, parte cephalica fulvo-cinereo-pubescenti, subsquamulata, utrinque rubro-pilosa, parte thoracica subglabra sed linea marginali exili, lineisque dorsalibus binis, postice divaricatis, albo-pilosis, ornata. Pili oculorum rufuli. Clypeus angustus, pilosus. Abdomen longe oblongum, nigrum, supra fulvo-cinereo leviter micanti pubescens, antice arcu marginali, postice utrinque vitta lata, intus valde dentata, albo-pilosis, decoratum, subtus dilutius et parce albo-pilosum, sed vitta media lata nigra subglabra, notatum. Chelae robustae, nigrae, ad basin crasse albo-luteo-pilosae, ad apicem subglabrae. Partes oris nigrae, apice rufulae. Sternum fuscum. Pedes albo nigroque hirsuti, obscure castanei vel nigricantes, coxis sex posticis, metatarsis tarsisque dilutioribus. Area genitalis leviter depressa, plagula media nigra parva, transversim triquetra et bifoveolata munita.

Plate XVIII. fig. 7.

HAB. Hawaii; Kona, Kau, Mauna Loa.—Molokai.

(2) *Sandalodes validus*, sp. nov.

♂. Long. 8 mm. A *S. pubenti*, cui valde affinis est, differt cephalothorace antice et utrinque rubro-pubescenti, linea marginali exili et postice vittis latis binis divaricatis luteo-albido-pilosis decorato, pilis oculorum obscure rubris (non fulvis), chelis antice valde coriaceis, crebre flavo-pilosis et hirsutis, pedum 2<sup>i</sup> paris tibia subtus aculeis exterioribus trinis aculeoque interiore apicali atque intus aculeis lateralibus binis munita. Caetera fere *S. pubentis*.

Plate XVIII. fig. 6.

HAB. Hawaii, Olaa.

(3) *Sandalodes albociliatus*, sp. nov.

♂. Long. 6—7 mm. A *S. pubenti*, cui affinis est, differt cephalothorace nigro fulvo-cinereo-pubescenti, parte thoracica in declivitate sensim glabra sed in medio lineis binis abbreviatis et divaricatis albo-pilosis ornata, oculis anticis in lineam minus recurvam, pilis albis cinctis, clypeo glabro, abdomine atro, supra crebre ravidopubescenti atque antice arcu albo marginato, subtus fere nudo, chelis nigris, glabris, subtiliter coriaceis et opacis, pedibus fulvo-rufulis, femoribus, praesertim anticis, valde infuscatis fere nigris, pedibus 1<sup>i</sup> paris patella intus minute uniaculeata, tibia aculeis inferioribus 3—3 aculeoque laterali interiore subapicali, tibia 2<sup>a</sup> subtus tantum aculeis 1—3 sed aculeis lateralibus interioribus binis, munitis. Pedes-maxillares fere *S. pubentis* sed femore nigro.

Plate XVIII. fig. 8.

HAB. Lanai, Koele Mts.

(4) *Sandalodes canosus*, sp. nov.

♀. Long. 8 mm. Cephalothorax modice altus, ovatus, antice posticeque attenuatus, niger, parte cephalica parteque thoracica in medio, pilis albis pronis depressis et leviter ovatis crebre vestitis, atque in medio setis longissimis albis erectis paucis et inordinatis, munitis, utrinque in declivitate fulvo-rufulo sed versus marginem sensim albidius pubescens. Pili oculorum obscure rubri. Clypeus glaber. Oculi antici in lineam sat recurvam, laterales a mediis distincte separati. Abdomen atrum, supra cinereo-nitido-pubescens et setis longissimis albis conspersum, antice sensim albidius et utrinque vittis obliquis abbreviatis albis notatum, subtus vitta media latissima nigra et subglabra, notatum. Chelae robustae, convexae, nigrae, rugosae et rugatae, antice creberrime albido-luteo-pilosae, sed apice glabrae. Partes oris sternumque nigra. Pedes robusti, albo-pilosi et longissime hirsuti, nigri, antici tarsis dilutioribus, postici coxis metatarsis ad basin tarsisque castaneis, aculeis, ut in *S. pubenti* ordinatis, armati. Area genitalis postice marginata, utrinque foveola ovata impressa.

Plate XVIII. fig. 13.

HAB. Maui, Haleakala.

(5) *Sandalodes navatus*, sp. nov.

♂. Long. 6.5 mm. Cephalothorax niger, sublaevis, parte cephalica haud vel vix distincte tuberculata, in medio crebre albido-cinereo vel fulvo-nitido pilosa, antice, prope oculos, vitta longitudinali albidiore sed confusa, notata, utrinque fulvo-rufulo vel cervino pilosa, parte thoracica vitta media latissima, postice abbreviata et furcata, lineaque marginali exili albo-pilosis notata. Pili oculorum fulvo-rufuli, inter oculos medios albi. Clypeus in medio parce luteo-barbatus, utrinque in genis fulvo-rufulo-pilosus. Abdomen oblongum, nigricans, vitta longitudinali dilutiore, antice confusa, postice ampliata et arcibus transversis tenuibus fuscis secta, notatum, rufulo-pubescens sed antice arcu marginali, dein vitta longitudinali lata et postice vitta transversa, saepe confusa, albo-pilosis decoratum, subtus parce albo-pilosum. Chelae sat longae et parallelae, atrae, coriaceo-opaeae, pilis longis albis, lineas longitudinales designantibus, antice ornatae, margine inferiore sulci dente valido armato. Partes oris sternumque nigra. Pedes albo nigroque hirsuti, antici nigri, metatarsis ad basin tarsisque fulvis, postici nigricantes, coxis trochanteribus femoribus ad basin, metatarsis ad basin, tarsisque fulvis, tibiis 4<sup>i</sup> paris annulo medio fulvo saepe notatis. Pedes 1<sup>i</sup> paris ut in *S. pubenti* aculeati. Pedes 2<sup>i</sup> paris tibia aculeis exterioribus trinis aculeoque interiore apicali (rarius aculeis binis) subtus armata et intus aculeis lateralibus binis munita, patella intus minute uniaculeata. Pedes-maxillares ut in praecedentibus sed fusco-castanei, parce albo-pilosi.

♀. Long. 6 mm. Cephalothorax niger, longe cinereo-albido-pubescent, parte cephalica antice fulvo-pilosa, sed vitta media albidiore, oculus attingente, notata, parte thoracica postice area triquetra glabra munita. Pili oculorum fulvi. Pili clypei densissimi et longi, albi. Chelae parce et longe albido-crinatae. Abdomen longe oblongum, cinereo-albido-pubescent, utrinque fusco-variatur, postice arcubus parvis fuscis seriatis notatum. Pedes fere maris sed breviores et paulo dilutiores.

Plate XVIII, fig. 9.

HAB. Hawaii, Kona.—Lanai, Mt. Koele.—Maui, Haleakala.—Kauai, Waimea.

(6) *Sandalodes verecundus*, sp. nov.

♂. Long. 4—5 mm. Cephalothorax niger opacus, in medio pallide luteo utrinque fulvo-rufulo-pubescent, parte thoracica postice vittis binis divaricatis abbreviatis albidius pilosis, ornata. Pili oculorum fulvo-rufuli, inter oculos lutei. Clypeus crebre luteo-barbatus. Pars cephalica postice, inter oculos, tuberculo humillimo vix distincto munita. Area oculorum dorsalium vix latior postice quam antice et postice cephalothorace vix angustior. Abdomen oblongum, obscure testaceum, antice vitta longitudinali angusta lanceolata, utrinque zonis obliquis latissimis trinis subcontiguas, fusco-violaceis, supra notatum, luteo rufuloque pubescens. Chelae angustae et parallelae, atrae, valde coriaceo-opaeae, pilis luteis longis subseriatis ornatae, margine inferiore sulci dente valido armato. Partes oris nigricantes. Sternum fuscum. Pedes 1<sup>i</sup> paris fusco-castanei, femore compresso fere nigro, metatarso tarsoque dilutioribus, tibia subtus aculeis mediocribus 3—3 aculeoque laterali interiore subapicali, metatarso aculeis longioribus 2—2 munitis. Reliqui pedes fulvi, femoribus, tibiis metatarsisque apice leviter infuscatis, tibia 2<sup>i</sup> paris subtus aculeis exterioribus trinis aculeoque interiore parvo apicali et intus aculeo laterali armata, tibiis metatarsisque posticis numerose aculeatis. Pedes-maxillares fulvo-rufuli, graciles, fere ut in *S. pubenti*.

Plate XVIII, fig. 10.

HAB. Oahu, Kawailoa River.

(7) *Sandalodes cruciatus*, sp. nov.

♂. Long. 4 mm. Cephalothorax niger, sublaevis, pilis longis depressis et squamiformibus albis supra crebre vestitus, utrinque parcius fulvo-pilosus sed linea marginali exili albo-pilosa cinctus, parte thoracica vittis albis binis abbreviatis et divaricatis notata, parte cephalica postice tuberculo humillimo vix expresso notata. Pili oculorum fulvi. Pili clypei pauci lutei. Abdomen oblongum, nigrum, antice arcu marginali, dein vitta media lata, parallela vel postice attenuata et dentata et plerumque postice vitta transversa cruciata, niveo-pilosis supra decoratum, subtus parce albo-pilosum. Chelae parallelae, atrae, coriaceo-opaeae, pilis luteis longis, subseriatis,

ornatae, margine inferiore sulci dente valido armato. Partes oris sternumque nigra. Pedes nigro alboque hirsuti. Pedes 1<sup>i</sup> paris nigricantes, metatarso ad basin, tarsoque fulvis. Reliqui pedes obscure fulvi, fusco-annulati, femoribus, basi excepto, fere nigris, aculeis, ut in praecedenti ordinatis, armati. Pedes-maxillares fere ut in *S. verecundo* sed nigri, tarso parvo apice diluore.

Plate XVIII. fig. 11.

HAB. Hawaii, Kona.

(8) *Sandalodes seniculus*, sp. nov.

♂. Long. 4 mm. Cephalothorax niger, sublaevis, pilis longis depressis (squami-formibus) pronis albis supra crebre vestitus, utrinque subglaber sed linea marginali exili alba cinctus, parte cephalica utrinque et antice fulvo-pilosa sed antice vitta media alba notata, postice tuberculo medio humillimo, vix perspicuo, notata. Pili oculorum supra oculos rufuli, inter oculos et subtus albi. Clypeus in medio parce utrinque in genis crebre albo-barbatus. Abdomen oblongum, atrum, in medio confuse dilutius et postice arcubus transversis fuscis notatum, sed omnino crebre et crasse albo-pubescentis. Chelae, partes oris, sternum pedesque praecedentis sed metatarsis anticis fulvis. Pedes-maxillares paulo breviores, fusco-castanei.

Plate XVIII. fig. 12.

HAB. Maui, Haleakala.

Ordo SCORPIONES.

ISOMETRUS Hempr. et Ehrbg.

(1) *Isometrus maculatus* de Geer.

HAB. Hawaii.—Maui.—Oahu.

Espèce répandue dans toutes les régions chaudes du monde; introduite aux Sandwich; déjà indiquée de Honolulu par Karsch et par nous-même de Maui.

Ordo CHERNETES.

Fam. CHELIFERIDAE.

CHELIFER Geoffroy.

(1) *Chelifer bifissus* E. Simon.

*C. bifissus* E. Simon, in Ann. Soc. ent. Belg., XLIII 1899, p. 121.

HAB. Hawaii, Oloa.

Nous avons décrit cette espèce de Sumatra; elle est sans doute répandue dans toute la région Malaise.

Le *C. bifissus* de Hawaii ne diffère en rien de celui de Sumatra.

(2) *Chelifer hawaiiensis*, sp. nov.

♂. Long. 5 mm. Cephalothorax anophthalmus, subtilissime coriaceus et opacus, haud granulosus, breviter et simpliciter parce pilosus, multo longior quam lator, antice parum attenuatus, obtusus et convexus, sulcis transversis binis subrectis impressus, sulco 1°, vix ante medium sito, profundissimo, altero leviore. Segmenta abdominalia opaca, setis fulvis minutissimis simplicibus sed truncatis, transversim ordinatis, munita. Pedes-maxillares longissimi, coxa nitida, reliquis articulis subtiliter coriaceis et opacis, brevissime et simpliciter pilosis, sed digitis pilis tenuibus albis longioribus munitis, trochantere breviter pediculato dein subgloboso sed paulo longiore quam latiore, postice convexo, prominulo sed obtusissimo, femore haud pediculato, a basi ad apicem sensim ampliato, intus recto, extus, in parte apicali, leviter convexo, tibia femore vix brevior, haud latiore et saltem triplo longiore quam latiore, et intus et extus leviter convexo, ad basin attenuato, manu tibia paulo longiore et paulo latiore, teretiusscula, apicem versus leviter ampliata, digitis manu paulo brevioribus, atque ad basin abrupte angustioribus.

Cephalothorax et pedes-maxillares pallide fusco-testacei. Segmenta abdominalia dorsalia fulva, seg. I—IV maculis fuscis binis subgeminatis, seg. V—VI transversim late infuscata, reliqua maculis fuscis parvis quadriseriatis notata. Coxae pedum-maxillarium fusco-castaneae. Pedes lutei, subpellucentes, coxis olivaceis.

♀. Long. 4 mm. A mari differt magnitudine paulo minore, sulco thoracico 1° recurvo, pedibus-maxillaribus paulo brevioribus, femore ad basin minus attenuato, manu latiore, apice, versus digitos, leviter attenuata.

HAB. Hawaii, Kona.—Kauai.

Cette espèce, relativement de grande taille, ressemble, par la structure de sa patte-mâchoire (dont le fémur est graduellement atténué à la base, non pédiculé) aux *Ch. cancroides* L. et *meridianus* L. Koch, mais elle s'en distingue par le céphalothorax anophthalme et plus parallèle, à peine atténué en avant. Elle pourrait former à elle seule un groupe spécial dans le genre *Chelifer*.

## Fam. GARYPIDAE.

## GARYPUS L. Koch.

(1) *Garypus personatus*, sp. nov.

♂—♀. Long. 1.5 mm. Brevis, latus et valde depressus, subtilissime rugosus, pilis carens. Cephalothorax vix longior quam postice lator, antice, usque ad oculos, leviter attenuatus, ante oculos abrupte angustior, longe productus et obtuse canaliculatus,

ante medium stria transversa superficiali vix expressa notatus. Oculi utrinque bini, inter se contigui, anticus postico paulo minor. Pedes-maxillares minute et crebre rugosi, digitis setis tenuibus longis paucis munitis, reliquis articulis nudis; trochantere brevissime pediculato, dein lato, intus convexo et vix longiore quam latiore; femore parallelo, haud pediculato; tibia femore evidenter brevior, circiter aequilata sed versus basin sensim attenuata; manu tibia circiter aequilonga sed duplo latiore, ovata, intus convexa; digitis gracilibus, manu paulo longioribus. Pedum quatuor posteriorum trochanteres longi et convexi. Truncus pallide luteo-testaceus, cephalothorace antice, usque ad oculos, fusco vel nigricanti, segmentis abdominalibus cunctis utrinque minute fusco-notatis, segmentis I et II maculis parvis medianis binis subgeminatis, seg. III immaculato, segmentis reliquis maculis parvis binis inter se remotis et lineas duas designantibus notatis. Pedes-maxillares obscure fuscii, digitis rufescentibus. Pedes pallide lutei, subpellucents.

Cette très petite espèce est fort voisine du *G. irrugatus* E. Sim., de Sumatra; elle s'en distingue surtout par ses téguments beaucoup plus finement rugueux et dépourvus de poils claviformes.

HAB. Oahu, Kaala Mts.

AMBLYOLPIUM E. Simon.

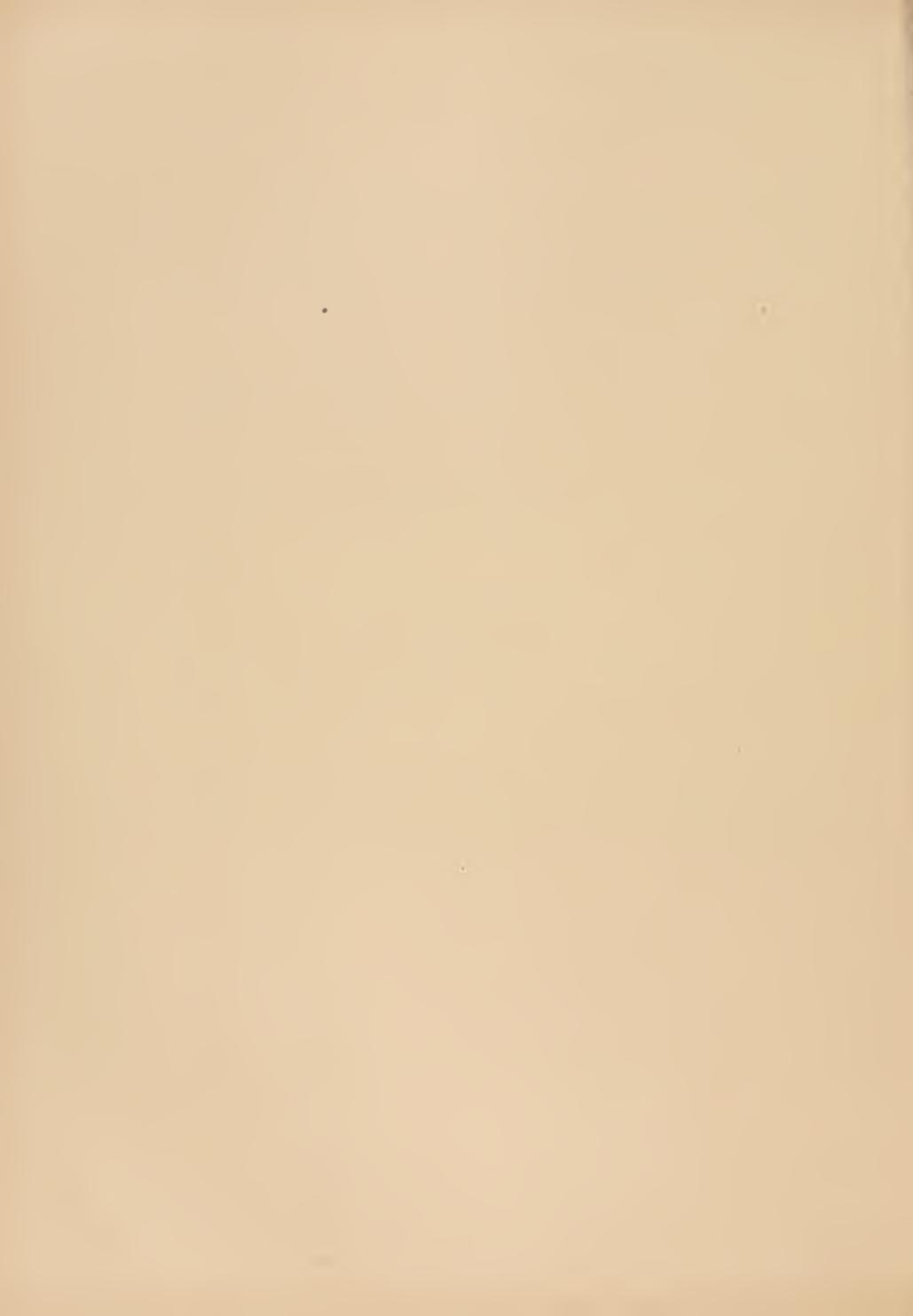
(1) *Amblyolpium longiventer* Keyserling.

*Olpium longiventer* Keyserl. in L. Koch, Ar. Austr., II, 1885, p. 50, tab. VI, fig. 9.

HAB. Hawaïi, Kau.

Décrit d'Australie (Queensland) par Keyserling; indiqué depuis de Funafuti par R. I. Pocock. (Ann. Mag. Nat. Hist. ser. 7, vol. I, p. 321.)

Le genre *Amblyolpium* diffère du genre *Olpium* par le front tronqué au niveau des yeux antérieurs, nullement prolongé en forme de museau.



## CRUSTACEA ISOPODA.

Par Adrien Dollfus.

ARMADILLO Latr.

(1) *Armadillo hawaiiensis* Dana (*Spherillo*).( $\delta$  = *Armadillo bidens*, Budde-Lund. ♀, *A. australis*, Budde-Lund.)

LA description et les figures du *Spherillo hawaiiensis*, Dana (Explor. Expedit., Crust., p. 722, pl. 47 (5a—e)), que nous avons pu consulter dans la bibliothèque de M. Milne-Edwards, ne nous laissent pas de doute sur l'identité de cette espèce avec celle dont Mr Budde-Lund a décrit le  $\delta$  sous le nom d'*Armadillo bidens* et la ♀ sous celui d'*A. australis*.—Cette espèce présente un caractère de dimorphisme sexuel très-particulier : en effet, le *clypeus* (partie céphalique située au dessus du labre) est muni chez le  $\delta$  de deux processus dentiformes qui ne se voient pas chez la ♀.

HAB. Lanai, 2000 pieds, Perkins, 1892.—Kauai, Makaweli, 3000 pieds, 1897.—Hawaii, Lihue, 2000 pieds (VII, 1896).

(2) *Armadillo albospinosus*, sp. nov.

Corps très-convexe, assez étroit, couvert d'épines coniques sur tout le corps, plus longues à la partie supérieure.—Cephalon : bord frontal un peu incurvé vers le centre, nettement marginé ; épistome muni antérieurement d'un relief en écusson assez accentué mais qui n'atteint pas la ligne frontale dont il est séparé par une aire déprimée ; clypeus presque rectangulaire, à processus latéraux peu développés ; yeux assez grands, environ 16 ocelles ; antennes à premier article du fouet trois fois plus court que le second.—Pereion : premier article du pereion à partie coxale bien développée, dépassant sensiblement l'angle du somite lequel présente l'aspect d'un relief triangulaire à la partie postéro-latérale du premier segment ; deuxième segment sans duplication coxale distincte.—Pleon, Telson : Pleotelson un peu plus long que large, un peu arrondi postérieurement et muni dorsalement de quatre épines coniques très-fortes (chez le  $\delta$ ) ; exopodite du premier pleopode ( $\delta$ ) large et court avec une incurvation bien marquée ; endopodite très-développé, un peu recourbé au sommet ; uropodes peu obliques :

Pl. S. Barber,  
National Museum,  
U. S. Washington, D. C.

endopodites courts atteignant la moitié du pleotelson; exopodites petits, situés sur la face dorsale de l'article basilaire, à une petite distance de l'angle interne, et par conséquent non visible sur la face inférieure de l'uropode.

Couleur: gris brun vers le centre, un peu marbré sur les côtés, à épines blanchâtres.—Dimensions:  $8 \times 3$  millim.

Obs. La ♀ diffère du ♂ par ses granulations beaucoup moins spinescentes et étroites surtout vers la région médiane, et par une couleur générale qui paraît uniformément gris-brun, l'extrémité des granulations restant seules blanchâtres.—Peut-être s'agit-il là de deux espèces différentes?

HAB. Oahu, Kawailoa, 1 exemplaire ♂, Perkins, iv. 1892.—Kauai, Makaweli, 3000 pieds, 1 exemplaire ♀, 1897.

(3) *Armadillo perkinsi*, sp. nov.

Corps peu convexe, un peu déprimé latéralement, ponctué et couvert de granulations assez fortes mais obtuses, disposées en rangées transversales assez confuses sur les trois premiers segments, au nombre de deux sur les quatre derniers segments péreiaux; les granulations sont presque effacées sur le pleon.—Cephalon muni antérieurement de deux forts tubercules, dépassant la ligne frontale, celle-ci est presque droite, un peu infléchie au centre; épistome à relief à peine sensible; clypeus court et peu large à processus latéraux peu développés; yeux moyens, environ 16 ocelles; fouet des antennes à premier article trois fois plus court que le second.—Pereion: les deux premiers segments ne présentent aucune duplicature coxale distincte.—Pleon, Telson: Processus latéraux des segments du pleon peu divergents; pleotelson un peu plus long que large, à bord postérieur égalant la moitié de la base; uropodes à base allongée, étroite, à endopodite atteignant aux  $\frac{2}{3}$  du pleotelson, à exopodite assez développé, situé vers la moitié du côté interne de la base.

Couleur: ambré avec taches irrégulières brunes et rougeâtres.—Dimensions:  $7 \times 3\frac{1}{2}$  millimètres.

HAB. Maui, Haleakala, 5000 pieds, iv. 1894, un exempl. ♂.

(4) *Armadillo danae*, sp. nov.

Corps peu convexe, un peu déprimé latéralement, ponctué et présentant antérieurement des granulations espacées très-obtuses, qui s'effacent postérieurement.—Cephalon muni antérieurement d'un relief (non bi-tuberculé comme dans l'espèce précédente), formant processus frontal et qui est bordé antérieurement par une ligne marginée distincte, dédoublement de la ligne marginée frontale qui est un peu infléchie au centre; épistome à relief peu sensible; clypeus court et peu large, à processus latéraux peu

développés; yeux assez petits, environ 12 ocelles; fouet des antennes à premier article près de trois fois plus court que le second.—Pereion: les deux premiers segments ne présentent aucune duplicature coxale distincte.—Pleon, Telson: Processus latéraux des segments peu divergents, ceux du 5<sup>e</sup> segment à bord postérieur un peu sinueux; pleotelson un peu plus long que large, à sommet dépassant en largeur la moitié de la base; uropodes peu obliques, à côté interne sinueux, endopodite dépassant les  $\frac{2}{3}$  du pleotelson, exopodite petit, situé vers les  $\frac{2}{3}$  du bord interne de la base.

Couleur: ambré avec taches irrégulières brunes.—Dimensions:  $7 \times 3\frac{1}{2}$  millimètres.

HAB. Kauai, Makaweli, 3000 pieds, 1897.

(5) *Armadillo sharpi*, sp. nov.

Corps assez convexe, finement ponctué, présentant antérieurement des tubercules obtus et sur le bord postérieur de chaque segment une rangée de granulations dont la médiane est la plus accentuée, donnant un aspect vaguement caréné à la ligne médiane du corps. Cephalon: le front présente un processus large, analogue à celui de l'espèce précédente mais plus accentué encore, limité comme lui par un dédoublement de la marge frontale; épistome à relief peu sensible; clypeus court et peu large, à processus latéraux peu développés; yeux moyens, environ 12 ocelles; fouet des antennes à premier article  $2\frac{1}{2}$  fois plus court que le second.—Pereion: les deux premiers segments ne présentent aucune duplicature coxale distincte.—Pleon, Telson: processus latéraux des segments du pleon peu divergents; pleotelson un peu plus long que large, à sommet dépassant en largeur la moitié de la base; uropodes peu obliques, endopodite dépassant les  $\frac{2}{3}$  du pleotelson, exopodite petit, situé à une petite distance du sommet, sur le bord interne de la base.

Couleur: gris presque uniforme, avec quelques petites taches plus claires.—Dimensions:  $7 \times 3\frac{1}{4}$  millimètres.

HAB. Kauai, 4000 pieds, VIII. 1896, un exemplaire ♀.

Ces trois dernières espèces sont très-voisines de l'*Armadillo bifrons* B. L., de Rockhampton (Australie), qui se rapproche d'*A. perkinsi* par le processus frontal bituberculé et d'*A. sharpi* par les granulations qui donnent à la partie médiane du corps un aspect caréné.—Ces espèces, auxquelles il faut joindre sans doute *A. nigrinus* B. L. (indiqué avec doute comme provenant du Cap(?)),—et peut-être *A. (Spherillo) spinosus*, Dana, de la Nouvelle-Zélande, forment une section bien nette du grand genre *Armadillo*, caractérisée par l'absence de parties coxales distinctes sur les deux premiers segments pereiaux. Un autre caractère que je mets en évidence sur les trois espèces Hawaïennes étudiées ci-dessus est présenté par la disposition du front qui présente antérieurement un relief bien accentué, soit bituberculé comme dans *A. perkinsi*, soit continu comme dans *A. danae* et *A. sharpi*; la marge frontale paraît se dédoubler vers

le tiers de son parcours en une ligne postérieure qui délimite le bord antérieur un peu infléchi de l'épistome, et une ligne antérieure qui suit le relief frontal; toutefois dans *A. perkinsi*, cette ligne antérieure n'est pas nette; les deux forts tubercules qui forment le relief frontal appartiennent certainement à la portion céphalique tergale et ne paraissent être qu'un achèvement à la disposition qu'offrent les deux autres espèces où la jonction entre le relief frontal et l'épistome paraît plus complète; la ligne postérieure, qui délimite ce dernier, semble même s'atténuer encore plus dans *A. sharpi* que dans les deux autres espèces.



PORCELLIO Latr.

(1) *Porcellio lacvis* Latreille.

HAB. Lanai, 2000 pieds, Perkins, 1892.

(2) *Porcellio scaber* Latreille.

HAB. Hawaii, Kona, Perkins, 1892.

Cette espèce, si commune dans l'Europe et même l'Amérique septentrionale, avait été trouvée en grande abondance dans certains pays tempérés et froids de l'hémisphère sud.—On ne l'a signalée que très-exceptionnellement en quelques localités des régions chaudes; c'est la première fois qu'elle a été rencontrée à Hawaii.

ALLONISCUS Dana.

(1) *Alloniscus floresianus* Dollfus.

HAB. Lanai, Monts Koele, l. 1894.

Nous avons décrit cette espèce d'après des exemplaires recueillis par le prof. Max Weber, à Sikka (Flores) (Isop. terr. des Indes Néerland., dans Zool. Ergebn. einer Reise in Niederl. Ost-Indien, Bd. iv. 1898, p. 374). L'*Alloniscus* d'Hawaii est bien identique à celui de Flores; il est donc probable qu'il faut lui assigner une assez grande extension.

## PHILOSCIA Latr.

(1) ? *Philoscia angusticauda*, Budde-Lund.

HAB. Hawaïi, Kona, 2000 à 3000 pieds, IX. 1892.—Oahu; Mts. Kaala, 2000 pieds, III. 1893; Honolulu, 2000 pieds, IX. 1892; Mts. Waianae, IV. 1892.

C'est avec un certain doute que nous rapportons les exemplaires de Hawaïi à l'espèce décrite par Budde-Lund d'après des exemplaires de Bornéo (Crust. Isop. terrestria, p. 216), mais il ne nous est pas possible de l'en différencier nettement.

Nous avons déjà remarqué (Zool. Ergebn. p. 377) que certaines espèces des Indes Néerlandaises, notamment *Ph. truncata* Dollfus et *Ph. variegata* Dollfus, provenant de Célèbes (nec *Ph. variegata* Dollfus, du Venezuela, Ann. Soc. Ent. France, 1893), étaient très-voisines de *Ph. angusticauda*. Nous croyons qu'il faudra les identifier aussi avec l'espèce de Bornéo.

## GEOLIGIA Dollfus.

J'ai établi en 1893 (Isop. rec. par M. E. Simon au Venezuela, d. Ann. Soc. Ent. France), sous le nom de *Geoligia*, un genre de Ligiens fondé sur un exemplaire très-intéressant découvert par M. Eug. Simon au Venezuela, dans les forêts, vers 1200 mètres d'altitude. J'indiquais comme caractère permettant de distinguer ce genre terrestre du genre *Ligia* qui paraît éminemment maritime, l'absence complète de séparation des coxopodites (ou épimères) qui sont au contraire bien distincts chez *Ligia*.

(1) *Geoligia perkinsi*, sp. nov.

Corps ovale, lisse.—Cephalon arrondi antérieurement; parties latérales formant un processus triangulaire; épistome muni d'une ligne transversale en relief assez accentué mais non flexueux; clypeus très-court et large; labre très-développé; yeux occupant environ  $\frac{1}{3}$  de la largeur du cephalon, pareils à ceux des *Ligia*; antennes longues, à fouet plus long que la tige, formé d'environ 27 articles; antennules très-petites, à premier article large.—Pereiopon: les segments 2 à 7, munis latéralement d'un léger sillon, se terminent par un angle aigu; l'incurvation postérieure du segment va en s'accroissant du 2<sup>e</sup> au 7<sup>e</sup> segment; la séparation des coxopodites (épimères), non distincte sur le premier segment, est indiquée par une ligne à peine visible sur les segments suivants.—Pleon: angles postéro-latéraux des segments pleonaux très-aigus; pleopodes de la première paire (♂) à endopodite bien développé, styloforme et exopodite large et

court ; ceux de la 2<sup>e</sup> paire à endopodite extrêmement long et se terminant en massue. —Pleotelson à bord postérieur muni de 5 dents obtuses, rappelant la forme de celui de *Ligia exotica* ; uropodes très-longs, article basilaire beaucoup plus long que le pleotelson, appendices filiformes, *articulés*, l'exopodite plus long que l'article basilaire, tri-articulé, l'endopodite très-grêle, deux fois plus long que l'exopodite, sex-articulé.

Couleur : gris verdâtre pâle, muni sur tout le corps de très-petits points pigmentés noirs, sauf sur les linéoles qui s'observent de part et d'autre de la ligne médiane. — Dimensions : longueur (♂ et ♀) 16 à 17 millimètres ; largeur 6,5 à 7 millimètres.

HAB. Hawaii, Lihue, un exemplaire ♂ (avec un uropode complet), 2000 pieds, VII. 1896 ; Olaa, 2000 pieds, IX. 1896 ; Hilo, 2000 pieds, I. 1896. —Kauai, Monts Waimea, 4000 pieds, VI. 1894 ; Koholuamano, 4000 pieds, V. 1895.

Les exemplaires recueillis par M. Perkins à Hawaii, également à une assez grande altitude, et qui me paraissent devoir être unis génériquement à *Geoligia simoni*, m'ont permis de constater que dans l'espèce d'Hawaii, la ligne de séparation entre les coxopodites et le somite, nulle sur le premier segment, existe sur les segments suivants, mais elle est à peine distincte. Les appendices des uropodes sont articulés ; ce dernier caractère est très-remarquable ; il nous a été malheureusement impossible de constater s'il existait aussi dans *Geoligia simoni*, les uropodes du seul exemplaire qui ait été recueilli jusqu'à présent étant incomplets.

Nous devons donc établir la caractéristique du genre ainsi qu'il suit :

Coxopodites (épimères) non ou très-peu distincts. Appendices des uropodes articulés.—Le reste, et notamment les parties buccales, comme dans le genre *Ligia*.—Espèces terrestres.

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## CRUSTACEA AMPHIPODA.

By Rev. T. R. R. Stebbing.

Fam. TALITRIDAE.

Gen. ORCHESTIA Leach.

*Orchestia platensis* Kröyer.

Plate XXI. A.

1845. *Orchestia platensis* Kröyer, Naturhistorisk Tidsskrift, Ser. 2, vol. 1.  
pp. 304—310, pl. 2, fig. 2, a—i.

Kröyer's specimens were taken on a rocky margin of the river Plate just north-west of Montevideo. The agility with which the animal skips, he says, is so great that it is pretty difficult to catch it. Specimens apparently belonging to this species have been entrusted to me by the authorities of the Copenhagen Museum. The labels show that these examples were taken at the Bermudas, at St Croix (West Indies), and at Beloxi (Mississippi, U.S.A.). Specimens of *Orchestia agilis* S. I. Smith, from the east coast of the United States, have been given me by my friends, Canon Norman and Mr S. J. Holmes. These also in my opinion should be included in Kröyer's species.

Now, after much hesitation, I feel constrained to increase its range by applying the name to the specimens taken by Mr Perkins at an elevation of 3000 feet and 2000 feet respectively in the Sandwich Islands. At the greater height there was but one example, labelled "Kona, Hawaii." The others were labelled "Oahu" and "Honolulu," and "Lanai." Others were labelled, without specifying elevation, "Waianae Mts., Oahu, shrimps in dead wood."

The eastern specimens differ to a slight degree from the western in having the second antennae more slender, with flagella not always limited to thirteen or fourteen joints, one of the female specimens having twenty-three, and one of the males twenty-four joints; also the first gnathopods of the male have the distal part of the sixth joint

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less conspicuously widened, nor can I guarantee that the armature of spines on the uropods is precisely the same in both forms.

In the second gnathopods of the male the large oval sixth joint has a smoothly convex palmar margin, bordered with submarginal spinules. Round this the long finger curves, closely fitting it, but laying its apical part within a long groove which succeeds the palmar margin. Krøyer, it should be observed, neither figures nor describes this apical part of the finger, which is membranaceous in appearance, slender, but not very acute at the point. According to Krøyer the telson is at the apex flatly rounded off or nearly truncate. In the specimens which I have examined in this respect it is minutely emarginate.

The pereopods are without specially dilated joints. The second joint of the fourth pereopods is much more narrowly oval than that of the fifth pair; the second joint of the latter has its hind margin rather strongly serrate. The first pair of uropods have the outer ramus free from spines except at the apex, but this character is common to various other species in the family.

Length reaching 12 mm.

*Orchestia pickeringii* Dana.

Plate XXI. B.

1853. *Orchestia pickeringii* Dana, U. S. Exploring Exp., Crustacea, pt. 2, p. 882, pl. 59, f. 9 a—f.

Dana, at p. 1595 of his great work, states that 'the locality of *Orchestia pickeringii*, was Kauai or Oahu, Sandwich Islands.' He does not give any further detail as to the habitat. Stimpson records it from California, without comment. The specimens obtained by Mr Perkins are labelled "Honolulu. Oahu. 2000 ft." They were taken on the same date and at the same height as specimens of *Orchestia platensis*, and the question suggested itself whether by chance the two species might be identical. There is considerable general resemblance, but that perhaps is only as much as to say that both are species of *Orchestia*. The idea of uniting them is, I think, untenable.

The second gnathopod of the male has a very large sixth joint, the sloping palmar margin of which is in these specimens diversified by two spinulose projections, in correspondence with which the strongly curved finger has a very sinuous inner margin, its apex entering a small pocket or groove of the somewhat flattened hind margin of the sixth joint. Dana describes the palm as having two very low prominences near base of finger, whereas these are very marked, and one of them is remote from the base of the finger. But an Oahu specimen from the Copenhagen Museum and an Australian specimen from the Australian Museum, show modifications approximating to Dana's

form. These have the inner margin of the finger smoothly concave. In Dana's figure the finger has a slight convexity near the base, and also has a produced apex, corresponding with a long groove in the sixth joint, which in a manner recall the same features in *Orchestia platensis*.

Dana gives the flagellum of the first antennae three-jointed. This variable feature has sometimes five joints. The ultimate and penultimate joints of the peduncle of the second antennae are much stouter than in any of the specimens referred to *Orchestia platensis*, and yet the flagella are not more than fourteen-jointed. It seems unlikely that the larger and more strongly armed male should have a shorter flagellum than a less highly developed male of the same species. The specimens referred to *Orchestia pickeringii* have the fourth and fifth joints of the fifth pereopods, though not dilated, thickened in a way not exhibited by the other set. This, however, might be a character of advanced maturity.

Length reaching 14 mm.

One female specimen, 12.5 mm. long, which I am inclined to refer to this species, differs from those of the same sex referred to *Orchestia platensis* in rather superior bulk, and also in having a distal boss on the fourth joint of the second gnathopods, agreeing in that respect with Dana's figure of the limb in question in *Parorchestia hawaiiensis*, ♀. From that species it is completely distinguished by the short, few-jointed, upper antennae.

#### Gen. PARORCHESTIA, Stebbing.

1899. *Parorchestia* Stebbing, Trans. Linn. Soc. London, vol. VII, pt. 8, pp. 397, 402.

This genus was instituted to receive three of Dana's species of *Orchestia*, namely, *tenuis*, *hawaiiensis*, and *sylvicola*.

#### *Parorchestia hawaiiensis* Dana.

##### Plate XXI. C.

1853. *Orchestia hawaiiensis* Dana, U.S. Expl. Exp., Crustacea, pt. 2, p. 880, pl. 59, f. 8 a—g.

1899. *Parorchestia hawaiiensis* Stebbing, Trans. Linn. Soc. London, vol. VII, pt. 8, p. 402.

Dana's description and figures of this species, obtained at 'Oahu or Kauai, Hawaiian Islands,' refer only to the female. Specimens of both sexes obtained by Mr Perkins were labelled as coming from "Koholuamano, Kauai," and from "Waiaanae Mts., Oahu." It has also been taken by Dr Arthur Willey at Lifu.

From the species of *Orchestia* above discussed the present species is separated by many particulars in addition to the minute distinction on which the genus *Parorchestia* is founded.

♂. The upper antennae extend along at least two-thirds of the last joint of the peduncle of the lower antennae. The second joint of the peduncle is longer than the first, the third as long as the first plus the second; the flagellum of nine joints is as long as the peduncle.

The lower antennae are slender, the penultimate joint of the peduncle more than twice as long as the preceding joint, and the ultimate as long as both of these together; the flagellum of twenty-one joints is as long as the peduncle or rather longer. As usual, these dimensions and numbers are subject to some variation.

The upper lip appears to be rather wider and shorter than in *Orchestia*, but no tangible differences could be discerned in mandibles, lower lip, and the two pairs of maxillae. The maxillipeds differ from those of *Orchestia platensis* in having both the inner and outer plates smaller, the first and second joints of the palp less expanded, the third joint with less convex margins, as well as in possessing a distinct though minute fourth joint; also the spinules on the various joints are fewer and more scattered, none being seen on the outer margin of the inner plate, while on the other hand the outermost spine-tooth on its distal margin is exceptionally large.

The first gnathopods are slight, the fourth joint having a sort of boss or distal expansion of the hind margin; the fifth joint widens gradually to the rounded distal end, and the sixth is rather similarly expanded, the small finger not quite reaching the extremity of the palmar margin, which is not at all oblique.

The second gnathopods have the sixth joint massive, broadly oval, the palmar margin oblique, not strongly convex, ending in a small groove or pocket, to receive the apex of the finger. The inner margin of the finger is slightly irregular, at its base not fitting exactly the palmar margin, while its apex has a membranaceous aspect as in *Orchestia platensis*.

The uropods scarcely differ in any important particular from those of the above-named *Orchestia*, but the telson has a truncate apex, with a spinule at each corner, two smaller ones in between them, and two on each side above them.

Length 13 mm.

Except in regard to the two pairs of gnathopods and the purely sexual characters, the male and female have close resemblance. Dana's figures of the female are unfortunately very poorly reproduced in the Catalogue of the Amphipodous Crustacea in the British Museum, 1862, a work which might have been of extreme value, had the plates been executed with sufficient care to make them trustworthy.



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## Supplement by G. W. Kirkaldy

to

## HEMIPTERA.

Vide pp. 93—174 hujus operis tom. III<sup>1</sup>.

This second contribution deals principally with the Auchenorrhynchous Homoptera; I have, however, added species of the Heteroptera etc. described since 1902, as well as new species and notes on previously known forms.

The total number of the Hemiptera so far described from the Hawaiian Islands is 305, or, if we exclude the 63 determined species of Coccidae, Aleyrodidae and Aphidae, which greatly swell the non-endemic total, 242. Of these 226 are not known elsewhere, though I have grave doubts as to the endemicity of some of them.

The Hemipterous fauna is now seen to lack representatives in many of the most important families, only the following six containing undoubtedly endemic forms, viz. Myodochidae, Nabidae, Reduviidae, Anthocoridae, Miridae and Acanthiidae, among the 26 recognized Heteropterous families, and by four only of the 14 Homopterous families, viz. Tettigoniidae, Fulgoridae, Asiracidae and Chermidae, that is to say, by 10 out of 40, or exactly one-fourth! But this scanty representation is still better shown by the fact that out of these ten, only seven are represented by more than ten species each, and that none contain more than one subfamily, except the Myodochidae, which have an endemic subfamily, Metrarginae.

Although there are several species still to be described, I think that all but a very few genera have been accounted for.

In the Cimicinae, *Oechalia* and *Coleotichus* are possibly endemic, as regards their species, but, on the other hand, these may very possibly be found in Samoa or Tahiti, the endemic Hemipterous fauna of which is unknown.

<sup>1</sup> I regret that I have to announce the decease of Mr Kirkaldy, which has occurred while these pages have been in the press, so that they have not had the benefit of his revision. The residence of Mr Kirkaldy in the islands for some years, induced a change in his views on numerous points, so that the alterations in this supplement are of considerable extent and importance. The species with a number prefixed are not hitherto enumerated in the Fauna, and are practically additions, though some were described previous to Mr Kirkaldy's first treatment of the subject. EDITOR.

The following is a list of the families represented endemically in these Islands :

MYODOCHIDAE, with Metrarginae and Cyminae; NABIDAE; REDUVIIDAE with Ploiariinae only; ANTHOCORIDAE; MIRIDAE; ACANTHIDAE; TETTIGONIIDAE; with the tribe Phrynomorphini only; FULGORIDAE, with Cixiinae only; ASIRACIDAE; and CHERMIDAE.

CIMICIDAE. Excluding an undoubted introduction, we have three species that are not known elsewhere, but may occur in Samoa or some other Pacific Island.

UROLABIDIDAE and ARADIDAE are entirely absent.

LYGAEIDAE. Excluding an undoubted introduction, we have *Ithamar*, which will probably be found elsewhere.

MYODOCHIDAE. In the Metrarginae, we have an apparently endemic subfamily, which however may occur in Samoa and other islands. *Nysius* has between 20 and 30 species, all the endemic ones being arboreal. I think all the latter could have originated from one immigrant. *Sephora* and *Nesocymus* are, I think, endemic, but possibly not. *Reclada* I do not know, and, I think, it is not endemic.

PYRRHOCORIDAE and TINGIDAE are entirely absent endemically, as also GERRIDAE, ENICOCEPHALIDAE, NEPIDAE and MACROCEPHALIDAE.

NABIDAE are well represented by more than 20 endemic species. *Milu* is doubtless a direct offshoot of a *Reduviolus* like *sharpianus*. The endemic *Reduviolus* proper are arboreal, but their offshoot *Nesotyphlias* are found on the ground under dead leaves etc. and on tree-ferns.

REDUVIIDAE are represented endemically only by the slender, long-legged Ploiariinae, of which I have recorded seven species; one of these is however probably not endemic.

ANTHOCORIDAE have six or more endemic forms.

CLINOCORIDAE, POLYCTENIDAE and DIPSOCORIDAE are absent.

MIRIDAE require a revision with more material, and there is a considerable number of species undescribed. *Sulamita*, *Kalania*, *Pseudoclerada* and *Kamehameha* are interesting endemic genera. *Tichorhinus* and *Sarona* seem to be the dominant forms.

ACANTHIDAE are represented by five or more endemic species of *Acanthia*, which are very variable in colour and pattern and need fresh study with more material. The other families of the Notonectoidea are not represented endemically.

In the Homoptera, Cicadidae, Cercopidae and Membracidae are absent, as also (endemically) Aphidae, Aleyrodidae and Coccidae. Tettigoniidae are represented by the endemic *Nesophrosyne* with a large number of forms, extremely variable and difficult to limit, by *Nesophryne* (one to four species) also apparently endemic, and by one or two other forms in the same tribe (Phrynomorphini) also possibly endemic.

FULGORIDAE consist only of Cixiini, in two genera, the endemic *Iolania* (several species, only one yet described) and the cosmopolitan *Oliarus*, with several endemic forms.

ASIRACIDAE are well represented and comprise several endemic genera and a large number of species.

POEKILOPTERIDAE, ISSIDAE, TETTIGOMETRIDAE and DERBIDAE are absent, the first named having a single immigrant.

CHEMIDAE are rather numerous, but very variable, and scarcely studied.

My thanks are due to the following gentlemen: to Dr R. C. L. Perkins for loan of specimens and much help in various ways; to Mr W. M. Giffard for the gift of his valuable Hemipterous collections made in various localities, but principally on Mt. Tantalus, Oahu; and to my colleagues Messrs F. W. Terry and O. H. Swezey, for specimens.

### Heteroptera

For a sketch of the classification of the Heteroptera see Kirkaldy, 1907, P. Haw. E. S. I. 135 et seqq.; and 1908, Can. Ent. XL.

#### Fam. CIMICIDAE.

##### OECHALIA.

As stated elsewhere, P. Haw. E. S. I. pp. 141—3, I feel certain that there are two valid species of this genus, as there are two kinds of ova; at the same time I do not believe that the synonymy already given is incorrect.

##### *Oechalia grisea*, Burmeister.

*Oc. griseus*, huj. op. III. p. 171.

I have described some of the stages and figured an egg. Dr Perkins writes in reference to other remarks in that paper, "You give a wrong impression as *Oechalia* often swarms in *Myoporum*, *Acacia koa* and many others. I have seen hundreds in a few yards of sugar cane and it is often very common near the coast and even in the outskirts of Honolulu on foreign vegetation. The whole remark certainly gives no idea of the ubiquity of this very abundant bug. It is on nearly all native trees, both in egg and other stages, as well as on low vegetation." Recently, I have taken it at Kilauea (Hawaii) on *Myoporum*, *Acacia koa* and ferns.

*C. blackburniae.*

*C. blackburniae*, huj. op. III. p. 172.

I have described and figured the ova, and described the nymphal stages (1907, op. cit. p. 144, figs. 2—4). Dr Perkins writes "I have seen it swarming near the coast on *Dodonaea* as well as in the mountains. I never saw it on Koa in anything like such numbers as on *Dodonaea*. The latter covers acres of land where is no Koa. The fact is it is partial to 'pods' and 'capsules' and the tree itself is of minor consideration, if it bears these." Maui should be added to the list of islands.

[Van Duzee (1905, Bull. Amer. Mus. XXI. 207) has cited *Piezodorus rubrofasciatus* as a Hawaiian Insect, but in error. See Kirkaldy, 1908, P. Haw. E. S. I. 172 and 187. Oshanin has given these islands as a habitat of *Carpocoris pudicus* var. *fuscispina*, also in error.]

## Subfam. CYDNINAE.

*Geotomus pygmaeus* Dallas.

*G. pygmaeus*, huj. op. III. p. 172.

This little species is common under dried cow-dung, and under stones. It is nocturnal, coming to "light" in the evenings. Add Kauai and Lanai to the islands.

## Fam. LYGAEIDAE.

*Ithamar hawaiiensis* Kirkaldy.

*I. hawaiiensis*, huj. op. III. p. 170.

Dr Perkins writes, "this species is not attached to *Sida*, it abounds on Molokai at 3000 ft. on other plants, and at the Volcano (Kilauea), and as high as 8000—10,000 ft. on Haleakala. You refer merely to the coast-line." It has been common in Kaimuki this year (1908) on *Sida cordifolia*, but is attacked by *Zelus renardii*. I have briefly described the eggs and first nymphal instar (1907, P. Haw. E. S. I. p. 149). Add Hawaii to the islands.

This species, although unknown elsewhere, must be a recent introduction as it was not taken by Blackburn who would certainly have collected it near Honolulu had it been here then.

*Rhopalus hyalinus*, Fabr.

*R. hyalinus*, huj. op. III. p. 170.

I have described the ova and nymphs (1907, op. cit. pp. 146—8). This has been common this year on *Sida cordifolia* in Kaimuki, as well as on *Sonchus oleraceus*, its more natural food plant. It feeds also on *Euphorbia cordata* and is preyed on by *Zelus renardii*. Add Kauai to the islands.

## Fam. MYODOCHIDAE.

## METRARGA.

*Metrarga*, huj. op. III. p. 165.

I have recently founded two subgenera in this, viz. *Nesocryptias* and *Nesoclimacias* (1908, P. Haw. E. S. I. p. 189).

The forms now known are :

a. typical subgenus :

*M. nuda* (F. H. III. p. 165) typically apparently an Oahuan species, with var. *mauiensis* (1908, P. Haw. E. S. I. p. 188).

*M. obscura* (F. H. III. p. 166) ; I have recently taken this at Kilauea, Hawaii, on *Ohia lehua* (*Nani polymorpha*).

b. subg. *Nesoclimacias*.

*contracta* (F. H. III. p. 166) ; with var. *picea* (1908, P. Haw. E. S. I. p. 188).

(1) *lanaiensis* (1908, l. c.), sp. n.

c. subg. *Nesocryptias*.

*villosa* (F. H. III. p. 167).

Dr Perkins writes me that the species of *Metrarga* are "certainly not bark-dwellers, unless as a rare and exceptional case."

*Sephora crinigera* White.

*Sephora crinigera*, huj. op. III. p. 161. See also Kirkaldy, 1907, Can. Ent. XXXIX. p. 244.

## NESOMARTIS.

*Nesomartis* Kirkaldy, 1907, op. cit. p. 245.

(1) *Nesomartis psammophila* Kirkaldy.

*Nesomartis psammophila* Kirkaldy, 1907, l. c.

HAB. Oahu, "on the coast on the ground amongst *Sida*," grass etc., and "Hawaii, Kona coast in similar situations" (Perkins). Probably introduced.

## NESOCYMUS.

*Nesocymus*, Kirkaldy, 1907, l. c.

Apparently allied to *Cymoninus* Breddin, but there is no percurrent main vein on the corium, at least not one at all which "teilt das Corium in zwei annähernd gleiche Teile," and while the corium is partly punctured, partly smooth, it is the middle oblique

third which is punctured, almost all the rest being smooth; moreover, the clavus is closely punctured. The first segment of the antennae is distinctly longer than the long diameter of an eye and extends beyond the clypeus. The third and fourth segments are about equally long. The impressed line on the pronotum is situated about the middle (as stated on p. 245; a misprint occurs on p. 244 in the table).

*Nesocymus calvus*, White.

*Sephora calvus*, Kirkaldy, 1902, F. H. III. 162.

*Nesocymus calvus*, Kirkaldy, 1907, Can. Ent. XXXIX. 245.

HAB. Oahu, at roots of herbage in the mountains, from 1500—2000 ft. (Perkins). At the top of Tantalus (Perkins, Giffard). One of Giffard's specimens has the second and third segments of the right antenna coalesced and shortened, a comparatively common occurrence in the *Cymini*.

NYSIUS Dallas (huj. op. III. p. 162).

In the ensuing descriptions, I have, owing partly to the fact that several species are represented only by one or two carded specimens, paid no attention to the bucculae, structures considered by Stål to be so important, but have used other characters which appear to me better for specific differentiation. The form of the metapleura, utilized here for subgenera, is considered by Stål and later authors as of generic importance, in other *Cyminae*, but I cannot regard it as such in *Nysius*. *Orsillus*, distinguished among other things by the armed fore femora, has the labium passing beyond the hind coxae, *Nysius* being separated by the same authors by the unarmed femora and shorter labium. I cannot, however, regard the length of the labium here as a generic character.

I have therefore united all the species now described, in a single genus *Nysius*, but have separated off two subgenera, *Oceanides* and *Neseis*.

It is unfortunate that I have not seen the types of the species proposed by Blackburn and White, and that I am unable to identify ten of them. Most of them were recorded from Kilauea, Hawaii, a locality rather closely investigated on several occasions by Dr Perkins and Messrs Swezey and Giffard, as well as by myself.

*Conspectus quarundam specierum hawaiiensium.*

- |     |  |   |
|-----|--|---|
| 1.  | Metapleura postice satis rotundatim emarginata, angulo extero laterali nonnihil prominente, margine postica late reflexa ..... | (2).  |
| 1a. | Metapleura postice truncata, plerumque anguste, interdum late, reflexa; labium post coxas posticas extensum .....              | [subj. <i>Oceanides</i> nov.,<br>nimbatō typo]. |
| 2.  | Labium ad metasternum extensum .....   | (3).  |
| 2a. | Labium ad coxas posticas extensum .....  | (6).  |

- 2b. Labium post coxas posticas extensum; callositas pronoti flavescens; pronotum antice ad margines laterales subito rotundatum.....[subj. *Neseis* nov.]  
28 *monticola* nov.
3. Species pubescentia satis fortiter vestita .....7 *delectus* White<sup>1</sup>.
- 3a. Species glabrae, nitidae .....(4).
4. Callositas pronoti nigrescens .....(5).
- 4a. Callositas pronoti pallida .....1 *saundersianus* Kirkaldy<sup>2</sup>.
5. Color ex parte maxima fuscescens vel nigrescens .....2 *Mauianensis* Blackburn.
- 5a. Color ex parte maxima pallida .....8 *hylaetus* nov.
6. Species pubescentia vestitae .....(7).
- 6a. Species glabrae, nitidae; vel pubescentia minutissime vestitae .....(9).
7. Longitudo ultra 7 mm. ....9 *Kanehameha* Kirkaldy.
- 7a. Longitudo 4—4½ mm. ....(8).
8. Supra pallidior; femora postica pallida, fuscomaculata .....10 *coenosulus* Stål<sup>3</sup>.
- 8a. Nigrescens; femora postica nigrescentia .....12 *lichenicola* nov.
9. Caput flavescens, ex parte leviter brunneosuffusum.....13 *ochriasis* Kirkaldy.
- 9a. Caput nigrum .....(10).
10. Femora postica pallida, brunneomaculata.....14 *insulicola* nov.
- 10a. Femora postica pallida, immaculata, apice roseosuffuso .....15 *silvestris* nov.
11. Pronotum nigrum, maculis pallidis tribus parvis ad marginem posticam ornatum .....16 *orestrophus* nov.
- 11a. Pronotum rufescens vel brunneoflavescens, areis laevigatis nigris vel nigrescentibus vel fusciscentibus .....(12).
12. Vertex linea rufescente mediana longitudinali ornatus .....17 *nubicola* nov.<sup>4</sup>.
- 12a. Vertex niger, vix maculatus .....(13).
13. Tegmina haud maculata vel ad marginem apicalem corii prope medium brunneo-notata, interdum fortius maculata. Pedes pallidiores, leviter maculatae .....19 *nimbatus* nov.<sup>5</sup>.
- 13a. Tegmina fortiter fusconotata. Pedes magis fuscatae .....(14).
14. Labii segmentum primum post marginem apicalem prosterni extensum .....(15).
- 14a. Labii segmentum primum haud ad capitis basim extensum .....24 *oribasus* nov.
15. Species glabra, vel sparsissime pubescens .....26 *montivagus* nov.
- 15a. Species pubescens .....25 *insulivagus* nov.

*Nysius saundersianus* Kirkaldy.

*Nysius saundersianus* Kirkaldy, huj. op. III. p. 163.

I recorded this formerly from Lanai, Molokai and Hawaii; Mr Giffard has since taken it on the former island, Koele Mts., 2000 ft. (Oct. cf. Giffard, 1908, P. Haw. E. S. I. 180).

The pronotal callosity is pale, and extends from one lateral margin to the other; the lateral margins are somewhat sinuate.

<sup>1</sup> Verisimiliter prope hanc speciem pertinet *N. dallasi* White, species mihi incognita.

<sup>2</sup> Verisimiliter prope hanc speciem pertinent *N. arboricola* White, *N. longicollis* White, *N. whitei* Blackburn, species mihi incognitae.

<sup>3</sup> Verisimiliter prope hanc speciem pertinet *N. blackburni* White, species mihi incognita.

<sup>4</sup> Prope hanc speciem pertinet verisimiliter *N. nemorivagus* White.

<sup>5</sup> Prope hanc speciem pertinent verisimiliter *N. rubescens*, *nitidus*, *pteridicola*, *vulcan* White

(1) *Nysius mauiensis* Blackburn.

*Nysius mauiensis* Blackburn, 1888, P. Linn. Soc. N. S. W. (2) iii.

I have identified a number of specimens as this species, but am hampered by the fact that I do not know *N. arboricola*, with which Blackburn compares it. The length of the labium is not stated, but I suppose it to be as in *N. arboricola*.

This species seems somewhat variable, the antennae being feebly ringed, conspicuously so, or almost entirely fuscate; the tegmina are in some specimens principally pale, in others principally dark.

HAB. Maui, Haleakala, 4500 ft. (Blackburn), 5000 ft. (Mar., Apr., Perkins).—Lanai, 2000 ft. (Jan., Sept., Perkins), 3000 ft. (Feb., Perkins).—Hawaii, Kona, 4000 ft. (Aug., Perkins); Kilauea, 4000 ft. (Perkins).

(2) *Nysius arboricola* White.

*Nysius arboricola* F. B. White, 1878, A. M. N. H. (5) i. 368.

I do not know this species. Blackburn took it "high up in the mountainous district," i.e. of Oahu, probably Mt. Tantalus.

(3) *Nysius whitei* Blackburn.

*Nysius whitei* Blackburn, 1888, op. cit. 346.

This was obtained from Hawaii, Mauna loa, abt. 4000 ft. (Feb.). I do not know it.

(4) *Nysius longicollis* Blackburn.

*Nysius longicollis* Blackburn, 1888, op. cit. 344.

This was obtained on Oahu. I do not know it.

(5) *Nysius dallasi* White.

*Nysius dallasi* F. B. White, 1878, op. cit. 367.

This was taken on Oahu, near Nuuanu Pali. It is probably an introduced form near *N. delectus*, but I have been unable to determine it, though it may be the species I incorrectly, according to Dr Bergroth, determined previously as *N. vinitor* Bergroth.

(6) *Nysius delectus* White.

*Nysius delectus* F. B. White, 1878, op. cit. 367; Kirkaldy, 1907, P. Haw. E. S. i. 152.

An introduced form, widely distributed; near the coast it is common on *Bidens pilosa*.

HAB. Apparently on all the islands at almost all elevations; not arboreal.

(7) *Nysius hylaeus*, sp. nov.

Pale yellowish testaceous, glabrous. Vertex with some dark markings, principally longitudinal, which vary in situation and depth of colour, in the three specimens before me. Second and third (except extreme apex), a spot on fourth, and the whole of the fourth segment of antennae, blackish brown (in one example, second and third paler). Eyes red-brown. Ocelli red. Pronotum with a short, oblique, subpyriform, laevigate, black spot on each side of the middle, not nearly reaching the lateral margins of the pronotum. Pronotum closely punctured, punctures mostly nearly colourless, except on and near the apical margin. Postero-lateral angle in some examples dark, also the hind margin is soiled in some. Scutellum similarly punctured, a blackish spot on the anterior half in the middle. Sterna dark brown, polished; pleura closely punctured, a little darkly suffused in part; hind margin of metapleura pale, not punctured. Tegmina rather feebly mottled with brownish grey, apical margin of corium in some examples more darkly so, apical angle in some blackish brown. Membrane hyaline, mottled with brown. Femora with a subapical dark brown ring, tinged with rose apical of this. Abdominal sternites tinged with rose, a sublateral black blotch on basal half (this is somewhat variable). Antennae with the first segment extending just beyond apex of vertex, second slightly longer than the third, and slightly shorter than the clavate fourth. Labium reaching to metasternum. Pronotum with the lateral margins very slightly sinuate, not much wider basally than apically, toothed minutely at the antero-lateral angle. ♂ not remarkable. ♀ 5th sternite apically obtusangulate, 6th acutangulate. Length  $4\frac{1}{4}$  mm.

HAB. Kauai, high plateau (Aug., Perkins), Waimea Mts., 4000 ft. (May, Perkins).

This species is easily recognized among the pale glabrous forms by the short, pyriform, laevigate areas on the pronotum.

*Nysius kamehameha* Kirkaldy.

*Nysius kamehameha* Kirkaldy, huj. op. III. p. 164.

HAB. Hawaii, Hualalai, 5000 ft. (Aug., Perkins).

I have seen no specimens beyond the carded type of this, for a *Nysius*, handsome species. The labium extends practically as far as the hind coxae. The tegmina are parallel for about one-seventh of their length, thence gently rounded. The exterior half of the metapleura black, the hind margin and the interior half, together with the orifice, pale.

(8) *Nysius coenosulus* Stål.

*Nysius coenosulus* Stål, 1859, *Eugenies Resa*, Zool. p. 243; F. B. White, 1878, A. M. N. H. (5) I. p. 369.

Through the kindness of Dr Aurivillius, I was able to see the type—unfortunately in poor condition—of this doubtless introduced species. It occurs in mixed sweeping, principally, I think, on *Erigeron canadensis*.

HAB. Oahu, near Honolulu (Perkins and others); Waianae Coast (March, Perkins).—Lanai, 3000 ft. (Perkins).—Hawaii, 2000—4000 ft. (Perkins).

(9) *Nysius blackburni* White.

*Nysius blackburni* F. B. White, 1881, A. M. N. H. (5) VII. p. 53.

HAB. Hawaii, Kilauea, 4000 feet on ferns (White). I do not know this.

(10) *Nysius lichenicola*, sp. nov.

Head and pronotum yellowish testaceous, closely punctured, and more or less suffused, with dark brown; lateral margins of head, anterior third of pronotum, posterior margin very narrowly (usually interrupted medially and at the lateral angles), scutellum etc., dark. Tegmina typically yellowish testaceous, closely irrorated with blackish grey, usually more so towards the middle, apical angle of corium dark. Membrane vitreous, variegated varyingly with brownish grey, apical angle usually blackish. Antennae, labium, femora etc., blackish or piceous; coxae and apex of femora testaceous or pale ferruginous. Underside black, orifices dark testaceous. The fourth segment of the antennae is about twice as long as the third, and a little longer than the second. Pronotum much as in *N. coenosulus*. Length ♂  $3\frac{1}{2}$ , ♀  $3\frac{1}{2}$ —4 mm.

HAB. Hawaii, Kilauea, among the lichen on the trunks of fallen *Nani polymorpha* and *Acacia koa* (April, Kirkaldy); Kaumana, above Hilo, 2000 ft. (Jan., Perkins, no. 679).—Maui, Haleakala, 5000—9000 ft. (March, Apr., Perkins). Dr Perkins tells me he has taken it from various fruits, Mynah-bird's dung etc. This species is possibly not endemic.

It is variable, but I cannot find structural differences. In a Mauian female, the tibiae are more testaceous and the apical angle is almost entirely pale. In one male, the hind margins of the pleura are paler, but much more material is necessary for comparison, before elevating the following varieties to possible specific rank.

var. (*b*) *brunnealis* nov.

Tegmina pale ferruginous inwardly.

HAB. Haleakala, 5000 ft. (April).

var. (*c*) *atralis* nov.

Upper surface blackish brown; a small spot at base of head, one at middle and one at each lateral angle of hind margin of pronotum, pale; a few testaceous specks on tegmina, mostly near the lateral margin.

HAB. Haleakala, 5000 ft. (April).

The type of this species is one of the specimens from Haleakala.

(11) *Nysius ochriasis* Kirkaldy.

*Nysius ochriasis* Kirkaldy, 1902, *huj.* op. III. 162.

Food plant: *Dubautia* sp.

(12) *Nysius insulicola*, sp. nov.

Similar in general appearance to *N. mauiensis*, but the pronotum is maculate only at the postero-lateral angles.

Head black; clypeus and a ring around the eyes, brownish yellow. Antennae pale brownish yellow, indistinctly infuscate medially. Labium pale yellow, apically blackish. Pronotum brownish yellow (callosities browner), confusedly and comparatively sparsely brownly punctured, postero-lateral angles blackish brown. Scutellum brownish yellow, basally and laterally punctured with dark brown, posterior angle whitish. Tegmina subhyaline, pale brownish yellow, commissure and a short oblique stripe apically on exocorium dark fuscous. Membrane hyaline, a broad fuscous stripe down the middle. Beneath pale yellowish brown with a pink tinge; sterna mostly blackish, abdomen medially pale yellow; ambulacra and orifices whitish; legs pale yellow, femora spotted with dark brown, hind femora with a dark brown subapical ring. Second and third segments of the antennae subequal, each longer than the fourth. Pronotal callosity percurrent; lateral margins very slightly sinuate. ♀ 6th and 7th sternites acutely angularly emarginate apically. Length 5 mm.

HAB. Lanai, over 2000 ft. (Jan., Perkins).

(13) *Nysius silvestris*, sp. nov.

Head black, clypeus pale yellow, ocelli red; eyes black, interiorly margined with testaceous. Antennae and labium pale brownish testaceous, the former with segments 1-3 feebly ringed with pale fuscous, 4th pale ferruginotestaceous, apically pale fuscous, the apex of labium blackish.

Pronotum pale ferruginous, with 5 longitudinal, parallel, elongate spots (or short stripes) on the basal third, the middle one extending anteriorly as far as the transverse swelling, the sublateral ones sometimes rather indistinct. Scutellum piceous, basal angles pale ferruginous, posterior angle white. Tegmina piceous, extero-lateral margin on basal half brownish yellow. Membrane hyaline, basal third dark fuscous. Sterna polished black, pleura brownish yellow tinged with red, and more or less marked with blackish. Legs and ambulacra pale, apical half of hind femora rosy. Abdomen beneath pale reddish brown, more or less clouded with blackish on sternites 2—6. Orifices pale, slightly rosy. Three apical segments of antennae subequal, the fourth a little the longer, rather elongately incrassate. Pronotal callosities percurrent, pronotum rather sparsely punctured.

♀ 6th sternite very obtusely, 7th acutely, emarginate. Length  $3\frac{1}{2}$ —4 mm.

HAB. Oahu, Waianae Mts., about 3000 ft., Feb. (no. 547).

(14) *Nysius oresitrophus*, sp. nov.

Black; apex of clypeus, apex of first, second and third segments of antennae, a small spot on middle of hind margin of pronotum, labium, legs, etc. brownish testaceous or brownish yellow, femora and tibiae broadly banded with piceous; tarsi partly fuscous. Postero-lateral angles of pronotum and posterior angle of scutellum yellowish testaceous. Tegmina yellowish testaceous, a large spot at base, another at intero-apical angle of corium, and a larger one on apical margin of corium, black. Membrane yellowish brown, apparently basally blackish. Antennae with the second and fourth segments subequal, a little longer than the third. Labium reaching well beyond the hind coxae. Pronotum rather superficially punctured, almost striate. Length  $4\frac{1}{2}$  mm.

HAB. Maui, Haleakala, over 5000 ft. (Oct., Perkins, no. 636) 1 carded example.

(15) *Nysius nubicola*, sp. nov.

Head blackish with a red line down the middle; antennae reddish or reddish testaceous. Pronotum reddish or reddish testaceous punctured with blackish, the laevigate areas blackish (sometimes reddishly suffused). Scutellum rufescent, punctured with blackish. Tegmina yellowish hyaline, in some examples almost immaculate, in others blotched apically. Labium, legs, ambulacra, orifices, etc. rufescent or yellowish testaceous, apical segment of labium black, femora spotted with black. Underside black, the pleura partly rufescent, abdomen varyingly pale in part. Head and pronotum sparsely pubescent. Labium extending beyond hind coxae, first segment reaching to apical margin of prosternum. Second segment of antennae distinctly longer than the

third, which is longer than the fourth. Pronotum closely punctured; lateral margins scarcely sinuate, not at all carinate. Length  $4-5\frac{1}{2}$  mm.

HAB. Hawaii, Kona, 4000 ft. and over, Aug. (no. 231, Perkins); Hualalai, 5000 ft. (Perkins). One of the Kona specimens is the type.

(16) *Nysius nemorivagus* White.

*Nysius nemorivagus* F. B. White, 1881, op. cit. 54.

HAB. Hawaii, Mauna Kea.—Maui, Haleakala, 5000—6000 ft. I do not know this.

(17) *Nysius nimbatus*, sp. nov.

Head and most of underside black. Pronotal callosities piceous. Antennae, pronotum, scutellum, tegmina etc. pale olive-testaceous, a brown irregular  $\cup$  near the middle of the apical margin of the corium. Pronotum and scutellum with blackish brown punctures, the anterior half of the former sometimes being suffused with black.

Legs, orifices etc. pale brownish yellow, fore and middle femora sparsely spotted with pale brown, hind femora strongly spotted with blackish brown. Abdomen beneath sometimes largely pale apico-medially. Antennae in some examples tinged or marked with brown. Second and fourth segments of antennae subequal, each shorter than the third. Pronotum rather sparsely punctured, laevigate areas reaching the lateral margins, which are very slightly sinuate. Length  $5\frac{1}{2}-6\frac{1}{2}$  mm.

HAB. Oahu, Honolulu, 2500—3000 ft., Oct.—Nov. (Perkins).

(18) *Nysius rubescens* White.

*Nysius rubescens* F. B. White, 1881, A. M. N. H. (5) VII. 55.

This was described from Hawaii, Kilauea, 4000 ft. I do not know it.

(19) *Nysius pteridicola* White.

*Nysius pteridicola* F. B. White, 1881, l. c.

This was described from the same place as the preceding. I do not know it.

(20) *Nysius nitidus* White.

*Nysius nitidus* F. B. White, 1881, A. M. N. H. (5) VII. 53.

HAB. Maui, Haleakala. I do not know it.

(21) *Nysius vulcan* White.

*Nysius vulcan* F. B. White, 1881, op. cit. 56.

HAB. Hawaii, Mauna loa, elevation not stated. I do not know it.

(22) *Nysius oribusus*, sp. nov.

Elongate. Head black. Antennae, pronotum and scutellum piceous; base and apex of first three segments of antennae pale, as also angles and keel down scutellum, and postero-lateral angles of pronotum. Labium, ambulacra, orifices and legs pale; the first and fourth segments of the labium, and the tibiae partly, fuscate; femora thickly spotted on the basal half, or so, with dark brown, coxae basally piceous. Tegmina hyaline, strongly blotched with dark brown. Beneath blackish, abdomen in one example a little pale in part. Second segment of antennae slightly longer than the third, which is longer than the fourth. Pronotum coarsely punctured; lateral margins very slightly sinuate, not at all carinate; laevigate areas blackish.

HAB. Oahu, Waialua, Koolau range, 2000 ft., Feb. (Perkins); Kaala, 1500 ft. Jan. (Perkins). The Waialua specimen is the type.

(23) *Nysius insulivagus*, sp. nov.

Sparsely yellowish pubescent. Head, sterna and pleura black, propleura partly brownish piceous. Pronotum, scutellum, and tegmina brownish piceous; laevigate areas of pronotum rather darker; scutellum partly darker, carina down the middle yellow; tegmina very closely mottled pallidly, veins paler, especially the forked median. Beneath, the abdomen is piceous, becoming more palely ferruginous towards the apex. Antennae, labium and legs pale ferruginous; apex of first three segments of antennae dark; orifices pale. First segment of labium extends beyond the apical margin of the prosternum. Second segment of antennae distinctly longer than the third, which is subequal to the fourth. Lateral margins of pronotum scarcely sinuate, obsolescently carinate.

HAB. Hawaii, Hualalai, 8000 ft., Aug. (Perkins); Kilauea, 4000 ft. (Perkins) and at the same locality on *Nani polymorpha* ("Ohia lehua," April).—Maui, Haleakala, 10,000 ft., Aug. (Perkins). One of the Hualalai examples is the type.

(24) *Nysius montivagus*, sp. nov.

Differs from the preceding by the glabrous, more shining appearance, paler pronotum (laevigate areas dark), darker antennae, maculate femora etc.

HAB. Lanai, Molokai, Hawaii.—Lanai, Halepaakai, July (Perkins).—Molokai, 4000 ft. (May, Perkins). Hawaii, Kilauea (Kirkaldy).

(25) *Nysius monticola*, sp. nov.

Superficially somewhat like *N. ochriasis*, but larger and more sordid, the fourth segment of the antennae dark, and the pronotum laterally sinuate.

Yellowish brown, a paler clear line on the vertex along the middle. Eyes blackish

brown, ocelli reddish brown. A ring at base and another near apex of second segment, one at base of third, and all the fourth (except extreme base) segment of antennae, dark fuscous. Apex of labium black. A clearer line on anterior two-thirds of pronotum down the middle, clearer also medio-laterally; rather sparsely punctured with brown, as also on pleura. Scutellum punctured with dark brown on the basal margin and between the keels and the lateral margins. Tegmina and membrane immaculate brownish yellow, veins concolorous. Ambulacra, orifices and legs immaculate brownish yellow. The whole insect glabrous, shining. Pronotum laterally sinuate, roundedly narrowing laterally in front of the callosity, slightly reflexed in part; impressed behind the callosity. Antennae with the second and third segments subequal, a trifle longer than the fourth. Labium reaching nearly to the middle of the abdomen, first segment beyond the base of the head. ♀ 6th sternite very obtusely, 7th rectangularly, emarginate. Length 6 mm.

HAB. West Mani Mts., 4000 ft. (no. 357, April, Perkins, 1 ♀)<sup>1</sup>.

(1) *Orthoeta vincta*, Say.

*Pamera vincta* (Say) Stål.

*Orthoeta periplanios* Kirkaldy, 1907, Canad. Ent. xxxix, p. 246.

*O. pacifica* Kirkaldy, 1907, P. Haw. E. S. i. 150; and 1908, P. Linn. Soc. N. S. W.

*O. vincta* Kirkaldy, 1908, P. Haw. E. S. i. 189 and P. Linn. Soc. N. S. W.

This little bug "swarmed in 1900, but was not seen prior to 1897" (Perkins). It has been described under 8 names and has spread over about the whole of America, and occurs in Ceylon, India, Burma; Christmas Islands (Indian Ocean); South Africa; Australia, Tahiti and Fiji! I have described the last nymphal instar (1907, P. Haw. E. S. i. 150), which has also with long- and short-winged adults, been figured (1908, P. Linn. Soc. N. S. W.). In Hawaii, *O. vincta* is found in *Cynodon dactylon*, but does not, I think, feed on it.

HAB. I have collected, or seen, specimens from Kauai, Oahu, Maui and Hawaii.

*Clerada apicicornis* Sign.

*Clerada apicicornis* Sign., huj. op. iii. p. 160.

I have described the final nymph (1907, P. Haw. E. S. i. 151). Dr Perkins has seen this species "feeding on a dead Blattid (which had perhaps died before it was fed upon)" and does not think it catches *Lepisma*. I have only seen this on Oahu.

<sup>1</sup> The printed label bears the indication "West Maui 4000 ft.," but no. 357 (on the underside of the card to which the specimen is affixed) refers to "Haleakala 4000 ft.," which is in East Maui.

*Merragata hebroides* White.*Merragata hebroides*, huj. op. III. p. 168.Common and widely distributed<sup>1</sup>.

## Fam. NABIDAE.

Vide Subfam. *Nabinae*, huj. op. III. p. 153.*Conspectus generum ac subgenerum hawaiiensium.*

1. Caput ordinarium..... 1 *Reduviolus* W. Kirby (2).
- 1a. Caput utrimque spina obtusa, prominente; segmentum primum antennarum  
incassatum..... (subj. 2) *Milu* Kirkaldy.
2. Clavus ac corium haud discreta; membrana perminuta; ocelli plus minus  
obsolescentes..... (subj. 1b) *Nesotyphlias* Kirkaldy.
- 2a. Tegmina ordinaria; ocelli adsunt ..... (3).
3. Scutellum immaculatum; antennae pedesque haud annulatae; margines  
laterales pronoti fere recti, lobo postico pronoti vix elevato... (subj. 1a) *Nesomachetes* Kirkaldy.
- 3a. Scutellum maculatum; antennae pedesque annulatae; margines laterales  
pronoti sinuati, lobo postico pronoti elevato ..... (subj. typicum).

## REDUVIOLUS.

(1) *Reduviolus kahavalu* Kirkaldy.*Reduviolus innotatus* Kirkaldy, huj. op. III. p. 154, Pl. v. fig. 32.*R. kahavalu* Kirkaldy, 1907, P. Haw. E. S. I. p. 156.Delete the Oahuan record. I have founded a subg. *Nesomachetes* for this (1908, P. Haw. E. S. I. p. 190).*Reduviolus capsiformis* Germar.*Nabis capsiformis* Germar, 1837, Silb. rev. Ent. v. p. 132.*Reduviolus innotatus* F. B. White, 1877, A. M. N. H. (4) xx. p. 112; Kirkaldy, 1907, P. Haw. E. S. I. p. 156.*R. blackburni* (part) Kirkaldy, huj. op. III. p. 155; Perkins, 1903, Bull. Board Agr. Hawaii Ent. I.; Swezey, 1905, Bull. H. S. P. Ent. I. p. 234, Pl. 17, figs. 1-4.*R. capsiformis* Reuter, 1908, Mem. Soc. ent. Belg. xv. p. 114.The adoption of the above name is on Reuter's authority; in his remarks on p. 115 anent the figure of *R. innotatus*, he has overlooked my paper in the P. Haw. E. S. I. 156. *R. capsiformis* has been described, or alluded to, under eleven names,<sup>1</sup> A Tingid of the genus *Teleonomia* is now firmly established in the Islands, but has nothing to do with the original fauna, having been purposely introduced to check the *Latana camara*.

and is practically cosmopolitan. It has nothing to do with *R. blackburni* which is a much darker, probably endemic, insect, found at Kūauea, Hawaii and elsewhere, on ferns, grasses etc.

*Reduviolus morai* Kirkaldy.

*Reduviolus morai* Kirkaldy, huj. op. III, p. 155, Pl. v. fig. 39; and 1908, P. H. E. S. I. 191.

Delete Lanai from the islands.

*Reduviolus subrufus* White.

*Reduviolus subrufus*, huj. op. III, p. 156.

Delete *R. koelensis* and *oscillans* from the synonymy; only fig. 37, in the "Fauna," applies to this species.

(2) *Reduviolus koelensis* Blackburn.

*Nabis koelensis* Blackburn, 1888, P. Linn. Soc. N. S. W. (2) III, p. 352.

HAB. Lanai, Koele.

I am not sure that I know this form, but at least it cannot, I think, be included under *subrufus*.

(3) *Reduviolus oscillans* Blackburn.

*Nabis oscillans* Blackburn, l. c.

The same remarks apply to this.

HAB. Hawaii, Mauna loa, about 4000 ft.

(4) *Reduviolus arrogans* Kirkaldy.

*Reduviolus arrogans* Kirkaldy, 1908, P. H. E. S. I. p. 191.

HAB. Molokai.

(5) *Reduviolus truculentus* Kirkaldy.

*Reduviolus subrufus* Kirkaldy, 1902, huj. op. III, Pl. v. fig. 38, but not of the text p. 156.

*R. truculentus* Kirkaldy, 1908, P. H. E. S. I. p. 191.

HAB. Oahu, Honolulu Mts. on *Pipturus albidus*.

(6) *Reduviolus nubigenus* Kirkaldy.

*Reduviolus nubigenus* Kirkaldy, 1908, l. c.

HAB. Lanai—also, I think, Maui and Molokai.

(7) *Reduviolus kaonohiula* Kirkaldy.*Reduviolus kaonohiula* Kirkaldy, 1908, op. cit. p. 192.

In fresh examples, the abdomen is grass-green.

The last nymph, which, with the adult, is found on *Cyathodes tameiameiae* at Kilauea, Hawaii, is grass-green with yellow markings.(8) *Reduviolus montivagus* Kirkaldy.*Reduviolus montivagus* Kirkaldy, 1908, l. c.

HAB. Kauai.

## (c) REDUVIOLUS subgen. NESOTYPHLIAS.

Kirkaldy, 1907, P. H. E. S. I. 155.

*Reduviolus lusciosus* White.*Nabis* ? *lusciosus* F. B. White, 1877, A. M. N. H. (4), xx, 112.*Reduviolus lusciosus* Kirkaldy, huj. op. III. p. 157 (part), Pl. v. fig. 35; Reuter, 1908, Mém. Soc. ent. Belg. xv. p. 124.*Nesotyphlias lusciosus* Kirkaldy, 1907, P. H. E. S. I. p. 155.

HAB. Oahu. Not yet found on any other of the islands.

(9) *Reduviolus silvicola* Kirkaldy.*Reduviolus silvicola* Kirkaldy, 1908, P. H. E. S. I. 192.

HAB. Molokai.

(10) *Reduviolus monticola* Kirkaldy.*Reduviolus monticola* Kirkaldy, 1908, l. c.

HAB. Oahu.

(11) *Reduviolus procellaris* Kirkaldy.*Reduviolus procellaris* Kirkaldy, 1908, op. cit. 193.

HAB. Molokai.

(12) *Reduviolus volcanicola* Kirkaldy.*Reduviolus lusciosus* Kirkaldy, huj. op. III. Pl. v. figs. 34 and 34a.*R. volcanicola* Kirkaldy, 1908, P. H. E. S. I. p. 193.

HAB. Hawaii, Kilauea, on tree-ferns and among dead leaves on the ground.

(13) *Reduviolus curtipennis* (Blackburn).*Nabis* ? *curtipennis* Blackburn, 1888, op. cit. 353.

HAB. Hawaii, Waimea.

(14) *Reduviolus paludicola* Kirkaldy.*Reduviolus paludicola* Kirkaldy, 1908, l. c.

HAB. Molokai.

(15) *Reduviolus lolupe* Kirkaldy.*Reduviolus lolupe* Kirkaldy, 1908, l. c.

HAB. Uncertain.

(16) *Reduviolus silvestris* Kirkaldy.*Reduviolus silvestris* Kirkaldy, 1908, op. cit. 194.

HAB. Kauai.

## (d) REDUVIOLUS subgen. MILU Kirkaldy.

*Milu* Kirkaldy, 1907, Can. Ent. XXXIX. p. 247.*Reduviolus* subg. *Milu*, Reuter, 1908, Mém. Soc. ent. Belg. xv. p. 109.(17) *Reduviolus kerasphoros* Kirkaldy.*Reduviolus rubritinctus* Kirkaldy, huj. op. III. p. 157, Pl. v. fig. 33, nec Blackburn.*Milu kerasphoron* Kirkaldy, 1907, Can. Ent. XXXIX. p. 248.*M. kerasphoros* Kirkaldy, 1908, P. Haw. E. S. I. p. 194; with var. *purpurea*, p. 195.*Reduviolus kerasphoron* Reuter, 1908, l. c.

HAB. Oahu.

*Reduviolus rubritinctus* Blackburn.*Nabis rubritinctus*, Blackburn, 1889, P. Linn. Soc. N. S. W. (2) III. p. 351.*Milu* ? *rubritinctus* Kirkaldy, 1908, l. c.

HAB. Maui.

I have not seen this species, which is apparently distinct from the preceding.

## Fam. REDUVIDAE.

*Zelus renardii* Kolenati.

*Zelus renardii* Kolenati, 1856, Bull. Soc. Nat. Moscou, xxix. 460, Pl. 3, fig. 2;

Kirkaldy, 1908, P. Haw. E. S. 1. 195.

*Z. laevicollis* Champion, 1899, B. C. A. Het. II. 252 and 260, Pl. xv. fig. 24.

*Z. peregrinus* Kirkaldy, huj. op. III. p. 149; Perkins, 1903, Bull. Agr. Hawaii

Ent. 1. 20; Kirkaldy, 1904, Haw. For. Agr. 1. 183; Swezey, 1905, Bull.

H. S. P. Ent. 1. 232, Pl. xvi. figs. 1—3; Kirkaldy, 1907, P. Haw. E. S. 1. 156; and Canad. Ent. xxxix. 247.

This species was first seen in Honolulu in 1897, but had become common and generally spread over Oahu by 1900. It is now common in the lowlands of all the islands, the brown egg masses being very conspicuous on *Saccharum officinarum*, *Hibiscus rosasinensis*, *Citrus aurantium* etc. In the younger stages, it feeds on Aphids, young leafhoppers etc., but the adult preys on several very destructive beetles as well, though sometimes becoming injurious by sucking Coccinellids. It is apparently distributed over the Western States (California, Arizona etc.) and Mexico.

Swezey<sup>1</sup> and I<sup>2</sup> have contributed to the knowledge of the life-history.

## TRIATOMA Lap.

*Triatoma* Laporte, 1832, Essai Hém. pp. 6 and 11.

*Conorhinus* Laporte (1832?) Essai Hém. p. 77.

(1) *T. rubrofasciata* de Geer.

*Cimex rubrofasciatus* de Geer, 1773, Mém. III. 349, Pl. xxxv. fig. 12.

*Triatoma rubrofasciata* Kirkaldy, 1904, Haw. For. Agr. 1. 185.

This has been taken by Koebele and Perkins around labourers' huts on certain Oahuan plantations. It is a native of Brazil, the Antilles etc., but has become distributed over the Philippines, China, Burma, Malay Peninsula, Ceylon, Andamans, India, West Africa and Madagascar.

*Luteva insolida* White.

*Luteva insolida* White, huj. op. III. p. 152.

This occurs also around Honolulu; it is probably not endemic.

<sup>1</sup> 1905, op. cit. pp. 232-4, Pl. xvi. figs. 1-3.

<sup>2</sup> 1907, P. Haw. E. S. 1. pp. 156-8.

(1) *Luteva insulicola* Kirkaldy.*Luteva insulicola* Kirkaldy, 1908, P. Haw. E. S. I. p. 196.

HAB. Oahu. Waialua.

(1) *Nesidiolestes insularis* Kirkaldy.*Nesidiolestes insularis* Kirkaldy, 1908, op. cit. p. 195.

HAB. Oahu, Tantalus, 1800 ft.

I have seen only a single example of this, taken up Tantalus by Mr O. H. Swezey, and now in my collection.

## Fam. ANTHOCORIDAE.

Vide Miridae subfam. Anthocorinae, huj. op. III. p. 125.

*Triphleps persequens* White.*Triphleps persequens* White, huj. op. III. p. 125.

This is distributed throughout the islands in the plains, being very common in sugar-cane fields and on cultivated *Hibiscus* etc. It is doubtless introduced. It feeds on Aphidae, Psocidae, and other small insects. Swezey<sup>1</sup> has described the nymph as yellowish, and has figured the adult. *T. persequens* is now known from Queensland and Fiji<sup>2</sup>.

*Physopleurella mundula* White.*Physopleurella mundulus* White, huj. op. III. p. 126.

This is also widely distributed similarly to the last, and has similar food-habits. Swezey has briefly described and figured the ova and nymphs, as well as the adult<sup>3</sup>.

*Lasiochilus denigratus* White.*Lasiochilus denigrata* White, huj. op. III. p. 126.

I followed Reuter in placing *L. decolor* as a synonym, but, as I now think, wrongly. So far as the material now before me goes, *L. denigratus* is restricted to Hawaii.

HAB. Hawaii.

(1) *Lasiochilus decolor* White.*Dilasia* (?) *decolor* White, 1879, Ent. Mo. Mag. XVI. p. 147.

*Lasiochilus denigratus* (part) Reuter; and *L. denigrata* (part) Kirkaldy, huj. op. III. p. 126.

HAB. Oahu. This seems to be restricted to Oahu.

<sup>1</sup> 1905, Bull. H. S. P. Ent. I. 235, Pl. XVI. fig. 7.<sup>2</sup> 1908, Kirkaldy, P. Linn. Soc. N. S. W. XXXII. 784.<sup>3</sup> 1905, loc. cit., Pl. XVI. figs. 4-6.

(2) *Lasiochilus silvicola* Kirkaldy.*Lasiochilus silvicola* Kirkaldy, 1908, P. Haw. E. S. I. 196.

HAB. Kauai, Koholuamano.

(3) *Lasiochilus montivagus* Kirkaldy.*Lasiochilus montivagus* Kirkaldy, op. cit. 197.

HAB. Lanai, Koele Mts. (also doubtfully from Hawaii).

(4) *Lasiochilus nubigenus* Kirkaldy.*Lasiochilus nubigenus* Kirkaldy, l. c.

HAB. Maui, Haleakala.

## Fam. CLINOCORIDAE.

Subfam. *CACODMINAE*, huj. op. III. p. 129.For *Klinophilus* use *Clinocoris* Fallén 1829.

## Fam. MIRIDAE.

Subfam. *MIRINAE*, huj. op. III. p. 129.*Sulamita lunalilo* Kirkaldy.*Sulamita lunalilo*, huj. op. III. p. 130.

The type was a specimen from Kilauea, Hawaii. Pl. IV. fig. 12a refers to this.

(1) *Sulamita dryas* Kirkaldy.*Sulamita lunalilo*, var. Kirkaldy, huj. op. III. Pl. IV. fig. 12.*S. dryas* Kirkaldy, 1908, P. Haw. E. S. I. p. 197.(2) *Sulamita oreias* Kirkaldy.*Sulamita lunalilo*, brach. form, Kirkaldy, huj. op. III. Pl. IV. fig. 13.*S. oreias* Kirkaldy, 1908, P. Haw. E. S. I. 197.

## TIC HORHINUS Fieber.

*Tichorhinus* Fieber, 1858, Wien. E. Mon. II. p. 314.*Orthotylus* Fieber, 1858, op. cit. p. 315; Kirkaldy, 1902, huj. op. III. p. 132.

(1) *Tichorhinus kassandra* Kirkaldy.

*Orthotylus daphne* var. *kassandra* Kirkaldy, huj. op. III. p. 135.

*Cyrtopeltis hawaiiensis* Kirkaldy.

*C. hawaiiensis*, huj. op. III. p. 138.

HAB. Add, Oahu, Tantalus (Dec. Perkins, Swezey, Giffard); Maunawili (Giffard) on *Touchardia*.

An error has crept into the description, viz. the base of the pronotum is wider than half the length of the second segment of the antennae.

Dr Perkins informs me this species is rather variable, some specimens being much darker.

*Opuna hawaiiensis* Kirkaldy.

*Opuna hawaiiensis*, huj. op. III. p. 140.

HAB. Oahu, on *Sida cordifolia*.

(1) *Pseudoclerada kilaueae* Kirkaldy.

*Pseudoclerada morai* part, Kirkaldy, huj. op. III. p. 141, Pl. IV. fig. 19.

*P. kilaueae* Kirkaldy, 1908, P. H. E. S. I. p. 198.

HAB. Hawaii, Kilauea.

KALANIA Kirkaldy.

*Baracus* Kirkaldy, huj. op. III. p. 143.

*Kalania* Kirkaldy, 1904, Entom. XXXVII. p. 280.

*Kalania hawaiiensis*.

*Baracus hawaiiensis*, huj. op. III. p. 143.

HAB. This seems restricted to Lanai. It was retaken there by Giffard (1908, P. H. E. S. I. 180).

*Hyalopeplus pellucidus* Stål.

*Hyalopeplus pellucidus*, huj. op. III. p. 143.

This has been redescribed from the type by Reuter (1905, Öfr. Finska Vet. Förh. XLVII. no. 12, p. 2). It is distributed from sea level up to 5000 ft. and is certainly not endemic. Near Honolulu it is common on *Hibiscus rosasinensis*, but swarms, further from the town, on Guava, *Sida*, *Dodonaea* etc. I have described the last nymph (1907, P. H. E. S. I. 159).

*Koanoa hawaiiensis* Kirkaldy.

*Koanoa hawaiiensis*, huj. op. III. p. 136.

This is arboreal and endemic.

*Nesiomiris hawaiiensis* Kirkaldy.

*Nesiomiris hawaiiensis*, huj. op. III. p. 145.

This also is arboreal and endemic. On the other hand *Oronomiris hawaiiensis* is graminivorous and an introduction.

*Acanthia exulans* White.

*Acanthia exulans*, huj. op. III. p. 146.

HAB. Oahu. I can only definitely refer this typically now from Oahu, possibly also from Kauai. I have described (1908, P. Haw. E. S. I. p. 198) var. *molokaiensis* from Molokai.

*Acanthia oahuensis* Blackb.

HAB. Oahu. I can refer this also only from Oahu now.

(1) *Acanthia humifera* Kirkaldy.

*Acanthia humifera* Kirkaldy, 1908, op. cit. p. 199.

HAB. Oahu, N. W. Koolau Range.

(2) *Acanthia nubigena* Kirkaldy.

*Acanthia nubigena* Kirkaldy, 1908, l. c.

HAB. Maui, Haleakala.

(3) *Acanthia procellaris* Kirkaldy.

*Acanthia procellaris* Kirkaldy, 1908, op. cit. p. 200.

HAB. Molokai, 4000 ft.

*Arctocorisa blackburni* White.

*Corixa blackburni*, huj. op. III. p. 148.

*Corixa blackburni* is now referred to *Arctocorisa*, recently raised to generic rank.

## BUENOA Kirkaldy.

*Buenoa* Kirkaldy, 1904, Wien. E. Z. XXIII. p. 120.

Included under *Anisops*, huj. op. III. p. 148.

(1) *Buenoa pallipes* Fabricius.

*Notonecta pallipes* Fabricius, 1803, Syst. Rh. 103.

*Anisops* sp. ? Kirkaldy, Huj. op. III. p. 148.

*Buenoa pallipes* Kirkaldy, 1904, Wien. E. Z. XXIII. p. 123.

### Homoptera.

#### Fam. MEMBRACIDAE.

A single introduced species (from New Zealand, where doubtless introduced from Australia) occurs. I have seen a specimen in Dr Perkins' collection. It is a small Centrotine, probably a *Centrotypus* sp.

#### Fam. TETTIGONIIDAE.

The Hawaiian species—endemic and introduced—belong entirely to the tribe *Phrynomorphini*, though *Tettigoniini* and *Eurymelini* have been recorded in error. They are comprised in three endemic, closely related, genera, and three more or less cosmopolitan.

#### Tribe PHRYNOMORPHINI<sup>1</sup>.

##### *Conspectus generum.*

- |     |  |                                     |
|-----|--|-------------------------------------|
| 1.  | Venae alarum prima secundaque apicem versus haud confluentes .....         | (2)                                 |
| 1a. | Hae venae apicem versus confluentes .....                                  | 5 <i>Nesosteles</i> Kirkaldy.       |
| 2.  | Tegmina cellulis subapicalibus duabus instructa .....                      | (3).                                |
| 2a. | Tegmina cellula subapicali unica instructa .....                           | (5).                                |
| 3.  | Cellula subapicalis exterior (minor) basi et apice pedicellata .....       | 2 <i>Nesophrosyne</i> Kirkaldy.     |
| 3a. | Cellula subapicalis exterior (minor) haud et basi et apice pedicellata ... | (4).                                |
| 4.  | Vertex brevis ac latus .....   | 1 <i>Nesophryne</i> Kirkaldy.       |
| 4a. | Vertex antice ultra oculos extensus .....                                  | 3 <i>Conosanus</i> Osborn and Ball. |
| 5.  | Cellula subapicalis tegminis subovalis, medio paullo constricta.....       | 2a (subg.) <i>Nesoreias</i> nov.    |
| 5a. | Cellula subapicalis basi acutangularis .....                               | 4 <i>Macrosteles</i> Fieber.        |

Hic conspectus consanguinitatem non monstrat; *Nesosteles* e *Macrosteles*, *Nesoreias* e *Nesophrosyni* derivatae.

On the face of many *Phrynomorphini*, there is a characteristic pattern of two dark stripes up the middle, with more or less concentrically curved, subparallel, transverse stripes. Sometimes this is very well marked, sometimes very obscurely, sometimes absent. I propose, for the sake of brevity, to term this the "craticuliform pattern" or "craticulum," i.e. the "grill."

<sup>1</sup> For horismology etc. see my recent classification of the Auchenorrhyncha, Bull. Haw. Plant. Ent. 1. 269—479, Pls. 21—32 (1906) and op. cit. III. 1—186, Pls. 1—20 (1907).

## NESOPHRYNE Kirkaldy.

*Nesophryne* Kirkaldy, Proc. Haw. Ent. Soc. 1. p. 160, 1907.

Allied to *Eutettix* Van Duzee, but the habitus is quite different, and the vertex much shorter and more declivous, with the eyes scarcely so wide as the transversely striolate pronotum. Frons very wide, almost obliterating the fasciolae; lateral margins sloping roundly to the clypeus, the sides of the latter very slightly roundly emarginate. Antennae inserted a little nearer to the ocelli than to the base of the lora; they have a short flagellum. Clypeus about twice as long as its width, the lora do not nearly reach its apical margin. The labium reaches to the apex of the middle coxae. Tegminal venation not altogether unlike that of *Eutettix*, as represented by *E. sellata* and *melaleuca*, but the two subapical cells extend equally far apically and are truncate there, while the long median cell is apically angular. There is a well defined appendix, four apical cells and a nodal cell. Wing venation normal. Type *filicicola*. The genus is confined to Kauai.

There are probably four species, as it is very likely that my *Bythoscopus kukanaroa* and *kamaiaiao* belong here. The declivous vertex and the position of the ocelli on the apical part of the bend of the head, probably led me to place them in *Bythoscopus*. I cannot refer to them now, however. The two species known to me are separable thus:

1. Tegmina brunneo-flavescentia venis fuscis, cellulis sparse medio brunneo-irroratis. Valvula maris pallida; pygophor feminae brunneo-flavescentis ...1 *filicicola* Kirkaldy.
- 1a. Tegmina forte nigrescenti-suffusa, clavo paucis areis maculisque albidis ornato; cellula subcostali partim brunneo-flavescenti, subhyalina. Valvula maris nigra; femina mihi incognita .....2 *microlepiae* sp. nov.

(1) *Nesophryne filicicola* Kirkaldy.

*Nesophryne filicicola* Kirkaldy, 1907, l. c.

♂ yellowish; pronotum tinged with greenish, sparsely clouded etc. with dark fuscous and olive brown. A large transverse band on the bend of the head, dark fuscous, enclosing the conspicuous yellowish red ocelli; a central line down the clypeus, most of the lora, and a spot on the genae, dark fuscous. Tegmina yellowish cinereous, veins olive brown, the principal cells obscurely irrorate inside in the middle. The long median cell has two subhyaline spots on its apical half, the interior subapical has two, and there are others, not so distinct, on the other cells. Wings smoky with dark veins. Fore and middle femora rather obscurely banded with fuscous, base of spines of hind tibiae blackish. Vertex somewhat declivous, distinctly wider than long, wider than an eye, flattened, not produced in front of eyes. Valve pale, wider than long, angularly rounded apically; plates a little longer in the middle than the valve, the two together truncately rounded apically.

♀ a little darker than the male. Tergites dark; pygophor pale yellowish ferruginous, ovipositor sheath extending beyond the apex of the tegmina (and of the pygophor); last sternite trisinate apically. Clypeus blackish, genae and lora ferruginous. Length ♂  $5\frac{1}{2}$ , ♀  $6\frac{1}{2}$  mm.

HAB. Kauai, Kalihiwai, 400 ft., on fern (*Microlepia strigosa*, not as first stated *Gleichenia dichotoma*) (Oct., Giffard)<sup>1</sup>.

Nymph (last instar): pale brownish yellow, more or less infuscate (varyingly so) on the nota, a pale fuscous band across the bend of the head. Ocellar rudiments reddish. Basal half of tergites clouded in the middle with pale fuscous, blackish sublaterally; apical half laterally broadly blackish; beneath mostly pale yellowish; sutures blood red. Like the adults, but the head is a little more produced subangulately.

(2) *Nesophryne microlepieae*, sp. nov.

♂ closely allied to the last, but much darker. Black; basal margin of vertex, a few irregular markings on pronotum and scutellum, a large central suffusion on frons, rostrum (except the apex) etc., brownish testaceous. Tegmina cinereous yellow heavily suffused with black, except in a few places, i.e. a few pale spots on clavus, and the extero-lateral fourth of the corium (except the suffused cross-veins). Legs brownish yellow and black.

Pygophor black with very short, sparse yellow hairs. Length ♂  $5\frac{1}{2}$  mm.

HAB. Kauai, Kalihiwai, 400 ft., on fern *Microlepia strigosa* (Oct., Giffard). This may be only a dark var. of the preceding, but I do not think so.

*Nesophryne kukanaroo*, Kirkaldy.

*Bythoscopus kukanaroo* Kirk. huj. op. III. p. 114.

HAB. Kauai, Halemanu, 4000 ft.

I cannot refer to the unique type, but I suspect it is allied to the two preceding forms, if not identical.

*Nesophryne kaiaimamao*, Kirkaldy.

*Bythoscopus kaiaimamao* Kirkaldy, huj. op. III. p. 115.

HAB. Kauai, high plateau.

The unique type is, in this case too, not available for inspection by me, but I believe it is allied to the three preceding. If this is so, then a little group of four stoutly built forms in this genus, occur only on Kauai.

<sup>1</sup> One nymph was labelled "Kilauea, Hawaii," certainly by mistake. It should have been "Kilauea, Kauai."

## NESOPHROSYNE Kirkaldy.

*Nesophrosyne* Kirkaldy, 1907, Proc. Haw. Ent. Soc. 1. p. 160.

Type *perkinsi*. This genus is closely allied to *Nephotettix*, but the venation will separate it<sup>1</sup>. Typically there are two discoidals, the median cell (interior discoidal) running undivided to the subapical line; there is only one normal subapical cell, which is a little constricted medianly, but in all the species but two, a second subapical cell is formed by the forking and quick reunion of the radial vein, this small cell being one-third of the length of the other subapical cell, and of course pedicellate at both ends. This small subapical is joined at its base by a straight cross (nodal) vein to the subcostal vein, sometimes there are other nodals. There are four apical cells and a well-defined appendix. The pronotum is very short at the sides. In two species, however, *insularis* and *oceanides*, the exterior subapical cell has disappeared<sup>2</sup>. These two last may form a subgenus *Nesoreias* (type *insularis*). *N. haleakala* I formerly separated subgenerically, on account of the longer head and shorter wings, but *N. halemanu* seems to form too strong a link with the more typical species.

This genus—*Nesophrosyne*—is the most difficult of the Hemipterous genera of these islands to deal with specifically. It is impossible in some instances, from the material before me, to say whether certain forms are species or only local varieties. A much more adequate material, a knowledge of the range of variation, of the foodplants, and of the nymphs, is necessary before the synonymy can be settled. The variation in some forms known to me is quite bewildering.

## (a) Subgenus typicum.

(1) *Nesophrosyne umbratilis*, sp. nov.

♂ black; a longitudinal stripe down the vertex, the face (base excepted), sterna, legs, scutellum (except the lateral angles broadly) white. Ocelli red. Tegmina black, three pale yellowish elongate spots basally and two white ones apically, on clavus; four (or so) obscurer ones on the apical cells internally, and a broad white exterior band from near the base to near the apex, broken only by the dark fuscous first apical vein. Tergites black, laterally pale; sternites basally and laterally whitish, the rest—including the valve—black, except the creamy plates which are fringed with fine, short, pale hairs. Vertex produced about two-thirds of the length of an eye beyond the eyes, a little longer than wide at base. Length 4 mm.

HAB. Kauai, Kalihiwai, 400 ft. (Oct., Giffard), on fern (probably *Microlebia strigosa*).

A striking species, of which only a single male is yet known.

<sup>1</sup> This is figured 1908, P. Haw. E. S. 1. textf. 3, on p. 208.

<sup>2</sup> In one species the exterior cell is open exteriorly in one example, the only exception I have seen.

(2) *Nesophrosyne halemanu*, sp. nov.

Brownish yellow; vertex with a mediolongitudinal fuscous line, suffused a little anteriorly, and four specks, two anteriorly and two posteriorly, of the same hue. Face with a strong dark radiating pattern, antennae pale. Tegmina hyaline, tinged with yellow, veins brownish fuscous, more or less suffused, apex of tegmen suffusedly brownish fuscous. There are some rather faint brownish fuscous smudgings in the subcostal and interior discoidal cells. Front and middle femora blackish annulate, hind tibiae strongly spotted with black. Vertex rounded anteriorly, forming a curve with the eyes, subcircularly depressed medianly, a trifle longer than wide at base and a little longer than the pronotum, which is a little longer than the scutellum.

♂ sternites more or less greyish black medianly, valve blackish, plates yellowish. Length  $4\frac{1}{4}$  mm.

HAB. Kauai, Halemanu, 4000 ft. (May, 1895, Perkins, 503, one ♂ and one without abdomen).

(3) *Nesophrosyne silvigena*, sp. nov.

Pale ferruginous; face black, this encroaching on to the vertex; grill only visible at sides as  $\Xi$ , ferruginous. Sterna (? entirely), femora (except apically) etc., blackish; hind tibiae striped longitudinally with black, bristles pale ferruginous. Membrane clouded with black inwardly, in one example with a pale spot on the clavus. Length  $4\frac{1}{2}$ — $5\frac{1}{8}$  mm.

HAB. Kauai, Koholuamano (April, no. 519, Perkins).

(4) *Nesophrosyne perkinsi*, Kirkaldy.

*Eutettix perkinsi* Kirk., 1904, Entom. xxxvii. p. 178; and Haw. For. Agr. I. 183.  
*Nesophrosyne perkinsi* Kirk., 1907, Pr. Haw. Ent. Soc. I. 160; and 1908 op. cit., fig. 3 on p. 208.

♂ creamy, eyes pale olive green. Venation partly pale brownish fuscous, partly suffused on the cells, but very variably. Head with eyes as wide as the pronotum, obtusely rounded anteriorly; vertex about as long as its width. Tegmina with the exterior subapical cell remote from the subcostal vein; one nodal vein.

♀ like the ♂, but usually immaculate, sometimes the venation in part a little brownish. Two specks on apical margin of last sternite and the ovipositor sheath fuscous. Length ♂  $3\frac{1}{3}$ — $3\frac{2}{3}$ , ♀  $4$ — $4\frac{1}{2}$  mm.

Nymphs described in Pr. Haw. Ent. Soc. I., 1907, p. 160.

HAB. Oahu, coast range around Leahi, and up into Kaimuki, on *Sida cordifolia*.

(5) *Nesophrosyne maritima*, sp. nov.

♂. Head and scutellum pale yellowish brown; pronotum and tegmina pale greenish, subcostal and apical cells hyaline, second apical faintly smoky; veins on apical half of tegmina and some on the basal half, more or less dark fuscous, some more or less suffused, especially at their apices. Beneath and the legs, whitish. Vertex scarcely produced in front of eyes, transversely impressed anteriorly.

♀. Head and scutellum pale creamy, sometimes suffused with yellowish; ovipositor pale ferruginous; seventh sternite sinuate, very minutely notched medianly. Otherwise like the male. Length  $3\frac{3}{4}$ —4 mm.

Nymph: ♀ pale yellowish ferruginous, irregularly suffused. Vertex with two black specks close to the middle; four specks on the top of the head in an arched row. Pronotum with four specks in two sublateral rows and another on each side under the eyes. Mesometanotum with about a dozen rather irregular specks.

HAB. Oahu: Waianae Coast (Perkins, 781, Jan. 2 exx.); Makua (Perkins coll.).

(6) *Nesophrosyne gouldiae*, sp. nov.

♂. Whitish; claval veins (mostly) suffusedly, and two blotches on the apical third, inwardly, of the tegmen, dark brownish; wings hyaline. Sometimes the rest of the hopper is whitish, sometimes the base of the vertex and the disk of the pronotum irregularly, dark brownish, with a faint fuscous grill, scarcely apparent laterally. Sometimes the tegmina are more darkly suffused, but always only on the interior half. Vertex obtuse-angled in front of the eyes, scarcely longer than its basal width, somewhat flat.

♀. Immaculate (practically) whitish; ovipositor sheath fuscous. Vertex more convex. Length ♂  $4\frac{1}{2}$ , ♀ 5 mm.

This has very much the appearance of *N. perkinsi*, but beyond the difference in habitat and foodplant, the vertex is convex and not impressed transversely anteriorly, and is also longer, while the size is greater; in *perkinsi* the shorter head is distinctly flattened and impressed in front of the ocelli. The type is a Tantalus specimen.

HAB. Oahu, Tantalus, 1400 ft. (Sept., Terry and Perkins) on *Gouldia* sp.; Palolo, 1400 ft. (Kirkaldy) on *Gouldia*.

(7) *Nesophrosyne pipturi*, sp. nov.

Sexes almost monomorphic. Head and underside whitish, ocelli honey yellow. Eyes greyish black; a brownish black speck on the tempora. Pronotum and scutellum pale testaceous, the latter whitish posteriorly. Tegmina subhyaline, somewhat milky, pattern obscure, a faint St Andrew's cross on the clavi when closed. Subcostal cell

with two greyish brown suffused spots. Veins (except the colourless radial and claval veins) mostly yellowish fuscous, cells slightly suffused. Posterior tibiae with brown piliferous tubercles. Lora remote from apical margin of genae. Anal vein of clavus not hooked or strongly curved. Vertex obtuse, forming more or less of a curve with the eyes, a little produced.

♂. Genital segments pale. Valve short. Plates pointed apically, flaccid, lateral margins reflexed, about three-fourths of the length of the mostly blackish pygophors which are bristly apically. Sternites sometimes more or less dark.

♀. Hypopygium somewhat long, laterally rounded, gradually produced at the middle which is slightly notched. Pygophor elongate, not quite so long as the black ovipositor, apical half with scattered pale yellow bristles. Length  $4\frac{1}{2}$  mm.

HAB. Oahu, Tantalus, 1300 ft. (Feb.—Apr., Kirkaldy, Terry, Giffard and Swezey), and Maunawili, 820 ft. (Feb., Giffard) on Mamake (*Pipturus albidus*). The type is a Tantalus specimen.

(8) *Nesophrosyne ponapona*, sp. nov.

Allied to the last, but darker and with a different pattern. Head etc. pale yellowish testaceous, vertex with a thin brown transverse line and two specks of the same tint. Ocelli orange. Basal two-thirds of frons yellowish brown with dark brown grill; apical third testaceous. Clypeus and lora apically blackish brown. Pronotum pale orange brown tinged with olivaceous, with obscure longitudinal streaks. Prosternum and sternites black (except laterally, ♂ orange yellow, ♀ yellowish). Scutellum whitish, anterolateral and posterior angles widely pale orange brown. Tegmina milky, basal two-thirds suffused with pale ochreous brownish, subcostal cell and a number of spots on the rest, milky white; veins yellowish fuscous, apical ones mostly darkly suffused, two dark spots in the subcostal cell. Tegmina with two nodal veins, one from the middle, one from the base, of the exterior subapical cell, suffused; subapical cell remote from the subcostal vein. Wings smoky; veins dark fuscous.

♂. Sternites black, lateral margins orange yellow.

♀. Sternites blackish, lateral margins yellowish, pygophor orange brown with yellowish brown bristles; ovipositor sheath blackish.

Var. Sometimes very dark and suffused. Length  $4\frac{1}{4}$  mm.

HAB. Same localities and foodplant as *N. pipturi*, but easily distinguished by the pattern of the tegmina.

(9) *Nesophrosyne opalescens*, sp. nov.

Allied to *N. pipturi*. Vertex, frons, antennae, pronotum and scutellum pale, somewhat soiled, luteous. Clypeus, lora and genae mauvish opalescent. Ocelli crimson-ringed. Tegmina brownish yellow, with fuscous markings much as in *N. pipturi*, the

whole strongly mauvish opalescent. Wings strongly opalescent, veins dark. Abdomen black. Femora dark mauvish opalescent, tibiae pale.

♂. Pygophor with crimson and white tufts. Length 4 mm.

HAB. Oahu, Waianae (no elevation stated, April, Perkins).

(10) *Nesophrosyne*, sp. ?

Adult unknown.

Nymph: ♂. Vertex as in adult. Pale creamy or whitish, eyes greenish brown; first segment of antennae whitish, rest greenish fuscous. Pronotum with two black submedian specks on posterior margin and one under the eye laterally on each side. Mesometanotum with two pairs of submedian black spots, one anteriorly and one posteriorly, and a curved line laterally on the tegminal pad. Tergites 2—7 with two black bristly hairs on each side laterally, eighth with about a dozen. Legs pale with black, or pale fuscous, bristly hairs.

HAB. Oahu. I took three ♂♂ off "Ohia lehua" (*Nani polymorpha*) on Palolo Ridge at about 1300 ft. (Sept.), but have not yet connected them with an adult.

(11) *Nesophrosyne monticola*, sp. nov.

Vertex whitish, with a blackish brown inverted short-handled trident; frons pale yellowish, narrowly whitish basally with a slightly curved narrow blackish transverse line just apical of the yellowish brown ocelli; then just apical of this, suffused with sanguineous; clypeus, lora and genae mostly blackish. Pronotum yellow, anterior margin blackish ferruginous, continued in a narrow line down the middle. Scutellum yellow, more or less suffused with ferruginous. Tegmina ferruginous, a large yellowish white black-ringed spot on the middle of the clavi closed together; corium with a few small subopaque whitish spots interiorly, and the subcostal in part (apicalwards) hyaline; first and fifth subapical cells hyaline, veins dark ferruginous, sometimes verging on black, suffused.

HAB. Oahu, Kaala, over 2000 ft. (Dec., Perkins). Unfortunately only one ♂ of this pretty and distinct little hopper.

(12) *Nesophrosyne koleae*, sp. nov.

♂. Vertex and a large round spot on the middle of the closed tegmina, orange yellow. Face and legs pale yellow, second segment of posterior tarsi blackish. Base of vertex (narrowly and irregularly), pronotum and scutellum (except the usually yellowish posterior angle) blackish. Tegmina variegated: obscure subhyaline, irregularly but strongly suffused (especially the veins) with dark fuscous, with a bluish

bloom basally; apical half of the subcostal cell white with two suffused brownish dark brown veins towards the apex; a large yellowish cinereous spot occupying most of the basal half of the clavus; apical cells mostly smoky; there is also the orange yellow spot mentioned before. Wings dark smoky, veins blackish. Abdomen and sterna black, mostly.

♀ duller and less variegated, the orange yellow spot sometimes almost absent. Pronotum basally and the scutellum olivaceous. Sternites partly pale. Genital segments pale yellowish ferruginous, ovipositor black. Length ♂  $3\frac{1}{2}$ , ♀  $4\frac{1}{2}$  mm.

HAB. Oahu, Tantalus, 1300 ft. (Jan. and Apr., Giffard) on *Koolea (Myrsine lessertiana)*.

(13) *Nesophrosyne giffardi*, sp. nov.

♂. Head and scutellum bright pale yellow. Pronotum and tegmina French grey, the latter with a broad black longitudinal stripe along the inner margin of the corium as far as the apex of the clavus, the stripes on the two tegmina being connected by a short transverse stripe. Subcostal cell and membrane whitish or hyaline; apical and subapical veins suffused with black or smoky. Wings smoky, veins dark. Legs whitish, second segment of posterior tarsi dark. Sterna blackish. Abdomen black and white annulate, somewhat irregularly.

♀ more obscure, the tegminal band absent, or faintly indicated. Sternites mostly pale. Length ♂ 4, ♀  $4\frac{1}{2}$  mm.

HAB. Hawaii, Kilauea (Aug., Perkins). Oahu: Tantalus, 1300 ft. (Jan., Feb., Apr., Giffard). The type is a Kilauea specimen.

(14) *Nesophrosyne ulaula*, sp. nov.

♀. Rosy ferruginous, posterior margin of vertex very narrowly pale yellow. Ocelli ringed around with fuscous. Clypeus narrowly lined exteriorly with fuscous. Mesonotum, tergites, sternites, femora (at least basally) dark fuscous or black. Labium, rest of legs etc., pale brownish testaceous (the latter sometimes a little fuscous). Tegmina dark yellowish ferruginous; apical cells (except the first) and appendix pale. Wings pale smoky, veins fuscous. Genital segments dorsally fulvous, ventrally pale ferruginous, ovipositor dark fuscous. Hypopygium apically sinuate, minutely notched medially. Length  $5\frac{3}{4}$  mm.

HAB. Oahu, "Honolulu Mts" (Aug., Perkins).

Var. *nigrolineata* nov.

Differs from the type by the slightly more angulate vertex, by a dark fuscous, transverse, percurrent stripe apical of the ocelli, and by the rather yellower tegmina.

HAB. Oahu, Maunaloa, 2000 ft. (Dec., Giffard).

This may be a good species, but I have seen only a single female, and only two females of the typical form.

(15) *Nesophrosyne bobae*, sp. nov.

Much the appearance of *caelicola*, but the mark on the vertex is of different form, and the grill is more clearly defined. Head and scutellum ivory white, the vertex with a subrescentic mark (the base of the grill), the lateral margins concave to enclose the pale ocelli. Frons with a well-defined brown grill, the middle line widening apically; clypeus with lateral margins blackish brown, genae and lora sparsely marked with blackish brown. Pronotum pale olive green. Scutellum with pale olive brown anterior angles. Tegmina hyaline, tinged with olivaceous, with a slight bronzy gleam; subcostal, brachial and claval veins yellowish testaceous, the rest dark olive brown, suffused at the nodal veins and the first two apicals. Clavus a little soiled along the commissure, the median cell and inner discoidal cell a little nebulose in the middle. Wings a little smoky, veins dark. Tergites black. Sternites and legs pale, base of bristles of hind tibiae blackish. Vertex subangular anteriorly. Pronotum aciculate-punctate. Exterior subapical cell remote from subcostal vein, angulate exteriorly, one nodal vein arising from the middle, suffused. Length ♂  $4\frac{3}{4}$ , ♀ 5 mm.

HAB. Oahu, Tantalus, 1800 ft., on *Bobea elatior* (Oct., 1906, Perkins).

(16) *Nesophrosyne paludicola*, sp. nov.

♀. Blackish; a yellowish ferruginous grill on a purplish brown frons; a whitish spot on the pronotum near the lateral margins. Scutellum sordid whitish, more or less suffused (especially apically) with brownish. Tegmina whitish hyaline, claval veins suffused brown, apical angle brown; inner half of corium brownish except a narrow claval margin and one or two apical spots, whitish; exterior half whitish; apical cells mostly brownish. Abdomen mostly blackish brown, hind tibiae blackish brown, with white spines. Pygophor pale with pale hairs, ovipositor sheath blackish. Length  $4\frac{1}{2}$  mm.

HAB. Molokai, 4000 ft. (June, Perkins, 1 ♀).

(17) *Nesophrosyne palustris*, sp. nov.

Vertex, pronotum, scutellum and clavus rose pink; a faint grill, face more or less fuscous apically. Corium testaceous, closely sprinkled with rose pink. Coxae and femora (except apex) piceous, rest of legs and abdomen brownish testaceous. Hind tibiae at base of bristles piceous. Other characters those of *N. ulaula*, from which it is readily distinguished by the piceous femora and the rosy hue. Length 5 mm.

HAB. Molokai, Kahanui (Feb., Perkins coll.). One rather immature specimen in bad condition.

(18) *Nesophrosyne procellaris*, sp. nov.

Pale yellowish brown, or yellowish testaceous, the tegmina hyaline brownish testaceous, veins rather yellower (except the subcostal), the two claval veins rather widely so apically. Exterior subapical cell oval, remote from the subcostal vein, one nodal vein. Length  $5\frac{1}{8}$  mm.

HAB. Molokai, Kalae (Aug., 1893, no. 167).

(19) *Nesophrosyne nimbicola*, sp. nov.

Head black, the frons with a faint ferruginous radiating pattern. Antennae pale. Pronotum basal of the eyes luteous, above this, also the scutellum, ferruginous. Tegmina brownish yellow, a large luteous spot on the clavus, a dark fuscous spot of variable size exterior to this, and a dark fuscous line from apex of clavus to apex of tegmina, then curving outwardly a little; two subhyaline specks near the apex of the tegmina outwardly. Wings smoky, veins dark. Underside mostly blackish, pleurites pale or reddish ferruginous. Tibiae and tarsi brownish yellow, hind tarsi partly black, hind femora with brownish yellow bristles.

♀ pygophor reddish ferruginous (fuscous exteriorly at the base) with paler hairs, ovipositor-sheath blackish. Length  $4\frac{7}{8}$  mm.

HAB. Lanai, over 2000—3000 ft. (2 ♀♀ Perkins, Jan.).

(20) *Nesophrosyne umbricola*, sp. nov.

Differs from the last as follows:

Frons with better developed pattern. Pronotum yellow. Scutellum sordid yellow. A fuscous smudge at the base of the tegmina in the middle, fourth and fifth (and a small part of third) apical cells smoky, first apical and apex of median cell hyaline. Wings pale yellowish, veins darker. Sternites pale ferruginous. Length  $4\frac{7}{8}$  mm.

HAB. Lanai, 2000 ft. (1 ♀, Perkins, Dec.).

(21) *Nesophrosyne milu*, sp. nov.

♂. Blackish brown, with a violet tinge. Ocelli pale. Eyes reddish picceous. Fore and middle tibiae and tarsi mostly pale, hind tibiae with white bristly hairs; apex of the first and all the third segment of the tarsi, pale. Tegmina blackish brown, opaque violet black on clavus, with a small yellow spot; two hyaline spots near the apex of the tegmina. Wings hyaline smoky, veins dark. Abdomen blackish brown. Length 4 mm.

HAB. Lanai, 3000 ft. (Jan., Perkins, 1 ♂).

(22) *Nesophrosyne imbricola*, sp. nov.

♀. Head, pronotum and scutellum pale yellow, with four yellowish ferruginous lines, the two inner short (almost spots), the two outer longer and united transversely anteriorly. Face pale yellowish ferruginous with a rosy tint, a fuscous more or less faint pattern on the frons, lateral margins of clypeus narrowly fuscous (or altogether so). Anterolateral angles of scutellum yellowish ferruginous. Tegmina yellowish ferruginous, with many faint whitish spots (mostly basally) and four or five small pale yellowish opaque ones nearer the middle; two subhyaline spots, one about the middle on the exterior margin and one apical of that; apical cells more or less decolored; there are also three or four small, dark fuscous spots. Wings smoky hyaline, veins dark. Legs yellowish brown, fore and hind femora with the basal half blackish, middle femora entirely black except the extreme apex. Abdomen mostly fuscous, lateral margins broadly pale, apical margin of sternites pale. Pygophor ferruginous red, with sparse ferruginous yellow hairs, ovipositor-sheath fuscous. Length  $5\frac{1}{2}$  mm.

HAB. Lanai, over 2000 ft. (Jan., Perkins).

(23) *Nesophrosyne oneanea*, sp. nov.

♀. Head brownish testaceous, vertex with two basal dots, a transverse line just basal of the ocelli and two thin lines at right angles thence to base of vertex at eyes, dark fuscous. A well marked grill, the apico-interior part suffused, rest of face suffused, the genae a little less so. Pronotum irregularly dark sublaterally on the hind margin. Tegmina pale brownish yellow, veins suffusedly brownish fuscous, apical half of radial and part of subapical-cell-veins, partly yellowish. Wing veins dark fuscous. Legs pale. Sterna partly fuscous, pygophor orange yellow, sheath black. Vertex subangular. Exterior subapical cell subremote, joined to subcostal vein by a suffused broad dark spot. Length  $5\frac{1}{2}$ — $5\frac{3}{4}$  mm.

HAB. Lanai, 3000 ft. (Jan., Feb., Perkins).

In the other specimen the vertical mark is feeble, while the face is more blackly suffused, the apical margin of the genae clearly pale, but the tegmina are characteristic.

(24) *Nesophrosyne caelicola*, sp. nov.

This has very much the characters of *bobeae*, but I do not think it is the same. The principal difference is that the vertical marking encircles the ocelli as well, while in *bobeae* it is quite clear. A much better series than I have of this and other dubious forms, is necessary to settle them definitely. Length  $5\frac{1}{2}$  mm. (♂).

HAB. Lanai, 3000 ft. (Jan., Perkins).

(25) *Nesophrosyne nubigena*, sp. nov.

♀. Very close to the last, but (except faint traces of the grill), the whole face, the fore and middle femora (except apices), hind femora, tibiae and tarsi (except the pale third segment), greater part of sterna and abdomen, the pygophor and sheath etc., black. Fore and middle tibiae and bristles of hind tibiae, brownish yellow. Some orange yellow bristles on pygophor. Length  $5\frac{1}{2}$  mm.

HAB. Lanai, 2000 ft. (Perkins).

This may be the ♀ of *caelicola*, but I do not think so.

(26) *Nesophrosyne haleakala*, sp. nov.

Head, pronotum and scutellum pale yellow, the vertex with some small inconstant fuscous markings, frons with strong, dark fuscous, radiating pattern, apex of frons and the clypeus blackish brown, almost immaculate, genae and lorae marked inconstantly with fuscous. Tegmina milky, veins dark fuscous, some of the transverse and apical ones suffused; there are fuscous smudgings in most of the cells and the apex of the middle apical cell is fuscous. Wings smoky, veins dark. Vertex acute-angled, longer than wide at base and much longer than pronotum, subcircularly impressed in the middle. Scutellum very small, shorter and much narrower than pronotum. Tegmina a little shorter than abdomen.

♀ pygophor pale fulvous, ovipositor blackish brown. Length  $3\frac{1}{2}$  mm.

HAB. Maui, Haleakala, 9000 ft. (April, Perkins, 2 ♀♀).

(27) *Nesophrosyne nimbigena*, sp. nov.

Vertex pale brownish yellow; a basal dot on each side of the middle and a somewhat sinuate subapical transverse line fuscous. Face brownish yellow, clearer basal of the ferrugineo-fuscous grill which is fairly well defined but somewhat suffused; apex of frons brownish yellow; rest of face yellowish testaceous, a dark fuscous spot on the middle of each lora; the base of the genae and the entire clypeus, dark fuscous. Pronotum olivaceous, anterior half dark fuscous. Scutellum brownish yellow, antero-lateral angles (excluding the lateral margins very narrowly) and a submedian spot on each side near the anterior margin, dark fuscous. Tegmina cinereo-hyaline, veins brownish or yellowish; a nebulous band across the middle of the clavus and an apical blotch on the same, also an irregular blotch on the corium about the middle, part of the first and most of the second apical cell, dark fuscous. The exterior subapical cell is remote from the exterolateral margin; there are two nodal veins, one at each end of the cell, connecting it with the lateral margins, also another vein basal of the nodals,

the two cells thus formed having a transverse, nearly percurrent, line in the middle of each. Underside blackish brown. Antennae, labium, legs, incisures of segments etc., pale, a blackish spot at base of middle femora [fore femora missing].

♂ plates pale ferruginous, extreme apex yellowish.

HAB. Maui, Haleakala, over 5000 ft. (Oct., Perkins, no. 636).

(28) *Nesophrosyne myrsines*, sp. nov.

♂. Blackish brown, more or less suffused with bluish; base of vertex very narrowly, antennae and ocelli, pale yellow. Pronotum a little paler irregular locally, posterior angle of scutellum ferruginous. Tegmina hyaline, tinged with yellowish brown, on the middle third is a broad dark band which starts at the exterior margin and on reaching the clavus sends out a narrow fork at an obtuse angle, the space on the clavus between this and the main band being pale yellowish white with a green tinge; at the commissure the main band starts back at right angles (thus forming a broad V), and at the inner margin of the subcostal cell forks, sending one broad, short, branch across the subcostal and another on to the first apical cell. The exterior area forming the contents of the "V" is subhyaline, the veins suffused with pale yellowish brown; the apical part of the subcostal cell, between the last mentioned fork, is hyaline. The apical part (obliquely) of the tegmen is smoky, with a paler spot; wings smoky, veins dark fuscous. Abdomen black. Genital segments black, with crimson and white hairs. Legs pale yellowish brown, femora suffused with dark fuscous and tibiae laterally striped with the same. Length  $4\frac{3}{4}$  mm.

HAB. Hawaii, Kilauea, on *Myrsine*.

. Nymph: ♂. Vertex and basal three or four tergites, pale yellow, paler beneath and on the sides and legs. Eyes and pronotum crimson, the latter anteriorly yellowish. The mesometanotum and tegmina crimson, tegmina pale yellowish laterally, the former more or less suffused with blackish brown locally. Apical half of abdomen above crimson, darkening locally to blackish, eighth segment with particolored hairs (pale yellowish basally, darkening apically). Tergites 2—7 with a lateral blackish bristly hair close to apical margin. Vertex convex, subangularly produced in front of the eyes, longer than wide basally.

(29) *Nesophrosyne pluvialis*, sp. nov.

Superficially not unlike a pale form of *Thamnotettix clitellaria*.

Black: anterior margin of vertex very narrowly, frons (except apically a little obscurely), a line down middle of clypeus, antennae, etc., brownish yellow; posterior half of pronotum, a large semicircular spot on each clavus (united in repose) opaque creamy; apex of tegmina smoky, subiridescent; two large hyaline spots on the apical

half exteriorly and a few smaller scattered hyaline specks. Wings smoky hyaline, veins dark. Legs pale except the posterior tibiae which are greyish black, with whitish bristles. Apical margin of tergites and lateral margin of pleurites pale. Vertex scarcely produced beyond eyes, not longer than pronotum.

♀ pygophor and ovipositor black, the former with sparse whitish hairs.

HAB. Hawaii, Olaa (Dec., Perkins, 1 ♀).

(30) *Nesophrosyne elu*, sp. nov.

♀. Allied to *N. ponapona*. Pale immaculate ferruginous. Tegmina translucently spotted, subcostal area and apical cells etc., translucent. Wing veins dark fuscous. Ovipositor-sheath black. Length 4 mm.

HAB. Hawaii, Kilauea (Aug., Perkins), Hilo (Apr., Swezey). The type is a Kilauean example.

(31) *Nesophrosyne oreadis*, sp. nov.

Pale ferruginous; vertex ivory white anteriorly and basally, base of frons very narrowly fuscous. Clypeus, sterna partly, fore and middle femora mostly, blackish brown, pleurites yellow. Tegmina brownish yellow, or pale ferruginous; a large pale yellow spot on clavus with a fuscous edging basally; corium spotted with hyaline and the nodals are fuscous. Two nodals, one at the apex and one at the middle of the remote exterior subapical.

HAB. Hawaii, Kilauea (Aug., Perkins, no. 656).

(32) *Nesophrosyne montivaga*, sp. nov.

Somewhat like *N. pipturi*, but the veins are more suffused etc.

Yellowish (sometimes more testaceous, sometimes tinged with orange or reddish); a narrow curved transverse line at base of frons, genae, lora, clypeus (and sometimes apical half of frons), sterna, abdomen etc. black. Pronotum varying speckled with blackish. Tegmina yellowish cinereous, veins mostly blackish brown, varyingly suffused; inside some of the cells is a median nebulosity; two nodal veins almost united. Length ♂  $3\frac{3}{4}$ —4, ♀ 4 mm.

HAB. Hawaii, Kilauea (Aug., Perkins), Hamakua (Apr., Swezey). A Kilauea specimen is the type. Separated at once from *N. pipturi*, *ponapona* and *montium* by the clypeus, lora and genae being always blackish.

(33) *Nesophrosyne montium*, sp. nov.

Near *ponapona* and *montivaga*; from the latter it differs by the genae being always pale, except the extreme inward part; from the former by the clypeus and lora being always dark piceous, except a short ferruginous line on the clypeus, and by the dark suffused tegminal subapicals. Beneath black.

♂. Pygophor black.

♀. Pygophor blackish ferruginous, sheath black. Length, ♂  $3\frac{1}{2}$ , ♀ 4 mm.

HAB. Hawaii, Mountain View (March, Swezey).

(34) *Nesophrosyne silvicola*, sp. nov.

Pale olivaceous, paler beneath; vertex and scutellum brownish testaceous, a brown line on the anterior margin of the former, joining the testaceous ocelli archingly and also encircling them, a thinner line joining them straightly. Frons tinged with olivaceous and with a faint grill, the rest of the face yellowish brown, the clypeus apically more or less fuscate at the sides. Tegminal veins brownish olivaceous, sometimes fading in places; in others, especially apically and at the nodes, slightly suffused. The clavus is sometimes a little marked interiorly with brownish olivaceous. Wings hyaline. Legs testaceous, base of spines on hind tibiae blackish. Pronotum a little longer than the head, acuminate punctate. Tegmina with the exterior subapical cell remote from the subcostal vein; one nodal (median) vein, suffused.

♀. Ovipositor sheath blackish. Length, ♀  $5\frac{1}{2}$  mm.

HAB. Hawaii, Kilauea (August, Perkins), Kona, 4000 ft. (July); Hamakua (April, Swezey). Probably also from Lanai, over 2000 ft. (Jan., Perkins). The type is a specimen from Kilauea.

(35) *Nesophrosyne ignigena*, sp. nov.

♀. Bright yellow, with a greenish tinge; frons (and sometimes vertex), underside, legs, etc., yellowish white. Clavus and interior half—irregularly—of corium, opaque yellowish (sometimes partly greenish), except a couple of hyaline spots each on median and interior subapical cells; rest of corium hyaline. Apical cells hyaline, second yellow, third and fourth a little smoky. Wings smoky basally, veins blackish. Tergites black, lateral margins broadly pale yellow. Vertex basally about as wide as an eye, interior lateral margins of eyes slightly divergent, vertex rounded apically, very little produced beyond eyes, not quite as wide as pronotum. Ovipositor black. First (exterior) subapical cell minute. Length, ♀  $4\frac{3}{4}$  mm.

HAB. Hawaii, Kilauea (July, Giffard), in the Koa-forest (not necessarily on Koa).

(36) *Nesophrosyne pele*, sp. nov.

Yellowish, tinged with green, vertex with four fuscous specks; frons with a warm brown, well defined, radiating pattern; rest of face (except a small part of the apical margin of the genae), abdomen (except pleurites partly yellowish) etc., black. Antennae yellowish. Clavus opaque greenish yellow, veins yellow, two large black spots exteriorly and three basal and three interior specks. Corium hyaline, varyingly (usually mostly,

except the subcostal cell) suffused with blackish brown, veins yellowish, a whitish spot basal of the middle. In the subcostal cell there is a spot close to the radial cell, and two nodal veins suffused, blackish brown. Apical cells hyaline, veins blackish brown, mostly suffused, apical margin suffused. Wings smoky. Exterior subapical cell exteriorly obtusetriangular, with two short nodals at the angle (very close together) and another at the base of the cell.

♀. Pygophor and last sternite pale, ovipositor sheath black.

HAB. Hawaii, Kilauea (Aug., Perkins), Olaa (Sept., Perkins); probably also Kauai (no. 631).

(37) *Nesophrosyne umbrigena*, sp. nov.

Dark piceous; ocelli, hind margin of vertex narrowly, and antennal peduncle, yellowish; posterior half of scutellum orange brown. Grill merely a yellow lateral line on frons, with very obscure transverse lines. Tegmina pale ferruginous; apical half of clavus dark fuscous with a large whitish spot; subcostal area medially and apically subhyaline, with a dark spot at the base, and one or two smaller spots interiorly, a large dark fuscous spot around the nodal vein. Apical two-thirds of membrane dark fuscous. Sternites black, pleurites partly brownish yellow. Legs as in *N. silvicola*. Length  $4\frac{7}{8}$ —5 mm.

HAB. Hawaii, Kilauea (July—Aug., Perkins). In a damaged example, the pronotum is largely whitish, and the dark area of the clavus reduced.

(38) *Nesophrosyne craterigena*, sp. nov.

Orange red, pronotum a little soiled; apical margin of scutellum irregularly, narrowly, blackish. Clavus and interior half of corium pale olive greenish, opaque, the rest hyaline; two dark fuscous spots in median cell, a spot at the apex of the basal third of the subcostal cell, one at the nodal vein, and the apex (elongately) of clavus. The claval veins yellowish medially. Apical third of membrane smoky, first and second apical veins etc. a little suffused. Length  $4\frac{1}{2}$  mm.

HAB. Hawaii, Kona (March, 1 ♂, Perkins).

(39) *Nesophrosyne arcadiicola*, sp. nov.

Ferruginous; the head largely suffused with blackish, except a transverse line near the apex of the vertex, the frontal margins of the genae and the genal margins of the frons (on the latter indeed, faint transverse lines, the remains of the radiating pattern). The hind margin of the pronotum is white, and on the pronotum and scutellum are

sparse blackish marks. Tegmina with a broad band across the middle rather obliquely, a second nearer the apex, and the apex, blackish. A large whitish spot on the clavus, bordered basally with black. Rostrum and legs pale ferruginous, or brownish testaceous; the basal three-fourths of the fore femora, the middle femora, a ring on the hind femora, the bases (minutely) of the spines on the hind tibiae etc., black. Sternites black (and probably tergites).

♂. Valve very small. Length  $4\frac{1}{2}$  mm.

HAB. Hawaii, Hilo (April, Swezey).

(40) *Nesophrosyne nuenuue*, sp. nov.

♂. Yellowish testaceous; vertex with a more or less broken cross and four specks, brownish; frons with a broken and feeble brownish black radiating pattern. Pronotum (tinged with green) and scutellum somewhat soiled. Tegmina cinereous, tinged with green, the closed clavi with a large pale greenish white spot, irregularly and very narrowly margined with pale fuscous; corium exteriorly mostly hyaline, veins dark fuscous, cross veins somewhat suffused; two subcontiguous nodal veins and one near the base of the interior<sup>1</sup> subapical; some of the cells a little nebulose medianly. Sternites black, apical segments and pygophor pale greenish white, hairs pale. Head of the *pipturi* type.

♀. The grill fainter; pronotum more or less variegated with pale fuscous. Pygophor brownish yellow, hairs concolorous, ovipositor-sheath ferruginous, narrowly margined with blackish brown. Head not so angulate anteriorly as in the ♂. Eyes pale castaneous, with a transverse paler bar, narrowly bordered with blackish on each side, not so distinct in the ♂ as in the ♀. Length, ♂ 4, ♀  $4\frac{1}{2}$  mm.

Nymph: pale yellow brown, with the following blackish marks: two subcontiguous specks in the middle and four on the apical margin of the vertex; two spots anteriorly and four on the hind margin of the pronotum; a submedian longitudinal line on the mesometanotum and a short transverse line at the base which turns off upwards at right angles for a little space, also one or two spots etc. on the pads; eight sublateral and five lateral (basal) spots on the tergites and two submedian specks on the last tergite. Each of the 26 lateral and sublateral spots emits a black bristle and there are some of the latter also on the last tergite and on the pygophor. Legs pale, tibiae more or less striped with black, bristles of hind tibia pale. Antennae more or less fuscous, flagellum black. (Hamakua, April, Swezey.)

HAB. Hawaii, Kilauea (April, Swezey, Kirkaldy).

<sup>1</sup> On one tegmen there is only one subapical, the exterior, both the discoidals being undivided.

## Subgen. 2. NESOREIAS nov.

1. Face dark, with two paler spots ..... 1 *insularis*.  
 1a. Face yellow ..... 2 *occanides*.

(41) *Nesophrosyne (Nesoreias) insularis*, sp. nov.

Vertex and pronotum whitish yellow, the former suffused with fuscous, usually leaving simply two large subcontiguous pale spots at the base; pronotum sometimes a little suffused. Ocelli pale reddish orange, probably not functional. Scutellum yellowish. Frons blackish brown, basally narrowly obscure, two large contiguous pale fulvous spots close to this; genae, clypeus and lorae blackish brown, antennae pale. Underside yellowish white. Tegmina hyaline yellowish; clavus opaque pale greenish white; subapical line and apical veins suffusedly fuscous; apex of clavus and apical cells smoky. Wings smoky, veins dark. Vertex scarcely extending before the eyes. A slender species.

♂. Seventh sternite apically black, two small spots medianly, genital segment red and black. Length 4 mm.

HAB. Hawaii, Kilauea (Aug., Perkins), Hamakua (April, Swezey). The type is a Kilauea specimen.

(42) *Nesophrosyne (Nesoreias) occanides*, sp. nov.

Bright yellow; pronotum a little suffused with greenish. Tegmina with the clavus bright yellow, a spot at the base and a smaller one at the apex, brownish black, rest of tegmina brownish black except the apex of the subapical vein, the apical cells, and the subcostal cell (except basally) etc., hyaline; veins on these hyaline parts rather suffused dark fuscous. Subcostal vein pale yellow, except basally. Wings black. Legs pale yellowish, hind tibiae with the base of the spines etc., blackish. Vertex two-thirds wider between the eyes at ocelli than at base, one-third wider there than the length. Pronotum slightly longer than the head. Length 4½ mm.

HAB. Hawaii, Olaa (Aug., Perkins), Hilo (April, Swezey). The type is an Olaa specimen.

Nymph: Head pale yellowish with some obscure sanguineous lines on vertex; nota sanguineous (except lateral margins of pads); rest of body whitish or yellowish testaceous, except apical half of tergites which is mostly sanguineous with a blackish median line, suffused basally (on apical half). Head has much the shape of the adult's.

## NESOSTELES Kirkaldy.

*Nesosteles* Kirkaldy, 1906, Bull. Ent. H. S. P. Ent. 1. 343.

This is very close to *Balclutha* Kirkaldy, and its synonymy depends on whether *N. glauca* and *N. hebe* are congeneric; the latter seems to differ very little from

*Balclutha*, but I have not sufficient material of the latter now for effective comparison, so that I prefer, for the present, to leave matters as they are.

*Conspexus specierum hawaiiensium.*

1. Caput pronotumque viridi-testacea maculis parvis ac lineis inclaris, pallidis rufo-fuscis. Tegminum venae colore tegminum pallidiores.....(2).
- 1a. Caput pronotumque viridescencia vel aureo-brunnea. Tegminum venae virides .....(3).
2. Vertex ante oculos vix productus. Tegminum venae late pallidae. Longitudo  $3\frac{1}{2}$ —4 mm..... 1 *hebe* Kirkaldy.
- 2a. Vertex leviter rotundatim productus. Tegminum venae inclarae, pallidae. Longitudo 2 mm. .... 2 *volcanicola* nov.
3. Forma elongata, angusta, satis parallela; caput pronotumque aureo-brunnea; tegmina viridescencia; vertex subtriangulariter productus. Longitudo 4 mm..... 3 *plutonis* sp. nov.
- 3a. Brevior? latior, tegminibus ad latera magis rotundis. Vertex ante oculos rotundatim paullo productus. Longitudo  $2\frac{1}{2}$  mm..... 4 *peregrina* sp. nov.

(1) *Nesosteles hebe* Kirkaldy.

*Nesosteles hebe*, Kirkaldy, 1906, l. c.

HAB. Well distributed over the Islands. I have seen it from Kauai, Kealia (Oct., Giffard); Oahu, all over, frequently to light (Kirkaldy, Perkins, Giffard, Swezey, Terry). Hawaii, Kilauea (Perkins).

This seems to be *hebe* from Viti, though all the examples seen are much less reddish on the head, being more yellowish green. It may be convenient to distinguish it varietyally as *hospes*.

(2) *Nesosteles volcanicola*, sp. nov.

Closely allied to the above, but much smaller, the vertex more produced before the eyes, and the tegminal veins more obscure. The face also has a somewhat incomplete grill. Length 2 mm.

HAB. Hawaii, Kilauea (Perkins, 1906).

I have only seen a few carded examples from Kilauea, but it is probably not endemic.

(3) *Nesosteles plutonis*, sp. nov.

Head, pronotum, legs etc. golden brown; tegmina yellowish green, membrane hyaline, with yellowish green veins. Abdomen mostly black. Elongate and slender, head distinctly wider medianly than at the eyes, a trifle more angular in the ♀ than in the ♂. Length 4 mm.

HAB. Hawaii, Kilauea.

I have seen only a carded pair in Dr Perkins' collection. It is probably endemic.

(4) *Nesosteles peregrina*, sp. nov.

Yellowish green or green. Abdomen below partly faint fuscous. Membrane hyaline, veins yellowish green. Wings hyaline, veins faint fuscous. Vertex flatter than in the other three species, distinctly wider in the middle than at the eyes. Length  $2\frac{1}{2}$  mm.

A Kilauea specimen is the type.

HAB. Oahu, Honolulu, comes to light (Kirkaldy); Hawaii, Kilauea (Perkins and Giffard). Probably not endemic.

## MACROSTELLES Fieber.

*Macrosteles* Fieber, 1866, Verh. zool. bot. Ges. Wien xvi.

I know only a single Hawaiian species, which appears to be endemic.

(1) *Macrosteles kilaueae*, sp. nov.

Bright yellow, legs etc. paler. Eyes greenish grey. Apical cells of tegmina hyaline, with yellow veins. Wings hyaline, veins white, sometimes partly fuscous. There is no appreciable sculpture, except microscopic. Vertex wider between the eyes than its length, and wider than the eyes together, lateral margins slightly divergent; rounded obtusely anteriorly, somewhat convex, roundly obtuse in profile; frons somewhat convex. Pronotum wider than the head and a trifle longer, lateral margins short, not keeled, hind margin slightly obtuse-angulately emarginate. Tegminal venation not very unlike that of *M. punctifrons*, but the first apical vein is sublongitudinal, not subtransverse, and the fourth vein is also longer and more longitudinal.

♀. Sheath blackish brown. Length  $4\frac{1}{2}$  mm.

HAB. Hawaii, Kilauea. I have seen only one carded ♀, in Dr Perkins' collection.

## PHRYNOMORPHUS Curtis.

*Phrynomorphus* Curtis, 1833, Ent. Mag. i. p. 194.

*Athysanus* Burmeister, 1838, Gen. Ins. i., *Fassus*.

*Athysanus* subg. *Athysanus* and *Conosanus*, Osborn and Ball, 1902, Ohio Nat. II. 232 (not subg. *Commellus* which is part of *Deltoccephalus*, sens. lat.).

The synonymy of this and the allied genera is complicated and as the Hawaiian representative is an introduced form, it is unnecessary to dilate here on the generic nomenclature.

(1) *Phrynomorphus hospes*, Kirkaldy.*Deltocephalus hospes* Kirkaldy, 1904, Entom. xxxvii. 177.*Phrynomorphus hospes* Kirkaldy, 1907, Bull. H. S. P. A. Ent. III. 60, Pl. I. figs. 13—17.

The last nymphal instar is described and figured in the work last cited (p. 13).

This introduction from Australia and Fiji feeds here on *Cynodon dactylon*.

## Tribe EURYNELINI.

There do not appear to be any of this tribe in the Hawaiian Islands, the two species collected by Dr Perkins and referred by me to *Bythoscopus*, belonging really to the genus *Nesophryne*.

Stål described two species, *B. peregrinans* (referred to incorrectly on p. 115 of vol. III. as *B. peregrinus*) and *B. viduus* from Oahu, but erroneously<sup>1</sup>.

*B. peregrinans* was described from Tahiti, Oahu, California and Rio de Janeiro. It has been since recognized as an *Agallia* (sens. lat.) by Berg and recorded from the Argentine Republic; recently Osborn and Ball (now the highest North American authorities on Homoptera), believe that a species from California answers to Stål's description; they place it close to *A. sanguinolentus*, which is an *Aceratagallia*. It is perhaps a little doubtful however whether the same species actually has this distribution from Vancouver to the Argentine. It is well known that the localities recorded in the "Eugenies Resa" are often quite inaccurate and as *B. viduus* is recorded from Tahiti as well as Oahu, and as nothing like either *peregrinans* or *viduus* has ever been recorded from the Hawaiian Islands, both may safely be expunged from the Hawaiian lists.

## Fam. ASIRACIDAE.

The Hawaiian Asiracidae are, as regards the endemic, arboreal forms, characterized by the spur of the hind tibiae being solid, subcylindrical, with rather large teeth; a condition known, in outside faunas, only in *Proterosydne arboricola* Kirkaldy, from Queensland.

In this family, the male genitalia are of the highest specific, and even generic, importance; hence in these islands, as in other countries, females are often very difficult to determine, unless taken with the males. The colour and pattern of the nymphs are generally of specific value.

The genera in Hawaii may be separated as follows, but I must remark that *Nesosydne* is probably heterogeneous. A considerable proportion of the species, however, is known only in the brachypterous state, if indeed these latter forms are ever macropterous, and I therefore prefer waiting a little before founding the probably necessary new genera.

<sup>1</sup> Cf. Kirkaldy, 1907, A. S. E. Belg. LI.

*Conspectus generum.*

1. Calcar mobile tibiarum posticarum laminatum, bifidum, dentibus invalidis instructum. Formae graminivorae [Tribus Criomorphini]<sup>1</sup> .....(2).
- 1a. Calcar solidum, subcultratum, dentibus fortioribus, paucioribus instructum. Formae arborivorae vel filicivorae, *Nesosydne ipomoecicola*, forma herbivora, excepta. [Tribus Proterosydniini].....(4).
2. Antennae fere cylindricae .....(3).
- 2a. Antennae depressae ac dilatatae ..... 2 *Perkinsiella* Kirkaldy.
3. Carinae frontis fere ad basim frontis in unum conjunctae ..... 3 *Kelisia* Fiebr.
- 3a. Carinae frontis fere medio oculorum conjunctae..... 1 *Peregrinus* Kirkaldy.
4. Caput ordinarium .....(5).
- 4a. Caput perelongatum, abdomine thoraceque simul sumptis longius ... 10 *Dictyophorodelphax* Swezey.
5. Frons carinis duabus, interdum obsolescentibus, instructa .....(6).
- 5a. Frons carinis duabus, in unum fere ad basim conjunctis, instructa .....(9).
6. Tegmina haud reticulata .....(7).
- 6a. Tegmina brevia, venis haud faciliter distinguendis, subreticulatis ..... 6 *Nesorestias* Kirkaldy.
7. Frons elongata, carinis duabus perdistinctis, subparallelis, instructa..... 5 *Nesoplecias* gen. nov.
- 7a. Frons minus elongata, carinis lateralibus haud semper faciliter distinguendis ; si distinctis, tunc rotundatis.....(8).
8. Frons immaculata ..... 4 *Aloha* (typ.) Kirkaldy.
- 8a. Frons pallide maculata..... 4a (subg.) *Leialoha* nov.
9. Formae pergraciles ..... 9 *Nesodryas* Kirkaldy.
- 9a. Formae robustae .....(10).
10. Frons haud maculata ..... 7 *Nesosydne* Kirkaldy.
- 10a. Frons pallide maculata ..... 8 *Nesothoe* Kirkaldy.

## PEREGRINUS Kirkaldy.

*Peregrinus* Kirkaldy, 1904, Entom. xxxvii. p. 175.

(1) *Peregrinus maidis*, Ashmead.

*Delphax maidis* Ashmead, 1890, Psyche v. p. 323, figs.

*D. psylloides* Lethierry, 1896, Ind. Mus. Notes III. p. 105, fig.

*Peregrinus maidis* Kirkaldy, 1906, Bull. H. S. P. Ent. I. p. 407; and 1907 op. cit. III. p. 132, Pl. 12, figs. 7—8; Pl. 10, fig. 14.

*Pundaluooya simplicia* Distant, 1906, Faun. Ind. Rh. III. 468, fig. 255.

*Liburnia psylloides* Distant, op. cit. 484.

HAB. All the islands on *Zea mays*, the adults also on *Saccharum officinarum*, *Sorghum vulgare*, etc. One specimen was taken by Dr Perkins in 1892. This introduced species is found also on *Bromus unioloides* and *Cynodon dactylon* in Queensland (Tryon), and has been collected as well in Fiji, New South Wales, Java, Ceylon, Florida, Texas, and the Antilles.

<sup>1</sup> *Asiraca* atque genera proxima tribum 'Asiracini' constituunt. Habent haec calcar subuliforme.

## PERKINSIELLA Kirkaldy.

*Perkinsiella* Kirkaldy, 1903, Entom. xxxvi. p. 179.

(1) *Perkinsiella saccharicida* Kirkaldy.

*Perkinsiella saccharicida* Kirkaldy, 1903, l. c. ; 1906, Bull. H. S. P. Ent. i. p. 405, Pls. 26 & 27, figs. 1—5 ; 1907, op. cit. iii. p. 137, Pl. viii. figs. 5—8 ; Pl. xii. figs. 2—13.

*P. saccharida* Kirkaldy, 1906, op. cit. i. p. 406.

HAB. Wherever *Saccharum officinarum* is grown in the islands ; now greatly reduced by various parasites. It has been found in Eastern Australia and Java.

The metamorphoses are partly described and figured in the papers cited above.

## KELISIA Fieber.

*Kelisia* Fieber, 1866, Verh. zool. bot. Ges. Wien xvi. p. 519.

Three species, apparently not endemic, have been found in the islands. I cannot, however, connect them with any previously described.

(1) *Kelisia sporobolicola*, sp. nov.

♂ ♀. Yellowish testaceous, keels paler. Face and antennae brownish testaceous, the frons speckled with yellowish testaceous. Tegmina tinged with cinereous, veins whitish testaceous, rather thickly granulated with blackish brown. Abdomen above spotted laterally with blackish brown. The tegmina reach to the middle of the abdomen, and there are no clear apical cells.

♂. Pygophor pale, partly more or less infusate ; with black genital styles, oedeagus etc. ; genital styles long and narrow, divergent, apical third acuminate.

♀. Pygophor concolorous with the underside.

The type is an Oahuan specimen.

HAB. Oahu, Honolulu coast (Oct. 1 ♂, 2 ♀♀ Perkins ; March, Swezey and Kirkaldy) ; Hawaii, Puako (May, Swezey).

(2) *Kelisia swezeyi*, sp. nov.

♂. Superficially not unlike the last described, and with not very dissimilar genital organs, but the pronotal keels are less divergent posteriorly, the tegmina are longer and less granulate, and the frons is different.

Head, pronotum and scutellum pale fuscous, frons and clypeus bordered with black inside the pale lateral keels ; rest of body yellowish testaceous, the abdomen sparsely

marked with black laterally and on the pygophor. Tegmina rather feebly granulate with brown, a black speck near the apex of the clavus on the commissure. Head dorsally very slightly produced beyond the eyes, frontal keels blunt. Tegmina reaching to about three-fourths of the length of the abdomen, with somewhat clear apical cells. Pygophor testaceous, a longitudinal line dorsolaterally, the ventral wall of the anal tube, the genital styles, etc., black; the last very similar in form to those of *K. sporoboli*. Length  $2\frac{1}{2}$  mm.

HAB. Oahu, Kalihi (March, Swezey). Only a single specimen, kindly lent to me by Mr Swezey; it is the only one he has seen.

(3) *Kelisia paludum*, sp. nov.

♂. Brownish yellow, abdomen often largely infuscate; a dark fuscous spot at the apex of the commissural area. Tibial spur with 18 minute teeth. Tegmina very feebly granulate.

The ♂ pygophor is more or less dusky; genital styles long and narrow, slightly curved, shortly bifid apically.

♀. Immaculate yellow.

HAB. Oahu, Waikiki (Jan. and March, Swezey and Kirkaldy), on *Herpestis monnieria* and *Juncus*. These were closely intermingled, and eggs not having been found, the actual foodplant is not certain.

ALOHA Kirkaldy.

*Aloha* Kirkaldy, 1904, Entom. xxxvii. p. 177.

Corresponds to *Criomorphus* in the Criomorphini. The median keels of the frons are roundedly arched outwardly, but are sometimes obsolescent in *A. myoporica*, which probably does not belong to this genus. Type *A. ipomocae* Kirkaldy.

*Conspectus specierum hawaiiensium.*

- |     |   |                         |
|-----|---|-------------------------|
| 1.  | Frons nigrofusca, parte apicali quarta saltem, cum sex saltem maculis utrimque inter carinas submedianas atque margines laterales, pallida, maculis quibusdam basin versus minoribus. Antennarum segmentum primum nigrescens [subgen. <i>Leialoha</i> nov., typo <i>naniicola</i> Kirkaldy (2). |                         |
| 1a. | Frons concolor, interdum maculis subobsoletis pallidis ornata. Antennarum segmentum primum nigrescens apud has, pallidum apud illas species... (5).   |                         |
| 1b. | Frons nitida, nigra, immaculata .....   | 7 <i>myoporica</i> nov. |
| 2.  | Tegmina vitrea, notis fuscis paucis ornata..... (3).  |                         |
| 2a. | Tegmina lactea basi; apice pallida, fusco-notata; fascia lata, fusco-fuliginea trans medium ornata. Tegminum pili albi .....  | 3 <i>pacifica</i> nov.  |
| 3.  | Tegmina pallide testaceo et inconspicue granulata, pilis albis.....   | 1 <i>naniicola</i> nov. |
| 3a. | Tegmina rude albo-granulata, pilis fuscis .....   | 2 <i>oceanides</i> nov. |

5.	Tegmina maculata .....	4	<i>lehuae</i> nov.
5a.	Tegmina haud maculata, commissura apice excepta .....	(6).	
6.	Forma plus minus rubra .....	5	<i>ohiae</i> nov.
6a.	Forma haud rubra .....	6	<i>ipomoeae</i> Kirkaldy.

(1) *Aloha naniicola*, sp. nov.

Vertex and pronotum testaceous, the latter fuscous laterally with whitish specks. Frons darkish fuscous, apical third and some specks, yellowish white; genae yellowish white, extreme base fuscous. Antennae dark fuscous. Clypeus fuscous with pale keels. Tegmina hyaline milky with an irregular band along the middle of the membrane, apex of clavus, etc., fuscous. Femora pallid, with a subapical fuscous ring, the apex sub-sanguineous. Tibiae testaceous, anterior and intermediate pair with two fuscous rings on each; posterior tibiae with one near the base. Length 4—4½ mm.

HAB. Oahu, Waianae, 3000 ft. (Feb., Perkins); Tantalus, 1300 ft. (Jan., April, Giffard, Kirkaldy, Swezey). Hawaii, Kilauea (Perkins, Kirkaldy). On Ohia lehua (*Nani polymorpha*, also known generically as *Metrosideros*). The type is a Kilauea example.

(2) *Aloha oceanides*, sp. nov.

Vertex, frons, genae and nota dark brown; all the keels, the basal specks on frons and the specks on the pronotum, yellowish brown; apical fourth of frons, apical third of genae, apical specks on frons, and some at base of genae whitish; clypeus dark fuscous, basal half of middle keel pallid. Antennae dark fuscous or blackish (second segment in immature examples paler dorsally). Ventral part of pronotum and the sterna dark fuscous. Tegmina milky hyaline, veins (more or less suffusedly) dark brown, strongly and closely studded with white granules which emit white hairs; marginal vein yellowish brown. Tegmina suffused with dark brown as follows: extreme base, a short irregular transverse blotch extending from marginal vein to median just apical of the junction of the latter with the brachial (basally it is fairly straight, apically it extends along the median and subcostal veins about as far again), a large rhomboid spot on the subcostal cell, at about three-quarters of its length, which extends obliquely on to the median at its forking. The apical cells have a large irregular T-shaped mark, and the veins are all suffused, at least apically. Anal and axillary suffused just basal of their union. Wing veins brownish black. Legs yellowish brown, femora and tibiae annulate with dark fuscous. Tergites mostly black; pleurites yellowish brown and dark fuscous chequered. Length 5¼—5½ mm.

HAB. Kauai, 4000 ft. (July—Aug., Perkins, three examples, also one in bad condition).

In immature examples, the vertex and the disk of the pronotum, etc., may be pallid.

(3) *Aloha pacifica*, sp. nov.

♀. Similar to *A. oceanides*, but proportionately slightly more robust. The whole of the tegmina basal of the apical cells is dark smoky except the basal fourth of that space, the subcostal cell in part, the apex of the clavus, and the tegminal granules, the latter supporting white hairs. Apical keels of the vertex and the middle keels of the pronotum and scutellum subsanguineous. Length  $5\frac{1}{3}$  mm.

This is a quite distinct species, but the male and definite localities are desiderata.

HAB. "Kauai? Molokai?" (1 ♀, Perkins).

(4) *Aloha lehuae*, sp. nov.

Head and pronotum pale ochraceous, the latter a little fuscate partly, scutellum dark ferruginous. Tegmina hyaline, veins pale, granules pale brown; a dark fuscous band across the tegmina close to the base, a short fuscous line at apex of claval cell and a fuscous smudge along the middle of the membrane. Wings pale smoky, veins blackish brown. Length  $4\frac{1}{3}$  mm.

HAB. Oahu, Tantalus; on Ohia lehua (*Nani polymorpha*).

(5) *Aloha ohia*, sp. nov.

Head pale yellow; antennae, legs, scutellum, underside, red (sometimes paler). Tegmina hyaline, tinged with yellowish red, veins and granules red. Length 5 mm.

The type is a Waiialua specimen.

HAB. Oahu, Waiialua, Palolo, Pacific Heights, Tantalus. Hawaii, Kona. (Perkins, Kirkaldy, Giffard, Terry, Swezey) on *Nani polymorpha*.

(6) *Aloha ipomoeae* Kirkaldy.

*Aloha ipomoeae* Kirkaldy, 1904, Entom. xxxvii. p. 177; and 1908, P. H. E. S. 1. Pl. 4, fig. 9.

This species is usually micropterous, but macropterous forms occur.

HAB. Oahu, Tantalus, etc., up to the summit on *Ipomoea pes-caprae*, *balatas*, *bonanox*, *tuberculata*, *insularis*, etc. (Perkins, Kirkaldy, Terry, Swezey, Giffard); Makiki, beneath Hilo grass (Nov., Swezey). Hawaii, Paauhau (March, Swezey).

(7) *Aloha?* *myoporicola*, sp. nov.

♂. Vertex, frons, pronotum and scutellum shining polished black or blackish brown; keels of vertex and of extreme base of frons, apical margin (narrowly) of frons, the clypeus, genae (except a slight line), posterior angle, very minutely, of scutellum, legs (except femora, a little fuscous locally, and tibiae more or less obscurely annulate),

pale yellowish. Antennae yellowish. Tegmina subhyaline pale yellow, veins yellowish white, sparsely granulate with brown; middle two-thirds of tegmen from subcosta to suture, smoky. Tergites yellowish, sutures blackish, lateral margins variegated with black, sternites mostly blackish. Labium reaching to hind coxae; second segment of antennae scarcely twice as long as the first, the second being about as long as the median width of the frons. Tegmina micropterous, extending about as far as the apex of the abdomen, with 5—6 apical cells. Spur with eight spines.

♀. Usually much paler than the male, the vertex, pronotum, and scutellum being more or less pallidly suffused, but sometimes these approach the coloration of the male. Tergites dark with yellowish markings apically. Length 4 mm.

HAB. Hawaii, Kilauea, 4000 ft. (July—Sept., nos. 578, 656, 686 & 691, Perkins, July, Giffard, Dec., April—May, Kirkaldy) on *Myoporum sandwicense*; Kona, 4000—5000 ft. (June—July, Perkins).

The type is a Kilauean example.

#### NESOPLEIAS, gen. nov.

This genus has very much the appearance of *Nesorestias*, but the tegmina are not reticulate, and the frons has two entire keels. From *Aloha*, etc. it differs by the form of the tegmina, and by the elongate frons, which has two fine, very distinct, subparallel keels, which enclose a sublinear space throughout, meeting just basal of the truncate apical margin. The genal carina meets the frontal keels acutely. Pronotum with three straight keels, the lateral ones meeting archedly in front; all meeting the hind margin straightly. Scutellum tricarinate.

#### *Conspectus specierum hawaiiensium.*

1. Tegmina cellulis apicalibus destituta; margine postica densata ..... 1 *nimbata* nov.  
 1a. Tegmina cellulis apicalibus instructa; margine postica ordinaria..... 2 *dubautiae* nov.

#### (1) *Nesopleias nimbata*, sp. nov.

♀. Pale brownish yellow, paler beneath, the tegmina with a fuscous band just exterior to the clavus and crossing it at the apex, where it darkens and thickens; basal of this band the colour is paler. Tergites blackish brown laterally. Tegmina scarcely reaching beyond the middle of the hopper, roundedly arched externally, rounded apically. Subcostal cell and apical margin strongly thickened, especially the latter, which is not venose. Radial and brachial veins forked obscurely immediately basal of the apical margin. Length 3 mm.

HAB. Oahu, Tantalus, 1500 ft. (Feb., 1907, Perkins). I have seen only a single female of this curious form.

(2) *Nesoplecias? dubautiae*, sp. nov.

Highly variable in colour, in some examples almost immaculate pale brownish yellow; in others, the tegmina and abdomen above are heavily blotched with blackish brown. These colour variations are not sexual. Spur with nine spines. The pygophor has a minute spine on the lip. The ♂ styles are contiguous to the oedeagus at their laterobasal angle and are produced ventralwards in a triangular lobe; using the inner side of this as a base, they are acuminate and obliquely triangular and are very different to those of any other Hawaiian species. Length 3 mm.

HAB. Oahu, Tantalus (1907, Perkins); Konahuanui, 2000 ft. (May, Dec., Swezey) on Naenae (*Dubautia plantaginea*).

## NESORESTIAS Kirkaldy.

*Nesorestias* Kirkaldy, 1908, P. H. E. S., t. p. 205.

(1) *Nesorestias filicicola* Kirkaldy.

*Nesorestias filicicola* Kirkaldy, 1908, l. c.

HAB. Oahu, Tantalus, 2000 ft. (Kirkaldy, Swezey, Terry) on ferns.

## NESOSYDNE Kirkaldy.

*Nesosydne* Kirkaldy, 1907, op. cit. 161.

This genus corresponds more or less with *Delphacodes* Fieber in the section with non-compressed spur. The type is *N. koae*, but the genus as now comprehended is doubtless heterogeneous.

(1) *Nesosydne koae* Kirkaldy.

*Nesosydne koae* Kirkaldy, 1907, l. c.; and 1908, op. cit., Pl. iv. fig. 2.

♂ ♀. Pale green, usually yellowing after death. Tegmina hyaline, veins pale greenish, with fuscous granules. Sutures of tergites narrowly fuscous.

♂. Base of tergites and the lateral margins greenish, rest blackish. Genital styles narrow, elongate, slightly truncately bifid at apex.

♀. Ovipositor dark fuscous. Length ♂  $3\frac{1}{2}$ , ♀ 4 mm.

HAB. Oahu, Tantalus, 1200—1500 ft., on the young leaves of *Acacia koa* (Perkins, Kirkaldy, Giffard, Terry, Swezey).

Nymphs pale green.

var. *rubescens* Kirkaldy, 1907, op. cit. p. 161.

Similar to the type and found with it, but larger and with a rosy brownish tinge. Length ♂ 4, ♀ 5 mm.

Nymphs green tinged with roseate.

I have examined some numbers of this sometimes common hopper, but have never found a brachypterous form.

(2) *Nesosydne pipturi* Kirkaldy.

*Nesosydne pipturi* Kirkaldy, 1908, op. cit. p. 202, Pl. iv. fig. 3.

♂. Head, pronotum and scutellum fuscous or blackish, with pale keels, the dorsal one broadly so and rather suffused. Antennae, clypeus, sterna and legs pale; femora partly fuscous. Tegmina whitish hyaline, a fuscous smudge across the middle third, accentuated by the radial and brachial veins being blackish medially and the apex of the clavus also blackish; sometimes the darkening is continued more or less to the apex of the clavus. Abdomen pale sanguineous, with a few scattered blackish marks. Head dorsally scarcely reaching in front of the eyes, apical margin smoothly rounded; frons very smooth, keels almost obsolescent, except as pale lines. Second segment of antennae  $\frac{3}{4}$ ths longer than the first. Labium reaching to the base of the hind trochanters. Lateral margins of pronotal keels curving outwards, but reaching hind margin. Tegmina rounded apically, not extending as far as apex of abdomen; with two or three apical cells. Spur with 7—8 spines, first segment of hind tarsi much longer than the other two.

♀. Pale yellowish, intracarinal areas of vertex and frons rather irregularly fuscous, not so deeply or entirely as in the ♂. Tegmina hyaline, veins pale yellow, a short black line on the commissure. Tergites sometimes lightly stained with fuscous. Length ♂  $1\frac{1}{2}$ , ♀  $2\frac{1}{8}$  mm.

Easily distinguished by the smooth, wide, somewhat polished frons, with scarcely raised keels and by the green nymphs.

♂. Genital styles broad, constricted medially, flatly bifid apically.

Nymphs pale green, paler beneath. Labium reaching to middle of the hind trochanters. Spur with seven spines.

HAB. Oahu, N.W. Koolau range (825, 786, Perkins, 3 ♂♂), Tantalus 1500—2000 ft. (Feb., May, Aug., Oct., Perkins, Giffard, Kirkaldy, Swezey, Terry), Kona-huanui ridge (Feb., Swezey, Jan., Kirkaldy), on Mamake (*Pipturus albidus*); Molokai, Pelekunu (Oct., Perkins, 3 ♀♀).

(3) *Nesosydne halia* Kirkaldy.

*Nesosydne halia* Kirkaldy, 1908, op. cit. Pl. 4, fig. 8.

♂. Pale luteous; frons between the keels, pronotum and scutellum (usually except the keels), dark fuscous. Tegmina cinereo-hyaline, entire margin pale luteous; with a

tiny dark fuscous speck near the apex of the commissure, or also with an obscure oblique stripe. Abdomen above sometimes dark apicolaterally; beneath with dark lateral wedges on the three middle segments. Frons elongate, broader at the base than at the apex, keels broad and rather flat. Antennae extending to about the middle of the clypeus, second segment a little longer than the first. Pronotal keels reaching the hind margin, then curving around slightly. Hind tibiae longer than tarsi, first segment of the latter one-third longer than the second and third together. Spur with eight teeth. Tegmina with three apical cells not nearly attaining the apex of the abdomen. Genital styles broad at the base, sinuate, apically acuminate, but truncate at the apex, the inner angle acute. The oedeagus is horned on each side basally.

♀. Similar to the ♂ but larger; luteous, the keels paler. Abdomen above mottled with fuscous laterally on the apical two-fifths, also similarly at the base. Beneath as in the ♂. Tegmina also with a dark fuscous blotch at the apex of the commissural cell. Length ♂ 3, ♀ 3 $\frac{7}{8}$  mm.

HAB. Oahu, Tantalus, 1300 ft. (Perkins, Kirkaldy, Giffard), Pacific Heights ridge (May, Swezey).

var. ♀. A dark fuscous oblique stripe on the tegmen, varying to pale. Head, pronotum and scutellum (except keels) dark fuscous.

(4) *Nesosydne pele*, sp. nov.

Of the general appearance of *N. kooe*, but larger and differently coloured.

Head and pronotum brownish testaceous, or pale olivaceous, the clypeus between the keels (and sometimes the vertex and frons between the keels), genae and pronotum partly anteriorly, dark brown or blackish. Antennae testaceous, extreme apex of first segment dark. Scutellum blackish, or piceous. Tegmina hyaline; apex of anal cell of clavus dark brown; veins brown, rather feebly granulate, black-haired. Legs sordid testaceous, more or less suffused. Abdomen dorsally and the body beneath mostly blackish. Pronotal keels divergent, not reaching the hind margin. Spur with about nine spines. Length 5 mm.

HAB. Hawaii, Kilauea (Perkins, 1906).

(5) *Nesosydne umbratica*, sp. nov.

Pale, rather sordid, greenish yellow; head between the keels fuscous. Tegmina with apex of clavus and of subcostal cell dark fuscous. Fore tibiae apically fuscous. Labium reaching to the apex of the hind coxae. Second segment of the antennae about one-fifth longer than the first. Tibial spur with 9—10 teeth. Tegmina with five apical cells, clavus not completely sutured off; apex of subcostal very narrow, truncate, continuation of the subapical transverse vein. Tegmina not reaching to the apex of abdomen. Length 4 $\frac{1}{8}$  mm.

HAB. Hawaii.

(6) *Nesosydne gouldiae*, sp. nov.

Brownish white; frons and clypeus between the keels, dark fuscous; pronotum and scutellum between the keels, genae, etc., more or less fuscous. Tegmina yellowish brown, hyaline, veins more or less fuscous, the apical ones yellowish brown, apex of clavus and of subcostal dark fuscous. Legs and sterna pale yellowish. Tergites more or less variegated with dark fuscous. Second segment of antennae one-third longer than the first. Tegmina with the clavus not completely sutured off; three apical cells, subcostal cell apically acute. Spur with 10—11 spines. Tegmina not reaching to the apex of the abdomen. Length 4—5 mm.

The nymphs of the last instar have the same general colour as the adult, but the tergites are fuscous except a narrow longitudinal row of spots down the middle (making a broken line), and two sublateral longitudinal brownish yellow stripes on two or three segments. There are also some pale specks, etc. Second antennal segment about twice as long as the first, fore and middle tarsi unjointed, hind tarsi trisegmentate, the spur with 7—8 spines.

HAB. Oahu, Honolulu Mts. (Sept., Perkins, nos. 793 & 805, Nov.—Dec., Perkins) and Konahuanui (no. 867, March, Perkins); also Tantalus (Perkins, Terry); Palolo, 1800 ft. (Terry), on Manono (*Gouldia* sp.).

(7) *Nesosydne nephrolepidis* Kirkaldy.

*Nesosydne nephrolepidis* Kirkaldy, 1908, op. cit. p. 203, Pl. 4, fig. 1.

HAB. Oahu, Tantalus.

(8) *Nesosydne ipomoeicola* Kirkaldy.

*Delphax pulchra* Stål, 1854, O. V. A. F. XI. 246; and 1859, Eugenicus Resa, Zool. 275.

*Nesosydne ipomoeicola* Kirkaldy, 1908, op. cit. 202, Pl. 4, fig. 4.

Somewhat like *N. halia*, but the pronotal keels are more divergent and curving, and do not reach the hind margin; the brachial and radial veins are forked near the subapical line; there are five apical cells and the tegmina are a little longer. The frons is nearly parallel-sided, very slightly (and gradually) narrower basally than apically. Antennae shorter, scarcely reaching beyond the base of the clypeus. Basal margin of tegmina fuscous.

♂. Head, pronotum and scutellum dark fuscous, or blackish, keels of head pale. Sterna, abdomen more or less, etc., dark fuscous or blackish.

♀. Similar to the same sex in *N. halia*, but the abdomen is more obscure.

Vars. Both sexes vary more or less in the following directions, head often scarcely fuscate. Apex of commissural and of subcostal cells, etc. dark fuscous; these may meet and be extended in a large median black blotch in the ♂. Abdomen often orange red, more or less marked with black. Length ♂  $2\frac{1}{2}$ ; ♀  $3\frac{1}{2}$ — $3\frac{3}{4}$  mm.

HAB. Kauai, 400 ft. (Oct., Giffard); Oahu, Honolulu (Stål), Tantalus, 1300 ft. (Kirkaldy, Giffard, Perkins, Swezey, Terry), on *Ipomoea bonanox*, etc.; Honolulu and Kalihi, sea-level to 50 ft., on *Jussiaea villosa* (June, Swezey); Makiki, 150 ft., on *Dolichos lablab* (March, Swezey). Hawaii, above Hilo, 1800 ft. (Dec., Perkins, two ♂♂), Olaa (Nov., Perkins, one ♂).

This is perhaps the commonest endemic Asiracid. I have not seen Stål's type, but I have no doubt of the correctness of the identification; the name given by him, however, is preoccupied.

Macropterous form. Head with keels brownish yellow, the intracarinal spaces more or less fuscous. Nota brownish yellow, more or less strongly and entirely suffused with dark fuscous, the keels usually excepted. Tergites mostly blackish brown. Tegmina hyaline, veins pale testaceous, basal margin and a mark on the commissure blackish, apical veins (at least apically) and apical margin, also veins of wings, fuscous. Length 4 mm.

(9) *Nesosydne hamadryas*, sp. nov.

♀. Shining dark fuscous; keels of frons and clypeus narrowly margined with fuscous. Antennae, labium and legs, pale yellowish white. Scutellum piceous. Tegmina hyaline iridescent, appearing blackish basally, owing to the abdomen showing through, veins fuscous. Head dorsally scarcely longer than broad, extending very little beyond the eyes; lateral margins of frons subparallel. Antennae reaching well beyond the base of the clypeus, second segment one-half longer than the first. Tegmina reaching well beyond the abdomen, with six apical veins, second and third with a common base, and the third forked near its base. Pronotum with the lateral keels not reaching the hind margin but also not curving away. Spur with 10 spines. Length ♀  $4\frac{1}{2}$  mm.

HAB. Oahu, Tantalus (1 ♀, Perkins, 1906).

I am indebted to Dr Perkins for the loan of this, the only specimen he has taken.

(10) *Nesosydne haleakala*, sp. nov.

♀. Brownish yellow; genae, clypeus and apical part of frontal keel blackish brown. Tegmina with a fuscous stripe obliquely from the base (exteriorly) to apex of clavus, darkening at the two ends. Tarsi blackish. Tegmina scarcely reaching beyond the middle of the abdomen, clavus not completely sutured off; three apical veins, the sub-

costal cell acute apically. Second segment of antennae about one-fourth longer than the first. Length  $3\frac{7}{8}$  mm.

HAB. Maui, Haleakala, 5000 ft. (by "grubbing," April, no. 251, 2 ♀♀, also an example in very bad condition, Perkins).

(11) *Nesosydne nephelias*, sp. nov.

♂. Head, pronotum and scutellum blackish, the keels widely pale; antennae and legs yellowish testaceous, femora long, striped with dark fuscous. Abdomen yellowish testaceous, partly suffused with brown. Tegmina hyaline cinereous, veins partly fuscous, a spot at the apex of the subcostal cell and the commissure at the apex of the clavus, dark fuscous. Venation irregular.

♀. Pronotum, scutellum and abdomen less dark.

HAB. Lanai, 2000 ft. and over (Jan.—Feb., Perkins).

(12) *Nesosydne procellaris*, sp. nov.

♂ ♀. Brownish yellow; a line on the genae and the lateral margins of the pronotum and scutellum (rather feebly), dark fuscous. Tegmina brownish yellow, hyaline, base very narrowly and a transverse smudgy stripe just basal of the subapical veins, dark fuscous; veins mostly pale brownish. Apices of tibiae, tarsi etc., dark brown. Tegmina brachypterous, with five apical veins (sometimes one may be forked very close to the apical margin); the subcostal is undivided and its apical margin is a continuation of the subapical transverse vein.

♂. Frons between the keels, apical part of vertex and posterolateral margins of scutellum all faintly fuscous. Sternites blackish brown, broadly bordered with yellowish, last segment yellowish, pygophor piceous, styles blackish ferruginous. Tegmina not reaching as far as the apex of the abdomen. Last tergite truncate apically; pygophor not spined in profile, subcircular, lateral margins a little thickened and flattened.

♀. Frons between the keels, apical part of vertex, posterolateral margin of scutellum very narrowly, dark fuscous. Sternites yellowish, marked with brownish. Pygophor yellowish brown suffused basally with brown, ovipositor yellowish. Tegmina reaching just beyond the apex of the abdomen. Ovipositor narrow and parallel-sided for more than its apical half, basally considerably widened, lateral margins of pygophor subparallel; nebenplatten narrow and oblique. Length  $4\frac{1}{2}$  mm.

HAB. Molokai, 3000 ft. (June, 1 ♂, 1 ♀, Perkins).

This species is very probably now extinct. It is the bulkiest of the Hawaiian Asiracidae.

(13) *Nesosydne palustris* Kirkaldy.

*Nesosydne palustris* Kirkaldy, 1908, op. cit. p. 202, Pl. IV. fig. 7.

♂. Head, pronotum and scutellum sordid brownish yellow, scutellar keels darker, the median suffused; anterior margin of head darker; genae and clypeus with paler keels. Tegmina brownish yellow, hyaline, immaculate except a short, dark stripe on the commissure at the apex of the clavus; also some of the veins dark. Tergites pale brownish yellow, variegated with blackish brown. Legs and sterna pale yellowish. Second segment of antennae two-sevenths longer than the first. Spur with nine spines. There is no continuous subapical transverse line, and the clavus is not completely sutured off from the corium. There are four apical veins, the subcostal cell being acute apically. (In one example, there is a supplementary transverse vein in the interior discoidal cell of one tegmen.) Tegmina reaching not quite as far as the apex of the abdomen. Last tergite deeply acute-angularly emarginate; pygophor in profile with a horizontal spine on the dorsal margin. Length  $3\frac{1}{2}$ — $3\frac{3}{4}$  mm.

HAB. Molokai, 4950 ft. (Sept., Perkins) and 4500 ft. (Sept., Perkins), two ♂♂ on trees in the excessively wet bogs in the highest points of Molokai. This species is also probably extinct now.

(14) *Nesosydne nubigena*, sp. nov.

♂. Closely allied to the last, but smaller. Tegmina reaching to about the middle of the pygophor, with two apical cells only. Spur with eight spines. Length 3 mm.

HAB. Molokai, forest above Pelekunu (July, one ♂, Perkins). Also probably extinct.

(15) *Nesosydne cyathodis*, sp. nov.

Head brownish yellow, the apical margin of frons and genae, clypeus, antennae, legs (except spur), etc., dark fuscous or blackish brown. Tegmina whitish. Pronotum and scutellum fuscous with pale keels. Abdomen blackish with pale spots and a broken pale line down the middle. Tegmina reaching to about three-fourths the length of the abdomen.

♂ pygophor black, styles, etc., black; genital styles in shape somewhat like those of *chambersi*, but more elongate and narrower. Length  $1\frac{1}{4}$  mm.

The nymphs of the last instar are of the same general colour as the adult, but the frons is pale only basally, and the abdomen is rather more marked pallidly.

HAB. Hawaii, Kilauea, 4000 ft. (April, Swezey, Giffard, May, Kirkaldy), on Pukeawe (*Cyathodes tameiameiae*).

(16) *Nesosydne raillardiae* Kirkaldy.

*Nesosydne raillardiae* Kirkaldy, 1908, op. cit. p. 203, Pl. iv. fig. 5.

HAB. Hawaii, Kilauea, 4000 ft. (Swezey) on *Raillardia*.

(17) *Nesosydne chambersi* Kirkaldy.

*Nesosydne chambersi* Kirkaldy, 1908, op. cit. Pl. iv. figg. 10—12.

Yellowish, or pale ferruginous. Tegmina subhyaline, veins mostly concolorous with the prominent brown granules; apical margin of tegmina narrowly suffused with brown, also a very little suffusing round each granule. Each tergite margined apically with dark fuscous. Length 3 mm.

Pl. iv. figg. 11—12 of the work cited above, show the venational discrepancy in the same individual.

HAB. Hawaii, Kilauea, 4000 ft. (April, Swezey).

(18) *Nesosydne argyroxiphii* Kirkaldy.

*Nesosydne argyroxiphii* Kirkaldy, 1908, op. cit. p. 201, Pl. iv. fig. 6, and text-fig. i.

Black; keels of head and nota, a broken, very narrow line down the middle of the abdomen etc., testaceous. Antennae dark fuscous, partly stained with dirty testaceous. Tegmina subopaque, milky, veins fuscous. There are no apical cells and the tegmina do not reach to the middle of the abdomen. Length 3 mm.

The nymphs of the last instar are brownish testaceous, largely suffused with dark fuscous.

HAB. Maui, crater of Haleakala (Oct., Perkins, two ♀♀, Swezey, Terry), on *Ahinahina* (*Argyroxiphium sandwicense*), at about 10,000 ft. Mr Swezey has kindly lent me a male, the only one I have seen, to study the genitalia.

(19) *Nesosydne imbricola*, sp. nov.

♂. Dark fuscous; keels brownish yellow; frons and clypeus with broad brownish yellow median and lateral keels. Antennae and legs brownish yellow, largely suffused with dark fuscous. Exterior half of clavus and apical fourth of tegmina cinereous hyaline, also most of subcostal cell, the rest fumate with one or two small hyaline spots; a spot at apex of commissural area and another at apex of subcostal area, the subcostal vein, etc., dark fuscous. Tegmina feebly granulate, not reaching beyond about three-fourths of the length of the abdomen. Length 3 mm.

HAB. Maui, Haleakala, 5000 ft. (March, April, one ♂, Perkins).

(20) *Nesosydne monticola*, sp. nov.

♀. Black; submedian keels of vertex (and sometimes of the base of the frons) pale. Pronotal keels obscurely pale ferruginous. Tegmina cinereo-hyaline, largely suffused with fuscous (almost altogether except a hyaline transverse stripe near the apical margin); veins mostly dark fuscous. The frons has a few pale specks along the lateral margin and three along the middle keel on each side (the latter sometimes obsolescent). Antennae more or less dark fuscous. A row of pale specks down the middle of the tergites, the apical two or three segments spotted or specked (individually) pallidly. Tegmina reaching to about three-fourths of the length of the abdomen; mostly four apical cells. Length 3 mm.

HAB. Maui, Haleakala, 8000 ft. (April, three ♀♀, Perkins).

## NESOTHOË Kirkaldy.

*Nesothoë* Kirkaldy, 1908, P. H. E. S. I. p. 202, fig. 2.

An endemic genus of ten species, males of which I have seen in three species. It corresponds somewhat to *Chloriona* in the "lamine-spurred" series. Beyond the spur, it differs by the sudden compression of the tegmina at the base of the apical cells, the stronger excavation of the vertex and the union of the submedian keels of the frons closer to the base of the latter. First segment of the antennae not, or scarcely, as long as wide, about one-third of the length of the second segment (typically), which is rather flattened; clypeus tricarinate. Tibial spur subcultrate, compressed, solid, narrow and elongate, with 7—10 strong teeth. In all the species, the frons is marked transversely, more or less clearly, with pale, broken lines and spots. Type *N. fletus*.

The species are separable as follows:

1. First segment of antennae blackish or dark fuscous (or if pale, then the second is blackish) .....(2)
- 1a. Antennae pale .....(6)
2. Frons basally dark with pale markings, apically white .....(3)
- 2a. Frons pale brownish yellow with whitish specks and a whitish suffused blotch in the middle; tegmina brown with a broad white basal band and an extrolateral crescent of the same hue .....1 *fletus* Kirkaldy.
3. Vertex and pronotum white; tegmina immaculate.....2 *hula* Kirkaldy.
- 3a. Vertex and pronotum pale yellowish or brownish; tegmina maculate .....(4)
4. Apical third of tegmen not maculate, some of the veins narrowly suffused .....3 *frigidula* Kirkaldy.
- 4a. Apical third of tegmen irregularly suffused, at least one of the cells smoky ... (5)
5. Tibiae whitish, clearly annulate with brown .....4 *bobae* Kirkaldy.
- 5a. Tibiae brownish yellow, feebly annulate .....5 *perkinsi* Kirkaldy.
6. Apical part of tegmen not blotched.....(7)
- 6a. Apical part of tegmen blotched with brown .....(9)
7. Tegmen with an oblique band near the base .....(8)
- 7a. Tegmen only suffusedly smoky .....6 *laka* Kirkaldy.

8. Larger, tegmina milky .....7 *piilani* Kirkaldy.  
 8a. Smaller, tegmina not milky, face more clearly spotted apically.....8 *terryi* Kirkaldy.  
 9. Second segment of antennae four times as long as the annuliform first .....9 *pluvialis* Kirkaldy.  
 9a. Second segment less than three times as long as the non-annuliform first .....10 *silvestris* Kirkaldy.

These species are distributed as follows :

Kauai : *hula*, *pluvialis*. Oahu : *perkinsi*, *bobeae*, *terryi*. Molokai : *piilani*. Lanai : *silvestris*. Maui : *fletus*, *laka*. Hawaii : *frigidula*.

(1) *Nesothoë fletus* Kirkaldy.

*Nesothoë fletus* Kirkaldy, 1908, op. cit. p. 204.

♂♀. Head and pronotum yellowish, with paler keels, the pronotum fuscous laterally with pale granules; frons with a number of white specks all over the middle third, and a suffused white blotch about the same place; clypeus fuscous. First segment of antennae black, second fuscous. Scutellum brownish ferruginous, with paler keels. Tegmina warm brown, the base broadly white, produced a little on to the clavus, a large crescentic white area on the apical half exteriorly and a few spots apically; veins mostly pale with brownish granules. Sterna and sternites pale. Femora and tibiae piceous; the former pale or sanguineous, basally and apically, the latter annulated with brownish yellow or sanguineous; tarsi pale. Frons slightly more than twice as long as broad, laterally gently rounded. Second segment of antennae scarcely three times as long as the first, somewhat more rounded in profile than the other species, first about as broad as long. Spur with eight spines. Length ♂ 4½; ♀ 4⅔ mm.

The name "*fletus*" is in allusion to the battle of "Ke Paniwai" in 1776, when the Iao River was "choked" with the slain.

HAB. Maui, Western Mts, Iao Valley (March, Perkins, one ♀, and July, one ♂, Swezey). Easily recognized by the broad warm brown band down the white tegmen.

(2) *Nesothoë hula* Kirkaldy.

*Nesothoë hula* Kirkaldy, 1908, op. cit.

♂. Vertex and pronotum white, lateral margins of the latter blackish; base and apex of frons rather narrowly, middle keel, three short transverse lines in the middle etc., white, the rest dark fuscous; genae (except the white apex), clypeus, first segment of antennae, scutellum (except the posterior angle minutely, and a few specks on the posterolateral margins) black, keels of scutellum sometimes ferruginous; second segment of antennae fuscous. Tegmina hyaline, veins on clavus and corium pale, with minute fuscous granules, subcostal veins and veins on membrane fuscous, two or three blackish marks on commissure; marginal vein fuscous. Legs pale, femora longitudinally striped with black. Abdomen apparently mostly black. Frons narrowed basally. Second segment of antennae about three times as long as the first, which is longer than broad. Spur with eight spines.

♀. The black in the male is replaced by yellowish brown, except the first segment of the antennae, and two or three spots on the vertex and a few on the genae, also the marks on the commissure. Sternites pale, ovipositor dark. Length ♂  $4\frac{1}{2}$ , ♀  $5\frac{1}{2}$  mm. Easily recognized by the spotless tegmina and dead white head and pronotum.

HAB. Kauai, high plateau (Aug., Perkins, two ♂♂, two ♀♀, nos. 96 and 631).

(3) *Nesothoë frigidula* Kirkaldy.

*Nesothoë frigidula* Kirkaldy, 1908, op. cit.

♀. Pale (or dark) yellowish brown, paler beneath; apical third, or two-thirds, of frons and specks on the basal part pale; second segment of antennae blackish. Tegmina hyaline tinged with cinereous, feebly granulate, veins almost concolorous, except the subcostal and 2nd—4th apicals, which are fuscous. Near the base of the tegmen there is a broad, suboblique, fuscous band. Wings hyaline, veins fuscous. Length  $4\frac{1}{2}$  mm.

HAB. Hawaii, Kona, over 2000—3000 ft. (Sept.—Oct., 2 ♀♀, Perkins).

(4) *Nesothoë bobae* Kirkaldy.

*Nesothoë bobae* Kirkaldy, 1908, op. cit. text-fig. 2 (venation).

♂ ♀. Vertex and pronotum cinereous, the latter fuscous laterally with pale granules. Frons fuscous, (apically whitish), three or four elongate pale spots medially, the fourth nearly on the apical pale part, and very narrowly ringed with brown; also pale specks laterally. Clypeus fuscous; genae dark fuscous basally, pale apically. Scutellum sordid pale brown, fuscous laterally. Tegmina cinereous hyaline, veins pale, with dark fuscous granules closely set, corium and clavus suffused discally with fuscous, also sparsely on apical cells (especially the middle one), 1st—3rd apical veins suffused with dark fuscous. First segment of antennae black, second dark fuscous. Sterna and legs pale, the latter annulate with dark fuscous. Abdomen dark fuscous mostly. Frons about  $2\frac{1}{3}$  times as long as wide, narrow; lateral margins vertically reflexed. Labium reaching nearly to hind coxae. Second segment of antennae nearly three times as long as the first, which is as wide apically as long. Spur with seven spines. Length 4 mm.

In the male, the penultimate sternite is deeply subangulately emarginate, the last slightly so.

HAB. Oahu, Honolulu Mts. (Dec., 2 ♂♂, Perkins), Tantalus, 1300 ft. (Dec., Giffard, Perkins), on *Bobea*.

(5) *Nesothoë perkinsi* Kirkaldy.

*Nesothoë perkinsi* Kirkaldy, 1908, op. cit.

♀. Vertex, basal two-thirds of frons, base of genae, scutellum, etc. piceous; pronotum dark fuscous; keels, granules, and 15—16 specks on frons—some of which may fuse, forming three short transverse lines—pale brownish yellow. Apical third of

frons and apical  $\frac{3}{4}$  of genae, whitish. First segment of antennae black, second brownish yellow. Tegmina cinereous hyaline, veins pale with fuscous granules, apical veins fuscous, first three suffused; an irregular smoky smudge near the middle of the corium, another on the apical cells interiorly, spreading a little on to the corium. Legs pale brownish yellow, femora marked and tibiae annulated, with brown. Tergites piceous or blackish, sutures pale. Frons scarcely twice as long as broad, lateral margins regularly rounded, frons little wider apically than at the base. Second segment of the antennae more than three times as long as the first. Spur with nine spines. Length ♀  $4\frac{7}{8}$ —5 mm.

HAB. Oahu, Honolulu Mts. (Sept., Perkins, over 2000 ft., Oct., Perkins, 5 ♀♀); Tantalus (1906, Perkins); Palolo (March, 1800 ft., Swezey), on *Myrsine* sp.

(6) *Nesothoë piilani* Kirkaldy.

*Nesothoë piilani* Kirkaldy, 1908, op. cit.

Pale yellow, disk of scutellum fuscous. Vertex and base of frons sordid pale brownish yellow, rest of frons paler and clearer, with scarcely perceptible paler, short, cross lines. Antennae testaceous, extreme apex of first segment partly fuscous. Tegmina milky hyaline, an undulating fuscous line near the base of the tegmen and parallel with it, faintly smoky a little apical of this. Veins mostly pale, apical ones a little darker, granules brown. Legs pale, apex of femora and base of tibiae a little fuscate. Tergites more or less fuscate. Second segment of antennae more than three times as long as the first, which is scarcely longer than wide, lateral margins regularly rounded, frons a little wider apically than at base. Ovipositor dark. Length 5 mm.

HAB. Molokai, 3000 ft. (June, Perkins, 1 ♀ in bad condition).

(7) *Nesothoë terryi* Kirkaldy.

*Nesothoë terryi* Kirkaldy, 1908, op. cit.

Very close to the preceding, but smaller, the frons more clearly spotted apically and the tegmina not milky. Length  $4\frac{1}{4}$  mm.

HAB. Oahu, Waialua, Koolau range (Perkins, 3 ♀♀, no. 428).

(8) *Nesothoë laka* Kirkaldy.

*Nesothoë laka* Kirkaldy, 1908, op. cit.

♀. Pale brownish yellow, scutellum fuscous between the keels. Frons slightly suffused with fuscous, with pale median keels and four specks on each side in a longitudinal row. Tegmina hyaline, tinged with yellowish cinereous, a little smoky in part; marginal vein tinged with sanguineous; other veins pale with closely set, small, fuscous

granules; a small short fuscous line on the corium near the apex of the clavus, the apices of most of the apical veins a little suffused. Legs yellowish white, fore tarsi banded with fuscous. Frons somewhat like that of *N. flatus*. Second segment of antennae about three times as long as the first, which is rather less cylindrical than in the genotype, and which is much shorter than broad. Ovipositor dark. Length 5 mm.

HAB. Maui, Iao Valley, Western Mts. (March, Perkins, 1 ♀).

(9) *Nesothö pluvialis* Kirkaldy.

*Nesothö pluvialis* Kirkaldy, 1908, op. cit.

♀. Pale yellowish (or tinged with sanguineous); keels, three transverse lines—nearly reaching the lateral margins—a few spots on frons etc., paler. Tegmina hyaline, basal half (except the base, etc.) faintly smoky, an irregular brown blotch on the apical cells, apices of apical veins suffused; granulations dark, close; marginal vein sanguineous. Tibiae and tarsi pale, base of femora piceous; femora piceous, apex sanguineous. Tergites partly fuscous. Frons widening towards the apex, about three-fourths longer than wide apically. Antennae like those of the genotype, second segment about four times as long as the first, which is annuliform. Spur with seven or eight spines. Length 4—4½ mm.

HAB. Kauai, Halemanu, 4000 ft. (no. 510, May, Perkins, 1 ♀), and Koholuamano, 4000 ft. (no. 526, April, Perkins, 2 ♀♀); Head of Koloko Ditch, 800 ft. (Oct., Giffard).

(10) *Nesothö silvestris* Kirkaldy.

*Nesothö silvestris* Kirkaldy, 1908, op. cit.

Pale sordid fuscous; the frons with three transverse lines and some specks, and the apical margins narrowly, whitish yellow; genae apically pale; clypeus dark fuscous; antennae brownish white. Tegmina careous hyaline; veins naturally pale, but often suffused with dark fuscous; a curved dark fuscous stripe on the subcostal, extending over the middle three-fourths and touching the radial internally about the middle of the scutellar margin triangularly from this inwards, the corium and a part of the clavus smoky; apical and subapical veins mostly dark fuscous suffusedly, a blotch on the interior part of these cells; granules rather feeble, with pale hairs; subcostal cell pale brownish yellow, except where the curved stripe touches it basally and apically. Femora and tibiae brownish yellow, biannulate with dark fuscous, tarsi dark fuscous. Labium reaching to hind coxae. Spur with eight spines. Frons about twice as long as broad, about as wide apically as basally, lateral margins gently rounded; keels of genae and of frons not meeting apically. Second segment 2¾ times as long as the first, which is longer than broad. Length ♀ 4¾—5 mm.

HAB. Lanai, Koele Mts., 2000 ft. (Jan., Perkins, 2 ♀♀).

## NESODRYAS Kirkaldy.

*Nesodryas* Kirkaldy, 1908, op. cit. pp. 201 & 203.

Somewhat allied to *Megamelus* Fieber, but the basal segment of the antennae is shorter than wide, not more than one-fourth of the length of the thickened second; the hind tibiae are distinctly longer than their tarsi, and the first segment of the latter is more than twice as long as the others together. Veins of tegmina feebly granulate; five apicals, the second and third with a common stalk, fourth forked near apex. Tibial spur solid, narrow, with 4—7 strong spines. Type *N. freycinetiae*. The species of this genus are perhaps the most delicate of all the Asiracidae.

The four species may be separated as follows:

- |     |   |     |                               |
|-----|---|-----|-------------------------------|
| 1.  | Vertex and pronotum each with two small, but conspicuous, dark fuscous spots .....  | 1   | <i>freycinetiae</i> Kirkaldy. |
| 1a. | Vertex immaculate .....   | (2) |                               |
| 2.  | Vertex and pronotum immaculate, pale .....  | (3) |                               |
| 2a. | Vertex black .....  | 5   | <i>dryope</i> , sp. nov.      |
| 2b. | Vertex pale, pronotum dark smoky .....  | 2   | <i>elaecarpi</i> Kirkaldy.    |
| 3.  | ♂ ♀. Pale greenish testaceous; tegmina milky coloured .....   | 3   | <i>giffardi</i> Kirkaldy      |
| 3a. | ♂ ♀. Pale brownish yellow. ♂ tegmina greyish hyaline; ♀ tegmina yellowish hyaline with the interior half pale orange brown, or yellowish fumate ..... | 4   | <i>eugeniae</i> Kirkaldy.     |

(1) *Nesodryas freycinetiae* Kirkaldy.

*Nesodryas freycinetiae* Kirkaldy, 1908, op. cit. p. 203.

♂ ♀. Greenish testaceous (the green often fading locally), or even changing to pale orange brown; clavus and inner half of corium and of membrane, the abdomen, etc., suffused with pale reddish brown (sometimes also pronotum and scutellum). Vertex and pronotum each with a couple of small conspicuous blackish brown spots. Apex of first apical cell and adjoining exterior margin of tegmen, apex of inner apical cell, etc., fuscous. Vertical keels faint. Length ♂ ♀ 4—4½ mm.

The ♂ pygophor has a very long, subascendant, lateral spine on each side; the genital styles are narrow.

The nymphs have been described by Swezey (1908, P. H. E. S. II.).

HAB. Oahu, Honolulu Mts., 2000 ft. (Nov., Perkins, 1 ♀); Pacific Heights ridge, 1500 ft. (May, Swezey); Tantalus, 1300 ft. (Jan., April, Oct., Dec., Giffard), on Ieie (*Freycinetia arborea*); also reported from *Acacia koa*, but certainly in error.

(2) *Nesodryas elaecarpi* Kirkaldy.

*Nesodryas elaecarpi* Kirkaldy, 1908, op. cit.

Head, antennae, etc., greenish testaceous. Eyes blackish grey. Pronotum dark smoky. Labium and legs (except the black tip of the former, and black hind femora and base of hind tibiae) testaceous. Tegmina hyaline with a broad dark fuscous stripe

along the middle; veins not on this stripe testaceous. Wings pale smoky with dark brown veins. Tergites black; sternites mostly pale greenish. Pygophor, etc., black. Length ♀  $4\frac{1}{2}$  mm.

HAB. Oahu, Tantalus (April, 1906, Perkins, Swezey), on *Elaeocarpus bifidus*.

(3) *Nesodryas giffardi* Kirkaldy.

*Nesodryas giffardi* Kirkaldy, 1908, op. cit.

Pale greenish, fading after death. Eyes and claws dark fuscous. Tegmina subhyaline milky, with white hairs; veins greenish testaceous (fading), a short fuscous line at the apex of the commissural cell; the base of the tegmina varyingly narrowly and rather faintly fuscous; interior apical cell usually faintly fuscous. Labium reaching to, or a little beyond, the base of the hind femora. Length ♂ ♀  $4-4\frac{1}{2}$  mm.

HAB. Oahu, Maunawili, 800 ft. (Febr., March, Giffard, Swezey), on *Olona* (*Touchardia latifolia*) and *Cyrtandra grandiflora*; Tantalus (Perkins).

(4) *Nesodryas eugeniae* Kirkaldy.

*Nesodryas eugeniae* Kirkaldy, 1908, op. cit.

♂. Head, pronotum, scutellum and underside pale yellow. Tegmina subhyaline, appearing silvery grey basally owing to the dark body beneath, apical third pale smoky. Wings hyaline, veins dark.

♀. Pale luteous, or pale brownish yellow, testaceous beneath, immaculate; scutellum and tergites pale orange brown. Tegmina with exterior half of entire length more or less hyaline, inner half yellowish fumate, or pale orange brown, veins and granulations pale; sometimes the base of the commissural cell, apices of apical cells, etc., a little fuscous. Ovipositor blackish. Length ♂ 4, ♀  $4\frac{1}{2}$  mm.

HAB. Oahu, Tantalus, 1300 ft. (Perkins; Jan., March, April, Giffard); Palolo (Sept., Swezey) on *Ohia* (*Eugenia sandwicensis*).

(5) *Nesodryas dryope*, sp. nov.

♀. Vertex shining black, also the pronotum (except the varyingly pale brownish posterior margin). Frons, genae, and antennae pale yellowish white, first segment of last partly blackish. Eyes reddish. Scutellum fuscous or blackish. Abdomen above blackish brown. Tegmina hyaline, basal veins colourless, the apical veins, the subcostal, and the veins of the wings, fuscous; an oblique fuscous smudge on the tegmina near the base, a dark fuscous mark near the apex of the clavus. Femora, and tibiae basally, dark fuscous, rest pale. Head dorsally longer than wide, produced a little in front of the eyes; keels strong and well cut; frontal keels uniting close to the base, filiform, not

parallel. First segment of antennae annuliform, second short, not reaching to the base of the clypeus. Tegminal veins feebly granulate, five apicals, the second forked near the base. Spur with 5—6 spines. ♀. Ovipositor scarcely as long as the pygophor. Tegmina reaching well beyond the apex of the abdomen. Length  $3\frac{3}{4}$  mm.

HAB. Oahu, Tantalus (Feb., 1906, Perkins, ♀), ridge near Tantalus (Dec., Swezey, ♂); Kauai, Koloko (800 ft., Giffard, Oct.).

The type is a Tantalus specimen.

Dictyophorodelphax Swezey.

*Dictyophorodelphax* Swezey, 1907, P. H. E. S. I. p. 104.

(1) *Dictyophorodelphax mirabilis* Swezey.

*Dictyophorodelphax mirabilis* Swezey, 1907, op. cit. p. 105; and 1908, op. cit. II. 2, text-figg. 1—4.

Swezey has described and figured the ultimate nymph (1908, l.c.).

HAB. Oahu, Konahuanui, 2200—2500 ft., in mixed sweeping, but probably on sedges (Swezey, Terry, Feb., Dec.).

Fam. CHERMIDAE.

(= Psyllidae auctt. et huj. op. III. p. 113.)

Dr Perkins' collections from 1892—1902 are in the hands, I understand, of Mr E. A. Schwarz. I add only two to my former enumeration, though I took at least ten new species recently during a visit to Kilauea, Hawaii.

HEVAHEVA Kirkaldy (huj. op. III. p. 113).

(1) *Hevaheva monticola* Kirkaldy.

*Hevaheva monticola* Kirkaldy, 1908, P. H. E. S. I. p. 205.

I originally described this from a carded pair taken recently by Dr Perkins at an elevation of about 2000 ft. on Tantalus, Oahu. I have since secured a pair taken about the same place by Mr Swezey.

HAB. Oahu.

(2) *Hevaheva silvestris* Kirkaldy.

*Hevaheva silvestris* Kirkaldy, 1908, op. cit. p. 206.

Described from a single example taken by Dr Perkins on Tantalus; I have since secured another specimen taken at the same place by Mr Swezey.

HAB. Oahu.

## Fam. APHIDAE.

H. S. Barber,  
U. S. National Museum,  
Washington, D. C.

There are apparently no endemic Aphidae in Hawaii. In a recent paper (1907, P. H. E. S. 1, pp. 99—102), I recorded four species, viz.: *Myzus citricidus* Kirkaldy, *Aphis rosae* (Linn.), *Loxerates sacchari* (Zehntner) and *Myzocallis kahawaluokalani* Kirkaldy. Aphids on *Sorghum*, *Sonchus*, Hibiscus and Cabbage, have not been studied sufficiently fully yet, and I recently found another species at Kilauea, Hawaii, on grasses etc. All these are probably introduced.

## Fam. ALEYRODIDAE.

Six species of *Aleyrodes*, none apparently endemic, have been enumerated by Kotinsky in my recent Catalogue of this family (1907, Bull. Board Agric. Hawaii 11.), viz.: *giffardi*, *hibisci*, *kirkaldyi* and *sonchi* of Kotinsky, *vaporariorum* Westwood, and an unnamed species on *Coffea*.

## Fam. COCCIDAE.

Since the first part of this contribution was published, (huj. op. III, pp. 102 etc.), a revised list has been issued (1904, Entom. XXXVII, pp. 226—30, with a bibliography), totalling 53 species, a net increase of five.

**Supplement**  
by **R. C. L. Perkins**

to

**HYMENOPTERA.**

Previously treated in Vol. I.

**HYMENOPTERA.**

In describing numerous additional species of Hawaiian Hymenoptera, I have, for convenience, arranged the genera and species nearly in accordance with Ashmead's Classification, as set forth in Vol. I. pp. 279—281 of this work, and have adopted the superfamily Divisions, as enumerated by him. At the same time, I think it would be more natural to combine the whole of the Aculeata together with the Chrysididae, Bethyridae and the Proctotrupeoidea in one large group, as in fact Sharp has already suggested. Failing this, a greater number of superfamilies, equivalent to those of Ashmead, should be adopted, e.g. one for the Chrysididae and another for the Mymaridae. The latter appear to me to be equivalent to all the other families of the Chalcidoidea taken together. In any case Ashmead's characters for superfamilies and lesser groups need defining anew, for those that he gives are frequently altogether inadequate or incorrect. I need only instance the Chrysididae and Dryininae (Bethyridae) which he places in his Vespoidea, in spite of the fact that hosts of the species have not the thoracic structure he assigns to the superfamily. Similarly some characteristic Sphecoidea have the pronotal angles attaining the tegulae and would be placed in the Vespoidea in accordance with his tables. His characters for the Mymaridae are quite erroneous. In drawing up his generic characters I should imagine that his extraordinarily acute sight led him to almost entirely neglect the precaution of dissecting the smaller forms. The Monograph of North American Proctotrypidae, the most elaborated of his works, suffers greatly from this neglect. Most of the genera, that I have examined, in that group, have quite different mouth-parts from those described by him. It is much to be desired that a thorough revision of Ashmead's tabular classifications should be made by those entomologists, who have access to his collections. It is greatly to be deplored that he should not have lived to accomplish this himself, after having laboured so long and so successfully for the advancement of our knowledge of his favourite Order of insects.

## APOIDEA.

## Fam. PROSOPIDAE.

## NESOPROSOPIS Perkins.

*Nesoprosopis* Perkins, *huj. op. i. p. 75.*

I have made a dichotomous table for distinguishing the numerous species of this large genus. The females I am unable to tabulate at present. Unfortunately one species *N. nivalis*, of which the male is known, was omitted in the table. It would there be identified as *N. anthracina*, from which it is at once distinguished by the unusually long hairs clothing the front of the head and the thorax and the yellow base to the hind tibiae.

Another species, *N. crabronoides*, was not known to me in the male sex, when I made the table, but I have since taken it numerously at Kilauea, the only known locality for this remarkable little insect. It may be included in the following manner:

- |      |   |                         |
|------|---|-------------------------|
| 20.  | Prothorax with yellow marking .....                                     | 20a.                    |
|      | Prothorax without yellow marking .....                                  | 23.                     |
| 20a. | Hind tibiae widely yellow at the base but the tarsi entirely dark ..... | <i>N. crabronoides.</i> |
|      | Hind tibiae or tarsi or both otherwise coloured .....                   | 21.                     |

Synopsis of *Nesoprosopis* 33.

- |    |   |                         |
|----|---|-------------------------|
| 1. | Genital armature with the stipites produced so that in dorsal aspect they extend far behind the apex of the sagittae, more or less membranous apically and forming an apical (often blunt) angle at the end of their inner margin, this apical part being more or less deflexed ..... | 2.                      |
|    | Genital armature usually with the stipites hardly or not at all extending beyond the apex of sagittae in dorsal aspect, their apex well rounded not forming an angle inwardly with the inner margin and not membranous ...  | 5.                      |
| 2. | Posterior tibiae not distinctly whitish or yellow at the base .....   | 3.                      |
|    | Posterior tibiae white or yellow at the base .....  | 4.                      |
| 3. | Stipites of genital armature fringed with hairs right to the apical inner angle ...   | <i>N. simplex.</i>      |
|    | Stipites with hairs on their outer margin, which become very short and inconspicuous or altogether fail near the apex .....   | <i>N. facilis.</i>      |
| 4. | Process of eighth ventral segment with long bifurcation at apex; face not very wide .....   | <i>N. chlorosticta.</i> |
|    | Process of eighth segment without long apical bifurcation; face very wide .....   | <i>N. hirsutula.</i>    |
| 5. | Second segment of the abdomen without a definite puncturation and never with a distinct metallic reflection, species rarely large .....   | 6.                      |
|    | Second segment evidently punctured or with a metallic reflection; species large .....   | 37.                     |
| 6. | Process of eighth ventral segment linear or sublinear, not dilated; face below the antennae never with three widely separated yellow spots .....  | 7.                      |
|    | Process of eighth ventral segment nearly always dilated, at least expanded at its flexure; or if not dilated the face below the antennae bears three widely separated yellow spots .....  | 10.                     |

7. Scape of antennae not much dilated, about twice as long as wide on its broad surface.....8.  
Scape of antennae strongly dilated, subtriangular, not twice as long as wide ...*N. anthracina*.
8. Cheek between the eye and mandible distinct and rather long, plate above the clypeus generally narrow and elongate, basal joint of antennae less arched beneath .....*N. volcanica*.  
Cheek short or very short, plate above the clypeus short; scape more strongly arched beneath .....9.
9. Process of eighth ventral segment without a longish apical bifurcation; pubescence of mesonotum rather long .....*N. difficilis*.  
Process of eighth segment with longish bifurcation: pubescence of mesonotum short .....*N. laeta*.
10. Scape of antennae little or not at all dilated, twice as long as wide or more than twice, face below the antennae wholly or nearly all yellow, at most the post-clypeal plate and the clypeal sutures being black, the yellow colour always continued back above the line of insertion of the antennae along the inner orbits; abdomen never conspicuously ferruginous on the basal segments .....11.  
Scape nearly always distinctly, often strongly, dilated, nearly always less than twice as long as wide; in species, where least dilated, with the hind margin at least strongly curved not very gently curved as in the above group, frequently subtriangular or even subcordiform; face in front of the antennae rarely largely yellow and with this colour produced behind the antennae along the eye-margins and if so then either the hind margin of the scape is quite strongly rounded or the basal abdominal segments are ferruginous .....15.
11. Face wholly yellow in front of the antennae .....12.  
Face not wholly level in front of the antennae, at least part of the post-clypeal plate black, the yellow colour produced back along the eye-margins as a narrowing vitta .....*N. obscurata*.
12. Scape of antenna with a yellow mark apically or with a complete yellow line ...*N. blackburni*.  
Scape not so marked; face elongate .....13.
13. Posterior tibiae yellow with a fuscous stain behind .....*N. flavipes*.  
Posterior tibiae black at most yellow at the base and apex .....14.
14. Face longer, apical margin of post-clypeal plate much shorter than its sides to the antennal fossa .....*N. longiceps*.  
Face shorter, apical margin of post-clypeal plate about as long as its side .....*N. fuitima*.
15. Abdomen not conspicuously ferruginous on the basal segments; at most (as a variation) with a piceous, dull reddish or immature appearance .....16.  
Abdomen conspicuously ferruginous basally .....35.
16. Scape of antennae not arched beneath, its lower edge straight or almost straight .....17.  
Scape distinctly arched beneath .....20.
17. Anterior area of propodeum somewhat coarsely rugose all over .....*N. haleakala*.  
Anterior area at most with short wrinkles in front; species very small .....18.
18. Process of eighth ventral segment not distinctly dilated .....*N. mutata*.  
Process dilated dorsoventrally .....19.
19. A very conspicuous deep black median area behind the antennae .....*N. dumetorum*.  
Deep black area not or hardly noticeable .....*N. angustula*.
20. Prothorax with yellow marking .....21.  
Prothorax without yellow marking .....23.

21. Face extremely wide; the supra-clypeal plate extremely wide and short .....22.  
 Face not wide and transverse; supra-clypeal plate with the apical margin  
 about equal in length to its side as far as the antennal fossae .....*N. kona*.
22. Clypeus for the most part or entirely yellow; wings nearly clear .....*N. kauaiensis*.  
 Clypeus with a yellow spot, wings dusky .....*N. unica*.
23. Yellow markings of face continued up far behind the antennae along the eye-  
 margins as a broad vitta .....*N. inquilina*.  
 Yellow markings rarely continued back behind the antennae and then only for  
 a short distance or as a rapidly narrowing vitta .....24.
24. Face extremely wide and transverse across the eyes in front view; clypeus  
 black, but yellow spots on each side of the face between the clypeus and  
 the eyes are sometimes present .....*N. laticeps*.  
 Clypeus generally yellow-marked, if black the face is not transverse .....25.
15. Scape of antennae very strongly dilated, subcordiform; face below the an-  
 tennae entirely yellow or almost entirely .....*N. flavifrons*.  
 Scape not so shaped, often elongate triangular, the anterior margin not  
 strongly rounded .....26.
6. Clypeus with a large yellow spot or all yellow, sometimes there is a small spot  
 outside the clypeus near to or touching its side margin on each side .....27.  
 Clypeus either with a small yellow spot or entirely black, or if with a large  
 yellow spot or nearly all yellow then there is a large yellow generally more  
 or less triangular-shaped spot between the clypeus and the eye-margin on  
 each side, these spots always distinct from the yellow clypeal spot .....28.
- Wings dusky, hind tibiae not yellow at the base, plate above the clypeus  
 black .....*N. koea*.  
 Wings clearer, hind tibiae yellow at the base, supra-clypeal plate more or less  
 yellow .....*N. vicina*.
- Very small narrow species, with excessively short wrinkles at the anterior  
 margin of the propodeum, the rest of the dorsal surface of which is  
 smooth, except for microscopic surface sculpture; clypeus black, meso-  
 thorax not clothed with dark hairs .....*N. mauiensis*.
- Species not very small and narrow; propodeum generally rugose or rugulose  
 to the brow or nearly; clypeus generally yellow-marked, if black, the  
 mesonotum is clothed with long black hairs .....29.
- Clypeus and sides of face either black or yellow-marked, variable, antennal  
 scape very deeply arched beneath; mesonotum with long erect black  
 hairs .....*N. melanothrix*.
- Antennal scape gently or moderately arched, mesonotum not clothed with long  
 black hairs .....30.  
 Plate above the clypeus always short and wide, wider than long to the point  
 where its sides meet the antennal fossae .....31.  
 Plate above the clypeus as long or longer than wide to the point where its  
 sides meet the antennal fossae .....32.  
 Clypeus only bearing a yellow spot .....*N. comes*.  
 Clypeus below the antennae with three yellow spots .....*N. coniceps*.  
 Clypeus black .....*N. ombrias*.  
 Clypeus yellow or marked with yellow .....33.  
 Clypeus ad posteriorly strongly emarginate, so that the vertex is much shorter  
 medially than at the sides .....*N. sphaecoides*.  
 Clypeus ad lightly emarginate, the length of vertex in the middle and at the sides  
 not greatly different .....34.

34. Wings darker and facial markings generally much smaller .....*N. assimulans*, var. *oahuensis*.  
 Wings clearer and facial markings larger .....*N. assimulans*.
35. Yellow colour of the face continued far behind the antennae as a broad vitta  
 along the eye-margins .....36.  
 Yellow colour if continued behind the antennae forming a narrowing vitta,  
 pointed at its termination .....*N. volatilis*.
36. Scape of antenna pale above anteriorly, mandibles with a yellow line .....*N. hostilis*.  
 Scape entirely pale above, mandibles without a yellow line .....*N. hilaris*.
37. Abdomen ferruginous .....*N. paradoxa*.  
 Abdomen not ferruginous .....38.
38. Scape excessively dilated, the front margin very strongly rounded (prothorax  
 never with a yellow line or spots).....39.  
 Scape not excessively dilated, its front margin at most only gently rounded,  
 prothorax sometimes with a pale line or spots .....40.
39. Scape of antennae strongly transverse, front margin extremely strongly rounded *N. insignis*.  
 Scape less wide and its front margin less strongly rounded .....*N. satelles*.
40. Face dotted with rather short erect black hairs, for the most part evenly,  
 between the antennae and apex of clypeus; two large facial spots below  
 the antennae and sometimes the clypeus also with pale marking .....*N. setosifrons*.  
 Face not so clothed .....41.
41. Prothoracic pale band very broad, hind tibiae almost entirely creamy white,  
 wings very dark with steely iridescence, face black (? always) .....*N. perspicua*.  
 Without some or any of these characters .....42.
42. Wings above (when expanded) fuscous, without conspicuous blue or violet  
 iridescence .....43.  
 Wings with conspicuous blue or violet iridescence.....45.
43. Face below the antennae with pale markings .....*N. anomala*.  
 Face without pale markings .....44.
44. Pronotum with an entire or almost entire pale band .....*N. fuscipennis*.  
 Pronotum rarely with an entire band sometimes all black.....*N. pubescens*.
45. Apical abdominal segments with dark hairs, second ventral segment less raised  
 from the base, pronotum always with an entire or almost entire band .....*N. caeruleipennis*.  
 Apical segments pale-haired, second ventral segment more raised, pronotum  
 black, or with pale spots or a broken band, rarely with an entire one .....*N. pubescens* var.

(1) *Nesoprosopis ombrias*, sp. nov.

Male black, the legs more pitchy, the tarsi paler, the front tibiae yellow in front the flagellum of the antennae dull reddish beneath, clypeus black, a yellow spot on the face on either side of it, probably sometimes absent. Cheek very short, the base of the mandibles nearly touching the eye, the plate above the clypeus not very wide, its apical side about as long as its lateral one to the antennal fossa, the front of the head densely and shallowly punctured. Scape of antennae subdilated, its upper side strongly rounded, about twice as long as its greatest width, seen from in front slightly arched beneath. Mesonotum excessively dull with dense minute surface sculpture, finely and very shallowly punctured, the scutellum more closely. Propodeum with its anterior area entirely rugose. Wings smoky brown, with some blue iridescence. Abdomen less dull than

the thorax, having a very fine and close surface sculpture, and excessively fine indefinite puncturation.

Female, except for the usual sexual differences, like the male in sculpture, etc., the face entirely black, the front tibiae somewhat reddish in front. Mesonotum and scutellum excessively dull, finely and very shallowly punctured and the propodeum rugose as in the other sex. Wings smoky brown. Puncturation of the abdomen excessively fine and feeble or indefinite, apical segment clothed with fuscous hairs. Larger than the ♂. Length 7—10 mm.

Closely allied to *N. assimulans*, but quite easily distinguishable. The female is one of the largest of the species having no well-defined abdominal puncturation.

HAB. Hawaii, Kona district.

(2) *Nesoprosopis flavipes*, Sm.

*Nesoprosopis flavipes* Smith, *huj. op. i. p. 99.*

This is apparently a distinct species, which I have now taken on Hawaii. It is extremely close to *N. blackburni* Sm.

HAB. Hawaii, a coast or low-land species.

Fam. MEGACHILIDAE.

(1) *Lithurgus* sp.?

HAB. Oahu, widely distributed and sometimes abundant. First appeared about 1900.

*SPHECOIDEA.*

(= *Fossores* *huj. op. i. p. 7.*)

Fam. PEMPHREDONIDAE.

Subfam. *PSENINAE.*

*STIGMUS* Jur.

(1) *Stigmus inordinatus* Fox.

*Stigmus inordinatus* Fox.

A single specimen of a *Stigmus* was taken in Honolulu some years ago, but the species has not since been met with. I sent a description to Dr Ashmead of Washington, who informed me that it agreed well with the above, found in California and Colorado.

HAB. Oahu, Honolulu.

## Fam. TRYPOXYLONIDAE.

## TRYPOXYLON Latr.

(1) *Trypoxylon bicolor* Sm.

Identified by Dr Ashmead. It is an Oriental species, not known to occur in 1897, but common in 1900 at Hilo, Hawaii. It has now spread to Oahu and probably to the other islands, as it often nests in furniture, chairs, etc.

HAB. Hawaii, Oahu.

## PISON Spinola.

Vide huj. op. i. p. 14.

(1) *Pison* sp.?

A third species of this genus has been introduced recently and is now very abundant in Honolulu. I find that *P. iridipennis* was common here in 1900, but it is now lost amongst the great numbers of the new species.

HAB. Oahu, Honolulu.

## Fam. CRABRONIDAE.

In the Trans. Ent. Soc. London, 1902, p. 145 et seq. I divided the Hawaiian Crabronids into five groups or genera, including *Nesocrabro*, already characterized in this work.

*Xenocrabro* includes all the species other than those previously referred to *Nesocrabro*, excepting *Crabro abnormis* now *Oreocrabro*, *Crabro tumidoventris* now *Hylocrabro*, and *Crabro curtipes* now *Melanocrabro*. The species assigned to *Xenocrabro* are clearly very closely allied to the common European species called *Crabro* or *Solenius vagus*, and I believe the other Hawaiian forms are all related to or derived from *Xenocrabro*.

## NESOCRABRO Perkins.

*Nesocrabro adspectans*, Blackb.

*Nesocrabro daemonius* Perkins, huj. op. i. p. 28.

Having seen the types of *N. adspectans*, I see no specific characters to distinguish *N. daemonius*.

*Nesocrabro rubrocaudatus*, Blackb.

*Nesocrabro bidecoratus* Perkins, huj. op. i. p. 27.

As I anticipated, this is nothing more than a very remarkable variety of the above species.

## Fam. EUMENIDAE.

## PSEUDOPTEROCHEILUS Perkins.

*Pseudopterocheilus* Perkins, Ent. Mo. Mag. xxxvii. p. 266.

To this genus belong the following species.

*Pseudopterocheilus pterocheiloides*, P.

*Odynerus pterocheiloides* P., huj. op. i. p. 69.

*Pseudopterocheilus congruus*, Sm.

*Odynerus congruus* Smith, huj. op. i. p. 69.

*Pseudopterocheilus relictus* P.

*Pseudopterocheilus relictus* P., Proc. Hawaii Ent. Soc. i. p. 63; not *Odynerus relictus* P., huj. op. i. p. 74.

OBS. There is found on the coast of Kauai a species, the male of which is almost inseparable from *P. congruus* and *P. hawaiiensis*. Until the female is discovered, it, however, would be rash to consider it as being identical with either of these species, as the males of *Pseudopterocheilus* exhibit specific differences much less strongly than the females.

## CHELODYNERUS P.

*Chelodynerus* Perkins, Tr. Ent. Soc. London, 1902, p. 136.

*Chelodynerus chelifer*, P.

*Odynerus chelifer* P., huj. op. i. p. 70.

*Chelodynerus* P., Proc. Hawaii Ent. Soc. i. p. 68.

## NESODYNERUS P.

*Nesodynerus* Perkins, Ent. Mo. Mag. xxxvii. p. 277.

The following species mostly referred originally to *Odynerus* belong to my genus *Nesodynerus*.

*Nesodynerus rudolphi*, D. T.

*Odynerus rudolphi* D. T., huj. op. i. p. 46.

*Nesodynerus conifer*, P.

*Odynerus conifer* P., huj. op. i. p. 38.

*Nesodynerus dilatatipes*, P.

*Odynerus dilatatipes* P., huj. op. 1. p. 37.

*Nesodynerus vittativentris*, P.

*Odynerus vittativentris* P., huj. op. 1. p. 65.

*Nesodynerus cooki*, P.

*Odynerus cooki* P., huj. op. 1. p. 64.

(1) *Nesodynerus paractias* P.

*Nesodynerus paractias* P., Pr. Hawaii Ent. Soc. 1. p. 73.

*Nesodynerus oblitus*, P.

*Odynerus oblitus* P., huj. op. 1. p. 74.

*Nesodynerus eupteryx*, P.

*Odynerus eupteryx* P., huj. op. 1. p. 47.

(2) *Nesodynerus optabilis* P.

*Nesodynerus optabilis* P., Proc. Hawaii Ent. Soc. 1. p. 61.

This species has not been described at length, but only distinguished by such characters, as are given in my tables of the species of *Odynerus* of the island of Oahu. It is superficially somewhat like *N. rudolphi*, *Odynerus montanus*, *O. unicus* and others from Oahu.

Black, shining, wings deeply infuscate and with purple iridescence. Clypeus impressed at the apex and distinctly emarginate. Head shining, puncturation inclining to be rugose. Mesonotum with the larger punctures very sparse and irregular, the finer ones between these distinct, irregular and not dense, parapsidal furrows complete and distinct; scutellum finely and sparsely and rather indefinitely punctured, propodeum nearly smooth, shining, trenchant at the sides. Basal abdominal segment shallowly and remotely punctured, second very convex, subtuberculate in dorsal aspect; beneath, the costae moderate, the depression subtriangular, distinct, but not deep. Wings with the two recurrent nervures about as distant from each other, as the first is from the basal lower angle of the second cubital cell, distance from second recurrent nervure to the apical lower angle of the cell rather greater than the distance between the recurrent nervures; the second cubital cell is wider above, less triangular, than in *N. rudolphi*.

HAB. Oahu, Waialua district, outside the forest, flying over ferns.

*Odynerus iopteryx* P.

*O. iopteryx* Perkins, *huj. op.* i. p. 63.

*O. illudens* P., *Ent. Mo. Mag.* (2) XII. p. 267.

The unique specimen, on which I described *O. iopteryx*, was a somewhat abnormal example.

HAB. Oahu; widely distributed, coast and mountains.

*Odynerus acoelogaster* P.

*O. acoelogaster* P., *huj. op.* i. p. 65.

*O. relictus* P., *t. c.* p. 74.

*O. lithophilus* P., *Ent. Mo. Mag.* (2) XII. p. 267.

*O. lithophilus*, *Pr. Hawaii Ent. Soc.* i. p. 72.

The original description was based on an abnormal example; *O. relictus* was founded on a very old unique specimen in the British Museum from the Beechey collection. The proper description of this variable species is in the Proceedings of the Hawaiian Entomological Society as cited above. The original name is fortunately quite applicable to the species in all its varieties.

*Odynerus egens* P.

*O. egens* P., *huj. op.* i. p. 61.

*O. infaustus* P., *t. c.* p. 73.

The latter described from a very old specimen of the Beechey collection is no doubt identical with *O. egens*.

(1) *Odynerus thersites*, sp. nov.

Black, teeth of mandibles more or less red, sometimes a spot behind the eyes and a median frontal spot yellow. Wings hyaline and subinfusate, with a bluish or violaceous iridescence in some lights. General appearance that of *O. peles*, but the clypeus is quite deeply emarginate and bidentate; the head above the antennae with excessively dull surface and a very scanty and feeble, in fact hardly discernible puncturation. Mesonotum excessively dull, with remote and very faint punctures, the propodeum rugose. Basal segment of the abdomen with largish but shallow punctures, the second simply convex, beneath the costae well-developed, the depression not defined but represented by a faint median impressed line. Male; length 6—8 mm.

An overlooked species, very likely previously confounded by me with the variable *peles*, but nevertheless distinct.

PP. <sup>1</sup> AB. Hawaii in the mountains at 4000 ft. or more.

F. H.

*Odynerus peles* P.

*O. peles* P., *huj.* op. 1. p. 39.

The puncturation of this species varies a good deal in intensity and I do not feel sure that, even after the segregation of *O. thersites* described above, there are not more than one species under the name of *O. peles*. Specimens taken in wet districts at moderate elevations of two or three thousand feet and others found below the 1000 ft. line are generally more strongly punctate than those taken at 4000 ft. and upwards.

(2) *Odynerus lipocharis*, sp. nov.

Black, the first abdominal segment inconspicuously or interruptedly margined with yellow. Wings very darkly infuscate and with blue iridescence. Clypeus impressed at apex and bidentate, but only slightly emarginate, closely punctate. Front very closely rugosely punctate. Mesonotum coarsely and closely punctured, the interstices between the coarse punctures shining and punctulate; scutellum strongly punctured. Propodeum rugose, the side-margins explanate. Basal abdominal segment strongly and closely punctured, second segment very strongly tuberculately raised, highest point rather in front of the middle of its length; beneath with rather shallow, but distinct, depression, the middle costae long. Male; length 11 mm.

Allied to *O. konanus*, *hiloensis* etc., and superficially unlike any other Kauai species, as well as being quite distinct structurally.

HAB. Kauai, near Lihue, at no great elevation above the sea.

(3) *Odynerus subegens*, sp. nov.

Very like *Odynerus egens* P., but readily distinguished by the puncturation of the thorax, which, though very fine and feeble, is distinct. The apex of the clypeus is not red.

HAB. Hawaii, 4000 ft.

The following species of *Odynerus* have been described by me since the publication of Vol. 1. pt. 1 of this work, in the Proc. Hawaii Ent. Soc., Vol. 1. pp. 70—74 and in the preceding tables, pp. 61—70.

(4) *Odynerus homocophanes* P.

*O. homocophanes* P., t. c. p. 70.

HAB. Oahu.

(5) *Odynerus eucharis* P.

*O. eucharis* P., t. c. p. 71.

HAB. Oahu.

(6) *Odynerus pseudochromoides* P.*O. pseudochromoides* P., t. c. p. 71.

HAB. Oahu.

(7) *Odynerus paludicola* P.*O. paludicola* P., t. c. p. 71.

HAB. Oahu.

(8) *Odynerus paranaia*s P.*O. paranaia*s P., t. c. p. 71.

HAB. Oahu.

(9) *Odynerus epipseustes* P.*O. epipseustes* P., t. c. p. 72.

HAB. Oahu.

(10) *Odynerus tempe* P.*O. tempe* P., t. c. p. 72.

HAB. Maui.

(11) *Odynerus monas* P.*O. monas* P., t. c. p. 73.

HAB. Molokai.

(12) *Odynerus aprepes* P.*O. aprepes* P., t. c. p. 73.

HAB. Maui.

(13) *Odynerus xerophilus* P.*O. xerophilus* P., t. c. p. 72.Represents on Oahu the *O. scoriaceus* P. of Hawaii and the *O. molokaiensis* of the intermediate islands.

HAB. Oahu.

(14) *Odynerus acyanus* P.*O. acyanus* P., t. c. p. 63.

HAB. Oahu.

The following species were described in the Trans. Ent. Soc. London, 1902, pp. 131—140.

(15) *Odynerus cypris* P.*O. cypris* P., t. c. p. 138.

HAB. Hawaii.

(16) *Odynerus entretus* P.*O. entretus* P., t. c. p. 138.

HAB. Hawaii.

(17) *Odynerus holomelas* P.*O. holomelas* P., t. c. p. 138.

HAB. Hawaii.

(18) *Odynerus crypterythrus* P.*O. crypterythrus* P., t. c. p. 139.

HAB. Hawaii.

(19) *Odynerus newelli* P.*O. newelli* P., t. c. p. 139.

HAB. Hawaii.

(20) *Odynerus mesospilus* P.*O. mesospilus* P., t. c. p. 140.

HAB. Hawaii.

## Fam. BETHYLIDAE.

Vide p. 282 huj. op. Tom. I.

The Hawaiian species of *Scleroderma* and *Sierola* are endemic, those of *Holepyris* are introduced and usually found in houses. One or two other genera also occur in houses or more rarely outside, being parasitic on insects attacking grain or seeds, while one is parasitic on the minute beetle, *Hypothenemus eruditus* Westw.

(1) *Scleroderma euprepes*, sp. nov.

Head black, two basal joints of antennae, the legs, and the pronotum yellow, rest of the antennae sordid yellow or infuscate, the rest of the thorax brown, very dark at the sides, along the anterior margin of the propodeum, abdomen dark brown.

Head much wider than the thorax, with minute microscopic reticulation, which prevents it from being very shining, and some sparse feeble punctures, sparingly pilose. Length of eye about half the distance from its upper edge to the occiput. Antennae

rather long, the pedicel about as long as the two following joints together, the third a little longer than the fourth, none of the funicle joints being at all strongly transverse. Thorax duller than the head, similarly sculptured, the propodeum and pronotum subequal, the former widening posteriorly and impressed along its front margin. Abdomen much more shining than the thorax and as long or rather longer than the head and thorax together. Length, ♀ 4.25 mm.

HAB. Kauai, 4000 ft.

(2) *Scleroderma poecilodes*, sp. nov.

Head dark brown, pronotum yellow, rest of thorax dull brown, the propodeum more or less yellowish. Abdomen brown at base and apex, the intermediate segments black or nearly so, the apical margins being pale, the basal segment yellowish at the sides basally. Legs with the femora and tibiae brown, more or less yellow-tinged, the tarsi paler, yellowish. Antennae yellow, the flagellum with the joints more or less sordid or darkly annulate.

Head shining, much wider than the thorax, with very fine reticulate sculpture of the surface, the eyes about half as long as the distance from their upper margin to the occiput; antennae stout, the pedicel about as long as the two first funicle joints, the funicle joints short and most of them strongly transverse. Thorax much duller than the head, similarly but rather more strongly sculptured, and like it sparsely pilose, the proportion of the parts much as in *S. euprepes*; abdomen shining, with very fine but evident sculpture of the surface, as long or rather longer than the head and thorax together. Length, ♀ 3 mm.

HAB. Oahu; near Honolulu, 1500 ft.

(3) *Scleroderma chlorodes*, sp. nov.

Head yellowish brown or testaceous, the thorax a little paler, yellow, legs entirely pale, concolorous with the thorax or almost so. Abdomen with the basal and apical segments more or less pale, being brown or rufescent, the intermediate segments black or blackish brown with pale apical margins. Scape and pedicel of the antennae yellow, the rest also yellowish, but infusate, or with dark annulations.

Head somewhat, but not much, shining, owing to the surface sculpture, and bearing a few very fine feeble punctures; antennae shortish and thick, formed much as in *S. poecilodes*, with the funicle joints mostly very short and transverse. Thorax dull, propodeum a good deal wider posteriorly than on its anterior margin. Abdomen more shining than the thorax, but with the surface sculpture distinct, sparsely pilose, about as long as the head and thorax together. Length, ♀ 3 mm.

HAB. Oahu; Waianae mountains.

(4) *Scleroderma sophorae*, sp. nov.

Head and thorax brown, rarely altogether concolorous, the prothorax usually being distinctly paler (more yellowish) than the sordid parts behind it, the head too (except anteriorly) is more often concolorous with the paler pronotum, than with the mesonotum and propodeum. Antennae entirely pale, the funicle joints with fuscous rings. All the legs are yellowish-tinged, but they are for the most part of a dark colour, brownish or sordid, with yellow tarsi. The basal segment and tip of the abdomen are brown or yellowish brown, the intermediate segments black or dark brown, with the apices somewhat widely pallid. When the intermediate segments are paler than usual, the basal segment is always paler still (more yellowish).

Head very long and narrow, parallel-sided, the eyes only about one-third as long as the distance from their upper margin to the occiput; the surface appears smooth, the minute reticulation, distinct enough under high powers of the compound microscope, being invisible under a very strong lens; on the thorax, however, the reticulation can be distinguished with the latter, appearing as an excessively fine puncturation or shagreening. The antennae are short, the funicle joints for the most part strongly transverse, the pedicel as long as the two next joints together. Abdomen more shining than the thorax, and as long or a little longer than the latter and the head together. Length, ♀ 2.5 mm.

HAB. Hawaii, 4000 ft.; bred from the dead wood of *Sophora*.

OBS. It is clear to me from the examination of this species and from others, of which I have seen a number of examples obtained in company, that slight differences of colour are not of specific value in this genus. Further, the abdominal segments are subject to retraction and I suspect that Ashmead's *S. breviventre* is an unnaturally contracted specimen.

## SIEROLA Cameron.

(1) *Sierola dichroma*, sp. nov.

Female black, the lower part of the face, the head about the posterior angles, the pronotum and mesonotum ferruginous, legs, scape of antennae and mandibles paler, yellow testaceous or whitish, rest of antennae infusate or sordid, abdomen brown-black, paler in parts.

Male ferruginous, a dark cloud about the ocelli, a black transverse one along the scutellar and propodeal suture, the base and about five transverse indefinite fasciae on the abdomen dark, mandibles whitish, legs pale yellow, base of antennae clear yellow, the rest more sordid or brownish.

Head in both sexes very broad, the temples rounded, the surface dull and coriaceous and with distinct, remote, shallow punctures. Antennae moderately long, the

flagellar joints moniliform, not transverse, the pedicel and first funicle joint cylindrical, the former slightly the longer, both being decidedly elongate. Thorax not quite so dull as the head, the mesonotum with shallow sparse punctures, the rest almost impunctate, but with minute surface sculpture. Wings subinfusate, stigma and parastigma dark fuscous, the veins lighter, but still dark. Abdomen smooth and shining, the apical margins impressed so as to make large angular emarginations in the surface of the segments in the middle. Length 3—3.5 mm.

In some examples the abdomen is nearly uniformly dark brown.

HAB. Oahu; 1500 ft. and upwards.

#### HOLEPYRIS Kieff.

##### (1) *Holepyris? hospes*, sp. nov.

Black, the antennae and legs ferruginous, the coxae mostly dark brown, the front femora posteriorly and the hind ones outwardly more or less infusate or darkened, mandibles, clypeus, apical abdominal segment, and the impressed margin of the pronotum also ferruginous.

Clypeus with a longitudinal median carina, head dull, finely and not densely, but distinctly, punctured, eyes pilose. Antennae 13-jointed, the pedicel subequal to or rather longer than the first funicle joint; joints of the funicle mostly subequal and a little longer than wide. Pronotum as long as the mesonotum and scutellum together, very dull and very finely punctured, the punctures of unequal size. Mesonotum much shorter than the scutellum, the latter with a transverse basal impression, both dull and finely punctured; propodeum longer than the mesonotum and scutellum together, abruptly truncate posteriorly, the truncation margined; a median raised line reaches right through to the truncation, on each side of this are two other lines, which do not attain the truncation, and between all these lines the surface is shagreened; external to these lines, between the outer ones and margined sides of the propodeum the surface is obliquely rugulose. There is a well-developed tooth on the underside of the claw of the anterior tarsi near its middle. Wings hyaline, venation yellow, stigma divided in the middle by a white space, so as to form a prostigma, at least not much less developed than in *Sierola*. Abdomen smooth and shining, the apices of the segments except the first pale. Length, ♀ 4.5 mm.

HAB. Oahu; Honolulu.

Obs. This species seems to me certainly congeneric with *Epyris hawaiiensis* Ashm., which Kieffer refers to his genus *Holepyris*. *E. hawaiiensis* is a domestic species, common in houses, and rarely seen outside. It is certainly introduced, as also is *H. hospes* now described.

## Fam. COSILIDAE.

## SIEROLOMORPHA Ashm.

(1) *Sierolomorpha hospes*, sp. nov.

Female black, smooth and shining, legs, except the coxae, which are more or less dark, tip of abdomen, apex of clypeus, second and third antennal joints all pale-coloured, yellowish brown or testaceous; scape of antennae dark brown but paler at base and apex, antennae except the above-mentioned joints sordid, but more or less reddish-tinged; wings infusate, stigma fuscous.

Head smooth and shining, very remotely and sparsely punctured, the ocelli in a triangle widest at base, antennae 12-jointed, scape rather short, the pedicel subovate and subequal to the first funicle joint, which is decidedly shorter than the second, apical joint much longer than the preceding one. Thorax very sparsely punctate and sparingly pilose, smooth and shining except the impressed front of the pronotum, parapsidal furrows subconvergent posteriorly, not reaching the front margin of mesonotum; scutellum with a deeply impressed transverse line in front; propodeum with a transverse costate sulcature in front and a median rough triangular area, the rest smooth. Abdomen smooth and shining, very sparsely pilose and punctate. Wings with only one cubital and two discoidal cells bounded by true nervures, the second recurrent nervure and the second of the transverse cubiti indicated only by white lines, the first transverse cubitus also incomplete above. Length 4 mm.

Ashmead figures the wing of the type of this genus, Bull. U.S. Nat. Mus. XLV. Pl. iv. fig. 2, as *Sierola* Cam.? Kieffer assigns *Sierolomorpha* to the Bethylidae, as Ashmead did originally, removing it later to the Cosilidae.

HAB. Oahu, Honolulu, 1906.

## PROCTOTRUPOIDEA.

## Fam. CERAPHRONIDAE.

## Subfam. CERAPHRONINAE.

## CERAPHRON Jur.

(1) *Ceraphron plebeius*, sp. nov.

Black, the scape of the antennae and the legs except the coxae brownish yellow or testaceous, the front femora more or less darker, brown.

Head and thorax very densely finely punctured or shagreened; pedicel of the antennae elongate, longer than the next joint, which is itself elongate and longer than the following one; second, third and fourth funicle joints small and short, the following ones a good deal larger than these and subequal, and not evidently transverse; scutel-

lum distinctly shining and smoother posteriorly; posterior lower angles of the propodeum spinose. Wings hyaline and lightly infuscate, radius given off from the marginal vein before the apical third of the length of the wing. Second abdominal segment longitudinally costate on about its basal third, for the rest polished and impunctate. Length, ♀ 1—1.5 mm.

HAB. Oahu; Honolulu.

(2) *Ceraphron abnormis*, sp. nov.

Ferruginous, the apex of the scape of the antennae black, as well as all the other joints, excepting that the pedicel may be somewhat pale. Abdomen with a dark transverse basal band, and the apical segments also black or dark, this colour beginning usually about the middle of the large second segment.

Head dull densely sculptured, shagreened, scape of antennae attenuate towards the apex, pedicel in the ♂ very small, the first flagellar joint about three times as long as wide, a little longer than the following, which are subequal; pedicel in the ♀ elongate, rather more than half as long as the very elongate first funicle joint, which is double the length of the second funicle joint; subapical joints of the funicle rather longer than wide. Thorax densely punctate, or shagreened, the scutellum smooth and polished posteriorly, the metanotum prominently angulate in the middle. Abdomen with long regular longitudinal costae at the base, for the rest smooth and shining, glabrous, the head and thorax bearing a very short pubescence. Length about 2 mm.

It is doubtful whether this insect is a true *Ceraphron*, as it has the parapsidal furrows distinct, at least in front. According to Ashmead's definition of the group it differs from all *Ceraphroninae* in that the maxillary palpi are three-jointed, and there are two distinct spurs on the hind tibiae. The generic characters are as follows:

Head transverse; ocelli in a small subequilateral triangle, the lateral ones very remote from the eye-margins, the eyes pubescent, not nearly reaching the mandibles. Mandibles bidentate, maxillary palpi with three elongate and subequal joints, the first broadest basally, the second near the middle and the third subtriangularly dilated. Labial palpi very short, with an elongate pilose joint and probably a short basal one before this. Antennae of ♂ long, filiform, 11-jointed, subattenuate apically; in the ♀ 10-jointed and with subclavate flagellum. Mesonotum with the parapsidal furrows marked by punctate lines, which usually fail before reaching the hind margins; medio-dorsal grooved line complete and distinct. Axillae triangular, large, meeting inwardly, marked off from the scutellum, which is acutangular in front, by crenate lines. Posterior tibiae with two distinct calcaria. Marginal vein linear, less than one-third of the length of the long curved radius, separated by a pale spot from the submarginal. Abdomen with the second segment forming most of its surface, and costate at the base.

HAB. Oahu and one or more of the other islands; introduced from North America, as I have collected it in California. Swezey discovered it to be a parasite on Dryinids, *Haplogonatopus* and *Echthrodelfax*.

Fam. SCELIONIDAE.

Subfam. TELENOMINAE.

(1) *Telenomus despiciendus*, sp. nov.

Black, the scape dark brown, pale beneath, and also above at the base, the legs yellowish or testaceous, the tibiae and femora, seen from above, sometimes more or less darker or sordid, the pedicel of the antennae more or less brown. Head and mesonotum not much shining, closely and finely sculptured or punctate, the face polished, with a few microscopic punctures. Antennae with the pedicel obconical and much longer than the small third joint, three following joints all small and short and not differing much from one another, the seventh joint is a good deal larger than these, but still is much smaller than the eighth, which with the three following may be said to form the club. Scutellum smooth and shining, lower lateral angles of the propodeum not prominent. Basal abdominal segment and the second at the base regularly longitudinally rugose, the latter segment much longer than its basal width and except at the base polished. Front wings with short apical cilia. Length, ♀ 6 mm.

HAB. Oahu; Honolulu.

*Telenomus rhopali*, sp. nov.

Closely allied to *T. despiciendus*, the structure of the antennae being in most respects similar.

Black, with black antennae and dark legs, which are black or in part dark brown; knee-joint of front legs, apex of tibiae more or less, and the base of tarsi paler; extreme base of middle and hind tibiae, and the basal joint or two joints of their tarsi yellowish. Antennae with the pedicel about as long as the two following short joints together; the seventh joint is transverse, and considerably larger than the very small sixth joint, but much smaller than the eighth, which with the three next forms a four-jointed club. Sculpture of abdomen as in *T. despiciendus*. Length, ♀ 6 mm.

The male closely resembles the female, excepting that the antennae are not clavate, the pedicel is not longer than the third joint, the latter and the two following being longer than the sixth and following joints, which are short and subquadrate, the apical joint pointed and much longer than the penultimate. Legs sometimes paler than in the ♀, dark sordid brown or pitchy, and the tarsi etc. more clearly and extensively yellow.

HAB. Oahu; parasitic in eggs of *Rhopalus hyalinus*, but in no wise related to the other species of *Telenomus* infesting these eggs.

(3) *Telenomus paractias*, sp. nov.

Black, the scape of the antennae and legs clear testaceous, the tip of the scape and of the tarsi infusate, pedicel a little pallid, at least apically. Wings lightly infusate, neurulation rather pallid, the fringe of front wings moderately short.

Head polished in front, on the vertex dull, densely and minutely punctured; pedicel of the antennae obconical, rather shorter than the slender and elongate third joint, fourth rather similar to the third, subequal to it or slightly shorter, fifth much shorter than the fourth and wider, sixth and following short, subquadrate, wider than the fifth, so as to form a fairly distinct six-jointed club, the apical joint being smaller than the preceding and pointed. Mesonotum finely punctured, sparsely pilose, lower posterior angles of the propodeum prominent. Basal abdominal segment regularly longitudinally rugose, the second with short regular wrinkles at the base, and forming the greater part of the dorsal surface, much longer than its basal width, smooth and shining. Length, ♀ 1 mm.

HAB. Honolulu; parasitic in eggs of *Rhopalus hyalinus*.

(4) *Telenomus adelphus*, sp. nov.

Extremely like *T. paractias* and only distinguishable so far as I can see by the more widely darkened apex of the scape of the antennae, the more confusedly rugose basal abdominal segment and chiefly by the antennal structure. Though the length of the antennal joints is nearly similar in either species, in *T. adelphus* the club is only 5-jointed, the sixth joint of the antennae being not very different from the fifth, while the seventh is much wider than the former.

The male of this species is known to me, and in general resembles the female, but the scape is dark pitchy except at the base and the hind and middle tibiae are more or less darker, the former at least being somewhat infusate above. Antennae filiform, pubescent, 12-jointed, the scape a good deal shorter than the elongate third joint, the latter slightly shorter than the fourth, the fifth also shorter than the latter, the following joints tending to decrease in length to the apical one, which is longer than the preceding and pointed.

HAB. Oahu, 1500—2000 ft.

(5) *Telenomus vulcanus*, sp. nov.

Black, the tarsi brown or obscure, wings hyaline, iridescent, subinfusate, clearer at base. The head is not very much wider than the thorax, and both are sparsely clothed with white hairs and are punctate. The sculpture of the mesonotum under high powers of the microscope is seen to consist of scattered punctures, and of very delicate reticulate lines, which are not close enough to prevent the surface from being shining; under

similar powers the rugosity of the basal abdominal segment and the transverse costate impression at the base of the second can easily be seen, but under a strong lens the sculpture is seen with difficulty.

The antennal club may be said to be four-jointed, since the seventh joint of the antennae is notably smaller than the eighth, though likewise notably larger than the sixth; the pedicel is ovate or obconical, and much wider and also longer than the third antennal joint, which is elongate and about twice as long as wide, the third does not differ much in length from the second, the penultimate joint is about as long as its greatest width. The cilia of the front wings are rather long, the longest being about half the length of the width of the wings, where widest. Abdomen narrow, elongate and subparallel-sided. Length ♀ .8 mm.

The male has filiform-moniliform antennae, the pedicel and first funicle joint about equal, the latter, in one aspect, more than usually wide, with the sides rounded, subequal in length to the next, which is narrower, the apical joint pointed, and one and a half times as long as the preceding.

This species is remarkable for its narrow elongate form.

HAB. Hawaii; Kilauea.

#### Subfam. BAEINAE.

The two following species do not agree with the subfamily characters, as given by Ashmead, since they possess a quite distinct postmarginal vein. They are easily separated from each other as follows:

- 1 (2). Abdomen petiolate, posterior ocelli close to the eye-margins ..... *Pseudobaeus*.  
 2 (1). Abdomen sessile, posterior ocelli very remote from the eye-margins ..... *Dyscritobaeus*.

These insects are certainly introduced; they are found in gardens in Honolulu, in company, usually, with introduced species of bugs. I suspect they are egg-parasites of these, but theoretically they should be bred from eggs of spiders.

In *Dyscritobaeus* I have considered the segment, which is apparently the first and fits close to the propodeum as the second, as I believe a preceding segment exists, but is not readily observed.

#### PSEUDOBÆUS, gen. nov.

Head as wide or wider than the thorax, eyes pubescent, lateral ocelli close to the eye-margins. Antennae of the ♂ filiform, moniliform, 12-jointed; of ♀ 7-jointed, with large solid club, several lines of hairs no doubt indicating the effaced articulations. Mesonotum with the parapsidal furrows indicated only posteriorly. Wings pubescent, shortly fringed, basal nervure present, but faint, marginal vein shorter than the stigmal, the latter oblique, but not extremely so, knobbed at the tip, rather shorter than the postmarginal, which bears three or four bristly long hairs, similar to those regularly disposed on the marginal and submarginal veins. Abdomen petiolate, the basal segment

much narrower than the second segment at apex or than the metanotum, second segment narrow at base and smaller than the third segment, which is the largest.



*Dyscritobaculus*, front wing.



*Pseudobaculus*, front wing and female antenna.

(1) *Pseudobaculus peregrinus*, sp. nov.

Male: head and thorax dark brown or blackish, abdomen brown more or less suffused with black or very dark brown, the first segment always paler, yellowish brown; scape of antennae more or less yellowish brown, legs for the most part sordid.

Female much lighter brown than the male, the thorax darker than the face, the abdomen with dark margins, scape in front concolorous with the face or nearly so, the flagellum more sordid, legs testaceous.

Head punctured, the face smooth and shining, impunctate, mesothorax and scutellum closely punctured, clothed with short white hairs, lower posterior angles of propodeum prominent or spinose. First and second abdominal segments longitudinally striate, the third with excessively fine striae. Antennal scape of ♂ about as long as the four following joints together, pedicel evidently smaller than the first funicle joint, which is longer than the following, the second to sixth being roundish, small and subequal; seventh, eighth and ninth rather larger, the apical joint elongate, acuminate. Scape of female long, cylindrical, longer than the pedicel and funicle together, pedicel longer and larger than the first funicle joint, which is evidently longer than wide and about equal to the three following joints together, these being very short or transverse; club ovate, equal to the scape in length. Length .75 mm.

HAB. Oahu, Honolulu.

DYSCRITOBACULUS, gen. nov.

Male: head fully as wide as the thorax, the eyes pubescent, the vertex concave behind, the ocelli in a triangle, widest at the base, but the outer ones are very remote

from the eye-margins and often difficult to see. Antennae filiform 12-jointed. Mesonotum without furrows. Marginal vein of front wings shortish, shorter than the postmarginal, which is well developed, rather longer than the stigmal, the latter knobbed at the apex, very oblique or almost longitudinal in direction, originating about the middle of the length of the wing; marginal, submarginal and postmarginal veins with regular series of bristles; front wings shortly fringed, the cilia longest near the apex of the dorsal margin, basal nervure not defined. Abdomen very wide at base adapted to the propodeum, sessile, the second and third segments not differing greatly, or the latter rather longer.

(1) *Dyscritobaeus comitans*, sp. nov.

Male black, with whitish pubescence, the scape of the antennae in front, the legs, the whole of the second abdominal segment, the third at least on its basal portion yellowish brown or testaceous.

Head dull, appearing very densely punctate or shagreened, antennae with the scape extended about as long as the whole insect, the pedicel subtriangular, about as long as the first funicle joint, the latter and all the following not differing much in appearance, appearing slightly longer than wide, apical joint acuminate and longest. Thorax dull, closely punctate (under high powers of the microscope the sculpture is seen to consist of punctures and a reticulation of fine lines) metathorax a little angulate in the middle. Second and third abdominal segments longitudinally striate, the former more strongly and distinctly than the latter. Length 7.5 mm.

HAB. Oahu, Honolulu; in company with the preceding, which it very closely resembles superficially.

BAEUS Hal.

(1) *Baeus persordidus*, sp. nov.

Dark pitchy brown, the head almost black, the abdomen rather paler than the thorax, legs infusate or sordid yellow, paler than the body, hind tarsi yellow above, the tips dark.

Head much wider than the thorax, somewhat shining and smooth, very finely and not closely punctured; thorax and abdomen finely punctured and clothed with short white hairs. Hind tibiae long, but not twice as long as the tarsi, basal joint of the latter about equal to the three following together. Abdomen very strongly decurved, in dorsal aspect the second segment forms nearly the whole visible surface.

The antennae have an elongate ovate club, rather longer than all the funicle joints and the pedicel together; the latter is nearly as long as all the funicle joints, which are very short, the first being the longest. Length (♀) 5 mm.

HAB. Oahu; about 2000 ft.

Subfam. *SCELIONINAE*.*OPISTHACANTHA* Ashm.(1) *Opisthacantha dubiosa*, sp. nov.

Black, the mandibles, scape of the antennae wholly or in part and all the legs yellowish brown or testaceous, abdomen often distinctly brownish on the basal portion, rarely black. Head and thorax with white pubescence, both very densely and roughly sculptured, but the head more finely than the thorax; postscutellum in profile appearing as a short spine projecting over the propodeum. First segment of the abdomen short, strongly transverse, much shorter than the second, both of these strongly longitudinally striate, third as long as the two preceding together, and much more finely longitudinally striate, the following segments excessively finely punctured.

Antennae of the male filiform moniliform, the pedicel extremely small, the first funicle joint decidedly longer than those following, which are short, but not transverse, and do not differ much from one another, apical joint longer than the preceding and pointed.

Antennae of female with a large six- or seven-jointed club, as long or longer than the pedicel and funicle joints together, pedicel about as long as the first funicle joint, which is longer than the following. The basal of the seven joints, which appear to me to form the club, may really belong to the funicle. Length about 2 mm.

Differs from the type of *Opisthacantha* in the total absence of parapsidal furrows and the want of a basal cell. Ashmead appears to have seen specimens agreeing in these respects with the above (vide his classifications). Although he describes the third abdominal segment as "a little longer" than the second, he figures it as being much longer.

HAB. Oahu; males very common in company with introduced bugs.

*ANTERIS* Först.(1) *Anteris montana*, sp. nov.

Female: black, the abdomen for the most part, the funicle of the antennae dark fuscous or pitchy, scape of antennae and legs testaceous, the pedicel of the former and coxae of the latter being darker, or more brown; scutellum with the margin testaceous.

Head pubescent, densely punctate; first funicle joint of antennae much longer than the pedicel, and rather longer than the second, which like the third is elongate; the latter about as long as the next two together, the fourth being rather longer than the fifth and not transverse; basal joint of the club wider than long and much less wide than the next joint. Mesonotum and scutellum dull and very finely punctured, the postscutellum prominent and angulate in the middle posteriorly, propodeum rugulose-punctate, its inferior lateral angles minutely dentate, the superior ones slightly prominent.

Wings slightly yellowish tinged, the neuration yellowish, the stigmal vein paler. Abdomen with the basal segment regularly strongly striate, the second much more finely striate and crenate along the basal margin, the third very finely rugulose punctate or subaciculate, the following very minutely punctured and hardly shining. Length 2.75 mm.

The male, which no doubt belongs to this female, agrees very closely with it in sculpture, but is generally more elongate. The antennae are filiform, becoming attenuate apically, the pedicel is very small, the funicle joints are subequal in length, mostly about twice as long as wide, the apical joint much longer than the preceding and pointed. Hind coxae and hind and middle tibiae dark brown or dark fuscous, much darker than in the female. Allied to *A. perkinsi* Ashm. but with different sculpture of the abdomen and slightly different in other points.

HAB. Oahu; in the mountains, the male commoner than the female.

(2) *Anteris oahuensis*, sp. nov.

Female: head black, the mesonotum ferruginous, scutellum, except the margin, postscutellum and propodeum more or less darkly infusate, abdomen obscure dark brown. Antennae testaceous, the funicle more sordid, the club nearly black. Legs yellow, tarsi appearing darker from the clothing of black hairs.

Head somewhat coarsely sculptured, punctate and transversely rugose, funicle joints of antennae slender, the first three not differing much in length, and each several times as long as wide, fourth joint much shorter than the third, but considerably longer than wide, basal joint of club not at all strongly transverse, and only a little narrower than the following. Mesonotum and scutellum very finely punctured, postscutellum longitudinally rugose, with rounded well-raised posterior margin, not at all angulate; propodeum emarginate posteriorly, its hind margin raised. Basal segment of the abdomen striate and with a smoother median elevation on its basal half, second more finely striate, third and fourth still more finely so, fifth and sixth very finely punctured. Wings lightly infusate, veins yellow. Length 3.5 mm.

HAB. Oahu; near Honolulu, 1800 ft.

CALOTELEIA Westw.

(1) *Caloteleia elegans*, sp. nov.

Ferruginous, the funicle joints of the antennae, the scape, legs, base of second and of the terminal abdominal segment paler in colour, more yellow, but these parts themselves are not uniform in tint. Five apical joints of the antennae, third, fourth and fifth abdominal segments, most of the second and the apical part of the sixth, black. Pedicel of the antennae and basal club joint more or less infusate, but not black, apex of

posterior femora also dark. Head well rounded in front and emarginate behind, the eyes pubescent, not nearly attaining the mandibles. Scape of antennae long, cylindrical, pedicel small, nearly equal to the first funicle joint, which is longer than the second, the latter about as long as its greatest width, club with six joints, transverse except the apical one, the basal one pale; mandibles bidentate.

Head and thorax quite dull, with dense, excessively minute sculpture, propodeum excavated and carinated on each side of the excavation. Front wings blackish smoky, with two transverse white bands, one considerably before and the other just beyond the marginal vein, the area between these pale bands is the darkest part of the wing. The wings are very narrow (petiolate) on less than the basal half, marginal vein short, thickish, the stigmal knobbed at the tip, the postmarginal difficult to see, but longer than the stigmal. In some aspects a basal cell can be traced, but the nervures are very faint. Parapsides of the mesonotum evident. Basal abdominal segment longer than wide, its sides subparallel, the large suberect, shagreened basal process, attaining the postscutellum; second segment elongate narrow at base, longer than the third, longitudinally striate. Third segment, wider than long, much longer than fourth, smooth, polished and impunctate, sixth only half the width of the base of the fifth, about as long as this and the fourth together, pointed at apex. Female: length 2.25 mm. Remarkable for the petiolate wings.

HAB. Oahu, Honolulu; certainly introduced.

(2) *Calotelia exul*, sp. nov.

Black, the mandibles and scape of the antennae, except more or less of the tips of each of these, testaceous or ferruginous, pedicel also more or less pale, legs testaceous.

Head and thorax very densely and finely sculptured, dull, the mesonotal parapsides distinct. Pedicel of antennae about as long as the first funicle joint which is longer than either of the three following short joints, club six-jointed. Wings hyaline faintly clouded, neuration dark, basal cell faintly indicated, postmarginal vein longer than stigmal. Propodeum concave and carinate on each side. First abdominal segment dull, shagreened, the process, fitting the propodeal concavity, smoother, the extreme apex of the segment smooth; second segment crenate at base and with some delicate striae reaching to about the middle of the length of the segment on its disc, otherwise smooth and shining, like the third, to which it is about equal in length, or rather longer; apical segment very narrow subtriangular, longer than the preceding. Female: length 2.5 mm.

HAB. Honolulu; no doubt introduced.

## Fam. PLATYGASTERIDAE.

## INOSTEMMA Hal.

(1) *Inostemma abnormis*, sp. nov.

Black, the tegulae brown, the abdomen dark brown, legs flavotestaceous, coxae browner. Wings hyaline, pubescent. Head dull, lateral ocelli extremely close to the eye-margins. Mesonotum dull, with dense minute sculpture, under high powers of the microscope showing a reticulation of fine lines; posteriorly between the parapsidal furrows, which are distinct, the sculpture is less fine, and there are three short raised lines. Scutellum consute at the base, shagreened, propodeum with a spinose angle on each side. Basal abdominal segment rugose, its erect process reaching about to the dorsal surface of the thorax, but not extending over it, this process on its upper part densely covered with small pointed or spinose elevations; second segment with a basal sculptured depression, longer than all the following segments together and, except at the base, smooth and shining. Length 1.6 mm.

The single example I have seen is in poor condition and deprived of its antennae. Its generic position is uncertain, but clearly it is very near to *Inostemma*, even if it does not actually belong there. It is the only Platygasterid yet found in the islands, excepting the very abnormal genus *Aphanomerus*, introduced by myself and Koebele to destroy the eggs of *Siphanta*. *Aphanomerus pusillus*<sup>1</sup> is now thoroughly established.

HAB. Oahu, near Honolulu.

## Fam. DIAPRIIDAE.

## PHAENOPRIA Ashm.

(1) *Phaenopria frater*, sp. nov.

Black, smooth and shining, impunctate, the scape and pedicel of the antennae red, the latter sometimes only red-tinged, all the legs ferruginous, the front tibiae and all the femora usually more or less obscured and darker than the hind tibiae and tarsi.

Head with sparse pale hairs, the eyes small, very slightly convex, the ocelli in a nearly equilateral triangle. Antennae about two-thirds the length of the insect, the scape about equal to the following four joints together, the first flagellar joint distinctly longer than the second, longer but not so thick as the pedicel, the flagellar joints gradually widening to the tip of the antennae, but without a definite club, except that the apical joint is as long as the two preceding and wider than these. Pronotum rather densely hairy, the scutellum without a fovea in front, but with the axillae marked off, the propodeum conspicuously hairy towards the sides, and bearing a strong median carina, which seen in profile is bent into a distinct angle near the base. Petiole of the

<sup>1</sup> *Aphanomerus* would probably be more correctly referred to the subfam. Baeinae, p. 620 ante. R. C. L. P.

abdomen sometimes reddish, with dense clothing like the propodeum, the abdomen itself elongate-ovate, the second segment about twice as long as all the following together. Wings with the thickened or punctiform marginal vein blackish fuscous.

HAB. Oahu; 1500—2000 ft.

(2) *Phaenopria soror*, sp. nov.

Very like *P. frater*, but differing in the colour of the antennae, the scape being almost black above, except at the tip; in the darker colour of the legs, the clavate portion of the hind tibiae being darkly infuscate; and in the more elevated and sharper basal angle of the median carina of the propodeum and the rather larger club joint of the antennae.

HAB. Hawaii, Kilauea; taken while ovipositing in larvae of a species of *Drosophila*.

(3) *Phaenopria subtilis*, sp. nov.

Extremely like *P. soror* and *P. frater* and variable in colour.

Black, polished, the legs and more or less of the antennae being red. Scape sometimes wholly red or partly or all except the base and apex suffused with black or dark brown; pedicel and flagellum sometimes wholly pale, the former and some of the basal joints of the latter always red beneath, though nearly the whole flagellum may be dark above. Legs sometimes to a considerable extent embrowned.

Antennae with the pedicel thicker and as long or rather longer than the first funicle joint, the latter a little longer than the second, the funicle joints being mostly small and longer than wide to about the sixth joint, the seventh, eighth and ninth are notably wider than the preceding, the two latter appearing in some aspects fully as wide as long or even somewhat transverse, the apical joint or club about as long as the three preceding together or at least not much shorter. Basal abdominal girdle of yellow hair very dense; carina of propodeum in lateral aspect with its anterior angle not very prominent. Length 1.5—1.7 mm.

HAB. Oahu; Koolau range, 1500 ft. and above.

(4) *Phaenopria ambulator*, sp. nov.

Female reddish brown or castaneous, the head and the abdomen except at the base black or nearly so; the antennae black; the scape and pedicel more or less red-tinged, the legs ferruginous or brownish yellow.

Head with the sides slightly convergent behind the eyes basally, sparsely clothed with pale hairs, the eyes small; ocelli absent; antennae not much shorter than the whole insect, scape about as long as the four following joints, the pedicel and first flagellar joint nearly equal, the latter much longer than the second, the joints widening towards the apex of the antennae, there being no definite club; the penultimate joint

subquadrate, about as long as its greatest width, the apical joint ovate, just as long as the two preceding together, but not quite twice as long as its greatest width. Head, thorax and abdomen smooth and polished, the head sparsely pilose; the pronotum, propodeum and abdominal petiole with dense pale ochreous wool-like hair. Neck when exposed coarsely transversely rugose. Scutellum distinct, not impressed at base, the axillae not defined. Wings quite rudimentary, mere filaments, clothed like the propodeum and easily overlooked. Abdomen ovate, pointed at apex, the second segment twice or more than twice the length of all the following together.

Male closely resembles the female; the antennae are longer, being as long as the whole insect, the first and second flagellar joints elongate, the second being distinctly longer than the pedicel, most of the following joints roundish and moniliform.

Var. *a*. Smaller, the scape and pedicel concolorous with the legs, the abdomen brown, black only apically and at the sides, the head also less black.

HAB. Oahu; 1500—2000 ft.

(5) *Phaenopria montana*, sp. nov.

Black, the legs rufotestaceous, the antennae red, becoming darker apically so that towards the tips they are black or almost so; thorax sometimes dark brown or pitchy, a little rufescent in front.

Smooth and shining, the antennae formed much as in *P. ambulator*, the third joint quite strongly elongate, decidedly longer than the pedicel. Posterior part of thorax very densely covered with appressed yellowish hair, the abdomen with a rather conspicuous clothing of subdecumbent pubescence. When seen from in front it is noticeable that these abdominal hairs are more or less directed towards the middle line from each side. Length 2 mm. Readily distinguished from *P. ambulator* by colour and abdominal vestiture.

HAB. Honolulu mountains, about 2000 ft.

(6) *Phaenopria hylaea*, sp. nov.

Closely allied to *P. ambulator*. Head, thorax, two basal joints of the antennae and the legs ferruginous or testaceous; abdomen and the flagellum of the antennae black.

Head smooth, flattish above, and thinly clothed like the thorax and abdomen with short erect hairs. Antennae much shorter than those of *P. ambulator*; the pedicel is rather wider and longer than the following joint, which is subelongate, the fourth and following joints are small and nearly round, while those preceding the apical one are strongly transverse, the latter conic-ovate and shorter than the two preceding together. Thorax and abdomen smooth and shining, the hairy covering of the posterior part of the former yellowish, and less dense than that of *P. ambulator*. Length 1.5 mm.

HAB. Honolulu mountains, about 2000 ft.

## DIAPRIA Latr.

(1) *Diapria drosophilae*, sp. nov.

Black, the thorax, abdominal pedicel and sometimes the second segment more or less red or dull red, in the ♂ the thorax is sometimes nearly black or only slightly reddish tinged; antennae in the ♀ red excepting the dark club, in the ♂ the two basal joints only are wholly yellow or red, but the basal stalk of the other joints is usually red, legs yellow with the apical joint of tarsi dark.

Head smooth and shining, with sparse long hairs, and a patch of pale pubescence along the sides of the occipital margins. Antennae of the male very long, the pedicel not as long as the first funicle joint, which is much shorter than the following and lacks the long basal stalk, the second and following joints of the funicle are subequal, each with a very thin stalk, as long or longer than the thickened apical part of the joint, which bears a whorl of long hairs; the apical funicle joints are noticeably shorter than the basal ones, the terminal joint being the smallest of all. Antennae of ♀ short, with well-marked three-jointed club, the pedicel much larger and longer than the first funicle joint, which with all the following joints is elongate or subelongate, the seventh funicle joint is noticeably wider than the preceding, but still much less wide than the basal joint of the club. Thorax polished and bearing sparse long hairs, the pronotum densely clothed with appressed hair; scutellum foveated at the base, propodeum with a median carina forming a projecting angle anteriorly, in lateral aspect, pubescent on each side. Abdominal petiole short, about as long as wide in the ♀, rather longer in the ♂, hairy and with appressed pubescence; the rest of the abdomen smooth and polished. Wings subinfusate, the cilia shortish. Length about 2 mm.

HAB. Oahu, Honolulu; commonly parasitic on introduced species of *Drosophila*.

(2) *Diapria xenica*, sp. nov.

Male black, the two basal antennal joints and all the legs yellow.

Head globose, polished, clothed with sparse pale hairs; antennae with the funicle moniliform and with whorls of long hairs, the pedicel very much shorter than the first funicle joint, which is subequal to the second, these two being the longest, but the latter is more incrassate, and in one aspect concave on one side, convex on the other, the following joints have at the most a very short stalk and are ovate, the several subapical joints being shorter than the basal ones and nearly round, the terminal joint somewhat shorter than the two preceding together. Thorax smooth and polished, sparsely clothed with erect hairs, the prothorax with a pubescent collar, the scutellum with a basal impression; propodeum dull, with a median carina. Wings hyaline, pubescent, with rather short cilia, the stigma yellow. Abdominal pedicel hardly longer than wide,

dull, hairy and pubescent, the rest of the abdomen smooth and polished. Length about 1.5 mm. ♂.

Possibly this species should be referred to Ashmead's genus *Ceratopria*.

HAB. Oahu, Honolulu; no doubt introduced.

#### CHALCIDOIDEA.

The endemic Chalcids are chiefly, if not solely, represented by the Families Miscogasteridae, Encyrtidae, Eulophidae, and possibly a few species of Pteromalidae of the subf. Spalanginae. In these families only a few genera are represented by native species, but there are a good many unquestionably introduced ones, represented each by only one or a few species. New forms are constantly appearing in Honolulu, having been accidentally introduced with plants from other countries, or in some cases purposely for economic reasons.

Two or three species of Chalcididae have been recently introduced and one has now become a very common insect and will soon, no doubt, be ubiquitous.

#### Fam. EURYTOMIDAE.

##### EURYTOMA Ill.

##### (1) *Eurytoma* sp.?

HAB. Oahu, Hawaii and probably all the islands. A recent introduction now common, parasitic on various Braconids.

##### ISOSOMA Walker.

##### *Isosoma* spp.?

Two species of this genus occur in foreign grasses and are now widely distributed in the islands.

#### Fam. ENCYRTIDAE.

##### Subfam. EUPELMINAE.

In addition to the species described below I know two or three other species of Eupelmines, all introduced and not yet determined.

##### EUFELMUS Dalman.

The species of this genus are numerous in the islands and I suspect that Ashmead included many species under the two names *E. vulgaris* Ashm. and *E. flavipes* Cam. To these two species he assigned the whole of my numerous specimens, excepting nine individuals, of which five were named *E. konoae*, the other four each representing a

distinct species. *E. niger* Ashm., *xanthopus* Ashm., and *molokaiensis* seem all to be very easily distinguished and have not again been met with. *E. hawaiiensis* Ashm., and *E. flavipes* Cam. could hardly be recognized without inspection of the type, with any certainty, and the same might be said of *E. vulgaris* Ashm. I have made no attempt to include these in my tables, in fact it could not possibly be done, since characters of essential importance are not mentioned in the descriptions. As far as Ashmead's "table" is concerned, I may say that examples bred from such distinct hosts as bees of the genus *Prosopis*, cocoons of *Chrysopidae*, eggs of *Orthoptera*, etc. (each of the parasites, bred from these, forming a distinct species) would run down to *E. flavipes* Cam.

One may doubt whether all the Hawaiian species rightly belong to one genus, but at present until the genera of Eupelmine Encyrtids are thoroughly revised I do not care to detach any from the genus *Eupelmus*. The impossibility of the use of the hairs on the eyes for generic separation is obvious on examination of the Hawaiian forms, since all conditions between conspicuously hairy eyes, and those on which only a few hairs can be detected with difficulty, under high powers of the microscope, are to be found.

Unfortunately the males cannot be associated with their females except by breeding, and they are likely to prove more difficult to separate than the latter. All the males I have bred, that belong to females with almost entirely yellow legs, have the legs dark. Ashmead, however, refers the males with dark legs to similarly coloured females, males with pale legs to females so coloured, and his determinations are certain to prove erroneous in many of these cases.

Of course not too much stress can be laid on the metallic colouration of the head, thorax, etc. in determining species, yet in some cases this colouration is very fairly constant. The dichotomous table, which I have made, not without considerable trouble, would probably fail anyone attempting to name isolated species, but will I believe prove to be of considerable assistance to the worker, after he has given a good deal of time to the preliminary study of a fairly representative collection. To see the characters properly it is necessary to relax and manipulate all the specimens, so that the parts are well exposed for examination.

#### *Synopsis of species (females).*

- |   |                    |
|---|--------------------|
| Wings smoky black, white for a short distance basally, scape of antennae distinctly dilated (apical joint of maxillary palpi dark)..... | 1.                 |
| Wings uniformly hyaline, at most faintly yellow-tinged or infuscate; scape simple .....   | 2.                 |
| 1. Hind tarsi with the two apical and (excepting the base and apex) the two basal joints dark above.....                                | <i>setiger.</i>    |
| Hind tarsi with a band on the basal joint, and the apical joint black .....   | <i>subsetiger.</i> |
| 2. Palpi pale .....   | 3.                 |
| Palpi dark .....  | 17.                |

3. Scape of antennae to a large extent and the mesopleura yellow .....*E. rhynogoni*.  
Scape dark, yellow at most at the base above, mesopleura not yellow ...4.
4. Facial impression above the interantennal elevation black, blue-black, or purple-black, more or less shining, at least in some aspects, finely shagreened or quite smooth, never extremely dull and densely and evenly shagreened over its whole surface.....5.  
Facial impression generally metallic, of various hues, but very rarely as above, the surface very dull, conspicuously and densely shagreened, generally shallow.....11.
5. Front and hind femora black or metallic green or blue-black, the apices only yellow .....6.  
Front and hind femora largely or entirely pale or the hind femora only pale...7.
6. Head brilliantly shining.....*E. xestias*.  
Head not very polished, owing to minute surface sculpture .....*E. axestias*.
7. Hind tarsi blackish or dark fuscous above .....8.  
Hind tarsi pale .....9.
8. Front femora black, metallic .....*E. ombrias*.  
Front femora yellow .....*E. parombrias*.
9. Ovipositor black and very short .....*E. dysombrias*.  
Ovipositor pale, except at base .....10.
10. Facial impression smooth and highly polished .....*E. xestops*.  
Facial impression only somewhat shining, being feebly shagreened.....*E. paraxestops*.
11. Facial impression dark, blue-black or purple-black, and the sides of the face between the impression and the margins of the eyes also with purple or purple-red reflections .....*E. axstops*.  
Facial impression of various metallic tints, as also the sides of the face adjoining it, rarely the impression itself is of a dark obscure tint and only slightly metallic .....12.
12. Scape with a clear yellow or brownish yellow band at the base .....13.  
Scape without a yellow band at base.....14.
13. Abdomen (except basally) largely of a very dull red or rosy colour and excessively densely shagreened, the surface being very dull .....*E. rhodias*.  
Abdomen nearly uniformly metallic and in some aspects shining.....*E. xanthodorus*.
14. Very large species 5 mm. or more; mesonotum extremely dull and densely sculptured, its colour for the most part dull metallic coppery, posterior femora dark and metallic outwardly in the lower part, the posterior tibiae infuscate outwardly.. .....*E. cupreps*.  
Smaller species without some or any of the above characters .....15.
15. Front femora dark and metallic posteriorly except at the apex and more or less dark in front also at the base; eyes rather conspicuously hairy under a strong lens .....*E. orbitates*.  
Front femora yellowish or brown, eyes very little hairy.....16.
16. Front tibiae yellow, not at all dark or metallic, mesonotum mostly vivid green...*E. oreias*.  
Front tibiae metallic and usually distinctly darkened above; mesonotum more golden or brassy green .....*E. chrysopinus*.
17. Antennae short and thick, basal funicle joints short not or only a little longer than wide.....41.  
Antennae slender, several of the basal joints of funicle elongate and much longer than wide .....17 a.
- 17a. Ovipositor hardly exerted behind the abdomen .....43.  
Ovipositor well exerted .....18.

18. Facial impression blue-black or with purple reflections, always shining in certain aspects, often nearly smooth, more or less deep and narrow...19.  
 Facial impression rarely black or with purple reflections, usually green, golden or of other metallic tints, densely and evenly shagreened all over, quite dull, more or less wide and often shallow .....26.
19. Ovipositor black or dark fuscous above, at most a little pale apically .....20.  
 Ovipositor largely pale, being at least partly yellow or dull reddish.....24.
20. Front femora for a large part or altogether yellow or yellowish brown .....21.  
 Front femora dark, pitchy and metallic, or metallic black, at most pale at the tips .....23.
21. Larger, legs except front and hind coxae clear brownish yellow, the hind femora a little metallic outwardly .....*E. monas*.  
 Smaller, legs more or less darkened or sordid in various parts .....22.
22. Middle tibiae brown above, except at base and apex .....*E. asthenes*.  
 Middle tibiae pallid yellowish throughout .....*E. parasthenes*.
23. Front tibiae above uniformly dark or pitchy, metallic .....*E. leptophyas*.  
 Front tibiae black or metallic black and brightly yellow at the apex .....*E. epilamprops*.
24. Facial impression above with a strong median carina .....*E. dryas*.  
 Facial impression above with at most a faint trace of a carina .....25.
25. Legs brownish yellow or yellowish brown .....*E. peles*.  
 Legs pallid yellow .....*E. chloropus*.
26. Ovipositor as long as the abdomen .....*E. euoplias*.  
 Ovipositor shorter than the abdomen .....26a.
- 26a. General colour of the front and hind femora and tibiae dark or black metallic green, the base and apex usually yellow .....27.  
 General colour of these parts yellow or brownish yellow, at most somewhat darkened and metallic above or outwardly .....34.
27. Middle femora dark brown or pitchy above and beneath (excepting at the extreme base and at the apex) and hardly metallic; ovipositor black, at most pale at the extreme tip .....*E. pelopus*.  
 Middle femora pale beneath, usually more or less dark only on the posterior face; ovipositor in some species pale to a considerable extent medially, yellow or obscure reddish .....28.
28. Middle tibiae almost uniformly pale and not, or hardly perceptibly, metallic above; ovipositor black .....*E. melanacrias*.  
 Middle tibiae more or less darkened and metallic above over a considerable portion of their surface, or if not very noticeably darkened, the ovipositor is more or less pale, at least dull reddish in part .....29.
29. Ovipositor black .....*E. epimelas*.  
 Ovipositor pale, yellowish, reddish or obscure red in the middle .....30.
30. Abdominal pleura with wide dark bands, that are hardly metallic, separated by metallic bands .....*E. chalcoprepes*.  
 Abdominal pleura nearly uniformly metallic.....31.
31. Intermediate abdominal segments metallic blue or green with narrow, dark and hardly metallic apical margins.....*E. caerulophanes*.  
 Intermediate abdominal segments above dark blackish fuscous, dull bluish black or purple-black, with bright metallic tints, at most, only at the extreme base .....32.
32. Head in front aspect between the front ocellus and the facial impression hardly shining or dull, densely sculptured; mesonotal ridges red or rosy metallic.....33.

- Head in front above the facial impression rather shining and smoother ; mesonotal ridges not reddish ..... *E. heterosomus*.
33. Smaller ; marginal vein yellow, nearly uniform in colour and like the stigmal ; facial impression sordid metallic..... *E. rhododorus*.  
Larger ; marginal vein infusate, much paler at the extreme base, darker than the stigmal ; facial impression green metallic ..... *E. amauroses*.
34. Scape of antennae yellow or brownish yellow basally ..... 38.  
Scape not yellow at the base ..... 35.
35. Ovipositor very short about half the length of the hind tarsi ..... *E. achreiodes*.  
Ovipositor more than half the length of the hind tarsi..... 36.
36. Front tibiae at most a little browner and slightly metallic above..... *E. aporostichus*.  
Front tibiae with a dark conspicuous metallic line above ..... 37.
37. Middle tibiae with a dark metallic line above ; facial impression brightly metallic green or golden ..... *E. eustichus*.  
Middle tibiae at most a little deeper brown above and not or hardly metallic ; facial impression of sordid metallic colour ..... *E. pelodes*.
38. Fully the basal half of the scape of antennae yellow ..... *E. hemixanthus*.  
Less than half of the scape yellow ..... 39.
39. Front tibiae above yellow without a conspicuous dark metallic line ; abdominal pleura brightly metallic basally, dark apically ..... *E. pauroxanthus*.  
Front tibiae above with a dark metallic line ; abdominal pleura not so coloured, very dull and densely sculptured ..... 40.
40. Mesothoracic pleura with distinct green metallic tint in part ..... *E. leucothrix*.  
Mesothoracic pleura without distinct green tint ..... *E. paraleucothrix*.
41. Mesonotum medially fine metallic green, the ridges purple and strongly contrasted with the other ..... *E. basileius*.  
Mesonotum without these strongly contrasted colours..... 42.
42. Middle tibiae above dark and metallic except at the extreme base and at the apex ; hind tarsi black or dark above, except at the base ..... *E. melanotarsus*.  
Middle tibiae above only somewhat sordid in the middle ; hind tarsi mostly yellow ..... *E. xanthotarsus*.
43. Hind femora and tibiae dark, the latter yellow apically ; middle legs entirely yellow, excepting the tips of the tarsi..... *E. dysoplias*.

(1) *Eupelmus setiger*, sp. nov.

Very dull, the head and thorax very densely shagreened and clothed with short, thick, white, subappressed setae. Head posteriorly with a greenish metallic tinge in front of this obscure coppery; mesonotum posteriorly dark fuscous, very little metallic, in front and externally to the ridges dull reddish, scutellum and axillae still more conspicuously red, mesopleura with a dull green tint in the middle. Abdomen shining metallic red at the extreme base, for the rest dull bluish or greenish black and densely sculptured, its sides with white setae like those of the thorax. Legs for the most part purplish black, the knee joints pale, basal joint of the front and middle tarsi pale at base and the former also at the apex, second and fourth joints of front tarsi brownish above, third yellow, fifth black ; third and fourth joints of middle tarsi yellow, hind tarsi like the front ones with third joint entirely yellow, the second and fourth

brown. Ovipositor white, black on more than its apical third, and also at the extreme base.

Head with the facial impression shallow, dull, densely shagreened, not defined above; eyes distinctly pubescent, scape of antennae dilated, the basal part of the funicle metallic green or golden green and densely clothed with appressed white hair, apical two or three joints of funicle and the club not so clothed, black and only slightly metallic. Wing smoky blackish, with a white band near the base, neuration sordid yellowish. Ovipositor short, about as long as the first two or three joints of the hind tarsi. Length ♀ 3 mm.

A robust species, very unlike any other, except the following, and probably not a true *Eupelmus*.

HAB. Hawaii, Kilauea.

(2) *Eupelmus subsetiger*, sp. nov.

Extremely like the preceding in colour, clothing and sculpture, but only about half the bulk, length 2 mm. Front tarsi with the basal and apical joints dark, the rest yellow, hind tarsi with the basal joint widely pale at base, and narrowly at the apex, the three following joints yellow, the apical joint dark, ovipositor black at extreme base, lightly infuscate apically.

HAB. Oahu, on the coast.

(3) *Eupelmus rhyncogoni* P.

*Eupelmus rhyncogoni* Perk., Proc. Hawaii Ent. Soc. 1. p. 132.

HAB. Oahu; 1200 ft. and upwards.

(4) *Eupelmus xestias*, sp. nov.

Head above with brassy and red reflections, smooth and shining, with some feeble punctures; facial impression deep purplish black, smooth and shining with a median carina above, palpi pale yellow or whitish. Antennae elongate, clavate, the first two funicle joints elongate and the longest, the third stouter than the second, but longer than wide, the apical joints transverse; scape with bright metallic green reflection. Mesonotum golden, with redder reflections in the front and on the scapulae, very finely shagreened and with scattered punctures. Front and hind coxae, front and hind femora, except at the apex, and half or more of the anterior tibiae black or dark, rest of the legs brownish yellow, or in parts yellow. Neuration yellow. Abdomen with bright green metallic reflection at base, the rest dull, densely shagreened or sculptured, black or at the most faintly metallic. Ovipositor black, about as long as the first two or three joints of the hind tarsi. Length ♀ 2 mm.

HAB. Hawaii; 4000 ft.

(5) *Eupelmus axestias*, sp. nov.

Head above dull or only slightly shining, the sculpture very fine and indefinite, metallic green or yellowish green and with some coppery red reflection, facial impression dark with purple reflections, smooth and shining, deep, its upper edge well margined, and with a median carina; palpi whitish. Antennae subclavate, the pedicel much stouter and as long or longer than the first funicle joint, which with the next two is elongate, the last funicle joint being as wide or wider than long; scape with metallic green reflection, eyes distinctly hairy. Front and hind coxae, front and hind femora, except apically, dark and metallic, the front tibiae also dark, but widely yellow apically, middle tibiae a little brown above near the base, the rest of the legs brownish yellow or in parts still paler. Mesonotum with white pubescence, dull, bronzy, very finely and closely shagreened, and with scattered feeble punctures, externally to the ridges more coppery; abdominal pleura dull purplish black; ovipositor black, about as long as the three first joints of the hind tarsi. Length ♀ about 2 mm.

HAB. Oahu, 1800 ft.

(6) *Eupelmus ombrias*, sp. nov.

Head black, with slight metallic green reflection, finely rugulose behind the ocelli, but otherwise very feebly sculptured, yet hardly shining. Palpi pale yellow; facial impression very deep, smooth and shining, with a median carina, and its upper margin well defined, deep black or with slight purple lustre. Eyes very little pubescent. Antennae of the usual form, subclavate, the pedicel and first flagellar joint subequal, the several basal joints of the funicle all being elongate, scape metallic green-black. Mesonotum more or less black or dark in front and at the sides, metallic with various hues, but not very brightly. Mesopleura blackish, slightly metallic. Abdomen green or blue-black above. Ovipositor missing, probably very short. Front and hind coxae dark, metallic, and also the front femora, rest of legs for the most part brownish yellow, at most a little darker in parts (e.g. the middle coxae basally); the hind tarsi conspicuously dark. Length ♀ 2 mm.

HAB. Molokai; 2500 ft.

(7) *Eupelmus parombrias*, sp. nov.

Head above slightly metallic, not shining; the facial impression deep, black with slight purplish tinge, smooth and shining in some aspects, its upper margin well-defined, without a definite median carina. Palpi pale, scape of antennae largely brown or yellowish brown basally, darker and slightly metallic apically; the basal joints of the funicle elongate, the first being the thinnest and longest, the last funicle joint as wide or wider than long. Mesonotum greenish black and with some golden or brassy reflection, its pubescence dark and inconspicuous; pleura of the thorax pitchy brown, dull and

metallic. Abdomen blackish, with green metallic reflection at extreme base. Legs yellow, the front coxae browner, the hind tarsi entirely brown or infuscate. Wings hyaline, neuration yellow. Ovipositor dark or pithy, shorter than the hind tarsi. Length ♀ about 2 mm.

HAB. Oahu; Koolau range, 1500 ft.

(8) *Eupelmus dysombrias*, sp. nov.

Head finely punctured and somewhat shining and smooth, black, with metallic reflections behind the ocelli, blue-black in front of these, the facial impression deep, black or with slight purple tinge, viewed from the apex appearing nearly smooth, in front view very finely shagreened, its upper margin distinctly defined, no distinct median carina. Antennae with the basal joints of the funicle elongate; eyes very sparsely hairy. Mesonotum brassy, but not very brightly metallic, densely shagreened, clothed with short and not very conspicuous, white hairs; mesopleura for a large part dull coppery. Abdomen at the base and sides bright copper-coloured, in the depression blackish with coppery reflections. Front and hind coxae dark and metallic, middle coxae also dark beneath, rest of legs yellow, the front femora outwardly with metallic green reflection, but not darkened. Neuration yellow. Ovipositor black, short, about as long as the two basal joints of the hind tarsi. Length ♀ 1.8 mm.

HAB. Oahu, Honolulu, not 100 ft. above sea-level.

(9) *Eupelmus xestops*, sp. nov.

Head smooth, with a few fine punctures, polished; facial impression deep, smooth, blue or purplish black, a trace of a median carina at its upper extremity, the margin of which is well defined. Eyes distinctly but rather sparsely hairy, palpi pale; scape of antennae with metallic green reflection, basal funicular joints elongate, the apical one about as long as wide. Mesonotum with white, short hairs, quite dull and densely shagreened, dull brassy; mesopleura in front and posteriorly more coppery. Front and hind coxae dark and more or less metallic, rest of legs brownish yellow or testaceous and not metallic. Abdomen brilliant coppery at the base, the rest of the surface and the pleura also conspicuously metallic, but less bright than the base. Ovipositor yellow or yellowish brown, black at the base, as long as the hind tarsi, or rather longer. Length ♀ 3 mm.

HAB. Hawaii, Kau, 4000 ft.

(10) *Eupelmus paraxestops*, sp. nov.

Head dull, or at least only faintly shining in part, metallic with distinct green reflection in part at least, the surface finely rugulose and with some faint punctures; facial impression deep, blue or purplish black, smooth, with indication of a median

longitudinal carina, its upper margin distinctly defined. Palpi pale, antennae obscurely brown basally, of the usual structure, eyes apparently with very few hairs or almost glabrous. Mesonotum metallic green, with brassy or golden reflections, mesopleura with a bluish space near the middle. Abdomen brilliantly metallic green at the base, its depressed portion dark bluish or purplish black, the pleura metallic green and coppery. Legs, except the dark and metallic front and hind coxae, entirely yellow or brownish yellow. Neuration yellow. Ovipositor yellow, black at the base, shorter than the hind tarsi. Length ♀ about 3 mm.

HAB. Oahu; Koolau range, 1500 ft.

(11) *Eupelmus axestops*, sp. nov.

Head brightly metallic above, brassy or golden with more or less red or coppery red reflections; facial impression deep, blue- or purple-black, dull, distinctly and closely shagreened, its upper margin distinctly defined. Antennae slender and elongate, the four basal funicular joints all long and slender, scape brightly metallic, usually more or less brownish basally. Palpi pale, eyes somewhat pubescent, but not very conspicuously so. Mesonotum bright green, or brassy green, the scapulae metallic red or coppery red, the pubescence white, the surface dull with dense distinct shagreening; pleura with red and coppery reflections. Abdomen at the extreme base bright green, behind this dull black or purplish black, the apical segments metallic, the pleura nearly uniformly coppery red. Front and hind coxae dark and metallic, rest of legs yellow or brownish yellow. Ovipositor black at the extreme base, the rest yellow or brownish yellow, nearly as long as the hind tarsi. Length ♀ 3.5—4 mm.

HAB. Oahu; widely distributed at elevations of 1200 ft. and upwards.

(12) *Eupelmus rhodias*, sp. nov.

Head and thorax of an infusate or sordid copper colour, extremely dull and very densely shagreened, clothed conspicuously with pale hairs. Facial excavation shallow, very densely shagreened and dull, not distinctly margined above; antennae widely pale (yellowish brown) at the base, on the apical portion dark brown or fuscous; palpi pale; eyes conspicuously hairy; first funicle joint of antennae longer than the pedicel, the second also elongate but shorter than the first; mesopleura somewhat like the mesonotum in colour, but with dull green tints in part. Legs with the front and hind coxae dark and metallic, for the rest the legs are brown and yellowish, being darker in some parts than others, the apices or base and apices of the joints being usually more yellow. Neuration yellow. Abdomen very dull and densely shagreened, black and red or dull rose-coloured for the most part, at the extreme base brilliantly metallic, but even here with a quite distinct surface sculpture. Ovipositor sordid yellowish, black at the base, longish, as long or longer than the hind tarsi. Length ♀ 3.5 mm.

HAB. Molokai, 2500 ft.

(13) *Eupelmus xanthodorus*, sp. nov.

Head dull, rough with shallow punctures and surface sculpture, obscure coppery metallic. Facial impression not very deep, very dull, densely shagreened, with greenish tint in the antennal scrobes, its upper edge not distinctly margined, faint traces of a median carina, which is probably not a constant character. Eyes sparsely and inconspicuously hairy; scape of antennae clear yellowish at the base, three basal funicle joints all quite strongly elongate. Palpi pale. Mesonotum dull, roughly shagreened, copper-coloured, clothed with white hairs, mesopleura coppery, except the usual dull median area. Front and hind coxae dark and metallic, rest of legs yellow or brownish yellow, hind femora outwardly rather browner and with metallic reflection. Abdomen above metallic, most conspicuously so at base, the pleura nearly uniform coppery and shining in some aspects. Ovipositor sordid yellowish brown, black at base, and nearly white close to the tip, hardly as long as the hind tarsi. ♀. Length 4 mm.

HAB. Hawaii, Kau?. The locality of this species is a little uncertain and possibly it may be from Oahu.

(14) *Eupelmus euprepes*, sp. nov.

Head of a dull copper colour, its surface extremely dull and densely shagreened, facial impression shallow, very densely shagreened, dull, its sculpture finer than on the sides of the face adjoining. Eyes with excessively short, inconspicuous hairs. Palpi pale. Mandibles except the tips and the pedicel at the base of the scape of the antennae yellowish, scape metallic, first funicle joint very long, longer than the pedicel or than the second joint, which with the next two is strongly elongate. Mesonotum dull copper-coloured, very densely shagreened, not the least shining, thoracic pleura to a large extent metallic green. Front and hind coxae dark and metallic, the rest of the legs for the most part yellow or brownish yellow, the front femora with a dark metallic line behind, the front tibiae largely dark and metallic, posterior femora dark and metallic outwardly on their lower part at least, the hind tibiae subinfuscate and with metallic reflection; middle tibiae similarly somewhat sordid and metallic, except at the base and apex. Abdomen with brilliant green and golden reflections at the extreme base, behind this banded with blackish hardly metallic and dull greenish metallic transverse areas, pleura dull metallic-coloured (mostly green or coppery) with narrow dark apical bands. Ovipositor yellow, rather widely black at base, about one and a half times the length of the hind tarsi. Length 5.5 mm. ♀.

HAB. Hawaii, Kilauea.

(15) *Eupelmus oribates*, sp. nov.

Head above golden and green metallic, more or less sordid anteriorly, facial impression very dull, shagreened, moderately deep, its upper limits definite, but without a distinct margin, colour dull metallic green to a large extent. Palpi pale, antennae

without special characters, the several basal joints of the funicle elongate, the first the longest. Eyes distinctly hairy. Mesonotum roughly shagreened, golden metallic, the scapulae reddish coppery, very conspicuously clothed with white hairs. Front and hind coxae dark and metallic, legs otherwise mostly brownish yellow, the front femora are darkened at the base and have a dark metallic line beneath, the front tibiae are somewhat embrowned and metallic. Posterior femora more or less darkened outwardly and with green metallic reflection. Abdomen brightly metallic at base, the rest blackish and hardly metallic, except the apex, which, as often, is again brightly metallic; abdominal pleura coppery metallic. Ovipositor yellow, black at base, shorter than the hind tarsi, about equal to the first two or three joints. Length ♀ about 3 mm.

HAB. Oahu, Pali, Decr. 1900, no. 803.

(16) *Eupelmus orcias*, sp. nov.

Head metallic green, the facial impression dark coloured, with slight bluish or purplish tint in some lights, densely shagreened, dull, rather deep; the sides of face between the impression and the eyes metallic coppery or golden. Antennae normal, palpi pale, eyes hardly noticeably hairy. Mesonotum largely bright green, densely shagreened, scapulae more golden or golden green; clothing of white hairs not very conspicuous, chiefly observable at the sides; thoracic pleura less brightly metallic than the mesonotum, having dull green and golden reflections, abdominal pleura coppery. Front and hind coxae dark and metallic, legs otherwise entirely pale. Abdomen above metallic, dark banded. Ovipositor short, yellow, black at the base, about half the length of the hind tarsi. Length ♀ 2.75 mm.

HAB. Oahu, Koolau range, 1500 ft.

(17) *Eupelmus chrysopinus*, sp. nov.

Head metallic, green, golden green or golden, the facial impression dull metallic of various colours, sometimes dull greenish or purplish black, but always with blue or purple reflection about the interantennal elevation, the surface densely shagreened and dull. Palpi pale; antennae without special characters, eyes very little hairy. Mesonotum dull or nearly so, brassy or golden green, the scapulae coppery or reddish, wholly or in part. Front and hind coxae dark and metallic, the rest of the legs pale, yellow or brownish yellow, the front tibiae above metallic and usually dark on this metallic line. Abdomen at the base brilliantly green, behind this dark purplish black and with more or less blue or green reflections, the apical segment bright metallic coppery, the pleura uniformly copper-coloured. Ovipositor yellow, black at the base, short, about half the length of the hind tarsi. Length ♀ 3—3.8 mm.

HAB. Hawaii, Kau at various elevations.

(18) *Eupelmus monas*, sp. nov.

Head somewhat shining, golden with some green and coppery reflections, finely rugulose and with some sparse fine punctures, facial impression, purple or reddish purple, with the surface rugulose and not shining, with a more or less distinct median longitudinal carina. Antennae of the usual form, eyes with very short hairs, palpi dark. Mesonotum rather dull golden, densely shagreened, quite conspicuously clothed with white hairs, scapulae more or less infusate. Neuration yellow. Front and hind coxae dark and metallic, the rest of the legs yellow, hind femora appearing a little dark above. Abdomen bright metallic coppery at extreme base and at the apex, the intermediate parts dull blackish, the pleura uniformly metallic coppery, ovipositor black or blackish fuscous, a little shorter than the hind tarsi, about equal to the three or four basal joints together. Length ♀ 3 mm.

On account of the dull rugulose facial impression, which is less narrow at the bottom than is usual in the species, in which the colour of this part is purple, and also because the impression is of more metallic tint than in the other species, it is doubtful whether this species should really be placed with those having a blue-black or purple-black face.

HAB. Oahu, near Honolulu, 1500 ft.

(19) *Eupelmus asthenes*, sp. nov.

Head shining, golden, more or less rugulose and with fine punctures, facial impression very deep, smooth, deep black or purplish black; eyes scarcely hairy, antennae of the usual form. Palpi dark. Mesonotum dull, finely and closely shagreened, deeply depressed in the middle, dull brassy, in front and the scapulae coppery. Front and hind coxae black and metallic, general colour of rest of legs yellow or yellowish brown, the front femora behind darkened and metallic, front tibiae excepting the apex and extreme base dark and metallic above; hind femora, hind and middle tibiae also more or less embrowned and with metallic reflection, the apex of the tibiae being quite pale. Base of abdomen brightly metallic green, behind this the segments are blackish and hardly metallic, the terminal segment bright coppery; abdominal pleura also copper-coloured. Ovipositor black, about equal in length to the hind tarsi. Length ♀ 2.25 mm.

HAB. Hawaii, Kilauea.

(20) *Eupelmus parasthenes*, sp. nov.

Head above somewhat shining, green or golden, the facial impression very deep, purple-black in colour, and sometimes with more or less evidence of a median carina, in some aspects the surface appearing nearly smooth. Palpi dark, eyes collapsed after death, probably very little hairy, antennae with no special characters. Mesonotum with conspicuous white pubescence, brassy with the front lobe and the scapulae more reddish

or copper-coloured. Front and hind coxae dark and metallic, rest of legs generally yellow, the front femora behind are somewhat darkened and metallic, the front tibiae a little sordid, the hind femora are embrowned outwardly and have a metallic reflection, the hind tibiae are also somewhat darkened above and slightly metallic, their apices and the base of the tarsi being white. Abdomen bright coppery at the base and tip, between these dark and hardly metallic, the pleura wholly copper-coloured. Ovipositor blackish, about as long as the hind tarsi. Length ♀ 2·6 mm.

HAB. Oahu, on *Pipturus*, no. 857.

(21) *Eupelmus leptophyas*, sp. nov.

Head scarcely shining, finely and sparsely punctured, golden or golden green; the facial impression deep, purple-black, smooth and shining, face between the impression and eye margins also black; palpi dark, antennae of the usual form, eyes with sparse hairs. Mesonotum brassy, green tinged, finely shagreened, the scapulae more reddish golden or coppery, clothed with white hairs. Neuration yellow. Front and hind coxae, the front and hind femora (except at extreme base and apex) dark and metallic, front tibiae dark and metallic above (except at base and apex), hind tibiae at most slightly embrowned, rest of legs brownish yellow or yellow, except the tips of the tarsi. Abdomen brilliantly green at extreme base, behind this dull blackish, the apex reddish coppery; abdominal pleura fiery copper-coloured, the intermediate segments, when not contracted, green metallic basally. Ovipositor blackish or dark fuscous, paler at the extreme tip, long and slender, rather longer than the hind tarsi. Length ♀ 4·5 mm.

The abdominal segments in this example were fully extended, so that some specimens might be considerably shorter.

HAB. Hawaii (Mauna Loa), 4000 ft.

(22) *Eupelmus epilamprops*, sp. nov.

Head finely rugulose, in some aspects shining about the ocelli, and golden metallic, facial impression deep, purplish black, the surface nearly smooth seen from the apex, and with a more or less distinct median carina; antennae of the usual form, the palpi dark, the eyes inconspicuously hairy. Mesonotum coppery in front and on the scapulae, posteriorly more golden, conspicuously clothed with white hairs. Front and hind coxae dark and metallic, front femora almost entirely dark brown or pitchy, metallic above and behind, front tibiae much the same as the femora, tarsi brown or fuscous above. Middle legs yellowish, the tibiae dark above except at the base and apex. Hind femora embrowned, more yellow apically, slightly metallic, hind tibiae dark or brown above except at the apex, the tarsi dark above, except the basal joint, which is mostly pale.

Neuration pale, yellowish. Abdomen brilliantly metallic at the extreme base and coppery at the tip, between these mostly dull blackish, the pleura coppery. Ovipositor slender, black, about equal in length to the hind tarsi. Length ♀ 3 mm.

HAB. Hawaii, Kau, 4000 ft.

(23) *Eupelmus dryas*, sp. nov.

Head in some aspects a little shining, finely rugulose and sparsely punctured, green or golden green, facial impression purple-black, smooth or nearly so at least in some aspects and with a median carina; palpi dark, eyes bare or nearly so, antennae of the usual structure, with elongate basal funicular joints. Mesonotum in front and on the scapulae coppery, posteriorly more or less green, dull, densely shagreened, clothed with white pubescence. Neuration yellow. Front and hind coxae dark and metallic, all the rest of the legs brownish yellow, front femora with metallic tint posteriorly. Abdomen brilliant metallic green at base, the apex coppery, most of the intermediate segments dull black, or purplish black, pleura copper-coloured. Ovipositor reddish, longer than the hind tarsi. Length ♀ 3.75 mm.

Var. *dubius*, the legs paler yellow, the middle tibiae except at base and apex subinfusate above, the front femora without metallic tint posteriorly, facial impression less smooth and with fine surface sculpture.

HAB. Molokai, 3000 ft.; var. *dubius* Oahu, 1500 ft. I have seen only a damaged specimen of the latter, which has lost its ovipositor; it is probably a distinct species.

(24) *Eupelmus chloropus*, sp. nov.

Head above green and usually with some golden reflections, more or less shining anteriorly, in some aspects at least; facial impression deep, somewhat rugulose or shagreened, but still appearing smooth and shining when viewed from the apex, usually with fine reddish purple reflections; palpi dark, antennae normal, with several of the basal funicular joints elongate. Eyes usually collapsed in dry specimens, probably with very few hairs. Mesonotum metallic green, densely shagreened, the front lobe more golden and the scapulae with coppery red or fiery reflections, conspicuously clothed with white hairs. Neuration pale yellowish. Legs excepting the dark and metallic front and hind coxae almost entirely pale yellow. Abdomen brilliant metallic green at the extreme base, behind this dull blackish, the apex coppery; pleura copper-coloured. Ovipositor black at base and more or less fuscous at the apex, the rest yellow, rather longer than the hind tarsi. Length ♀ 3—4.25 mm.

This species is unusually slender and elongate.

HAB. Oahu; mountains near Honolulu, 1200 ft. and upwards.

(25) *Eupelmus peles*, sp. nov.

Head metallic, with coppery and green, or golden reflections, rugulose and sparsely punctured; facial impression deep, wide, shagreened, but the antennal grooves are smoother and shining in some aspects, purplish black, as also the sides of the face between its impression and the eye margins. Palpi black, antennae of the usual form, eyes bare or nearly so. Mesonotum coppery or reddish coppery on the front lobe and on the scapulae, posteriorly dull golden or greenish, densely shagreened, the surface dull. Neuration yellow. Legs brownish yellow or yellowish brown, the front and hind coxae dark and metallic, the front femora above and the hind ones outwardly with slight metallic reflection, but not dark. Abdomen brilliantly golden green at the base, behind this for the most part blackish; the bases of the intermediate segments, when exposed, are metallic, at least on each side, the pleura coppery. Ovipositor black at the base, the rest yellowish, decidedly longer than the hind tarsi. Length ♀ 4.25 mm.

HAB. Hawaii, Kilauea.

(26) *Eupelmus euoplías*, sp. nov.

Head above coppery or more golden in some lights, dull, rugulose and sparsely and finely punctured; facial impression dull, densely shagreened, wide at the bottom, metallic like the sides of the face adjoining it, and more or less green about the antennal grooves, but somewhat less bright, antennae slender with elongate basal funicular joints as usual, palpi dark, eyes sparsely hairy. Mesonotum coppery or reddish metallic on the front lobe and on the ridges of the scapulae, dull and densely shagreened. Front and hind coxae, front and hind femora and tibiae dark and metallic, except the knee joints of the front legs and the apex of their tibiae, the knee joint of the hind legs which are more widely yellowish, the extreme base of the hind femora, and the apices of the hind tibiae; middle tibiae distinctly embrowned and metallic above except at the base and apex, middle coxae also partly dark and metallic, tarsi brown or infusate above, those of the middle legs less dark than the others, basal joint of hind tarsi whitish at base. Neuration yellowish, the stigmal vein postmarginal and apical part of the marginal vein more sordid or infusate. Abdomen brightly metallic at the extreme base, behind this blackish, the apex coppery, as also the pleura. Ovipositor long, black, but on about its apical half it is sordid yellowish, about as long as the abdomen, when this is not contracted, interrupted a little before the basal fourth of its length. Length ♀ 3.75 mm.

This species must be very close to *E. konae* Ashm., but differs so much in detail, that I hesitate to consider it to be that species.

HAB. Hawaii, Kilauea.

(27) *Eupelmus pelopus*, sp. nov.

Head green, in dorsal aspect dull, rugulose, with a few, nearly effaced, punctures, the facial impression wide, shallow, dull, densely rugulose, even in the antennal grooves, metallic greenish. Antennae of the usual form, eyes glabrous or nearly, palpi dark. Mesonotum dull, densely shagreened, green, the front lobe more golden, the ridges with coppery reflections. Front coxae, femora and tibiae almost wholly dark and brightly metallic, the trochanters black, slightly metallic, tarsi for the most part dark brownish above; middle legs with the femora blackish, pale at base and apex, tibiae also darkish brown except at base and apex, tarsi mostly pale; hind legs with the coxae and femora brilliant metallic green, the tip of the latter yellow, the tibiae dark fuscous and much less metallic than the femora, their base and apex pale, basal joint of tarsi pale, the rest dark above. Neuration yellow, appearing darker from the clothing of black hairs. Abdomen metallic green at the base, coppery at the tip. Ovipositor black, the tip pale, a little shorter than the hind tarsi. Length ♀? 3.5 mm.

Having seen but one example, which is in a much contracted state, I cannot give its length exactly.

HAB. Hawaii, Kau district, about 4000 ft.

(28) *Eupelmus melanacrius*, sp. nov.

Head above golden in some aspects with green reflections, dull and rugulose, but seen obliquely somewhat shining; facial impression dull blackish, as also the sides of the head between it and the eye-margins, the surface quite dull, rugulose or shagreened; palpi dark, antennae of the usual form, eyes with excessively short hairs, fairly numerous in parts, but very inconspicuous. Mesonotum dull and shagreened, the front lobe and the parapsides or scapulae coppery or reddish coppery, the rest with some greenish tint. Front coxae, femora and tibiae dark and metallic (at most pale at the apices) the trochanters also mostly dark and metallic, tarsi yellow, the apical joints dark above; middle legs brownish yellow, hind legs with the coxae and femora dark and metallic, the latter yellow at the tips, tibiae dark except at base and apex and metallic, trochanters and tarsi, except the apical joints, yellow. Neuration yellow. Abdomen metallic blue and green above, the tip coppery; ovipositor blackish, inclining to pitchy, about as long as the hind tarsi without their apical joint. Length ♀ 3 mm.

HAB. Molokai, 4000 ft.

(29) *Eupelmus chalcoprepes*, sp. nov.

Head green or golden green, the surface dull and roughened with rugulosity and some shagreening; facial impression somewhat shallow, the surface dull, very densely shagreened or somewhat rugulose, the colour metallic, but not of vivid hues; scape fine

metallic green in some lights, the palpi dark, the eyes sparsely and inconspicuously pilose. Mesonotum with pallid yellowish or whitish hairs, green and more or less golden, the ridges sometimes coppery. Front and hind coxae, femora, and tibiae dark and metallic green, their apices and bases (excepting the coxae) more or less yellow, their trochanters also for the most part dark, all the joints of their tarsi more or less darkened above, the basal joint pale at the base; middle legs yellowish, their coxae outwardly dark and metallic, the femora with a dark metallic line, the tibiae brown and metallic above except at the base and apex, the tarsi pale. Abdomen brilliant metallic green at the base, behind this the segments are dark, blackish, with basal metallic green or blue bands, tip of abdomen in apical view brilliant coppery, pleura blackish, with basal metallic bands; ovipositor black at base, and darkened towards the apex, between these parts yellowish or reddish, about as long as the first two or three joints of the hind tarsi. Marginal and stigmal veins of front wings subinfusate. Length ♀ 4—4.5 mm.

HAB. Hawaii, Kau district, 4000 ft.

(30) *Eupelmus epimelas*, sp. nov.

Head above dull golden, the surface minutely but roughly sculptured, dull and rugulose, facial impression rather shallow, greenish, densely shagreened or rugulose, dull, palpi dark, antennae of the usual form, eyes hairy, but not conspicuously so. Mesonotum greenish metallic, finely shagreened, dull, with sparse and fine but roughish punctures, the ridges with reddish reflections. Legs almost similar to those of *E. chalcoprepes*, but the middle coxae and the hind trochanters are yellow. Abdomen metallic green at the base, behind this purplish black, the tip green, seen from above, coppery in apical view; pleura coppery. Ovipositor black, shorter than the hind tarsi, about equal to the three basal joints. Length ♀ about 3 mm.

HAB. Hawaii, Kilauea.

(31) *Eupelmus caeruleophantes*, sp. nov.

Head above metallic green or golden, densely finely rugulose and shagreened, so as to be rough and dull in dorsal aspect, facial impression shallow, densely rugulose shagreened, the surface dull, with green and coppery metallic colour; eyes inconspicuously pilose, palpi dark, antennae of the usual form. Mesonotum with rather sparse white hairs, dull, densely shagreened, golden, the parapsidal ridges reddish coppery. Legs much as in *E. chalcoprepes*, but the basal joint of the hind tarsi is entirely yellow or whitish; hind trochanters yellow, middle tibiae subinfusate above, a little beyond the base, and metallic, the base and the apex more widely pale. Abdomen brilliant blue-green at the base, the intermediate segments dull metallic blue or green with dark fuscous apical bands, fifth segment entirely bluish metallic. Ovipositor black

at the base and apex, between pale, of an obscure yellowish brown colour, a good deal shorter than the hind tarsi, about as long as the two basal joints together. Length ♀ 3.75 mm.

HAB. Oahu, Waimea, no. 829.

(32) *Eupelmus heterosomus*, sp. nov.

Head above dull in one aspect, finely rugulose, in other positions considerably shining, with coppery and brassy reflections, facial impression wide but deep, entirely rugulose shagreened, metallic with some purplish lustre; antennae of the usual form; eyes with a good many hairs, but they are very short and not conspicuous; palpi dark. Mesonotum conspicuously white-haired, shagreened, dull, of a golden or brassy metallic colour, darker on the front lobe and on the parapsides. Legs almost as in *E. caeruleophantes*, the basal joint of hind tarsi entirely yellow, the hind tibiae widely yellow at the apex, the middle femora entirely or almost entirely yellow or brownish yellow, the middle tibiae very dark and metallic above, except at the base and apex. Abdomen brightly metallic at extreme base, the rest dull black or bluish black, the tip, viewed apically, bright copper colour; pleura coppery; ovipositor black at base and more or less dark at the apex, the rest reddish, shorter than the hind tarsi. Length ♀ about 3 mm.

HAB. Hawaii, Kau, 4000 ft.

(33) *Eupelmus rhododorus*, sp. nov.

Head above reddish golden, dull, roughly sculptured, the facial impression dull, densely rugulose shagreened, of much duller metallic colour than the sides of the face along the margin of the eyes, the latter with a good many short hairs on their outer portion, the antennae of the usual form, the palpi dark. Mesonotum bright metallic green, more golden on the anterior lobe, the parapsides metallic red or rosy. Front and hind legs much as in the several preceding species, middle coxae with bright metallic tint and darkened, middle femora with a metallic line, middle tibiae whitish yellow at base and apex, brownish and metallic, but not dark, between; basal joint of hind tarsi yellowish white, like the apex of the tibia. Abdomen brilliant metallic green and golden at the base, the rest dull blackish, the tip, viewed apically, copper-coloured; ovipositor black at base, beyond this sordid reddish or brown, not differing much from the hind tarsi in length. Length ♀ 3.5 mm.

HAB. Oahu, near Honolulu, 1500 ft.

(34) *Eupelmus amaurodes*, sp. nov.

Head above green, more golden in front, dull with rough surface sculpture, and anteriorly with remote, largish, feebly impressed punctures; facial impression very densely shagreened and dull, shallow on its upper part, green, the sides of the face

adjoining it golden or reddish golden; antennae of the usual form, eyes evidently pilose, but the hairs extremely short, palpi dark. Mesonotum brightly metallic, green and golden, densely and rather strongly shagreened, the parapsides rosy red. Front and hind legs as in the preceding species, the basal joint of hind tarsi entirely pale, middle femora with a darkened metallic line, the tibiae dark brown above, except at base and apex, and metallic. Front wings with marginal, stigmal and postmarginal veins fuscous. Abdomen with bright green metallic colour at the base, behind this for the most part dull blackish, the tip in apical view coppery red, the pleura coppery; ovipositor black at base, beyond this brown, short, about as long as the two or three basal joints of the hind tarsi. Length ♀ 4.5 mm.

HAB. Hawaii, Kilauea.

(35) *Eupelmus achreioides*, sp. nov.

Head green and golden above, rugulose and with largish feeble or subobsolete punctures anteriorly, facial impression shallow and very wide, dull, densely shagreened, blackish green, the upper extremity of the interantennal elevation purplish, sides of face between the impression and the eyes metallic; antennae of the usual structure, palpi dark, eyes very little hairy. Mesonotum densely shagreened, clothed with white hairs, green or golden green, the parapsides with reddish coppery reflections. Front and hind coxae dark and metallic, the rest of the legs yellow, front tibiae darkened above. Neuration yellow. Abdomen bright metallic green at the base, behind this mostly metallic green or blue, and duller, the tip and the pleura coppery. Ovipositor yellow, black at base, short, about half as long as the hind tarsi. Length ♀ 3.5 mm.

HAB. Hawaii, Kau, about 2000 ft.

(36) *Eupelmus aporostichus*, sp. nov.

Head above green, rugulose, facial impression green, dull and rugulose shagreened, wide, the sides of face adjoining it golden; antennae of the usual form, palpi dark, eyes apparently glabrous. Mesonotum fine metallic green, less dark than that of the facial impression, the parapsides reddish golden. Front and hind coxae dark and metallic, the middle ones dark brown and metallic beneath, rest of legs yellow, the front tibiae a little darkened and metallic above. Abdomen brilliantly green at the base, behind this metallic green-black, the tip green above, coppery in apical view, pleura coppery. Neuration yellow. Ovipositor black at base, the rest yellowish brown and more or less subinfusate apically, as long as the three basal joints of the hind tarsi. Length ♀ 3 mm.

HAB. Oahu, Honolulu mountains, on *Pipturus*, July 1900, no. 786.

(37) *Eupelmus eustichus*, sp. nov.

Head green or golden and green, the surface rugulose, with shallow punctures in front near the eye margins, the facial impression densely rugulose shagreened, and sometimes with a slight median raised line, dull and wide; the antennae of the usual form, palpi dark, eyes glabrous or nearly so. Mesonotum green or golden green, the parapsides coppery or reddish coppery; front and hind coxae dark and metallic, front tibiae with dark metallic line above, as also the middle tibiae, front tarsi more or less brownish or lightly infuscate above, rest of the legs mostly yellow or brownish yellow. Neuration yellow. Abdomen brightly metallic green or blue at the extreme base, behind this mostly metallic blue-black or green-black, tip of abdomen in apical view coppery red, pleura coppery. Ovipositor black at base, the rest yellowish or reddish, rather shorter than the hind tarsi, or about equal to the basal four joints. Length ♀ 3.25—4 mm.

HAB. Oahu, mountains near Honolulu, 1500 ft. or more.

(38) *Eupelmus pelodes*, sp. nov.

Head above more or less green, in front with reddish reflections, the surface quite rough, with fine wrinkles or shagreening and wrinkles together, the facial impression sordidly metallic, dull, densely rugulose shagreened, sides of the face adjoining golden or coppery red; antennae of the usual form, palpi dark, eyes with very few hairs. Mesonotum very dull, and densely shagreened, clothed with pale hairs, of green and dull golden colour, the parapsides dull reddish golden or coppery. Neuration yellow. Front and hind coxae dark and metallic, rest of legs mostly yellow or brownish yellow, front tibiae with a metallic dark line above, the middle one slightly embrowned above between the pale base and apex, apical two joints of posterior tarsi dark brown or blackish. Abdomen brilliant green at the base, behind this dull bluish black, not metallic, tip of abdomen in apical view bright coppery, pleura uniformly copper-coloured. Ovipositor yellow, black at the base, about equal in length to the hind tarsi. Length ♀ 4 mm.

HAB. Hawaii, Kilauea.

(39) *Eupelmus hemixanthus*, sp. nov.

Head above of a dull metallic colour, its surface densely finely shagreened and very dull, clothed with white hairs, the facial impression very shallow, with dull golden and green metallic tints, very densely shagreened all over and the surface quite dull; eyes considerably hairy, antennae of the usual form, the palpi dark; scape of antennae yellow on the basal half or more. Mesonotum very densely shagreened and dull, metallic dull golden and green, the parapsides redder, clothed conspicuously with white hairs. Neuration yellow. Front and hind coxae dark and metallic, the front and

middle tibiae with a dark metallic line above, the hind tibiae brownish except at the base and apically, rest of the legs yellow, including the tarsi, yellow, except more or less of the apices of these. Abdomen brilliantly metallic green at the base and reddish coppery at the tip, between mostly blackish; pleura unusually dull with dense surface sculpture, and conspicuously clothed with white hairs, coppery; ovipositor yellow, black at base and more or less darkened at the apex, about as long as the three basal joints of the hind tarsi. Length ♀ about 3 mm.

HAB. Oahu, near Honolulu, 1500 ft.

(40) *Eupelmus pauroxanthus*, sp. nov.

Head above green and golden, the surface rugulose, dull or very little shining, the facial impression, mostly dull metallic coppery, wide, very densely finely shagreened, dull; antennae of ordinary form, the scape pale brown or yellowish for a short distance at the base, then becoming darker and metallic brown; palpi dark, eyes sparsely and inconspicuously hairy. Mesonotum green with golden tints, dull, densely shagreened, the parapsides also for the most part green. Front and hind coxae dark and metallic, rest of legs yellow, the posterior femora outwardly slightly metallic, but not darkened, the posterior tarsi, except the white basal joint, lightly infusate above. Abdomen brightly metallic green at the base, behind this the segments are brightly metallic basally, dull blackish apically, the pleura of the segments fiery metallic basally, dark apically; ovipositor yellow, black at base, about as long as the first four or five tarsal joints. Length ♀ about 2.5 mm.

HAB. Oahu, Honolulu, 200 ft., July 1900, no. 769.

(41) *Eupelmus leucothrix*, sp. nov.

Head above green, finely and extremely densely shagreened, very dull; facial impression wide, shallow, very dull and densely shagreened, green and golden; antennae of the usual form, the scape yellow at the base, the rest mostly black and metallic; palpi dark; eyes considerably and noticeably hairy. Mesonotum dull golden, or green and golden, very densely shagreened, parapsides viewed from the sides more reddish. Front and hind coxae dark and metallic, front tibiae dark and brightly metallic above, the tarsi subinfusate above; middle tibiae dark brown above except at the base and apex; hind femora with a darkened and brightly metallic area outwardly, the tibiae dark above except at base and apex, the basal tarsal joint white, the apical ones dark above; the general colour of the legs is brownish yellow. Neuration yellow. Abdomen bright metallic green at base, behind this blackish, the tip in apical view fiery copper-coloured, the pleura dull with dense surface sculpture, clothed with white appressed hairs, coppery; ovipositor yellow, black at base, and more or less dark at the apex, shorter than the hind tarsi. Length ♀ 2—3 mm.

HAB. Oahu, near Honolulu, 1500 ft.

(42) *Eupelmus paraleucothrix*, sp. nov.

Head above more or less golden, densely minutely shagreened and dull, facial impression wide, not deep, very densely shagreened and dull, of rather dark metallic colour, antennae of the usual form, the scape yellow for a short distance at the base, the rest dark and metallic, eyes considerably hairy, palpi dark. Mesonotum very densely shagreened and clothed conspicuously with white hairs, deep or reddish golden behind and still more red on the parapsides, in front greenish golden, pleura with hardly any green tint. Legs nearly as in *P. leucothrix*, all the tibiae with a dark line or darkened above, the front and hind ones conspicuously metallic on the dark line. Abdomen brilliant metallic at the base, and the tip, in apical view, reddish coppery, between for the most part dull bluish black, pleura coppery; ovipositor yellow, black at base, as long as the first two or three joints of the hind tarsi. Length ♀ 3.5 mm.

HAB. Hawaii, Kilauea.

(43) *Eupelmus basileius*, sp. nov.

Head above green punctate and more or less rugulose, facial impression deep, in some aspects nearly smooth at the bottom, black; antennae short and stout, the several basal joints of the funicle not elongate, but short; palpi dark, eyes apparently glabrous. Mesonotum green or blue-green, extremely finely shagreened, somewhat shining, the parapsidal portion purple. Front and hind legs dark and metallic green, tip of the front tibiae and the tarsi mostly pale; knee joints, and apical part of tibiae of hind legs yellow. Middle femora black and submetallic, also the tibiae except narrowly at the base and widely at the apex, which parts are yellow. Abdomen conspicuously metallic blue, brightly green at the base, pleura green; ovipositor black, as long or nearly as long as the hind tarsi. Length ♀ 2 mm.

HAB. Oahu, Tantalus and elsewhere, 500—1500 ft.

(44) *Eupelmus xanthotarsus*, sp. nov.

Like *E. basileius* with short thick antennae, the head green, punctate or shagreened and with black face.

Mesonotum entirely green, densely and evenly and more strongly shagreened and duller. Legs very similarly coloured, but the middle tibiae are less dark above, though embrowned, except at the base and apex. The hind tarsi yellow. Ovipositor black above, more or less yellowish tinged at the sides. Length ♀ 2.4 mm.

HAB. Oahu, near Honolulu, 1500 ft.

(45) *Eupelmus melanotarsus*, sp. nov.

Very like *E. xanthotarsus*, but with the head above much less dull.

Mesonotum densely and rather strongly shagreened, legs much as in the two preceding species, but the front and hind tarsi are black or dark fuscous above. The middle femora and tibiae are black or very dark, except at the extreme base and at the tips. Abdomen blue or green with fine purple reflections. Ovipositor black or blackish, more or less pale at the extreme tip, as long as the hind tarsi or nearly. Length ♀ 2.5 mm.

HAB. Oahu near Honolulu, about 1500 ft.

(46) *Eupelmus dysoplias*, sp. nov.

Head above punctate or shagreened, blackish with metallic reflections, green or brassy, facial impression deep and narrow, finely shagreened, dull, with greenish tint at the bottom; antennae slender basally, the first two or three funicle joints being quite elongate; palpi dark, eyes collapsed, probably glabrous or nearly. Thorax blackish, but with brassy or golden reflections quite distinct. Front and hind coxae black, and somewhat metallic; front femora and tibiae and the last four tarsal joints blackish or dark fuscous, the knee joint, apex of tibiae and basal tarsal joint yellow or pale. Middle legs yellow; hind legs with the femora and tibiae black, the latter widely yellow at the apex, the knee joint brownish, the basal joint of the tarsus yellow, the following joints infusate above. Neuration mostly fuscous. Abdomen bright green at the base, the rest blackish and very little metallic, pleura black; ovipositor hardly exerted behind the abdomen, the tip somewhat pale. Length ♀ 2.25 mm.

HAB. Oahu, Honolulu; not much above sea level, under 100 ft.

Subfam. *MIRINAE*.

*ANAGYRUS* How.

(1) *Anagyrus major*, sp. nov.

Head reddish or yellowish brown, scape and pedicel of the antennae blackish or fuscous, the former being more or less yellow at the sides, five first funicle joints yellow, the sixth and the club black or dark fuscous. Thorax sordid fuscous above, more or less reddish-tinged, prothorax whitish, sides and ventral surface of thorax yellow. Abdomen dark fuscous at the base, the rest sordid yellowish or brown; legs yellow or brownish yellow, the hind tibiae and femora at least more or less sordid, the colour of the legs apparently rather variable; front tarsi dark. Marginal vein dark fuscous, the stigmal vein paler, and with an ill defined small infuscation about it.

Head with a dense shagreening or close fine sculpture, pubescent, a rounded ridge between the antennae, the ocelli in a triangle, the outer ones well separated from the

margins of the eyes, the latter hairy. Scape of antennae somewhat dilated on the apical part beneath, pedicel obconical, elongate, considerably longer than the first joint of the funicle, the latter not differing much in length, the apical ones appearing somewhat shorter than the basal, club with three subequal joints and about as long as the three preceding joints together. Thorax densely sculptured, the sculpture, which appears to be a close shagreening, more or less concealed by the conspicuous clothing of short white pubescence. Marginal vein subpunctiform, postmarginal very little developed, stigmal shortish. Hairless, oblique line very distinct, rest of wing closely and regularly set with hairs. Length 1.5 mm. Ovipositor very little prominent. Female.

HAB. Hawaii, Kilauea.

(2) *Anagyryus xanthogaster*, sp. nov.

Very like the preceding, but in its typical form smaller, the antennae shorter and very differently coloured, the general appearance being sordid yellowish, the apical joints darker, but without the strongly contrasted coloration of *A. major*. The abdomen yellow above.

On Oahu I have found a larger form, not apparently differing in structure from the above, the mesonotum is reddish brown, the face nearly entirely pale yellow.

HAB. Hawaii, Kilauea; Oahu, on the coast.

(3) *Anagyryus nigricans*, sp. nov.

Black, the legs yellow, the hind femora and tibiae slightly clouded. Wings hyaline but not quite clear.

Head dull, with fine feeble and not dense puncturation; antennae pale-tinted, not quite black, with the scape subdilated beneath, the pedicel obconical about as long as the first funicular joint, which is much longer than wide, the following joints not differing much in length, all being more or less elongate, the club longer than the two preceding together. Mesonotum and scutellum slightly shining, very finely, remotely punctured. Abdomen triangular, acute at apex, deeply concave in dry specimens, and more or less pallid in the concavity. Neurulation etc. as in the preceding. Length rather more than 1 mm. Female.

HAB. Oahu, near Honolulu, 1500 ft.

(4) *Anagyryus fraternus*, sp. nov.

Very similar to *A. nigricans*, but the scape of the antennae is very little dilated, though somewhat thickened towards the apex, and the thoracic puncturation is rather more distinct and the punctures more numerous on the scutellum. The hind femora

are black or pitchy black, but the tibiae brightly yellow. The pedicel and the elongate funicular joints are all subequal and the club is longer than the two preceding joints, the antennal joints not differing much in their proportional length from those of *A. nigricans*.

What I take to be the male of this species has the antennae longer, and set with longish hairs, the thorax duller and more distinctly punctate, the pedicel shorter than the first funicle joint, the club about as long as the two preceding joints together. It is of a less black colour, more inclining to pitchy, especially at the sides of the thorax, and the legs are for the most part infusate, or dirty yellow. The species appears to be rather larger than *A. nigricans*.

HAB. Hawaii, Kilauea.

(5) *Anagyris laeviceps*, sp. nov.

Very similar to *A. fraternus* and *A. nigricans*. The head in front is nearly smooth and the remote punctures are extremely faint; the mesonotum is very finely, evenly punctured, but not closely, the scutellum faintly and a good deal more sparsely. The antennae are slender with elongate funicle joints, the scape widened apically, but without a conspicuous dilatation, the proportional length of the funicle joints and pedicel much as in the above species, or subequal. Wings dusky hyaline, legs black or dark pitchy, hind tibiae with a paler spot at the base, and darker than the tarsi. Length 1.5 mm. Female.

In the specimen described the sheath of the ovipositor is suberect or bent backwards, and in side view appears as a pointed blade-like process. Probably it is usually closed down on the hypopygium.

HAB. Oahu; near Honolulu, 2000 ft.

(6) *Anagyris tantaleus*, sp. nov.

Black, the posterior part of the thorax and the abdomen above within the concavity obscure or pitchy brown. Antennae black, the pedicel reddish at the apex. Legs for the most part yellow, the hind coxae dark, the hind femora infusate especially on their outer surface. Wings lightly infusate or yellowish-tinged. Very similar to the several preceding species.

Front of the head above the antennae evenly and distinctly punctured, dull; scape of antennae rounded on the lower side so as to be slightly thickened or dilated, pedicel obconical, rather longer than the first funicle joint, which is subelongate, as are the following and subequal. Mesonotum rather more finely punctured than the head, the scutellum still more finely. Abdomen distinctly longer than the head and thorax together. Length about 2 mm. Female.

HAB. Oahu; mount Tantalus,

## BLEPYRUS Howard.

(1) *Blepyrus marsdeni* How.

*Blepyrus marsdeni* Howard, Proc. U.S. Nat. Mus. XXI (1898), p. 234.

This is a very abundant species throughout the islands and I do not feel certain that it is not synonymous with *Encyrtus insularis* Cam. described on a single ♂. It would appear that if *B. insularis* is distinct from the above, it must now have become extinct, for it was found by Blackburn on several islands and, being no doubt a parasite of scale insects, could hardly have failed to have been bred by myself, Koebele or others, if it still existed.

## MICROTERTYS Thom.

(1) *Microterys flavus* Howard.

HAB. Common throughout the islands, on introduced scale-insects.

## APHIDENCYRTUS Ashm.

(1) *Aphidencyrtus*? sp.?

HAB. Oahu; a common parasite of some imported Aphides.

## HELEGONATOPUS Perk.

(1) *Helegonatopus*, sp.?

HAB. Oahu; parasitic on *Echthrodolphax* and other Dryinidae.

OBS. Several other minute and obscure Mirine Encyrtids, all no doubt imported, have been collected, but not yet determined.

## Fam. PTEROMALIDAE.

It is almost certain that this vast family is unrepresented in the islands by endemic forms, excepting possibly by a few species of the subf. Spalangiinae. Several introduced species have been found and, as some of them are spreading, they will no doubt become ubiquitous. Species of the genus *Pteromalus* have been imported for economic reasons. Most conspicuous of the Pteromalidae, that are foreign, are two or three species belonging to the subf. Sphegigasterinae.

## Subfam. SPHEGIGASTERINAE.

## TOMOCERA How.

(1) *Tomocera ceroplastis* Perk.

*Tomocera ceroplastis* Perk., Proc. Hawaii Ent. Soc. i. p. 76.

HAB. Oahu; introduced.

## PACHYNEURON Walk.

*Pachyneuron* spp.

Two or more species of this or allied genera are parasitic on species known to be of foreign origin.

HAB. Oahu.

## Subfam. SPALANGIINAE.

## SPALANGIA Latr.

(1) *Spalangia cameroni*, sp. nov.

Female: Aeneous black, the abdomen deep black or blue-black, the tarsi yellow, dark at the tips. Head elongate, coarsely punctate, the punctures well separated from one another, the eyes with erect white hairs, longer than is usual on these organs. There is an elongate smooth median space at the bottom of the depression above the insertion of the antennae. Antennae with the second joint or pedicel elongate, very much longer than, but hardly twice as long as the first joint of the funicle, four terminal joints of the funicle quadrate, club nearly as long as the three preceding joints. Pronotum very densely rugose-punctate in front and at the sides between which is a smooth, more or less triangular, area, with at most a few punctures, this area bounded behind by a transverse costate line, the apical margin behind the line smooth. Mesonotum with a smooth median line, and a densely punctate area on each side of this; the parapsides marked out by a costate or punctate furrow, the scapulae bearing some fine punctures; axillae smooth and shining, like the scutellum, and separated from this by costate lines and both impunctate or nearly, the scutellum having a transverse costate line in front of the hind margin and the suture between it and the postscutellum is costate. Propodeum very smooth and shining, with a median narrow costate channel, divided by a longitudinal raised line, and punctate around its margins; the pleura marked off by a costate suture, very densely and finely punctured below, but smoother near the suture. Wings clear hyaline, neuration brownish. Abdominal pedicel with about half a dozen raised longitudinal lines, the other segments very smooth, the fourth the largest, the third emarginate posteriorly, the apical ones with pale hairs. Length about 3 mm.

Male very like the female, but the head is shorter, the pedicel of the antennae is minute, hardly longer than wide, much shorter than the first funicle joint, which is much longer than the following; the other funicle joints longer than in the female, being longer than wide. Length 3 mm. but much smaller examples occur. This is probably the species referred to *S. hirta* by Cameron.

Distinguished at once from *S. hirta* Hal. by the long second antennal joint in the female.

HAB. Oahu, Hawaii, Molokai and no doubt all the islands.

(2) *Spalangia simplex*, sp. nov.

Black, the head usually with slightly greenish tinge, the thorax more brassy and the fourth segment of the abdomen also slightly metallic, the post-petiolear one deep black. Tarsi yellowish or testaceous, apex of tibiae, the knee joints and the trochanters (more or less) also pale, reddish or testaceous. Front of head smooth and shining, with at most a few feeble punctures, but with a distinct fine medio-frontal crenate or punctate line reaching the anterior ocellus. Antennae of the female with the funicle joints short, increasing in width towards the club, and being mostly transverse, pedicel elongate, about as long as the two first funicle joints together, club as long or rather longer than the three last joints of the funicle. In the male the antennae are more elongate, the funicle joints all much longer than wide, the first much the longest, three times as long as wide, nearly as long as the next two together, the pedicel very small, hardly half the length of the first funicle joint, club about as long as the two preceding joints.

Pronotum smooth and shining, but closely punctate on the neck and with a transverse curved crenate line near the hind margin; mesonotum with a similar submedian transverse crenate line and with one or two pits behind it on the mediodorsal line. Axillae marked off posteriorly by strong crenate lines, a less distinct one between scutellum and postscutellum; a distinct transverse crenate line on the former behind the middle; propodeum acutely spined on each side, with a median longitudinal double crenate line and with crenate margins enclosing two large smooth spaces, the pleura roughly sculptured. Mesonotum and scutellum smooth and shining except as above noted. Wings clear, venation brown. Pedicel of the abdomen with numerous fine longitudinal raised lines, twice as long as wide in the ♂, but a good deal shorter in the female, rest of abdomen smooth and polished. Length 1.5—2 mm.

HAB. Oahu, Honolulu.

## Fam. EULOPHIDAE.

To this enormously large and difficult family belong a considerable number of endemic Chalcids. The specimens preserve very badly in the tropics and, a few hours after death, distort and shrivel in such a manner as to preclude any proper description from being made, unless they are preserved in a special manner. They are best described when freshly killed. Though I have collected a considerable amount of material, I do not think it worth while to describe any new forms, until still more comprehensive and better preserved material is available. Many species of Aphelininae and some species of other subfamilies have been introduced for economic purposes, many also accidentally. To the species described by Ashmead in Vol. I. of this work two species only need be added here.

## PARAPHELINUS Perk.

(1) *Paraphelinus xiphidii* Perk.

*Paraphelinus xiphidii* Perk., Bull. H. S. P. A. Exp. Station 1. p. 264.

HAB. Oahu, Maui, Kauai and probably all the islands.

## MELITTOBIA Westw.

(1) *Melittobia hawaiiensis* P.

*Melittobia hawaiiensis* Perkins, Proc. Hawaii Ent. Soc. 1. p. 124.

HAB. Hawaii, Oahu; Oahu, Honolulu; Hawaii, Kilauea and no doubt throughout the islands.

## Fam. TRICHOGRAMMIDAE.

There are several species of this family known in the islands, but it is doubtful whether there are any endemic forms. Those here described are almost certainly all foreign. Several other species are known to me, e.g. a species commonly parasitic in the eggs of the introduced Locustid *Elimaea appendiculata*, and one parasitic in the eggs of the Chrysopine genus *Anomalochrysa*. All the species invariably shrivel up and collapse within a few hours after death, if not placed in fluid, and are best described, when freshly killed. The genus *Westwoodella* belongs to the subfamily Oligositinae, all the other known Hawaiian Trichogrammids (including those undescribed) belong to the Trichogramminae. I have described two species under the genus *Pentarthron*, but this appears to me to be synonymous with Westwood's genus *Trichogramma*. *P. flavum* is perhaps identical with *Trichogramma pretiosa*.

## WESTWOODELLA Ashm.

(1) *Westwoodella hilaris*, sp. nov.

Head and thorax orange-red or brownish red, varying in tint in dried specimens, abdomen black, with a basal yellowish or reddish, wide ring, sides of thorax posteriorly dark, antennae sordid, darker in parts; front legs sordid, hind legs with the femora dark, the tibiae and tarsi pale, tips of all the tarsi black or dark fuscous.



Pedicel, funicle and club of antenna  
of *Westwoodella hilaris* ♀.

Head transverse, collapsed in dry specimens, eyes pilose; scape of antennae stoutish, narrowed apically, pedicel obconical, longer than thick, funicle joint rather like the pedicel, but considerably less thick and a little shorter, club long pointed, of three subequal elongate joints; with the ring joint the antennae are seven-jointed.

Wings pedicellate, narrow, and with a long fringe, hyaline with a fuscous shade where the wing widens after the pedicel and another distinct blotch about the stigmal vein. Marginal vein as long as the submarginal, stout, bearing about six long bristles, the submarginal with one bristle near its middle, stigmal vein short, thick. Mesothorax with a few black bristles, scutellum with one on each side about its middle. Abdomen in dried specimens concave above, narrow and elongate, as long as head and thorax together. Length .5 mm. Female.

HAB. Oahu, Honolulu; amongst foreign grasses.

PENTARTHON Ril.

(1) *Pentarthron semifumatum*, sp. nov.

Black, the thorax at the sides and posteriorly more or less pitchy or obscurely reddish, head red, collapsing in dried specimens, antennae sordid yellowish. Legs with the femora black or blackish, the tibiae and tarsi yellow, but the hind tibiae at least are sometimes black on their basal half. Wings with a smoky cloud on the front pair from their base to the region of the stigmal vein, and occupying all the basal part of the wing.



Antenna *Pentarthron semifumatum* ♀.

Antennae with five distinct joints and apparently a very minute ring joint, the scape long, the pedicel ovate, longer than the two funicle joints together and much wider, first funicle joint in some aspects appearing much wider than the second, club rather longer than pedicel and funicle together and without perceptible segmentation. Thorax and abdomen more or less shining in some aspects, the mesonotum under the microscope with a sculpture of very delicate reticulate lines. Abdomen just about as long as the head and thorax together, the ovipositor very little exerted.

The truly marginal portion of the neurulation of the front wings, i.e. the true marginal vein, is very short and bears a long bristle, there is another a little before this on the submarginal and one a little after it at the base of the stigmal, the three veins appearing as a continuous curve. There are many hair lines, some of which, about six or eight, stand out more distinctly than the others, owing to a considerable space on each side of them being hairless. Between these are many less distinctly separated hair lines. Length .5 mm. Female.

HAB. Hawaii, Oahu, and probably all the islands, since it occurs both in the town of Honolulu and in the mountains of Hawaii above 4000 ft.

(2) *Pentarthron flavum*, sp. nov.

Female, entirely flavous, the head in life probably still paler, the eyes and ocelli red, lateral ocelli near the eye-margins.

Antennae six-jointed with a ring joint, the club solid, and equal in length to the pedicel ring joint and funicle together, the two funicle joints in some aspects appear not very different from one another, the scape with its basal pedicel is a good deal longer than the pedicel and funicle joints together. The mesonotum has a bristle



*Pentarthron flavum* ♀.

Antenna in two rather different aspects.

in front on each side, and another near the posterior angles, the scutellum one on each side near the posterior margin. The axillae encroach greatly on the parapsides of the mesonotum, so that the latter are subsecuriform, being dilated in front and sublinear posteriorly. Abdomen equal in length to the head and thorax together, the ovipositor not, or hardly, exerted.

Wings hyaline about 7 or 9 more prominent hair lines, between which are a number of others closer together, or more confused, or incomplete. Length ♀ 8 mm.

HAB. Oahu, Honolulu.

## Fam. MYMARIDAE.

The Mymarids are a very distinct group of Hymenoptera, to be ranked as a superfamily more distinct from any one other than, for instance, is the superfamily Apoidea from the Sphecoidea. They show affinities with the Proctotrupeoidea, especially with the Diapriidae, and also with the parasitic Cynipoidea. Of the Chalcid series they appear more nearly related to some Eulophidae and Trichogrammidae, but the affinity is very remote.

The endemic Hawaiian species are probably confined to the genus *Polynema*, but some species introduced either casually, or purposely for economic reasons, are also present, and now more numerous individually than the native forms. I have not thought it advisable at present to describe specimens from the intermediate islands, which may represent mere varieties of those occurring on Hawaii and Oahu. Considering the difficulty of differentiating species from the different islands in the case of larger insects, it may naturally be expected that in minute parasitic Hymenoptera these difficulties will reach a climax. Various species, of which only one sex is known, I have also left undescribed at present.

## Subfam. GONATOCERINAE.

## ALAPTUS Hal.

(1) *Alaptus immaturus* P.

*Alaptus immaturus* Perk., Bull. H. S. P. A. Exp. Station 1, p. 197.

HAB. Oahu and probably all the islands; bred from eggs of Psocidae.

## LEIMACIS Forst.

(1) *Leimacis peregrina*, sp. nov.

Dark, blackish fuscous, more or less yellowish or tinged with yellow, especially along the sutures, the legs pale yellow, but in parts a little smoky, antennae smoky blackish, the scape and pedicel, more fuscous or yellow tinged in lateral view. Front wings hyaline except round the margin, and the marginal vein is dark.

Antennae 8-jointed, the scape and club nearly equal, the pedicel large, obconical, about as long as the two following joints together, first funicle joint stouter and shorter than the second, which is more slender than the third, these two being nearly equal in length, fourth and fifth wider than the third, but not differing much from it in length, club almost as long as the whole of the funicle joints together. Thorax and abdomen nearly of equal length, the former truncate posteriorly, on the head and thorax a very few fine bristles are noticeable. Front wings spatulate, the longest cilia four or five times as long as the greatest width of the wing, the disc with a line of only three or four hairs, marginal vein long. Length 2.5 mm.

HAB. Oahu, Honolulu.

## Subfam. MYMARINAE.

## POLYNEMA Hal.

(1) *Polynema gigas*, sp. nov.

Black, the front legs yellow or brownish yellow, the middle and hind legs brown or partly yellowish brown, their tibiae and tarsi blackish; abdominal petiole for the most part dark brown; pedicel of the antennae yellowish at the sides, scape laterally pitchy or brown.

Antennae of male long and filiform, the pedicel compressed, ovate, the first funicle joint decidedly shorter than the second, which is about six times as long as wide; first funicle joint in the female short, barely one-half the length of the very long second joint, the three terminal ones elongate and not very unequal, the fifth joint being about four times as long as wide. Mesonotum with delicate rugulose or reticulate surface sculpture, propodeum with smooth and shining surface. Abdominal petiole narrowing to the

apex, its upper side curved, when seen in profile; ovipositor exerted to about the length of the claw joint of the hind tarsus. Wings with dark, ovate, punctiform marginal vein; the longest cilia hardly half as long as the greatest width of the front wing. Length 1.5—2 mm.

HAB. Hawaii, 4000 ft.; bred from shoots of *Myrsine* bored by the caterpillar of a very large species of *Archips* (Tortricidae), but I cannot conjecture the true host of this parasite.

(2) *Polynema terrestris*, sp. nov.

Black, two basal antennal joints and all the legs yellow; abdominal petiole yellow or brownish yellow or in the ♂ partly dark brown, third antennal joint in the ♀ more or less pale.

Antennae of ♂ very long and filiform, one and a half times as long as the whole insect, the joints of the funicle elongate and about equal, the third being five times (or more) as long as wide. First funicle joint in ♀ hardly half as long as the second, which is considerably longer than the third, the fourth, fifth and sixth subequal, the last about three times as long as its greatest width, club rather longer than the two preceding. Sculpture of the thorax, which is somewhat shining, of the usual kind, but hardly visible under the strongest lenses; front wings with dark, punctiform marginal vein, the longest cilia hardly half as long as the greatest width of the wing. Ovipositor of ♀ very slightly exerted. Length 1.5—1.75 mm.

HAB. Oahu, 1500 ft. and upwards.

(3) *Polynema pyrophila*, sp. nov.

Black, the second joint of the antennae beneath paler, more or less yellowish or brown, in the ♂ sometimes obscurely pitchy; coxae and trochanters generally more or less brownish, tips of femora, except sometimes the hind ones, distinctly pale.

Antennae of ♂ with the pedicel roundish in lateral aspect, the first funicle joint rather shorter than the second, the following joints subequal and more than three times as long as wide. Antennae of ♀ very slender, the long ovate club rather longer than the two preceding joints together, the pedicel dilated, the first funicle joint hardly half as long as the second, which is about one and one-fifth longer than the third. Pronotum short, mesonotum hardly shining, with excessively fine reticulate surface sculpture, visible only under a very strong lens, the parapsidal furrows very distinct, the scutellum elongate and large, divided by a fine transverse line about the middle; the propodeum and abdomen smooth and polished. Second abdominal segment much narrowed from the apex forwards to its junction with the petiole. Ovipositor prominent, as long

as the second joint of the hind tarsus. Wings evenly hairy, the marginal vein thick, punctiform, the longest cilia of the front wing only about half the greatest width of this. Length 1.3—1.4 mm.

HAB. Hawaii; 4000 ft.

(4) *Polynema scrutator*, sp. nov.

Male black, the abdominal pedicel and all the legs yellowish or brownish yellow, the pedicel sometimes somewhat darkened; all the tibiae, the middle and hind femora and sometimes also the front ones brown or dark brownish, claw joint of tarsi dark. Antennae with the pedicel yellow laterally, the scape sometimes brown or piceous at the sides.

Antennae long and filiform, the joints of the funicle subequal, the third about three times as long as its greatest width, the pedicel compressed, dilated, being very strongly rounded beneath, first funicle joint a little shorter than the second. Thorax with distinct microscopic rugulosity under strong magnification, the abdomen smooth, shining, with the pedicel much narrowed from base to apex. Front wings with the marginal vein ovate, subpunctiform, dark, the longest cilia much shorter than the greatest width of the wing, or only about half as long. Length 1 mm.

HAB. Oahu, Honolulu. Though I have on various occasions found this species in the town of Honolulu, I have never at any time taken a female of the males described above. Males and females of *P. redwiohi* occur with it, in some localities.

(5) *Polynema rubriventris*, sp. nov.

Female black, the abdomen ferruginous, sometimes partly dark or infuscate; the legs, except the apical tarsal joints, entirely yellow, as also the two basal and sometimes the third antennal joint; the club and three preceding funicle joints black, while the more basal funicle joints are mostly more or less sordidly yellowish or brown.

Antennae slender, the pedicel compressed, obconic, the first funicle joint half as long as the very slender and elongate third, the three apical joints of the funicle subequal, slender, three or four times as long as wide, the club as long as the two preceding joints. Thorax hardly shining, the minute surface sculpture or rugulosity distinct, the impresso-punctate transverse line on the scutellum about two-thirds the length of the latter from its front margin. Abdomen smooth and shining, the ovipositor distinctly subinserted. Marginal view of front wings subovate, the longest cilia not half as long as the greatest width of the wing. Length 1.6—1.75 mm.

HAB. Oahu; 1500 ft. and upwards.

(6) *Polynema tantalea*, sp. nov.

Male ferruginous, the head and the abdomen, except its base and the petiole, and the apical joints of the tarsi black; middle and hind tibiae blackish and their tarsi more or less infuscate. Antennae black, the two basal joints clear yellow. Legs, except as noted above, yellow.

Antennae very long and slender filiform, much longer than the whole insect, the first funicle joint considerably shorter than the second, the several following this not differing much in length, the third being about five times as long as its greatest width, whilst several of the apical joints are noticeably shorter than these basal ones. Thorax dull, with very fine surface sculpture, the transverse line near the hind margin of the scutellum distinct. Abdomen smooth and shining. Front wings evenly pubescent, marginal vein punctiform, dark, the submarginal yellow, longest cilia not half as long as the greatest width of the wing. Length 1.25 mm.

HAB. Oahu; 1500—2000 ft.

(7) *Polynema oahuensis*, sp. nov.

Ferruginous or yellowish brown, the head black, but the occipital region and the face below the antennae is concolorous with the rest of the body; apical joint of the tarsi black, as well as the club and the three preceding antennal joints.

Antennae of the ♀ with the first funicle joint quite short, not half as long as the very long second joint, the pedicel obconic, the club as long as the two preceding joints together. Thorax hardly at all shining, the surface sculpture very fine; transverse impressed line near the hind margin of the scutellum distinct; abdomen smooth and shining, the ovipositor distinctly subexserted, black. Wings evenly pubescent, marginal vein punctiform, dark; longest cilia of front wings, not more than half the length of the greatest width of the wing. Length ♀ 1.5 mm.

HAB. Oahu; 1500—2000 ft.

(8) *Polynema triscia*, sp. nov.

Ferruginous, a transverse line across the head in front, the apical joints of the middle and hind tarsi, and the apical part of the abdomen, black or dark-coloured. The hind tibiae infuscate on their apical portion. Basal two joints of antennae clear yellow, the third yellowish but infuscate, the following shows more or less of a yellow tinge, while most of the flagellum is black.

Antennae of male very long, decidedly longer than the whole insect, filiform, attenuate apically, scape short, wide in lateral aspect, pedicel very short, ovate or subrotundate, first flagellar joint elongate, three times as long as its greatest width and just about equal to the second, the latter and the following joints being all nearly equal in length, and all fluted on their flattened sides. Mesonotum and scutellum dull, with

the usual minute sculpture (reticulated under a compound microscope) distinct; propodeum smooth and shining. Wings with the neuration fuscous, the marginal vein of the front wings subovate, beneath which is a fuscous fascia, a second fascia near the middle of the wing, while a third occupies the apical part of the wing and is broader than the clear space between itself and the middle fascia; cilia short, the longest not half the length of the greatest width of the wing. Abdomen shining. Length ♂ (abdomen somewhat contracted) 1·5 mm.

HAB. Oahu; Koolau range, 1500 ft.

(9) *Polynema apicalis*, sp. nov.

Ferruginous, the antennae except the two basal joints, which are more or less yellow or brown, black; the middle tibiae are noticeably darkened, the hind ones, except basally, nearly black; the hind femora are also dark on the apical portion; and the apical joint of all the tarsi is black. Wings hyaline, but widely black on the apical portion. Vertex of head with a transverse black line in front.

Antennae with the pedicel subtriangular or obconic, the first funicle joint very short, about equal to the pedicel but much more slender, the second very long, more than twice as long as the preceding, and also much longer than the third; fourth, fifth and sixth not differing much in length and shorter than the third, club ellipsoidal, somewhat shorter than the three preceding joints together. Thorax not shining, appearing densely minutely punctate, from the microscopic reticulation of the surface. Marginal vein dark, elongate-ovate, the longest cilia of front wings not equal in length to half the greatest width of the wing. Abdomen smooth and shining, the ovipositor very slightly exerted. Length 1·6 mm.

HAB. Oahu; Honolulu mountains, about 2000 ft.

(10) *Polynema perforator*, sp. nov.

Yellow or brownish yellow, the head, abdomen except the pedicel, and the claw joints of all the tarsi black. Antennae with the three basal joints in the ♂, and two in the ♀, yellow; the following joints more or less infusate, the club fuscous or blackish.

Antennae in the ♂ long and filiform, the pedicel compressed and dilated, strongly rounded beneath, the first funicle joint rather shorter than the second; in the ♀ the first funicle joint much shorter than the next, not two-thirds of its length, the club large and as long as the three preceding joints together. Thorax sculptured as in the other species, the abdomen smooth and shining. Ovipositor as long or rather longer than the claw joint of the hind tarsi. Front wings with marginal vein subpunctiform, dark-coloured, ovate, the longest cilia hardly half as long as the greatest width of the wing. Length 0·75—1·2 mm.

HAB. Oahu, in the mountains.

(11) *Polynema ciliata*, sp. nov.

Black, the two basal joints of the antennae, the pedicel of the abdomen, and all the legs, pale yellow, the pulvillus of all the tarsi dark.

Head smooth and shining, the pedicel of the antennae strongly compressed, obconical, or ovate, as long or a little longer than the slender first joint of the funicle, the latter about half the length of the very elongate second joint, the third rather shorter than the second, the three following joints on their wide surface much wider than the preceding joints, the two first of these being subequal, the last conspicuously more elongate, the club just about equal to the three preceding joints together. The club and funicle joints are blackish or smoky, the basal funicle joints sometimes showing a yellowish tinge; the scape and pedicel are almost entirely yellow, the upper edge of the former and the tip of the latter being darkened. Mesonotum shining, hardly or not visibly sculptured under a strong lens, the propodeum quite smooth and shining. Abdomen smooth and polished, the ovipositor very slightly exerted. Front wings hyaline basally to considerably beyond the marginal vein, the rest appearing darker, with even clothing of black hairs, marginal vein short more or less pale, longest cilia as long as the greatest width of the wing, or rather longer. Length ♀ hardly 1 mm. when fully extended.

HAB. Oahu; 1500 ft.; parasitic in the eggs of a small Delphacid.

(12) *Polynema jassidarum*, sp. nov.

Black, the antennae black or fuscous in the male, the second joint is always noticeably yellowish, and the scape and first funicle joint may be more or less obscurely or sordidly pale. In the female the scape is dark or black, the pedicel and most of the funicle joints yellow, the club and preceding funicle joint always dark. Legs and abdominal pedicel yellow or brownish yellow, the femora and tibiae usually more or less embrowned, the apical joint of the tarsi black.

Antennae of the ♂ considerably longer than the whole insect, the pedicel roundish in lateral view, the funicle joints subequally elongate, the third about two and a half or three times as long as wide. Female with the first funicle joint short, only about half the length of the second, the latter slender and the longest of all, the club as long as the three preceding joints, which are subequal and shorter than the third funicle joint. Form and sculpture of the thorax as in the other species; the abdomen smooth and shining, with the ovipositor distinctly exerted. Wings with the marginal vein punctiform, dark brown or brownish yellow, variable in colour; the longest cilia of the front wings rather less than the greatest width of the wing. Length ♂ 65—85 mm.

HAB. Oahu near the coast; parasitic on eggs of a Jassid.

(13) *Polynema nana*, sp. nov.

Black, the antennae entirely black above, but the scape and pedicel in lateral view are usually more or less pale, piceous or sometimes yellowish; legs blackish or dark brown, but the tarsi are paler, generally yellowish, sometimes infuscate above, the apical joint being conspicuously black.

Antennae of ♂ considerably longer than the whole insect, pedicel compressed, dilated, strongly rounded beneath, the first funicle joint decidedly shorter than the second, the third and following subequal, the latter being rather more than twice as long as its greatest width. In the ♀ the first funicle joint is short, much shorter than the second, the club as long as the three preceding joints together, the pedicel compressed, ovate. Pronotum short and hardly noticeable in dorsal aspect, the mesonotum shining, with distinct parapsidal furrows and a very delicate reticulate sculpture under high powers of the microscope. Scutellum large and long as in the other Hawaiian species. Wings evenly hairy, marginal vein dark, punctiform, the cilia, where longest, as long as or longer than the greatest width of the front wing. Abdomen smooth, shining, the ovipositor slightly, but distinctly, exerted. Length about 5 mm.

HAB. Hawaii, Kilauea. One apterous female, taken with the winged ones, appears identical with the above.

(14) *Polynema reduvioli* P.

*Polynema reduvioli* Perk., Bull. H. S. P. A. Exp. St. 1. p. 196.

HAB. Oahu, Kauai, Hawaii, and no doubt all the islands.

## CYNIPOIDEA.

## Fam. FIGITIDAE.

## Subfam. EUCOILINAE.

The species of Eucoline Cynipoids are numerous in the islands, and unquestionably difficult to determine specifically. Ashmead referred the Hawaiian species described by him to a number of genera, but to me all the Hawaiian species appear intimately allied and likely to prove still more intimately so, as new species are found. Kieffer in Wytman's *Genera Ins.* refers Ashmead's Hawaiian species to three genera, and I believe the *Pilinotherix* of Ashmead should have been placed with the forms, which Kieffer refers to *Cothonaspis*, subg. *Anectocleis*. It is also noteworthy that the Hawaiian species with closed marginal cell, referred by Kieffer to *Eucoila*, subg. *Psichaera*, very closely resemble some of the forms with open marginal cell and that this cell in different species varies very much as to how far it is open above. In fact in some Hawaiian forms it is not at all easy to decide whether the marginal cell is really closed or open.

Kieffer gives as a character of *Cothonaspis* (s. l.) "cupule non convexe," but in all or nearly all the Hawaiian forms it is more or less convex and sometimes very strongly so. Only in the species, for which I have formed the subg. *Nesodiranchis* is the scutellar cup depressed.

Under the circumstances, I think it better to place all the Hawaiian species with more or less open marginal cell (excepting the one just referred to) in a subgenus *Hypodiranchis* Ashm., treating this as a section of *Cothonaspis*. Ashmead's characters for *Hypodiranchis* will not fit most of the species here described, nor in fact do the examples he described agree with the generic characters he laid down. In the sense used here, *Hypodiranchis* will refer to a division of *Cothonaspis* in which the cup of the scutellum is generally more or less convex, sometimes strongly so, and never impressed, and the antennae of the female are without a definite club.

I find it impossible to refer males, caught at large, to their proper females with any certainty and therefore have described none of this sex. Had I done so the list of species would have been much increased, but no doubt many or most of the names given to males would become mere synonyms of previously described females. By breeding, or special collecting in the field, the sexes will no doubt be rightly assigned in the future.

I may note that several species of parasitic Cynipids have been introduced into the islands for economic purposes, but these are not considered in this account.

#### COTHONASPIS Hart.

##### NESODIRANCHIS, subgen. nov.

Like *Diranchis*, as defined by Ashmead, in most characters, but with the antennae not at all clavate, the more basal flagellar joints being larger and longer than those at the apex, so that the antennae become distinctly attenuate towards the tips. Third antennal joint slightly longer than the fourth, all of these beyond the pedicel being elongate, the sides slightly rounded, the surface very finely striate or rugulose rather than fluted, fourth and fifth joints about twice as long as wide, apical joint about one and one-half times the length of the preceding. Scutellar cup large, ovate, depressed, the posterior fovea large, transverse; marginal cell in front wings entirely open above, cubitus effaced, represented by a hair line; abdomen about as long as the thorax, with a slight hairy girdle at base, hypopygium not conspicuously prominent.

##### (1) *Cothonaspis* (*Nesodiranchis*) *ashmeadi*, sp. nov.

Black, the mandibles, the two basal antennal joints (and the third obscurely) red; legs yellow, tarsal joints mostly black. Neuration brownish towards the base, but the radius darker, the last abscissa black or almost so.

Antennae shortly pilose, pedicel short, hardly longer than wide; mesonotum smooth and shining, scutellar cup distinctly concave, with a few punctures on each side,



*Nesodiranchis ashmeadi* ♀.  
Antenna and cup of scutellum.

in front of the posterior fovea, distinct; sides of cup pilose, with close rugose puncturation; propodeum with a carina on each side of the middle, the area between these shining; on each side of this area externally the propodeum is pubescent. Abdomen smooth and shining, with a thin basal pubescent girdle. Length 2 mm. Female.

HAB. Oahu, 1500—2000 ft.

Subgen. *COTHONASPIS* Först.

(2) *Cothonaspis* (*Hypodiranchis*) *pele*, sp. nov.

Black, polished, the mandibles and all the legs ferruginous, the tarsi, at least the hind and middle ones, more or less infuscate above, the pedicel of the antennae obscurely red or pitchy.

Antennae moderately long, rather longer than the head and thorax together, 13-jointed, the pedicel hardly longer than wide, the first funicular joint elongate, more than twice as long as wide, distinctly, though not greatly, longer than the second, and about equal to the third; the first and second distinctly more slender than the latter, the latter more so than the fourth, this and all the following being subequal and moniliform, each longer than wide, and all fluted. Mesonotum very smooth and shining, with sparse pale hairs; scutellar cup narrowly ovate, pointed anteriorly, twice as long as its greatest width, with a large fovea posteriorly, and with some distinct piligerous punctures on each side in front of the fovea; sides of scutellum beneath the disc distinctly rugose and posteriorly pilose. Meso- and metapleura smooth. Wings hyaline, ciliated, neuration dark and strong, the marginal cell open above for about half its length, the cubitus much fainter than the rest of the neuration. Propodeum carinate on each side of the middle, the surface dull and thinly pubescent. Abdomen about equal in length to the head and thorax together, with a rather sparse and inconspicuous hairy girdle at the base, the hypopygium strongly exerted. Length 2 mm. ♀.

HAB. Hawaii, Kilauea; ovipositing in Dipterous larvae, belonging to the genus *Drosophila*.

(3) *Cothonaspis (H.) intermedia*, sp. nov.

Female black, polished, the legs brown, the hind ones darker, the front and middle pair more yellowish brown or testaceous. Antennae obscure brownish or pitchy, the apical joints black, or nearly so, the pedicel being the palest joint.

The joints of the flagellum are all elongate, the first being distinctly longer than the second, the following joints subequal, the more apical slightly wider than the first and second; the third joint is nearly  $2\frac{1}{2}$  times as long as its greatest width, the antepenultimate joint only about twice as long as wide. Scutellar disc very convex above, very long and narrow, subparallel-sided, the very fine margins generally, in some aspects, appearing slightly sinuate inwardly behind the middle, the fovea very large, with one or two very fine punctures on each side in front of the fovea; below the disc the scutellum is finely and regularly longitudinally striate and sparsely hairy; propodeum with the median area between the carinae punctate, the sides with yellow pubescence, like that of the abdominal girdle, the latter also having an apical ciliation of longer hairs. Meso- and metapleura smooth. Wings hyaline, somewhat yellow-tinged, especially about the nervures, which are rather dark fuscous; cubitus pallid, not distinct, marginal cell closed above for about half its length from the base. Hypopygium rather strongly exerted. Length 2.5 mm. ♀.

Male very like the female, but with much longer, filiform antennae, the flagellar joints subequally elongate, the third being about  $2\frac{1}{2}$  times as long as wide, the antepenultimate about 4 times, owing to the attenuation of the antennae apically, the first distinctly, but slightly, curved.

Var. Scutellum at the sides, more or less of the sides of the abdomen at the base, more or less of the basal joints of the antennae, or some of these parts, reddish, or pitchy.

HAB. Oahu; widely distributed in the mountains above 1300 ft.

(4) *Cothonaspis (H.) tantali*, sp. nov.

Polished black, the mandibles and the pedicel of the antennae dark red, all the legs ferruginous, the apical joint of the front and middle tarsi and most of the posterior tarsi above, infuscate.

Antennae long and filiform, 13-jointed, slightly longer than the whole insect, the pedicel short, hardly longer than wide, the first flagellar joint slightly longer than the second, the latter three times as long as its greatest width, the joints towards the apex of the antennae a little wider in proportion to their length, the penultimate joint being rather more than twice as long as its greatest width, the terminal joint long, one and two-thirds the length of the preceding. Mesonotum polished, sparsely pilose; scutellar disc narrow, two and a half times (or more) as long as its greatest width, deeply and

largely foveated posteriorly, and with a series of distinct marginal piligerous punctures on each side, from near the base to the fovea; sides of scutellum below the disc longitudinally wrinkled and pilose; propodeum between the carinae very dull and densely rugulose, at the sides with a patch of dense woolly hair; mesopleura smooth, metapleura longitudinally strigose. Wings hyaline, faintly yellow-tinged, ciliated; neuration for the most part rather pale yellowish brown, marginal cell open above, the cubitus much fainter than the other nervures. Abdomen elongate-ovate pointed at apex, with a dense basal girdle of yellowish pubescence, the hypopygium not conspicuously exerted, but more so in some examples than in others. The basal flagellar joints of the antennae are sometimes more or less reddish-tinged. Length 2.25 mm. ♀.

The antennae are so slender that they can hardly be called subclavate, and possibly this species could be referred to Förster's genus *Anectoclis*.

HAB. Oahu, near Honolulu, above 1500 ft.

(5) *Cothonaspis* (*H.*) *strigosa*, sp. nov.

Extremely similar to *P. tantali*, having the same scutellar structure, similar antennae etc. It is readily distinguished, however, by the mesopleura posteriorly being strongly longitudinally strigose, like the metapleura, instead of being altogether smooth and shining.

HAB. Oahu; Honolulu, above 1500 ft.

(6) *Cothonaspis* (*H.*) *declivis*, sp. nov.

Black, the two basal antennal joints red, mandibles and legs testaceous or brownish yellow.

Antennae long, about as long as the whole insect, all the flagellar joints elongate, the flagellum appearing subclavate, owing to the more apical joints being proportionately rather wider and shorter than the more basal ones, in some aspects; first and second flagellar joints nearly equal in length, the latter slightly stouter, about equal to the following, but rather more slender, third about three times as long as wide, the antepenultimate joint about twice as long as wide. Mesonotum polished, sparsely pilose, pleural region smooth and polished, including the metapleura. Scutellar cup more than twice as long as wide, very convex longitudinally and very strongly declivous posteriorly before the large round fovea, also strongly convex transversely, sides of the cup rugulose, but partly smooth; propodeum dull between the carinae, but very indistinctly sculptured. Wings ciliated, neuration brownish yellow, the marginal cell open above, except for a short distance at base, cubitus very faint. Hypopygium not prominent. Length 2 mm. ♀.

HAB. Oahu; near Honolulu, above 1500 ft.

NOTE. With *P. declivis* and *P. tantali* I take a male Cynipid, which I cannot refer to either with any certainty. It may be distinct from either, but I suspect this is not the case.

(7) *Cothonaspis (H.) naias*, sp. nov.

Black, polished, five basal joints of the antennae red, mandibles and legs testaceous or ferruginous, hind coxae browner, hind tarsi evidently infusate.

Antennae two-thirds the length of the whole insect, the basal joint of the flagellum equal in length to the third, but evidently more slender, the second joint being much shorter, about two-thirds the length of these, fourth and following joints wider than the third, all elongate, submoniliform, subequal, the antepenultimate joint about twice as long as wide. Scutellar cup long and narrow, acuminate in front, foveated at its posterior end, about three times as long as wide, with several evident punctures on its smooth surface, its sides distinctly, finely rugulose. Propodeum with a dense patch of pubescence outside each of the longitudinal carinae; meso- and metapleura smooth and polished. Wings clear, hyaline, ciliated, marginal cell apparently closed above on less than its basal half, neuration yellowish brown, cubitus faint. Hypopygium somewhat prominent. Length 1.75 mm. ♀.

HAB. Oahu; 1500 ft.

(8) *Cothonaspis (H.) debilis*, sp. nov.

Black, polished, mandibles and two basal antennal joints yellowish brown, some other of the basal flagellar joints also more or less pale, legs testaceous, apices of tarsi dark.

Antennae as long as the whole insect, slender, but gradually subclavate, the two basal flagellar joints being notably more slender than those towards the apex. First flagellar joint subequal to or a trifle longer than the second, which is subequal to the following joints; fluted sculpture distinct; antepenultimate joint of antennae twice as long as wide. Scutellar cup elongate-ovate, twice as long as its greatest width, foveate at its posterior end, and with a few fine punctures before the fovea; sides very finely rugulose; propodeal carinae distinct, the pubescence not dense; mesothoracic and metathoracic pleura smooth, polished. Neuration brown, yellow-tinged, cubitus much paler and fainter than radius, but easily seen, marginal cell closed above for only a short distance at the base. Hairy girdle of abdomen not dense, hypopygium not strongly prominent. Length hardly 1.5 mm. ♀.

*C. debilis* var. *similis* var. nov.

Very like the above in appearance and structure, but the hind coxae are rather darker brown, the scutellar cup is slightly wider, its margins more distinct and at the sides it is shining and smooth instead of being rugulose.

*C. debilis* var. *subdebilis* var. nov.

Antennae paler than in typical *debilis* (var. *similis* being intermediate), scutellar cup decidedly narrower than in either of the above forms, about  $2\frac{1}{2}$  times as long as wide, shining and nearly smooth on its sides, or at least hardly visibly sculptured even under a very strong lens.

HAB. Hawaii; Kilauea. Without a long series of examples the three forms described can hardly be considered as species.

(9) *Cothonaspis* (*H.*) *abnormis*, sp. nov.

Black, polished, two basal antennal joints, mandibles and all the legs ferruginous or testaceous.

Antennae long and slender, as long as the whole insect, the flagellum feebly subclavate, the apical joints being evidently wider, when compared with the basal joints, but all are elongate, the antepenultimate joint being about three times as long as wide. Three basal joints almost of equal length, though the basal one, on actual measurement is a trifle shorter. Scutellar cup elongate, not distinctly margined, and best seen when looked at obliquely from in front. It is of narrow ellipsoidal form and very little raised, the sides being extremely low, rugosely sculptured, and there is no posterior fovea; propodeum bicarinate, dull and hardly perceptibly sculptured between the carinae, pubescent at the sides; pleura smooth, the mesopleura with an impression. Wings more or less yellowish-tinged, marginal cell closed above on about the basal half, neuration brownish yellow, cubitus rather distinct. Abdomen strongly compressed, with complete hairy girdle, the hypopygium prominent. Length 1.5—1.75 mm. ♀.

HAB. Oahu; 1500—2000 ft.

OBS. This species might be placed in a distinct genus, but the possibility of the occurrence in the islands of others, which would connect it with more usual forms, renders it inadvisable to separate it generically at present.

(10) *Cothonaspis* (*H.*) *dubiosa*, sp. nov.

Black, polished, two basal joints of antennae and mandibles distinctly red, legs flavo-testaceous, abdomen blackish or very dark brown over most of the basal portion, becoming reddish apically, as also widely so at the sides beneath. Front and middle tarsi brownish, the posterior tarsi dark fuscous.

Antennae about two-thirds the length of the insect, the flagellum subclavate, fluted, its third joint being evidently wider than the second, the latter and the first almost equal in length, the third and fourth very slightly longer, the antepenultimate joint twice as wide as long, the third rather longer, about  $2\frac{1}{2}$  times its width and evidently fluted. Scutellar cup elongate, twice as long as its greatest width, very distinctly

marked by its pale margins throughout, a few scattered punctures (in the type specimen) in front of the posterior fovea; sides of the cup somewhat shining, with some very fine punctures, and extremely fine longitudinal rugulosity, sparsely pilose; pleura smooth and polished; propodeum with the two longitudinal carinae as in the other species. Wings ciliate, the neuration yellowish at base, becoming darker apically, the apical side of the marginal cell being dark fuscous; this cell closed on its basal half above. Length rather more than 2 mm. ♀.

I cannot be sure that the marginal cell in this species is not altogether closed, as in some aspects the nervure on the upper side of the cell appears continuous to the apex, though fainter beyond the middle.

HAB. Oahu; 1500 ft. I have only examined one example and the abdomen is partly crushed.

(11) *Cothonaspis (H.) dichroma*, sp. nov.

Black, polished, the two basal joints of the antennae distinctly red, as well as the mandibles, legs testaceous, the tarsi more or less infusate, the hind ones dark fuscous or blackish above, abdomen ferruginous.

Antennae rather more than two-thirds the length of the whole insect, the flagellum subclavate, its second joint being considerably less wide than the third, its first joint more slender still; the first of these joints very little longer than the second, and all the flagellar joints are elongate, submoniliform, the antepenultimate (with its contracted base) being about twice as long as wide. Scutellar cup elongate, rather more than twice as long as wide, pointed anteriorly and foveated at the other extremity, one or two fine punctures inside either margin; at the sides it is densely rugosely sculptured or rugose-punctate and sparsely pilose. Propodeum between the carinae impressed, slightly hairy, hardly sculptured. Pleura smooth, not sculptured. Hypopygium somewhat exserted. Length 2 mm. ♀.

HAB. Oahu, about 1500 ft.

EUCOILA Westw.

(1) *Eucoila (Psichacra) oreias*, sp. nov.

Black, smooth and shining, mandibles red on their apical part, coxae black or very dark; front and middle femora mostly dark brown above, the apical part being pale brownish yellow, front and middle tibiae yellowish brown, the latter sometimes darker than the former; hind legs darker than the others, the femora black or nearly, excepting the yellowish apices, tibiae dark brown except at base, the tarsi entirely blackish or dark fuscous. Neuration yellowish, the apical side of the marginal cell paler than most of the neuration.

Antennae as long as the entire insect, or almost so, the first two joints beyond the pedicel being somewhat thinner than the next. The flagellar joints are subequal in

length, the first being slightly shorter than the second, both elongate and slender, the antepenultimate joint of nearly the same length as these, but much stouter, about twice as long as wide. The scutellar cup is elongate-ovate, its greatest width being less than half its length; its margins are not very distinct, its dorsal surface bears no punctures in front of the posterior fovea, or at most one or two very feeble ones, but its sides are somewhat roughened by a number of punctures. Abdominal hairy girdle not dense. Length ♀ 1.75 mm.

HAB. Hawaii, Kilauea.

(2) *Eucoila* (*P.*) *orobates*, sp. nov.

Extremely like *E. oreias*, with similar long antennae, which do not differ much in structure from those of that species. The legs, however, are less dark in nearly all parts, brown and, where paler, yellowish, the neuration of the wings is darker, fuscous; the scutellar cup is well margined, wider, about twice as long as its greatest width, and bears punctures on each side dorsally in front of the posterior fovea, its sides are quite smooth, polished and impunctate or nearly. Length ♀ 1.75 mm.

HAB. Hawaii, Kilauea.

(3) *Eucoila* (*P.*) *hygrophila*, sp. nov.

Black, polished, legs ferruginous or testaceous, hind coxae and sometimes the middle ones darkish brown, the hind femora and tibiae also browner, the hind tarsi dark fuscous; several of the basal antennal joints more or less distinctly reddish. Neuration fuscous, more or less yellow-tinged. Antennae considerably shorter than the whole insect, without a definite club, but the fourth joint of the flagellum is considerably thicker than the third, the first joint being decidedly longer than the second or third, which are subequal and shorter than the fourth; the antepenultimate joint is considerably less than twice as long as its width. The scutellar cup is well defined, not at all impressed, but with a distinct posterior fovea, very elongate, about three times as long as wide; the sides are finely longitudinally rugulose; sides of the propodeum and the basal abdominal girdle densely hairy. Length ♀ 1.5—2 mm.

*Eucoila hygrophila* var. *philygra* nov.

Like the above in sculpture etc. but with the neuration yellower, and the basal joints of the flagellum rather different, the first joint being slightly but distinctly longer than the second, and about equal to the third. Length ♀ 1.2 mm.

HAB. Oahu; 1500—2000 ft.

## EUCOILIDEA Ashm.

(1) *Eucoilidea micromorpha*, sp. nov.

Black, abdomen beneath at least at the base yellowish or brownish yellow. Legs mostly testaceous, the front and middle femora distinctly dark brown above except apically, tarsi and sometimes the posterior tibiae also more or less dark. Head, abdomen, and mesonotum smooth and polished. Antennae with short, globose pedicel, funicle with the joints increasing slightly in width towards the apex of the antennae, and fluted, the first and second joints nearly equal in length and the slenderest, the third being slightly wider than the latter, and also of about the same length, antepical joints longer than their greatest width, but not much longer. Scutellar cup with a distinct complete series of marginal punctures just within its border, rugose-punctate below this. Mesopleura smooth and shining. Propodeum very finely sculptured in the middle between the carinae, and with a pubescent patch external to the carinae on each side in front. Abdominal petiole longitudinally costate. Neuration sordid yellowish. Length 1.2 mm. Female.

Var. *a*. Smaller, the antennae more pithy, or blackish fuscous, abdomen more widely yellowish brown from base to apex, posterior femora as dark, or almost as dark, as the others.

HAB. Oahu, Honolulu on the lowlands and in the mountains to 1500 ft.

## ICHNEUMONOIDEA.

## Fam. ICHNEUMONIDAE.

## Subfam. CRYPTINAE.

Cryptine Ichneumons are represented, in addition to the introduced species enumerated in Vol. I., by a single species of the tribe Hemitelini, a common parasite in the nests of spiders. I have little doubt the species is introduced. It is widely distributed in the islands.

## Subfam. PIMPLINAE.

## PIMPLA Fabr.

(1) *Pimpla*, sp.?

A commonplace species of *Pimpla* is now common on Oahu, where it was first noticed in 1901.

*Pimpla hawaiiensis* Cam.

This species, described from the islands, also inhabits Mexico, and I have bred it from pupae of Mexican Tortricidae. It is no doubt an importation into the islands.

## GLYPTOGASTRA Ashm.

(1) *Glyptogastra ashmeadi*, sp. nov.

Black, the apex of the clypeus, the labrum, antennae, front legs except a large part of the coxae, the middle tibiae, the sides (more or less) and the apical margins of the second to sixth abdominal segments, the whole or nearly the whole of the seventh and eighth and the genital armature ferruginous or testaceous. Middle and posterior femora red, the hind tibiae obscure red, as also the middle and hind trochanters, the coxae and tarsi black or blackish. Apical half of the antennae blackish above, beneath paler, but sordid. Abdomen dull, metallic greenish black.

Face below the antennae and nearly the whole thorax conspicuously clothed with pale brownish yellow hairs; antennae with 32 joints and with the first funicle joint much longer than the second, the rest decreasing in length towards the apex, each joint sub-compressed so as to be wider at its base and apex than in the middle. Thorax dull and densely sculptured beneath the pubescence, formed as in *G. hawaiiensis* Ashm., the propodeum with very shallow punctures, which are larger than those of the mesonotum, the posterior median impression without hairs. Elevation of first abdominal segment concave above, second to sixth with lateral oblique lines, meeting at their apices the more or less distinct transverse impressed lines, which are distinct only towards the sides of each segment. Apical three or four segments recurved. Wings uniformly light shining fuscous, the neuration and stigma dark. Length (abdomen not straightened out) 9 mm.

OBS. *G. hawaiiensis* is not simply black as described, but is distinctly metallic.

HAB. Oahu; Honolulu, 1500 ft. I have not seen the female.

## Subfam. OPHIONINAE.

## ENICOSPILUS Curt.

The Hawaiian species of *Enicospilus* present unusual difficulties owing to the variation of important structural characters, as well as of colour. In some species the entire absence of the blister-like spot on the front wings decharacterizes the genus. It is, however, quite impossible to separate such species generically, because these spots are subject to variation in other species, so that in some cases, while the blister spot is tolerably distinct in some examples, in others it may be almost or entirely effaced. The transverse carina of the propodeum is also variable. Thus in *E. kaalae* Ashm. the male (as in the type) may be without the carina, or it may be well developed, as it always is in the female.

*Enicospilus kaalae* Ashm.

*Enicospilus semirufus* Perkins, Tr. Ent. Soc. London, 1902, p. 142.

My *E. semirufus* is a variety of the above. I characterized it as distinct from the fact that the male of *E. kaalae* was said to resemble the female. In the type, however, the male of *E. kaalae* lacks the distinct carina of the female. The colour description likewise did not altogether agree. The examination of a large number of examples shows that the carina on the propodeum of *E. kaalae* may be present or absent and is not a specific character.

HAB. Oahu; very common throughout the island. The type is from Kauai.

(1) *Enicospilus tyrannus*, sp. nov.

Male, head and face yellow, the ocelli very large, dark brown; the mandibles and mouth-parts brownish, the impressions on each side of the clypeus and a median spot beneath the antennae brown. Antennae ferruginous or testaceous, towards the apex fuscous. Pronotum mostly yellowish, the mesonotum dark brown, bordered with yellowish, and with a yellow longitudinal line on each side of the middle, dividing the dark colour into an anterior and two postero-lateral lobes; scutellum and postscutellum brown medially, more yellow laterally, propodeum blackish pitchy; more brown on the smooth anterior area. Legs ferruginous, the tibiae and tarsi paler. Abdomen dark brown or dark fuscous, in parts more reddish brown, especially in lateral aspect.

Female with the inner orbits widely pale yellow below the antennae, narrowly so above; middle of the face brown, the clypeus more yellowish, palpi and mandibles testaceous or ferruginous, the latter with dark teeth, occiput mostly pale yellow. Pronotum dark brown with a yellow area on each side, mesonotum blackish fuscous, the lateral margins in front and a space in the middle posteriorly, yellowish or reddish; scutellum at sides yellow, more testaceous above; propodeum black. Legs with the coxae black or very dark brown, the femora brown, tibiae and tarsi ferruginous. Abdomen dark blackish fuscous, a little red-tinged in parts.

Antennae of male extending well beyond the apex of the spread wings, in the female reaching about to the apex, the eyes very large, leaving only a very short cheek between the eyes and mandibles. Mesonotum dull, with very fine and dense rugulose puncturation, more pubescent in the female; propodeum nearly smooth and somewhat shining in front in the male, and at the most with faint traces of a carina dividing off the posterior finely rugose portion; in the female the carina is distinct, the part in front of it finely and densely rugose, but less dull and more finely sculptured than the posterior portion. Wings distinctly yellowish-tinged in the male, still more conspicuously so in the female; stigma of male brown, of female dark brown, discocubital cell with two distinct yellowish spots, the basal larger and of triangular shape. Length ♂ 17, ♀ 22 mm.

HAB. Molokai, 4000 ft.

(2) *Enicospilus capnodes*, sp. nov.

Male black, or in parts blackish fuscous, labrum testaceous, mandibles except the tip reddish, the inner orbits narrowly, the posterior widely, yellow; second joint of trochanters and apex of first joint ferruginous. Wings evenly fuscous; though translucent, and not very dark, they are darker than in most of the Hawaiian *Enicospilus*.

Head with the eyes very large, only separated from the mandibles by a very narrow cheek, the face below the antennae densely and finely punctate, the vertex smooth and shining between the large ocelli; antennae very long, reaching far beyond the apices of the expanded wings. Mesonotum very minutely punctured, the propodeum clothed with short pale pubescence, slightly shining in front in some aspects, the transverse carina represented only in the middle by a short line or tubercle, behind this closely rugose, dull and much less smooth than in front of it. Discocubital cell of front wings with a small dark spot, showing signs of total obsolescence, the radius thickened at the base, transverse median nervure not interstitial with the basal nervure, first recurrent not interstitial with the second transverse median nervure, but the space between them is very short, one-fourth the length of the second recurrent nervure. Abdomen very finely punctured or appearing granulate and clothed with pale fuscous pubescence. Length 14 mm.

HAB. Hawaii; Kona, 3000 ft.

(3) *Enicospilus dispilus* P.

*Enicospilus dispilus* Perkins, Tr. Ent. Soc. London, 1902, p. 143.

HAB. Oahu; abundant in the mountains.

(4) *Enicospilus dimidiatus* P.

*Enicospilus dimidiatus* Perkins, loc. cit. supra.

HAB. Oahu; common in the mountains.

## ATHYREODON Ashm.

*Abanchogastra* Perkins, Tr. Ent. Soc. London, 1902, p. 141.

My genus *Abanchogastra* is synonymous with the above. A serious misprint or error, of which there are several in Ashmead's table of the genera of Ophionini, misled me into supposing my genus undescribed.

*Athyreodon hawaiiensis* Ashm.

*Athyreodon hawaiiensis*, Ashmead huj. op. 1. p. 343.

A colour variety, separable by no structural character, so far as I can see, is found on Maui.

HAB. Maui, West Maui, and probably general, if looked for specially.

(1) *Athyredon debilis* P.

*Abanchoastra debilis* Perkins, Tr. Ent. Soc. London, 1902, p. 141.

HAB. Oahu; mountains round Honolulu.

## BANCHOASTRA Ashm.

(1) *Banchoastra vitreipennis*, sp. nov.

Female black, the front tarsi somewhat brownish, the wings hyaline, iridescent, only slightly infusate.

Mesonotum very densely and finely punctured, the propodeum dull and rugose behind the transverse carina, in front of this smoother and more shining. Abdomen narrow, the second segment nearly parallel-sided, elongate, one and a half times (or more) as long as its basal width.

Closely allied to *B. nigra* but distinguished by its comparatively clear wings and long second abdominal segment. Length 9—10.5 mm.

HAB. Maui; Haleakala, 5000 ft. and upwards.

## PYCNOPTION Ashm.

(1) *Pycnophion fuscipennis*, sp. nov.

Rufous, the head, a median stripe on the mesonotum and the abdomen black. Legs mostly black, but the coxae for the most part (the hind ones being more or less dark) are red, as well as the extreme apex of the trochanters and base of femora of the middle and hind legs. Posterior orbits narrowly yellow and the anterior ones to the height of the antennal insertions. Wings shining fuscous, and iridescent.

Eyes very large, there being a short cheek between these and the mandibles, the first funicle joint of antennae nearly as long as the next two together. Mesonotum dull, finely punctate, the propodeum without a transverse carina, irregularly finely rugose. Ovipositor rather short, extruded to about the length of the three preceding dorsal segments. Female. Length 9 mm.

In this species the first recurrent nervure is almost interstitial with the discoidal.

HAB. Kauai, 3000 ft. and at lower elevations.

## PRISTOMERUS Curtis.

(1) *Pristomerus hawaiiensis*, sp. nov.

Male black, the two basal joints of the antennae, the mandibles, palpi, apex of clypeus, all the legs (except the tips of the tarsi, the apex of the hind tibiae and more or less of the hind coxae) yellow, brownish yellow, or testaceous. Scutellum and middle of mesonotum on its posterior half red, this colour continued forwards along the furrows

and in front at the sides to the tegulae; upper edge of anterior and posterior orbits narrowly red, with a dilatation of this colour on the vertex. Basal abdominal segment red at the base for half its length or nearly, second segment red-marked at extreme base and at the apex, second and third for a large part or wholly red, claspers testaceous.

Scape of antennae short, not or hardly longer than its greatest width, first and second flagellar joints subequally elongate. Mesonotum dull, shallowly but distinctly punctured on its posterior half, the punctures becoming effaced anteriorly; scutellum shining and punctate, the deep transverse impression in front of it longitudinally rugose; propodeum strongly areolated, the areoles of the posterior surface rugose. Wings slightly yellowish-tinged, venation yellowish fuscous, stigma very large, triangular, fuscous. Basal abdominal segment finely longitudinally rugose on its apical half, second segment very finely so, third excessively finely rugulose at the base laterally. Hind coxae with a strong tooth beneath near the middle, between which and the apex are several minute teeth.

Female generally like the male, but the basal antennal joints are dark brown or infuscate, the orbits and thorax wholly black, the hind coxae nearly entirely black or very dark brown, the hind femora nearly wholly pitchy brown, and much more slender, the tooth is more slender and placed nearer to the apex of the joint, the minute teeth following it being absent or hardly visible, the third, fourth and fifth abdominal segments with narrow red apical margins. Ovipositor nearly as long as the abdomen. Length 5.5—7.5 mm.

HAB. Hawaii, widely distributed at an elevation of 1000—2000 ft.

(2) *Pristomerus hilaris*, sp. nov.

Very closely allied to *P. hawaiiensis*, but the ♂ is easily distinguished by having the whole thorax red, excepting more or less of the propodeum; the antennae have the basal flagellar joints pale, as well as the scape. In some examples the propodeum is nearly entirely black, in others it is half red. The basal abdominal segments are a little more finely longitudinally rugose, and the metapleura above the hind coxae less strongly punctured. Length ♂ 7 mm.

I have not seen a female of this species, which replaces the preceding on Oahu, Maui and Molokai, but may prove to be merely a variety and not a good species.

HAB. Oahu, Molokai and Maui; 1000 ft. or more above sea-level.

ATROMETRUS Först.

(1) *Atrometrus tephrias*, sp. nov.

Male with the whole head, excepting the occiput and a broad median band extending from this to the antennae and enclosing the ocelli, lemon-yellow; scape, pedicel and base of flagellum more or less pale beneath; the whole of the prothorax,

the mesosternum and mesopleura, excepting a spot beneath the tegulae, and the scutellum, pale yellow. Thorax above for the most part blackish, the margins of the mesonotum, a spot on the disc, one on the postscutellum and at the anterior margin of the propodeum, as well as a band on the sides of the latter, all pale in colour, red, testaceous or yellow, but never bright yellow like the head. Abdomen beyond the second segment brownish, with black bands. Middle and front legs brownish yellow, hind legs pitchy brown, the coxae yellow, marked with black, the trochanters also more or less pale. Wings very iridescent, neuration blackish.

Female with head markings as in the ♂, but the pale colour is more testaceous and the sides of the head behind the eyes largely blackish. Prothorax reddish, mesonotum red with a median anterior and two lateral dark areas, mesosternum black, the pleura dark, but partly reddish, especially posteriorly, scutellum and propodeum red, the former paler; legs much as in the male, the hind pair generally darker than the others, the coxae brownish. Basal joints of antennae more or less pale, especially beneath. Basal two segments of abdomen black or nearly so, the rest obscure brown.

Head above the antennae finely and densely punctate or coriaceous; thorax also very finely and densely so; propodeum closely irregularly rugose, with short and rather dense, pale pubescence. Antennae of female with about 24 joints, of ♂ 25 or 26 joints. Length 6 mm.

HAB. Oahu; not rare at about 1500 ft. in the mountains.

(2) *Atrometrus sociabilis*, sp. nov.

Black, the whole face below the antennae, the scape of the antennae beneath, the orbits for a short distance above the yellow of the face, the tegulae, the anterior and intermediate coxae and trochanters, sulphur yellow or pale yellow. The pronotum is reddish or yellowish in the middle above, more or less blackish or infusate at the sides, where the posterior and inferior angles are both paler, being either yellow or testaceous. Mesonotum and propodeum entirely black. Front legs, except the still paler coxae and trochanters, clear testaceous, the hind coxae black, yellow at the tips, the femora pitchy, the tibiae and tarsi sordid, brownish yellow. Abdomen black, or in part brownish-tinged, third and following segments ventrally yellowish brown. Neuration dark brown or blackish. Antennae with the small ring joint 22- or 23-jointed in either sex. Head above the antennae very densely and evenly punctate, propodeum densely irregularly rugose, and pubescent, mesonotum excessively finely and closely punctured. Length 5 mm. Apparently allied to *A. flavifrons* Ashm.

HAB. Hawaii; Kilauea.

(3) *Atrometus satelles*, sp. nov.

Male black, the face beneath the antennae bright yellow and this colour is continued upwards for a very short distance along the orbits; posterior orbits black, scape of antennae yellow beneath, the following two short joints and the next long joint also yellowish brown; seen from above all these joints are also pale, but more sordid. Pronotum, tegulae, front and intermediate coxae and trochanters pale yellow, scutellum in front with a reddish mark, becoming yellow at its anterior angles; a reddish spot on the postscutellum; front and middle legs, except as above noted otherwise, clear testaceous, a minute yellow spot at the apex of the mesopleura; posterior coxae yellow, with a dark stripe outwardly and inwardly; first joint of trochanters blackish, second yellow above; femora pitchy brown, tibiae and tarsi more or less sordid yellowish. Abdomen pitchy, third, fourth and fifth segments brown, with a dark apical band.

Antennae 23-jointed, head above the antennae smooth, the sculpture nearly effaced, propodeum finely granulate or shagreened, a little rugulose posteriorly. Length 5 mm.

HAB. Hawaii; Kilauea.

(4) *Atrometus solitarius*, sp. nov.

Male black, the face below the antennae, the whole orbits except for an interruption on the vertex, the whole prothorax, the tegulae, the anterior and intermediate coxae and trochanters, a mark more or less reddish on the scutellum, a band (reddish anteriorly) on the mesopleura, sulphur yellow. First three antennal joints (counting the minute ring joint) brown beneath, darker above. Front and intermediate legs (except as above noted otherwise) clear yellowish brown, the tarsi of the latter darker; posterior legs with the coxae reddish, with a black stripe on each side, basal joint of trochanters black, pale at the tip; femora pitchy brown, pale at extreme base; tibiae and tarsi blackish pitchy. Abdomen blackish, after the second segment dark fuscous, pubescent and finely punctured, the venter yellowish brown. Antennae 24-jointed, with the minute annular joint. Head above the antennae dull, densely punctured; mesonotum extremely finely punctured, the propodeum densely rugose. Length 5 mm.

HAB. Hawaii; Kilauea.

## Fam. BRACONIDAE.

All Hawaiian Braconids are no doubt of foreign origin, excepting *Ecphylopsis* and possibly *Ischiogonus palliatus* Cam. Of recent introduction are a species of *Bracon*, one or two of *Macrodyctium*, several species of *Apanteles*, three species herewith described, and a few still undetermined. *Chelonus blackburni* Cam. is also found in Australia, while *Phanerotoma hawaiiensis* Ashm. was probably introduced by Koebele (? from Japan).

## FAUNA HAWAIIENSIS

Subfam. MICROGASTERINAE.

APANTELES Först.

*Apanteles*, spp.

Several species have become established, one is known to me from North America and one is parasitic on caterpillars of domestic Lepidoptera.

Subfam. BRACONINAE.

BRACON Fabr.

(1) *Bracon*, sp.?

HAB. Oahu, at and near Honolulu.

MACRODYCTIUM Ashm.

(1) *Macrodyctium omiodivorum* Terry.*Macrodyctium omiodivorum* Terry, Bull. H.S.P.A. Exp. Station.

A very variable species.

HAB. All the islands.

HABROBRACON Ashmead.

(1) *Habrobracon*, sp.?

HAB. Oahu and probably the other islands; often found in houses. It attacks caterpillars living in beans etc.

Subfam. RHOGADINAE.

ISCHIOGONUS Wesm.

(1) *Ischiogonus pallidiceps*, sp. nov.

Female black, the head yellowish brown, the tegulae and legs pale testaceous, basal joints of antennae also more or less pale, apex of mandibles dark. Antennae with the second joint of flagellum shorter than the first, the head smooth polished. Mesonotum shining in front and at the sides, in the middle more dull and with indefinite rugulose puncturation; scutellum at the base longitudinally costate; propodeum with a median raised line or carina, the anterior areas separated by this carina, rugulose; areola and petiolar areas confluent, and more strongly rugulose; pleural area marked off by a very fine longitudinal carina. Wings hyaline, iridescent, nervures brown, the extremities of the nervures at the base of the stigma yellowish. Basal abdominal segment coarsely rugose, second longitudinally strigose, dull and sculptured between the strigae, third shortly strigose at base, the rest smooth and shining, ovipositor exerted to about the length of the abdomen.

Male agrees generally in structure with the female, but is pale brown in colour, the basal or more than one of the abdominal segments often darker, sometimes the whole abdomen of a darker hue than the head and thorax. Length 3—5 mm.

HAB. Oahu; appeared first rather numerously in 1900, since which time it has been very common. It attacks various Longicorn Coleoptera, notably the species of *Clytarus* and *Plagithmysus*. I have seen a specimen, apparently identical, from New Zealand.

Subfam. SPATHIINAE.

HORMIUS Nees.

(1) *Hormius* (?) *peregrinus*, sp. nov.

Head and thorax ferruginous or reddish brown varying in depth of colour, the rest of the thorax darker, blackish, more or less tinged with red, basal and usually the apical abdominal segments dark, the second segment always pale yellowish, legs testaceous, the hind femora more or less dark at least on the apical portion outwardly, their tibiae also dark except on the whitish basal portion, antennae testaceous basally, becoming dark apically, ovipositor black on the apical third or less, the rest pale.

Head dull, transversely rugose posteriorly; mesonotum very finely punctured, dull, in the middle posteriorly with some more or less longitudinal wrinkles, scutellum with a few strong costae anteriorly; propodeum with a close more or less reticulate rugose sculpture like that of the first abdominal segment, the areolation effaced; stigma dark fuscous, pale at base and sometimes at the apex. Hind femora exceedingly robust and incrassate, armed beneath with teeth, the basal of these placed before the middle, a longer one is placed nearly at the middle and is closely followed by about five or six others which decrease in size towards the apex of the femora. Basal abdominal segment subparallel-sided, about twice as long as wide in the male, less elongate in the female, only about half as wide as the apex of the second segment, which like the following is only very minutely sculptured. Ovipositor longer than the abdomen. Length 3.5—4.5 mm.

HAB. Oahu, Honolulu; of recent introduction.

OBS. I am unable to place this insect generically with any certainty. It appears to show some affinity with the Helconinae.

SPATHIUS Nees.

(1) *Spathius perdebilis*, sp. nov.

Male brown, the propodeum, petiole of abdomen and its apical segments, the lateral lobes of the mesonotum more or less, dark brown or infuscate, head paler yellowish brown, legs yellow, as also the several basal antennal joints, the other joints infuscate. Neuration mostly pallid, the stigma fuscous, pale at base.

Head shining, microscopically rugulose, first flagellar joint of antennae longer than the second. Mesonotum dull, densely and minutely punctate or shagreened; propodeum with a delicate median carina in front, the surface finely shagreened, the petiolar area defined, very narrow, but dilated or somewhat diamond-shaped anteriorly. Petiole long and very narrow, many times as long as wide, dull, densely and finely shagreened, its upper edge in profile well curved; rest of abdomen polished and smooth. Length 2.5 mm. I have not seen the female.

HAB. Oahu, Honolulu, introduced, without doubt.

## Supplement by R. C. L. Perkins

to

## ORTHOPTERA.

Vide pp. 1—16 hujus tomi.

## ACRIDIOIDEA.

## ATRAC TOMORPHA Sauss.

(1) *Atractomorpha crenaticeps* Bl.

HAB. Oahu; now common round Honolulu; first appeared about 1900.

## LOCUSTOIDEA.

## HOLOCHLORA Stål.

(1) *Holochlora venosa*.

HAB. Oahu; the eggs inserted in young shoots of trees have been frequently found since 1896, but the mature insect is still rarely met with.

The determination of the above species and of the Mantid named below, were, I believe, kindly made by the authorities at the Dept. of Agriculture in Washington for some of the economic entomologists in the islands.

## BRACHYMETOPA Redt.

*Brachymetopa blackburni* de B.*Brachymetopa discolor* Redt., Perkins, Fauna Haw. II. p. 9.

In the Part 'Orthoptera' of the Fauna I have referred to the peculiar case of *B. discolor* and *B. blackburni*, but at the time of publication of that Part I had not sufficient evidence to warrant my uniting these as forms of one species. There is no doubt that they merely represent a striking case of dimorphism. Some years ago I spent two days investigating the matter and carefully examining every mature insect, that I could find. Of twenty-six adult ♂♂ 24 belonged to the var. *discolor*, the brownish-coloured black-faced form. Two males only were the green *blackburni* form. One of the latter was so far intermediate as to have a large triangular brownish or darkened area on the face, this marking being characteristic of the distinct Oahuan species *B. unica* P.

Of twenty-one females, one only was of the *discolor* var. but one or two of the other twenty (typical green *blackburni*) showed the triangular dark facial area as in the ♂ above referred to. In reality this variety can hardly be considered as a true intermediate form, but rather as a third constant variation, rare in either sex. It is certainly interesting to find this peculiarity of marking occurring as a constant specific character in *B. unica* of which I have, since its description, examined additional specimens.

It would appear then that about one ♂ in 13 of *B. blackburni* is green, typical or subtypical, the others being var. *discolor*, while of the females one in twenty-one only is var. *discolor* the others being the green form. Consequently there is exhibited a sexual dimorphism in *B. blackburni*, which is not yet quite complete, while a third form is of uncommon occurrence in either sex, in some respects forming a slight intermediate condition between the *blackburni* and *discolor* forms and resembling in colour another species of the genus, very distinct from and much rarer than *blackburni* but occurring with it.

I ought to add that all the specimens here considered were taken in the same locality.

GRYLLOIDEA.

(1) *Gryllus*, sp. ?

A commonplace species of *Gryllus* appeared in Honolulu in 1901 and has now spread into the country.

PARANEMOBIUS Alf. k.

(1) *Paranemobius schauinslandi* Alf. k.

What I take to be this species is an evidently<sup>1</sup> imported species, found in dirty and dusty houses, in closets, cellars, etc., in Honolulu and elsewhere.

LEPTOGRYLLUS P.

(1) *Leptogryllus cylindricus*, sp. nov.

Testaceous or ferruginous, becoming often more or less discoloured after death, the front tibiae and femora with faint fuscous spots or annulations, apex of first, the second and apex of third joints of hind tarsi and sometimes of the middle ones infusate. Tip of ovipositor blackish, with numerous small teeth on each side, the apical ones the larger. Hind femora very slender, with many small fuscous spots outwardly. Tegmina squamiform, about covering the metanotum in the male, smaller in the female, their inner margins not nearly touching the middle line. Ovipositor of the female very long, considerably longer than the hind femur. Length of body without ovipositor 15 mm., ovipositor 13 mm., hind femur 10 mm.

HAB. Kauai, about 2500 ft.

<sup>1</sup> An examination of the figures of *P. schauinslandi* has since convinced me that it is not the household insect above referred to, and it is still unknown to me. R. C. L. P.

(2) *Leptogryllus apicalis*, sp. nov.

Colour, size and form generally as in *L. nigrolineatus*, the tegmina in the male covering nearly all the metanotum, the posterior femora dark or black for a large extent on the basal portion. Length ♂ 18 mm., hind femora 12 mm.

HAB. Molokai and Maui (3000 ft.).

(3) *Leptogryllus deceptor*, sp. nov.

Extremely like *L. nigrolineatus* having the same colouration but distinguished at once by the small laterally placed tegmina, leaving the metanotum mostly exposed, and the ovipositor is apparently longer. Female. Length ♂ hind femora 12 mm.; ovipositor 9—10 mm.

HAB. Oahu, 1500—2000 ft.

## PROGNATHOGRYLLUS Brunn.

The genus *Nesogryllus* is the male of *Prognathogryllus* and was originally separated largely on account of the quite different cerci. It is noteworthy that in the allied genera there is no such sexual difference in these organs. The species are difficult and specimens from the other islands are so close to the Kauai and Oahu forms, as to be inseparable without a good series of specimens, especially as those taken in numbers appear to show considerable variation.

## MANTOIDEA.

A second species of this group has been imported to the island of Hawaii, where it is now common in some localities and spreading.

## PARATENODERA Rehn.

(1) *Paratenodera sinensis* Sauss.

HAB. Hawaii; now common on the windward side; first taken in 1900.

## BLATTOIDEA.

## PANCHLORA Burm.

- (1)
- Panchlora maderae*
- F.

I omitted this species in my earlier paper on the Orthoptera, although it was known to me that it had occurred in Maui. It has since been found on Oahu, Molokai and Hawaii, and is no doubt generally distributed.

## DERMAPTERA.

At least three species of earwigs have been imported and become established since my former list was made up. They are of little importance for the purposes of this work. The most conspicuous is a species of *Labidura*.

## LABIDURA Leach.

- (1)
- Labidura icterica*
- Serv.

HAB. Oahu, Honolulu and in the country. It occurs as high as 1000 ft. or more in the mountains also.

## Supplement by R. C. L. Perkins

to

## NEUROPTERA

Vide pp. 31—89 hujus tomi.

Fam. HEMEROBIIDAE.

Subfam. *CHRYSOPINAE*.*Anomalochrysa reticulata* P.

At Kilauea, Hawaii, I have taken specimens of an *Anomalochrysa* agreeing well with *A. reticulata*, but they are rather small and, as in many other species, there is some variation in the neuration. The male characters are remarkable. The apical dorsal plate is fringed with hairs and bears a specially developed stout spinose one on each side at the base; the apical ventral valve is hairy beneath, subtriangular, being subacute at the apex, which forms a recurved hook. The abdomen has the clothing normal, the hairs not directed basally, as in *A. frater* P., which it much resembles.

HAB. Hawaii, Kilauea.

*Anomalochrysa rufescens* McL.

I suspect that my *A. biseriata* is the female of *A. rufescens* McL., the type of which I have not seen.

Subfam. *HEMEROBINAE*.(1) *Nesomicromus angularis*, sp. nov.

Head pale, yellowish, clothed with pale hairs, the pronotum also pale, but dark-spotted at the sides and thereon with dark hairs, rest of thorax pale but more or less dark in parts, abdomen brownish, with pale hairs. Antennae pale yellowish. Anterior wings light brown mottled with darker and with a large triangular dark brown or blackish fuscous triangular area on the basal half, connected with dark spaces on the costa, apical margin whitish hyaline, this pale area interrupted by a dark space a little above its middle, neuration pink in the pterostigmatic region. Posterior wings hyaline with dark fuscous markings along the outer gradate nervures and beyond these, with a good deal of fuscous strigulation; pterostigmatic nervures and many of the others pink. Front and middle tibiae annulate, the hind ones very long, pale, subfusiform in shape.

F. H. II.

89

Anterior wings with emarginate apical margin, the costa bisinuate, the dorsal margin rounded, seven to nine radial sectors, hind wings with apical margin distinctly concave. Apical dorsal appendages of abdomen long but not extending far beyond the ventral plate, which is triangular, between the appendages two chitinous spines crossing one another. Expanse about 16 mm.

HAB. Molokai, 4500 ft.

(2) *Nesomicromus phaeostictus*, sp. nov.

Brownish (after drying) the head above yellow, clypeus and middle of face brown, antennae pale yellow, the joints fuscous-ringed; front and middle tibiae conspicuously dark-ringed.

Wings hyaline, the front pair with four small but conspicuous dark spots on the basal fourth of the costa, and nearly equidistant one from another, three similar spots below these on the radius, three nearly equidistant dark blotches on the costa beyond the small spots, and with one or two other small spots between each of these blotches, a transversely elongate spot beyond the latter, a spot at the tip of the wing, sometimes connected with the last of the costal blotches, two elongate dark spots on the apical margin. For the rest the wings are strigulated with brown or fuscous with darker spots on the cubitus and the gradate nervules; the nervures bear conspicuous light and dark hairs, the former more numerous. Hind wings with seven or eight dark spots on the costa, a dark suffusion in the costal cells beneath the three or four basal spots, and a second suffusion beneath two of the other spots; a large smoky cloud on the lower part of the apical margin and a small one, distant from this, on the dorsal.

Front wings falcate, the apical margin conspicuously concave, the dorsal margin nearly straight or faintly concave on the basal half; radius with about seven sectors. Hind wings with the apical margin distinctly concave. Female: expanse about 16 mm. Allied to the preceding species.

HAB. Oahu, 1500 ft. Koolau range.

(3) *Nesomicromus ombrias*, sp. nov.

Dark brown or blackish, the lower part of the face testaceous, a pale marking on the head above, some spots on the pronotum, the mesonotum in the middle in front, yellowish. Basal two joints of the antennae brown, the following testaceous. Legs pale, yellowish, the front and middle tibiae with two dark wide rings, the hind pair very long, dilated after the basal third, with a more or less dark cloud near the base and another at the apex; femora also more or less infuscate at apex, apex of abdomen yellowish.

Front wings darkish brown or fuscous, mottled over most of their surface with pale spots or strigulations, interrupting the dark nervures with pale spaces, the gradate

nervules dark and with darker suffusion at their sides, especially the outer series. The dilated costal cells form the clearest part of the wing, beyond the outer gradate nervules the mottling is sparse but there is a marginal series of five or six conspicuous pale spots, widely separated from one another, extending from the apical on to the dorsal margins. There is a large basal area between the radius and dorsal margin of a generally darker colour than the rest of the wing, forming a large blotch, angulated below and more or less curved above, where it is broken by pale spaces about the cubital nervures. About its angle it is uniformly dark. Hind wings smoky hyaline, iridescent, with a conspicuously darker smoky area along the dorsal margin, on the basal third or fourth of the wing length.

Front wings rounded at the tips, apical margin not at all excised, costa strongly curved on its basal part, where the costal cells are unusually high. Six sectors to the radius. Apical segment of the abdomen raised or somewhat bent back, angulately emarginate in dorsal aspect, the appendices in side view elongate triangular, bluntly pointed, conspicuously clothed with curved hairs, extending far beyond the apical ventral segment. Male: expanse 15 mm.

HAB. Oahu; mountains near Honolulu, 1500 ft.

## ODONATA.

### Fam. AGRIONIDAE.

The Hawaiian species referred to the genus *Agrion*, I believe, are none of them really referable to that genus, and the species though apparently all allied to one another, yet themselves form a number of groups. Probably in the hands of a specialist the whole will form a peculiar genus, with several subgenera. I have previously spoken of the great variability exhibited by the various species, and were it not for the characters shown by the terminal appendages of abdomen in the ♂, the difficulty of separating the species would be intense. Having now examined many more specimens from the different islands, I am the more convinced of the extreme importance of these characters. In many species, if one only had the extreme forms, one would certainly consider these to form distinct species, but when one has large series, especially from different localities and different islands, one finds that the apparently strong distinctions between extremes, apart from those afforded by the appendages, all vary and intermediate forms occur. Characters usually considered of specific, or even of more than specific importance, whether of colour, size, neurulation, etc. all vary and one is finally driven to the male structures to find constant characters.

The following tabulation is probably a fairly natural grouping of the species that I have examined. It is based on the male characters.

1. Superior appendages of the ♂ abdomen short, the inferior ones extending behind them; most of the abdominal segments dark and metallic, and at most with a pale band at the base; lower appendages bidentate at the apex or obliquely truncate in side view.....*A. xanthomelas, pacificum, nigrohamatum*.  
Without some or all of the above characters.....2.
2. Superior appendages generally shorter than the lower and with a black tooth on the inner side towards the base, this tooth being usually directed upwards; abdomen largely red.....*A. oresitrophum, orobates, leptodemus, calliphya*.  
Without some or any of these characters.....3.
3. Legs mostly dark brown or black; abdomen usually black or pitchy and metallic, rarely with red segments behind the two basal ones; insect often with more or less whitish pruinosity; upper appendages in lateral view emarginate at apex so as to form two apical processes or teeth.....  
*A. koelense, asteliae, amaurodytium, eudytum, adytum*.  
Without some or all of these characters.....4.
4. Upper appendages extremely long and forcipate, dilated only at the extreme base.....*A. nesiotae*.  
Appendages not so formed.....5.
5. Upper appendages turned outwards, their broad surface exposed in dorsal aspect; apical abdominal segment strongly and obliquely raised from base to apex.....*A. oahuense*.  
Without these characters.....6.
6. Postcostal area of front wings with a single row of cellules, rarely with a few divided, to form a double row; abdomen slender or very slender.....  
*A. deceptor, vagabundum, kauaiense, molokaiense, jugorum*.  
Postcostal area of front wings always with a double row of cellules for a considerable part; species of large size and the abdomen relatively stout compared with the above species.....*A. oceanicum, blackburni, heterogamias*.

The last three species form the genus *Megalagrion* of McLachlan, but individuals of some of the preceding group might be included therein.

(1) *Agrion calverti*, sp. nov.

Head dull black, apex of clypeus and labrum, orbits to the height of the antennae, mouth-parts and a spot on the basal joint of the antennae yellow or cream-coloured. Postocular spots orange, not connected. Prothorax yellow in front and at the sides. Dorsum of mesothorax black with purplish metallic lustre, a spot on each side in front connected with a sutural line not reaching the hind margin, a spot on each side near this margin, a band on the sides of the mesothorax extending back from the middle coxae for less than half its length, but represented by a detached spot near the hind margin, the whole lower part of the mesopleura extending back from the posterior coxae to the hind margin, except a spot posteriorly, yellow. Median longitudinal ridge of mesonotum reddish. Legs with the femora and tibiae sordid brownish or fuscous above, beneath and the trochanters yellow, the coxae infusate in part. Abdomen black or pitchy, with a green metallic lustre, basal segment yellow at the sides and with very narrowly pale apical margin, third to the seventh with narrow yellow basal band, terminal segment reddish, but sordid in parts.

Front wings with about 18 postcubitals, the stigma fuscous, its lower side covering one cellule; three cellules between the quadrilateral and the nodus. Postpterostigmatic cellules forming a single row.

Apical abdominal segment broadly emarginate; the superior appendages about as long as this, dilated on more than their basal half, the dilated part reddish and without a distinct tooth on its lower margin apically, at most with a very minute notch in the margin just before its apical angle. Seen from above the upper appendages are slightly curved inwardly at the tips, the lower ones are red, black at the acute tips, and more strongly curved inwards.

Length of abdomen 35 mm., expanse about 45 mm. Female not known. Colour variation not known.

HAB. Oahu, near Honolulu, 1200 ft. Named after Prof. P. Calvert.

*Agrion adytum* var. *tillyardi* nov.

Very slender and elongate, head and thorax dull black, the latter with slight metallic reflection. Face black, apex of clypeus and labrum and the orbits to about the height of the insertion of the antennae white or pale-coloured. Occipital margin of the vertex red; postocular spots wanting. Prothorax with the front margin yellow, as also the whole underside; dorsum of mesothorax with a yellow spot on each side at the base, sometimes continued back as a fine sutural line to or nearly to the wings; sides of thorax yellowish, sometimes with a black spot in front of the insertion of the hind wings, or with a continuous black longitudinal band in place of this spot. Thorax posteriorly reddish. Legs for the most part blackish or brown above, yellow beneath, as also are the tarsi for the most part above; spines long slender and black. Basal two abdominal segments black, the first yellowish or red at the base, sides, and along the apical margin, the second with red apical margin and yellow on the sides, third segment reddish pitchy or pitchy black and this like the preceding sometimes submetallic, the apex still darker, fourth, fifth and base of sixth segments either quite red or else pitchy, the apices darker, seventh with the extreme base red, eighth entirely red, or only its extreme base red, two last segments red, sometimes more or less sordid or infuscate. Appendages red, the tips black. Beneath the abdomen is yellow or reddish.

Front wings with 16—20 postcubital cellules before the stigma, the latter wine-red, overlying one and part of a second cell, three cellules between the quadrilateral and the nodus. Superior appendages ♂ as long as the terminal segment, much dilated basally, when viewed inwardly; in external profile view emarginate at apex to form a large superior and small inferior process or tooth, both of which are black, the upper ones seen from above a little bent inwards at the tip, lower appendages acute at tips, which reach back to the small tooth of the upper ones.

The postpterostigmatic cellules do not form a double series as is usual in *A. eudytum* P., though sometimes one or more of them is petiolate. Length of abdomen 35 mm.; expanse about 50 mm. I do not know the female.

HAB. Kauai; near Lihue on a mountain stream. Named for Mr R. J. Tillyard, who has done so much work on Australian Odonata.

(2) *Agrion williamsoni*, sp. nov.

Agrees generally in size and appearance with the darker example of *A. tillyardi*, but the prothorax is black or dark above anteriorly, and the middle and hind tibiae are less dark or embrowned; the second abdominal segment is dark at the sides, unicolorous with the dorsal surface; antepenultimate segment with only its extreme apical margin red, the terminal segment, with an apical red band, occupying about half its whole surface. Pterostigma fuscous, only a little red-tinged.

Superior appendages of the male strongly curved inwards, minutely tuberculate at the tip, strongly dilated beneath on the basal two-thirds or more of their length, the dilatation forming a great prominent angle, but bearing no spine or tooth. Lower appendages pale and dilated at the base, black on the apical portion and acute at the tips, about as long as the superior appendages. Female not known.

HAB. Kauai; in the same locality as *A. adytum* var. *tillyardi*. Named for Mr E. B. Williamson of Indiana.

## Supplement by R. C. L. Perkins

to

## DIPTERA.

Vide Tom. III. hujus operis, pp. 1—92.

## Fam. PIPUNCULIDAE.

(1) *Pipunculus vulcanus*, sp. nov.

Head with the front and face black, with inconspicuous fuscous tomentum and in the female smooth and shining for half the distance between the ocelli and antennae; posteriorly the head is greyish tomentose, at least towards the sides, but not densely so. Antennae entirely dark, black or piceous, third joint acuminate produced at the apex. Mesonotum somewhat shining, especially in the male, with hardly noticeable fuscous tomentum, and further clothed with short and sparse, but very distinct, erect, black hairs; in the female the sides as far as the tegulae and the anterior margin with a narrow border of whitish tomentum; the pleura with sparse whitish tomentum in both sexes; scutellum with a marginal fringe of bristly hairs, which are more developed than the mesonotal ones; metanotum with whitish tomentum. All the legs entirely dark above, the femora being black or very dark brown, with short bristly black or spinose hairs beneath, the middle ones with a very regular series of longer hairs, curved downwards, on their posterior face; tibiae often less dark than the femora, piceous or reddish pitchy, and without special bristles on the hind pair; tarsi black, or at least dark, above. Wings strongly infumate or fuscous in the male, nearly clear in the female, third costal segment much shorter than the fourth, posterior cross-vein obliquely transverse, its upper extremity about opposite the apex of the second longitudinal, terminal segment of fourth distinctly bisinuate; stigma brown. Abdomen shining on the apical segments of the male, very little tomentose except rather obscurely on the apical part of the basal segment, which has the lateral series of bristles well developed, the rest of the abdomen bearing short black hairs. In the female the abdomen is greyish tomentose and clothed with short black hairs, dull, except the fifth segment. Length 3.5—4 mm.

Allied to *P. jvator*, a variable and widely distributed species, which is found with it, and also occurs on other of the islands. Superficially *P. vulcanus* is most readily distinguished by the darker legs.

HAB. Hawaii, Kilauea.

(2) *Pipunculus acrothrix*, sp. nov.

Female black, the abdomen shining metallic aeneous-black. Face below the antennae with dense white tomentum, that on the head posteriorly more fuscous. Third antennal joint clear yellow, the beak thin and long, white. Mesonotum with thin fuscous tomentum, dense only at the sides, sparsely and shortly pilose; marginal bristles of scutellum well developed; metanotum and pleura with denser yellowish grey tomentum. Wings long and clear, neuration as in *P. vulcanus*, stigma brown, about half as long as the fourth costal segment. All the coxae dark, the trochanters and tibiae all clear yellow, the femora of this colour at base and apex, the middle being black, the tarsi, except the basal joint, being more or less dark above. Posterior tibiae with three or four long bristles outwardly near the middle. Abdomen with a distinct band of pale tomentum on the basal segment, the rest brightly shining and clothed with short hairs, the fifth at the apex with many long black bristles. Length 4.75 mm.

Very distinct by the colour of the legs, bristles of hind tibiae, the metallic colour and clothing of fifth abdominal segment.

HAB. Hawaii, Kilauea. Male not known to me.

(3) *Pipunculus pyrophilus*, sp. nov.

Deep black, more or less shining, especially the male, the very sparse tomentum of the surface being mostly fuscous and nowhere conspicuous, except perhaps an apical band on the first abdominal segment of the female. Legs in both sexes entirely black, or at most a trifle reddish or pitchy at some of the articulations. Antennae entirely black; the face of the female above the antennae not at all shining.

General appearance that of a minute *P. vulcanus*, but easily distinguished by being even more entirely black in both sexes; by the erect hairs of the mesonotum, which are unusually long, and as well, or almost as well, developed as the scutellar bristles. Wings smoky hyaline, differing very little in the sexes, though rather darker in the male. Stigma very short compared with the long fourth costal segment. Neuration generally as in *P. vulcanus*. Abdominal hairs black, longer in the female than in the male. Length 3 mm.

HAB. Hawaii, Kilauea. Attached to one or both of the small Delphacid leaf-hoppers, that are so common on *Raillardia* around the crater.

(4) *Pipunculus holomelas*, sp. nov.

Female entirely black and for the most part shining, the antennae entirely dark, piceous. Mesonotum apparently without tomentum (? abraded) shining and with very short erect hairs, metanotum with greyish tomentum. Halteres pale in the middle, more or less dark at base and apex. Legs with the coxae and femora black, the

trochanters and some of the articulations alone being more or less yellowish or brown, tibiae and tarsi piceous or dark brown above. Posterior tibiae with three or four long bristles outwardly about the middle. Wings nearly clear, only slightly smoky, neuration much as in *P. vulcanus*. Abdomen with greyish tomentum on the first two segments, the rest deep black and shining, the ovipositor yellow, short and strong. Length 4 mm.

HAB. Molokai; readily known from the other species, that have the long bristles on the hind tibiae, by the almost entirely dark legs. The male will no doubt have darker wings as is usual in Hawaiian species.

(5) *Pipunculus jvator* P.

*P. jvator* Perkins, Bull. H. S. P. A. Exp. Station 1. 152.

HAB. Hawaii, Oahu and no doubt other of the islands.

(6) *Pipunculus oahuensis* P.

*P. oahuensis* Perkins, loc. cit. p. 153.

HAB. Oahu, 100—1000 ft.

(7) *Pipunculus terryi* P.

*P. terryi* Perkins, loc. cit. pp. 153 and 154.

HAB. Kauai, Lihue in cane-fields.

(8) *Pipunculus swezeyi* P.

*P. swezeyi* Perkins, loc. cit. p. 154.

HAB. Oahu, 1500—1800 ft. not usually common.

(9) *Pipunculus hawaiiensis* P.

*P. hawaiiensis* Perkins, loc. cit. p. 155.

HAB. Hawaii, Hamakua, 1200 ft.

Fam. DROSOPHILIDAE.

(1) *Idiomyia heteroneura*, sp. nov.

Front yellow or golden with a dark transverse mark anteriorly, orbits posteriorly and the vertical triangle dark, forming part of a transverse dark band, face yellow, antennae reddish yellow, the third joint blackish, the proboscis and palpi yellow. Thorax yellowish, two narrow black stripes, well separated, extend on each side of the middle from the anterior margin for about two-thirds of the length of the mesonotum; just external to these anteriorly is a largish black spot on each side

and behind their middle externally on each side there starts another black stripe reaching to the scutellum, while between them on the posterior half of the mesonotum is a median dark stripe (or perhaps two very closely apposed stripes). Scutellum dark on the disc, but broadly bordered with yellow, metanotum mostly dark; pleura with three or four dark spots. Halteres yellow. Legs yellowish, tips of tibiae noticeably infuscate. Wings hyaline, their base as far as the apex of the first vein for the most part infuscate, the infuscation irregular in depth and distribution, marginal cell infuscate, as well as the tip of the wing on either side of the apex of the second, third and fourth veins; transverse veins and a small portion of the fourth longitudinal vein just before the apical one of the two transverse veins that are between it and the third, distinctly infuscate on each side. This second or apical transverse vein oblique, placed much before the posterior transverse, the sector of the fourth vein between these being not much shorter than the first named. Abdominal segments hairy, more or less shining, black medially and apically, so as to leave a well-marked series of yellow spots on each side. Ovipositor reddish yellow.

HAB. Hawaii.

(2) *Idiomyia silvestris*, sp. nov.

Front golden yellow, the orbits as far as the apical fronto-orbital bristle, the vertical triangle and a band connecting these posteriorly, blackish and with grey tomentum; face, palpi and proboscis yellow. Antennae dark, the second joint pitchy brown, the arista with about four bristles beneath, the basal part being bare, and about nine above. Mesonotum yellowish, most of its surface suffused with brown or blackish infuscation, forming vague lines and spots, but not a definite pattern; scutellum dark brownish black, metanotum black, tomentose; mesopleura mostly blackish. Halteres pale yellow. Legs yellowish or brownish yellow with the middle and hind femora dark brown or blackish, the tibiae also more or less dark. Wings hyaline, basally as far as the termination of the first vein largely but irregularly infuscate, marginal cell faintly brownish, tip of wing darkly infuscate on either side of veins two, three and four. Transverse veins infuscate, as also the part of vein four just before the origin of the second or apical of the two transverse veins between it and the third. This second transverse vein is oblique and placed much before the posterior cross-vein, so that the sector of the fourth that lies between them is not much shorter than this second transverse vein itself. Abdomen black, at the base a little pale, pilose and shining, the ovipositor paler.

HAB. Hawaii.















**ZOOLOGICAL RESULTS** based on material from New Britain, New Guinea, Loyalty Islands and elsewhere, collected during the years 1895, 1896, and 1897, by ARTHUR WILLEY, D.Sc. Lond., Hon. M.A. Cantab., Late Balfour Student of the University of Cambridge. Demy 4to. Parts I, II, and III. Price 12s. 6d. each. Parts IV and V. Price 21s. each. Part VI (completing the work). Price 12s. 6d.

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# INDEX

## TO ALL THE THREE VOLUMES

The arabic numerals refer to the page. The roman numerals i, ii and iii refer to the Vol., but roman numerals beyond iii refer to the page of the Introduction  
Names of families are in clarendon type, and in the alphabetical arrangement the taxonomical termination *idae* is treated as non-existent

- Abanchoastra Perk. ii 679  
debilis Perk. ii 680
- Ablepharus Fitz. i 368  
boutonii Wieg. i 368
- Acalles Schönh. ii 131  
augusticollis Sharp ii 135  
callichroma sp. n. ii 132  
chlorolepis sp. n. ii 136  
decoratus Blackb. ii 135  
duplex Sharp ii 135  
frater sp. n. ii 133  
humeralis sp. n. ii 132  
ignotus Blackb. ii 136  
innotabilis sp. n. ii 134  
koae sp. n. ii 133  
lanaiensis sp. n. ii 136  
lateralis Sharp ii 131  
leptothorax sp. n. ii 134  
mauiensis Blackb. ii 135  
melanolepis sp. n. ii 132  
monticola sp. n. ii 138  
nigripennis sp. n. ii 136  
oahuensis sp. n. ii 138  
pallidicollis sp. n. ii 137  
pusillissimus sp. n. iii 653  
tuberculatus sp. n. ii 137
- Acanthaspidae** Leth. & Sev. iii 150
- Acanthiidae** iii 146, cciii
- Acanthia** Fabr. iii 146, xlix  
exulans White iii 146, ii 554  
humifera Kirk. ii 554  
lectularia Fabr. iii 129  
nubigena Kirk. ii 554  
oahuensis Blackb. iii 146, ii 554  
procellaris Kirk. ii 554
- Acanthocephala ii 434  
Acanthocinides ii 113
- Acarina iii 702
- Achatina accincta Migh. ii 356  
adusta Gould ii 373  
bicolor Jay ii 373  
chrysalis Pfeiff. ii 358  
cochlea Reeve ii 373  
decora Fér. ii 304  
fuliginea Pfeiff. ii 373  
gravida Fér. ii 349  
lorata Fér. ii 303  
luteola Fér.? ii 346  
newcombi Pfeiff. ii 374  
oahuensis Green ii 346  
obeliscus Reeve ii 374
- Achatina sandwicensis Pfeiff. ii 368  
sculpta Pfeiff. ii 368  
spirizona Fér. ii 344  
turricula Migh. ii 374  
turritella Fér. ii 346
- Achatinellidae** ii 296, xxx, lxiii, lxx, lxx  
**Achatinella** ii 298  
abbreviata Reeve (*Bulinella*) ii 305  
accincta Gould ii 356  
acuminata Gould ii 357  
acuta Newc. ii 349  
acuta Swains. ii 344  
adamsi Newc. ii 314  
adusta Reeve ii 327  
affinis Newc. ii 333  
alba Nutt. ii 303  
albescens Gul. ii 323  
albospira Smith ii 298  
alexandri Newc. ii 348  
amena Pfeiff. (*Frickella*) ii 379  
ampla Newc. (*Bulinella*) ii 305  
ampulla Gul. ii 318  
anceyana Baldw. (*Partulina*) ii 311  
anthonii Newc. ii 353  
apexfulva Dixon ii 298  
apicata Pfeiff. ii 299  
apicata alba var. n. ii 299  
aplustre Newc. ii 321  
aptycha Pfeiff. (*Newcombia*) ii 311  
aptycha Pfeiff. (*Partulina*) ii 311  
assimilis Newc. ii 334  
augusta Smith (*Achatinellastrum*) ii 321  
bacca Reeve ii 305  
baileyana Gul. ii 318  
baldwinii Newc. ii 339  
bella Reeve (*Achatinellastrum*) ii 321  
bellula Smith ii 325  
bicolor Pfeiff. ii 299  
bilineata Reeve (*Achatinellastrum*) ii 321  
biplicata Newc. ii 334  
betica Migh. ii 344  
brevis Pfeiff. ii 353  
buddii Newc. (*Achatinellastrum*) ii 321  
bulbosa Gul. ii 351  
bulmoides Swains. (*Bulinella*) ii 306, 309  
byronii Wood (*Bulinella*) ii 306  
callosa Pfeiff. (*Labrella*) ii 358  
canaliculata Baldw. (*Newcombia*) ii 331  
casta Newc. (*Achatinellastrum*) ii 322  
castanea Reeve ii 327  
cerea Pfeiff. ii 376

- Achatinella cervina* Gul. (*Achatinellastrum*) ii 322  
*costus* Newc. ii 308  
*chamissoi* Pfeiff. (*Auriculella*) ii 376  
*cinerea* var. n. ii 305  
*cinerosa* Pfeiff. (*Bulinella*) ii 302  
*cingula* Migh. ii 359  
*cinnamomea* Pfeiff. (*Newcombia*) ii 331  
*citrina* Pfeiff. ii 348  
*clara* Pfeiff. ii 370  
*clementina* Pfeiff. (*Achatinellastrum*) ii 305  
*coesia* Gul. ii 321  
*cognata* Gul. ii 322  
*colorata* Reeve (*Achatinellastrum*) ii 322  
*compta* Pease (*Partulina*) ii 311  
*concaevospira* Pfeiff. ii 303  
*concidens* Gul. ii 301  
*concinna* Newc. ii 348  
*concolor* Smith (*Achatinellastrum*) ii 322  
*confusa* nom. n. (*Partulina*) ii 312  
*consanguinea* Smith ii 325  
*contracta* Gul. ii 323  
*cookeri* Baldw. (*Apeza*) ii 300  
*cornea* Newc. ii 335  
*corneola* Pfeiff. ii 360  
*corrugata* Gul. ii 309  
*corusca* Gul. ii 319  
*costulata* Gul. ii 360  
*crassa* Newc. (*Partulina*) ii 312  
*crassidentata* Pfeiff. (*Achatinellastrum*) ii 328  
*crassilabrum* Newc. ii 335  
*crocea* Gul. ii 314  
*crystallina* Gul. ii 361  
*cucumis* Gul. (*Achatinellastrum*) ii 322  
*cumingi* Newc. ii 331  
*cuneus* Pfeiff. (*Achatinellastrum*) ii 323  
*curta* Newc. (*Achatinellastrum*) ii 323  
*cylindrica* Newc. ii 335  
*decepta* C. B. Adams ii 347  
*decipiens* Newc. (*Bulinella*) ii 307  
*decora* Fér. ii 301, 304  
*delta* Gul. (*Achatinellastrum*) ii 323  
*dentata* Pfeiff. ii 365  
*deshayesii* Mor. ii 334  
*diluta* Smith (*Achatinellastrum*) ii 323  
*dimidiata* Pfeiff. (*Leptachatina*) ii 359  
*dimondi* C. B. Adams ii 350  
*dimorpha* Gul. ii 323  
*dolei* Baldw. (*Partulina*) ii 312  
*doliium* Pfeiff. (*Bulinella*) ii 302  
*dubia* Newc. (*Partulina*) ii 312  
*dunkeri* Pfeiff. ii 326  
*dwrightii* Newc. (*Partulina*) ii 313  
*eburnea* Gul. ii 318  
*elegans* Newc. (*Bulinella*) ii 308  
*elevata* Pfeiff. ii 363  
*ellipsoidea* Gould ii 336  
*elongata* Newc. ii 349  
*emmersonii* Newc. ii 325  
*ernestina* Baldw. (*Achatinellastrum*) ii 324  
*exilis* Gul. ii 361  
*extincta* Pfeiff. (*Laminella*) ii 336  
*faba* Pfeiff. (*Bulinella*) ii 307  
*fasciata* Gul. ii 318  
*flavescens* Newc. ii 337  
*forbesiana* Pfeiff. ii 300  
*formosa* Gul. (*Achatinellastrum*) ii 324  
*fragilis* Gul. ii 363  
*fricki* Pfeiff. ii 307  
*fulgens* Newc. (*Achatinellastrum*) ii 324  
*fuliginosa* Gould. ii 346  
*fulva* Pfeiff. ii 319  
*Achatinella fumosa* Newc. ii 362  
*fusca* Newc. ii 362  
*fuscobasis* Smith ii 310  
*fuscolineata* Smith ii 327  
*fuscozona* Smith ii 321  
*fuscula* Gul. ii 362  
*fusiformis* Pfeiff. (*Laminella*) ii 340  
*fusoidea* Newc. (*Partulina*) ii 313  
*gemma* Pfeiff. (*Newcombia*) ii 331  
*germana* Newc. (*Achatinellastrum*) ii 324  
*gigantea* Newc. ii 347  
*glabra* Newc. (*Bulinella*) ii 307  
*glauca* Gul. ii 329  
*globosa* Pfeiff. (*Achatinellastrum*) ii 304  
*glutinosa* Pfeiff. (*Laminella*) ii 363  
*goniostoma* Pfeiff. (*Laminella*) ii 333  
*gouldi* Newc. (*Partulina*) ii 313  
*gracilis* Pfeiff. (*Achatinellastrum*) ii 363  
*grana* Newc. ii 363  
*granifera* Gul. ii 356  
*gravidia* Fér. ii 349  
*grayana* Pfeiff. (*Laminella*) ii 337  
*grisea* Newc. (*Partulina*) ii 315  
*grossa* Pfeiff. (*Laminella*) ii 341  
*gummea* Gul. ii 363  
*guttula* Gould ii 363  
*hanleyana* Pfeiff. ii 302  
*hawaiiensis* Baldw. (*Partulina*) ii 316  
*hayseldeni* Baldw. (*Partulina*) ii 313  
*helena* Newc. ii 330  
*helvina* Baldw. (*Laminella*) ii 350  
*herbaeca* Gul. ii 307  
*horneri* Baldw. (*Partulina*) ii 313  
*humilis* Newc. ii 337  
*hybrida* Newc. ii 326  
*induta* Gul. ii 314  
*inflata* Pfeiff. (*Laminella*) ii 337  
*innotabilis* Smith ii 301  
*inornata* Migh. ii 346  
*intermedia* Newc. ii 338  
*irregularis* Pfeiff. ii 338  
*johnsoni* Newc. ii 321  
*juddii* Baldw. (*Achatinellastrum*) ii 324  
*jucea* Gul. ii 322  
*kauaiensis* Newc. (*Carinella*) ii 355  
*labiata* Newc. ii 365  
*lacrima* Gul. ii 363  
*lactea* Gul. ii 319  
*lagena* Gul. ii 365  
*lehuensis* Smith (*Achatinellastrum*) ii 324  
*leucocchila* Gul. ii 365  
*leucophaea* Gul. ii 301  
*leucorraphe* Gul. ii 302  
*ligata* Smith (*Achatinellastrum*) ii 325  
*lignaria* Gul. (*Partulina*) ii 314  
*liliacea* Pfeiff. (*Achatinellastrum*) ii 328  
*limbata* Gul. ii 306  
*lineolata* Newc. ii 338, 365  
*livida* Pfeiff. ii 327  
*livida* Swa. (*Achatinellastrum*) ii 325  
*longispira* Smith (*Achatinellastrum*) ii 325  
*lorata* Fér. ii 303  
*lorata* Reeve ii 368  
*lucosa* Pfeiff. (*Laminella*) ii 338  
*lurida* Pfeiff. (*Auriculella*) ii 376  
*luteostoma* Baldw. (*Bulinella*) ii 308  
*lymaniana* Baldw. (*Bulinella*) ii 308  
*lyonsiana* Baldw. (*Bulinella*) ii 308  
*magna* C. B. Adams ii 339  
*mahogani* Gul. ii 306  
*manoensis* Newc. (*Amastra*) ii 347

- Achatinella margarita* Pfeiff. (*Leptachatina*) ii 356  
 marginata Gul. ii 366  
 marmorata Gould (*Partulina*) ii 314  
 mastersi Newc. ii 339  
 mauiensis Pfeiff. ii 330  
 melampoides Pfeiff. ii 347  
 melanosis Newc. ii 339  
 melanostoma Newc. ii 306  
 micans Pfeiff. (*Laminella*) ii 350  
 microstoma Gould ii 345  
 mighelsiana Pfeiff. (*Partulina*) ii 314  
 modesta C. B. Adams ii 339  
 moesta Newc. ii 340  
 monacha Pfeiff. ii 303  
 morbida Pfeiff. (*Bulinella*) ii 315  
 morbida Pfeiff. (*Partulina*) ii 315  
 mucida Baldw. (*Partulina*) ii 315  
 mucronata Newc. ii 340  
 multicolor Pfeiff. ii 309  
 multilineata Newc. ii 303  
 multizonata Baldw. (*Achatinellastrum*) ii 325  
 mustelina Migh. ii 301  
 myrrea Gul. ii 313  
 napus Pfeiff. (*Achatinellastrum*) ii 303  
 nati Baldw. & Hartm. (*Achatinellastrum*) ii 326  
 neglecta Smith ii 301  
 nigra Newc. ii 340  
 nittida Newc. ii 366  
 nivea Baldw. (*Partulina*) ii 315  
 nivosa Newc. ii 305  
 nobilis Pfeiff. ii 303  
 nubilosa Migh. ii 341  
 nucleola Gould ii 353  
 nucleola Reeve ii 333  
 nympa Gul. ii 306  
 obclavata Pfeiff. (*Leptachatina*) ii 368  
 obeliscus Pfeiff. ii 377  
 obesa Newc. ii 351  
 obesa var. agglutinans Newc. ii 353  
 obliqua Gul. ii 306  
 obscura Newc. ii 340  
 obtusa Newc. ii 366  
 octogyrata Gul. ii 366  
 olivacea Reeve (*Achatinellastrum*) ii 326  
 oomorpha Gul. ii 306  
 ornata Newc. ii 330  
 oryza Pfeiff. (*Leptachatina*) ii 367  
 ovata Newc. (*Bulinella*) ii 308  
 oviformis Pfeiff. (*Bulinella*) ii 309  
 ovum Pfeiff. (*Achatinellastrum*) ii 303  
 pallida Nutt. ii 303  
 papyracea Gul. (*Achatinellastrum*) ii 326  
 parvula Gul. ii 372  
 perdis Reeve (*Partulina*) ii 315  
 perforata Gul. ii 319  
 perversa Swains. ii 301  
 petila Gul. ii 367  
 petricola Newc. ii 341  
 pexa Gul. ii 321  
 pfeifferi Newc. ii 332  
 phaeozona Gul. ii 308  
 physa Newc. (*Partulina*) ii 312, 316  
 pica Swains. ii 298  
 picta Migh. ii 350  
 planospira Pfeiff. ii 307  
 platystyla Gul. ii 307  
 plicata Pfeiff. ii 332  
 plumata Gul. ii 321  
 plumbea Gul. (*Partulina*) ii 316  
 poleta Newc. (*Achatinellastrum*) ii 326  
 polymorpha Gul. ii 299  
*Achatinella porcellana* Newc. (*Partulina*) ii 316  
 porphyria Newc. ii 341  
 producta Reeve (*Achatinellastrum*) ii 326  
 proxima Pease (*Partulina*) ii 316  
 pulchella Pfeiff. (*Achatinellastrum*) ii 304  
 pulcherrima Reeve ii 328  
 pulcherrima Swains. ii 306  
 pulla Pfeiff. ii 342  
 pumila Gul. ii 339  
 pupoidea Newc. ii 342  
 pusilla Newc. ii 342  
 pygmaea Smith ii 323  
 pyramidalis Gul. (*Partulina*) ii 317  
 pyramis Pfeiff. ii 367  
 radiata Gould (*Partulina*) ii 317  
 radiata Pfeiff. ii 310  
 recta Newc. ii 306  
 redfieldi Newc. (*Partulina*) ii 317, lxvii  
 reevei C. B. Adams ii 325  
 renyi Newc. ii 351  
 resinula Gul. ii 368  
 reticulata Newc. ii 343  
 rhodoraphe Smith ii 323  
 rosea Swains. (*Bulinella*) ii 309  
 rotunda Gul. (*Bulinella*) ii 309  
 rubens Gould ii 343  
 rubens Pfeiff. ii 339  
 rubiginosa Newc. ii 310  
 rudis Pfeiff. ii 344  
 rufa Newc. (*Partulina*) ii 318  
 rugosa Newc. (*Bulinella*) ii 309  
 rutila Newc. ii 311  
 saccata Pfeiff. (*Achatinellastrum*) ii 327  
 saccula Hartm. (*Leptachatina*) ii. 368  
 sanguinea Newc. ii 351  
 saxatilis Gul. ii 368  
 scitula Gul. ii 307  
 semicarinata Newc. ii 320  
 semicostata Pfeiff. (*Leptachatina*) ii 369  
 sericea Pfeiff. (*Laminella*) ii 343  
 simulans Reeve ii 304  
 solida Gul. ii 318  
 solitaria Newc. (*Achatinellastrum*) ii 327  
 sordidum Newc. ii 304  
 soror Newc. ii 351  
 sowerbyana Pfeiff. (*Bulinella*) ii 310  
 spadicea Gul. ii 308  
 splendida Newc. (*Partulina*) ii 318  
 spirazona Fér. ii 344  
 stewarti Green ii 328  
 straminea Reeve ii 352  
 striatella Gul. ii 370  
 striatula Gould ii 370  
 subrostrata Pfeiff. (*Laminella*) ii 345  
 subula Gul. ii 363  
 subvirens Newc. ii 311  
 succincta Newc. ii 370  
 suffusa Reeve ii 350  
 sulcata Pfeiff. (*Neocombia*) ii 332  
 swainsoni Pfeiff. (*Bulinella*) ii 304  
 swiftii Newc. ii 300  
 taenjolata Pfeiff. (*Bulinella*) ii 310  
 talpina Gul. ii 313  
 tapaniana C. B. Adams (*Partulina*) ii 318  
 terebra Newc. (*Partulina*) ii 319  
 terebralis Gul. ii 371  
 teres Pfeiff. (*Leptachatina*) ii 371  
 tessellata Newc. (*Partulina*) ii 319, lxvi  
 tetrao Newc. ii 352  
 textilis Fér. ii 345  
 theodorei Baldw. (*Partulina*) ii 330, lxvii

- Achatinella torrida* Gul. ii 309  
*transversalis* Pfeiff. (*Laminella*) ii 345  
*tricolor* Smith ii 328  
*trilineata* Gul. (*Achatinellastrum*) ii 327  
*tristis* Fér. ii 346  
*triticea* Gul. ii 367  
*tuba* Gul. ii 318  
*turgida* Newc. ii 300  
*turrita* Gul. ii 372  
*turritella* Fér. ii 346  
*umbilicata* Pfeiff. (*Laminella*) ii 341  
*undosa* Gul. ii 315  
*undulata* Newc. ii 323  
*ustulata* Gul. (*Partulina*) ii 319  
*valida* Pfeiff. (*Achatinellastrum*) ii 300  
*variabilis* Newc. (*Partulina*) ii 319  
*variegata* Pfeiff. ii 347  
*ventrosa* Pfeiff. ii 303  
*ventulus* Fér. ii 345, 347  
*venulata* Newc. ii 326  
*venusta* Migh. ii 352  
*versicolor* Gul. ii 301  
*versipellis* Gul. (*Achatinellastrum*) ii 327  
*vespertina* Baldw. ii 299  
*vestita* Migh. ii 304  
*vidua* Pfeiff. (*Bulinella*) ii 310  
*violacea* Newc. ii 347  
*virens* Gul. ii 327  
*virgulata* Migh. (*Partulina*) ii 320  
*viridans* Migh. (*Bulinella*) ii 310  
*viridans* Pfeiff. ii 307  
*viridans* Reeve ii 325  
*vittata* Reeve ii 304  
*vitrea* Newc. ii 372  
*vitrea* Gul. ii 372  
*vulpina* Fér. (*Achatinellastrum*) ii 327  
*waiuanaensis* sp. n. (*Achatinellastrum*) ii 328  
*wheatleyi* Newc. ii 307  
*zebra* Newc. ii 330  
*zonata* Gul. (*Achatinellastrum*) ii 329
- Achatinellastrum* Pfeiff. ii 320  
*conspersa* Pfeiff. ii 343  
*olesonii* Baldw. ii 329
- Achorutidae** iii 302  
*Acompe suavis* Koch. ii 511  
*Acridioidea* ii 8, 687, ccxv  
*Acritochaeta* gen. n. iii 41, 84  
*pulvinata* sp. n. iii 42
- Acritus* Lec. iii 511  
*angustisternum* sp. n. iii 528  
*basalis* Lec. iii 522  
*basalis* var. *Sharp* iii 522  
*concentricus* Sharp iii 531  
*facilis* Sharp iii 517  
*facilis* var. *hawaiiensis* var. n. iii 517  
*flavitaris* Lew. iii 532  
*germanus* sp. n. iii 523  
*longipes* var. *haleakalae* var. n. iii 530  
*insolitus* sp. n. iii 532  
*insularis* Sharp iii 515  
*kauaiensis* sp. n. iii 518  
*kukuiaie* sp. n. iii 519  
*longipes* Sharp iii 529  
*makawellae* sp. n. iii 521  
*mauiaie* sp. n. iii 519  
*minor* sp. n. iii 516  
*moloakaie* sp. n. iii 518  
*monticola* Blackb. iii 527  
*nepos* sp. n. iii 526, 527  
*ornatus* sp. n. iii 516
- Acritus parvulus* sp. n. iii 533  
*perkinsi* sp. n. iii 529  
*pulchellus* sp. n. iii 528  
*punctatus* sp. n. iii 520  
*sculptus* sp. n. iii 520  
*similis* sp. n. iii 527  
*solitarius* sp. (?) n. iii 532  
*subalatus* sp. n. iii 530  
*subbasalis* sp. n. iii 523  
*subrotundus* sp. n. iii 533  
*waianaie* sp. n. iii 522
- Acrodrepans* Perk. iii 355  
*megalophylla* Meyr. iii 355  
*nesiotis* Perk. iii 355
- Acrolepia* Cr. i 726  
*aureonigrella* sp. n. i 727  
*autumnitella* Cr. i 726
- Acrosticta* Loew. iii 44, 85  
*pallipes* sp. n. iii 44, 85
- Acrulocercus* Cab. i 440, xxxi  
*apicalis* Gould i 445  
*bishopi* Kotsch. i 445  
*braccatus* Cass. i 445  
*nobilis* Merr. i 445
- Actidium* Matth. iii 535  
*sharpianum* Matth. iii 535
- Adelencyrtus* Ashm. i 323  
*kaulae* sp. n. i 323
- Adelocera* Latr. iii 368  
*modesta* Boisd. iii 368
- Adenoneura* gen. n. i 677  
*falsifalcellum* sp. n. i 677  
*latifemoris* sp. n. i 679  
*marcidellum* sp. n. i 678  
*montanum* sp. n. i 679  
*plicatum* sp. n. i 678  
*rufipennis* Bal. i 680
- Adoretus* Cast. iii 402  
*tenaimaculatus* Waterh. iii 402  
*viaticus* Nonfr. iii 402
- Adrastidia* gen. n. ii 503  
*longula* sp. n. ii 504  
*nebulosa* sp. n. ii 503  
*stigmatica* sp. n. ii 503  
*stigmatica* Sim. iii 343
- Aedia* Dp. i 507  
*Aegosoma* Serv. ii 96  
*hirtus* iii 645  
*reflexum* Karsch. ii 96, iii 645
- Aeletes* Horn iii 511  
*concentricus* Sharp iii 531  
*facilis* Sharp iii 517  
*flavitaris* Lew. iii 532  
*longipes* Sharp iii 529  
*monticola* Blackb. iii 527
- Aeolus cinnamomeus* Boisd. iii 369  
*Aeschmnia* ii 62
- Agelenidae** ii 505  
*Aglaotoma* Först. i 301  
*moloakaensis* sp. n. i 301  
*rufiventris* sp. n. i 301
- Agnostochthona* Kirk. iii 604  
*alienigera* Kirk. iii 604
- Agonismus* gen. n. i 512  
*argentiferus* sp. n. i 513  
*coruscans* sp. n. i 513  
*flavipalpis* sp. n. i 512
- Agrilus* Steph. iii 400, cxxxii  
*sp.* iii 400
- Agriolimax* Mörch ii 276  
*benvenuti* Coll. ii 276

- Agriolimnax globosus Coll. ii 276  
   laevis Mull. ii 276  
   perkinsi Coll. ii 276  
   sandwichiensis Soul. ii 276  
**Agriionidae** ii 693, xxxii  
 Agriionina ii 63  
 Agriion Fabr. ii 63  
   adytum sp. n. ii 69  
   adytum var. tillyardi n. ii 695  
   amaurodytum sp. n. ii 66  
   astelliae sp. n. ii 66  
   blackburni M<sup>c</sup>Lachl. ii 76  
   calliphya M<sup>c</sup>Lachl. ii 71  
   calverti sp. n. ii 694  
   deceptor M<sup>c</sup>Lachl. ii 74  
   eudytum sp. n. ii 68  
   hawaiense M<sup>c</sup>Lachl. ii 64  
   heterogamias sp. n. ii 77  
   jugorum sp. n. ii 72  
   kauaiense sp. n. ii 75  
   koelense Blackb. ii 65  
   leptodemus sp. n. ii 70  
   microdemus var. n. ii 71  
   molokaiense sp. n. ii 73  
   nesiotes sp. n. ii 72  
   nigro-hamatum Blackb. ii 65, xxxii  
   oahuense Blackb. ii 74  
   oceanicum M<sup>c</sup>Lachl. ii 76  
   oresitrophum sp. n. ii 69  
   orobates sp. n. ii 70  
   pacificum M<sup>c</sup>Lachl. ii 64  
   satelles Blackb. ii 74  
   vagabundum sp. n. ii 75  
   williamsoni sp. n. ii 696  
   xanthomelas Selys. ii 64  
**Agromyzaeidae** iii 74  
 Agromyza Fall. iii 74  
 Agrotis Ochs. i 142, iii 346  
   arenivolanus Butl. i 144  
   anlacias sp. n. i 145  
   austalea sp. n. i 152  
   baliopa sp. n. i 149  
   ceramophaea sp. n. i 151  
   chersotoides Butl. i 151  
   cinctipennis Butl. i 150  
   cremata Butl. i 145  
   crinigera Butl. i 148, iii 346  
   dislocata Walk. i 146, iii 346  
   epicremna sp. n. i 149  
   hephaestaea sp. n. iii 346  
   melanoneura sp. n. i 146  
   mesotoxa sp. n. i 148  
   microreus sp. n. i 143  
   neurogramma sp. n. i 149  
   paucipennis sp. n. i 144  
   perigramma sp. n. i 145  
   photophila Butl. i 147, iii 346  
   psammophaea sp. n. i 151  
   saucia Hübn. i 143  
   selenias sp. n. i 150  
   spoderopa sp. n. i 148  
   tephrias sp. n. i 147  
   xiphias sp. n. i 146  
   ypsilon Rott. i 143, iii 346  
 Agrypnus modestus Boisd. iii 368  
 Alaptus Hal. ii 661  
   immaturus Perk. ii 661  
 Aleocharini iii 551  
**Aleyrodidae** ii 599  
 Alitargus Casey iii 418  
   baltatus Cas. iii 418  
 Alloecoranum Reut. iii 150  
   biannulipes M. & S. iii 150  
 Allobophora Sav. ii 414  
   caliginosa Sav. ii 414  
   foetida Sav. ii 414  
   limicola Mich. ii 414  
   nordenskioldii Eisen. ii 414  
   putris Hoffm. ii 414  
   rosea Sav. ii 414  
 Alloniscus Dana ii 524  
   floresianus Dolf. ii 524  
 Aloha Kirk. ii 579  
   ipomoeae Kirk. ii 581  
   lehuae sp. n. ii 581  
   myoporocola sp. n. ii 581  
   naniicola sp. n. ii 580  
   oceanides sp. n. ii 580  
   ohiae sp. n. ii 581  
   pacificae sp. n. ii 581  
 Alplitobus Steph. ii 253  
   diaperinus Fanz. ii 253  
   lateralis Boh. ii 253  
   piceus Ol. ii 253  
 Alucita Z. (L.) i 477  
**Alysiidae** i 358, cx  
 Amalia M.-T. ii 275  
   babori Coll. ii 275  
   gagates Drap. ii 276  
 Amastra H. & A. Adams ii 333, xix, xlv  
   affinis Newc. ii 333  
   alata Pfeiff. (*Kauaia*) ii 355  
   albolabris Newc. ii 333  
   alexandri Newc. (*Laminella*) ii 348  
   amicta Smith ii 333  
   anthonii Newc. (*Amastrella*) ii 353  
   antiqua Baldw. (*Amastrella*) ii 353  
   assimilis Newc. ii 334  
   austroma Baldw. ii 334  
   badia Baldw. ii 334  
   biplicata Newc. ii 334  
   breviata Baldw. ii 334  
   bulbosa Gul. ii 351  
   carinata Gul. (*Amastrella*) ii 353  
   citrea Sykes ii 335  
   citrina Pfeiff. (*Laminella*) ii 348  
   concinna Newc. (*Laminella*) ii 348  
   conicospira Smith ii 335  
   conifera Smith ii 333  
   cornea Newc. ii 335  
   crassilabrum Newc. ii 335  
   cyclostoma Baldw. (*Amastrella*) ii 353  
   cylindrica Newc. ii 335  
   decorticata Gul. ii 336  
   depicta Baldw. (*Laminella*) ii 348  
   duranti Ancy. ii 336  
   ellipsoidea Gould ii 336  
   elliptica Gul. ii 336  
   elongata Newc. (*Laminella*) ii 349  
   erecta Pease (*Laminella*) ii 349  
   extincta Pfeiff. ii 336  
   farcimen Pfeiff. (*Laminella*) ii 349  
   flavescens Newc. ii 337  
   fraterna Sykes (*Laminella*) ii 349  
   frosti Ancy. ii 337  
   gravida Fér. (*Laminella*) ii 349  
   grayana Pfeiff. ii 337  
   heliciformis Ancy. (*Kauaia*) ii 355  
   helvina Baldw. (*Laminella*) ii 350  
   humilis Newc. ii 337  
   hutchinsonii Pease (*Laminella*) ii 350  
   inflata Pfeiff. ii 337

- Amastra intermedia* Newc. ii 338  
*irregularis* Pfeiff. ii 338  
*kauaiensis* Newc. (*Kauaia*) ii 355  
*knudseni* Baldw. (*Kouaia*) ii 356  
*lineolata* Newc. ii 338  
*longa* Sykes ii 338  
*lucida* Pfeiff. ii 338  
*magna* C. B. Adams ii 339  
*malleata* Smith ii 339  
*mastersi* Newc. ii 339  
*melanosis* Newc. ii 339  
*micans* Pfeiff. (*Laminella*) ii 350  
*modesta* C. B. Adams ii 339  
*moesta* Newc. ii 340  
*mucronata* Newc. ii 340  
*nana* Baldw. ii 340  
*nigra* Newc. ii 340  
*nigrolabris* Smith ii 344  
*nubilosa* Migh. ii 341  
*nucleola* Gould (*Amastrella*) ii 353  
*nutula* Smith ii 341  
*obesa* Newc. (*Amastrella*) ii 354  
*peasei* Smith ii 341  
*pellucida* Baldw. ii 341  
*petricola* Newc. ii 341  
*picta* Migh. (*Laminella*) ii 350  
*porphyria* Newc. ii 341  
*porphyrostoma* Pease ii 342  
*pullata* Baldw. ii 342  
*pupoidea* Newc. ii 342  
*pusilla* Newc. ii 342  
*renyi* Newc. (*Laminella*) ii 351  
*reticulata* Newc. ii 343  
*rosotincta* Sykes ii 344  
*rubens* Gould ii 343  
*rubens* Reeve ii 347  
*rubicunda* Baldw. ii 343  
*rubida* Gul. ii 343  
*rudis* Pfeiff. ii 344  
*rugulosa* Pease (*Amastrella*) ii 354  
*rustica* Gul. ii 333  
*sanguinea* Newc. (*Laminella*) ii 351  
*sericea* Pfeiff. ii 343  
*similaris* Hartm. ii 343  
*similaris* Pease ii 354  
*similaris* Hartm. ii 343  
*solida* Pease ii 344  
*soror* Newc. (*Laminella*) ii 351  
*sphaerica* Pease (*Amastrella*) ii 354  
*spirazona* Fér. ii 344  
*straminea* Reeve (*Laminella*) ii 352  
*subrostrata* Pfeiff. ii 345  
*tenulabris* Gul. ii 345  
*tenuispira* Baldw. ii 345  
*tetrao* Newc. (*Laminella*) ii 352  
*textilis* Fér. ii 345  
*transversalis* Pfeiff. ii 345  
*tristis* Fér. ii 346  
*turritella* Fér. ii 346  
*umbilicata* Pfeiff. ii 341  
*umbrosa* Baldw. ii 342  
*undata* Baldw. ii 346  
*uniplicata* Hartm. ii 346  
*variegata* Pfeiff. ii 347  
*ventulus* Fér. ii 347  
*venusta* Migh. (*Laminella*) ii 352  
*vetusta* Baldw. (*Amastrella*) ii 354  
*villosa* Sykes (*Laminella*) ii 352  
*violacea* Newc. ii 347  
*Amastrella* subg. n. *Amastra* ii 352  
*Amblyolpium* Sim. ii 519  
*Amblyolpium longiventer* Keyserl. ii 519  
*Amblyptilia* Hübn. i 472  
*Amblyptilus* Wlgrn. i 472  
*Amyntas* Kinb. ii 414  
*hawayanus* Rosa ii 420  
*hesperidum* Bedd. ii 417  
*heterochaeta* Mich. ii 416  
*peregrinus* Flect. ii 414  
*schmardae* Horst. ii 426  
*Anacamptis sarcitæa* Cr. i 649  
*sarcitella* Sph. i 649  
*Anagyris* How. ii 652  
*fraternus* sp. n. ii 653  
*laeiceps* sp. n. ii 654  
*major* sp. n. ii 652  
*nigricans* sp. n. ii 653  
*tantaleus* sp. n. ii 654  
*xanthogaster* sp. n. ii 653  
*Ananca collaris* Sharp ii 247  
*Anastatus* Motsch. i 320  
*koebelae* sp. n. i 320  
*Anas* L. i 458  
*boscas* Linn. i 458  
*wywilliana* Scl. i 458  
*Anax* Leach ii 62  
*junius* Drury ii 62  
*strenuus* Hagen ii 62  
*Ancaeus* Fauv. iii 539  
*laevigatus* Kraatz iii 539  
*Anchomenides* iii 190  
*Anchomenini* liv  
*Anchoteflus* Blackb. iii 240  
*coruscus* Er. iii 206  
*cuneipennis* Blackb. iii 241  
*epicurus* Blackb. iii 235  
*erro* Blackb. iii 216  
*fossipennis* Blackb. iii 239  
*fraternus* Blackb. iii 236  
*fugitivus* Blackb. iii 240  
*incendiarius* Blackb. iii 208  
*lucipetens* Blackb. iii 210  
*meticulosus* Blackb. iii 234  
*muscula* Blackb. iii 223  
*oceanicus* Blackb. iii 240  
*protervus* Blackb. iii 240  
*putealis* Blackb. iii 231  
*rupicola* Blackb. iii 208  
*scrupulosus* Blackb. iii 235  
*sharpi* Blackb. iii 209  
*Anchonymus* gen. n. iii 199  
*agonoides* sp. n. iii 199  
*Anchoteflus* gen. n. iii 195  
*elegans* sp. n. iii 196  
*gracilis* sp. n. iii 195  
*Ancyllostoma duodenale* Dub. ii 428  
*Ancylus* Geoffroy ii 394  
*sharpi* sp. n. ii 394  
*Anemosa aurora* Butl. i 225  
*Anesychia* Hb. i 507  
*Anisodactylus cuneatus* Karsch iii 193  
*Anisolabis* Fieb. ii 4  
*annulipes* Luc. ii 4  
*litorea* White ii 4  
*maritima* Bon. ii 4  
*pacifica* Erichs. ii 4  
*Anisomeristes* Matth. iii 416  
*basalis* Sharp iii 416  
*Anisops* Spin. iii 148  
*sp?* Kirk. ii 555  
**Anobiidae** iii 581, cxviii  
*Anobium* iii 613

- Anobium paniceum L. iii 613  
 Anomalochrysa M'Lachl. ii 47  
   angulicosta sp. n. ii 50  
   biseriata sp. n. ii 58  
   cognata sp. n. ii 50  
   debilis sp. n. ii 49  
   deceptor sp. n. ii 54  
   frater sp. n. ii 52  
   fulvescens sp. n. ii 60  
   gayi sp. n. ii 56  
   haematura sp. n. ii 58  
   hepatica M'Lachl. ii 59  
   longipennis sp. n. ii 53  
   maclachlani Blackb. ii 54  
   molokaiensis sp. n. ii 48  
   montana Blackb. ii 49  
   nana sp. n. ii 52  
   ornatipennis Blackb. ii 59  
   paurosticta sp. n. ii 53  
   peles sp. n. ii 49  
   princeps sp. n. ii 47  
   proteus sp. n. ii 59  
   raphidioides sp. n. ii 57  
   reticulata sp. n. ii 57, 691  
   rhododora sp. n. ii 60  
   rufescens M'Lachl. ii 59, 691  
   simillima sp. n. ii 55  
   soror sp. n. ii 51  
   sylvicola sp. n. ii 48  
   viridis sp. n. ii 51  
   xerophylla var. n. ii 61  
   zoe sp. n. ii 56  
 Anosia Hubn. i 193  
   erippus Cram. i 193  
 Anotheorus Blackb. ii 173  
   ignavus Blackb. ii 173  
   montanus Blackb. ii 173  
   robustus sp. n. ii 173  
 Anoura Gerv. iii 302  
 Anous Leach "Noio" i 464  
   hawaiiensis Rothsch. i 464  
   stolidus L. i 464  
 Anser Briss. i 457  
   albifrons Hart. i 457  
 Anteris Först. i 297, ii 623  
   hawaiiensis sp. n. i 298  
   montana sp. n. ii 623  
   nigricornis sp. n. i 297  
   oahuensis sp. n. ii 624  
   perkinsi sp. n. i 298  
   tarsalis sp. n. i 298  
**Anthicidae** ii 247, cxxvi  
 Anthicus Payk. ii 247  
   mundulus Sharp ii 247  
   oceanicus Laf. ii 247  
 Anthocorinae iii 125  
**Anthocoridae** ii 554, cxcix  
**Anthomyiidae** iii 29, 84, clxxvii  
 Anthomyia aeneascens Wied. iii 30  
   spp. iii 43  
 Anthothrips Uzel iii 695  
   usitatus sp. n. iii 695  
**Anthribidae** ii 182, cxxiv  
 Antilissus Sharp iii 429  
   aper Sharp iii 430  
 Apamea cinctipennis Butl. i 150  
 Apanteles Först. ii 684  
   spp. ii 684  
 Apate lifauna Mont. iii 643  
   castanoptera Fairm. iii 643  
 Apetasisus gen. n. iii 458  
   involucer sp. n. iii 458  
 Apetisus gen. n. iii 458  
   brevis Sharp iii 460  
   explanatus Sharp iii 460  
   macrothorax sp. n. iii 459  
   medius sp. n. iii 459  
   pumilio sp. n. iii 460  
 Apex albofasciatus Smith ii 304  
   coniformis Gul. ii 301  
   flavidus Gul. ii 300  
   gulicki Smith ii 300  
   innotabilis Smith ii 301  
   leucophaeus Gul. ii 301  
   leucorrhapha Gul. ii 302  
   leucozonus Gul. ii 303  
   liliaceus Gul. ii 300  
   neglectus Smith ii 301  
   polymorpha Gul. ii 299  
   tumefactus Gul. ii 304  
   versicolor Gul. ii 301  
   tubercans Gul. ii 300  
   turbiniiformis Gul. ii 300  
 Aphaereta Först. i 358  
   muscae Ashm. i 358  
 Aphelia Stph. i 687  
**Aphidae** ii 599, ccx  
 Aphidencyrthus Ashm. ii 655  
 Aphodius Ill. iii 401  
   lividus Oliv. iii 401  
 Aphonogryllus gen. n. ii 26  
   apteryx sp. n. ii 26  
 Aphononetus gen. n. i 517  
   albocinera sp. n. i 527  
   aspersa Btl. i 529  
   bitincta sp. n. i 521  
   columbella sp. n. i 521  
   confusa sp. n. i 523  
   corticicolor sp. n. i 519  
   diffusa sp. n. i 527  
   digressa sp. n. i 522  
   divergens sp. n. i 520  
   elegans sp. n. i 530  
   eleuthera sp. n. i 522  
   exsul sp. n. i 526  
   fluctuosa sp. n. i 519  
   fugitiva sp. n. i 518  
   hirsuta sp. n. i 528  
   humerella sp. n. i 528  
   kauaiensis sp. n. i 518  
   lichenalis sp. n. i 522  
   mediocris sp. n. i 517  
   nemo sp. n. i 526  
   passerella sp. n. i 520  
   plumbifer sp. n. i 524  
   polia sp. n. i 525  
   puncticiliata sp. n. i 529  
   sagittata sp. n. i 530  
   spurcata sp. n. i 523  
   subocellata sp. n. i 526  
   trichophora sp. n. i 524  
   veterella sp. n. i 525  
 Apis mellifica i 115  
 Apodia Hein. i 478  
 Apoidea ii 601  
 Apomecyna Serv. ii 114  
   pertigera Thoms. ii 114  
 Aporodes micacea Butl. i 212  
 Aporodesminus gen. n. iii 327  
   wallacei sp. n. iii 328  
 Apororhynchus hemignathi Shipl. ii 434  
 Apterocis gen. n. ii 265

- Aptericis ephistemoides Sharp ii 265  
 hawaiiensis sp. n. ii 267  
 hystrix sp. n. ii 270  
 impunctatus sp. n. ii 268  
 lanaiensis sp. n. ii 266  
 minor var. n. ii 266  
 montanus sp. n. ii 266  
 ornaiipennis sp. n. ii 269  
 rufo-notatus sp. n. ii 268  
 strigosus sp. n. ii 269  
 subaeneus sp. n. ii 270  
 vagepunctatus Blackb. ii 266  
 variabilis sp. n. ii 267  
 variegatus sp. n. ii 268
- Apteroicyclus Waterh. iii 403, cxxxii  
 adpropinquans sp. n. iii 404  
 deceptor sp. n. iii 405  
 feminalis sp. n. iii 405  
 homolulensis Waterh. iii 405  
 muiroi sp. n. iii 403  
 varians sp. n. iii 404  
 waterhousei sp. n. iii 403
- Apterogasterinae iii 704  
 Apteromesus gen. n. iii 211  
 maculatus sp. n. iii 211
- Aptus Stål. iii 153
- Arachnida ii 443, iii 339, ccxxi
- Araecerus Schönh. ii 182  
 constans sp. n. ii 182  
 fasciculatus De Geer ii 182
- Aramigus fulleri Horn. iii 653
- Aranea oculata Walck. ii 478
- Araneae ii 444
- Araneus Clerck ii 482  
 domesticus Clerck ii 505  
 emmae sp. n. ii 482  
 emmae Sim. iii 341  
 kapiolaniae sp. n. ii 483, iii 341  
 nauticus Koch ii 482
- Archips  
 Hübn. i 690, 736  
 basialbana Wkr. i 690  
 capacinus Wlsm. i 736  
 consociata Wkr. i 690  
 dotatana Wkr. i 690  
 foedana Wkr. i 690  
 fuscoviridis sp. n. i 693  
 leopardellus sp. n. i 692  
 lichenoides sp. n. i 694  
 longiplicatus sp. n. i 691, 736  
 postvitanus Wkr. i 690, 736  
 punctiferanus sp. n. i 692  
 retractana Wkr. i 690  
 reversana Wkr. i 690  
 scitulana Wkr. i 690  
 secretana Wkr. i 690  
 secundana Wkr. i 690  
 sobriana Wkr. i 690  
 subsenescens sp. n. i 695  
 trochilidanus sp. n. i 693
- Arctocoris blackburni White ii 554
- Ardea Linn. i 456  
 sacra Cim. i 456
- Argiopidae** ii 460
- Argiopinae ii 476
- Argiope Aud. ii 476  
 avara Thor. ii 476, iii 341  
 avara kauaiensis subsp. n. ii 477
- Argocerus gen. n. iii 411  
 similis sp. n. iii 411  
 subguttatus sp. n. iii 412
- Argyresthia (?) aurisquamosa Btl. i 713
- Argyresthia zebrina Btl. i 715
- Argyritis Hein. i 478
- Argyrodes Sim. ii 446  
 argyrodes Walck. ii 446  
 epeirae Sim. ii 446  
 hawaiiensis sp. n. ii 447
- Ariadna Aud. ii 445  
 perkinsi sp. n. ii 445
- Ariamnes Thor. ii 447  
 comiger sp. n. ii 447, iii 339
- Aristotelia Hübn. i 478  
 arcuata sp. n. i 482  
 elegantior sp. n. i 481  
 epermeniella sp. n. i 480  
 ichthyochroa sp. n. i 479  
 lanaiensis sp. n. i 481  
 maculaticornis sp. n. i 478  
 mendax sp. n. i 481  
 nigriciliella sp. n. i 479  
 notata sp. n. i 480
- Arma  
 pacifica Stål. iii 171  
 patruelis Stål. iii 171
- Armadillo Latr. ii 521  
 albospinosus sp. n. ii 521  
 australis Budde-Lund ii 521  
 bidens Budde-Lund ii 521  
 danae sp. n. ii 522  
 hawaiiensis Dana ii 521  
 perkinsi sp. n. ii 522  
 sharpi sp. n. ii 523
- Artema  
 Walck. ii 448  
 sisyphoides Dol. ii 446
- Ascaris lumbricoides Lutz ii 428
- Asio Briss. "Pueo" i 448  
 accipitrinus Pall. i 448
- Asiracidae** ii 576, ccv
- Asiracinae iii 124
- Asopia gerontialis Walk. i 275
- Asopus griseus Burm. iii 171
- Aspidiotus Bouché iii 107  
 auranti Mask. iii 107  
 camelliae Sign. iii 108  
 citricola Pack. iii 110  
 cydoniae Comst. iii 107  
 cydoniae var. tecta Mask. iii 107  
 duplex Cock. iii 108  
 greenii Cock. iii 108  
 hederiae Vall. iii 109  
 lataniae Green iii 108  
 longispina Mask. iii 107  
 maskelli Cock. (*Morganella*) iii 107  
 maskelli Cock. iii 107  
 napax Newst. iii 108  
 nerii Bouché iii 109  
 perniciosus Comst. iii 108  
 persarum Cock. iii 107  
 pinnaeformis Bouché iii 110  
 pomorum Bouché iii 111  
 proteus Mask. iii 110  
 rapax Comst. iii 108  
 transparent Green iii 108
- Aspilota Först. i 359
- Astaropinae iii 162
- Asteliidae** iii 73
- Asteia Meig. iii 73  
 apicalis sp. n. iii 73  
 hawaiiensis sp. n. iii 73  
 sp. iii 74
- Astenma Lep. & Serv. iii 158  
 peruvianus Guér. iii 159
- Asterolecanium Targ. iii 104

- Asterolecanium pustulans* Cock. iii 104  
*Astichus* Först. i 326  
     *cyaneus* sp. n. i 326  
*Astrimus* Sharp ii 96  
     *hirtus* Fairm. ii 96  
     *obscurus* Sharp ii 96  
*Ataenius* Har. iii 401  
     *pacificus* Sharp iii 401  
     *peregrinator* Har. iii 401  
     *stercorator* Fabr. iii 401  
*Atelidium* gen. n. iii 284  
     *munroi* sp. n. iii 285  
*Atelothorax* gen. n. iii 269  
     *optatus* sp. n. iii 269  
*Atelothrus* gen. n. iii 216  
     *constrictus* sp. n. iii 217  
     *depressus* sp. n. iii 220  
     *dyscoleus* sp. n. iii 220  
     *erro* Blackb. iii 216  
     *filipes* sp. n. iii 218  
     *gracilis* sp. n. iii 219  
     *hawaiiensis* sp. n. iii 219  
     *insociabilis* Blackb. iii 220  
     *limbatus* sp. n. iii 217  
     *longicollis* sp. n. iii 217  
     *longulus* sp. n. iii 218  
     *platynoides* sp. n. iii 221  
     *politus* sp. n. iii 216  
     *stenopus* sp. n. iii 218  
     *transiens* sp. n. iii 221  
*Atheta* Thoms. iii 576  
     *coriaria* Kraatz iii 577  
     *olae* sp. n. iii 576  
*Athyreodon* Ashm. ii 679  
     *debilis* Perk. ii 680  
     *hawaiiensis* sp. n. i 343  
     *hawaiiensis* Ashm. ii 679  
*Athysanus* Burm. ii 575  
*Atrachynemis* Blackb. iii 193  
     *koebelei* sp. n. iii 194  
     *perkinsi* sp. n. iii 194  
     *sharpi* Blackb. iii 193  
*Atractomorpha* Sauss. ii 687  
     *crenaticeps* Bl. ii 687  
*Atrometes* Först. i 350, ii 681  
     *citricinctus* sp. n. i 353  
     *delicatus* sp. n. i 354  
     *flavifrons* sp. n. i 352  
     *haleakalae* sp. n. i 353  
     *hawaiiensis* sp. n. i 354  
     *molokaiensis* sp. n. i 353  
     *satelles* sp. n. ii 683  
     *sociabilis* sp. n. ii 682  
     *solitarius* sp. n. ii 683  
     *tarsatus* sp. n. i 352  
     *tephrias* sp. n. ii 681  
*Attagenus* Latr. iii 413  
     *plebeius* Sharp iii 413  
**Attidae** ii 511  
*Attus adansoni* tardigradus Aud. ii 511  
     *africanus* Vins. ii 512  
     *capito* Luc. ii 511  
     *ligo* Walck. ii 512  
     *ngrofuscus* Vins. ii 511  
     *paykulli* Aud. ii 512  
*Auchenorrhyncha* iii 114  
*Aulacaspis* Cock. iii 109  
     *rosae* iii 109  
*Auricula* owaihiensis Cham. ii 375  
     *sinistrorsa* Cham. ii 375  
*Auricullella* Pfeiff. ii 375  
*Auricullella ambusta* Pease ii 375  
     *auricula* Fér. ii 375  
     *brunnea* Smith ii 375  
     *cerea* Pfeiff. ii 376  
     *chamissoi* Pfeiff. ii 376  
     *crassula* Smith ii 376  
     *diaphana* Smith ii 376  
     *expansa* Pease ii 376  
     *juvunda* Smith ii 379  
     *lurida* Pfeiff. ii 376  
     *newcombi* Pfeiff. ii 377  
     *obliqua* Ancey ii 377  
     *patula* Smith ii 376  
     *perkinsi* sp. n. ii 377  
     *perpusilla* Smith ii 378  
     *pettiana* Pfeiff. ii 377  
     *ponderosa* Ancey ii 376  
     *pulchra* Pease ii 378  
     *solida* Gul. ii 379  
     *solidissima* Smith ii 379  
     *tenella* Ancey ii 378  
     *tenuis* Smith ii 378  
     *triplicata* Pease ii 378  
     *umbilicata* Ancey ii 383  
     *unplicata* Pease ii 378  
     *westerlundiana* Ancey ii 379  
*Automola pelodes* Meyr. i 486  
*Autosticha* Meyr. i 486  
     *pelodes* Meyr. i 487  
*Aves* i 368, xli, lxxii  
*Azinis hilarella* Btl. i 507  
*Bacanius* Lec. iii 510  
     *atomarius* Sharp iii 510  
     *confusus* Blackb. iii 511  
*Bactra* Sph. i 687  
     *straminea* Btl. i 687  
*Baesus* Hal. ii 622  
     *persordulus* sp. n. ii 622  
*Balea newcombi* Pfeiff. ii 377  
*Banchogastra* Ashm. i 343, ii 680  
     *nigra* sp. n. i 343  
     *vitreipennis* sp. n. ii 680  
*Banza* xxx  
*Baracus* gen. n. iii 143, ii 553  
     *hawaiiensis* sp. n. iii 143, ii 553  
*Baryneus* gen. n. iii 209  
     *sharpi* Blackb. iii 209  
*Barypristus* Sharp iii 208  
     *incendiaris* Blackb. iii 208  
     *rupicola* Blackb. iii 208  
     *sharpi* iii 209  
*Bassus* Fall. i 340  
     *laetatorius* Fab. i 340  
*Batodes* Gn. i 703  
*Batrachreda* Stn. i 508, 734  
     *bedelliella* sp. n. i 509  
     *ephelus* sp. n. i 509  
     *lomentella* sp. n. i 511  
     *microstigma* sp. n. i 510  
     *ruficiliata* sp. n. i 510  
     *sophroniella* sp. n. i 511  
     *supercincta* sp. n. i 510  
     *syraphella* sp. n. i 509, 734  
*Bavia* Sim. ii 511  
     *aericeps* Sim. ii 511  
*Bedellia* Stn. i 723  
     *convolvuliella* i 723  
     *minor* Busch. i 724  
     *orchilella* sp. n. i 725  
     *orpheella* Stn. i 723

- Bedellia sonnulentella* Z. i 723  
*staintoniella* Clem. i 723  
*struthionella* sp. n. i 725  
**Bembidijides** iii 275  
**Bembidium** Latr. iii 278  
*advena* sp. n. (*Synchostictus*) iii 278  
*ignicola* Blackb. (*Emphanes*) iii 279  
*molokaiense* sp. n. (*Emphanes*) iii 279  
*pacificum* Blackb. (*Emphanes*) iii 279  
*spurcum* Blackb. iii 277  
*teres* Blackb. (*Synchostictus*) iii 278  
*Beris servillei* Macq. iii 79  
*Bernicia* Steph. Nene. i 457  
*sandvicensis* Vig. i 458  
**Bethylidae** i 282, ii 612, xcix  
**Blabophanes** Z. i 727  
*heringi* Rdsn. i 728  
*hyalinella* Snell. i 728  
*lombardica* Snell. i 728  
*longella* Btl. i 727  
*monachella* Meyr. i 727  
*obumbrata* Btl. i 728  
*rusticella* Btl. i 729  
**Blackburnia** Sharp iii 191  
*frigida* Blackb. iii 200  
*insignis* Sharp iii 191  
*kaalensis* var. n. iii 191  
**Blastobasis** Z. i 648  
*inana* Btl. i 648  
**Blattidae** ii 5, 690, ccxiii  
*Blepharipa monticola* Big. iii 20  
*Blepyrus* How. ii 655  
*marsdeni* How. ii 655  
*Bolitochara impacta* Blackb. iii 571  
*testacea* Kraatz iii 571  
**Borboridae** iii 75  
**Borborus** Meig. iii 75  
*bilineatus* sp. n. iii 75  
*venalicus* Ost-Sack. iii 75  
**Boreophila minuscula** Butl. i 233  
**Bostrychidae** iii 642, ccxvii  
*Bostrychus migrator* Sharp iii 642  
**Bothriothorax** Ratz. i 321  
*insularis* Cam. i 321  
**Botys accepta** Butl. i 204  
*blackburni* Butl. i 202  
*continuatalis* Butl. i 205  
*demaratalis* Walk. i 205  
*localis* Butl. i 206  
**Brachydeutera** Loew iii 49, 85  
*argentata* Walk. iii 49, 85  
*dimidiata* Loew iii 49  
**Brachymetopa** Redt. ii 8, 687, xxx  
*affinis* sp. n. ii 11  
*blackburni* Borm. ii 9, 687  
*deplanata* Brunn. ii 12  
*discolor* Redt. ii 9, 687  
*kauaiensis* sp. n. ii 10  
*mauiensis* sp. n. ii 12  
*molokaiensis* sp. n. ii 12  
*nitida* Brunn. ii 9  
*parvula* sp. n. ii 11  
*unica* sp. n. ii 10  
**Brachypeplus** *affinis* Sharp iii 475  
*aper* Sharp iii 470  
*apertus* Sharp iii 498  
*bicolor* Blackb. iii 465  
*bidens* Sharp iii 483  
*blackburni* Sharp iii 503  
*brevis* Sharp iii 460  
*celatus* Sharp iii 498  
*Brachypeplus discedens* Sharp iii 494  
*discedens* var. *kauaiensis* Blackb. iii 495  
*expers* Blackb. iii 455  
*explanatus* Sharp iii 460  
*floricola* Blackb. iii 480  
*guttatus* Sharp iii 454  
*impersus* Sharp iii 463  
*inaequalis* Sharp iii 463  
*inauratus* Sharp iii 475  
*infimus* Sharp iii 506  
*koelensis* Blackb. iii 488  
*lanaiensis* Blackb. iii 504  
*metallesens* Sharp iii 493  
*obsoletus* Sharp iii 467  
*olinda* Blackb. iii 477  
*omaloides* Sharp iii 469  
*quadraticollis* Blackb. iii 501  
*parallelus* Blackb. iii 497  
*protinoides* Sharp iii 486  
*proticeps* Sharp iii 494  
*reitteri* Sharp iii 505  
*robustus* Sharp iii 452  
*sordidus* Sharp iii 455  
*spretus* Blackb. iii 468  
*striatus* Sharp iii 465  
*tinctus* Sharp iii 493  
*torvus* Blackb. iii 485  
*varius* Sharp iii 496  
*vestitus* Sharp iii 497  
**Braconidae** i 359, ii 683, 684, cx  
*Bracon* Fabr. ii 684  
*Branta* Scop. i 458  
*canadensis* Ridgw. i 458  
*nigricans* Lawr. i 458  
*Brontolaemus* Sharp iii 423  
*agilis* sp. n. iii 425  
*currax* sp. n. iii 424  
*currax* var. *lanaiensis* var. n. iii 424  
*currax* var. *mauiensis* var. n. iii 424  
*elegans* Sharp iii 423  
*elegans* var. *koehlele* var. n. iii 424  
*nudicornis* sp. n. iii 425  
*Brosconymus* gen. n. iii 198  
*optatus* sp. n. iii 198  
**Bruchidae** ii 95, cxv  
**Bruchus** L. ii 95  
 sp. ii 95  
*Bubaloceras* gen. n. i 548  
*subburneum* Wlsm. i 548  
*subburneum* sp. n. i 549  
*Buchananiella* Reut. iii 128  
*sodalis* White iii 128  
*Buenoa* Kirk. ii 554  
*pallipes* Fabr. ii 555  
**Bulimella** Pfeiff. ii 305  
*attenuata* Pfeiff. ii 319  
*candida* Pfeiff. ii 308  
*forbesiana* Pfeiff. ii 300  
*fuscobasis* Smith ii 310  
*macrostoma* Pfeiff. ii 310  
*multicolor* Pfeiff. ii 306  
*rosea* Swains. ii 309  
**Bulimus** *armatus* Migh. ii 375  
*clausinus* Migh. ii 359  
*gouldi* Pfeiff. ii 317  
*insignis* Migh. ii 320  
*junceus* Gould ii 383  
*kauaiensis* Pfeiff. ii 399  
*lactifusus* Pfeiff. ii 399  
*liratus* Pfeiff. ii 332  
*newcombianus* Pfeiff. ii 332

- Bulimus pumicatus* Migh. ii 379  
*pyrgiscus* Pfeiff. ii 384  
*rohri* Pfeiff. ii 320  
*scutillus* Migh. ii 368
- Bulweria* Bon. i 462  
*bulweri* J. & S. i 463
- Buprestidae** iii 400
- Buprestis adjecta* Lec. iii 400
- Buteo* Cuv. "10" i 446  
*solitarius* Peale i 447
- Bythoscopinae* iii 114
- Bythoscopus* Germ. Kirk. iii 114  
*kaiamamao* sp. n. iii 115, ii 557  
*kukanaroa* sp. n. iii 114, ii 557  
*peregrinus* Stål. iii 115  
*viduus* Stål. iii 116
- Cacodes* Sharp iii 368  
*debilis* Sharp iii 368, cxxix
- Cachura* Wkr. i 712  
*objectella* Wkr. i 712
- Cacodinae* Kirk. iii 129, ii 552
- Cacoecha postvittata* Meyr. i 690
- Caecilianella baldwini* Ancy. ii 384
- Caecilioides* Herm. ii 384  
*baldwini* Ancy. ii 384
- Cafius* Steph. iii 548  
*nauticus* Fairm. iii 548
- Calandrini* ii 139
- Calandra* Clairv. ii 139  
*linearis* var. *striata* Thunb. ii 139  
*obscura* Boisd. ii 139  
*oryzae* L. ii 139  
*remota* Sharp ii 139
- Calidris* Cuv. i 451  
*arenaria* L. i 451
- Callidiopsides* ii 97
- Callidium pillicorne* Fab. ii 97
- Calliphora* Desv. iii 27  
*aurea* iii 27  
*vomitaria* Linn. iii 27  
*ssp.* iii 28
- Callithymus* Sharp ii 113  
*cristatus* Sharp iii 650  
*hirtipes* var. n. ii 113  
*koebelii* Perk. iii 649  
*microgaster* Sharp ii 113, iii 649
- Caloteleia* Westw. ii 624  
*elegans* sp. n. ii 624  
*exul* sp. n. ii 625
- Calotermes* Hag. ii 88  
*marginipennis* Latr. ii 88
- Cambalidae** iii 329
- Camplyoneuraria* Kirk. iii 138
- Campodeidae** iii 293
- Campodea* Westw. iii 293
- Camponotus maculatus* cil
- Camponotus maculatus mitis hawaiiensis* i 122
- Campsinemus* Walk. iii 13, 80  
*calcaratus* sp. n. iii 14  
*distortipes* sp. n. iii 14  
*fimbriatus* sp. n. iii 13  
*patellifer* sp. n. iii 80  
*ssp.* iii 15
- Capsidae** cc
- Capsaria* Reut. iii 142
- Capsus pellucidus* Stål. iii 143
- Capua* Stph. i 703  
*castaneana* sp. n. i 705  
*flavocincta* sp. n. i 704  
*flavopicta* sp. n. i 703
- Capua fulva* sp. n. i 708  
*glaucoviridana* sp. n. i 706  
*ochrocrepura* sp. n. i 708  
*picta* sp. n. i 703  
*pleonectes* sp. n. i 705  
*trigomifer* sp. n. i 704  
*variabilis* sp. n. i 706
- Carabidae** iii 190, liv, cxxxix
- Caraboidea* iii 175
- Carabus pallens* Fabr. iii 288
- Caradrinidae** iii 345, cxlv
- Caradrina* Ochs. i 153  
*exanimis* sp. n. i 153  
*venosa* Butl. i 153
- Carcinops* Mars. iii 510  
*quatuordecimstriata* Steph. iii 510
- Cardiastethus mundulus* White iii 126  
*sodalis* White iii 128
- Cardiocondyla nuda* minutior i 120  
*wroughtonii hawaiiensis* i 119
- Carelia* H. & A. Adams ii 373, xix, lxxi, lxxii  
*bicolor* Jay ii 373  
*cochlea* Reeve ii 373  
*cumingiana* Pfeiff. ii 373  
*dolei* Ancy. ii 374  
*glutinosa* Ancy. ii 374  
*olivacea* Pease ii 374  
*paradoxa* Pfeiff. ii 374  
*sinclairi* Ancy. ii 374  
*turricula* Migh. ii 374  
*variabilis* Pease ii 374
- Carinella* Pfeiff. ii 355
- Carpophilus* Steph. iii 507  
*dimidiatus* Fabr. iii 507  
*hemipterus* Linn. iii 507  
*humeralis* Fabr. iii 507  
*maculatus* Murr. iii 507
- Carposinidae** i 654, 735, clxvii
- Catamempsis* gen. n. i 491  
*deciens* sp. n. i 491
- Catapicephala limbipennis* Thoms. iii 22
- Cathartus* Reiche iii 428  
*advena* Waltl iii 428
- Catorama mexicana* Chev. iii 614  
*pusilla* Sharp iii 614
- Cerambycidae** ii 95, iii 645, cxv
- Cerambycini* ii 96
- Cerambyx globosus* Oliv. ii 96
- Ceraphronidae** ii 616, cii
- Ceraphron* Jur. ii 616  
*abnormis* sp. n. ii 617  
*plebeius* sp. n. ii 616
- Ceratopogon* Meig. iii 5  
*ssp.* iii 5
- Ceratotaxia* gen. n. iii 399  
*tristis* sp. n. iii 400
- Ceresium* Newm. ii 97  
*simplex* Gyll. ii 97
- Ceroplastes* Gray iii 104  
*ceriferus* And. iii 105  
*floridensis* Comst. iii 105  
*rubens* Mask. iii 104
- Cerostoma maculipennis* Crt. i 652
- Cestoda* ii 429
- Chaenosternum* Blackb. ii 138  
*konanum* Blackb. ii 138
- Chaetogaedia* Br. & Berg. iii 20, 83  
*monticola* Big. iii 20, 83
- Chaetoptila* Peale i 445  
*angustipluma* Peale i 445
- Chalcidoidea* ii 630

- Chalcididae** i 305, civ  
**Chalcis** i 306  
   *obscurata* Walk. i 307  
   *polynesialis* Cam. i 306  
**Chalcopelidius** Eschsch. iii 368  
   *erythroloma* Cand. iii 368  
**Chalcomenus** gen. n. iii 206  
   *corruscus* Er. iii 206  
   *costatus* sp. n. iii 207  
   *molokaiensis* sp. n. iii 207  
**Chalybe** Dp. i 507  
**Charadrius** L. i 449  
   *fulvus* L. i 450  
   *squatarola* L. i 450  
**Charitonetta** Stejn. i 461  
   *albeola* L. i 461  
**Charopa** *baldwini* Ancey ii 289  
**Chasimpis** xxxi, clxii  
   *cabanis* "Elepaio" i 379  
   *gayi* Wils. i 381  
   *sandwicensis* Gmel. i 381  
   *sclateri* Ridgw. i 381  
**Chaulelasmus** Bon. i 461  
   *streperus* Linn. i 461  
**Cheliferidae** ii 517  
**Chelifer** Geoff. ii 517  
   *bifidus* Sim. ii 517  
   *hawaiiensis* sp. n. ii 518  
**Chelisoches** Scudd. ii 4  
   *morio* Fab. ii 4  
**Chelodymenus** Perk. ii 607  
   *chelifer* Perk. ii 607  
**Chelonus** Jur. i 359  
   *blackburni* Cam. i 359  
   *cameroni* D. T. i 359  
   *carinatus* Cam. i 359  
**Chen** Boie i 457  
   *hyperborea* Pall. i 457  
**Ohermidae** ii 598, ccx  
**Chermes** oleae Bern. iii 106  
**Cherretes** ii 517  
**Chiloides** i 687  
   *straminea* Btl. i 687  
**Chiloneurus** *maculatipennis* Prov. i 321  
**Chilopoda** iii 324  
**Chionaspis** *biclavus* Comst. iii 112  
   *biclavus* var. *detecta* Mask. iii 112  
   *eugeniae* Mask. iii 112  
   *prunicola* Mask. iii 112  
**Chironomidae** iii 47, clxxx  
**Chironomus** Meig. iii 4  
   *hawaiiensis* sp. n. iii 4  
**Chlamydataria** Kirk. iii 131  
**Chloridops** Wils. i 439, lxxii  
   *kona* Wils. i 440  
**Chlorodrepanis** i 408, lxxii  
   *chloridoides* Wils. i 411  
   *chloris* Cab. i 411  
   *kalaana* Wils. i 411  
   *parva* i 409, 411  
   *stejnegeri* Wils. i 411  
   *virens* Gmel. i 411  
   *wilsoni* Rothsch. i 411  
**Cholovocera** Motsch. iii 422  
**Chrestotes** *dryas* Bd. i 726  
**Chrysoclista** *haleakalae* Btl. i 573  
   *tigrina* Btl. i 533  
**Chrysoesthia** Hb. i 478  
**Chrysomelidae** ii 95  
**Chrysozmyza** Fall. iii 85  
**Chrysopides** ii 47, 691  
**Chrysopa** Leach ii 61, xvii  
   *microphya* M'Lachl. ii 61  
**Chrysopora** Clem. i 478  
**Chrysotus** Meig. iii 15  
   *hawaiiensis* sp. n. iii 16  
   *saxatilis* sp. n. iii 16  
   *spiniger* sp. n. iii 15  
**Oleidae** iii 114  
**Cillaeopeplus** gen. n. iii 505  
   *dubius* sp. n. iii 506  
   *infimus* Sharp iii 506  
   *perkinsi* sp. n. iii 506  
**Cimicidae** iii 171, ii 533, cxc  
**Cimex** *lectularius* Linné iii 129  
   *rubrofasciatus* de Geer ii 550  
**Circus** Lac. i 447  
   *hudsonius* Linn. i 447  
**Ciridops** Wils. *Ula-ai-hawane* i 405, lxxii  
   *anna* Dole i 405  
**Cioidae** ii 253, xlix, cxxvii  
**Cis** Latr. ii 255  
   *alienus* Sharp ii 255  
   *angustiformis* sp. n. ii 265  
   *apicalis* Sharp ii 260  
   *attenuatus* Sharp ii 261  
   *bicolor* Sharp ii 256  
   *bimaculatus* Sharp ii 257  
   *breviformis* sp. n. ii 255  
   *calidus* Sharp ii 260  
   *chloroticus* Sharp ii 259  
   *concolor* Sharp ii 260  
   *cognatissimus* sp. n. ii 256  
   *diminutivus* Sharp ii 264  
   *ephistemoides* Sharp ii 265  
   *evanesens* Sharp ii 264  
   *fallax* sp. n. ii 263  
   *haleakale* sp. n. ii 262  
   *insularis* Sharp ii 258  
   *kauaiensis* sp. n. ii 261  
   *laeticulus* Sharp ii 264  
   *longipennis* Blackb. ii 265  
   *nimus* sp. n. ii 263  
   *mirabilis* sp. n. ii 262  
   *molokaiensis* sp. n. ii 262  
   *nesiotes* sp. n. ii 256  
   *nigrofasciatus* Blackb. ii 257  
   *pacificus* Sharp ii 255  
   *porcatus* Sharp ii 258  
   *roridus* Sharp ii 261  
   *setarius* Sharp ii 260  
   *signatus* Sharp ii 261  
   *simulator* sp. n. ii 259  
   *tabidus* Sharp ii 259  
   *unicus* sp. n. ii 258  
   *vagepunctatus* Blackb. ii 266  
**Cistelidae** ii 247, cxvii  
**Cistela** Fabr. ii 248  
   *apicalis* sp. n. ii 249  
   *crassicornis* Sharp ii 248  
   *kauaiensis* sp. n. ii 248  
   *kona* sp. n. ii 250  
   *montana* sp. n. ii 249  
   *nigricollis* sp. n. ii 248  
   *subaenescens* sp. n. ii 249  
**Cixiaria** iii 117  
**Clambus** Fisch. iii 535  
**Clerada** Sign. iii 160  
   *apicicornis* Sign. iii 160, ii 545  
**Oleridae** iii 367  
**Clindium** Kirby iii 429  
   *liratum* Chevrr. iii 429

- Clinocoridae** ii 552  
**Clinocoris** Fall. ii 552  
**Clubionidae** ii 504  
**Clytides** ii 97  
**Clytarus** Sharp ii 98, 104  
   *abnormis* sp. n. ii 102  
   *annectens* sp. n. ii 104  
   *blackburni* Sharp ii 111  
   *claviger* sp. n. ii 101  
   *cristatus* Sharp ii 113  
   *debilis* sp. n. ii 99  
   *filipes* Sharp ii 99  
   *finchii* Har. ii 106  
   *fragilis* Sharp ii 99, iii 645  
   *laticollis* sp. n. ii 101  
   *longipes* sp. n. ii 103  
   *mediocris* sp. n. ii 99  
   *modestus* Sharp ii 101  
   *nodifer* sp. n. ii 102  
   *obscurus* sp. n. ii 100  
   *pennatus* Sharp ii 102  
   *pulvillatus* Karsch ii 111  
   *robustus* Sharp ii 107  
   *ultimus* sp. n. iii 645  
**Clytus** Laich. ii 97  
   *crnicornis* Chev. ii 97  
**Cnaemidophorus** Wlgrn. i 472  
**Cnephalcotes** Sm. ii 461  
   *simpliciceps* sp. n. ii 462, iii 340  
**Coeciniellidae** iii 414, cxxxii  
**Coecimella** abdominalis Say. iii 414  
**Coccophagus** Westw. i 327  
   *lecanii* Sm. i 328  
   *ochraceus* How. i 328  
**Coecidae** iii 102, ii 399  
**Coccus** Linné iii 105  
   *acuminatus* Sign. iii 105  
   *adonidum* Linné iii 103  
   *beckii* Newm. iii 110  
   *ceriferus* And. iii 105  
   *citri* Risso iii 103  
   *coffecae* Walk. iii 105  
   *gloverii* Pack. iii 111  
   *hederacae* Vall. iii 109  
   *hesperidum* Linné iii 105  
   *longulum* Dougl. iii 106  
   *mori* Sign. iii 106  
   *nigrum* Nietn. iii 106  
   *oleae* Bern. iii 106  
   *perforatum* Newst. iii 106  
   *tessellatum* Sign. iii 106  
   *zizyphus* Luc. iii 110  
**Cochlogena** decora Fér. (*Helictes*) ii 301  
   *lugubris* Chemn. (*Helictes*) ii 298  
**Coenosia** Meig. iii 32  
   *biseta* sp. n. iii 39  
   *dexioides* sp. n. iii 33  
   *dispar* sp. n. iii 35  
   *flavobasalis* sp. n. iii 32  
   *ingens* sp. n. iii 40  
   *kauaiensis* sp. n. iii 37  
   *latimana* sp. n. iii 35  
   *longipes* sp. n. iii 38  
   *rudis* sp. n. iii 40  
   *seminigra* sp. n. iii 33  
   *striata* sp. n. iii 38  
   *triangulifera* sp. n. iii 36  
   *valida* sp. n. iii 34  
   *ssp.* iii 41  
**Coleoptera** ii 91, iii 367, xxxii, xlix, cxii  
**Coleotichus** White iii 172  
   *blackburniae* White iii 172, ii 534, cxcii  
**Collembola** iii 299, cxxx  
**Colobicus** Latr. iii 430  
   *conformis* Pasc. iii 430  
   *parilis* Pasc. iii 430  
**Colour groups** (Wasps) xciii  
**Colovocera** Motsch. iii 422  
**Colpocaccus** gen. n. iii 213  
   *apicalis* sp. n. iii 215  
   *hawaiiensis* sp. n. iii 214  
   *lanaiensis* sp. n. iii 215  
   *marginatus* sp. n. iii 215  
   *posticatus* sp. n. iii 215  
   *tantalus* Blackb. iii 214  
**Colpocephalum** brachysomum sp. n. iii 314  
   *conspicuum* sp. n. iii 315  
   *discrepans* sp. n. iii 316  
   *epiphanes* sp. n. iii 313  
   *kilauiensis* sp. n. iii 312  
**Colpodes** mysticus Blackb. iii 213  
   *octocellatus* Karsch iii 209  
**Colpodiscus** Sharp iii 209, 213  
   *lahainensis* sp. n. iii 210  
   *lucipetens* Blackb. iii 210  
   *tantalus* Sharp iii 214  
**Colydiidae** iii 429, cxxxiv  
**Colymbetes** pacificus Boisd. iii 289  
   *parvulus* Boisd. iii 288  
**Comys** fusca How. i 321  
**Conocephaloides** gen. n. ii 13  
   *hawaiiensis* sp. n. ii 13  
**Conocephalus** blackburni Borm. ii 9  
**Conops** calcitrans Linn. iii 28  
**Conorhinus** Lap. ii 550  
**Copelatus** Erichs. iii 288  
   *mauiensis* Blackb. iii 288  
   *parvulus* Boisd. iii 288  
**Coptops** Serv. iii 650  
   *aedificator* Fabr. iii 650  
**Corixidae** iii 148, cciii  
**Coriscinae** Kirk. iii 169  
**Corixa** Geoff. iii 148  
   *blackburni* iii 148, ii 554  
**Corizus** Sign. iii 170  
**Corticaria** dentata Marsh iii 429  
**Corvus** Linn. i 372  
   *hawaiiensis* Peale i 373  
**Corylophidae** iii 415, cxxxii  
**Corylophodes** Matth. iii 417  
   *rotundus* Sharp iii 417  
   *suturalis* Sharp iii 417  
**Corylophus** Sharp iii 417  
   *rotundus* Sharp iii 417  
   *suturalis* Sharp iii 417  
**Cosilidae** ii 616  
**Cosmophila** Boisd. i 157, iii 348  
   *noctivolans* Butl. i 158, iii 348  
   *sabulifera* Guen. i 158, iii 348  
**Cosmopteryx** argyrogrammos Z. i 514  
**Cossonini** ii 139  
**Cothonaspis** Hart. ii 668, ii 669  
   *abnormis* sp. n. (*Hypodiranchis*) ii 673  
   *ashmeadi* sp. n. (*Nesodiranchis*) ii 668  
   *debilis* sp. n. ii 672  
   *debilis* var. *similis* var. n. ii 672  
   *debilis* var. *subdebilis* var. n. ii 673  
   *declivis* sp. n. (*Hypodiranchis*) ii 671  
   *dichroma* sp. n. (*Hypodiranchis*) ii 674  
   *dubiosa* sp. n. (*Hypodiranchis*) ii 673  
   *intermedia* sp. n. (*Hypodiranchis*) ii 670  
   *naias* sp. n. (*Hypodiranchis*) ii 672

- Cotonaspis pele sp. n. (*Hypodiranchis*) ii 669  
   strigosa sp. n. ii 671  
   tantali sp. n. (*Hypodiranchis*) ii 670  
**Crabronidae** ii 606, lxxxv  
**Crabro** i 15  
   abnormis sp. n. i 25  
   adspectans Bl. & C. i 29  
   affinis i 19  
   atripennis sp. n. i 24  
   curtipes sp. n. i 24  
   fulvicrus sp. n. i 22  
   hawaiiensis sp. n. i 17  
   mandibularis i 21  
   mauiensis i 17  
   molokaiensis sp. n. i 16  
   monticola sp. n. i 15  
   notostictus sp. n. i 20  
   polynesialis i 22  
   rubrocaudatus Bl. & C. i 27  
   stygius Kirby i 29  
   tumidoventris sp. n. i 18  
   unicolor i 23  
**Crambidae** iii 356, clvii  
**Creophilus** Mann. iii 548  
   maxillosus L. iii 548  
**Crioceris** parvula Fabr. iii 95  
**Crocidosema** Z. i 675, 736  
   blackburnii Btl. i 675  
   plebeiana Z. i 675, 736  
**Crossotarsus** Chap. ii 182  
   externedentatus Fairm. ii 182  
**Crustacea** amphipoda ii 527  
**Crustacea** isopoda ii 521  
**Cryptamorpha** Woll. iii 428  
   desjardinsi Guér. iii 428  
**Cryptinae** ii 676  
**Cryptodesmidae** iii 327  
**Cryptophaeidae** iii 422  
**Cryptophagus** serratus Gyll. iii 423  
**Cryptophilus** Reitt. iii 422  
   integer Heer iii 422  
**Cryptophlebia** carpophaga Wlsm. i 680  
   illepida Btl. i 681  
   illepida fulva var. n. i 681  
   illepida suffusa var. n. i 682  
   tetrao sp. n. i 683  
   vulpes sp. n. i 683  
**Cryptorhopalum** Guér.-Mén. iii 413  
   brevicorne Sharp iii 413  
   terminale Sharp iii 413  
**Cryptorhynchini** ii 131  
**Cucujidae** iii 423, cxxxiii  
**Cucujus** pusillus Schönh. iii 425  
   minutus Oliv. iii 425  
**Culicidae** iii 6, chxxi  
**Culex** Linn. iii 6  
   taeniatus Wied. iii 6  
**Cureulionidae** ii 117, iii 650, cxix  
**Curtemerus** Steph. ii 97  
   luteus Steph. ii 97  
   pilicornis Fab. ii 97  
**Cycloneda** Crotch iii 414  
   abdominalis Say iii 414  
**Cyclonotum** Erichs. iii 579  
   extraneum sp. n. iii 579  
   subquadratum Fairm. iii 578  
**Cyclosa** Meng. ii 477  
   albisterius Sim. ii 478, iii 341  
   cucurbitula sp. n. ii 482  
   oculata Walck. ii 478  
   olorina sp. n. ii 481  
**Cyclosa** perkinsi sp. n. ii 479  
   simplicicauda sp. n. ii 479  
   simplicicauda rufescens ii 480  
   turbinata Walck. ii 478  
   walkemeri McCo. ii 478  
   xanthomelas sp. n. ii 480  
**Cyclothorax** angusticollis Blackb. iii 246  
   bembidioides Blackb. iii 262  
   brevis Blackb. iii 267  
   cordaticollis Blackb. iii 259  
   deverilli Blackb. iii 270  
   inaequalis Blackb. iii 249  
   karschi Blackb. iii 266  
   laetus Blackb. iii 262  
   micans Blackb. iii 244  
   montivagus Blackb. iii 253  
   multipunctatus Blackb. iii 252  
   nubicola Blackb. iii 244  
   oahuensis Blackb. iii 274  
   obscuricolor Blackb. iii 266  
   paradoxus Blackb. iii 263  
   pele Blackb. iii 254  
   robustus Blackb. iii 268  
   rupicola Sharp & Blackb. iii 244  
   scaritoides Blackb. iii 272  
   simiolus Blackb. iii 274  
   unctus Blackb. iii 257  
   vulcanus Blackb. iii 249  
**Cydniinae** iii 172, ii 534  
**Cylas** Latr. ii 131  
   turcipennis Boh. ii 131  
**Cyminae** iii 161  
**Cymus** calvus White iii 162  
   cringer White iii 161  
**Cynipoidea** ii 667  
**Cyrtopeltis** Fieb. iii 138  
   hawaiiensis sp. n. iii 138, ii 553  
**Cyrtostolus** gen. n. iii 457  
   subalatus sp. n. iii 457  
**Dacnitus** gen. n. iii 384  
   currax sp. n. iii 385  
**Dactylopius** iii 103  
   adonidum Mask. iii 103  
   albizziae Mask. iii 103  
   calceolariae Mask. iii 103  
   vastator Mask. iii 103  
   virgatus Cock. iii 103  
**Dactylosternum** Woll. iii 578  
   abdominale Fabr. iii 579  
   subquadratum Fairm. iii 578  
**Dacus** Meig. iii 44  
   cucurbitae Coq. iii 45  
**Dafila** Steph. i 461  
   acuta L. i 461  
**Dasyuris** Guen. i 168  
   holombra sp. n. i 168, xxxix  
**Decadarchis** Meyr. i 714  
   melanastra Meyr. i 714  
   simulans Btl. i 714  
**Degeeria** Nic. iii 300  
**Deilephila** Ochs. i 191  
   calida Butl. i 192  
   lineata Fabr. (livornica Esp.) i 192  
   pyrias sp. n. i 191  
   smaragdithis sp. n. i 191  
   wilsoni Roths. i 192, xxix  
**Deinocossonus** gen. n. ii 147  
   nesiotes sp. n. ii 148  
**Deinomimes** gen. n. i 11  
   cognata sp. n. i 13

- Deinomimesa ferox* sp. n. i 12  
*haleakalae* sp. n. i 14  
*hawaiiensis* sp. n. i 13  
*puuae* sp. n. i 13  
*Delphax maidis* Ashm. ii 577  
*psylloides* Leth. ii 577  
*pulchra* Stal. ii 586  
*Deltocephalus hospes* Kish. ii 576  
*Dendrophilus quatuordecimstriata* Steph. iii 510  
*Depressaria argentea* Btl. i 496  
*convictella* Btl. i 487  
*gigas* Btl. i 493  
*gossypiella* Sndrs. i 731  
*indecora* Btl. i 497  
*lactea* Btl. i 497  
*usitata* Btl. i 504  
*Dermaptera* ii 4, 690  
**Dermestidae** iii 406, cxxxii  
*Dermestes* Linn. iii 413  
*cadaverinus* Fabr. iii 413  
*fumatus* Linn. iii 419  
*hemipterus* Linn. iii 507  
*surinamensis* Linn. iii 428  
*unidentatus* Fabr. iii 428  
*vulpinus* Fabr. iii 413  
*Dermothrips* gen. n. iii 677  
*hawaiiensis* sp. n. iii 678  
*Derobrosus* gen. n. iii 197  
*micans* sp. n. iii 197  
*politus* sp. n. iii 198, cxl  
*solitarius* sp. n. iii 198  
*Derolathrus* gen. n. iii 430, cxxxiv  
*atomus* sp. n. iii 431  
*Deroligota* subg. n. *Oligota* iii 555  
*Deropristus* gen. n. iii 192  
*blaptoides* Blackb. iii 192  
*deroderus* sp. n. iii 192  
*puncticeps* sp. n. iii 192  
*Diaea* Thoir. ii 490  
*insulana* Keys. ii 490, iii 342  
*vitellina* sp. n. ii 491  
**Diapriidae** ii 626, xlix, ciii  
*Diapria* Latr. ii 629  
*drosophilae* sp. n. ii 629  
*xenica* sp. n. ii 629  
*Diaspis* *boisduvalii* Sign. iii 109  
*costa* iii 109  
*florinae* Targ. iii 112  
*patelliformis* Sasaki iii 110  
*rosae* Mask. iii 109  
*Diceratothrips* Bagn. iii 696  
*brevicornis* sp. n. iii 697  
*Dichelia* Gn. i 709  
*foedana* Wkr. i 690  
*reversana* Wkr. i 690  
*sobriana* Wkr. i 690  
*Dicranomyia* Steph. iii 7  
*apicalis* sp. n. iii 7  
*brunnea* sp. n. iii 8  
*hawaiiensis* sp. n. iii 7  
*kauaiensis* sp. n. iii 8  
*latifrons* sp. n. iii 9  
*variabilis* sp. n. iii 8  
*Dictyophorodelphax* Swez. ii 598  
*Diestota* Muls. & Rey. iii 566  
*aberrans* sp. n. iii 571  
*angustifrons* sp. n. iii 567  
*athetiformis* sp. n. iii 566  
*carinata* Sharp iii 569  
*clavicornis* sp. n. iii 575  
*crassicornis* sp. n. iii 574  
*Diestota curtax* sp. n. iii 566  
*frontalis* sp. n. iii 570  
*incognita* Blackb. iii 569  
*kauaiensis* sp. n. iii 571  
*lanauensis* sp. n. iii 573  
*latifrons* Sharp iii 574  
*latiuscula* sp. n. iii 572  
*lurida* sp. n. iii 572  
*mauiensis* sp. n. iii 573  
*mayeti* Muls. & Rey. iii 571  
*molokaiensis* sp. n. iii 567  
*montana* Blackb. iii 568  
*occidentalis* sp. n. iii 569  
*palpalis* Sharp iii 574  
*parva* Sharp iii 574  
*plana* Sharp iii 575  
*puncticeps* Sharp iii 571  
*robusta* sp. n. iii 569  
*rulescens* Sharp iii 574  
*sculpturata* sp. n. iii 568  
*sordida* sp. n. iii 570  
*subplagiata* sp. n. iii 570  
*testacea* Kraatz iii 571  
*trogophloeoides* sp. n. iii 575  
*Dilasia* Reut. iii 126  
*decolor* White iii 126, ii 551  
*denigrata* White iii 126  
*Dilophogaster* How. i 324  
*californica* How. i 324  
*Dimera* iii 113  
*Dimerogonus* Attems iii 330  
*beddardi* sp. n. iii 333  
*carpenteri* sp. n. iii 332  
*harmeri* sp. n. iii 336  
*koebelii* sp. n. iii 338  
*lankesteri* sp. n. iii 336  
*perkinsi* sp. n. iii 337  
*pococki* sp. n. iii 334  
*sedgwicki* sp. n. iii 334  
*sharpi* sp. n. iii 330  
*sharpi* var. iii 331  
*shipleyi* sp. n. iii 332  
*sinclairi* sp. n. iii 335  
*Dimidiatella* Z. i 712  
*Dinoderus* Steph. iii 643  
*minutus* Fab. iii 643  
*Diomedea* L. i 464  
*immutabilis* Roths. i 464  
*nigripes* Aud. i 464  
*Diphysa spinigera* Walk. iii 79  
*Diplocheta* iii 329  
*Diploilus* Berl. iii 338  
*luscus* Mein. iii 338  
*Diplopoda* iii 327  
*Diplosara* Meyr. i 646  
*lignivora* Btl. i 647  
*Diptera* ii 697, iii 1, 79, xlviii, clxxx  
*Diptera puppara* iii 86  
*Dipterina* Meyr. i 697  
*fulvosericca* sp. n. i 697  
*imbriferana* Meyr. i 697  
*Diranchis* Först. i 302  
*monticola* sp. n. i 302  
*rufipes* sp. n. i 302  
**Discolomidae** iii 431  
*Disenochus* iii 200, 210  
*agilis* sp. n. iii 202  
*anomalus* Blackb. iii 201  
*aterrinus* sp. n. iii 203  
*brevipes* sp. n. iii 201  
*cephalotes* sp. n. iii 201

- Disenochus curtipes* sp. n. iii 202  
*erythropus* sp. n. iii 204  
*flavitaris* sp. n. iii 202  
*fractus* sp. n. iii 205  
*longipes* sp. n. iii 205  
*micantipennis* sp. n. iii 206  
*sulcipennis* sp. n. iii 204  
*terebratus* Blackb. iii 211
- Disthymna* Hb. i 507  
*Distoma clavatum* Kud. ii 429  
   *hepaticum* Lutz ii 429  
 Distribution of animals xlvii  
 Disuse 1  
*Ditoma rugicollis* Walk. iii 430  
*Decophorus communis* Nitz. iii 306  
   *macgregori* sp. n. iii 306  
   *fuliginosus hawaiiensis* var. n. iii 307
- Dolerotrrips* gen. n. iii 682  
   *angusticeps* sp. n. iii 688  
   *barbatus* sp. n. iii 683  
   *bicolor* sp. n. iii 688  
   *dubius* sp. n. iii 691  
   *flavipes* sp. n. iii 685  
   *intermedius* sp. n. iii 689  
   *lanaiensis* sp. n. iii 690  
   *ovatus* sp. n. iii 686  
   *perkinsi* sp. n. iii 687  
   sp. iii 692
- Dolichopodidae** iii 11, 80, clxxxiii  
*Dolichopus* Latr. iii 80  
*Doryonychus* gen. n. ii 465  
   *raptor* sp. n. ii 466
- Doryphora* Hein. i 478
- Drepanidomenia hemignathi* Shipl. ii 429, 434
- Drepanididae** i 381, xxxi  
*Drepanis* Temm. i 398, lxii  
   *pacifica* Gmel. i 401  
*Drepanorhamphus* Rothsch. i 401  
   *funereus* Newt. i 402
- Dromaeolus* Kiesenw. iii 386  
   *agriotoides* sp. n. iii 388  
   *arduus* sp. n. iii 388  
   *bonvouloiri* Sharp iii 387  
   *brachycerus* sp. n. iii 394  
   *cephalotes* sp. n. iii 397  
   *collaris* sp. n. iii 393  
   *compressus* sp. n. iii 390  
   *concolor* sp. n. iii 396  
   *cuneus* sp. n. iii 389  
   *elateroides* sp. n. iii 394  
   *germanus* sp. n. iii 387  
   *grandicollis* sp. n. iii 398  
   *hawaiiensis* sp. n. iii 397  
   *kauiensis* var. n. iii 398  
   *konensis* sp. n. iii 390  
   *mauiensis* sp. n. iii 392  
   *mixtus* sp. n. iii 391  
   *molokaiensis* sp. n. iii 395  
   *obscurus* sp. n. iii 390  
   *obtusus* Blackb. iii 393  
   *pachyderes* sp. n. iii 398  
   *parallelus* Blackb. iii 392  
   *perkinsi* sp. n. iii 386  
   *piger* sp. n. iii 396  
   *puncticeps* sp. n. iii 397  
   *pumilio* sp. n. iii 399  
   *puncticollis* sp. n. iii 391  
   *sculpturatus* Blackb. iii 392  
   *solitarius* sp. n. iii 392  
   *sordidus* sp. n. iii 389  
   sp. iii 394
- Dromaeolus sputator* sp. n. iii 395  
   *subtilis* sp. n. iii 395
- Drosophilidae** ii 699, iii 50, 86, clxxxviii  
*Drosophila* Fall. iii 55, 86  
   *anomalipes* sp. n. iii 62  
   *carinata* sp. n. iii 70  
   *cognata* sp. n. iii 69  
   *conspicua* sp. n. iii 59  
   *crassifemur* sp. n. iii 66  
   *crucigera* iii 86  
   *exigua* sp. n. iii 72  
   *flaviceps* sp. n. iii 63  
   *haleakalae* sp. n. iii 64  
   *hawaiiensis* sp. n. iii 60, 86  
   *humeralis* sp. n. iii 64  
   *inaequalis* sp. n. iii 69  
   *infuscata* sp. n. iii 63  
   *lanaiensis* sp. n. iii 60  
   *longiseta* sp. n. iii 68  
   *mauiensis* sp. n. iii 67  
   *melanosoma* sp. n. iii 68  
   *molokaiensis* sp. n. iii 67  
   *monticola* sp. n. iii 69  
   *nasalis* sp. n. iii 66  
   *nigra* sp. n. iii 62  
   *obscuricornis* sp. n. iii 71  
   *obscurifrons* sp. n. iii 72  
   *ochracea* sp. n. iii 61  
   *olae* sp. n. iii 66  
   *parva* sp. n. iii 65  
   *paucipuncta* sp. n. iii 62  
   *perkinsi* sp. n. iii 59  
   *pleticornis* sp. n. iii 57  
   *pilimana* sp. n. iii 61, 86  
   *plumosa* sp. n. iii 72  
   *polita* sp. n. iii 71  
   *pusilla* sp. n. iii 70  
   *setiger* sp. n. iii 64  
   *sharpi* sp. n. iii 65  
   *sordidapex* sp. n. iii 63  
   sp. iii 68  
   *undulata* sp. n. iii 58  
   *variegata* sp. n. iii 57  
   *varifrons* sp. n. iii 71  
   *xanthosoma* sp. n. iii 68
- Dryinidae** c  
*Dryophthorus* Schönh. ii 139, xxviii, lxiii  
   *brevipennis* sp. n. ii 144  
   *crassus* Sharp ii 141  
   *declivis* Sharp ii 142  
   *distinguendus* sp. n. ii 140  
   *fuscescens* sp. n. ii 145  
   *gravidus* Sharp ii 141  
   *homoeorhynchus* sp. n. ii 142  
   *insignis* Sharp ii 144  
   *insignoides* sp. n. ii 144  
   *kauiensis* sp. n. ii 143  
   *modestus* Sharp ii 142  
   *nesiotes* sp. n. ii 141  
   *oahuensis* sp. n. ii 143  
   *peles* sp. n. ii 140  
   *pusillus* Sharp ii 143  
   *squalidus* Sharp ii 139  
   *verticalis* sp. n. ii 145
- Dryotribus mimeticus* xlvii, cxxii  
*Dyscolus* Blackb. iii 213  
   *caliginosus* Blackb. iii 233  
   *mutabilis* Blackb. iii 232  
   *palmae* Blackb. iii 232  
   *tantalus* Blackb. iii 214  
*Dyscritobaeus* gen. n. ii 621

- Dyscritomyia comitans* sp. n. ii 622  
 gen. n. iii 21, 83  
*affinis* sp. n. iii 23  
*claripennis* sp. n. iii 23  
*hawaiensis* sp. n. iii 22  
*fulgens* sp. n. iii 23  
*limbipennis* Thoms. iii 22  
 sp. iii 24
- Dysderidae** ii 444
- Dysdera* Latr. ii 444  
*crocata* Koch ii 444  
*interrita* Hentz ii 444  
*rubicunda* Blackw. ii 444
- Dysdercus* Am. Serv. iii 158  
*peruvianus* cxciii
- Dysomma* gen. n. ii 151  
*sylvicola* sp. n. ii 152
- Dysphoria* gen. n. i 547  
*semicolon* sp. n. i 548
- Dytiscidae** iii 288, cxxxviii
- Eccoptocera* gen. n. i 673, 735  
*foetorivorans* Btl. i 674, 735
- Echinococcus* ii 434
- Echinorhynchus campanulatus* Dies. ii 441
- Echthromorpha* Holmgr. i 336  
*flavo-orbitalis* Cam. i 336  
*maculipennis* Holmgr. i 336
- Ecphylopsis* Ashm. i 363  
*nigra* sp. n. i 363
- Eidoreus* Sharp iii 415  
*minutus* Sharp iii 415
- Elachistidae** Meyr. + **Plutellidae** Meyr. i 508
- Elachista* Tr. i 513  
*longisquamella* sp. n. i 514  
*spilota* sp. n. i 513
- Elateridae** iii 368, cxxix
- flightless* iii 384, cxxxii
- Elater humeralis* Karsch iii 372  
*melanocephalus* Thunb. iii 369
- Elenchus melanius* sp. n. iii 667  
*melanius* var. *silvestris* var. n. iii 667
- Eleutheroda* Brunn. ii 7  
*dytiscoides* Serv. ii 7
- Elimaea* Stål. ii 8  
*appendiculata* Brunn. ii 8
- Elipsocus* Hag. ii 83  
*criniger* sp. n. ii 85  
*debilis* sp. n. ii 85  
*erythrostickus* sp. n. ii 86  
*frigidus* sp. n. ii 87  
*inaequifuscus* sp. n. ii 86  
*inconstans* sp. n. ii 84  
*micramaurus* sp. n. ii 87  
*montanus* sp. n. ii 83  
*psylloides* sp. n. ii 85  
*vinosus* McLachl. ii 86
- Embiidae** ii 88
- Emesiidae* iii 151, xlix
- Emoia cyanura* Stejn. i 367
- Emperoptera* gen. n. iii 81, xlviii  
*mirabilis* sp. n. iii 81
- Emporius* Ganglb. iii 429
- Enarmonia* Hb. i 683, 736  
*conspicua* sp. n. i 684  
*crassicornis* sp. n. i 685  
*obliqua* sp. n. i 686  
*stореella* sp. n. i 686  
*walsinghami* Btl. i 684, 736
- Encyrtidae** i 314, ii 630, cv
- Encyrtus* Latr. i 321
- Encyrtus fuscus* How. i 321  
*insularis* Cam. i 321
- Endemic fauna xlvj
- Endodonta alata* Pfeiff. (*Pterodiscus*) ii 292  
*apiculata* Ancey ii 287  
*baldwini* Ancey ii 289  
*binaria* Pfeiff. ii 289  
*capillata* Pease ii 289  
*contorta* Fér. (*Thaumatodon*) ii 288  
*decussatula* Pease (*Nesophila*) ii 290  
*distans* Pease (*Nesophila*) ii 290  
*elisae* Ancey (*Nesophila*) ii 290  
*hystricella* Pfeiff. (*Thaumatodon*) ii 288  
*hystrix* Migh. (*Nesophila*) ii 290  
*jugosa* Migh. (*Nesophila*) ii 290  
*lamellosa* Fér. ii 287  
*laminata* Pease ii 287  
*lanaiensis* Sykes (*Nesophila*) ii 291  
*nuda* Ancey (*Thaumatodon*) ii 288  
*paucicostata* Pease (*Nesophila*) ii 291  
*ringens* Sykes (*Thaumatodon*) ii 288  
*rugata* Pease (*Thaumatodon*) ii 289  
 sp. (*Nesophila*) ii 291  
*stellata* Gould (*Nesophila*) ii 291  
*tiara* Migh. (*Nesophila*) ii 291  
*wesleyi* Sykes (*Pterodiscus*) ii 292
- Endrosis Hb. i 648  
*betulinella* Hb. i 649  
*fenestrella* Stn. i 649  
*kennicottella* Clms. i 649  
*lacteella* Stgr.-Wkr. i 649  
*sarcitea* Hw. i 649  
*sarcitella* Hw. i 649
- Encicospilus* Curt. i 345, ii 677  
*capnodus* sp. n. ii 679  
*castaneus* sp. n. i 349  
*dimidiatus* Perk. ii 679  
*displux* Perk. ii 679  
*henshawii* sp. n. i 349  
*kaalae* sp. n. i 347, ii 678  
*longicornis* sp. n. i 350  
*maucola* sp. n. i 347  
*molokaiensis* sp. n. i 349  
*nigrolineatus* sp. n. i 348  
*semirufus* Perk. ii 678  
*tyrannus* sp. n. ii 678  
*variegatus* sp. n. i 348  
*waimeae* sp. n. i 348
- Entedon hagenowii* Ratz. i 329
- Entomobryidae** iii 300
- Entomobrya* Rond. iii 300  
*insularis* sp. n. iii 301  
*kalakana* sp. n. iii 301
- Entozoa ii 427
- Eocerus* gen. n. iii 412  
*depressus* sp. n. iii 412
- Eopenthes* Sharp iii 370  
*ambiguus* Blackb. iii 380  
*antennatus* sp. n. iii 378  
*ardus* sp. n. iii 378  
*auratus* sp. n. iii 371  
*basalis* Sharp iii 371  
*caeruleus* sp. n. iii 370  
*celatus* sp. n. iii 376  
*cognatus* sp. n. iii 375  
*debilis* Sharp iii 380  
*deceptor* sp. n. iii 374  
*divisus* sp. n. iii 374  
*funebis* sp. n. iii 377  
*germanus* sp. n. iii 373  
*gracilis* sp. n. iii 376

- Eopenthes humeralis* Karsch. iii 372  
*kauaiensis* sp. n. iii 373  
*konae* Blackb. iii 375  
*longicollis* sp. n. iii 371  
*marginatus* sp. n. iii 381  
*mauiensis* sp. n. iii 376  
*muticus* sp. n. iii 380  
*oahuensis* sp. n. iii 378  
*obscurus* Sharp. iii 372  
*palipes* sp. n. iii 373  
*parvulus* sp. n. iii 381  
*perkinsi* sp. n. iii 374  
*plebeius* sp. n. iii 377  
*politus* sp. n. iii 373  
*satelles* Blackb. iii 379  
*tarsalis* sp. n. iii 381  
*tinctus* sp. n. iii 379  
*unicolor* sp. n. iii 377  
*varians* sp. n. iii 379
- Epagoge**  
*argentinotata* sp. n. i 711  
*infaustana* sp. n. i 709  
*pernitida* sp. n. i 710  
*xanthogona* sp. n. i 710
- Epeira** *caudata* Hentz. ii 478  
*nautica* Koch. ii 482  
*oculata* Walck. ii 478  
*pullata* Thor. ii 482  
*strangulata* Koch. ii 478  
*turbinata* Walck. ii 478  
*walkenaueri* Keys. ii 478
- Ephestia** Guen. i 196  
*albosparsa* Butl. i 196  
*desuetella* Walk. i 196  
*elutella* Hüb. i 196  
*ficulella* Barr. i 196  
*humeralis* Butl. i 196
- Ephestiodes** Rag. i 196  
*erythrella* Rag. i 196  
*glivesscentella* Rag. i 196  
*infimella* Rag. i 196
- Ephyridae** iii 49, 85, clxxxviii  
**Epitragus** Latr. ii 252  
*diremptus* Karsch. ii 252
- Epitranus** Walk. i 305  
*lacteipennis* Cam. i 305
- Epitrix** Foudr. ii 95  
*parvula* Fabr. ii 95, cxiv
- Epyris** Westw. i 286  
*hawaiiensis* sp. n. i 286
- Eremotylus** First. i 345  
*orbitalis* sp. n. i 345
- Ereunetis** Meyr. i 714, 737  
*flavistriata* sp. n. i 716  
*iuloptera* Meyr. i 714  
*melanastra* Meyr. i 715  
*minuscule* Wlsm. i 716, 737  
*simulans* Btl. i 715, 737  
*zebrina* Btl. i 715
- Ergatis** Hein. i 478  
**Erigone** Aud. ii 460  
*litoralis* Koch. ii 461  
*vagans* Aud. ii 460
- Erinna** A. Adams ii 393  
*newcombi* A. Adams ii 393
- Eriococcus** Targ. iii 102  
*araucariae* Mask. iii 102
- Eris** niveipalpis Gerst. ii 511
- Eristalis** Latr. iii 19, 82  
*punctulatus* Macq. iii 82  
*tenax* Linn. iii 19
- Erotylidae** iii 415, cxxxii  
**Ethmia** Hb. i 507  
*colonella* sp. n. i 507  
*hilarella* Btl. i 507
- Euchiradia** Hb. i 477  
**Euchromius** Guen. iii 356  
*bella* Butl. non Hüb. i 197  
*ocelleus* Haw. i 197, iii 356
- Eueneimidophorus** Wlgrm. i 472  
**Eucemini** iii 385  
**Eucoilinae** ii 667  
**Eucoila** Westw. ii 674  
*hygrophila* sp. n. (*Psichacra*) ii 675  
*orcias* sp. n. (*Psichacra*) ii 674  
*orobates* sp. n. (*Psichacra*) ii 675
- Eucoilidea micromorpha** sp. n. ii 676  
**Euelymatogae** Hüb. i 159, iii 349  
*craterias* sp. n. i 163, iii 349  
*drynombrara* sp. n. i 161  
*monticolans* Butl. i 164, iii 349  
*niphoreas* sp. n. i 162  
*orichloris* sp. n. i 163  
*phaeocausta* sp. n. i 160  
*prasinombra* sp. n. i 162  
*rhodopyra* sp. n. i 162  
*scoriodes* sp. n. i 160  
*stauraphragma* sp. n. i 161
- Eudiestota** gen. n. iii 565  
*grandis* sp. n. iii 565
- Eulachus hispidus** Blackb. iii 430
- Eulophidae** i 326, ii 657, cvii  
**Eulophus** Geoffr. i 332  
*citripes* sp. n. i 332
- Eulota** Hart, ii 293  
*similaris* Fér. ii 293
- Eumenidae** ii 607, lxxxix  
**Eumerus** Meig. iii 82  
*marginatus* sp. n. iii 82
- Eunitidula** gen. n. iii 451  
*sublavivis* sp. n. iii 452
- Eucophrys delibata** Koch. ii 512
- Eupelminae** ii 630  
**Eupelminus** D. T. i 315  
*subapterus* sp. n. i 315
- Eupelmus** Dalm. i 315, ii 630  
*achreiodes* sp. n. ii 648  
*amaurodes* sp. n. ii 647  
*apostichus* sp. n. ii 648  
*asthenes* sp. n. ii 641  
*axestias* sp. n. ii 636  
*axestops* sp. n. ii 638  
*basileus* sp. n. ii 651  
*caerulophantes* sp. n. ii 646  
*chalcoprepes* sp. n. ii 645  
*chloropus* sp. n. ii 643  
*chrysoptinus* sp. n. ii 640  
*dryas* sp. n. ii 643  
*dysombrias* sp. n. ii 637  
*dysoplias* sp. n. ii 652  
*epilamprops* sp. n. ii 642  
*epimelas* sp. n. ii 646  
*euoplias* sp. n. ii 644  
*euprepes* sp. n. ii 639  
*eustichus* sp. n. ii 649  
*flavipes* Cam. i 319  
*hawaiiensis* sp. n. i 319  
*hemixanthus* sp. n. ii 649  
*heterosonus* sp. n. ii 647  
*konae* sp. n. i 317  
*leptophyas* sp. n. ii 642  
*leucotrix* sp. n. ii 650

- Eupelmus melanacrius* sp. n. ii 645  
*melanotarsus* sp. n. ii 652  
*molokaiensis* sp. n. i 318  
*monas* sp. n. ii 641  
*niger* sp. n. i 316  
*ombrias* sp. n. ii 636  
*oreias* sp. n. ii 640  
*oribates* sp. n. ii 639  
*paraleucothrix* sp. n. ii 651  
*parasthenes* sp. n. ii 641  
*paraxestops* sp. n. ii 637  
*parombrias* sp. n. ii 630  
*pauroxanthus* sp. n. ii 650  
*peles* sp. n. ii 644  
*pelodes* sp. n. ii 649  
*pelopus* sp. n. ii 645  
*rhodias* sp. n. ii 638  
*rhododorus* sp. n. ii 647  
*rhyncozoni* Perk. ii 635  
*setiger* sp. n. ii 634  
*splendissimus* sp. n. i 317  
*subsetiger* sp. n. ii 635  
*vulgaris* sp. n. i 318  
*xanthodorus* sp. n. ii 639  
*xanthopus* sp. n. i 319  
*xanthotarsus* sp. n. ii 651  
*xestias* sp. n. ii 635  
*xestops* sp. n. ii 637
- Euperissus* Btl. i 643, 735  
*cristatus* Btl. i 643, 735
- Eupetinus* gen. n. iii 461  
*aper* Sharp iii 470  
*bicolor* Blackb. iii 465  
*brevicollis* sp. n. iii 469  
*brevicornis* sp. n. iii 472  
*curtus* sp. n. iii 466  
*derasus* sp. n. iii 462  
*dubius* sp. n. iii 472  
*dubius* var. iii 472  
*hawaiiensis* sp. n. iii 464  
*impressus* Sharp iii 463  
*insignis* sp. n. iii 461  
*laevigatus* sp. n. iii 473  
*laevigatus* var. *molokaiensis* var. n. iii 474  
*lanaiensis* sp. n. iii 471  
*lanaiensis* var. *mauiensis* var. n. iii 471  
*latimargo* sp. n. iii 473  
*marginatus* sp. n. iii 471  
*obscurus* sp. n. iii 462  
*obsoletus* Sharp iii 467  
*omalioides* Sharp iii 469  
*priscus* sp. n. iii 465  
*sculptus* sp. n. iii 467  
*spretus* var. *parvus* var. n. iii 468  
*spretus* Blackb. iii 468  
*striatus* Sharp iii 465  
*subaper* sp. n. iii 463  
*sulcatus* sp. n. iii 466  
*tardus* sp. n. iii 470
- Eupithecia monticolens* Butl. i 164  
*Eurycreon litorea* Meyr. i 224  
*Eurymelini* ii 576
- Eurytomidae** ii 630, cv  
*Eurytoma* Ill. ii 630
- Eusipalia* gen. n. iii 576  
*brachyptera* sp. n. iii 576
- Eutettix perkinsi* Kirk. ii 559  
*Euthyrrhapha* Burm. ii 7  
*pacifica* Coqueb. ii 7
- Euxesta* Loew iii 44, 85  
*annonea* Fabr. iii 44, 85
- Euxestus* Woll. iii 415  
*minor* Sharp iii 415
- Evagora* Clem. i 478
- Evanidae** i 333, cviii  
*Evania* Fabricius i 333  
*appendigaster* Linné i 334  
*sericea* Cam. i 333
- Evapsidiotus hederæ* Leon. iii 109  
*Evergestis* Hüb. iii 361  
*anastomosalis* Guen. iii 361
- Eysarcoris* Hahn iii 171  
*insularis* Dall. iii 172
- Exochus femoralis* Grav. i 340
- Falagria currax* Sharp iii 578  
*Fallia* Sharp iii 433  
*elongata* sp. n. iii 433
- Fauna** xxiv
- Figitidae** civ, ii 667  
*Filaria immitis* Leidy ii 428  
*Florinia* Sign. iii 112  
*camelliae* Comst. iii 112  
*florinae* Green iii 112  
*pellucida* Tang. iii 112
- Flightlessness* xlviii  
*Flora* xxiv, lvii  
*Flowers, inconspicuous* xxx  
*Forficuloidea* cxiii  
*Forficula hawaiiensis* Brunn. ii 5  
*Formicaleo perjurus* Walk. ii 61  
*wilsoni* M'Lachl. ii 62
- Fornax bonvouloiri* Sharp iii 387  
*obtusus* Blackb. iii 393
- Fregata* Cuv. "Iwa" i 461  
*aquila* L. i 461
- Frickella* Pfeiff. ii 379  
*amoena* Pfeiff. ii 379
- Frost** xxiii
- Fulgoridae** cciv, iii 116  
*Fulgorinae* iii 117  
*Fulica* L. i 455  
*alai* Peale i 456
- Fuligula* Steph. i 461  
*marila* L. i 461  
*vallisneria* A. Wils. i 461
- Gallinago* Steph. i 451  
*delicata* Ord. i 451
- Gallinula* Briss. i 454  
*galeata* Bon. i 455
- Garypidae** ii 518  
*Garypus* Koch ii 518  
*personatus* sp. n. ii 518
- Gehyra mutilata* Wieg. i 367
- Gelechiidae** cxliii, i 478, 731  
*Gelechia* Hb. i 731  
*adrepptella* Wkr. i 654  
*gossypiella* Sndrs. i 731  
*incertella* Wkr. i 515  
*operculella* (? *Bryotropha*) i 483
- Genophantis* Meyr. i 195  
*iodora* Meyr. i 195, iii 355
- Geologia* Dollf. ii 525  
*perkinsi* sp. n. ii 525
- Geophilidae** iii 326  
*Geophilomorpha* iii 326  
*Geotomus* Muls. & Rey. iii 172  
*jucundus* White iii 172  
*pygmaeus* Dall. ii 534, iii 172  
*subtristis* White iii 172
- Gerridae** ccviii, iii 157

- Glyptogastra Ashm. i 338  
   ashmeadi sp. n. ii 677  
   hawaiiensis sp. n. i 338  
 Glyptoma Erichs. iii 538  
   blackburni Sharp iii 538  
   brevipenne Sharp iii 539  
 Gnamptopsiloop Aldr. iii 11, 80  
   pallidicornis sp. n. iii 12  
   patellifer Thoms. iii 11, 80  
 Gnathocerus Thunb. ii 252  
   cornutus Fabr. ii 252  
 Gnatholigota subg. n. Oligota iii 556  
 Gnatholymnaeum gen. n. iii 276  
   blackburni sp. n. iii 276  
 Godwinia gen. n. ii 277  
   caperata Gould ii 277  
   tenella Gould ii 278  
 Gonatocerinae ii 661  
 Gonatopus Ljungh i 293  
   haleakalae sp. n. i 293  
   perkinsi sp. n. i 293  
 Gonicocetes chinensis sp. n. iii 311  
 Gonioryctes Sharp iii 440  
   acuminatus sp. n. iii 441  
   anticatus sp. n. iii 448  
   arduus sp. n. iii 447  
   bifarius sp. n. iii 447  
   blackburni Sharp iii 449  
   calvus sp. n. iii 443  
   dissimilis sp. n. iii 446  
   elegans sp. n. iii 449  
   extraneus sp. n. iii 449  
   fugitivus Blackb. iii 438  
   haleakalae sp. n. iii 443  
   kauaiensis sp. n. iii 440  
   koae sp. n. iii 441  
   lanaiensis sp. n. iii 446  
   latus Sharp iii 445  
   latus var. dubius var. n. iii 445  
   mauiensis sp. n. iii 440  
   molekaiensis sp. n. iii 441  
   monticola Sharp iii 451  
   oahuensis sp. n. iii 444  
   oppositus sp. n. iii 450  
   pusillus sp. n. iii 449  
   similis Blackburn iii 445  
   sp.? iii 443, 444  
   suavis sp. n. iii 442  
   vicinus sp. n. iii 447  
 Goniorthox gen. n. iii 436  
   conicicollis sp. n. iii 436  
   cuneatus sp. n. iii 437  
   elongatus sp. n. iii 437  
   eremitus sp. n. iii 439  
   foveatus sp. n. iii 439  
   fugitivus Blackb. iii 438  
   inaequalis sp. n. iii 438  
   plebeius sp. n. iii 437  
   perkinsi sp. n. iii 438  
 Gonitis sabulifera Guen. i 158  
 Gracilaria Hw. i 721  
   convolvulicella Mn. i 723  
   epibathra sp. n. i 722  
   marginestrigata sp. n. i 721  
   praeangusta Hw. i 508  
 Gryllodea ii 14, ccxvi, ii 688  
 Gryllodes Sauss. ii 15  
   pocyi Sauss. ii 15  
 Gryllotalpa Latr. ii 14  
   africana Fabr. ii 14  
 Gryllus ii 14, 688  
   Gryllus innotabilis Walk. ii 14  
   Gygis Wag. i 464  
   alba Sp. i 464  
 Gypsonoma Meyr. i 676, 736  
   leprarum sp. n. i 676, 736  
 Habrobracon Ashm. ii 684  
 Haematobia Desv. iii 29  
   serrata Desv. iii 29  
 Halobates Eschsch. iii 158  
   sericeus Eschsch. iii 158  
 Haloxenus gen. n. ii 148  
   immigrans sp. n. ii 149  
 Halticaria Kirk. iii 139  
 Hapa White iii 126  
 Haptoncus Murr. iii 507  
   mundus Sharp iii 508  
   tetragonus Murr. iii 508  
 Harpalini iii 190  
 Hasarius Sim. ii 511  
   adansoni Aud. ii 511, iii 344  
   garetti Keys. ii 511  
   paykulli Sim. ii 512  
 Hastula Mill. i 709  
   hyerana Mill. i 709  
 Hawaiian group, age of lx  
 Hawaii, island xxi, lxxii  
 Hednota hydrophila Meyr. i 199  
   oxyptera Meyr. i 199  
 Helcogaster Boh. iii 368  
   pectinatus Sharp iii 368, cxxix  
 Heligonotopus Perk. ii 655  
**Helicidae** ii 396  
 Helicina Lam. ii 396  
   antoni Pfeiff. ii 397  
   bronniana Phil. ii 397  
   constricta Pfeiff. ii 396  
   crassilabris Phil. ii 397  
   fulgora Gould ii 397  
   laciniosa Migh. ii 396  
   magdalenae Ancey ii 396  
   pisum Phil. ii 397  
   rotellodea Migh. ii 397  
   sandwichiensis Soul. ii 397  
   uberta Gould ii 397  
 Helicter hutchinsonii Pease ii 350  
   proximus Pease ii 316  
 Heliothis Ochs. i 152, iii 346  
   armigera Hüb. i 152, iii 346  
 Heliothrips Hal. iii 698  
   haemorrhoidalis Bouché iii 698  
   rubromictus Giard iii 699  
**Helicidae** ii 392  
 Helix alata Pfeiff. ii 355  
   barnaclei Smith (*Merope*) ii 292  
   barrakporensis Pfr. ii 285  
   binaria Pfeiff. ii 289  
   byronii Wood ii 306  
   capillata Pease ii 289  
   chamissoi Pfeiff. ii 280  
   cicerula Gould ii 283  
   contorta Fér. ii 288  
   cryptopora Gould ii 279  
   decora Fér. ii 304  
   decussata Pease ii 290  
   disculus Pfeiff. ii 283  
   distant Pease ii 290  
   exaequata Gould ii 283  
   exserta Pfeiff. ii 293  
   filocostata Pease ii 291  
   fornicata Gould ii 293

- Helix fricki* Pfeiff. ii 287  
*eravida* Fér. ii 349  
*hawaiensis* Pfeiff. ii 279  
*hystricella* Pfeiff. ii 288  
*hystrix* Pfeiff. ii 290  
*intercarinata* Migh. ii 288  
*jugosa* Migh. ii 290  
*lamellosa* Fér. ii 287  
*laminata* Pease ii 287  
*lorata* Fér. (*Cochlogena*) ii 303  
*luteola* Fér. (*Cochlogena*) ii 346  
*newcombi* Pfeiff. ii 277  
*obtusangula* Pfeiff. ii 283  
*paucicostata* Pease ii 291  
*pauillus* Gould ii 275  
*pusillus* Gould ii 279  
*rubiginosa* Gould ii 290  
*rugata* Pease ii 289  
*sandwichensis* Pfeiff. ii 293  
*setigera* Gould ii 290  
*similaris* Fér. ii 293  
*spirazona* Fér. (*Cochlogena*) ii 344  
*stellula* Gould ii 291  
*subrutula* Migh. ii 285  
*subtilissima* Gould ii 285  
*textilis* Fér. (*Helicteres*) ii 345  
*tiara* Migh. ii 291  
*tristis* Fér. (*Helicteres*) ii 346  
*turritella* Fér. (*Cochlogena*) ii 346  
*ventulus* Fér. (*Helicteres*) ii 347  
*vulpina* Fér. ii 327
- Hellula* Guen. i 227, iii 361  
*undalis* Fabr. i 227, iii 361
- Helops piceus* Ol. ii 253
- Hemerobiidae** ii 36, 691, clxxi
- Hemidactylus* Gray i 366  
*gamotti* D. & B. i 366
- Hemignathus* Licht. i 421  
*lanaiensis* Rothsch. i 425  
*lichtensteini* Wils. i 425  
*obscurus* Gmel. i 425  
*procerus* Cab. i 426
- Hemiphyllodactylus leucostictus* Stejn. i 367
- Hemiptarsenus* Westw. i 330  
*hawaiensis* sp. n. i 330
- Hemiptera* iii 93, ii 531, clxxxix
- Hemitelini* i 334
- Hemiteles* Grav. i 334  
*melitaeae* Ashm. i 335  
*tenellus* Say i 335  
*variegatus* Ashm. i 334
- Hemicopidae** iii 325
- Henoticus* Thoms. iii 423  
*serratus* Gyll. iii 423
- Hesperobaenus* Lec. iii 434  
*capito* Fairm. iii 434, cxxxiv
- Hesperophanides* ii 96
- Heteractis* Stejn. "Ulili" i 450  
*incana* Gmel. i 451
- Heteramphus* Sharp ii 152, cxiii  
*cylindricus* Sharp ii 154  
*filicum* sp. n. ii 152  
*foveatus* Sharp ii 152  
*frater* sp. n. ii 153  
*haleakalae* sp. n. ii 153  
*hirtellus* Sharp ii 154  
*kauaiensis* sp. n. ii 154  
*molokaiensis* sp. n. ii 153  
*micicola* sp. n. ii 154  
*wollastoni* Sharp ii 152
- Heterocrossa* Meyr. i 654, 735
- Heterocrossa achroana* Meyr. i 671  
*atrontata* sp. n. i 669  
*bicincta* sp. n. i 661  
*cervinella* sp. n. i 667  
*corticella* sp. n. i 662  
*corticella* var. n. i 664  
*crinifera* sp. n. i 657  
*dispar* sp. n. i 661  
*distincta* sp. n. i 666  
*divaricata* sp. n. i 665  
*ferruginea* sp. n. i 664  
*gemmata* sp. n. i 660  
*gracillima* sp. n. i 672  
*graminicolor* sp. n. i 654  
*graminis* sp. n. i 658  
*herbarum* sp. n. i 658, 735  
*inscripta* sp. n. i 669  
*irrorata* sp. n. i 668  
*latifasciata* sp. n. i 662  
*mauii* sp. n. i 668  
*nigromaculata* sp. n. i 666, 735  
*nigronotata* sp. n. i 656  
*olivaceonitens* sp. n. i 655  
*pipeatella* var. n. i 663  
*plumbeonitida* sp. n. i 654  
*punctulata* sp. n. i 671  
*pusilla* sp. n. i 670, 735  
*pygmaeella* sp. n. i 662  
*semitogata* var. n. i 662  
*solutella* sp. n. i 672  
*subolivacea* sp. n. i 655  
*subumbata* sp. n. i 660, 735  
*tincta* sp. n. i 659  
*togata* sp. n. i 665  
*trigonotata* sp. n. i 670  
*viridis* sp. n. i 666
- Heterophaga lateralis* Boh. ii 253  
*pandanicola* Fairm. ii 253
- Heteropoda* Latr. ii 504  
*regia* Fabr. iii 343, ii 504  
*venatoria* ii 504
- Heteroptera* iii 125, ii 533
- Heterorhynchus* Lafr. i 426  
*affinis* Rothsch. i 430  
*hanapepe* Wils. i 430  
*lucidus* Licht. i 430  
*wilsoni* Rothsch. i 430
- Heterotomaria* Kirk. iii 132
- Hevaheva* gen. n. iii 113, ii 598  
*monticola* Kirk. ii 598  
*perkinsi* sp. n. iii 113  
*silvestris* Kirk. ii 598
- Hexaplasta* Först. i 304  
*konensis* sp. n. i 304
- Himantopus* Briss. i 452  
*knudseni* Stejn. i 453
- Himatione* Cab. i 407  
*sanguinea* Gmel. i 408
- Hippoboscidae** iii 77
- Histeridae** iii 508, cxxxvi
- Hodegia* gen. n. i 488  
*apatela* sp. n. i 488
- Holcobius* Sharp iii 581  
*affinis* sp. n. iii 583  
*diversus* sp. n. iii 583  
*frater* sp. n. iii 585  
*glabricollis* Sharp iii 584  
*granulatus* Sharp iii 584  
*haleakalae* sp. n. iii 582  
*haleakalae* var. *chrysodytus* n. iii 583  
*hawaiensis* sp. n. iii 583

- Holcobius insignis* sp. n. iii 582  
   *major* sp. n. iii 582  
   *minor* sp. n. iii 584  
   *simplex* sp. n. iii 584  
   *simulans* sp. n. iii 582  
*Holepyris* Kieff. ii 615  
   *hospes* sp. n. ii 615  
*Holobus Solier* iii 555  
*Holochila blackburni* Tuelcy i 194  
*Holochlora* Stål. ii 687  
   *venosa* ii 687  
*Holocorynus* gen. n. iii 550  
   *subdepressus* sp. n. iii 551  
*Homalomyia* Bouché iii 30, 84  
   *canicularis* Linn. iii 30  
   *femorata* iii 84  
*Homalota coriaria* Kraatz iii 577  
*Homocoesoma* Curt. i 196  
   *amphibola* sp. n. i 197, iii 356  
   *humeralis* Butl. i 196, iii 355  
*Homona* Wkr. i 703  
*Homoptera* iii 102, ii 555  
*Hoplerderma*=*Hoplophora* Koch iii 704  
   *dasyopus* Dugès iii 704  
*Hoplogaster* Rond. iii 43  
   *dubia* sp. n. iii 43  
*Hormius* Nees ii 685  
   *pergrinus* sp. n. ii 685, cxi  
*Howardia* Berl. & Leon. iii 111  
   *biclavus* Comst. iii 112  
   *eugeniae* Mask. iii 112  
   *prunicola* Mask. iii 112  
*Hyalinia baldwini* Ancey ii 279  
*Hyalopeplus* Stål. iii 143  
   *pellucidus* Stål. iii 143, ii 553  
**Hydriomenidae** iii 349, cxlix  
*Hydriomena* Hüb. i 164  
   *aphoristis* sp. n. i 165  
*Hydrobius* Leach iii 578  
   *nesiticus* sp. n. iii 578  
   *semicylindricus* Eschsch. iii 578  
*Hydroëssa* Burm. iii 157  
**Hydrophilidae** iii 578, cxxxviii  
*Hydrophilus semicylindricus* Eschsch. iii 578  
*Hydrotæa* Desv. iii 29  
*Hymenia* Hub. i 206, iii 358  
   *recurvalis* Fab. (*fascialis* Cram.) i 206, iii 358  
*Hymenoptera* ii 600, lxxiii  
   *Hymenoptera Aculeata* i 1  
   *Hymenoptera Parasitica* i 277  
*Hypena obsoleta* Butl. i 157  
*Hypenodes* Guen. i 153, iii 347  
   *altivolans* Butl. i 155, iii 347  
   *arrhæta* sp. n. iii 347  
   *cyaniæ* sp. n. i 154  
   *epicalca* sp. n. i 154  
   *oxygramma* sp. n. i 154  
   *sarothrura* sp. n. i 155, iii 347  
*Hypenomyia* gen. n. iii 53  
   *varipennis* sp. n. iii 54  
*Hyperdasyus* gen. n. i 640  
   *arundinicolor* sp. n. i 641  
   *cryptogamiellus* sp. n. i 642  
   *semiustus* sp. n. i 640  
   *unicolor* sp. n. i 642  
*Hyperectis* gen. n. iii 356  
   *diotias* sp. n. iii 357  
*Hyperomorpha* Blackb. ii 139  
   *squamosa* ii 139  
*Hypocala* Guen. i 159  
   *andremona* Cram. i 159, iii 348  
*Hypodiranchis* gen. n. i 393  
   *hawaiiensis* sp. n. i 393  
**Hyponomeutidae** i 508, 734, cxlv  
*Hyposmocoma* Btl. i 549, 734  
   *abjecta* Btl. i 559, 734  
   *adelphella* sp. n. i 615  
   *adjacens* var. n. i 567  
   *admirabilis* sp. n. i 580  
   *adollescens* sp. n. i 587  
   *advena* sp. n. i 569  
   *albifrontella* sp. n. i 565  
   *albonivea* sp. n. i 599  
   *alliterata* sp. n. i 600, 734  
   *arenella* sp. n. i 627  
   *argentea* sp. n. i 506, 734  
   *atrovittella* sp. n. i 555  
   *auripennis* Btl. i 571  
   *aurorargentea* sp. n. i 570  
   *auropurpurea* sp. n. i 614  
   *bacillella* sp. n. i 601  
   *barbata* sp. n. i 635  
   *bella* sp. n. i 614  
   *belophora* sp. n. i 631  
   *bilineata* sp. n. i 573  
   *blackburni* Btl. i 549, 559, 561, 734  
   *brevistrigata* sp. n. i 633  
   *butalidella* sp. n. i 578  
   *calva* sp. n. i 617  
   *candidella* var. n. i 564  
   *canella* sp. n. i 602  
   *carbonenota* sp. n. i 599  
   *carnea* sp. n. i 610  
   *centralis* sp. n. i 636  
   *chilonella* sp. n. i 637  
   *chilonella* var. n. i 637  
   *cincta* sp. n. i 566  
   *cinereoparsa* sp. n. i 603  
   *commensella* sp. n. i 558  
   *conditella* sp. n. i 620  
   *continua* sp. n. i 577  
   *costimaculata* sp. n. i 572  
   *cupreomaculata* sp. n. i 561  
   *discella* sp. n. i 553  
   *discolor* sp. n. i 633  
   *divisa* sp. n. i 554  
   *domicolens* Btl. i 562, *suffusella* i 564  
   *dorsella* sp. n. i 605, 734  
   *dubia* var. n. i 590  
   *emendata* sp. n. i 587  
   *emisa* sp. n. i 586  
   *ensifer* sp. n. i 588  
   *epicharis* sp. n. i 639  
   *evanescens* sp. n. i 574  
   *exornata* sp. n. i 550  
   *fallacella* sp. n. i 605  
   *falsimella* sp. n. i 606  
   *ferricolor* sp. n. i 575  
   *fervida* sp. n. i 626  
   *flavicosta* var. n. i 551  
   *fractinobella* sp. n. i 592  
   *fractistriata* sp. n. i 635  
   *fractivittella* sp. n. i 593  
   *fulvida* sp. n. i 608  
   *fulvocervina* sp. n. i 610  
   *fuscopurpurea* sp. n. i 582  
   *fuscotogata* sp. n. i 634  
   *geminella* sp. n. i 594  
   *genitalis* sp. n. i 592  
   *haleakalæe* Btl. i 573  
   *humerovittella* sp. n. i 566  
   *illuminata* sp. n. i 570

- Hyposmocoma impunctata* sp. n. i 575  
*indicella* sp. n. i 577  
*inflexa* sp. n. i 632  
*intermixta* sp. n. i 593  
*inversella* sp. n. i 615  
*iodes* sp. n. i 621  
*irregularis* sp. n. i 626  
*labetella* sp. n. i 557  
*lacertella* sp. n. i 582  
*lactea* sp. n. i 597  
*lacticretella* sp. n. i 597  
*leporella* sp. n. i 558  
*limata* sp. n. i 568  
*lineata* sp. n. i 579  
*liturata* sp. n. i 622  
*lixiviella* sp. n. i 623  
*longitudinalis* sp. n. i 636  
*lucifer* sp. n. i 574  
*ludificata* sp. n. i 579  
*lugens* sp. n. i 586  
*lunifer* sp. n. i 584  
*lupella* sp. n. i 563  
*lupella 4-suffusella* Wlsm. i 734  
*maestella* sp. n. i 610  
*malornata* sp. n. i 619  
*marginetotata* sp. n. i 585  
*mediella* sp. n. i 565, 734  
*metallica* sp. n. i 576  
*metrosiderella* sp. n. i 616  
*mimema* sp. n. i 613  
*mimica* sp. n. i 622  
*modesta* sp. n. i 604  
*montivolans* Btl. i 620  
*nebulifera* sp. n. i 555, 734  
*nebulifera* sp. n. i 628, 735  
*niger* sp. n. i 582  
*nigralbida* sp. n. i 551  
*nigrescens* sp. n. i 581  
*nigrodentata* sp. n. i 600  
*niveiceps* sp. n. i 583  
*nividorcella* sp. n. i 552  
*notabilis* sp. n. i 556  
*numida* sp. n. i 581  
*obliterata* sp. n. i 601  
*obscura* sp. n. i 609  
*ocellata* sp. n. i 586  
*ochreocervina* sp. n. i 612  
*ochreociliata* sp. n. i 618  
*ochreovitella* sp. n. i 606  
*oculifera* sp. n. i 551  
*ossea* sp. n. i 595  
*pallidipalpis* sp. n. i 591  
*paradoxa* sp. n. i 613  
*parda* Btl. i 623  
*partita* sp. n. i 554  
*patriciella* sp. n. i 577  
*percondita* var. n. i 638  
*persimilis* sp. n. i 598  
*phalacra* sp. n. i 625  
*phantasmatella* sp. n. i 595  
*picticornis* sp. n. i 594  
*progressa* sp. n. i 591  
*propinqua* sp. n. i 580  
*pseudolita* sp. n. i 625  
*pucciniella* sp. n. i 589  
*punctifumella* sp. n. i 584  
*punctiplicata* sp. n. i 584  
*quadripunctata* sp. n. i 607  
*quadristriata* sp. n. i 581  
*quinquemaculata* sp. n. i 619  
*radiatella* sp. n. i 634, 735
- Hyposmocoma rhabdophora* sp. n. i 571  
*roseofulva* sp. n. i 611  
*rubescens* sp. n. i 628  
*rustius* sp. n. i 614  
*sabulella* sp. n. i 565  
*saccophora* sp. n. i 604  
*saliaris* sp. n. i 624  
*scandens* sp. n. i 609  
*scepticella* sp. n. i 590  
*schismatica* sp. n. i 603  
*scolopax* sp. n. i 629  
*semifusca* sp. n. i 589  
*sideritis* sp. n. i 608  
*similis* sp. n. i 617  
*somatodes* sp. n. i 630  
*spp.?* i 588, 624  
*stigmatella* sp. n. i 591  
*straminella* sp. n. i 576  
*subargentea* sp. n. i 596  
*subcitrella* sp. n. i 632  
*subthavidella* sp. n. i 569  
*sublimata* sp. n. i 568  
*subnitida* sp. n. i 639  
*subscolopax* sp. n. i 629  
*subsericea* sp. n. i 611  
*sudorella* sp. n. i 607  
*suffusa* var. n. i 563  
*syrrhaptis* sp. n. i 612  
*tarsimaculata* sp. n. i 618, 734  
*tenuipalpis* sp. n. i 557  
*tetraonella* sp. n. i 630  
*thoracella* sp. n. i 568  
*tomentosa* sp. n. i 605  
*torella* sp. n. i 627  
*torquata* sp. n. i 556  
*tricincta* sp. n. i 588  
*trilonella* sp. n. i 583  
*trimaculata* sp. n. i 598  
*triocellata* var. n. i 637  
*tripartita* sp. n. i 567  
*trossulella* sp. n. i 554, 734  
*turdella* sp. n. i 631  
*unistriata* sp. n. i 578  
*venosa* var. n. i 638  
*vermiculata* sp. n. i 585  
*vicina* sp. n. i 607  
*vinicolor* sp. n. i 615  
*virgata* sp. n. i 572
- Hypothenemus* Westw. ii 180  
*griseus* Blackb. ii 180  
*insularis* sp. n. ii 181  
*maculicollis* Sharp ii 180  
*ruficeps* sp. n. ii 181  
*sylicola* sp. n. ii 181
- Icerya* Sign. iii 102  
*purchasi* Mask. iii 102
- Ichneumonidae** cviii, i 324, ii 676
- Ichneumon appendigaster* Lin. i 334  
*femoralis* Fourc. i 340
- Idecthis* Först. i 355  
*oahuensis* sp. n. i 355
- Idia pleuralis* Thoms. iii 28
- Idiomya* gen. n. iii 50  
*heteroneura* sp. n. ii 699  
*oahuensis* sp. n. iii 52  
*obscuripes* sp. n. iii 52  
*perkinsi* sp. n. iii 51  
*pieta* sp. n. iii 53  
*silvestris* sp. n. ii 700
- Immigrant species xlv

- Imported species xlv  
*Inclaria bilineata* Bens. ii 286  
*Inostemma* Hal. ii 626  
     *abnormis* sp. n. ii 626  
 Interbreeding xli  
*Iolania* gen. n. iii 118  
     *perkinsi* sp. n. iii 119  
*Ischiodontus* Cand. iii 369  
     *hawaiiensis* Cand. iii 369  
*Ischiogomus* Wesm. i 362, ii 684  
     *palliatu*s Cam. i 362  
     *pallidiceps* sp. n. ii 684  
*Isometrus maculatus* de Geer ii 517  
*Isoptera* clxxiv  
*Isosoma* Walk. ii 630  
*Isotoma* Bourl. iii 302  
     *perkinsi* sp. n. iii 302  
*Ithamar* gen. n. iii 169  
     *hawaiiensis* sp. n. iii 170, ii 534, cxliii  
*Itodacus* Sharp iii 382  
     *blackburnianus* sp. n. iii 383  
     *chloroticus* sp. n. iii 384  
     *collaris* sp. n. iii 384  
     *coruscus* Karsch iii 382  
     *gracilis* Sharp iii 382  
     *kauaiensis* sp. n. iii 383  
     *major* sp. n. iii 382  
     *sordidus* sp. n. iii 383
- Japygidae** iii 293  
*Japyx* Hal. iii 293  
     *sharpi* sp. n. iii 293
- Jassidae** iii 116  
*Jotus microphthalmus* Koch ii 512
- Julidae** iii 338
- Kahoolawe* xvi  
*Kalaniana* Kirk. ii 553  
     *hawaiiensis* ii 553  
*Kaliella* Blandf. ii 285  
     *konaensis* Sykes ii 286  
*Kamehameha* gen. n. iii 137  
     *lunalilo* sp. n. iii 137  
*Kauai* xviii  
*Kauaia* nom. n. ii 355  
*Kelisia* Fieb. ii 578  
     *paludum* sp. n. ii 579  
     *sporobolicola* sp. n. ii 578  
     *swezeyi* sp. n. ii 578  
*Kermicus* Newst. iii 104  
     *bambusae* Mask. iii 104  
*Klinophilos* Kirk. iii 129, ii 552  
     *lectularius* Linné iii 129  
*Koanoa* gen. n. iii 136  
     *hawaiiensis* sp. n. iii 136, ii 554
- Labdia deliciosella* Wkr. i 514  
*Labeo* *hawaiiensis* sp. n. i 294  
*Labetis* Waterh. ii 250  
     *comitans* sp. n. ii 251  
     *hawaiiensis* sp. n. ii 250  
     sp.? ii 252  
     *tibialis* Waterh. ii 251  
*Labia pygidata* Dabr. ii 4  
*Labidura* *icterica* Serv. ii 690  
*Labiella compacta* Pease ii 359  
     *pachystoma* Pease ii 367  
     *tenebrosa* Pease ii 371  
     *turgidula* Pease ii 371
- Labrocerus* Sharp iii 406  
     *affinis* sp. n.  
     *concolor* Sharp iii 407  
     *curticornis* sp. n. iii 407  
     *dasytoides* sp. n. iii 409  
     *flavicornis* sp. n. iii 410  
     *gravidus* sp. n. iii 407  
     *jaynei* Sharp iii 408  
     *laticornis* sp. n. iii 408  
     *moerens* sp. n. iii 406  
     *obscurus* Blackb. iii 408  
     *obsoletus* sp. n. iii 409  
     *pallipes* sp. n. iii 410  
     *quadrisingnatus* sp. n. iii 411  
     *setosus* sp. n. iii 410  
     *simplex* iii 407  
     sp. iii 409  
     *sulfusus* sp. n. iii 411  
     *vestitus* sp. n. iii 409  
*Labula* Sim. ii 462  
     *graphica* sp. n. ii 463  
     *torosa* sp. n. ii 464, iii 341
- Laemophloeus* Cast. iii 425  
     *aeneus* Sharp iii 426  
     *minutus* Oliv. iii 425
- Lagocheirus* Thoms. ii 113  
     *araneiformis* Sharp ii 113  
     *obsoletus* Thoms. ii 113
- Laniini* i 113  
*Lamia aedificator* Fabr. iii 650  
     *bankii* Fabr. ii 114  
     *nutator* Fabr. ii 114  
*Laminella* Pfeiff. ii 348  
     *albida* Pfeiff. ii 344  
     *depicta* Baldw. ii 348  
     *erecta* Pease ii 349  
     *ferussaci* Pfeiff. ii 351  
     *luctuosa* Pfeiff. ii 338  
     *luteola* Fér. ii 346  
     *mastersi* Newc. ii 339  
*Lamponyx spissus* Wood iii 326  
*Lamprotes* Hein. i 478  
*Lamyctes fulvicornis* Mein. iii 325  
     *hawaiiensis* var. n. iii 325  
     *heterotarsus* sp. n. iii 325
- Lanai* xx  
*Larus barrovianus* Ridg. i 464  
     *californicus* Lawr. i 465  
     *delawarensis* Ord. i 465  
     *franklini* Sw. & R. i 465  
     *glaucus* Br. i 464  
     *philadelphia* Ord. i 465  
*Lasiochilus* Reut. iii 126  
     *decolor* White ii 551  
     *denigrata* White iii 126, ii 551  
     *montivagus* Kirk. ii 552  
     *nubigenus* Kirk. ii 552  
     *silvicola* Kirk. ii 552  
*Lasioderma serricorne* F. iii 614
- Lathridiidae** iii 421  
*Lathridius nodifer* Westw. iii 421  
*Lathrostizus insularis* sp. n. i 355  
*Laurentia insularis* Burh. i 166  
*Laverna* *abjecta* Btl. i 559  
     *aspera* Btl. i 529  
     *corvina* Btl. i 553  
     *domicolens* Btl. i 562  
     *parda* Btl. i 623, 620  
     *sarcitella* Crt. i 649  
*Laysan* xvii  
*Lebiides* iii 288

- Lecanium* Burm. iii 105  
*acuminatum* Sign. iii 105  
*chirimollae* Mask. iii 106  
*coffea* Walk. iii 105  
*depressum* Targ. iii 106  
*hemisphaericum* Targ. iii 105  
*hesperidum* Mask. iii 105  
*hibernaculorum* Boisd. iii 105  
*longulum* Dougl. iii 106  
*mori* Sign. iii 106  
*nigrum* Nietn. iii 106  
*oleae* Sign. iii 106  
*perforatum* Newst. iii 106  
*tessellatum* Sign. iii 106  
*Leimacis peregrina* sp. n. ii 661  
*Leiopisma noctua* Stejn. i 367  
*Lelapinae* i 311  
*Lepidocyrtus* Bourl. iii 300  
*Lepidodactylus crepuscularis* Bav. i 367  
*heterophthalmus* sp. n. iii 300  
*lugubris* D. & B. i 367  
*Lepidoptera* i 123, iii 345  
 Review of cxlv  
*Lepidoptera* (micro) i 469  
*Lepidosaphes flava* Targ. iii 111  
*gloverii* Pack. iii 111  
*pallida* Mask. iii 111  
*pinnaeformis* Bouché iii 110  
*pomorum* Bouché iii 111  
*Lepisma hawaiiensis* sp. n. iii 296  
*Leptachatina* Gould ii 356  
*accincta* Migh. ii 356  
*acuminata* Gould ii 357  
*antiqua* Pease ii 357  
*antiquata* Ancey ii 357  
*approximans* Ancey ii 357  
*arborea* sp. n. ii 357  
*balteata* Pease ii 358  
*brevicula* Pease ii 358  
*callosa* Pfeiff. (*Labiella*) ii 358  
*cerealis* Gould ii 358  
*chrysalis* Pfeiff. ii 358  
*cingula* Migh. ii 359  
*clausiana* Migh. ii 359  
*clausina* Migh. ii 359  
*columna* Ancey ii 359  
*compacta* Pease ii 359  
*comicooides* sp. n. ii 359  
*convexiuscula* sp. n. ii 360  
*corneola* Pfeiff. ii 360  
*coruscans* Hartm. ii 360  
*costulata* Gul. ii 360  
*costulosa* Pease ii 361  
*crystallina* Gul. ii 361  
*cylindrata* Pease ii 361  
*emerita* sp. n. ii 361  
*exilis* Gul. ii 361  
*extensa* Pease ii 362  
*fumida* Gul. ii 362  
*fumosa* Newc. ii 362  
*fusca* Newc. ii 362  
*fuscula* Gul. ii 362  
*glutinosa* Pfeiff. ii 363  
*gracilis* Pfeiff. ii 363  
*grana* Newc. ii 363  
*guttula* Gould ii 363  
*hartmani* Hartm. ii 336  
*imitatrix* sp. n. ii 364  
*impressa* Sykes ii 364  
*isthmica* Ancey ii 364  
*konaensis* sp. n. ii 364  
*Leptachatina labiata* Newc. (*Labiella*) ii 365  
*laevis* Pease ii 365  
*leucochila* Gul. ii 365  
*lineolata* Newc. ii 365  
*lucida* Pease ii 365  
*marginata* Gul. ii 366  
*nitida* Newc. ii 366  
*obsolata* Pfeiff. ii 366  
*obtusa* Peaet. ii 366  
*octavula* Peaet. ii 366  
*octogyrata* Gul. ii 366  
*oryza* Pfeiff. ii 367  
*pachystoma* Pease (*Labiella*) ii 367  
*petila* Gul. ii 367  
*perkinsi* Sykes ii 367  
*pyramis* Pfeiff. ii 367  
*resinula* Gul. ii 368  
*saccula* Hartm. ii 368  
*sandwicensis* Pfeiff. ii 368  
*saxatilis* Gul. ii 368  
*saxitilus* Gul. ii 368  
*sculpta* Pfeiff. ii 368  
*scutulus* Migh. ii 368  
*semicostata* Pfeiff. ii 369  
*sempicta* Sykes ii 369  
*simplex* Pease ii 369  
*smithi* Sykes ii 369  
*striata* Newc. ii 370  
*striatella* Gul. ii 370  
*striatula* Gould ii 370  
*stiria* Gul. ii 369  
*succincta* Newc. ii 370  
*supracostata* ii 370  
*tenebrosa* Pease ii 371  
*temicostata* Pease ii 371  
*terebialis* Gul. ii 371  
*teres* Pfeiff. ii 371  
*turgidula* Pease ii 371  
*turrita* Gul. ii 372  
*vana* sp. n. ii 372  
*vitrea* Newc. ii 372  
*vitrea* Gul. ii 372  
*Leptacinus flavipennis* Kraatz iii 551  
*Leptemesis blackburni* M'Lachl. ii 62  
*Leptia* Gn. i 687  
*Leptogenys falcigera* i 118  
*insularis* Sm. i 118  
*Leptogryllus* gen. n. ii 28, 688  
*apicalis* sp. n. ii 689  
*cylindricus* sp. n. ii 688  
*deceptor* sp. n. ii 689  
*elongatus* sp. n. ii 29  
*forficularis* Brunn. ii 29  
*fuscconotatus* sp. n. ii 29  
*kauaiensis* sp. n. ii 29  
*nigrolineatus* sp. n. ii 28  
*ngromaculatus* sp. n. ii 28  
*similis* sp. n. ii 28  
*simillimus* sp. n. ii 30  
*Leucantia* Ochs. i 138, iii 345  
*amblycasis* sp. n. i 144, iii 346  
*anthracias* sp. n. i 139  
*compisias* sp. n. i 139  
*dislocata* Walk. i 146  
*euclidias* sp. n. i 140, iii 345, cxlv  
*macrosaris* sp. n. i 140  
*niphadopa* sp. n. i 140  
*photophila* Butl. i 147  
*pyrrhias* sp. n. i 141  
*typhlodes* sp. n. i 141  
*unipuncta* Haw. i 142

- Leucophaea surinamensis* Fab. ii 7  
*Leucostoma analis* Meig. iii 20  
*Leurocorynus* gen. n. iii 548  
     *cephalotes* sp. n. iii 549  
*Liancalus metallicus* sp. n. iii 13  
*Libellulina* ii 62  
*Liburnia psylloides* Dist. ii 577  
*Lilia dilecta* White iii 128, cc  
**Limacidae** ii 275  
*Limax gagates* Drap. ii 276  
     *laevis* Müll. ii 276  
     *sandwichiensis* Soul. ii 276  
*Limnaea* Lam. ii 390  
     *affinis* Soul. ii 392  
     *ambigua* Pease ii 391  
     *aulacospira* Ancey ii 391  
     *binominis* nom. n. ii 391  
     *compacta* Pease ii 391  
     *hartmanni* Cless. ii 392  
     *moreletiana* Cless. ii 392  
     *naticoides* Cless. ii 392  
     *oahuensis* Soul. ii 392  
     *peasei* Cless. ii 393  
     *reticulata* Gould ii 393  
     *rubella* Lea ii 393  
     *sandwichiensis* Phil. ii 391  
     *turgidula* Pease ii 393  
     *volutata* Gould ii 392  
*Limnaecia phragmitella* Stn. i 485  
*Limnaeus sandwichiensis* Phil. ii 392  
*Limneria* Holmgr. i 356  
     *polynesiensis* Cam. i 356  
*Limnerium* Ushm. i 356  
     *blackburni* Cam. i 357  
     *hawaiiense* Cam. i 357  
     *polynesiense* Cam. i 356  
**Limnobiidae** iii 6, clxxxii  
*Limnobia perkinsi* sp. n. iii 6  
*Limosa baueri* i 451  
*Limosina aequalis* sp. n. iii 76  
     *venalicia* Ost.-Sack. iii 75  
*Limothrips* Hal. iii 701  
     *avenae* Hinds iii 701  
     *caedium* Hal. iii 701  
*Lineodes* Gn. i 469, 731  
     *ochrea* sp. n. i 469, 731  
     *subextincta* sp. n. i 470  
*Linyphia argyrodes* Walck. ii 446  
*Liophaena* Sharp iii 564  
     *centralis* sp. n. iii 564  
     *flaviceps* Sharp iii 564  
     *gracilipes* Sharp iii 564  
     *oahuensis* sp. n. iii 565  
*Lipeurus docophoroides minahaensis* var. n. iii 310  
*Liposomphus* Berg iii 168  
*Lispe argenteifacies* sp. n. iii 30  
     *cupreigena* sp. n. iii 31  
     spp. iii 31  
*Lispinodes* Sharp iii 539  
     *crassus* sp. n. iii 542  
     *explicandus* Sharp iii 540  
     *germanus* sp. n. iii 542  
     *hawaiiensis* sp. n. iii 541  
     *kawaiensis* sp. n. iii 541  
     *mauiensis* sp. n. iii 541  
     *molokaiensis* sp. n. iii 540  
     *obscurus* sp. n. iii 541  
     *oxytelinus* sp. n. iii 540  
     *pallescens* Blackb. iii 539  
     *pallidus* sp. n. iii 540  
     *quadratus* Blackb. iii 539  
*Lispinus impressicollis* Motsch. iii 539  
     *laevigatus* Kraatz iii 539  
*Lissonota bellator* Grav. i 336  
*Litargellus* Cas. iii 419  
*Litargus balteatus* Lec. iii 418  
     *vestitus* Sharp iii 419  
**Lithobiidae** iii 324  
     *Lithobius hawaiiensis* sp. n. iii 324  
*Lithocharis fuscipennis* Kraatz iii 544  
     *incompta* Sharp iii 545  
     *vilis* Kraatz iii 544  
*Lithargus* sp.? ii 605  
*Lobioptera lacteipennis* Loew iii 74  
*Loboptera extranea* sp. n. ii 6  
*Locastra monticolens* Butl. i 211  
*Locustoidea* ii 8, 687, ccxiv  
*Loxioides* Oust. i 435  
     *baileui* Oust. i 436  
*Loxops* Cab. i 417  
     *caeruleirostris* Wils. i 421  
     *coccinea* Gmel. i 420  
     *ochracea* Rothsch. i 421  
     *rafa* Blox. i 421  
*Loxostege consialis* sp. n. i 226  
     *helioxantha* sp. n. i 226  
     *melanopsis* sp. n. i 226  
*Lozostoma flavofasciata* Stn. i 712  
**Lucanidae** iii 403  
*Lucilia* Desv. iii 28, 84  
     *caesar* Linn. iii 28  
*Luteva insolida* White ii 550, iii 152  
     *insulicola* Kirk. ii 551  
*Lycæna baetica* Linn. i 194, iii 355  
     *blackburni* Tuely i 194, iii 355  
**Lycaenidae** clvi, iii 355  
**Lycetidae** cxviii, iii 644  
*Lyctus* Fabr. iii 644  
     *brunneus* Steph. iii 644  
     sp.? iii 644  
**Lycosidae** ii 505  
*Lycosa* Latr. ii 505  
     *hawaiiensis* Sim. ii 506  
     *kailakonai* sp. n. (*Trochosa*) ii 506  
     *likeklikeae* sp. n. ii 506  
     *oahuensis* Keys. ii 505  
     *perkinsi* sp. n. iii 343  
     *stygialis* Sim. ii 505  
*Lycosella annulata* sp. n. ii 508, iii 344  
     *spinipes* sp. n. ii 507  
**Lygaeidae** ii 534, iii 169, ccxiii  
*Lygaeus hyalinus* Fabr. iii 170  
     *peruvianus* Guér. iii 159  
*Lygosoma cyapurum* Less. i 367  
     *noctua* Less. i 367  
*Lymnaeus rubellus* Lea ii 294  
*Lynnetia orpheella* Stn. i 723  
     *sommulentella* Z. i 723  
**Machilidae** iii 294  
*Machilis heteropus* sp. n. iii 295  
     *perkinsi* sp. n. iii 294  
*Macranillus* gen. n. iii 287  
     *coecus* sp. n. iii 287  
*Macrochlamys perkinsi* Sykes ii 284  
*Macrodyetium omiodivorum* Terry ii 684  
*Macropsis* Auctt. iii 114  
*Macrostes kilaeuae* sp. n. ii 575  
**Malacodermidae** iii 368  
*Mallophaga* iii 305  
     Hosts of, iii 320  
*Mammalia* i 465

- Mantodea ii 7, 689, cxxiii  
Mapsidius gen. n. i 650  
  auspicata sp. n. i 650  
  iridescens sp. n. i 651  
  quadridenta sp. n. i 651  
Mareca americana Gm. i 460  
Margarodes exaula Meyr. i 230  
Margaronia Hüb. i 200, iii 357  
  cyanomichla sp. n. i 201, iii 357  
  exaula Meyr. i 200, iii 357  
  glauculalis Butl. i 200  
Maui xx  
Mauia satelles Blackb. ii 183  
Mauna Blackb. iii 200  
  frigida Blackb. iii 200  
Mecaphesa gen. n. ii 495  
  cineta sp. n. ii 495  
  perkinsi sp. n. iii 342  
  semispinosa sp. n. ii 496, iii 343  
Mecistocephalus Wood iii 326  
Mecomenus gen. n. iii 230  
  koebele sp. n. iii 230  
  putealis Blackb. iii 231  
Mecostomus gen. n. iii 229  
  perkinsi sp. n. iii 229  
Mecyclothorax gen. n. iii 243  
  aeneus sp. n. iii 255  
  amaroides sp. n. iii 256  
  angusticollis Blackb. iii 246  
  bicolor sp. n. iii 246  
  bradycellinus sp. n. iii 247  
  cognatus sp. n. iii 255  
  cymindicus sp. n. iii 248  
  daptinus sp. n. iii 249  
  inaequalis Blackb. iii 249  
  interruptus sp. n. iii 252  
  iteratus sp. n. iii 250  
  konanus sp. n. iii 248  
  laetus sp. n. iii 247  
  longulus sp. n. iii 251  
  micans Blackb. iii 244  
  microps sp. n. iii 245  
  montivagus Blackb. iii 253  
  multipunctatus Blackb. iii 252  
  nubicola Blackb. iii 244  
  obscuricornis sp. n. iii 245  
  occultus sp. n. iii 256  
  oculatus sp. n. iii 251  
  ovipennis sp. n. iii 250  
  pele Blackb. iii 254  
  pusillus sp. n. iii 243  
  robustus sp. n. iii 255  
  rusticus sp. n. iii 244  
  sobrinus sp. n. iii 253  
  vulcanus Blackb. iii 249  
Mecyua Steph. i 225, iii 360  
  aurora Butl. i 225, iii 360  
  ennychioides Butl. i 216  
  exigua Butl. i 245  
  nigrescens Butl. i 211  
  virescens Butl. i 225  
Medon celebensis Fauv. iii 545  
  debilicornis Woll. iii 545  
  debilicornis Ganglb. (*Hypomeaon*) iii 545  
**Megachilidae** lxxxiii, ii 605  
Megachile diligens i 113  
  palmarum sp. n. i 114  
  schauinslandi i 114  
Megalomus Ramb. ii 36  
Megalomus hospes sp. n. ii 36  
Megascolex schmaridae Horst ii 426  
**Melanidae** ii 394  
Melania Lam. ii 394  
  baldwini Ancey ii 394  
  contigua Pease ii 395  
  indefinita Lea ii 394  
  kauaiensis Pease ii 395  
  mauiensis Lea ii 395  
  newcombii Lea ii 394, 395  
  verrauxiana Lea ii 395  
  verreauxiana Lea ii 395  
Melanoleuca Stph. i 507  
Melanomercyna ennychioides i 216  
  nigrescens i 211  
  stellata Butl. iii 359  
Melanosanthus Eschsch. iii 369  
  melanocephalus Thunb. iii 369  
Meliphora grisella Fab. i 197  
Melitotibia hawaiiensis Perk. ii 658  
**Membracidae** ccix, ii 555  
Mememerus paykulli Thor. ii 512  
Menopon cyrtotigum sp. n. iii 318  
  hawaiiensis sp. n. iii 317  
  hilensis sp. n. iii 319  
  invadens sp. n. iii 320  
Mergus serrator L. i 461  
Merimmetria gen. n. i 482  
  flaviterminella sp. n. i 482  
Merragata hebroides White ii 546, iii 168  
Mesolelaps gen. n. i 313  
  cyaneiventris sp. n. i 313  
Mesotriscus gen. n. iii 222  
  abax sp. n. iii 226  
  alternans sp. n. iii 228  
  collaris sp. n. iii 225  
  hawaiiensis sp. n. iii 224  
  kawaiensis sp. n. iii 226  
  kauaiensis sp. n. iii 223  
  microps sp. n. iii 226  
  muscolica Blackb. iii 223  
  opacus sp. n. iii 227  
  optimus sp. n. iii 227  
  prognathus sp. n. iii 223  
  tricolor sp. n. iii 224  
  truncatus sp. n. iii 225  
  vagans sp. n. iii 222  
Mestolobes Butl. i 228, iii 361  
  abnormis Butl. i 239, iii 361  
  amethystias sp. n. i 229  
  antichora sp. n. iii 361  
  aphrias sp. n. i 237  
  arctura sp. n. i 231  
  autodoxa sp. n. i 239, iii 361  
  banausa sp. n. i 233  
  chimoniae sp. n. i 236  
  chlorolychna sp. n. i 237  
  chrysomolybda sp. n. i 230  
  crypsichrysa sp. n. i 230  
  drosieropa sp. n. i 232  
  epidelta sp. n. i 231  
  erinnys sp. n. i 231  
  eurylyca sp. n. i 235  
  homalopa sp. n. i 240  
  iochrysa sp. n. i 232  
  mesacma sp. n. i 237  
  minuscula Butl. i 233, iii 361  
  ochrias sp. n. i 234  
  oenone i 239  
  ombrias sp. n. i 233  
  orthrias sp. n. i 235  
  perixantha sp. n. i 238  
  pessias sp. n. i 236

- Mestolobes pragmatica* sp. n. i 239  
*scleropsis* sp. n. i 234  
*semiochrea* Butl. i 238, iii 361  
*simethina* i 233  
*sirina* sp. n. i 231  
*xanthoscia* sp. n. i 230, iii 361  
*Metacoelus femoralis* Fourcr. i 340  
*Metasia abnormis* Butl. i 239  
*Methana ligata* Brunn. ii 6  
*Metrarga* iii 165, ii 535  
     *contracta* Blackb. iii 166  
     *nuda* iii 165, ii 535  
     *obscura* iii 166, ii 535  
     *villosa* White iii 167  
*Metraginae* sub. nov. iii 164  
*Metrocidium* gen. n. iii 285  
     *admirandum* sp. n. iii 286  
     *brevicolle* sp. n. iii 285  
*Metromenus* Sharp iii 231  
     *aequalis* sp. n. iii 233  
     *angustifrons* sp. n. iii 234  
     *bardus* Blackb. iii 240  
     *calathoides* sp. n. iii 242  
     *caliginosus* Blackb. iii 233  
     *cinctus* sp. n. iii 239  
     *canepennis* Blackb. iii 241  
     *epicturus* Blackb. iii 235  
     *fossipennis* Blackb. iii 239  
     *fugitivus* Blackb. iii 240  
     *fraternus* Blackb. iii 236  
     *fraudator* sp. n. iii 237  
     *meticulosus* Blackb. iii 234  
     *moerens* sp. n. iii 237  
     *mutabilis* Blackb. iii 232  
     *mysticus* Sharp iii 213  
     *latifrons* sp. n. iii 242  
     *leutus* sp. n. iii 235  
     *limbatus* sp. n. iii 241  
     *oceanicus* Blackb. iii 240  
     *palmae* Blackb. iii 232  
     *pavidus* sp. n. iii 238  
     *perpolitus* sp. n. iii 241  
     *protervus* Blackb. iii 240  
     *scrupulosus* Blackb. iii 235  
     *sphodriformis* sp. n. iii 238  
     *velox* sp. n. iii 236  
*Metrothorax* gen. n. iii 269  
     *blackburni* sp. n. iii 272  
     *crassus* sp. n. iii 274  
     *curtipes* iii 273  
     *debilis* sp. n. iii 275  
     *deverilli* Blackb. iii 270  
     *discedens* sp. n. iii 275  
     *extimus* sp. n. iii 273  
     *haleakalae* sp. n. iii 271  
     *laticollis* sp. n. iii 271  
     *macrops* sp. n. iii 270  
     *moleps* sp. n. iii 269  
     *oahuensis* Blackb. iii 274  
     *perkinsianus* sp. n. iii 270  
     *rotundicollis* sp. n. iii 273  
     *scaritoides* Blackb. iii 272  
     *simioius* Blackb. iii 274  
*Micracantha insularis* Pascoe ii 114  
     *nutans* Sharp ii 114  
*Microcleptes* Stal. iii 150  
*Microcystina* Mörch. ii 279  
     *cryptoportica* Gould ii 279  
*Microcystis* Beck ii 279  
     *abeillei* Ancey ii 280  
     *baldwini* Ancey ii 281  
     *Microcystis boettgeriana* Ancey ii 283  
     *chamissoi* Pfeiff. ii 280  
     *depressiuscula* Ancey ii 284  
     *indefinita* Ancey ii 284  
     *lymaniana* Ancey ii 284  
     *oahuensis* Ancey ii 284  
     *perlucens* Ancey ii 284  
     *platyla* Ancey ii 284  
     *plicosa* Ancey ii 285  
     *sericans* Ancey ii 285  
     *turgida* Ancey ii 285  
*Microdus hawaiiicola* sp. n. i 361  
*Microgasterinae* ii 684  
*Microneta insulana* sp. n. ii 461  
*Microterys* Thom. i 322, ii 655  
     *flavus* How. ii 655  
     *molokaiensis* sp. n. i 322  
*Microvelia* Westw. iii 157  
     *vagans* White iii 158  
*Midway* island xvii  
*Milu* Kirk. ii 549  
     *kerasphoron* Kirk. ii 549  
     *rubritinctus* Kirk. ii 549  
*Mimesa antennata* Sm. i 10  
*Minthea rugicollis* Walk. iii 430  
*Miraria* Reut. iii 144  
*Miridae* iii 125, ii 552, cc  
*Mirinae* ii 552, 652, 129  
*Mirosternus* Sharp iii 614  
     *acutus* Blackb. iii 639  
     *affinis* sp. n. iii 621  
     *affinis* var. *suturalis* n. iii 622  
     *amatus* sp. n. iii 632  
     *amaurodes* sp. n. iii 636  
     *angulatus* sp. n. iii 631  
     *bicolor* Sharp iii 629  
     *blackburni* sp. n. iii 621  
     *blackburnioides* sp. n. iii 621  
     *carinatus* Sharp iii 638  
     *cognatus* sp. n. iii 632  
     *debilis* Sharp iii 640  
     *denudatus* sp. n. iii 624  
     *dimidiatus* sp. n. iii 641  
     *discolor* sp. n. iii 634  
     *dubiosus* sp. n. iii 637  
     *duplex* sp. n. iii 620  
     *elongatus* sp. n. iii 636  
     *epichrysus* sp. n. iii 619  
     *euaceras* sp. n. iii 620  
     *eutheorus* sp. n. iii 628  
     *excelsior* sp. n. iii 617  
     *eximius* sp. n. iii 635  
     *fractus* sp. n. iii 625  
     *frigidus* sp. n. iii 619  
     *glabripennis* Sharp iii 630  
     *hawaiiensis* sp. n. iii 619  
     *hirsutulus* sp. n. iii 640  
     *hypocoelus* sp. n. iii 633  
     *ignotus* sp. n. iii 626  
     *irregularis* sp. n. iii 624  
     *kauaiensis* sp. n. iii 626  
     *konanus* sp. n. iii 631  
     *laevis* sp. n. iii 625  
     *lanaiensis* sp. n. iii 620  
     *latifrons* sp. n. iii 624  
     *lugubris* sp. n. iii 627  
     *marginatus* sp. n. iii 634  
     *maurus* sp. n. iii 627  
     *molokaiensis* sp. n. iii 626  
     *montanus* sp. n. iii 623  
     *muticus* Sharp iii 634

- Mirosternus nigrocastaneus sp. n. iii 629  
 obscurus Sharp iii 642  
 oculus sp. n. iii 616  
 pallidicornis sp. n. iii 630  
 parvus sp. n. iii 632  
 parvulus sp. n. iii 628  
 peles sp. n. iii 630  
 plebeius sp. n. iii 636  
 punctatissimus sp. n. iii 617  
 punctatus Sharp iii 635  
 pusillus sp. n. iii 624  
 pyrophilus sp. n. iii 618  
 rufescens sp. n. iii 637  
 rugipennis sp. n. iii 623  
 sculptus sp. n. iii 622  
 simplex sp. n. iii 623  
 solidus sp. n. iii 642  
 solitarius sp. n. iii 635  
 sordidus sp. n. iii 618  
 stenarthrus sp. n. iii 641  
 subparvus sp. n. iii 633  
 testaceus sp. n. iii 617  
 tetragonus sp. n. iii 637  
 tristis sp. n. iii 639  
 varicolor sp. n. iii 622  
 varius sp. n. iii 640  
 vestitus sp. n. iii 639  
 xanthostictus sp. n. iii 629
- Miscogasteridae** cv, i 307
- Misumena anguliventris sp. n. ii 488  
 anguliventris Sim. ii 486, iii 341  
 cretacea sp. n. ii 487  
 nesiotis Sim. ii 485, iii 341  
 nigrofrenata sp. n. ii 486  
 oreades sp. n. ii 484, 485, iii 341  
 velata sp. n. ii 489
- Mollica micropthalmus Koch ii 512
- Mollusca ii 271
- Mollusca, Review of ccxiii
- Molokai, island xix
- Monanus Sharp iii 429  
 brevicornis Blackb. iii 429  
 crenatus Sharp iii 429
- Monochroa Hein. i 478
- Monocrepidius exsul Sharp iii 369
- Monodonta seminigra Lam. ii 298
- Monolexis? palliatus Cam. i 362
- Monomera iii 102
- Monomorium floricola i 119  
 minutum liliukalanii i 119  
 vastator i 119
- Monopis Hb. i 727, 737  
 crociopitella Cms. i 728, 737  
 ferruginella Wlsm. i 728  
 heringi Rdsn. i 728  
 hyalinella Stgr. i 728  
 lombardica Hrng. i 728  
 longella Wkr. i 727  
 mediella F. i 727  
 monachella Hb. i 727  
 umbrobrata Btl. i 728
- Monotomidae** iii 434
- Mopsis Keyserl. ii 512
- Moranila testaceiceps Cam. i 324
- Muscidae** clxxvi, iii 27, 83
- Musca annonae Fabr. iii 44  
 azurea Fln. iii 27  
 caesar Linn. iii 28  
 canicularis Linn. iii 30  
 casei Linn. iii 48  
 domestica Linn. iii 29
- Musca flavinervis Thoms. iii 29  
 putris Linn. iii 48  
 regina Meig. iii 28  
 tenax Linn. iii 19  
 vomitoria Linn. iii 27
- Mycetaeidae** iii 421
- Mycetaea hirta Marsh iii 421
- Mycetophagidae (= Tritomidae)** iii 418
- Mycetophilidae** clxxx, iii 2
- Myllaena Erichs. iii 551  
 apetina sp. n. iii 553  
 cognata sp. n. iii 553  
 curtipes Sharp iii 552  
 discedens Sharp iii 551  
 familiaris Sharp iii 553  
 haleakalae sp. n. iii 552  
 oxypodina sp. n. iii 553  
 pacifica Blackb. iii 553  
 rufescens sp. n. iii 552  
 sp.? iii 551  
 vicina Sharp iii 552
- Mymaridae** civ, ii 660
- Mydochidae** cxciii, ii 535
- Mysticomenus gen. n. iii 212  
 mysticus Blackb. iii 213  
 tibialis sp. n. iii 212
- Mytilaspis citricola Green iii 110  
 flava Targ. iii 111  
 flava var. hawaiiensis Mask. iii 111  
 gloverii Mask. iii 111  
 gloverii var. pallida Green iii 111  
 pallida Mask. iii 111  
 pinnaeformis Newst. iii 110  
 pomorum Const. iii 111
- Myriopoda iii 323  
 Review of ccxxi
- Myrmecophila quadrispina sp. n. ii 14
- Myrmeleonidae** clxxxiii
- Myrmeleon perjurus Walk. ii 61  
 violentus Walk. ii 61
- Myrmicidae** ci
- Nabidae** iii 153, ii 546, cxcv
- Nabis Leth. & Sev. iii 153  
 blackburni White iii 155  
 capsiformis Germ. ii 546  
 curtispennis Blackb. iii 157, ii 549  
 innotatus White iii 154  
 koelensis Blackb. ii 547, iii 156  
 lusciosus White ii 548, iii 157  
 oscillans Blackb. ii 547, iii 156  
 rubritinctus Blackb. ii 549, iii 157  
 subrufus White iii 156
- Naegeidae** iii 168
- Nanina discus Pfeiff. ii 283  
 rinkii Mörch. ii 279
- Nannodia Hein. i 478
- Nauphoeta bivittata Burm. ii 7
- Nausibius dentatus Marsh iii 429
- Neanura MacGill. iii 302  
 citronella sp. n. iii 303
- Necremnus maculatipennis sp. n. i 331
- Necrobia ruficollis Fabr. iii 367  
 rufipes Fabr. iii 367
- Neda abdominalis iii 414  
 oculata Fabr. iii 414
- Neelysia gen. n. i 532  
 agnetella sp. n. i 538  
 anthinella sp. n. i 535  
 argyresthiella sp. n. i 544

- Neelysia basivittata* sp. n. i 539  
*cleodorella* sp. n. i 535  
*complanella* sp. n. i 546  
*cuprea* sp. n. i 532  
*exaltata* sp. n. i 542  
*fuscodentata* sp. n. i 534  
*fuscifusa* sp. n. i 538  
*incongrua* sp. n. i 546  
*lignicolor* sp. n. i 533  
*macella* sp. n. i 545  
*municeps* sp. n. i 537  
*nemoricola* sp. n. i 544  
*ningorella* sp. n. i 540, 543  
*paltodorella* sp. n. i 537  
*petalifera* sp. n. i 541  
*pluviella* sp. n. i 540  
*poeciloceras* sp. n. i 542  
*psaroderma* sp. n. i 536  
*rediviva* sp. n. i 543  
*repandella* sp. n. i 536  
*rotifer* sp. n. i 539  
*sciurella* sp. n. i 546  
*semifusa* sp. n. i 547  
*subaurata* sp. n. i 541  
*terminella* sp. n. i 547  
*tigrina* Btl. i 533  
*tischeriella* sp. n. i 545  
*Nematoda* ii 428  
*Neoclytus* Horn ii 104  
*Neocaxetra spinigera* Wied. iii 79  
*Neolelaps* gen. n. i 312  
*flavipes* sp. n. i 313  
*hawaiiensis* sp. n. i 313  
*Neoliodes* = *Liodes* Heyd. iii 704  
*theleproctus* Herm. iii 704  
*Nereine spinosa* Camb. ii 460  
*Neripteron gigas* Less. ii 398  
**Neritidae** ii 398  
*Neritina* Lam. ii 398  
*cariosa* Gray ii 398  
*convexa* Nutt. ii 398  
*granosa* Sow. ii 398  
*lugubris* Phil. ii 398  
*neglecta* Pease ii 399  
*nuttalli* Recl. ii 398  
*papillosa* Jay ii 398  
*sandwichensis* Desh. ii 398, 399  
*solidissima* Sow. ii 398  
*vespertina* Nutt. ii 399  
*Nesamipis obsoleta* Butl. i 157  
*plagiata* sp. n. i 156  
*Nesapterus* gen. n. iii 450  
*exilis* sp. n. iii 451  
*monticola* Sharp iii 451  
*Nesidiocheilus*, gen. n. iii 127  
*hawaiiensis* sp. n. iii 127  
*Nesidiolestes* gen. n. iii 152  
*insularis* Kirk. ii 551  
*selum* sp. n. iii 153  
*Nesidiorchestes* gen. n. iii 139  
*hawaiiensis* sp. n. iii 139  
*Nesiomiris* gen. n. iii 144  
*hawaiiensis* sp. n. iii 145, ii 554  
*Nesochlide epixantha* Perk. iii 349  
*Nesocidium* gen. n. iii 280  
*atomarium* sp. n. iii 284  
*corticarium* sp. n. iii 283  
*fulgens* sp. n. iii 282  
*koebelci* sp. n. iii 282  
*laeticulum* sp. n. iii 280  
*lahainense* sp. n. iii 281  
*Nesocidium perkinsi* sp. n. iii 282  
*rude* sp. n. iii 283  
*scydmaenoides* sp. n. iii 284  
*smaragdinum* sp. n. iii 282  
*Nesoclimacias contracta* ii 535  
*lanaensis* ii 535  
*Nesocrabro* gen. n. 25, ii 606  
*adspicans* Blackb. i 29, ii 606  
*bilecoratus* sp. n. i 27, ii 606  
*compactus* sp. n. i 25  
*daemonius* sp. n. i 28, ii 606  
*rubrocaudatus* Blackb. i 27, ii 606  
*stygius* Bl. & C. i 29  
*Nesocryptis villosa* ii 535  
*Nesocymus* Kirk. ii 535  
*calvus* White ii 536  
*Nesodiranchis* subgen. n. ii 668  
*Nesodryas* Kirk. ii 596  
*dryope* sp. n. ii 597  
*claeocarpi* Kirk. ii 596  
*eugeniae* Kirk. ii 597  
*giffardi* Kirk. ii 597  
*Nesodynerus* Perk. ii 607  
*conifer* Perk. ii 607  
*cooki* Perk. ii 608  
*dilatatipes* Perk. ii 608  
*eupteryx* Perk. ii 608  
*freycinetiae* Kirk. ii 596  
*oblitus* Perk. ii 608  
*optabilis* Perk. ii 608  
*paractias* Perk. ii 608  
*rudolphi* D.T. ii 607  
*vittatitris* Perk. ii 608  
*Nesogryllus* gen. n. ii 26  
*stridulans* sp. n. ii 27  
*Nesoligota* subg. n. *Oligota* iii 557  
*Nesolymnaeum* gen. n. iii 277  
*spurcum* Blackb. iii 277  
*Nesomartus psammophila* Kirk. ii 533  
*Nesomedon* gen. n. iii 546  
*brunescens* iii 546  
*oahuensis* sp. n. iii 547  
*quadratus* sp. n. iii 547  
*Nesomicromus* gen. n. ii 37  
*angularis* sp. n. ii 691  
*angustipennis* sp. n. ii 38  
*bellulus* sp. n. ii 40  
*brunnescens* sp. n. ii 43  
*distinctus* sp. n. ii 44  
*drepanoides* sp. n. ii 39  
*forcipatus* sp. n. ii 44  
*fulvescens* sp. n. ii 39  
*haleakalae* sp. n. ii 42  
*infumatus* sp. n. ii 41  
*latipennis* sp. n. ii 38  
*longispinosus* sp. n. ii 42  
*minimus* sp. n. ii 45  
*minor* sp. n. ii 41  
*molokaiensis* sp. n. ii 41  
*ombrias* sp. n. ii 692  
*paradoxus* sp. n. ii 39  
*phaeostictus* sp. n. ii 692  
*rubrinervis* sp. n. ii 43  
*stenopteryx* sp. n. ii 45  
*subochraceus* sp. n. ii 44  
*vagus* sp. n. ii 37  
*Nesomicrops* gen. n. iii 286  
*kauaiensis* sp. n. iii 286  
*Nesomimesa* gen. n. i 8  
*antennata* i 10  
*hawaiiensis* i 11

- Nesomimesa kauaiensis* sp. n. i 9  
 nitida i 11  
 sciopteryx i 10
- Nesocephalus* gen. n. iii 474  
 abnormalis sp. n. iii 481  
 anticriatus sp. n. iii 476  
 ater sp. n. iii 491  
 bidens Sharp iii 483  
 cognatus sp. n. iii 487  
 collaris sp. n. iii 476  
 confertus sp. n. iii 490  
 curthorax sp. n. iii 476  
 fallax sp. n. iii 479  
 floricola Blackb. iii 480  
 inauratus Sharp iii 475  
 insolitus sp. n. iii 482  
 koelensis iii 487  
 lambianus sp. n. iii 484  
 latiusculus sp. n. iii 488  
 molokaiensis sp. n. iii 478  
 nigricans sp. n. iii 487  
 obscurans sp. n. iii 486  
 olindae Blackb. iii 477  
 pictus sp. n. iii 480  
 protinoides Sharp iii 486  
 puncticollis sp. n. iii 490  
 roridus sp. n. iii 479  
 segnis sp. n. iii 477  
 serratus sp. n. iii 482  
 similis sp. n. iii 489  
 sinuatus sp. n. iii 491  
 solitarius sp. n. iii 481  
 sp. ? iii 488  
 testaceipes sp. n. iii 484  
 torvus Blackb. iii 485  
 vagepictus sp. n. iii 478
- Nesopetinus* gen. n. iii 492  
 apertus Sharp iii 498  
 blackburni Sharp iii 503  
 blackburni var. lanaiensis Blackb. iii 504  
 blackburni var. mauiensis var. n. iii 504  
 blackburnianus sp. n. iii 504  
 celatus Sharp iii 498  
 concolor sp. n. iii 500  
 discedens Sharp iii 494  
 eremitus sp. n. iii 497  
 filipes sp. n. iii 501  
 gonioryctoides sp. n. iii 493  
 intermedius sp. n. iii 503  
 kauaiensis Blackb. iii 495  
 metallescens Sharp iii 493  
 omissus sp. n. iii 495  
 pallidus sp. n. iii 500  
 parallelus Blackb. iii 497  
 perkinsi sp. n. iii 502  
 pusillus sp. n. iii 496  
 quadraticollis Blackb. iii 501  
 rudis sp. n. iii 502  
 scottianus sp. n. iii 499  
 sp. ? iii 496, 500  
 tinctus Sharp iii 493  
 varius Sharp iii 496  
 vestitus Sharp iii 497
- Nesophila* Pilsbry ii 289
- Nesophrosyne* Kirk. ii 556, 558  
 arcadicola sp. n. ii 571  
 bobeeae sp. n. ii 564  
 caelicola sp. n. ii 566  
 craterigena sp. n. ii 571  
 chu sp. n. ii 569  
 filicicola Kirk. ii 556
- Nesophrosyne* giffardi sp. n. ii 563  
 gouldiae sp. n. ii 560  
 haleakala sp. n. ii 567  
 halemanu sp. n. ii 559  
 ignigena sp. n. ii 570  
 imbricola sp. n. ii 566  
 insularis sp. n. (*Nesoveisia*) ii 573  
 kaianamao Kirk. ii 557  
 koleae sp. n. ii 562  
 kukanaroa Kirk. ii 557  
 maritima sp. n. ii 560  
 microleptae sp. n. ii 557  
 milu sp. n. ii 565  
 monticola sp. n. ii 562  
 montium sp. n. ii 569  
 montivaga sp. n. ii 560  
 myrsines sp. n. ii 568  
 nigrolineata var. n. ii 563  
 nimbicola sp. n. ii 565  
 nimbigena sp. n. ii 567  
 nubigena sp. n. ii 567  
 nuenuc sp. n. ii 572  
 oceanides sp. n. (*Nesoveisia*) ii 573  
 oncanea sp. n. ii 566  
 opalescens sp. n. ii 561  
 oreadis sp. n. ii 569  
 paludicola sp. n. ii 564  
 palustris sp. n. ii 564  
 pele sp. n. ii 570  
 perkinsi Kirk. ii 559  
 pipturi sp. n. ii 560  
 pluvialis sp. n. ii 568  
 ponapona sp. n. ii 561  
 procellaris sp. n. ii 565  
 silvicola sp. n. ii 570  
 silvigena sp. n. ii 559  
 sp. ? ii 562  
 ulaula sp. n. ii 563  
 umbratilis sp. n. ii 558  
 umbricola sp. n. ii 565  
 umbrigena sp. n. ii 571
- Nesopleias* gen. n. ii 582  
 dubautiae sp. n. ii 583  
 nimbata sp. n. ii 582
- Nesoprosopeis* gen. n. i 75, ii 601, lxiv  
 andrenoides sp. n. i 111  
 angustula sp. n. i 95  
 anomala sp. n. i 112  
 anthracina i 100  
 assimulans sp. n. i 101  
 assimulans oahuensis i 102  
 blackburni i 97  
 caeruleipennis sp. n. i 107  
 chlorosticta sp. n. i 78  
 comes sp. n. i 90  
 coniceps i 91  
 connectens sp. n. i 85  
 crabronoides sp. n. i 94  
 difficilis sp. n. i 80  
 dimidiata sp. n. i 96  
 dumetorum sp. n. i 92  
 erythrolemas sp. n. i 112  
 facilis i 77  
 finitima sp. n. i 100  
 flavifrons i 101  
 flavipes i 99, ii 605  
 fuscipennis i 106  
 fuscipennis obscuripes i 107  
 haleakalae sp. n. i 87  
 hilaris Sm. i 103  
 hirsutula sp. n. i 79

- Nesoprosopis hostilis* sp. n. i 104  
*inquilina* sp. n. i 102  
*insignis* sp. n. i 110  
*kauaiensis* sp. n. i 90  
*koae* sp. n. i 85  
*kona* i 82  
*laeta* sp. n. i 81  
*laticeps* sp. n. i 88  
*longiceps* sp. n. i 98  
*mauiensis* sp. n. i 94  
*melanothrix* sp. n. i 86  
*mutata* sp. n. i 93  
*neglecta* sp. n. i 89  
*nivalis* sp. n. i 83  
*obscurata* sp. n. i 99  
*ombrias* sp. n. ii 604  
*paradoxa* sp. n. i 111  
*perspicua* sp. n. i 109  
*pubescens* sp. n. i 107  
*rugulosa* sp. n. i 84  
*satelles* i 109  
*setosifrons* sp. n. i 108  
*simplex* sp. n. i 79  
*specularis* sp. n. i 93  
*sphecodoides* sp. n. i 105  
*unica* sp. n. i 88  
*vicina* sp. n. i 84  
*volatilis* i 105  
*volcanica* sp. n. i 83  
*Nesoreias* subg. n. ii 573  
*Nesorestias* Kirk. ii 583  
*filicicola* Kirk. ii 583  
*Nesosteles* Kirk. ii 573  
*bebea* Kirk. ii 574  
*peregrina* sp. n. ii 575  
*plutonis* sp. n. ii 574  
*volcanicola* sp. n. ii 574  
*Nesyodne* Kirk. ii 583  
*argyroxiphi* Kirk. ii 590  
*chambersi* Kirk. ii 590  
*cyathodis* sp. n. ii 589  
*gouldiae* sp. n. ii 586  
*haleakala* sp. n. ii 587  
*halia* Kirk. ii 584  
*hamadryas* sp. n. ii 587  
*imbricola* sp. n. ii 590  
*ipomoeicola* Kirk. ii 586  
*koae* Kirk. ii 583  
*monticola* sp. n. ii 591  
*nephelias* sp. n. ii 588  
*nephrolepidis* Kirk. ii 586  
*nubigena* sp. n. ii 589  
*palustris* Kirk. ii 589  
*pele* sp. n. ii 585  
*pipturi* Kirk. ii 584  
*procellaris* sp. n. ii 588  
*raillardiae* Kirk. ii 590  
*rubescens* Kirk. ii 584  
*umbratica* sp. n. ii 585  
*Nesothauma* gen. n. ii 46, xlix  
*haleakalae* sp. n. ii 47  
*Nesothoe* Kirk. ii 591  
*bobea* Kirk. ii 593  
*fictus* Kirk. ii 592  
*frigidula* Kirk. ii 593  
*hula* Kirk. ii 592  
*laka* Kirk. ii 594  
*perkinsi* Kirk. ii 593  
*pluvialis* Kirk. ii 595  
*pulani* Kirk. ii 594  
*silvestris* Kirk. ii 595  
*Nesothoe terryi* Kirk. ii 594  
*Nesothrips* Kirk. ii 681  
*oahuensis* Kirk. ii 682  
*Nesotocus* gen. n. ii 150  
*giffardi* sp. n. iii 654  
*kauaiensis* sp. n. ii 151  
*munroi* sp. n. ii 150  
*newelli* sp. n. ii 151  
*Nesotyphlias* Kirk. ii 548  
*lusciosus* Kirk. ii 548  
*Neuroptera* ii 31, 691  
*Review of clxx*  
*flightless* xlix  
*Newcambia* Pfeiff. ii 331  
*canaliculata* Bald. ii 331  
*chlorotica* Pfeiff. ii 344  
*cinnamomea* Pfeiff. ii 331  
*cumingi* Newc. ii 331  
*gemma* Pfeiff. ii 331  
*perkinsi* Sykes. ii 332  
*pfeifferi* Newc. ii 332  
*philippiana* Pfeiff. ii 332  
*plicata* Pfeiff. ii 332  
*sulcata* Pfeiff. ii 332  
*zebrina* Pfeiff. ii 331  
*Niihau*, island xvi  
*Niihoa*, Bird island xvii  
*Niphonides* ii 114  
*Nirmus diaprepes* sp. n. iii 309  
*gloriosus emarginatus* var. n. iii 310  
*minhaensis* sp. n. iii 307  
*orarius hawaiiensis* var. n. iii 310  
*stenozonus* sp. n. iii 308  
*Nitidulidae* cxxviii, iii 435  
*Nitidula dimidiata* Fabr. iii 507  
*humeralis* Fabr. iii 507  
*Nomophila* Hüb. i 227, iii 361  
*noctuella* Schiff. i 227, iii 361, xlvii  
*Nomia* Clem. i 478  
*Notaspis lucorum* Koch. iii 704  
*Noteraula straminea* Meyr. i 687  
*Notiphila argentata* Walk. iii 49  
*insularis* sp. n. iii 49  
*Notonectidae* ccviii, iii 148  
*Notonecta pallipes* Fabr. ii 555  
*Notopeplus* gen. n. iii 505  
*reitteri* Sharp iii 505  
*Number of species* xli  
*Numenius* Briss. i 451  
*tahitiensis* Gm. i 452  
*Nycticorax* Raf. i 456  
*griseus* Linn. i 456  
*Nymphalidae* cliv  
*Nymphula Schranck* i 200, iii 356  
*fluctuosalis* Zell. (*linealis* Guen.) i 200, iii 356  
*Nysius* Dall. ii 556, iii 162  
*arboricola* White ii 538  
*atralis* var. n. ii 541  
*blackburni* White ii 540  
*brunnealis* var. n. ii 541  
*coenosulus* Stål. ii 540  
*dallasi* White ii 538  
*delectus* White ii 538  
*hylaesus* sp. n. ii 539  
*insulicola* sp. n. ii 541  
*insulivagus* sp. n. ii 544  
*kamehameha* sp. n. iii 164, ii 539  
*lichenicola* sp. n. ii 540  
*longicollis* Blackb. ii 538  
*mauiensis* Blackb. ii 538  
*monticola* sp. n. ii 544

- Nysius montivagus* sp. n. ii 544  
*nemorivagus* White ii 543  
*nimbatus* sp. n. ii 543  
*nitidus* White ii 543  
*nubicola* sp. n. ii 542  
*ochriasis* sp. n. iii 162, ii 541  
*oresitrophus* sp. n. ii 542  
*oribasus* sp. n. ii 544  
*pteridicola* White ii 543  
*rubescens* White ii 543  
*saundersianus* sp. n. iii 163, ii 537  
*silvestris* sp. n. ii 541  
*vulcan* White ii 543  
*whitei* Blackb. ii 538
- Oahu, island xvii  
 Ocean currents xlvii  
*Oceanodroma cryptoleucura* Ridg. i 463  
*Odonata* ii 62, ii 693, clxxv  
*Odynerus* i 30, xc, clx
- accotogaster* sp. n. i 65, ii 609  
*aeoanus* Perk. ii 611  
*agilis* Sm. i 41  
*aprepes* Perk. ii 611  
*axestes* sp. n. i 66  
*blackburni* i 58  
*brevicostatus* sp. n. i 46  
*caenosus* sp. n. i 35  
*camelinus* sp. n. i 44  
*cardinalis* Bl. i 46  
*cephalostictus* sp. n. i 66  
*chelifera* sp. n. i 70, ii 607  
*conifer* sp. n. i 38  
*congruus* i 69, ii 607  
*cooki* sp. n. i 64, ii 608  
*cyanopteryx* sp. n. i 60, ii 612  
*cyphotes* sp. n. i 33  
*cypris* Perk. ii 612  
*deinogaster* sp. n. i 48  
*dilatitipes* sp. n. i 37, ii 608  
*diversus* Bl. i 45  
*dromedarius* i 45  
*dryas* sp. n. i 53  
*dubiosus* i 62  
*dyserythrias* sp. n. i 60  
*ecostatus* sp. n. i 42  
*egens* sp. n. i 61, ii 609  
*eludens* sp. n. i 36  
*epipseustes* Perk. ii 611  
*erro* sp. n. i 31  
*erythrogathus* sp. n. i 32  
*erythrotaetes* sp. n. i 53  
*eucharis* Perk. ii 610  
*eupteryx* sp. n. i 47, ii 608  
*eutretus* Perk. ii 612  
*flosculus* sp. n. i 64  
*frater* D.T. i 59  
*heterochromus* sp. n. i 49  
*hiloensis* sp. n. i 34  
*holomelas* Perk. ii 612  
*homochromus* sp. n. i 37  
*homoeogaster* sp. n. i 49  
*homoeophanes* Perk. ii 610  
*illudens* Perk. ii 609  
*infaustus* sp. n. i 73, ii 609  
*instabilis* sp. n. i 48  
*insulicola* i 67  
*iopteryx* sp. n. i 63, ii 609  
*kauaiensis* sp. n. i 38  
*kirbyi* i 37
- Odynerus konanus* sp. n. i 34  
*laevisulcatus* sp. n. i 51  
*lanaiensis* sp. n. i 68  
*leiodemas* sp. n. i 51  
*leucozomias* sp. n. i 36  
*lipocharis* sp. n. ii 610  
*lithophilus* Perk. ii 609  
*localis* i 71  
*maurus* Sm. i 70  
*melanognathus* sp. n. i 33  
*mesospilus* Perk. ii 612  
*microdemas* sp. n. i 55  
*mimus* sp. n. i 50  
*molokaiensis* sp. n. i 41  
*monas* Perk. ii 611  
*monobius* sp. n. i 55  
*montanus* i 43  
*montivagus* sp. n. i 54  
*naiadum* sp. n. i 32  
*nautarum* sp. n. i 72  
*nautarum* D.T. i 67  
*neslotes* sp. n. i 61  
*nesotrophes* sp. n. i 68  
*newelli* Perk. ii 612  
*nigripennis* i 70  
*nicicola* sp. n. i 52  
*nubicola* sp. n. i 42  
*oahuensis* i 45  
*oblitus* sp. n. i 74, ii 608  
*obscrepunctatus* i 59  
*orbis* sp. n. i 35  
*pacificus* Bl. i 59  
*paludicola* Perk. ii 611  
*paranaias* Perk. ii 611  
*peles* sp. n. i 39, ii 610  
*petrobis* sp. n. i 57  
*potamophilus* sp. n. i 56  
*pseudochromoides* Perk. ii 611  
*pseudochromus* sp. n. i 50  
*pterocheiloides* sp. n. i 69, ii 607  
*pterothraenes* sp. n. i 63  
*purpurifer* sp. n. i 47  
*radilla* i 71  
*relictus* sp. n. i 74, ii 609  
*rubritinctus* i 56, 58  
*rubropustulatus* i 57  
*rudolphi* i 46  
*rudolphi* D.T. ii 607  
*sandwichensis* sp. n. i 73  
*sandwichensis* D.T. i 56  
*scoriaceus* sp. n. i 40  
*smithii* i 41  
*sociabilis* sp. n. i 39  
*soror* sp. n. i 58  
*subegens* sp. n. ii 610  
*tempe* Perk. ii 611  
*theristes* sp. n. ii 609  
*threnodes* sp. n. i 62  
*unicus* sp. n. i 43  
*venator* sp. n. i 31  
*vittativentris* sp. n. i 65, ii 608  
*vulcanus* i 34  
*waianaeanus* sp. n. i 64  
*xanthorhoes* sp. n. i 52  
*xerophilus* Perk. ii 611
- Oechalia* ii 533, iii 171  
*grisea* Burm. ii 533, iii 171  
*patruelis* iii 171  
*pacifica* White iii 171
- Oecia maculata* Wlsm. i 649  
**Oecophoridae** Meyr. i 507, clxv

- Oecophora hydeniella* Fr. i 514  
*phycidella* Z. (*Scythris*) i 648  
**Oedemeridae** ii 247  
*Oedemotherpis* gen. n. iii 680  
*laticeps* sp. n. iii 680  
**Oemides** ii 96  
*Oenemona* Motsch. ii 104  
*Oestrelata* i 462  
*phaeopygia* Salv. i 462  
**Oestridae** iii 20  
*Oestrus ovis* Linn. iii 20  
**Olethreutinae** i 673  
*Olfersia acarta* sp. n. iii 87  
*Oliarus* Stal iii 119  
*hevaheva* sp. n. iii 122  
*kanakanus* sp. n. iii 121  
*koanoa* sp. n. iii 124  
*opuna* sp. n. iii 122  
*orono* sp. n. iii 124  
*tamehameha* sp. n. iii 120  
*tarai* sp. n. iii 123  
**Oligochaeta** ii 413  
*Oligostigma curta* Butl. i 200  
*Oligota* Mann. iii 554, iii 560  
*adpropinquans* sp. n. iii 561  
*aethiops* sp. n. iii 563  
*anomalocera* sp. n. (*Gnatholigota*) iii 556  
*bicolor* sp. n. (*Nesoligota*) iii 560  
*brevicollis* sp. n. (*Gnatholigota*?) iii 556  
*crivicornis* Sharp (*Melobus*) iii 555  
*cribripennis* sp. n. (*Nesoligota*) iii 559  
*currax* sp. n. (*Nesoligota*) iii 559  
*extranea* sp. n. (*Gnatholigota*) iii 557  
*frontalis* sp. n. iii 561  
*glabra* Sharp (*Nesoligota*) iii 559  
*gymnusa* sp. n. iii 561  
*haleakalae* sp. n. iii 562  
*insolita* sp. n. iii 561  
*kauaiensis* Blackb. (*Nesoligota*) iii 558  
*latifrons* sp. n. (*Gnatholigota*) iii 556  
*latipennis* sp. n. (*Nesoligota*) iii 558  
*longipennis* Blackb. iii 563  
*mutanda* Sharp iii 562  
*oahuensis* sp. n. iii 562  
*parca* sp. n. (*Gnatholigota*) iii 557  
*permigra* sp. n. iii 563  
*polita* Sharp (*Nesoligota*) iii 558  
*prolixa* Sharp (*Deroligota*) iii 555  
*scripta* sp. n. iii 560  
*scripta* var. *lactor* var. n. iii 560  
*simulans* Blackb. iii 562  
*tenuicornis* sp. n. iii 563  
*variegata* Blackb. iii 563  
*Oligotoma insularis* McLachl. ii 88, clxxiv  
*Olisthopus insularis* Karsch. iii 253  
*Omicrus brevipis* Sharp iii 579  
**Omiodes** Guen. i 201, iii 357  
*accepta* Butl. i 204, iii 358  
*anastrepta* sp. n. i 204, iii 358  
*antidoxa* sp. n. iii 358  
*asaphembra* sp. n. i 202  
*blackburni* Butl. i 202, iii 357  
*continuatalis* Wall. i 205, iii 358  
*demaratalis* Walk. i 205, iii 358  
*epicentra* sp. n. i 203, iii 357  
*euryprora* sp. n. i 202  
*iridias* sp. n. i 203  
*localis* Butl. i 206, iii 358  
*monogona* Meyr. i 206  
*monogramma* sp. n. i 205, iii 358  
*telegrapha* sp. n. i 204  
*Omphale metallica* sp. n. i 327  
*Oncophorus advena* Kell. iii 311  
*Oniscosoma pallida* Brunn. ii 7  
**Oodemas** Bohem. ii 155  
*aenescens* Bohem. ii 169  
*aeolosoma* sp. n. ii 169  
*aequale* Blackb. ii 161  
*affine* sp. n. ii 162  
*angustum* Blackb. ii 169  
*apionoides* sp. n. ii 161  
*borrei* Blackb. ii 170  
*brunneum* sp. n. ii 159  
*chrysolodum* sp. n. ii 158  
*corticis* sp. n. ii 168  
*costatum* sp. n. ii 157  
*crassicornis* Blackb. ii 160  
*cupreum* sp. n. ii 159  
*dilatatipes* sp. n. ii 156  
*dubiosum* sp. n. ii 164  
*flexirostre* sp. n. ii 164  
*graciliforme* sp. n. ii 163  
*grande* sp. n. ii 167  
*haleakalae* sp. n. ii 160  
*halticoides* Blackb. ii 169, iii 654  
*hawaiiense* sp. n. iii 655  
*infernum* Blackb. ii 172  
*insulare* Blackb. ii 170  
*konanum* sp. n. ii 171  
*leithorax* sp. n. ii 164  
*longicorne* sp. n. ii 157  
*longirostre* sp. n. ii 155  
*mauiense* Blackb. ii 170  
*mokaiense* sp. n. ii 158  
*montanum* sp. n. ii 160  
*multiforme* sp. n. ii 171  
*nitidissimum* sp. n. ii 170  
*nicicola* Blackb. ii 156  
*oblongum* sp. n. ii 167  
*obscurum* Blackb. ii 161  
*olindae* Blackb. ii 155  
*pachysoma* sp. n. ii 168  
*parallellum* sp. n. ii 162, iii 654  
*pulchrum* sp. n. ii 166  
*puncticolle* sp. n. ii 165  
*punctulatissimum* sp. n. ii 157  
*purpurascens* sp. n. ii 166  
*ramulorum* sp. n. ii 163  
*robustum* Blackb. ii 169, iii 654  
*sculpturatum* Blackb. ii 170  
*solidum* sp. n. iii 654  
*striatum* sp. n. ii 165  
*substrictum* Blackb. ii 161  
*tardum* Blackb. ii 161  
*Oopsis nutator* Fabr. ii 114  
*Opatum seriatum* Boisid. ii 252  
**Opeas** junceus Gould ii 383  
*prestoni* Sykes ii 384  
*pyrgiscus* Pfeiff. ii 384  
*striolata* Pease ii 384  
**Ophelinus** mauianensis sp. n. i 329  
*hawaiiensis* sp. n. i 330  
**Ophiomedon** Sharp iii 545  
*incomptus* Sharp iii 545  
*subtilis* sp. n. iii 545  
**Ophioninae** ii 677  
*Ophion lineatus* Cam. i 341  
*nigricans* Cam. i 341  
**Ophthalmomyia** lacteipennis Loew iii 74  
**Ophrya** aenescens Wied. iii 30  
*leucostoma* Wied. iii 30  
**Opisthacantha** dubiosa sp. n. ii 623

- Opogona aurisquamosa* Btl. i 713, 737  
*dimidiatella* Z. i 712  
*Opogona dives* sp. n. i 711  
*maculata* sp. n. i 711  
*Opisicoteus biannulipes* Montr. & Sign. iii 150  
*Opuna* gen. n. iii 140  
*hawaiiensis* sp. n. iii 140, ii 553  
*Orchestia hawaiiensis* Dana ii 529  
*pickeringii* Dana ii 528  
*platensis* Kröy. ii 527  
*Oreomyza* Stejn. i 413  
*bairdi* Stejn. i 416  
*flammea* Wils. (*Parorconyza*) i 417  
*maculata* Cab. (*Parorconyza*) i 417  
*mana* Wils. i 416  
*montana* Wils. (*Parorconyza*) i 417  
*newtoni* Rothsch. (*Parorconyza*) i 417  
*perkinsi* Rothsch. i 417  
**Oribatidae** iii 702  
*Oribata alata* Herm. iii 703  
*globula* Nic. iii 702  
*lapidaria* Luc. iii 703  
*oriformis* sp. n. iii 703  
*ovalis* Nic. iii 703  
 Origin of fauna iii  
**Orneodiidae** i 477, 731, clxiii  
*Orneodes* Ltr. i 477, 731  
*objurgatella* sp. n. i 477, 731  
*Ornithoica confluenta* Say. iii 91  
*peroneura* var. n. iii 91  
*Ornithomyia varipes* Walk. iii 89  
*Oronomiris* gen. n. iii 144  
*hawaiiensis* iii 144  
*Orothreptes* gen. n. ii 147  
*callithrix* sp. n. ii 147, iii 655  
**Ortaliae** iii 44, iii 85, clxxvii  
*Ortalis annonae* Wied. iii 44  
*Orthocladus* sp. iii 5  
*Orthodera prasina* Burm. ii 7  
*Orthoeca* Dall. iii 159  
*nigriceps* Dall. iii 159  
*pacifica* Kirk. ii 545  
*periplanios* Kirk. ii 545  
*vineta* Say ii 545  
*Orthomecyna* Butl. i 240, iii 362  
*albicaudata* Butl. i 243  
*aloptila* sp. n. i 243  
*amphilyca* sp. n. i 245  
*aphanopsis* Meyr. i 244  
*chrysophanes* sp. n. i 243  
*crossias* sp. n. i 242, iii 362  
*cupreipennis* Butl. i 245  
*epicausta* sp. n. i 244  
*exigua* Meyr. i 245  
*heterodyas* sp. n. i 242  
*mesochasma* sp. n. i 244, iii 362  
*metalycia* sp. n. i 241  
*phaeophanes* sp. n. i 241  
*picrodes* sp. n. i 244  
*Orthomorpha gracilis* Koch iii 328  
*Orthoperus aequalis* Sharp iii 417  
*Orthoptera* ii 1, ii 687  
 Review of cxxi  
*Orthostolus* gen. n. iii 452  
*atratus* sp. n. iii 456  
*expers* Blackb. iii 455  
*germanus* sp. n. iii 454  
*guttatus* Sharp iii 454  
*kauaiensis* sp. n. iii 456  
*nepos* sp. n. iii 453  
*prosternalis* sp. n. iii 454  
*Orthostolus robustus* Sharp iii 452  
*robustus* var. *lanaiensis* var. n. iii 453  
*sordidus* Sharp iii 455  
*Orthotylus* Fieb. iii 132, ii 552  
*azalata* sp. n. iii 136  
*daphne* sp. n. iii 135  
*daphne* var. *kassandra* Kirk. ii 553, iii 135  
*iolani* sp. n. iii 133  
*kanakanus* sp. n. iii 134  
*kekele* sp. n. iii 134  
*perkinsi* sp. n. iii 133  
*Otiorynchini* ii 122  
*Oxacis collaris* Sharp ii 247, cxxvii  
*Oxya velox* Fab. ii 8  
*Oxytelini* iii 543  
*Oxytelus advena* Sharp iii 543  
*bledioides* Blackb. iii 543  
*ferrugineus* Kraatz iii 543  
*pygmaeus* Kraatz iii 543  
 sp. iii 543  
*Oxyurus vermicularis* Lutz ii 428  
*Pachymerinae* iii 159  
*Pachyneuron* Walk. i 656  
*Paederini* iii 544  
*Paedisca immersana* Wkr. i 690  
*Pagiopalus* gen. n. ii 499  
*atomarius* sp. n. ii 500, iii 343  
*nigriventris* sp. n. ii 502  
*personatus* sp. n. ii 501  
*semipunctatus* sp. n. ii 501  
*Palmeria* i 405, lxxii  
*dolii* Wils. i 407  
**Paludestrinidae** ii 396  
*Paludestrina porrecta* Migh. ii 396  
*Paludina porrecta* Migh. ii 396  
*Pamera* Leth. & Sev. iii 159  
*nigriceps* Stål iii 159  
*vineta* Stål ii 545  
*Panaphelix* gen. n. i 695  
*marmorata* sp. n. i 696  
 sp. i 697  
*Panchlora maderae* F. ii 690  
*Pandemis consociata* Wkr. i 690  
*secundana* Wkr. i 690  
*Pandion haliaetus* Linn. i 447  
*Pantala flavescens* Fab. ii 62  
*Pantomorus fulleri* Horn. iii 653, cxx  
*olindae* sp. n. ii 130, iii 653  
*Papuina barnaclei* Smith ii 292  
*Parandra puncticeps* Sharp ii 95  
*Parandrita aenea* Sharp iii 426  
*gracilis* sp. n. iii 427  
*konae* sp. n. iii 426  
*liturata* sp. n. iii 427  
*molokaiiae* sp. n. iii 427  
*perkinsi* sp. n. iii 426  
*Paranemobius schauinslandi* Alfkr. ii 688  
*Paraphasis* gen. n. i 730  
*perkinsi* sp. n. i 730  
*Paraphelinus xiphidii* Perk. ii 658  
*Pararrhaptica* gen. n. i 689  
*perkinsana* sp. n. i 689  
*Paratenopoda sinensis* Sauss. ii 689  
*Paratrigonidium* Brunn. ii 15, xxviii, xxx, xlix, lxxviii  
*atroferrugineum* Brunn. ii 17  
*attenuatum* sp. n. ii 20  
*crepitans* sp. n. ii 19  
*debile* sp. n. ii 21  
*exiguum* sp. n. ii 21  
*filicum* sp. n. ii 17

- Paratrigonidium freycinetiae sp. n. ii 16  
     grande sp. n. ii 19  
     molokaiense sp. n. ii 20  
     pacificum Scudd. ii 22  
     robustum sp. n. ii 20  
     roseum sp. n. ii 16  
     saltator sp. n. ii 16  
     subroscum sp. n. ii 17  
     varians sp. n. ii 18  
     viridescens sp. n. ii 18  
 Parlatoria proteus Rur. iii 110  
     proteus var. pergandii Comst. iii 110  
     zizyphi Newst. iii 110  
 Parorchestia hawaiiensis Dana ii 529  
 Partula auricula Fér. ii 375  
     densilineata Reeve ii 317  
     dumartroyi Soul. ii 375  
     pusilla Gould ii 379  
     terrestris Pease ii 399  
     virgulata Migh. ii 320  
 Partulina Pfeiff. ii 311  
     hayseldeni Baldw. ii 313  
     proxima Pease ii 316  
 Patula digonophora Ancey ii 292  
 Paucity of individuals xxxviii  
 Pelopaeus caementarius i 8  
**Pemphredonidae** ii 605, lxxxiv  
 Pennula Dole i 453  
     caudata King i 454  
 Pentarthron flavum sp. n. ii 660  
     semifumatum sp. n. ii 659  
 Pentarthron blackburni Sharp ii 147, iii 655  
     obscurum Sharp ii 146  
     prolixum Sharp ii 146  
 Pentatoma insularis Dall. iii 172  
 Perdicella Pease ii 329  
     fulgurans sp. n. ii 329  
     helena Newc. ii 330  
     mauiensis Pfeiff. ii 330  
     minuscula Pfeiff. ii 330  
     ornata Newc. ii 330  
     theodorei Baldw. ii 330  
     zebra Newc. ii 330  
     zebrina Pfeiff. ii 331  
 Peregrinus maidis Ashm. ii 577  
 Perichaeta amazonica Rosa ii 420  
     bermudensis Bedd. ii 420  
     cupulifera Fed. ii 420  
     floweri Benh. ii 414  
     hawayana Rosa ii 420  
     hesperidum Bedd. ii 417  
     heterochaeta Mich. ii 416  
     indica Mich. ii 416  
     mandhorrens Mich. ii 420  
     mauritianae Bedd. ii 420  
     morrisi Bedd. ii 420  
     pallida Mich. ii 420  
     peregrina Fletch. ii 414  
     sandvicensis Id. ii 417  
     tritrypha Bedd. ii 426  
     vesiculata Coto & Hat. ii 426  
 Periplaneta americana L. ii 6  
     australasiae Fab. ii 7  
 Perkinsiella saccharicida Kirk. ii 578  
 Peropus mutilatus Stejn. i 367  
 Phaenopria ambulator sp. n. ii 627  
     frater sp. n. ii 626  
     hawaiiensis sp. n. i 296  
     hylaea sp. n. ii 628  
     montana sp. n. ii 628  
     soror sp. n. ii 627  
 Phaenopria subtilis sp. n. ii 627  
 Phaenogramma gen. n. iii 47  
     vittipennis sp. n. iii 48  
 Phaeornis Sclater i 377, xxxi  
     lanaiensis Wils. i 378  
     myiadesina Stejn. i 378  
     oahuensis Blos. i 378  
     obscura Gmel. i 378  
     palmeri Rothsch. i 379  
 Phaethon lepturus L. & D. i 462  
     rubricauda Bodd. i 462  
 Phalaena curtisella Don. (coenobitella) i 651  
 Phalaenesthes Kirk. iii 117  
     schauslandti Kirk. iii 117  
 Phalaropus fulicarius L. i 453  
     lobatus Linn. i 453  
 Phanerotoma hawaiiensis sp. n. i 360  
 Pheidole megacephala Fab. i 118, xxxix, xli, ci  
 Philodoria gen. n. i 717, 737  
     aeromagnifica sp. n. i 718  
     basalis sp. n. i 720  
     floscula sp. n. i 718  
     micropetala sp. n. i 719  
     nigrella sp. n. i 721  
     splendida sp. n. i 719, 737  
     succedanea sp. n. i 717  
 Philodrominae ii 496  
 Philomyces bilineatus Pens. ii 286  
 Philonesia gen. n. ii 280  
     abellei Ancey ii 280  
     baldwini Ancey ii 281  
     boettgeriana Ancey ii 283  
     cicerula Gould ii 283  
     exaequata Gould ii 283  
     hartmanni Ancey ii 283  
     indefinita Ancey ii 284  
     lymaniana Ancey ii 284  
     oahuensis Ancey ii 284  
     perkinsi Sykes ii 284  
     perlucens Ancey ii 284  
     platyla Ancey ii 284  
     plicosa Ancey ii 285  
     sericans Ancey ii 285  
     subrutula Migh. ii 285  
     subtilissima Gould ii 285  
     turgida Ancey ii 285  
 Philonthus discoideus Grav. iii 548  
     nauticus Fairm. iii 548  
     nigritulus Grav. iii 548  
     seybalarus Nordm. iii 547  
     turbidus Grav. iii 548  
 Philoscia angusticauda Budde-Lund ii 525  
 Phloeophagosoma tenuis Gemm. ii 149  
 Phloeopora cingulata Sharp iii 577  
     diluta Sharp iii 577  
 Phloeothripidae Hal. iii 677  
 Phlyctaenia Hub. i 206, iii 359  
     argoscelis Meyr. i 217  
     caliastrea sp. n. i 207  
     caminopsis sp. n. i 215  
     chalcophanes sp. n. i 209  
     chytropa sp. n. i 210  
     despecta Butl. i 217, iii 360  
     endopyra sp. n. i 219, iii 360  
     ennychioides Butl. i 216, iii 359  
     ephippias sp. n. i 210  
     eucrena Meyr. i 213  
     heterodoxa sp. n. i 220  
     hyacinthis sp. n. i 208  
     iocrossa sp. n. i 212  
     lampadias sp. n. iii 359

- Phlyctaenia liois sp. n. i 218  
   metasema sp. n. i 214  
   micacea Butl. i 212, iii 359  
   monticolans Butl. i 211, iii 359  
   nigrescens Butl. i 211, iii 359  
   ommatias sp. n. i 215  
   pachygramma sp. n. i 216  
   platyleuca sp. n. i 214  
   pyranthes sp. n. i 220  
   rhodias sp. n. i 219  
   stellata Butl. iii 359  
   synastra sp. n. i 208, iii 359
- Pholcidae** ii 446
- Pholcus distinctus Camb. ii 446  
   elongatus Vins. ii 446  
   margarita Workm. ii 446  
   phalangioides Dol. ii 446  
   tipuloides Koch ii 446
- Phora sp. n. iii 76
- Phomia regina Meig. iii 28
- Phoxopterus rufipennis Btl. i 680
- Phrynomorphini iii 555
- Phrynomorphus hospes Kirk. ii 576
- Pthorimacea operculella Z. i 483, 485, 731
- Phycitidae** iii 355, clvi
- Phyllodromia germanica L. ii 5  
   hieroglyphica Brunn. ii 5  
   hospes sp. n. ii 5  
   obtusa Brunn. ii 5
- Physa flavida Cless. ii 391  
   hartmanni Cless. ii 392  
   moreletiana Cless. ii 392  
   naticoides Cless. ii 392  
   peasei Cless. ii 393  
   reticulata Gould ii 393  
   sandwichensis Cless. ii 391
- Physopleurella mundula White ii 551, iii 126
- Physopus rubricincta Giar iii 699
- Pieris rapae cliv
- Piestini iii 538
- Piliotrix bicolor sp. n. i 299
- Pimpla Fabr. i 339, ii 676  
   hawaiiensis Cam. i 339, ii 676
- Piophilidae Linn. iii 48
- Pipunculidae** ii 697, iii 17, clxxxiii
- Pipunculus acrothrix sp. n. ii 698  
   hawaiiensis Perk. ii 699  
   holomelas sp. n. ii 698  
   juvator Perk. ii 699  
   molokaiensis sp. n. iii 17  
   nigrotarsatus sp. n. iii 18  
   oahuensis Perk. ii 699  
   pyrophilus sp. n. ii 698  
   rotundipennis sp. n. iii 18  
   sp. iii 19  
   swezeyi Perk. ii 699  
   terryi Perk. ii 699  
   vulcanus sp. n. ii 697
- Pison hospes i 14  
   iridipennis i 14  
   sp. ii 606
- Pityis elisae Ancey ii 290
- Plagithmysides ii 98
- Plagithmysus Motsch. ii 104, xxvi, cxvi  
   aequalis Sharp ii 112  
   aestivus Sharp ii 111  
   arachnipes Sharp ii 112  
   bilineatus Sharp ii 108  
   bishopi Sharp ii 108, lxxviii  
   blackburni Sharp ii 111  
   collaris sp. n. ii 107
- Plagithmysus concolor Sharp ii 106  
   cristatus Sharp ii 113, iii 650  
   cuneatus Sharp ii 106  
   darwinianus Sharp ii 109, lxxvii  
   diana sp. n. ii 107  
   elegans sp. n. iii 648  
   finschi Har. ii 106  
   fractus sp. n. iii 646  
   funebrius Sharp ii 106  
   giffardi Perk. iii 646  
   immundus sp. n. iii 646  
   lamarckianus sp. n. ii 110, lxxvii  
   lanaiensis Sharp ii 108  
   munroi sp. n. ii 112  
   newelli Sharp ii 105  
   perkinsi Sharp ii 109  
   permundus sp. n. ii 105  
   pulverulentus Motsch. ii 107  
   pervillatus Karsch ii 111  
   simplicicollis sp. n. iii 648  
   solitarius Sharp ii 106, iii 647  
   speculifer Sharp ii 111  
   sulphurescens Sharp ii 111  
   varians Sharp ii 109  
   varians Sharp var. ii 110  
   vicinus Sharp ii 108, lxxviii  
   vitticollis Sharp ii 105  
   vitticollis var. longulus ii 105
- Planchonia pustulans Cook. iii 104
- Plants, introduced xxv
- Platydema obscurum Sharp ii 252
- Platygasteridae** ii 626, ciii
- Platygaster lecanii Fitch i 328
- Platyhelminthes ii 429
- Platymschoidea gen. n. i 296  
   molokaiensis sp. n. i 296
- Platynus Bon. iii 228  
   ambiens sp. n. iii 228  
   calathiformis sp. n. iii 229  
   planus Karsch iii 216
- Platypini ii 182
- Platypitia Hb. i 472, 731  
   brachymorpha Meyr. i 474  
   cosmodaetyla Btl. i 472  
   fuscicornis Z. i 472, 731  
   insularis sp. n. i 475  
   littoralis Btl. i 476  
   repletalis Btl. i 475  
   rhyncophora Meyr. i 475
- Platyura fuscocostata sp. n. iii 2  
   hawaiiensis sp. n. iii 3  
   insularis sp. n. iii 4
- Plegadis guarana L. i 456
- Pleuroneuriphon hawaiiensis sp. n. i 342
- Plexippus ardeio Thor. ii 511  
   ligo Koch ii 512  
   paykulli Aud. ii 512
- Plochionus bonfilsii Dej. iii 288  
   pallens Fabr. iii 288
- Plodia interpunctella Hub. i 195
- Ploiariinae iii 151
- Ploiariodes White iii 151  
   pulchra Blackb. iii 152  
   rubromaculata Blackb. iii 151  
   whitei White iii 151
- Ploiariola Reut. iii 151
- Plusiidae** i 153, iii 347, cxlviii
- Plusia Ochs. i 159, iii 348  
   biloba Steph. i 159  
   chalctes Esp. iii 349  
   chalctes (verticillata) i 159

- Plusia pterygota* sp. n. iii 348  
*Plutella albovenosa* sp. n. i 653  
*annulatelus* Wd. i 652  
*brassicella* Fitch i 652  
*cicerella* Rndl. i 652  
*cruciferarum* Z. i 652  
*dubiosella* Beut. i 652  
*galeatella* Mab. i 652  
*limbipennella* Clms. i 652  
*maculipennis* Crt. i 652  
*mollipedella* Clms. i 652  
*xylostella* Hb. i 652  
**Poeciloptera** iii 116, cciv  
*Poeciloptera acuta* Walk. iii 117  
*Pogonomyrmex occidentalis* i 119  
*Polistes aurifer* i 29  
*hebraeus* i 30  
*Polyamma* Kri. i 336  
*Polyneura* Hal. i 332, ii 661  
*apicalis* sp. n. ii 665  
*ciliata* sp. n. ii 666  
*gigas* sp. n. ii 661  
*hawaiiensis* sp. n. i 332  
*jassidarum* sp. n. ii 666  
*nana* sp. n. ii 667  
*oahuensis* sp. n. ii 664  
*perforator* sp. n. ii 665  
*pyrophila* sp. n. ii 662  
*reduvii* Perk. ii 667  
*rubriventris* sp. n. ii 663  
*scrutator* sp. n. ii 663  
*tantalea* sp. n. ii 664  
*terrestris* sp. n. ii 662  
*triscia* sp. n. ii 664  
*Polyxenus hawaiiensis* sp. n. iii 327  
*Polyzosteria soror* Brunn. ii 6  
*Ponera* *gleadowii* decipiens i 118  
*kalakanae* sp. n. i 116  
*perkinsi* sp. n. i 117  
*Pontocolex hawaiiensis* Bedd. ii 414  
*Porcellio laevis* Latr. ii 524  
*scaber* Latr. ii 524  
*Prays* Hb. i 651, 735  
*fulvocanellus* sp. n. i 652, 735  
*Prenolepis bourbonica hawaiiensis* i 120  
*longicornis* i 120  
*obscura* i 120  
*sharpii* i 121, xlii  
*Prionini* ii 95  
*Prionopteryx exonoma* sp. n. i 198  
*Priperia* gen. n. iii 340  
*bicolor* sp. n. iii 340  
*Pristomerus hawaiiensis* sp. n. ii 680  
*hilaris* sp. n. ii 681  
*Proctotrupoidea* ii 616, ciii  
*Proctotrypes hawaiiensis* sp. n. i 294  
*Prodisonechus* gen. n. iii 210  
*terebatus* Blackb. iii 211  
*Proernus* nom. n. ii 497  
*aculeatus* sp. n. ii 498  
*castaneus* sp. n. ii 498  
*schaunslandi* Sim. ii 497, iii 343  
*velox* sp. n. ii 499, iii 343  
*Prognothogryllus* ii 22  
*Prognothogryllus* Brunn. ii 24, ii 689, xlix  
*alatus* Brunn. ii 24  
*elongatus* sp. n. ii 25  
*forficularis* Brunn. ii 29  
*inexpectatus* sp. n. ii 26  
*robustus* sp. n. ii 25  
*oahuensis* sp. n. ii 25  
*Prognostola* gen. n. i 167  
*cremnopis* sp. n. i 167  
*Promecoderus fossulatus* Karsch iii 211  
*Promylaea* gen. n. i 227  
*pyropa* sp. n. i 227  
*Propalticus* Sharp iii 420  
*oculatus* Sharp iii 421, cxxxiii  
**Prospodidae** ii 601, lxxviii  
*Prosopis anthracina* Sm. i 100  
*flavifrons* i 101  
*hilaris* Sm. i 103  
*kona* Bl. i 82  
*rugiventris* Bl. & C. i 100  
*volatilis* Sm. i 105  
*Prosopius banksii* Fabr. ii 114  
*Prostethochaeta* gen. n. iii 24  
*fasciata* sp. n. iii 25  
*luciooides* sp. n. iii 25  
*obscura* sp. n. iii 25  
*robusta* sp. n. iii 24  
*ssp.* iii 26  
*Protapanteles hawaiiensis* i 362  
*Protaulacis* gen. n. i 246  
*cataphaea* sp. n. i 246  
*Proteopteryx blackburnii* Btl. i 675  
*walsinghamii* Btl. i 684  
**Proterhinidae** ii 183, iii 656, ccxv  
*Proterhinus adelus* sp. n. ii 202, iii 657  
*adelus* var. *chrysaedus* var. n. iii 658  
*adelus* var. *constricticeps* var. n. iii 658  
*affinis* sp. n. ii 238  
*alysiae* sp. n. ii 244  
*amaurodes* sp. n. ii 190  
*analis* sp. n. ii 230  
*angularis* Sharp ii 243, iii 659  
*angustiformis* sp. n. ii 197  
*angustior* sp. n. ii 235  
*anthracinus* sp. n. ii 185  
*antiquus* sp. n. ii 193  
*archaeus* sp. n. ii 209, iii 666  
*arhopalus* sp. n. ii 219  
*basalis* Sharp ii 187  
*binotatus* sp. n. ii 191  
*blackburni* Sharp ii 246, iii 666  
*breviformis* sp. n. ii 229  
*brevipennis* sp. n. ii 218  
*calliphyas* sp. n. ii 224  
*cognatus* sp. n. ii 197  
*colaris* Sharp ii 190  
*comes* sp. n. ii 213  
*compactus* sp. n. ii 203  
*convexiusculus* sp. n. ii 232  
*crassicornis* sp. n. ii 185  
*debilis* Sharp ii 245  
*deceptor* sp. n. ii 245, iii 664, lxi  
*deinops* sp. n. ii 201, iii 661  
*denudatus* sp. n. ii 203, iii 661  
*desquamatus* sp. n. ii 240  
*detritus* Sharp ii 228  
*difficilis* sp. n. ii 188  
*dispar* Sharp ii 243, iii 663  
*dubiosus* sp. n. ii 187  
*echidna* sp. n. iii 658  
*echinoides* sp. n. ii 232  
*epichlorus* sp. n. ii 230  
*epichrysus* sp. n. ii 218  
*epimelas* sp. n. ii 226  
*epitrichus* sp. n. ii 220  
*epitretus* sp. n. ii 229  
*erythrodes* sp. n. ii 234  
*eugonias* sp. n. ii 186

- Proterhinus eulepis* sp. n. ii 188  
*eurhopalis* sp. n. ii 196  
*eurhynchus* sp. n. ii 239  
*excrucians* sp. n. iii 662  
*facilis* sp. n. iii 663  
*ferrugineus* sp. n. ii 241  
*gigas* sp. n. ii 185  
*gracilis* Sharp ii 238  
*haleakalae* sp. n. ii 219  
*hawaiiensis* sp. n. ii 236  
*hemichlorus* sp. n. ii 217  
*homocochromus* sp. n. ii 197  
*heterostictus* sp. n. iii 661  
*heterotarsus* sp. n. ii 234  
*humeralis* Sharp ii 217  
*hypotretus* sp. n. ii 240  
*ineptus* Sharp ii 228  
*innotabilis* sp. n. ii 242  
*insignis* Sharp ii 227  
*integer* Sharp ii 228  
*kaalae* sp. n. ii 209  
*kamparthrus* sp. n. ii 199  
*lanaiensis* sp. n. ii 227  
*laticollis* Blackb. ii 211  
*laticornis* sp. n. ii 196  
*lecontei* Sharp ii 213  
*leiorhynchus* sp. n. ii 200, iii 656  
*leptophyas* sp. n. ii 198  
*leptorhynchus* sp. n. ii 222  
*leptothrix* sp. n. ii 207  
*leucothorax* sp. n. ii 233  
*linearis* Blackb. ii 198  
*longicornis* Sharp ii 227  
*longulus* Sharp ii 208, iii 660  
*maculatus* sp. n. ii 221  
*maculifer* sp. n. ii 198  
*maurus* sp. n. iii 658  
*megalotarsus* sp. n. ii 216  
*microtarsus* sp. n. ii 215  
*minimus* sp. n. iii 666  
*mirabilis* sp. n. ii 223  
*molokaiensis* sp. n. ii 231  
*myrsineoides* sp. n. iii 659  
*myrsineus* sp. n. iii 659  
*navita* sp. n. ii 244  
*neglectus* sp. n. ii 189  
*nigricans* Sharp ii 191  
*nivicola* sp. n. ii 225  
*oahuensis* sp. n. ii 208  
*obscuricolor* sp. n. ii 202, iii 660  
*obscurus* Sharp ii 210, iii 663  
*ombrophilus* sp. n. ii 235  
*oscillans* Sharp ii 210, iii 664  
*osclans* sp. n. ii 222  
*oxygonias* sp. n. ii 206  
*pachygnemius* sp. n. ii 211, iii 664  
*paradoxus* Sharp ii 208  
*peles* sp. n. ii 237  
*persimilis* sp. n. ii 224  
*pipturi* sp. n. iii 665  
*platygonias* sp. n. ii 204  
*platygonioides* sp. n. iii 661  
*podagricus* sp. n. iii 656  
*pteridis* sp. n. ii 235  
*punctipennis* Sharp ii 225  
*pusillus* Sharp ii 212, iii 665  
*pusillus* var. *subpusillus* var. n. iii 665  
*robustus* Blackb. ii 205  
*rufescens* sp. n. ii 237  
*ruficollis* sp. n. ii 226  
*ruficornis* sp. n. ii 200, iii 657
- Proterhinus scutatus* Blackb. ii 192  
*separandus* sp. n. ii 221  
*serricornis* sp. n. ii 195  
*setticollis* sp. n. ii 207, iii 661  
*setiger* sp. n. ii 193  
*setulosus* sp. n. ii 192  
*sharpi* sp. n. ii 213  
*similis* Blackb. ii 241  
*simplex* Sharp ii 206  
*solitarius* sp. n. ii 193  
*squalidus* sp. n. ii 194  
*squamicollis* sp. n. ii 201, iii 657  
*sternalioides* sp. n. ii 215  
*sternalis* Sharp ii 215  
*subangularis* sp. n. iii 660  
*subdeceptor* sp. n. iii 664  
*subplanatus* sp. n. ii 205, iii 660  
*tarsalis* Blackb. ii 239  
*transversalis* sp. n. iii 662  
*tuberculiceps* sp. n. ii 214  
*validus* Sharp ii 212  
*vestitus* Sharp ii 205, iii 662  
*vicinus* sp. n. ii 212, iii 665  
*vulcanus* sp. n. ii 236  
*wikstroemiae* sp. n. ii 195
- Proterocosma triplanetis* Meyr. i 314  
*Protocolletis constricta* Meyr. i 225  
*Protoparce blackburni* Butl. i 193  
*Psallus sharpianus* sp. n. iii 131  
*Psammодиус* Serv. iii 402  
*Psammoechus* Latr. iii 427  
*desjardinsii* Guér. iii 428  
*insularis* Sharp iii 428  
*pallidipennis* Blackb. iii 428
- Psecadia* Hb. i 507  
*Pseudobaeus* gen. n. ii 620  
*peregrinus* sp. n. ii 621  
*Pseudobrocus* gen. n. iii 196  
*lentus* sp. n. iii 196  
*Pseudoclerada* gen. n. iii 140  
*kilaueae* Kirk. ii 553  
*morai* sp. n. iii 141, ii 553  
*Pseudococcus adonidium* Linné iii 103  
*albizziae* Mask. iii 103  
*calceolariae* Mask. iii 103  
*citri* Risso iii 103  
*vastator* Mask. iii 103  
*virgatus* Cock. iii 103
- Pseudocoremia paludicola* Butl. i 179  
**Pseudocorylophidae** Matth. iii 431  
*Pseudohyalina kauaiensis* Pfeiff. ii 279  
*Pseudolus hospes* sp. n. ii 149, iii 656  
*longulus* Boh. ii 149
- Pseudonestor* Rothsch. i 431, lxxii  
*xanthophrys* Rothsch. i 432
- Pseudopsectra* gen. n. ii 46, xlix  
*lobipennis* sp. n. ii 46  
*Pseudopterocheilus* ii 607  
*Pseudopterocheilus congruus* Sm. ii 607  
*pterocheiloides* Perk. ii 607  
*relictus* Perk. ii 607
- Psilopus patellifer* Thoms. iii 11  
*Psittaciostro* Temm. i 433, lxii  
*psittacea* Gmel. i 435
- Psocidae** ii 77  
*Psocoptera* clxxv  
*Psocus distinguendus* sp. n. ii 80  
*haleakalae* sp. n. ii 77  
*heterogamias* sp. n. ii 82  
*hualalai* sp. n. ii 79  
*kauaiensis* sp. n. ii 79

- Psocus konae* sp. n. ii 79  
*lanaiensis* sp. n. ii 81  
*mokaiensis* sp. n. ii 80  
*monticola* sp. n. ii 82  
*oahuensis* sp. n. ii 81  
*simulator* sp. n. ii 78  
*sylvestris* sp. n. ii 81  
*unicus* sp. n. ii 78  
*vittipennis* sp. n. ii 82
- Psychra* gen. n. i 489  
*brevipalpis* sp. n. i 490  
*phycidiformis* sp. n. i 490
- Psychodidae** iii 6, clxxx  
*Psychoda inornata* sp. n. iii 6
- Psyllidae** iii 113  
*Pterelis schaumslandi* Sim. ii 497  
*Ptericoptides* ii 114  
*Pterodiscus digonophorus* Ancey ii 292  
*petasus* Ancey ii 292  
*wesleyi* Sykes ii 292
- Pteromalidae** i 323, ii 655, cvi  
*Pteromalus fuscitarsis* sp. n. i 323  
*Pterophorina* i 471, 731, clxii  
*Pterostichides* iii 243, lvi
- Ptiliodes blackburni* Matth. iii 536  
*insignis* sp. n. iii 536  
*pulchellus* sp. n. iii 537  
*Ptinella pacifica* Matth. iii 537  
*Ptychothrix* gen. n. i 489  
*vagans* sp. n. i 489
- Puffinus cuneatus* Salv. i 463  
*newelli* Hensh. i 463
- Pulvinaria mammeae* Mask. iii 104  
*psidii* Mask. iii 104
- Pandaluoya simplicia* Dist. ii 577
- Pupidae** ii 293  
*Pupa acanthinula* Ancey ii 294  
*admodesta* Mlgh. ii 294  
*bacca* Pease ii 294  
*costata* Pease ii 294  
*costulosa* Pease ii 295  
*lyonsiana* Ancey ii 294  
*lyrata* Gould ii 294  
*magdalenae* Ancey ii 294  
*mirabilis* Ancey ii 295  
*nacca* Gould ii 295  
*newcombi* Pfeiffer ii 295  
*pediculus* Shutt. ii 295  
*peponum* Gould ii 380  
*peponum* Gould ii 382  
*perlonga* Pease ii 295  
*seminulum* Boettg. ii 295  
*striatula* Pease ii 294
- Pycnophion fuscipennis* sp. n. ii 680  
*kauaiensis* sp. n. i 344  
*mokaiensis* sp. n. i 344
- Pyralidae** i 275, iii 365  
*Pyralidina* i 731  
*Pyralis* Linn. iii 365  
*Boisd.* iii 365  
*achatina* Butl. i 275  
*griotiana* F. i 709  
*manihotalis* Guen. i 275  
*mauritalis* Boisd. i 275
- Pyrameis atalanta* etc. xxix  
*cordella* Doubl. i 193
- Pyraustidae** iii 356, clvii  
*Pyrausta schranck* i 220, iii 360  
*brontias* sp. n. i 223  
*bryochloris* sp. n. i 221  
*chloropis* sp. n. i 222
- Pyrausta constricta* Butl. i 224, iii 360  
*dracontis* sp. n. i 221  
*dryadopa* sp. n. i 222  
*litorea* Butl. i 224, xxv  
*phoebontia* sp. n. i 225  
*psychropa* sp. n. i 224  
*thermantis* sp. n. i 223
- Pyroderes** HS. i 514
- Pyrrhocoridae** iii 158
- Querquedula carolinensis* Linn. i 461
- Rainfall xxiii  
*Reclada moesta* White iii 160  
*Recurvaria sareita* Hw. i 649
- Reduviidae** iii 149, ii 550, cxviii  
*Reduviinae* iii 150  
*Reduviolus Kirby* iii 153, ii 546, xlix, lxviii, cxv  
*arrogans* Kirk. ii 547  
*blackburni* White iii 155, ii 546  
*capsiformis* ii 546, cxv  
*curtipennis* Blackb. ii 549  
*innotatus* iii 154, ii 546  
*kahavalu* Kirk. ii 546  
*kaonohiua* Kirk. ii 548  
*kerasphoros* Kirk. ii 549  
*koelensis* Blackb. ii 547  
*lotupe* Kirk. ii 549  
*lusciosus* iii 157, ii 548  
*milu* ii 549  
*monticola* Kirk. ii 548  
*montivagus* Kirk. ii 548  
*morai* sp. n. iii 155, ii 547  
*nubigenus* Kirk. ii 547  
*occellans* Blackb. ii 547  
*paludicola* Kirk. ii 549  
*procellaris* Kirk. ii 548  
*rubritinctus* iii 157, ii 549  
*sharpianus* sp. n. iii 156  
*silvestris* Kirk. ii 549  
*silvicola* Kirk. ii 548  
*subrufus* iii 156, ii 547  
*tarai* sp. n. iii 154  
*truculentus* Kirk. ii 547  
*volcanicola* Kirk. ii 548
- Reduvius laniger* Butl. iii 150
- Reptilia** i 365  
*Rhantus pacificus* Sharp iii 289  
*Rhinia testacea* Desv. iii 83  
*Rhinomactrum* gen. n. i 531  
*rutilellum* sp. n. i 531  
*scapulellum* sp. n. i 531
- Rhizophagus capito* Fairm. iii 434  
*Rhodacanthis* Rothsch. i 436, lxxii  
*flaviceps* Rothsch. i 438  
*palmeri* Rothsch. i 438
- Rhodaria despecta* Butl. i 217  
*Rhopalus* Schill. iii 170  
*hyalinus* Fabr. iii 170, exciii  
*Rhygchium nigripennis* Holm. i 70  
*Rhyncogonus blackburni* Sharp ii 126  
*depressus* sp. n. ii 128  
*dubius* sp. n. ii 125  
*extraneus* sp. n. iii 651  
*freycinetiae* sp. n. ii 126  
*funereus* sp. n. ii 123  
*fuscus* sp. n. iii 652  
*kauaiensis* sp. n. ii 127  
*koelensis* sp. n. ii 126, iii 653  
*lahaina* sp. n. ii 128  
*lanaiensis* sp. n. ii 128

- Rhyncogonus minor sp. n. ii 124  
 molokaiensis sp. n. ii 125  
 nitidus sp. n. ii 122  
 oleae sp. n. iii 652  
 sharpi sp. n. iii 650  
 simplex sp. n. iii 651  
 sordidus sp. n. ii 127  
 squamiger sp. n. ii 123  
 stygius sp. n. ii 124  
 sylvicola sp. n. ii 130  
 tuberculatus sp. n. ii 129  
 vestitus Sharp ii 130, xxv  
 vittatus sp. n. ii 129
- Rhyncolus gracilis Boh. ii 149  
 longulus Boh. ii 149  
 tenuis Gemm. ii 149
- Rhynchopimpla Kriechb. i 336  
 Rhyparochromus nigriceps Dall. iii 159
- Rhysodidae** iii 429  
 Rhyzodes liratus Chevrr. iii 429  
 Rhyzopertha dominica Fabr. iii 643  
 pusilla Steph. iii 643
- Rhipidophora Hb. i 477
- Sacium angusticolle sp. n. iii 416  
 Salbia continuatalis Wall. i 205  
 Salda exulans White iii 146  
 oahuensis Blackb. iii 146
- Salcius acutus Blackw. ii 511  
 citus Cambr. ii 511  
 ruficapillus Dol. ii 511  
 scabellatus Butl. ii 511  
 striatus Luc. ii 511  
 vaillanti Luc. ii 512
- Sandalodes Keyserl. ii 512  
 albociliatus sp. n. ii 514  
 canosus sp. n. ii 515  
 cruciatus sp. n. ii 516  
 navatus sp. n. ii 515  
 pubens sp. n. ii 513  
 seniculus sp. n. ii 517  
 validus sp. n. ii 514, iii 344  
 verecundus sp. n. ii 516, iii 344
- Saprinus lugens iii 510  
 oregonensis Lec. iii 510
- Sapromyza sp. iii 85, clxxxviii  
 Saproites pygmaeus Har. iii 402
- Sarcophagidae** iii 21, 83  
 Sarcophaga barbata Thoms. iii 26  
 dux Thoms. iii 27  
 pallinervis Thoms. iii 26
- Sargus sp. iii 11
- Sarona gen. n. iii 142  
 adonias sp. n. iii 142
- Saronychium inconspicuum Blackb. iii 288  
 Scaphisoma perkinsi sp. n. iii 534
- Scarabeidae** iii 401, cxxx  
 Scardia lignivora Btl. i 646, 647  
 Scatella hawaiiensis sp. n. iii 49, 85
- Scellonidae** ii 618, cii  
 Scenopinus niger Mg. iii 11, clxxxii  
 Schistoceros cornutus Pall. iii 642  
 Sciara molokaiensis sp. n. iii 2  
 Scieropepla typhicola Meyr. i 485
- Sciomyzidae** clxxxvii  
 Sciomyza hawaiiensis sp. n. iii 84  
 sp. iii 43
- Sciophagus pandanicola Fairm. ii 253
- Scleroderma breviventre sp. n. i 286  
 chlorodes sp. n. ii 613  
 cuprepes sp. n. ii 612
- Scleroderma kaalae sp. n. i 285  
 lanaiense sp. n. i 285  
 nigri ventre sp. n. i 285  
 perkinsi sp. n. i 284  
 poecilodes sp. n. ii 613  
 polynesiale Saund. i 284  
 sophorae sp. n. ii 614
- Sclerostomum armatum Dies. ii 428
- Scolothrips 6-maculatus Perg. iii 700
- Scolytidae** ii 173, cxxiii
- Scoparia Haw. i 246, iii 362  
 actias sp. n. i 256  
 aeolias sp. n. i 262  
 altivolans Butl. i 155  
 amphycypella sp. n. i 250  
 antimacha sp. n. i 252  
 balanopsis sp. n. i 250, iii 362  
 bucolica sp. n. i 263, iii 364  
 catactis sp. n. iii 363  
 clonodes sp. n. i 265  
 coarctata i 271  
 crataea sp. n. i 250  
 cryerodes sp. n. i 259  
 dactylopa sp. n. i 268  
 demodes Meyr. i 268, iii 364  
 empeda sp. n. i 267  
 epimystis sp. n. i 269  
 erebochalea sp. n. i 264  
 formosa Butl. i 257  
 frigida Butl. i 270, 272  
 geraea sp. n. i 269, iii 365  
 gonodecta sp. n. iii 362  
 halirrhoa sp. n. i 255  
 halmaea sp. n. i 272  
 halmaea Meyr. iii 365  
 hawaiiensis Butl. i 267, iii 364  
 ianthes sp. n. i 261, iii 364  
 ischmias Meyr. i 271  
 jucunda Butl. i 257  
 loxocentra sp. n. i 255  
 macrophanes Meyr. i 271  
 marmarias sp. n. i 261, iii 364  
 melanocephala sp. n. i 256  
 melanopsis Meyr. i 271, iii 365  
 melichlora sp. n. i 266  
 meristis sp. n. i 272, iii 365  
 mesoleuca sp. n. i 252, iii 363  
 miantis sp. n. i 252  
 montana Butl. i 271  
 nectararia sp. n. i 262  
 nyctombra sp. n. i 264  
 oenopsis sp. n. i 264  
 ombrodes Meyr. i 260, iii 364  
 omichlopis sp. n. i 274  
 orthoria sp. n. i 251  
 oxythyma sp. n. i 250  
 pachysema Meyr. i 254  
 parachlora sp. n. i 261  
 passalota sp. n. i 251  
 pentaspila sp. n. i 253  
 peronitis sp. n. i 270  
 platyscia sp. n. i 273  
 probolaea sp. n. i 273  
 pyrseutis sp. n. i 263, iii 364  
 religiosa sp. n. iii 365  
 rhombias sp. n. i 249, iii 362  
 siderina sp. n. i 260  
 struthias sp. n. i 257  
 tetranesa sp. n. i 249  
 thalamias sp. n. i 254  
 thyellopis sp. n. i 265

- Scoparia triacma* sp. n. i 258  
*tyraula* sp. n. i 253  
*venosa* Butl. i 274  
*zopiochloa* sp. n. i 266
- Scoptonoma* Z. i 460
- Scopula*  
*argoscelis* Meyr. i 217  
*constricta* Butl. i 224  
*despecta* Meyr. i 217  
*emynchioides* Meyr. i 216  
*eucrena* Meyr. i 213  
*exigua* i 217  
*litorea* Butl. i 224  
*micacea* Meyr. i 212  
*monticolans* Meyr. i 211  
*nigrescens* Meyr. i 211
- Scorpionis* ii 517
- Scotomera hydrophila* Butl. i 199
- Scotorythra* Butl. i 170, xxvi  
*anagraptis* sp. n. i 178  
*arboricolans* Butl. i 173, iii 350  
*artemidora* sp. n. i 186  
*auraea* sp. n. i 176  
*brachytarsa* sp. n. i 187, iii 354  
*capnopa* sp. n. i 183  
*caryopsis* sp. n. i 173, iii 350  
*corfica* Butl. i 174  
*demetrius* sp. n. i 180  
*dicercaunia* Meyr. iii 354  
*dissotis* sp. n. iii 351  
*epicyma* sp. n. i 174  
*euryphaea* sp. n. i 188, iii 354  
*goniastis* sp. n. i 180  
*hecataea* sp. n. i 177, iii 351  
*homotrius* sp. n. i 176, iii 351  
*hyparcha* sp. n. i 180  
*idolias* sp. n. i 178  
*isospora* sp. n. i 175  
*leptias* sp. n. iii 354  
*macrossoma* sp. n. i 185  
*megalophylla* sp. n. i 180, iii 355  
*metacrossa* sp. n. iii 352  
*nephelesticta* sp. n. i 183, iii 353  
*ortharcha* sp. n. i 181  
*oxyphractis* sp. n. i 181, iii 352  
*pachyspila* sp. n. i 185, iii 353  
*paludicola* Butl. i 179  
*paratactis* sp. n. iii 353  
*platycapna* sp. n. i 183  
*rara* Butl. i 187, iii 354  
*syngomopa* sp. n. i 172  
*trachyopsis* sp. n. i 184  
*trapezias* sp. n. i 177  
*triscia* sp. n. i 182, iii 353
- Scotosia rara* Butl. i 187  
*cortica* Butl. i 174
- Scymnus discedens* Sharp iii 414  
*ocellatus* Sharp iii 414  
*viduus* Sharp iii 414
- Scytodes marmorata* Koch iii 444
- Seldosemidae** iii 349, cl  
*Semiotocelis* Reut. iii 126  
*Semisulphurea* Stn. i 712
- Semnoprepia* gen. n. i 644  
*fulvogrisea* sp. n. i 644  
*margella* sp. n. i 645  
*petroptilota* sp. n. i 645
- Sephora* gen. n. iii 161  
*calvus* White iii 162, ii 536  
*criniger* White iii 161, ii 535
- Sericoderus basalis* Sharp iii 416  
*pupipennis* Sharp iii 417
- Setomorpha dryas* sp. n. i 726  
*rutella* Z. i 726  
 Sexual characters lxx
- Sierola*  
*Cam.* i 286, ii 614  
*collaris* sp. n. i 292  
*dichroma* sp. n. ii 614  
*flavocollaris* sp. n. i 291  
*kauaiensis* sp. n. i 292  
*leuconeura* Cam. i 289  
*molokaiensis* sp. n. i 290  
*monticola* Cam. i 289  
*oahuensis* sp. n. i 290  
*testaceipes* Cam. i 291
- Sierolomorpha hospes* sp. n. ii 616
- Silpha hirta* Marsh. iii 421  
*Silvanus surinamensis* Linn. iii 428  
*unidentatus* Fabr. iii 428
- Simodactylus cinnamomeus* Boisd. iii 369
- Simplicia caenuesalis* i 153  
*robustalis* Guen. i 153, iii 347
- Sinella Brooke* iii 300
- Sinoxylon conigerum* Gerst. iii 643
- Siphanta acuta* Walk. iii 117
- Sisyrophyta* gen. n. i 168  
*gomphias* sp. n. i 169, iii 349  
*ochettias* sp. n. i 169
- Smeringopus elongatus* Vins. ii 446
- Snow xxiii
- Solanella* Bdv. i 483
- Solenopsis geminata rufa* i 119
- Solenius* i 15
- Solindenia picticornis* Cam. i 314
- Sotenus setiger* Sharp. ii 97
- Sphaelotus crinigera* Butl. i 148
- Spalangia cameroni* sp. n. ii 656  
*hirta* Hal. i 325  
*lanaensis* sp. n. i 325  
*simplex* sp. n. ii 657
- Spathius perdebilis* sp. n. ii 685
- Species-formation* lxi
- Sphaeridium abdominale* Fabr. iii 579
- Sphaerococcus bambusae* Mask. iii 104
- Sphegidae** lxxxix
- Sphenophorus obscurus* Boisd. ii 139
- Sphingolabis hawaiiensis* Borm. ii 5
- Sphingidae** clii
- Sphinx convolvuli* Linn. (cingulata Fab.) i 193  
*celeus* Hübn. i 193
- Spiraxis cumingiana* Pfeiff. ii 373  
*obsoleta* Pfeiff. ii 366  
*paradoxa* Pfeiff. ii 374  
*sandwicensis* Pfeiff. ii 399
- Spodoptera exigua* Hübn. i 153  
*flavinaculata* i 153  
*mauritia* Boisd. i 152, iii 347
- Stagmatophora honorariella* sp. n. i 515  
*incertulella* Wkr. (*Proterocosmia*) i 515  
*quadrifasciata* sp. n. i 516  
*sordidella* sp. n. i 516  
*tridigitella* sp. n. (*Proterocosmia*) i 515
- Stagmopimpla* Sauss. i 336
- Staphylinidae** iii 538, cxxxvii
- Staphylinus discoideus* Grav. iii 548  
*maxillosus* L. iii 548  
*nigritulus* Grav. iii 548
- Stasilea curvicornis* Karsch. ii 114
- Steganopycha foetorivorus* Btl. i 673
- Stenagria curax* Sharp iii 578
- Stenamma longiceps* Sn. (*Ischnomyrmex*) i 118
- Stenocorus simplex* Gyll. ii 97

- Stenogyridae** ii 383  
*Stenopocus pulchripennis* sp. n. ii 83  
*Stenopterus pulverulentus* Motsch. ii 107  
*Sterna*  
*lanata* Peale i 464  
*melanucha* Temm. i 464  
*Stictomischus haleakalae* sp. n. i 311  
*Stigmus inordinatus* Fox ii 605  
*Stoeberhinus* Btl. i 485  
*testaceus* Btl. i 485, 733  
*Stomorhina* Rond. iii 28  
*pleuralis* Thoms. iii 28  
*Stomoxys* Geoffr. iii 28  
*calcitrans* Linn. iii 28  
**Stratiomyidae** iii 11, 79, clxxxii  
*Strepsilas interpres* Linn. i 449  
*Strepsiptera* iii 667  
*Stromatium hirtum* Fairm. ii 96  
*Strongyloides intestinalis* Bav. ii 428  
*Stylopyga decorata* Brunn. ii 6  
*Styrimomyia didyma* sp. n. iii 10  
*Succinea*  
*aperta* Lea ii 390  
*apicalis* Ancey ii 390  
*approximata* Shuttl. ii 390  
*aurulenta* Ancey ii 385  
*baldwini* Ancey ii 385  
*bicolorata* Ancey ii 385  
*caduca* Migh. ii 385  
*canella* Gould ii 385  
*casta* Ancey ii 386  
*cepulla* Gould ii 386  
*cinnamomea* Ancey ii 386  
*delicata* Ancey ii 386  
*elongata* Pease ii 386  
*explanata* Gould ii 387  
*fragilis* Soul. ii 386  
*garrettiana* Ancey ii 387  
*inconspicua* Ancey ii 387  
*komaensis* Sykes ii 387  
*latulenta* Ancey ii 387  
*lumbalis* Gould ii 387  
*mauiensis* Ancey ii 388  
*newcombi* Pfeiff. ii 389  
*newcombiana* Garr. ii 388  
*patula* Migh. ii 389  
*protracta* sp. n. ii 388  
*pudorina* Gould ii 390  
*punctata* Pfeiff. ii 388  
*rotundata* Gould ii 389  
*rubella* Pease ii 389  
*rubida* Pease ii 389  
*socileyeti* Ancey ii 386  
*tenerrima* Ancey ii 390  
*thaanurni* Ancey ii 389  
*venusta* Gould ii 389  
*vesicalis* Gould ii 390  
*waianacensis* Ancey ii 390  
*Sula*  
*fiber* L. i 462  
*piscator* L. i 462  
*Sulamita* gen. n. iii 129  
*dryas* Kirk. ii 552  
*lunalilo* sp. n. iii 130, ii 552  
*opuna* sp. n. iii 131  
*oreias* Kirk. ii 552  
*Sulamitaria* Div. n. iii 129  
*Sympetrum blackburni* McLachl. ii 62  
*Sympiesis konae* sp. n. i 331  
*Synaema* Sim. ii 492  
*dimidiatipes* sp. n. ii 493  
*fronto* sp. n. ii 493, iii 342  
*Synaema*  
*impotens* sp. n. ii 494  
*naevigerum* sp. n. ii 494  
*rufithorax* sp. n. iii 342  
*Synomotis* i 492  
*epicapna* Meyr. i 500  
*Syrirta oceanica* Macq. iii 19  
*Syroloma* gen. n. ii 509  
*major* sp. n. ii 509, iii 344  
*minor* sp. n. ii 510  
**Syrphidae** iii 19, iii 82, clxxxiv  
*Syrphus grandicornis* Macq. iii 19  
*obesus* Fabr. iii 19  
**Tachinidae** iii 20, 83, clxxxv  
*Tachyusa pumila* Sharp iii 577  
*Tachys*  
*arcanicola* Blackb. iii 287  
*atomus* Blackb. iii 287  
*mucescens* Blackb. iii 288  
*oahuensis* Blackb. iii 287  
*Taenia*  
*crassicolis* Rud. ii 434  
*solum* Lutz. ii 434  
*Talis floricolans* Butl. i 200, iii 356  
*geralea* sp. n. i 198  
*homoroda* sp. n. i 199, iii 356  
*hyacinthena* sp. n. i 200  
*hydrophila* Butl. i 199, iii 356  
*oxyptera* Meyr. i 199  
**Talitridae** ii 527  
*Tanytarsus lacteiclavus* sp. n. iii 5  
*Tapinoma melanocephalum* i 120, cii  
*Tarsostenus univittatus* Rossi iii 367  
*Tatara familiaris* xvii  
*Tebennophorus australis* Bergh ii 286  
*bilineatus* Bens. ii 286  
*striatus* Hass. ii 286  
*Tegenaria civilis* Walck. ii 505  
*dehrani* Thor. ii 505  
*domestica* Clerck ii 505  
*Tegocroanus pustulatus* sp. n. iii 704  
*Telenomus adelphus* sp. n. ii 619  
*despicendus* sp. n. ii 618  
*rhopalus* sp. n. ii 618, cxciii  
*paractias* sp. n. ii 619  
*vulcanus* sp. n. ii 619  
*Telephanus insularis* Sharp iii 428  
*pallidipennis* Blackb. iii 428  
*Telmatophilus debilis* Sharp iii 422  
*Temperature* xxiii  
*Tenebrio diaperinus* Panz. ii 253  
*mauritanicus* Linn. iii 434  
**Tenebrionidae** ii 252, cxxvii  
*Tenebroides* Pill. & Mitterp. iii 434  
*Tephritis*  
*annonae* Fabr. iii 44  
*crassipes* Ill 45  
*cratericola* sp. n. iii 46  
*limpidapex* sp. n. iii 46  
*Teras basialbana* Wkr. i 690  
*dotatana* Wkr. i 690  
*illepida* Btl. i 681  
*postvittana* Wkr. i 690  
*retractana* Wkr. i 690  
*secretana* Wkr. i 690  
*scitulana* Wkr. i 690  
*Teratodes* Gn. i 703  
**Termitidae** or 88  
**Tetigoniidae** or **Jassidae** iii 114, cxix  
*Tetigonia* Geoffr. iii 116  
*varicolor* Sign. iii 116  
*Tetragnatha* Latr. ii 466  
*cuneiventris* sp. n. ii 475  
*hawaiensis* sp. n. ii 470, iii 341

- Tetragnatha kauaiensis* ii 472  
*leptognatha* Thor. ii 468  
*mandibulata* Walck. ii 468  
*minorata* Sim. ii 468  
*netrix* sp. n. ii 468  
*perkinsi* sp. n. ii 470  
*restrita* sp. n. ii 473  
*sobrina* sp. n. ii 474  
*uncifera* sp. n. ii 474  
*Tetramorium guineense* Fabr. i 118  
*Tetrastichus hagenowii* Ratz. i 329  
**Tettigoniidae** ii 555  
*Teutana grossa* Koch ii 460  
*Thaunomia omphalodes* Ancey ii 373  
*Thallatoroda* gen. n. ii 146  
*insignis* sp. n. ii 146  
*Thaumatoxon Pilsbry* ii 288  
*Thaumatoeryllus* gen. n. ii 27  
*variegatus* sp. n. ii 27  
*Theridion* Walck. ii 448  
*acutitarse* sp. n. ii 456, iii 340  
*bajulans* Koch ii 450  
*borbonicum* Vins. ii 450  
*campestratum* sp. n. ii 450  
*flavourantiacum* Sim. ii 450  
*grallator* sp. n. ii 456  
*grossum* Koch ii 460  
*haleakalense* sp. n. ii 453  
*kauaiense* sp. n. ii 455  
*longipes* Hass. ii 450  
*luteipes* Camb. ii 450  
*mauiense* sp. n. ii 452  
*melinum* sp. n. ii 457  
*perkinsi* sp. n. ii 454, iii 340  
*posticatum* sp. n. ii 458  
*praetextum* sp. n. ii 450  
*praetextum concolor* ii 451  
*rufipes* Luc. ii 450  
*tepidariorum* Koch ii 449  
*trigatum* Hentz ii 446  
*vulgare* Hentz ii 449  
*Thoracophorus blackburni* Sharp iii 538  
*brevipennis* Sharp iii 539  
*Thrips 6-maculata* Perg. iii 700  
*multispinus* sp. n. iii 699  
*pallida* Beach iii 700  
*Thriscothorax* gen. n. iii 257  
*apicalis* sp. n. iii 264  
*argutor* sp. n. iii 268  
*bembidioides* Blackb. iii 262  
*bradyderus* sp. n. iii 267  
*brevis* Blackb. iii 267  
*chalcosus* sp. n. iii 264  
*constrictus* sp. n. iii 261  
*cordaticollis* Blackb. iii 259  
*discedens* sp. n. iii 263  
*ducalis* sp. n. iii 266  
*filipes* sp. n. iii 257  
*gracilis* sp. n. iii 258  
*insolitus* sp. n. iii 261  
*karschi* Blackb. iii 266  
*laetus* Blackb. iii 262  
*laticollis* sp. n. iii 267  
*modestus* sp. n. iii 259  
*molokaiae* sp. n. iii 260  
*mundanus* sp. n. iii 261  
*obscuricolor* Blackb. iii 266  
*palustris* sp. n. iii 258  
*paradoxus* Blackb. iii 263  
*perkinsi* sp. n. iii 265  
*perstriatus* sp. n. iii 260  
*Thriscothorax platysminus* sp. n. iii 268  
*robustus* Blackb. iii 268  
*subconstrictus* sp. n. iii 259  
*unctus* Blackb. iii 257  
*varipes* sp. n. iii 265  
*Thyene* Sim. ii 512  
**Thyreooridae** cxcii  
*Thyrocoopa* Meyr. i 492, 733, xxvi  
*abusa* sp. n. i 492, 504, 733  
*adumbrata* sp. n. i 503  
*albonubila* sp. n. i 495  
*alterna* sp. n. i 501  
*argentea* Btl. i 496, 733  
*cinerella* sp. n. i 494  
*depressarella* sp. n. i 498  
*epicappa* Meyr. i 500  
*fraudentella* sp. n. i 502  
*geminipuncta* sp. n. i 506  
*gigas* Btl. i 493  
*immutata* sp. n. i 501  
*indecora* Btl. i 497  
*inermis* sp. n. i 503  
*lactea* Btl. i 497  
*leonina* sp. n. i 505  
*mediomaculata* sp. n. i 506  
*megas* sp. n. i 495  
*minor* sp. n. i 496  
*nubifer* sp. n. i 499  
*pallida* sp. n. i 502, 733  
*pulverulenta* sp. n. i 500  
*usitata* Btl. i 504, 733  
*usitata* Meyr. i 492, 504  
*seminatella* sp. n. i 499  
*sp. Btl.* i 499  
*subahenea* sp. n. i 505  
*tessellata* sp. n. i 498  
*viduella* sp. n. i 494  
*Thysanoptera* iii 669, cxcii  
*Thysanura* ii 293, ccxx  
*Tichorhinus* Fieb. ii 552  
*kassandra* Kirk. ii 553  
**Tinea** L. i 729  
*aurifluella* Hb. i 507  
*crociacapitella* Clms. i 728  
*decurtella* Hb. i 478  
*ferruginella* Wlsm. i 728  
*fuscipunctella* Hw. i 729  
*hyalimella* Stgr. i 728  
*lactella* Schiff. i 648, 649  
*pellionella* L. i 729  
*pyrausta* Hb. i 507  
*rusticella* Hb. i 727  
*simulans* Btl. i 714  
*sp. ?* i 729  
*syringella* F. i 721  
**Tineidae** i 711, 737, clxix  
*Tineina* i 478, 731  
*Tomocera* How. i 324, ii 655  
*californica* How. i 324  
*ceroplastis* Perk. ii 655  
*Tomatellina* Beck ii 380  
*bacillariss* Mouss. ii 382  
*baldwini* Ancey ii 380  
*castanea* Pfeiff. ii 376  
*compacta* sp. n. ii 380  
*confusa* sp. n. ii 380  
*cylindrica* sp. n. ii 381  
*dentata* Pease ii 381  
*enryomphala* Ancey ii 381  
*extincta* Ancey ii 381  
*gracilis* Pease ii 381

- Tornatellina newcombi* Pfeiff. ii 382  
   *oblongata* Pease ii 382  
   *peponum* Gould ii 380, 382  
   *perkinsi* sp. n. ii 382  
   *petitiana* Pfeiff. ii 370  
   *striata* Newc. ii 370  
   *trochoides* sp. n. ii 383  
   *umbilicata* Ancy ii 383  
**Tortricidae** i 673, 735, clxvii  
*Tortrix* L. i 698  
   *capucina* sp. n. i 701, 736  
   *chlorocalla* sp. n. i 699  
   *faleriana* sp. n. i 701  
   *lanceolana* Hb. i 687  
   *metallurgica* sp. n. i 699  
   *piceana* L. i 690  
   *rubiginis* sp. n. i 702  
   *thoracina* sp. n. i 700  
   *viridana* L. i 698  
   *woeberiana* Schiff i 683  
*Toxema* Walk. i 307  
   *affinis* sp. n. i 309  
   *ferrugineipes* sp. n. i 309  
   *hawaiensis* sp. n. i 308  
   *nigrocyma* sp. n. i 311  
   *nubilipennis* sp. n. i 310  
   *tarsata* sp. n. i 309  
*Toxocampa noctivolans* Butl. i 158  
*Tramea lacerata* Hagen ii 62  
*Trematoda* ii 429  
*Triatoma rubrofasciata* de Geer ii 550  
*Tribolium ferrugineum* Fabr. ii 253  
*Trichocephalus dispar* Rud. ii 428  
**Trichogrammatidae** ii 658, cviii  
**Trichopterygidae** iii 535, cxxxvi  
*Trichopteryx* Kirby & Spence iii 538  
*Trichoptilus* Wlsm. i 471  
   *centetes* Meyr. i 471  
   *hawaiensis* Butl. i 471  
   *oxydactylus* Wkr. i 471  
   *pygmaeus* Wlsm. i 471  
*Trichothrips laticornis* sp. n. iii 692  
   *nigricans* sp. n. iii 693  
*Trigonidium pacificum* Scudd. ii 22  
*Trimicra lateralis* sp. n. iii 9  
*Tringa acuminata* Horsf. i 451  
   *maculata* Vieill. i 451  
*Trioza iolani* sp. n. iii 114  
*Triphleps* Fieb. iii 125  
   *persequens* White ii 551, iii 125  
*Tritocleis* gen. n. i 190  
   *microphylla* sp. n. i 190  
*Trogophloeus abdominalis* Sharp iii 544  
   *fontinalis* Sharp iii 544  
   *senilis* Sharp iii 543  
*Trogosita cornuta* Fabr. ii 252  
*Trox scaber* Linn. iii 401  
**Tryptidae** iii 44, clxxxvii  
*Trypeta crassipes* Thoms. iii 45  
*Trybliographa hawaiensis* sp. n. i 300  
*Trypoxylon bicolor* Sm. ii 606  
**Trypoxylonidae** ii 606, lxxxviii  
*Turbo apexfulva* Dixon ii 298  
   *lugubris* Chemn. ii 298  
   *lugubris sinistrorsus* Chemn. ii 301  
*Typhaea fumata* Linn. iii 419  
  
*Ulesanis oahuensis* sp. n. ii 460  
*Urocryptus* Westw. i 315  
*Urophora quadrivittata* Macq. iii 44  
  
*Vanessa atalanta* Linn. i 193  
   *cardui* Linn. i 194  
   *huntera* Fab. i 194  
   *tanmeamea* Esch. i 193, civ  
Variability lxviii, lxxix  
*Veliomorpha* de Carl. iii 157  
*Vermes* cxxxviii  
*Vertigo nacca* Gould ii 295  
**Vespidae** xcix  
*Vestiaria* Flem. i 402, xxi  
   *coccinea* Forst. i 405  
*Viridonia* Rothsch. i 412, lxxii  
   *sagittirostris* Rothsch. i 413  
*Vitrea* Fitz. ii 278  
   *lanaiensis* Sykes ii 278  
   *molokaiensis* Sykes ii 278  
   *pauvillus* Gould ii 279  
*Vitrina caperata* Gould ii 277  
   *tenella* Gould ii 278  
*Vo ucella obesa* Fabr. iii 19  
  
*Westwoodella hilaris* sp. n. ii 658  
  
*Xanthocorynus* gen. n. iii 549  
   *deceptor* iii 550  
*Xanthogramma grandicornis* Macq. iii 19  
*Xanthorhoe* Hüb. i 165  
   *caustoscia* sp. n. i 167  
   *insularis* Butl. i 166  
   *ioxantha* sp. n. i 165  
   *leucoxylla* sp. n. i 166  
*Xenusa pumila* Sharp iii 577  
*Xeroscopa demodes* Meyr. i 268  
   *formosa* Meyr. i 257  
   *hawaiensis* Meyr. i 267  
   *jucunda* Meyr. i 258  
   *melanopsis* Meyr. i 271  
   *pachysema* Meyr. i 254  
   *venosa* Meyr. i 274  
*Xiphidium fuscum* Fab. ii 14  
*Xyleborus agamus* Blackb. ii 178  
   *confusus* Eichhoff ii 177  
   *dubiosus* sp. n. ii 177  
   *exsectus* sp. n. ii 179  
   *frigidus* Blackb. ii 178  
   *hawaiensis* sp. n. ii 175  
   *ignobilis* sp. n. ii 180  
   *immaturus* Blackb. ii 178  
   *insularis* Sharp ii 177  
   *kauaiensis* sp. n. ii 174  
   *lanaiensis* sp. n. ii 176  
   *littoralis* sp. n. ii 179  
   *mauiensis* sp. n. ii 175  
   *obliquus* Sharp ii 177  
   *rugatus* Blackb. ii 178  
   *simillimus* sp. n. ii 176  
   *truncatus* Sharp ii 175  
   *vulcanus* sp. n. ii 179  
*Xyletobius* Sharp iii 585  
   *affinis* Sharp iii 595  
   *aleuritis* sp. n. iii 595  
   *ashmeadi* sp. n. iii 598  
   *aurifer* sp. n. iii 609  
   *beddardi* sp. n. iii 599  
   *blackburni* sp. n. iii 598  
   *blackburni* var. *scutellaris* n. iii 599  
   *blackburni* var. *simplex* n. iii 599  
   *blackburni* var. *suturalis* n. iii 599  
   *brunneri* sp. n. iii 597  
   *carpenteri* sp. n. iii 596

- Xyletobius chryseis* sp. n. iii 609  
*collingei* sp. n. iii 604  
*cyphus* sp. n. iii 603  
*dollfusi* sp. n. iii 589  
*durranti* sp. n. iii 587  
*euceras* sp. n. iii 594  
*euops* sp. n. iii 604  
*cuphorbiae* sp. n. iii 602  
*fosculus* sp. n. iii 610  
*foreli* sp. n. iii 600  
*fraternus* sp. n. iii 606  
*fraternus* var. *laetior* n. iii 606  
*grimshawi* sp. n. iii 588  
*hawaiensis* sp. n. iii 613  
*insignis* Blackb. iii 602  
*kirkaldyi* sp. n. iii 600  
*lasiodes* sp. n. iii 612  
*lineatus* Sharp iii 611  
*lineatus* var. *apicalis* n. iii 611  
*lineatus* var. *holomelas* n. iii 612  
*lineatus* var. *humeralis* n. iii 612  
*marmoratus* Sharp iii 589  
*megalops* sp. n. iii 601  
*mesochlorus* sp. n. iii 592  
*meyrickii* sp. n. iii 589  
*nigrinus* Sharp iii 603  
*mimus* sp. n. iii 594  
*molokaiensis* ii 174  
*monas* sp. n. iii 603  
*mundus* sp. n. iii 608  
*nuptus* sp. n. iii 592  
*nuptus* var. *kauaiensis* n. iii 592  
*nudus* sp. n. iii 604  
*oculatus* Sharp iii 595  
*pele* sp. n. iii 593  
*praeceps* sp. n. iii 608  
*proteus* sp. n. iii 590  
*proteus* var. *apicalis* n. iii 59
- Xyletobius proteus* var. *dorsalis* n. iii 591  
*proteus* var. *hastatus* n. iii 591  
*proteus* var. *maurus* n. iii 591  
*proteus* var. *simplex* n. iii 590  
*roridus* sp. n. iii 606  
*scotti* sp. n. iii 609  
*serricornis* Blackb. iii 612  
*sharpi* sp. n. iii 605  
*silvestrii* sp. n. iii 588  
*simoni* sp. n. iii 605  
*speiseri* sp. n. iii 604  
*stebbingi* sp. n. iii 610  
*stebbingi* var. *notatus* n. iii 610  
*submimus* sp. n. iii 594  
*suboculatus* sp. n. iii 596  
*sulcatus* sp. n. iii 613  
*sulcatus* var. *apicalis* n. iii 613  
*sykesii* sp. n. iii 607  
*sykesii* var. *molokaiensis* n. iii 607  
*walsinghamii* sp. n. iii 587
- Xylocopa aeneipennis* i 113, lxxxiii  
*Xylophagus spiniger* Wied iii 79  
*Xylopsocus castanoptera* Fairm. iii 643  
*Xylopertha religiosa* Boisd. iii 643  
*Xylothrips religiosa* Boisd. iii 643  
*Xylotrogus brunneus* Steph. iii 644  
*Nystophora* Hein. i 478  
*Nystrocera globosa* Olivier ii 96
- Zacranium* gen. n. i 295  
*oahuense* sp. n. i 295
- Zelinae* iii 149  
*Zelus* Fabr. iii 149  
*laevicollis* Champ. ii 550  
*peregrinus* sp. n. iii 149, ii 550  
*renardi* Kol. ii 550
- Zonitidae** ii 277  
*Zygocheta* iii 338







DESCRIPTION OF PLATE I. (VOL. II.)

ORTHOPTERA.

- Fig. 1. *Brachymetopa discolor* ♂; 1 a front view of head of the same.  
Fig. 2. *B. blackburni* ♀.  
Fig. 3. *B. nitida* ♂; 3 a variety of the ♀; 3 b example in the attitude assumed when the insect is molested.  
Fig. 4. *B. unica* ♀.  
Fig. 5. *B. mauiensis* ♀.  
Fig. 6. *B. parvula* ♀; 6 a var. *brunnea* ♂.  
Fig. 7. *B. deplanata* ♂.  
Fig. 8. *Conocephaloides hawaiiensis* ♀.  
Fig. 9. *Paratrigonidium roseum* ♀.  
Fig. 10. *P. atroferrugineum* ♂.  
Fig. 11. *P. viridescens* ♂.  
Fig. 12. *P. grande* ♂.  
Fig. 13. *P. attenuatum* ♂.  
Fig. 14. *Prognathogryllus robustus* ♀.  
Fig. 15. *P. elongatus* ♀.  
Fig. 16. *Thaumatogryllus variegatus* ♀.  
Fig. 17. *Leptogryllus nigro-maculatus* ♀.  
Fig. 18. *L. elongatus* ♀.  
Fig. 19. *L. simillimus* ♀.



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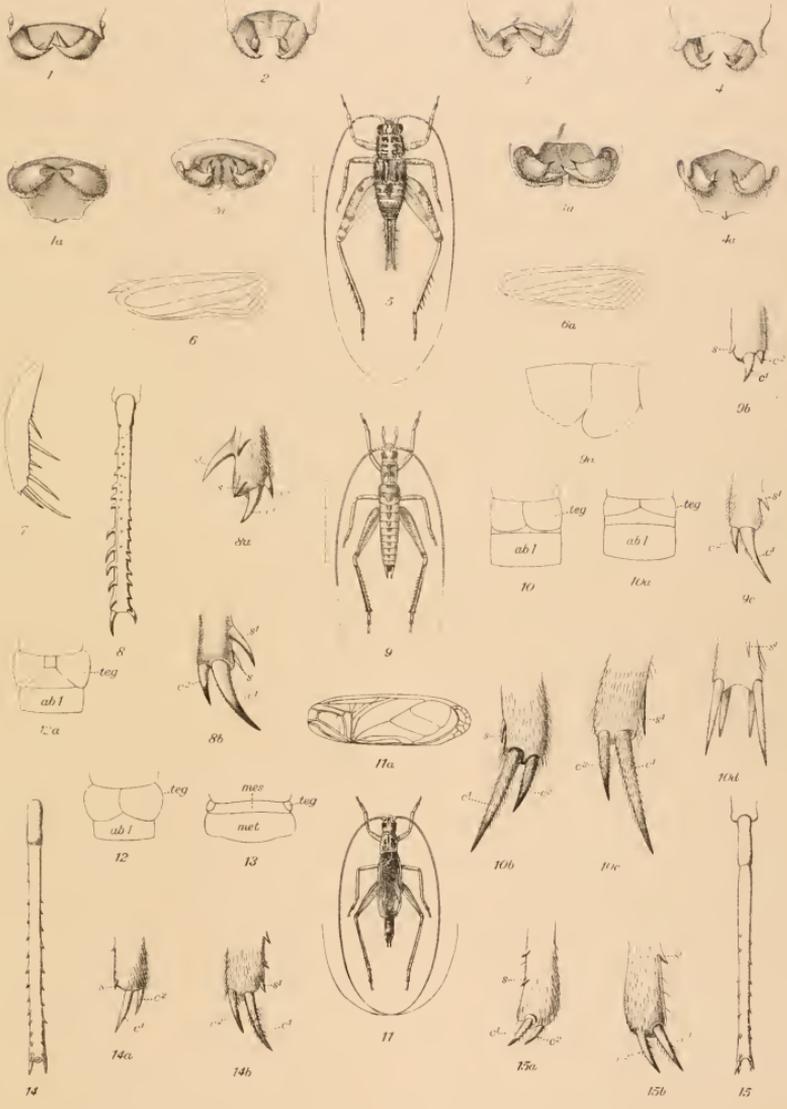




DESCRIPTION OF PLATE II. (VOL. II.)

ORTHOPTERA.

- Fig. 1. *Brachymetopa discolor*, apex of abdomen showing cerci in dorsal view; 1 a the same in apical view.
- Fig. 2. *B. nitida*, cerci in dorsal view; 2 a apical view of the same.
- Fig. 3. *B. deplanata*, cerci in dorsal view; 3 a apical view of the same.
- Fig. 4. *B. mauiensis*, cerci in dorsal view; 4 a apical view of the same.
- Fig. 5. *Paratrigonidium attenuatum*, var. *minor*, before the last ecdysis, showing wings and tegmina about equally developed. The former entirely disappear at the last moult.
- Fig. 6. Lateral field of superior tegmen of *P. filicum*; 6 a the same of *P. pacificum*.
- Fig. 7. *Myrmecophila quadrispina*, posterior tibia with four spines on its inner margin.
- Fig. 8. *Prognathogryllus alatus*, posterior tibia in dorsal aspect; 8 a apex of tibia viewed outwardly; 8 b the same on inner side (*s*, *s'*, the apical spine of the two series, *c'* and *c''* the upper and lower calcar in each figure).
- Fig. 9. *Aphonogryllus apteryx*; 9 a meso- and metathorax in lateral aspect; 9 b outer, and 9 c inner aspect of apex of posterior tibia (the lettering as before).
- Fig. 10. *Thaumatogryllus variegatus*, mesothorax, metathorax and first abdominal segment of ♂, showing the scale-like tegmina; 10 a the same parts in the ♀, the tegmina less developed (tegmina concealing more or less of the meso- and metathorax, *ab* 1 the first abdominal segment); 10 b and 10 c the two lateral views of apex of posterior tibia, the lettering as before; 10 d dorsal aspect of apex of posterior tibia of another example, in which the apical spine of either series is very far removed from the calcaria. Only the apex of one of these spines is shown, that on the other side being situated still further towards the base.
- Fig. 11. *Nesogryllus stridulans*; 11 a superior tegmen of the same enlarged.
- Fig. 12. *Leptogryllus nigromaculatus*, ♂ tegmina; 12 a the same in the ♀ (lettering as in fig. 10 and 10 a).
- Fig. 13. *L. similis* ♂, mesothorax with very small tegmina, and metathorax.
- Fig. 14. *L. forficularis*, posterior tibia in dorsal aspect; 14 a and 14 b outer and inner aspects of apex of the same (the lettering as in fig. 8).
- Fig. 15. *L. simillimus*, posterior tibia in dorsal aspect; 15 a and 15 b outer and inner aspects of apex of tibia of a variety of the same, in which the apical spine of either series is very remote from the calcaria (the lettering as in fig. 8).



S. W. Mason, with Cambridge





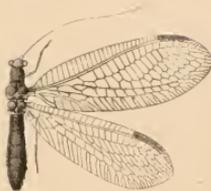




DESCRIPTION OF PLATE III. (VOL. II.)

NEUROPTERA. *CHRYSOPIDES*.

- Fig. 1. *Anomalechrysa princeps* ♂.  
Fig. 2. *A. sylvicola* ♂.  
Fig. 3. *A. angulicosta* ♂.  
Fig. 4. *A. viridis* ♂.  
Fig. 5. *A. longipennis* ♀.  
Fig. 6. *A. deceptor* ♂.  
Fig. 7. *A. gayi* ♂.  
Fig. 8. *A. raphidioides* ♀.  
Fig. 9. *A. biseriata* ♀.  
Fig. 10. *A. hepatica* ♂.  
Fig. 11. *A. proteus* ♂.  
Fig. 12. *A. proteus* ♀.  
Fig. 13. *A. proteus* ♀ var.  
Fig. 14. *A. fulvescens* ♂.  
Fig. 15. *A. fulvescens* ♂ var.  
Fig. 16. *A. fulvescens* ♀ var.



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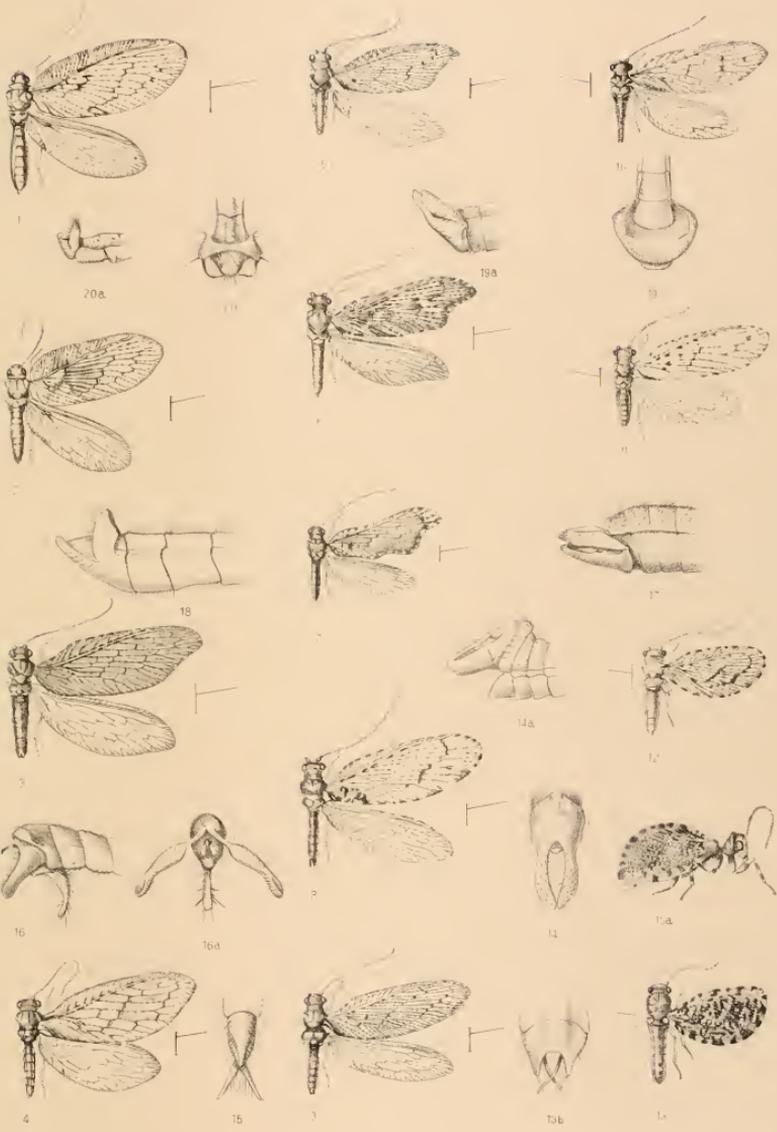




DESCRIPTION OF PLATE IV. (VOL. II.)

NEUROPTERA. *HEMEROBIIDES* and *CHRYSOPIDES*.

- Fig. 1. *Megalomus hospes*.  
Fig. 2. *M. hospes* var.  
Fig. 3. *Nesomicromus vagus*.  
Fig. 4. *N. latipennis*.  
Fig. 5. *N. angustipennis*.  
Fig. 6. *N. drepanoides*.  
Fig. 7. *N. paradoxus*.  
Fig. 8. *N. bellulus*.  
Fig. 9. *N. brunnescens*.  
Fig. 10. *N. subochraceus*.  
Fig. 11. *N. minimus*.  
Fig. 12. *Pseudopsectra lobipennis*.  
Fig. 13. *Nisothauma haloakalae*; 13*a*, the same in profile; 13*b*, terminal segment and appendices in dorsal aspect.  
Fig. 14. *Nesomicromus forcipatus*, ♂ terminal segments in dorsal aspect; 14*a*, the same in lateral view.  
Fig. 15. *N. longispinosus*, ♂ terminal segments in dorsal aspect.  
Fig. 16. *Megalomus hospes*, ♂ terminal segments in lateral view; 16*a*, the same seen from the apex.  
Fig. 17. *Anomalochrysa hepatica*, apical segments of abdomen of ♂ in lateral view.  
Fig. 18. *A. frater*, apical segments of abdomen of ♂ in lateral view.  
Fig. 19. *A. deceptor*, apical segments of abdomen of ♂ in dorsal aspect; 19*a*, the same in lateral view.  
Fig. 20. *A. princeps*, apical segments of abdomen of ♂ in dorsal aspect; 20*a*, the same in lateral view.



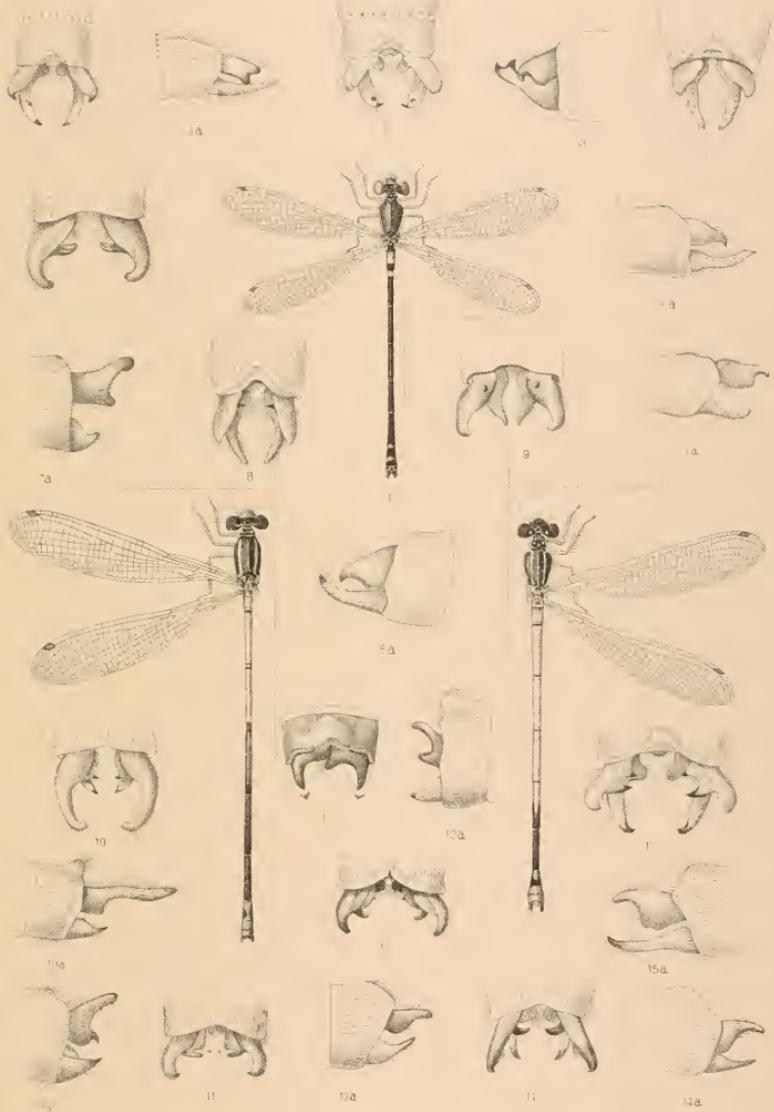




DESCRIPTION OF PLATE V. (VOL. II.)

ODONATA.

- Fig. 1. *Agrion xanthomelas* ♂.  
Fig. 2. *A. jugorum* ♂.  
Fig. 3. *A. heterogamias* ♂.  
Fig. 4. Terminal segment and appendices of *Agrion xanthomelas* ♂ in dorsal; 4a, in external lateral view.  
Figs. 5 & 5a. The same parts in *A. nigrohamatum*.  
Figs. 6 & 6a. The same in *A. pacificum*.  
Figs. 7 & 7a. The same in *A. koelense*.  
Figs. 8 & 8a. The same in *A. orestrophum*.  
Figs. 9 & 9a. The same in *A. calliphya*.  
Figs. 10 & 10a. The same in *A. nesiotis*.  
Figs. 11 & 11a. The same in *A. jugorum*.  
Figs. 12 & 12a. The same in *A. oahuense*.  
Figs. 13 & 13a. The same in *A. vagabundum*.  
Figs. 14 & 14a. The same in *A. oceanicum*.  
Figs. 15 & 15a. The same in *A. blackburni*.



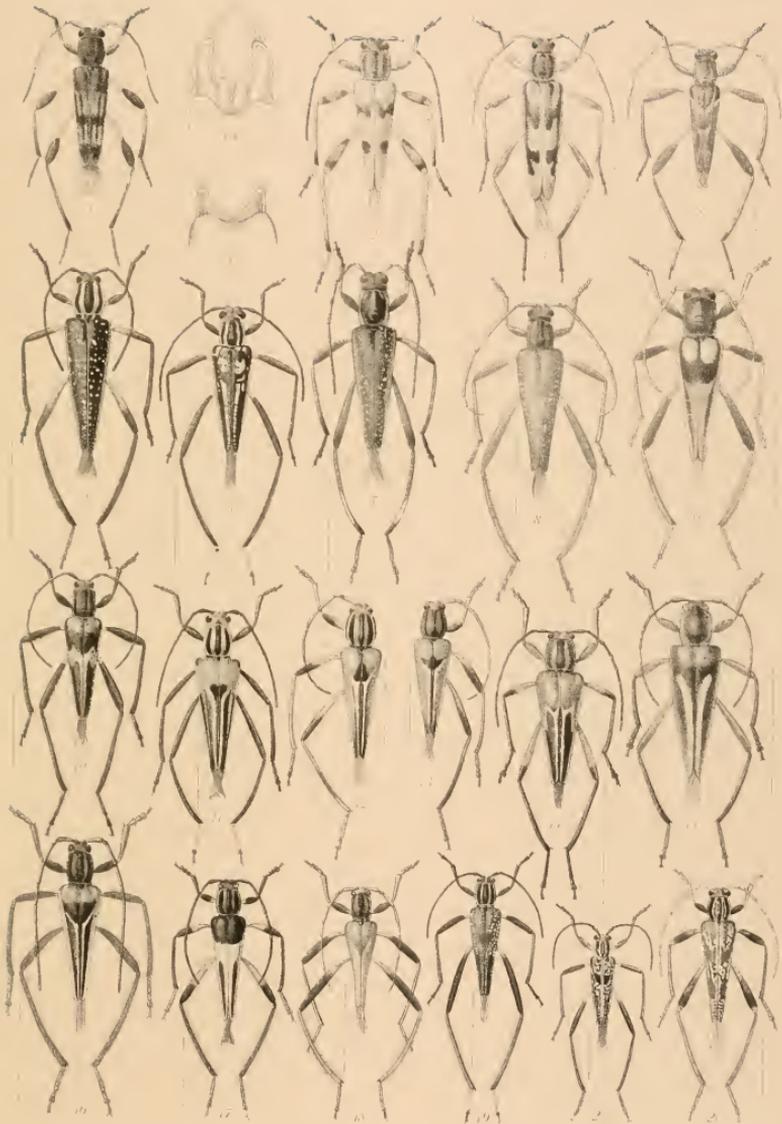




DESCRIPTION OF PLATE VI. (VOL. II.)

COLEOPTERA. CERAMBYCIDAE.

- Fig. 1. *Clytarlus mediocris* ♂.  
Fig. 1 a. Terminal ventral segments of *Clytarlus filipes* ♂.  
Fig. 1 b. " " " " *mediocris* ♂.  
Fig. 2. *Clytarlus pennatus* ♂.  
Fig. 3. " " ♀.  
Fig. 4. *C. longipes* ♂.  
Fig. 5. *Plagithmysus vitticollis* ♀.  
Fig. 6. *P. permundus*.  
Fig. 7. *P. newelli* ♀.  
Fig. 8. *P. concolor* ♀.  
Fig. 9. *P. cuneatus* ♀.  
Fig. 10. *P. funebris* ♂.  
Fig. 11. *P. diana*.  
Fig. 12. *P. bishopi*.  
Fig. 13. *P. callaris* ♂.  
Fig. 14. *P. bilineatus* ♀.  
Fig. 15. *P. perkinsi* ♀.  
Fig. 16. *P. darwinianus* ♂.  
Fig. 17. *P. sulphureus* ♂.  
Fig. 18. *P. albertisi* ♂.  
Fig. 19. *P. munroi* ♀.  
Fig. 20. *P. arachnipes* ♀.  
Fig. 21. *P. cristatus* ♂.



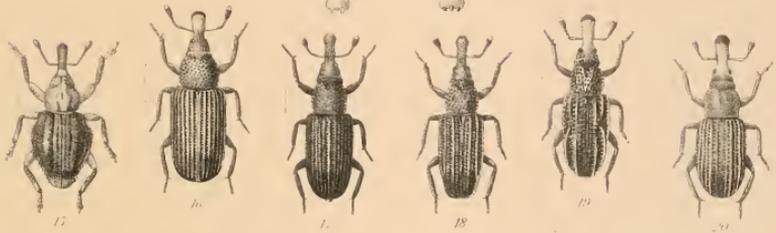
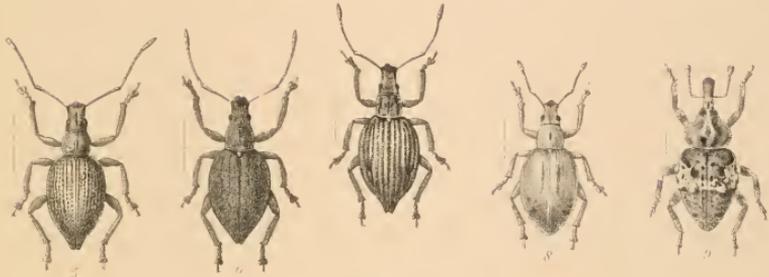




DESCRIPTION OF PLATE VII. (VOL. II.)

COLEOPTERA. CURCULIONIDAE.

- Fig. 1. *Rhyncogonus nitidus*.  
Fig. 2. *R. squamiger*.  
Fig. 3. *R. stygius*. (N.B. Although in the figure this species appears very like No. 1, it is really very different, being opaque, whereas *R. nitidus* has the surface shining.)  
Fig. 4. *R. freycinctiae*.  
Fig. 5. *R. koebelei*.  
Fig. 6. *R. depressus*.  
Fig. 7. *R. vittatus*.  
Fig. 8. *R. vestitus*.  
Fig. 9. *Acalles lateralis* ♂ (Kauai form).  
Fig. 10. *A. callichroma*.  
Fig. 11. *A. melanolepis*.  
Fig. 12. *A. leptothorax*.  
Fig. 13. *A. duplex* ♂.  
Fig. 14. *A. duplex* ♀.  
Fig. 15. *A. nigripennis*.  
Fig. 16. *Dryophthorus nesiotes*.  
Fig. 17. *D. homorhynchus*; 17 a, head and rostrum of ♀; 17 b, head and rostrum of ♂.  
Fig. 18. *D. declivis*.  
Fig. 19. *D. insignis*.  
Fig. 20. *D. verticalis*.



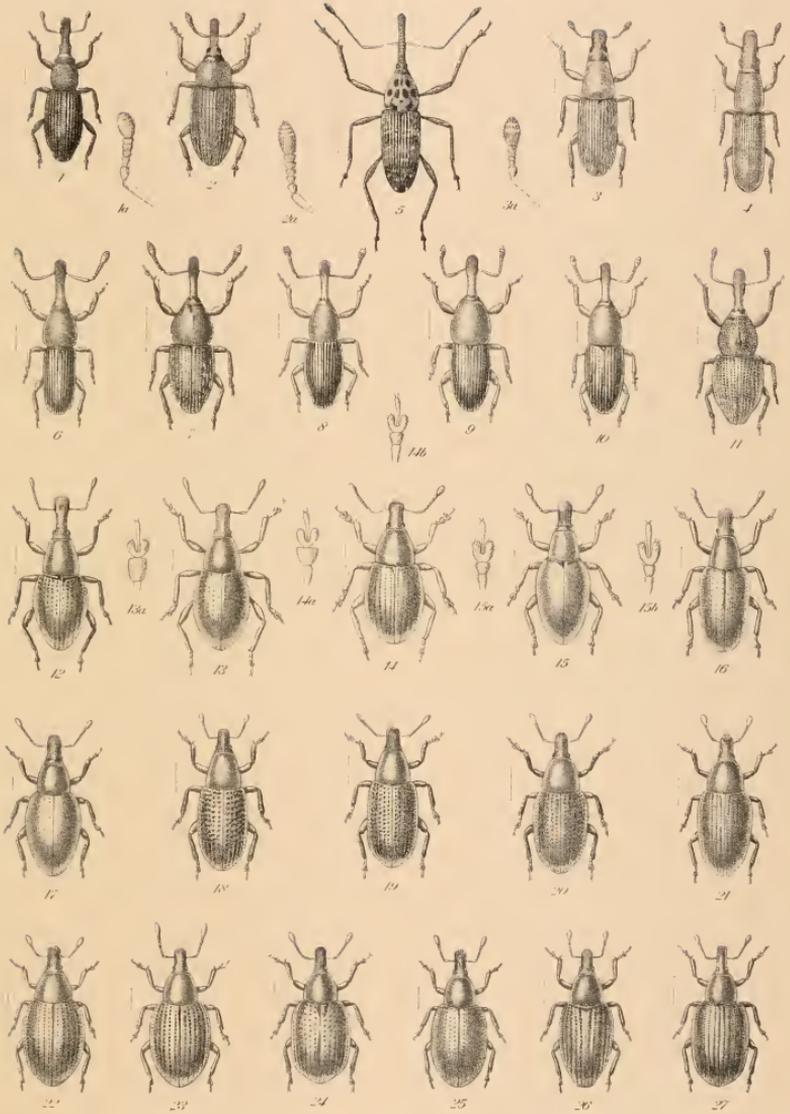




DESCRIPTION OF PLATE VIII. (VOL. II.)

COLEOPTERA. CURCULIONIDAE.

- Fig. 1. *Thalattodora insignis*; 1 a, antenna of the same.  
Fig. 2. *Orothreptes callithrix*; 2 a, antenna of the same.  
Fig. 3. *Deinocossonus nesiotus* var. *hawaiiensis*; 3 a, antenna of the same.  
Fig. 4. *Haloxenus immigrans*.  
Fig. 5. *Nesotocus kauaiensis*.  
Fig. 6. *Dysomma sylvicola*.  
Fig. 7. *Heteromphus filicum*.  
Fig. 8. *H. molokaiensis*.  
Figs. 9 & 10. *H. cylindricus* (large and small form).  
Fig. 11. *H. kauaiensis*.  
Fig. 12. *Oodemus olindae* ♀ var.  
Fig. 13. *O. longicorne* ♂; 13 a, anterior tarsi of the same.  
Fig. 14. *O. molokaiense*; 14 a, anterior tarsi of the same.  
Fig. 15. *O. chrysodorum* ♂; 15 a, anterior tarsi of ♂; 15 b, anterior tarsi of ♀.  
Fig. 16. *O. graciliforme*.  
Fig. 17. *O. leiothorax*.  
Fig. 18. *O. pulchrum*.  
Fig. 19. *O. oblongum*.  
Fig. 20. *O. grande*.  
Fig. 21. *O. corticis*.  
Fig. 22. *O. pachysoma*.  
Fig. 23. *O. aenescens*.  
Fig. 24. *O. sculpturatum*.  
Fig. 25. *O. mauicense*.  
Fig. 26. *O. striatum*.  
Fig. 27. *Anothorvus robustus*.



Drawn by Wm. H. Edwards, Cambridge.

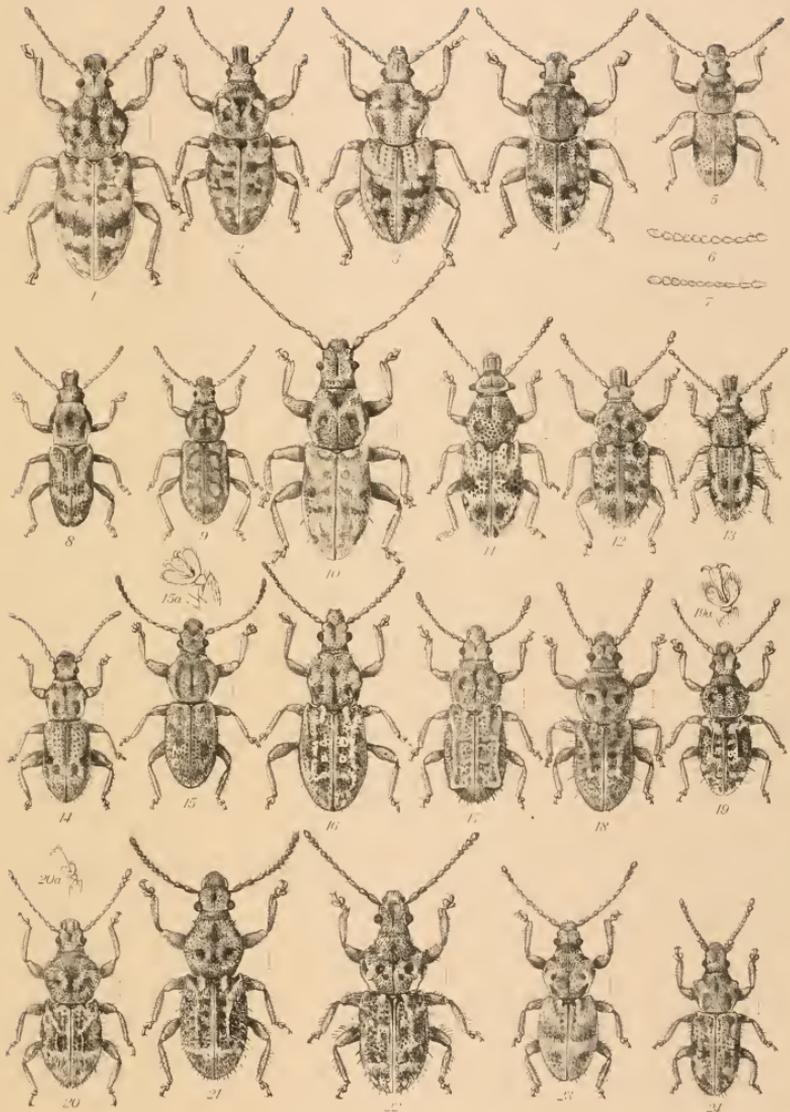




DESCRIPTION OF PLATE IX. (VOL. II.)

COLEOPTERA. PROTERHINIDAE.

- Fig. 1. *Proterhinus gigas* ♂.  
Fig. 2. *P. eugonias* ♀.  
Fig. 3. *P. eulepis* ♂.  
Fig. 4. *P. wikstroemiae* ♂.  
Fig. 5. *P. laticornis* ♂.  
Fig. 6. *P. serricornis*, antenna ♂.  
Fig. 7. *P. eurhopalus*, antenna ♂.  
Fig. 8. *P. leptophyas* ♀.  
Fig. 9. *P. maculifer* ♂.  
Fig. 10. *P. kamptarthrus* ♂.  
Fig. 11. *P. deinops* ♀.  
Fig. 12. *P. platygontias* ♀.  
Fig. 13. *P. leptothrix* ♀.  
Fig. 14. *P. pachygnemis* ♂.  
Fig. 15. *P. laticollis* ♂; 15 a, front tarsi of the same.  
Fig. 16. *P. validus* ♂.  
Fig. 17. *P. sharpi* ♂.  
Fig. 18. *P. tuberculiceps* ♂.  
Fig. 19. *P. sternalis* ♂; 19 a, front tarsi of the same.  
Fig. 20. *P. microtarsus* ♂; 20 a, front tarsi of the same (drawn on same scale as 19 a).  
Fig. 21. *P. arhopalus* ♂.  
Fig. 22. *P. mirabilis* ♂.  
Fig. 23. *P. alyxiae* ♂.  
Fig. 24. *P. pteridis* ♂.



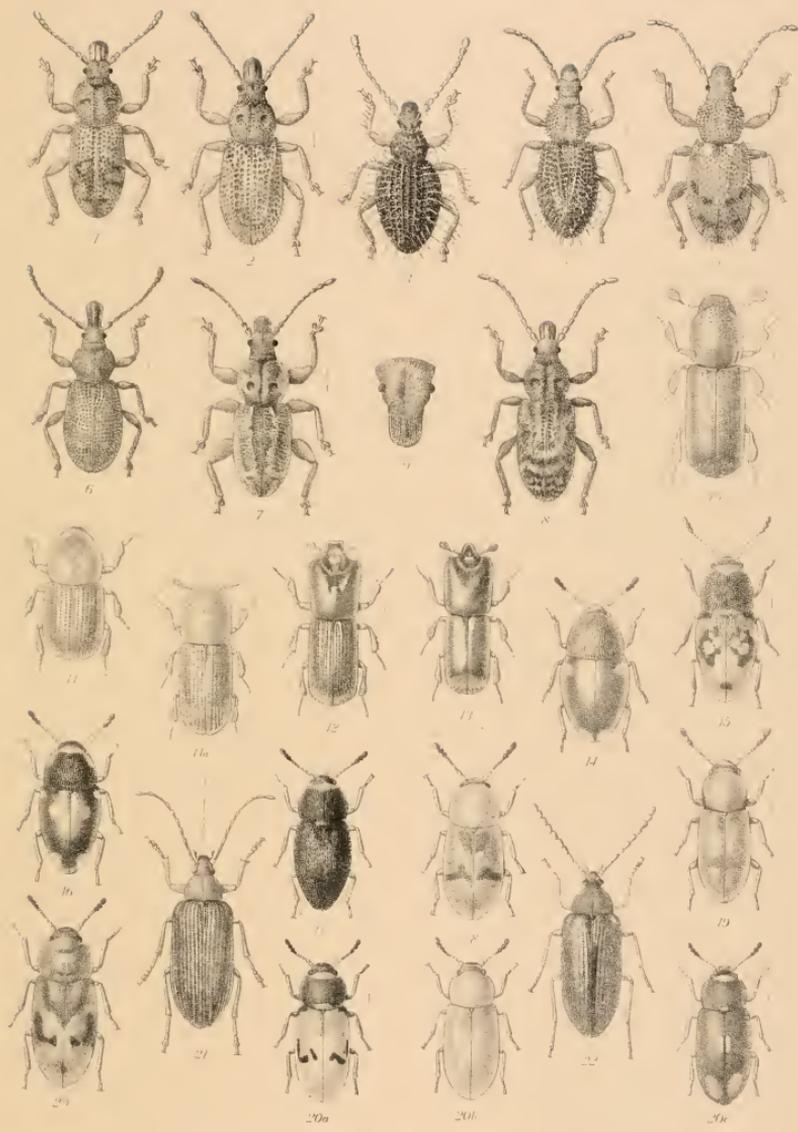




DESCRIPTION OF PLATE X. (VOL. II.)

COLEOPTERA. *PROTERHINIDAE*, *SCOLYTIDAE*, *CISTELIDAE*, *CIOIDAE*.

- Fig. 1. *Proterhinus detritus* ♀.  
Fig. 2. *P. epitretus* ♀.  
Fig. 3. *P. kaalae* ♂.  
Fig. 4. *P. oahuensis* ♂.  
Fig. 5. *P. blackburni* var. *bisignatus* ♂.  
Fig. 6. *P. osculans* ♀.  
Fig. 7. *P. persimilis* ♂.  
Fig. 8. *P. hawaiiensis* ♀.  
Fig. 9. *P. eurhynchus* ♂, front of head.  
Fig. 10. *Xyleborus molokaiensis* ♀.  
Fig. 11. *X. immaturus* ♂; 11 a, ♀.  
Fig. 12. *X. exsectus* ♂.  
Fig. 13. *X. vulcanus* ♂.  
Fig. 14. *Apterocis lanaiensis*.  
Fig. 15. *A. ornatipennis*.  
Fig. 16. *A. strigosus*.  
Fig. 17. *Cis haleakalae*.  
Fig. 18. *C. nigro-fasciatus*.  
Fig. 19. *C. insularis*.  
Fig. 20. *C. signatus*; 20 a, 20 b, 20 c, other varieties of the same.  
Fig. 21. *Labetis comitans*.  
Fig. 22. *Cistela kauaiensis*.







## DESCRIPTION OF PLATE XI. (VOL. II.)

## MOLLUSCA.

- Fig. 1. *Tornatellina compacta*, sp. nov. (p. 380).  
 Fig. 2. *Achatinella (Partulina) hayseldeni* Baldwin (p. 313).  
 Fig. 3. *Amastra similaris* Hartm., var. *roseofincta* Sykes (p. 344).  
 Fig. 4. *Amastra citrea* Sykes (p. 335).  
 Fig. 5. *Pardicella fulgurans*, sp. nov. (p. 329).  
 Figs. 6, 7. *Achatinella cestus* Newcomb (p. 300).  
 Fig. 8. *Leptachatina impressa* Sykes (p. 364).  
 Fig. 9. *Leptachatina imitatrix*, sp. nov. (p. 364).  
 Fig. 10. *Leptachatina emerita*, sp. nov. (p. 361).  
 Fig. 11. *Leptachatina convexiuscula*, sp. nov. (p. 360).  
 Fig. 12. *Leptachatina semipicta* Sykes (p. 369).  
 Fig. 13. *Leptachatina konaensis*, sp. nov. (p. 384).  
 Fig. 14. *Tornatellina perkinsi*, sp. nov. (p. 382).  
 Figs. 15, 16. *Achatinella (Partulina) redfieldi* Newcomb (p. 317).  
 Figs. 17, 18. *Auriculella perkinsi*, sp. nov. (p. 377).  
 Figs. 19, 20. *Achatinella (Achatinellastrum) waituaensis*, sp. nov. (p. 328).  
 Fig. 21. *Leptachatina arborea*, sp. nov. (p. 357).  
 Fig. 22. *Leptachatina supracostata*, sp. nov. (p. 370).  
 Fig. 23. *Amastra (Laminella) fraterna* Sykes (p. 349).  
 Fig. 24. *Amastra (Laminella) villosa* Sykes (p. 352).  
 Fig. 25. *Succinea protracta*, sp. nov. (p. 388).  
 Fig. 26. *Leptachatina conicoides*, sp. nov. (p. 359).  
 Fig. 27. *Leptachatina vana*, sp. nov. (p. 372).  
 Fig. 28. *Tornatellina cylindrica*, sp. nov. (p. 381).  
 Fig. 29. *Leptachatina smithi* Sykes (p. 369).  
 Fig. 30. *Leptachatina perkinsi* Sykes (p. 367).  
 Fig. 31. *Tornatellina trochoides*, sp. nov. (p. 383).  
 Fig. 32. *Succinea cinnamomea* Ancey (p. 386).  
 Fig. 33. *Kaliella konaensis* Sykes (p. 286).  
 Fig. 34. *Succinea konaensis* Sykes (p. 387).  
 Fig. 35. *Amastra longa* Sykes (p. 338).  
 Fig. 36. *Newcombia perkinsi* Sykes (p. 332).  
 Figs. 37, 38. *Endodonta (Nesophila) lanaiensis* Sykes (p. 291).  
 Figs. 39, 40. *Endodonta (Thaumatodon) ringens* Sykes (p. 288).  
 Figs. 41, 42. *Philonesia perkinsi* Sykes (p. 284).  
 Figs. 43, 44. *Vitrea lanaiensis* Sykes (p. 278).  
 Figs. 45, 46. *Vitrea molokaiensis* Sykes (p. 278).



*J. Green, del. et sculp.*

*Matern sculp.*

DESCRIPTION OF PLATE XII. (VOL. II.)

MOLLUSCA.

PHILONESIA BALDWINI Ancy (p. 281).

- Fig. 1. Mantle margin, with shell and dorsal lobes. *a*, denotes white spots on integument covering the branchial cavity.  
 Fig. 2. Extremity of foot from left side.  
 Fig. 2 *a*. Portion of foot showing sole.  
 Fig. 3. Genitalia, not quite complete.  
 Fig. 3 *a*. Male organs enlarged, to show the retractor muscle and coiled vas deferens.  
 Fig. 4. Jaw.  
 Fig. 5. Centre and two side teeth of radula.  
 Fig. 5 *a*. Median teeth, 7th—11th.  
 Fig. 5 *b*. Lateral teeth, 19th—22nd.  
 Fig. 5 *c*. Eleven of the outermost, or marginal, teeth.

GODWINIA CAPERATA Gould (p. 277).

- Fig. 6. Animal with shell removed, showing dorsal lobes.  
 Fig. 7. Portion of mantle zone, near respiratory orifice.  
 Fig. 8. Extremity of foot.  
 Fig. 9. Buccal mass, and salivary gland, &c.  
 Fig. 10. Sole of foot.  
 Fig. 11. Jaw.  
 Fig. 12. Central tooth of radula.  
 Fig. 12 *a*. Fifth intermediate, and following lateral teeth.  
 Fig. 12 *b*. Outermost, or marginal, teeth.

- Fig. 13. *Leptachatina acuminata* Gould. Central teeth of radula (p. 357).  
 Fig. 13 *a*. Intermediate and marginal teeth.  
 Figs. 14, 14 *a*. *Aneylus sharpi*, sp. nov. (p. 394).

EXPLANATION OF THE LETTERING.

<i>Al. Gd.</i> albumen gland.	<i>pr.</i> prostate.
<i>B. m.</i> muscle of buccal mass.	<i>r. d. l.</i> right dorsal lobe.
<i>Gen. ap.</i> generative aperture.	<i>r. m. P.</i> retractor muscle of penis.
<i>h. d.</i> hermaphrodite duct.	<i>r. s. l.</i> right shell lobe.
<i>i.</i> intestine.	<i>Sal. gland.</i> salivary gland.
<i>l. d. l.</i> left dorsal lobe.	<i>st.</i> stomach.
<i>l. s. l.</i> left shell lobe.	<i>v. d.</i> vas deferens.
<i>P.</i> male organ.	

The numerical digits in smaller type indicate the tooth figured, reckoning from 0, the central tooth.  
 All figures (except 14, 14 *a*) are from dissections and drawings made by Lt.-Col. H. H. Godwin-Austen, F.R.S.

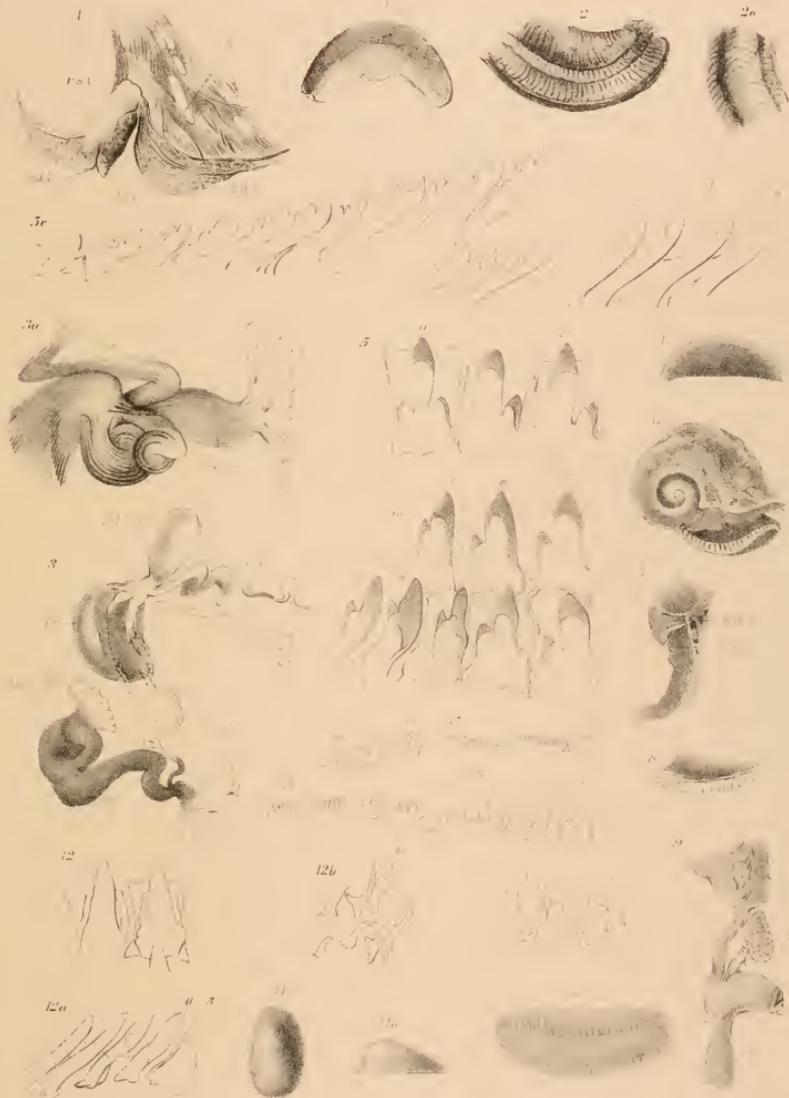


Fig. 1

Fig. 2

Fig. 3





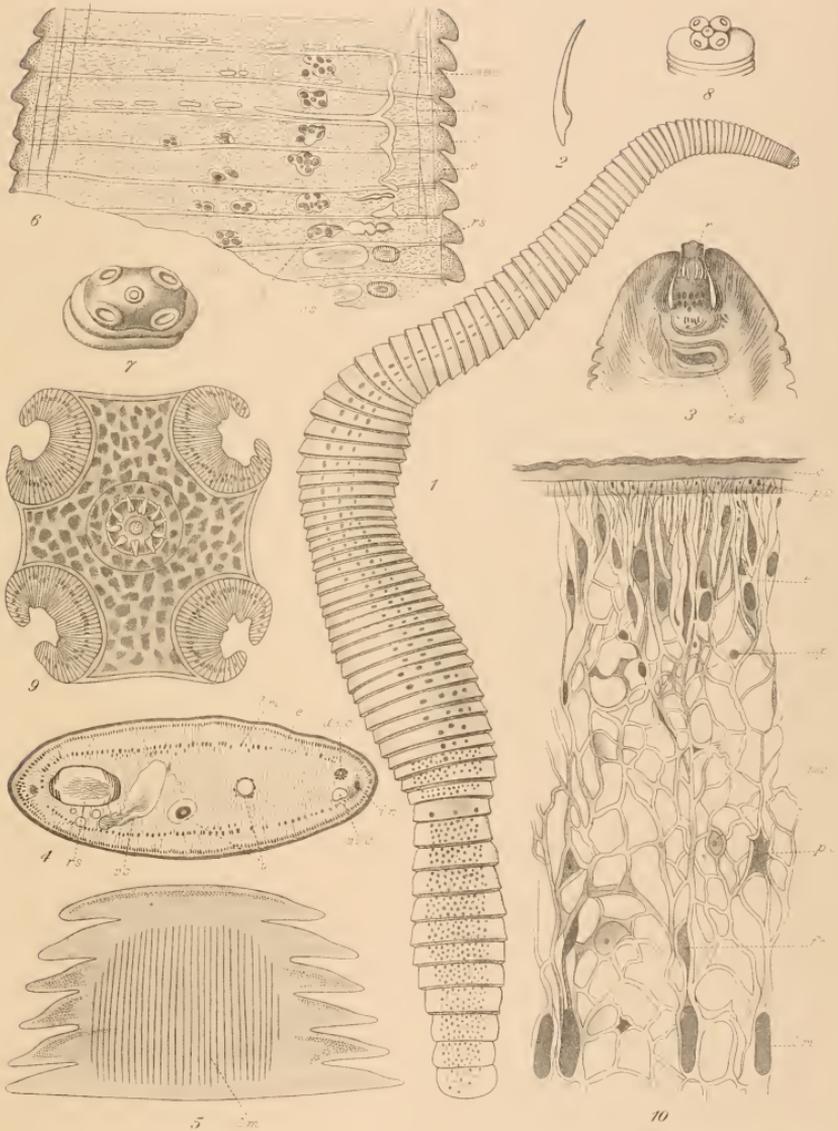
## DESCRIPTION OF PLATE XIII. (VOL. II.)

## ENTOZOA.

## LIST OF ABBREVIATIONS.

<i>b.</i>	Brain.	<i>n. s.</i>	Central nerve ganglion.
<i>c. m.</i>	Circular muscles.	<i>n.</i>	The amoeboid nuclei of the skin and the lemnisci.
<i>c.</i>	Cuticle.	<i>o.</i>	Ovary.
<i>d. e. c.</i>	Dorsal excretory canal.	<i>p.</i>	Nucleus of parenchymatous cell.
<i>e.</i>	Ectoderm.	<i>p. c.</i>	Parenchyma cell.
<i>e. m.</i>	Masses of ova.	<i>p. e.</i>	Knob-like ends of ectoderm cells under cuticle.
<i>f. c.</i>	? Flame-cell.	<i>r. s.</i>	Receptaculum seminis.
<i>g. d.</i>	Genital duct.	<i>r.</i>	Rostellum.
<i>g. p.</i>	The external opening of the duct.	<i>s.</i>	Coagulated masses of spermatozoa in the body-cavity of the female.
<i>l. &amp; la.</i>	The lacunae in the skin.	<i>t.</i>	Testis.
<i>le.</i>	The lemnisci.	<i>u.</i>	Uterus.
<i>li.</i>	The ligament.	<i>v. e. c.</i>	Ventral excretory canal.
<i>l. l.</i>	The large lateral lacunae of the trunk.	<i>v. s.</i>	Vesicula seminalis.
<i>l. m.</i>	Longitudinal muscles.		
<i>l. n.</i>	Lateral nerve.		
<i>m.</i>	The muscles from which the ligament arises.		
<i>n. c.</i>	Nerve cell.		

- Fig. 1. A view of *Drepanidotaenia hemignathi*,  $\times 15$ . The dark patches in the anterior two-thirds of the body are caused by the generative organs; in the posterior third they represent the eggs in the uterus.
- Fig. 2. An isolated hook from the rostellum,  $\times 500$ .
- Fig. 3. A longitudinal section through the head,  $\times 100$ . The rostellum, *r.*, is retracted. The point of fusion of the two lateral nerves is shewn at *n. s.* The section passes between the suckers.
- Fig. 4. A transverse section through a mature proglottis,  $\times 70$ .
- Fig. 5. A longitudinal section, somewhat oblique, showing the regular arrangement of the longitudinal muscles,  $\times 50$ .
- Fig. 6. A longitudinal section through several mature proglottides,  $\times 50$ . This shows the transverse connection between the two ventral longitudinal excretory canals and the transverse lines formed by the concentration of the parenchyma at the posterior end of each proglottis.
- Fig. 7. A view of the head in an expanded, flattened-out state,  $\times 60$ .
- Fig. 8. A view of another head in a contracted, bunched-up condition,  $\times 40$ .
- Fig. 9. A transverse section through the head, showing the ten hooks on the rostellum and the four suckers.
- Fig. 10. A portion of a proglottis, highly magnified to show the minute anatomy,  $\times 450$ .

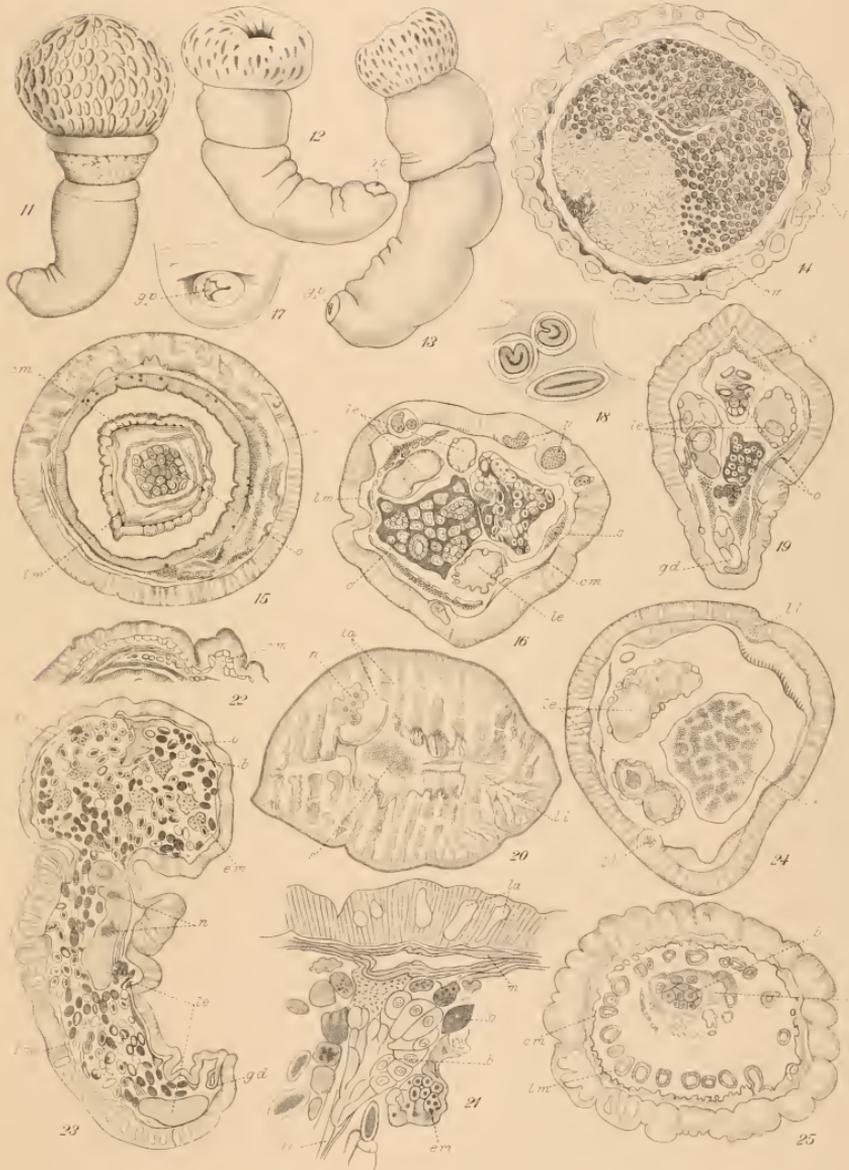


DESCRIPTION OF PLATE XIV. (VOL. II.)

ENTOZOA.

For explanation of letters see description of Plate XIII.

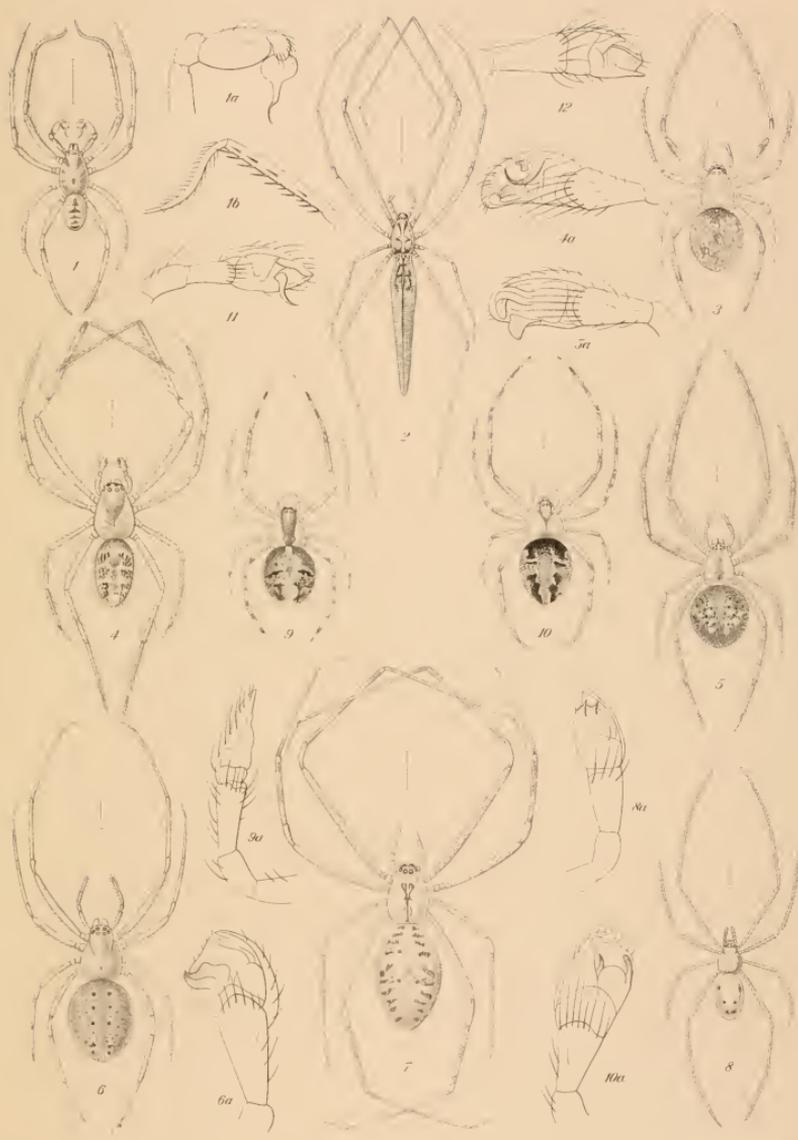
- Figs. 11, 12, and 13. Three views of three different specimens of *Arhynchus hemignathi*. Each  $\times 20$ . The division of the body into three regions is well marked. The details are shown in Fig. 11. Figs. 12 and 13 are rough sketches.
- Fig. 14. A transverse section through the head of a female, crowded with ova and egg-masses; the ligament is shown in section,  $\times 40$ .
- Fig. 15. A transverse section through the same, just below the edge of the collar. In the centre is the neck, which fuses with the collar a few sections further back. The big circular canal of the collar is shown at *L*,  $\times 40$ .
- Fig. 16. A transverse section through the trunk of the same. The uppermost lemniscus is cut in two places. The ovary is double, and shows egg-masses as well as eggs; some coagulated masses of spermatozoa are lying in the body-cavity,  $\times 40$ .
- Fig. 17. A surface view of the external opening of the genital duct,  $\times 40$ .
- Fig. 18. Some developing ova, highly magnified.
- Fig. 19. A transverse section through the trunk near the genital pore, taken from the same series as Figs. 14, 15, and 16. It shows part of the funnel-shaped internal opening of the genital duct, *g. d.*,  $\times 40$ .
- Fig. 20. A transverse section from another specimen taken behind the opening of the genital duct. This shows the arrangement of the lacunae and their communications with the lateral lacunae, *l. l.*
- Fig. 21. A longitudinal section through the central part of the skin of the head, showing the origin of the ligament and the ganglion cells of the brain, lying in a mass of ova and egg-masses.
- Fig. 22. A small portion of the skin in section, showing the single layer of circular muscle-fibres,  $\times 40$ .
- Fig. 23. A median longitudinal section through a female. The whole body-cavity full of ova and egg-masses. The ligament is seen in the head, and the genital duct near its opening in the trunk. The left lemniscus, cut twice, is alone seen,  $\times 30$ .
- Fig. 24. A transverse section through the trunk of a male, showing one of the testes. This section shows also the longitudinal muscles on the lemnisci and the large lateral lacunae, *lat. lac.*,  $\times 40$ .
- Fig. 25. A transverse section through the head of a male, showing the brain in the ligament, and the longitudinal muscle-fibres very well developed,  $\times 40$ .



DESCRIPTION OF PLATE XV. (VOL. II.)

ARANEAE.

- Fig. 1. *Ariadna perkinsi* E. Sim. ♂ ; 1a, maris pes-maxillaris ; 1b, ejusdem pes primi paris.  
Fig. 2. *Ariannes corniger* E. Sim. ♀ .  
Fig. 3. *Theridion campestratum* E. Sim. ♀ .  
Fig. 4. *T. praetextum* E. Sim. ; 4a, ♂ pes-maxillaris.  
Fig. 5. *T. haleakalense* E. Sim. ; 5a, ♂ pes-maxillaris.  
Fig. 6. *T. perkinsi* E. Sim. ♀ ; 6a, ♂ pes-maxillaris.  
Fig. 7. *T. kawaiense* E. Sim. ♀ .  
Fig. 8. *T. grallator* E. Sim. ♀ (pullus) ; 8a, ♂ pes-maxillaris.  
Fig. 9. *T. acutitarse* E. Sim. ♀ ; 9a, ♂ pes-maxillaris.  
Fig. 10. *T. melinum* E. Sim. ♀ ; 10a, ♂ pes-maxillaris.  
Fig. 11. *T. mauiense* E. Sim., maris pes-maxillaris.  
Fig. 12. *T. posticatum* E. Sim., maris pes-maxillaris.



See *Woolley's description*

*Chilodactylus*





DESCRIPTION OF PLATE XVI. (VOL. II.)

ARANEAE.

- Fig. 1. *Labulla torosa* E. Sim. ♂; 1a, pes-maxillaris; 1b, ejusdem tarsus pronus; 1c, chele maris supina; 1d, chele feminae supina.
- Fig. 2. *L. graphica* E. Sim. ♂; 2a, pes-maxillaris; 2b, ejusdem tarsus pronus; 2c, epigynum feminae; 2d, chele feminae supina; 2e, chele maris supina.
- Fig. 3. *Cyclosa xanthomelas* E. Sim. ♀.
- Fig. 4. *C. simplicicauda* E. Sim. ♀.
- Fig. 5. *C. olorina* E. Sim. ♀.
- Fig. 6. *Araneus emmae* E. Sim. ♀; 6a, epigynum feminae; 6b, ejusdem plagula inferior.
- Fig. 7. *A. kapiolaniae* E. Sim. ♀; 7a, epigynum feminae.
- Fig. 8. *Doryonychus raptor* E. Sim. ♂.
- Fig. 9. *Lycosella spinipes* E. Sim. ♀.
- Fig. 10. *L. annulata* E. Sim. ♀.
- Fig. 11. *Utesanis oahuensis* E. Sim. ♀; cephalothorax abdomenque a latere exhibita.







DESCRIPTION OF PLATE XVII. (VOL. II.)

ARANEAE.

- Fig. 1. *Misumena nigrofrenata* E. Sim. ♀.
- Fig. 2. *Synaema naevigerum* E. Sim. ♀; 2a, pes-maxillaris maris.
- Fig. 3. *S. dimidiatipes* E. Sim. ♀.
- Fig. 4. *Mecaphesa semispinosa* E. Sim. ♀; 4a, plagula genitalis.
- Fig. 5. *Proernus velox* E. Sim. ♂; 5a, processus tibialis pedis-maxillaris maris.
- Fig. 6. *P. schauinslandi* E. Sim. ♂; 6a, oculi proni; 6b, chele supina; 6c, pes-maxillaris maris; 6d, ejusdem processus tibialis a latere exhibitus.
- Fig. 7. *Pagiopalus atomarius* E. Sim. ♂; 7a, pes-maxillaris maris; 7b, ejusdem processus tibialis.
- Fig. 8. *P. personatus* E. Sim. ♀.
- Fig. 9. *Adrastidia longula* E. Sim. ♀.
- Fig. 10. *A. stigmatica* E. Sim. ♀.
- Fig. 11. *Misumena anguliventris* E. Sim., maris pes-maxillaris; 11a, feminae plagula genitalis.
- Fig. 12. *M. velata* E. Sim., maris pes-maxillaris; 12a, feminae plagula genitalis.
- Fig. 13. *Diaea insulana* Keyserl., processus tibialis pedis-maxillaris maris; 13a, id. varietas.
- Fig. 14. *D. vitellina* E. Sim., processus tibialis pedis-maxillaris maris.
- Fig. 15. *Pagiopalus semipunctatus* E. Sim., pes-maxillaris maris; 15a, ejusdem processus tibialis.



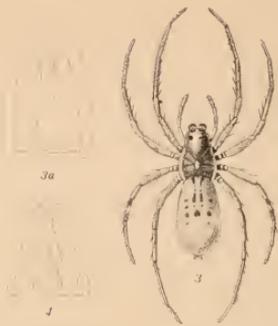
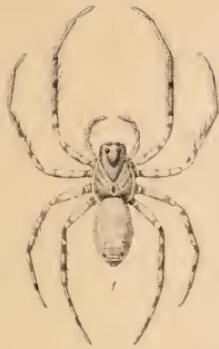




DESCRIPTION OF PLATE XVIII. (VOL. II.)

ARANEAE.

- Fig. 1. *Syroloma major* E. Sim. ♀; 1a, unguis tarsorum; 1b, plagula genitalis.  
Fig. 2. *S. minor* E. Sim. ♂.  
Fig. 3. *Lycosa likeliikeae* E. Sim. ♀; 3a, plagula genitalis.  
Fig. 4. *L. kalukanaï* E. Sim., plagula genitalis.  
Fig. 5. *Lycosella spinipes* E. Sim., plagula genitalis.  
Fig. 6. *Sandalodes validus* E. Sim. ♂.  
Fig. 7. *S. pubens* E. Sim. ♀; 7a, pes-maxillaris maris.  
Fig. 8. *S. albociliatus* E. Sim. ♀.  
Fig. 9. *S. navatus* E. Sim. ♂.  
Fig. 10. *S. verecundus* E. Sim. ♀.  
Fig. 11. *S. cruciatus* E. Sim. ♂.  
Fig. 12. *S. seniculus* E. Sim. ♂.  
Fig. 13. *S. canosus* E. Sim. ♀.  
Fig. 14. *Cnephalocotes simpliciceps* E. Sim., pes-maxillaris maris.  
Fig. 15. *Microneta insulana* E. Sim., chele maris prona; 15a, pes-maxillaris.



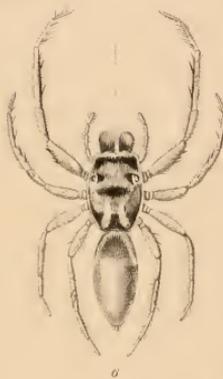
1a

3a

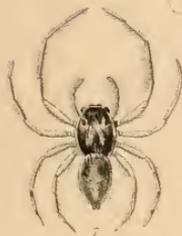
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1b



5



8



7a



9



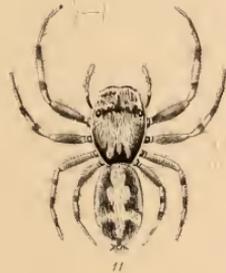
14



10



13



11



13



15a



12

*Simon, Araneae*

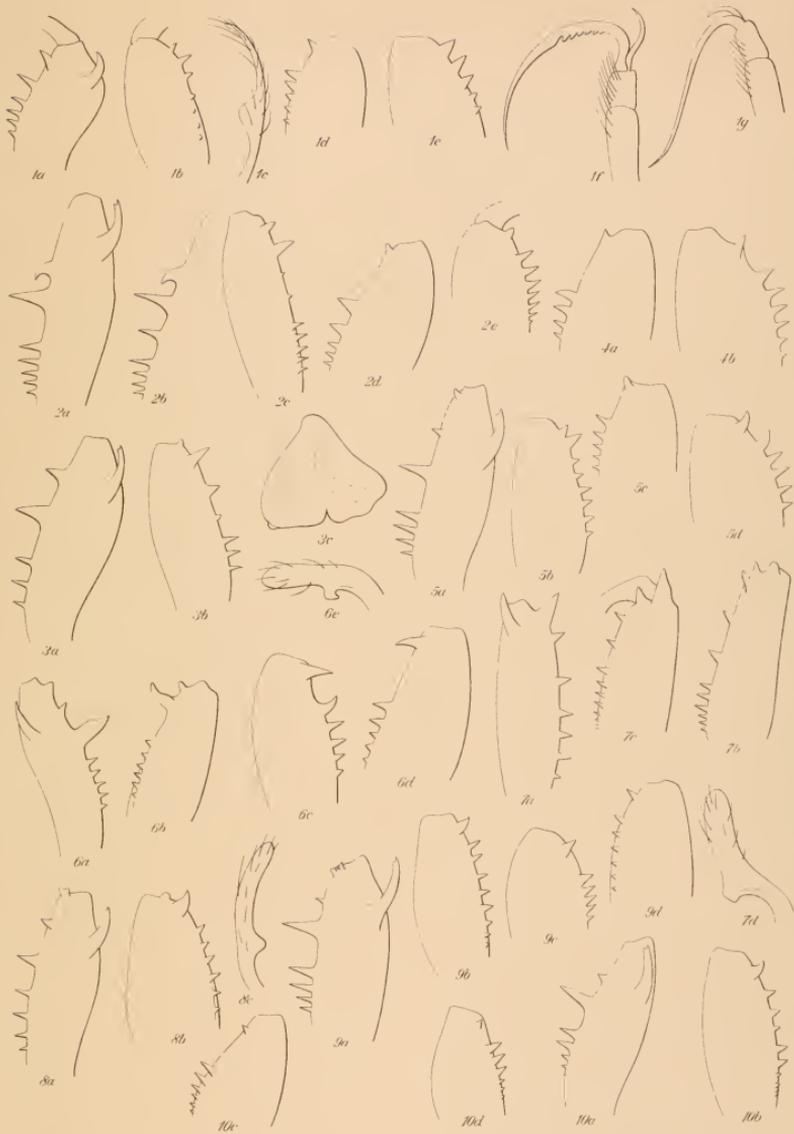




DESCRIPTION OF PLATE XIX. (VOL. II.)

ARANEAE.

- Fig. 1. *Doryonychus raptor* E. Sim. ; 1*a*, chele maris prona ; 1*b*, id. supina ; 1*c*, processus tarsalis maris ; 1*d*, chele feminae prona ; 1*e*, id. supina ; 1*f*, unguis tarsorum 1<sup>i</sup> paris intus ; 1*g*, id. extus.
- Fig. 2. *Tetragnatha unclifera* E. Sim. ; 2*a*, chele maris prona ; 2*b*, id. varietas ; 2*c*, id. supina ; 2*d*, chele feminae prona ; 2*e*, id. supina.
- Fig. 3. *T. cuneiventris* E. Sim. ; 3*a*, chele maris prona ; 3*b*, id. supina ; 3*c*, abdomen a latere exhibitum.
- Fig. 4. *T. hawaiiensis* E. Sim. ; 4*a*, chele feminae prona ; 4*b*, id. supina.
- Fig. 5. *T. perkinsi* E. Sim. ; 5*a*, chele maris prona ; 5*b*, id. supina ; 5*c*, chele feminae prona ; 5*d*, id. supina.
- Fig. 6. *T. netrix* E. Sim. ; 6*a*, chele maris prona ; 6*b*, id. supina ; 6*c*, chele feminae prona ; 6*d*, id. supina ; 6*e*, processus tarsalis maris.
- Fig. 7. *T. mandibulata* Walck. ; 7*a*, chele maris prona ; 7*b*, id. supina ; 7*c*, chele feminae prona ; 7*d*, maris processus tarsalis.
- Fig. 8. *T. sobrina* E. Sim. ; 8*a*, chele maris prona ; 8*b*, id. supina ; 8*c*, processus tarsalis maris.
- Fig. 9. *T. kauaiensis* E. Sim. ; 9*a*, chele maris supina ; 9*b*, id. supina ; 9*c*, chele feminae prona ; 9*d*, id. supina.
- Fig. 10. *T. restricta* E. Sim. ; 10*a*, chele maris prona ; 10*b*, id. supina ; 10*c*, chele feminae prona ; 10*d*, id. supina.



E Simon Araneae  
(Tetragnatha)





DESCRIPTION OF PLATE XX. (VOL. II.)

CRUSTACEA. ISOPODA.

- Figs. 1a & 1b. *Armadillo hawaiiensis* Dana; 1a, clypeus ♂; 1b, clypeus ♀.
- Figs. 2a—2h. *A. albospinosus*, sp. nov.; 2a, cephalon et premier segment pereial (♂); 2b, cephalon (vu en dessous) (♂); 2c, extrémité de l'antenne; 2d, partie latérale (coxale) des deux premiers segments pereiaux (vue en dessous); 2e, cinquième segment pleonal, pleotelson et uropodes (♂); 2f, premier pleopode (♂); 2g, uropodes et pleotelson (vus en dessous) (♂); 2h, cephalon et premier segment pereial (♀).
- Figs. 3a—3f. *A. perkinsi*, sp. nov. ♂; 3a, cephalon et premier segment pereial; 3b, cephalon (vu en dessous); 3c, extrémité de l'antenne; 3d, partie latérale (coxale) des deux premiers segments pereiaux (vue en dessous); 3e, cinquième segment pleonal, pleotelson et uropodes; 3f, premier pleopode.
- Figs. 4a—4g. *A. danae*, sp. nov. ♂; 4a, cephalon et premier segment pleonal; 4b, cephalon (vu en dessous); 4c, extrémité de l'antenne; 4d, partie latérale (coxale) des deux premiers segments pereiaux (vue en dessous); 4e, cinquième segment pleonal, pleotelson et uropodes; 4f, premier pleopode; 4g, uropode et pleotelson.
- Figs. 5a & 5b. *A. sharpi*, sp. nov. ♀; 5a, cephalon et premier segment pereial; 5b, cinquième segment pleonal, pleotelson et uropodes.
- Figs. 6a—6i. *Geoligia perkinsi*, sp. nov. ♂; 6a, cephalon et deux premiers segments pereiaux; 6b, cephalon (vu en dessous); 6c, antenne; 6d, pleotelson et uropode; 6e, lèvre inférieure; 6f, mandibules; 6g, première maxille; 6h, deuxième maxille; 6i, maxillipède.



Zoöl. Atlas, Tafel XX.

A Dollfus Crustacea, isopoda





DESCRIPTION OF PLATE XXI. (VOL. II.)

CRUSTACEA. AMPHIPODA.

A.

*Orchestia platensis* Kröyer.

At the top; lateral view of head and gnathopods, with lateral view of pleon immediately below.

*a. s.* First antenna.

*gn. 1, 2.* First and second gnathopods of the male, with portions more highly magnified.

*urp. 1, 3.* First and third uropods.

*mxp.* Maxillipeds, with palp of one side detached. These are from a second (male) specimen.

*gn. 1 ♀, gn. 2 ♀.* First and second gnathopods of a female specimen, with terminal part of *gn. 1* more highly magnified.

B.

*Orchestia pickeringii* Dana.

*O. P. gn. 2.* Second gnathopod of male.

C.

*Parorchestia hawaiiensis* Dana, ♂.

At the top; lateral view of head and gnathopods.

*l. s.* Upper lip.

*mxp.* Maxillipeds.

*gn. 1, 2.* First and second gnathopods, with portions more highly magnified.

*urp. 1, 2, 3.* First, second, and third uropods, third also more highly magnified.

*T.* Telson, to the same scale as the uropods, and also more highly magnified, to the same scale as upper lip and maxillipeds.











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