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SMITHSONIAN MISCELLANEOUS COLLECTIONS

PART OF VOLUME XLIX

Report on the Crustacea (Brachyura and  
Anomura) Collected by the North  
Pacific Exploring Expedition,  
1853-1856

BY

WILLIAM STIMPSON



(No. 1717)

CITY OF WASHINGTON  
PUBLISHED BY THE SMITHSONIAN INSTITUTION

1907



## ERRATA

[Insert in Stimpson's Report on the Crustacea Collected by the North Pacific Exploring Expedition. Smithsonian Miscellaneous Collections, XLIX, 1907.]

On pl. VIII, for *1a* read *2a*.

The figures numbered 1 on pl. XIII and 1 on pl. XV should be interchanged.

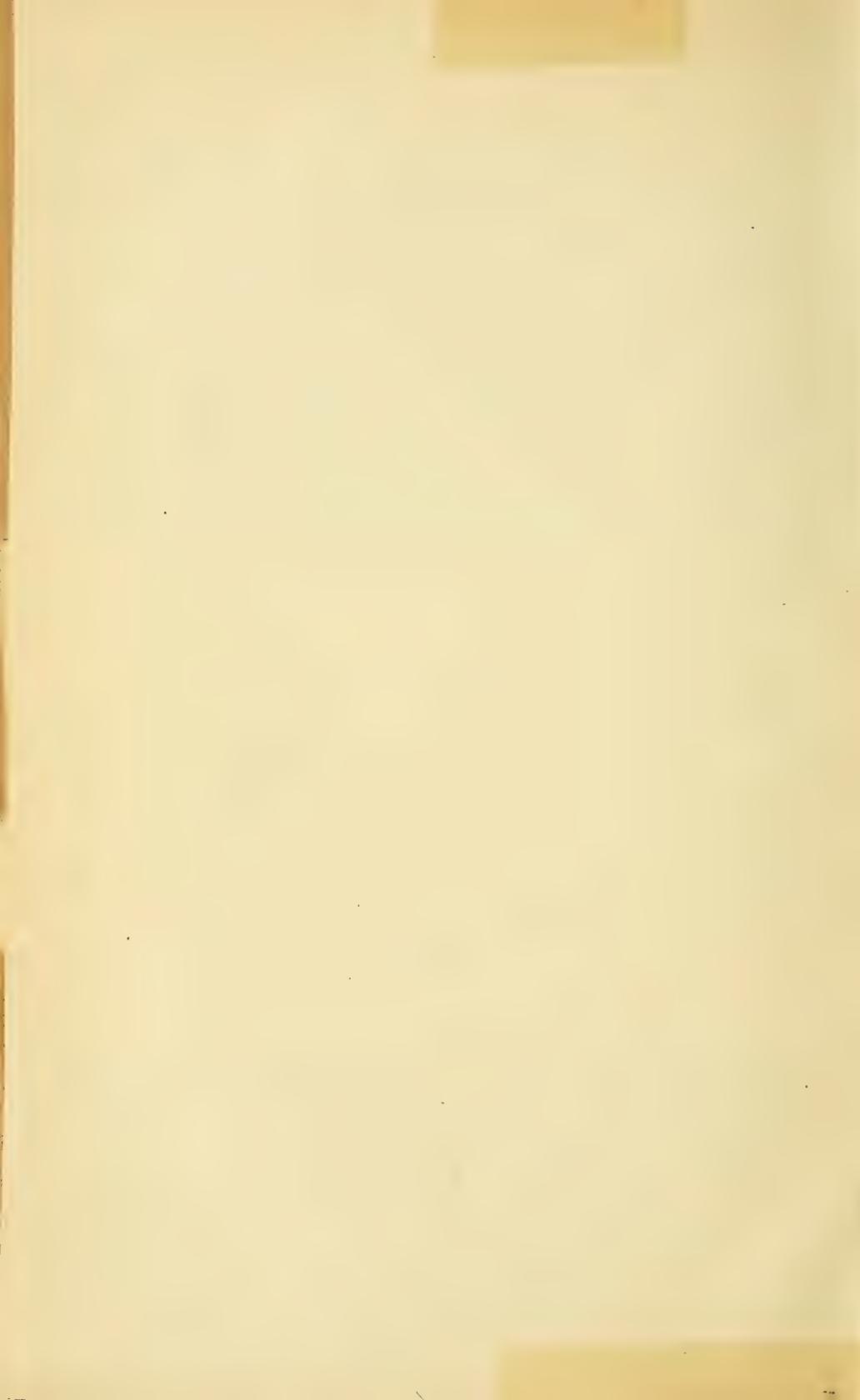
On pl. XIV, figs. *5a* and *5b* should be inverted.

On pl. XVIII, two figures are numbered 5; the lower one should be 7.

On pl. XXI, figs. *2a* and *2b* should be inverted.







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## INTRODUCTORY NOTE.

The North Pacific Exploring Expedition was sent out by the Navy Department under an appropriation from Congress in 1852, for "building or purchase of suitable vessels, and for prosecuting a survey and reconnaissance, for naval and commercial purposes, of such parts of Behring Straits, of the North Pacific Ocean, and the China seas, as are frequented by American whale-ships, and by trading vessels in their routes between the United States and China." The expedition set sail in June, 1853, and returned in 1856. Captain C. Ringgold, U. S. N., was placed in command, but, being recalled to the United States in 1854, he was superseded by Captain John Rodgers, U. S. N. William Stimpson acted as zoölogist. After leaving Norfolk the five vessels in service touched at Madeira, and then proceeded to Hongkong via the Cape of Good Hope. On this passage the sloop "Vincennes" and the brig "Porpoise" took the more southerly route to Van Diemens Land, thence through the Coral Seas, and by the Caroline, Ladrone, and Bashee Islands, while the steamer "John Hancock" and the other two vessels of the fleet traversed the straits of Sunda and Gaspar, the Carimata and Billeton passages, and the Sooloo Sea. Subsequently the expedition advanced northward, continuing work along the coasts of Japan and Kamchatka, in Bering Strait, on the coast of California, and at Tahiti, returning around the Cape [of Good Hope.] Horn\*

Of the vast collections obtained, it was estimated that the Crustacea numbered 980 species.

A few years after his return to the United States, Dr. William Stimpson became director of the Chicago Academy of Sciences, and moved to that place nearly all of the invertebrate material obtained by the expedition and belonging to the United States Government. Several preliminary papers had been prepared and published by him<sup>1</sup> in the Proceedings of the Academy of Natural Sciences of Philadelphia, when the collections with notes and drawings were destroyed by the memorable fire, in 1871.<sup>2</sup> In a statement of losses sustained,<sup>3</sup> Dr.

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<sup>1</sup> Prodomus descriptionis animalium evertibratorum, quæ in Expeditione ad Oceanum Pacificum Septentrionalem, a Republica Federata missa, Cadwaladaro Ringgold et Johanne Rodgers Ducibus, observavit et descripsit W. Stimpson.

<sup>2</sup> The above account is condensed from "Descriptive Catalogue of the collection illustrating the scientific investigation of the sea and fresh waters," by Richard Rathbun, published as Catalogue G of the Great International Fisheries Exhibition, London, 1883. Washington: Government Printing Office, 1883.

<sup>3</sup> According to Dr. Theodore Gill.

Stimpson enumerated the manuscript and drawings of the final report on the Crustacea Brachyura and Anomura. After his death, in 1872, however, this report was discovered at the Navy Department, and was sent to the Smithsonian Institution, where it has remained to the present time unpublished.<sup>1</sup>

In the meantime there are few students of the higher Crustacea who have not felt the need of more light on those rare genera and species known only from brief Latin diagnoses.

The following report has been treated as an historical document, and is published substantially as it was written by the author, the only additions being the references to his preliminary descriptions and the footnotes giving the current or accepted name where it differs from that used by Dr. Stimpson. It is hoped that the value of the descriptions will more than compensate for the antiquated nomenclature.

Numbers corresponding to those in the preliminary papers have been placed before each species for ready reference. The illustrations are from pencil drawings made, it is supposed, by Dr. Stimpson himself.

The many gaps in the illustrations and the absence from text or figures of any reference to the family Rhizopidæ are attributable to the withdrawal of these parts by Dr. Stimpson.

MARY J. RATHBUN.

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<sup>1</sup> Short extracts from the Maiioidea were published in the Proceedings of the United States National Museum, xv, pp. 276-277, pl. XL, 1892; xvi, pp. 95-103, pl. VIII, 1893.

REPORT ON THE CRUSTACEA (BRACHYURA AND ANOMURA)  
COLLECTED BY THE NORTH PACIFIC EXPLORING  
EXPEDITION, 1853-1856

BY  
WILLIAM STIMPSON

MAIOIDEA

MAIIDÆ

Genus LEPTOPUS Latreille

1. LEPTOPUS LONGIPES<sup>1</sup> (Herbst) Latreille

*Cancer longipes* HERBST.

*Leptopus longipes* LATREILLE; GUÉRIN, Icon., pl. x, fig. 3.

*Egeria Herbstii* MILNE EDWARDS, Hist. Nat. des Crust., I, 292.

*Egeria longipes* ADAMS and WHITE, Voy. Samarang, Crust., p. 7.

Among a large number of examples of this species collected by the expedition, there are two adult males which differ so much in the size and character of the chelopoda from the specimens ordinarily found, and those hitherto figured and described, that they might well be taken for a distinct species. The carapax of one of these specimens is 1 inch long and 0.85 inch broad. Proportion of breadth to length, 1:1.17. The chelopoda are large and robust, 1.8 inches in length. Hands much inflated; fingers gaping posteriorly; movable one with a large tooth at its inner base.

In nine-tenths of the male specimens taken, many of which are at least two-thirds as large as that above described, the hands are slender and weak, like those of the female; this (immature) form is that represented by Guérin's figure. In the sterile females, which occurred in equal numbers with the ordinary females and the males, the abdomen is flattened and only two-thirds as wide as the sternum.

In all of our specimens the præorbital tooth is very small; the orbits are interrupted above by two deep fissures, and below by one wide fissure divided into two by a small tooth. The projections of

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<sup>1</sup> *Phalangipus longipes* (Linnæus).

the carapax are rather tubercles than spines. In color the body is light reddish above, mottled with white; below white; feet whitish, annulated with red. The figure given by Milne Edwards in the "Règne Animal" is less characteristic of our specimens than that of Guérin.

Dredged in the harbor of Hongkong, China, on a muddy bottom, at the depth of 6 fathoms.

## Genus DOCLEA Leach

### 2. DOCLEA GRACILIPES Stimpson

#### PLATE I, FIG. I

*Doclea gracilipes* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 216 [23], 1857.

The species of the genus *Doclea* have great resemblance to each other in the shape and convexity of the carapax and in general appearance. The distinctions rest chiefly on the length of the feet and the proportional size of the lateral and posterior spines.

In *D. gracilipes* the body is covered with a short but dense villous coat, while the feet are less villous than is usual. The carapax, when this coating is removed, presents a deep suture or groove separating the stomachal, genital, and cardiac regions from the hepatic and branchial portions, and passing around behind the cardiac, separating this from the intestinal region. This groove is very deep where it passes the stomachal and genital regions. The median dorsal line is armed with six sharp tubercles, increasing in size posteriorly. The anterior three on the stomachal region are very small; one at the summit of the genital is larger; that on the cardiac becomes spiniform; and the posterior one, on the intestinal region, is still larger, though stout, blunt, and only one-tenth as long as the carapax. Of the four teeth usually described to be on the antero-lateral margin of the carapax, the anterior one belongs to the margin of the pterygostomial region, being at a lower level than the rest; in our species it is somewhat larger than the two following or intermediate ones; the posterior one, forming the extreme lateral spine, is very long (equaling in length more than one-sixth the width of the carapax), sharp, and curved forward. Besides the spines and teeth already mentioned, there are seven or eight slight tubercles on each side at the stomachal and branchial regions, only to be seen after the removal of the villous coat. The postero-lateral slopes are entirely smooth. The rostrum is but little longer than broad, slit for half its length, the horns being sharp. It is longitudinally



1



3



2



3a



4



grooved above, as is usual in the genus. The arrangement of the orbits and antennæ is as usual. There is a small spine at the exterior base of the basal article of the external antennæ; another larger one at the anterior angle of the buccal area, and a small one between this latter and the large pterygostomial tooth. The pterygostomial region is depressed, but not channeled. There are two sharp tubercles on the sternum between the bases of the feet of the second pair. The feet generally are long and slender; those of the second pair more than twice as long as the carapax; chelopoda of very small size, slightly villous, with a few scattered long hairs. Finger and thumb denticulated within and contiguous for the terminal half their length. Abdomen of male seven-articulate, narrowing rather abruptly at the fourth segment; there is a protuberance on the second segment.

The body is of a dirty yellowish or hay color, mottled with black. Feet annulated with orange. Dimensions (spines included): Length of carapax, 0.95; width, 1.02; proportion, 1:1.07; length of a foot of the second pair, 2.2 inches.

It resembles *D. muricata* Edw., but has no visible spines on the branchial regions, and the feet of the second pair are more than twice as long as the body. The two lateral spines are much longer than in *D. rissonii*.

It was found in considerable numbers in the vicinity of Hong-kong, China, occurring in 20 fathoms, gravelly mud, outside of the passages, and in 6 fathoms, mud, in some of the inner bays.

### 3. *DOCLEA CANALIFERA* Stimpson

PLATE I, FIG. 4

*Doclea canalifera* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 217 [23], 1857.

This species is remarkable for the depressed pterygostomial channels just without the maxillipeds. The whole surface, with the exception of the tips of the tarsi and the fingers, is covered with a dense villous coat concealing all but a few of the more prominent spines. The interregional groove and the spines and tubercles of the carapax are in number and position nearly the same as in *D. gracilipes*, except that there is an intermediate tubercle between the genital and cardiac spines. The terminal posterior spine is very slender, somewhat curving upward, and in length a little more than one-tenth that of the carapax. The posterior of the antero-lateral spines or teeth is larger than the others, slender, and in length about

one-ninth the width of the carapax; the pterygostomial spine is the smallest of the four. The parts about the head are nearly the same as in *D. gracilipes*, except that the forks of the rostrum are rather more slenderly pointed, and there is no tooth between the pterygostomial tooth and that at the anterior corner of the buccal region. The external maxillipeds nearly reach the bases of the internal antennæ, thus almost entirely concealing the epistome. The pterygostomial region is depressed so as to form a deep channel leading forward from the afferent branchial openings. This channel is bounded externally by a high, sharp ridge fringed with long hairs. The feet are stout; those of the second pair shorter than twice the length of the carapax. Chelopoda more slender than the other feet and not as long as the carapax; the fingers slender, minutely denticulated within and contiguous throughout their length. Color brownish above and below; smooth tips of dactyli red.

A single specimen only (a male) of this species was taken; its dimensions (including the spines) are: Length of carapax, 1.65; width, 1.50; length of posterior spine, 0.17; of lateral spine, 0.17; length of a foot of second pair, 2.54 inches.

Taken in the dredge with a mass of *Echini* from a muddy bottom at the depth of 20 fathoms, off Tamtoo Island, coast of China, near Hongkong.

#### Genus CHIONÆCETES Kroyer

##### 4. CHIONÆCETES BERINGIANUS<sup>1</sup> Stimpson

*Chionæcetes behringianus* STIMPSON, Proc. Bost. Soc. Nat. Hist., VI, 84, Feb., 1857; Jour. Bost. Soc. Nat. Hist., VI, p. 449, 1857.

*Peloplastus pallasii* GERSTÆCKER, Archiv für Naturgeschichte, XXII, 105, pl. I, fig. 1.

Gerstæcker has given an excellent figure of this species in the Archiv für Naturgeschichte for 1856, but his paper does not appear to have been published before April, 1857; our name has, therefore, priority. The entomologist of Berlin does not seem to have been acquainted with Kroyer's genus *Chionæcetes*, to which the species certainly belongs; in fact, it is most closely allied to the type, *C. opilio*.

This species was found in Bering Strait and northward as far as the expedition penetrated, many specimens having been dredged by Captain Rodgers. It also occurred to the southward of the strait as far as Matwi Island. It is found only in deep water and

<sup>1</sup> *Chionæcetes opilio* (O. Fabricius).



100





on bottoms more or less muddy. In a living state it was of a light brick-red color above, often iridescent; below yellowish-white; sides of feet shining white. The posterior feet are short. The dimensions of the carapax of a large female are: Length, 2.57; breadth, 2.72 inches.

In Gerstæcker's figure the surface of the carapax posteriorly and the upper sides of the ambulatory feet are represented as much more rugose than in any of our specimens.

*Chionacetes* is evidently nearest allied to *Hyas*, although probably a higher form. In young specimens the resemblance to *Hyas* is easily noticed. *Hyas chilensis* should probably belong to it. It has considerable resemblance in general appearance to *Salacia* of the opposite extremity of the American continent, of which it may be considered the analogue.

### Genus HYAS Leach

#### 5. HYAS LATIFRONS<sup>1</sup> Stimpson

##### PLATE II.

*Hyas coarctatus* STIMPSON (non LEACH), Crust. and Echin. of the Pacific shores of N. America, Jour. Bost. Soc. Nat. Hist., VI, p. 450, 1857.

This species differs from *H. coarctatus*, of the North Atlantic, in the following characters, which are found to be constant upon examination of numerous specimens of both forms: The body is thicker and much broader anteriorly across the post-orbital apophyses; the angles are all more obtuse. The dorsal surface is marked with fewer tubercles, which are also much larger and more obtuse, most of them being rather swellings than warts. The rostrum is shorter and less acute; and the superior fissure of the orbit is always closed, its margins overlapping.

It is subject to considerable variation in some of its characters, particularly in the greater or less approximation of the forks of the rostrum, which may be so closely appressed against each other as to overlap, or may diverge so as to leave a narrow V-shaped space between. They diverge most in the young. The feet and inferior surface of the body are densely hirsute in some individuals and quite smooth in others. The color is a dusky brick-red above, whitish below. The dimensions of a male from the Arctic Ocean north of Bering Strait are: Length of carapax, 2.85; greatest breadth, 2.12:

<sup>1</sup> *Hyas coarctatus* Leach.

greatest postorbital breadth, 1.75; breadth at constriction, 1.59 inches.

This species was found by us in great numbers in all parts of the North Pacific Ocean north of the parallel of 50°. The following localities may be mentioned: Sea of Okhotsk; Awatska Bay and off Chepoonski Noss, coast of Kamchatka; off Matwi Island; in Bering Strait, and in the Arctic Ocean. It occurred on all kinds of bottom, from low-water mark to a depth of 50 fathoms or more. Among several hundred specimens of this species not one of *H. aranea* was found, although this latter species is said by Brandt to occur in the Sea of Okhotsk.

The specimens from the waters of Awatska Bay, which are somewhat brackish, do not differ from those taken in the open sea.

Brandt, in the Zoölogy of Middendorff's "Reise in den Sibiriens," part I, page 79, describes a *Hyas* from the Sea of Okhotsk, which he considers a variety (*alutaceus*) of *H. coarctatus*. He states, however, that it differs from the Atlantic form in the somewhat more strongly granulated (*stärker chagrinierte*) upper surface of the carapax, in the broader posterior side of the body, and in the broader hands. These characters are certainly not those of our species, and for this reason we have not applied to the Pacific form the name *alutaceus*. In some of the larger specimens the surface is indeed granulated to some extent, particularly at the summits of the swellings; but specimens of ordinary size are always much smoother than any from the Atlantic. It is not impossible, therefore, that there is still another species in the North Pacific.

### Genus MICROPISA Stimpson

*Micropisa* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 217 [24], 1857.

It has been found necessary to institute a genus for the reception of a small *Pisa*-like crustacean which was taken in considerable numbers at the Cape de Verde Islands. It has a short and broad, ovate carapax and flattened rostrum. The orbits are much less complete than in *Pisa*, and have a single fissure above. It resembles *Scyra* in many respects, but the external antennæ are not concealed beneath the rostrum. The outer maxillipeds resemble somewhat those of *Pisa*; but the outer angle of the almost heart-shaped third joint is strongly projecting; and there is no notch for the reception of the fourth joint; the palpus is broad.

6. *MICROPISA OVATA* Stimpson

PLATE I, FIG. 3, 3a

*Micropisa ovata* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 217 [24], 1857.

In this little crab the carapax is rather depressed, and but little longer than broad. The regions are sufficiently prominent, but generally smooth and rounded; there are, however, three inconspicuous protuberances on the genital and three on each branchial region. Surface pubescent, the more prominent portions often surmounted by a few curled setæ. The antero-lateral margin is swollen, but without teeth, except that immediately behind the post-orbital tooth and a small conical one at the lateral extremity of the branchial region. The chelopoda of the adult male are robust; the meros toothed along the angles; the hand smooth, somewhat compressed, and surmounted above by a ridge. Posterior four pairs of feet pubescent; the meros with a small tooth at the summit and one or two near the base. Length of carapax, 0.4; width, 0.38 inch.

Several specimens were taken in the harbor of Porto Praya, Cape de Verde Islands. They were dredged on a nullipore bottom at the depth of 20 fathoms.

## Genus TIARINIA Dana

In addition to the characters given by Dana as defining this well-marked group, the following may be added. The palpus of the external maxillipeds is very broad; but little less than three-fourths as broad as the ischium or second joint; the antero-exterior angle of the meros is consequently much produced. As in many other genera of Maioids, the fingers of the chelopoda are in contact throughout their length in the young, but touch each other only at their tips in the adult; the dactylus bears a strong tooth within near its base. In *Tiarinia* the præorbital spine is more prominent than the tooth of the basal joint of the external antennæ, projecting over and concealing it; in *Pericera*, on the contrary, the antennal tooth is more prominent than the præorbital.

It has been usual to place *Pericera* and its allies near the *Menathæinæ*, along with *Halimus* and *Pugettia*, on the ground of the non-retractility of the eyes. But the eyes should scarcely be called non-retractile, when, as may be seen in any wet specimen, they are really more completely retractile than in any other genus of Maioids, and may be drawn in so far as to be completely hidden. It is true that this is not a folding back, as in *Hyas* and *Inachus*, but a direct

withdrawal into a sheath. *Pericera* is nearly allied to *Pisa*; in fact, *P. bicorna* is placed by some naturalists in one genus and by others in the other. The peculiar character of the orbit, however, seems to warrant the establishment of a new family division for the reception of this genus and *Tiarinia*.

### 7. TIARINIA CORNIGERA (Latreille)

PLATE III, FIG. 1

*Pericera cornigera* LATREILLE, Encyc., x, 141.

MILNE EDWARDS, Hist. Nat. des Crust., I, 335.

ADAMS and WHITE, Zoölogy of the Samarang, Crust.,  
18.

?*Tiarinia cornigera* DANA, U. S. Exploring Expedition, Crust., I, 110, pl.  
III, f. 5.

Our specimens differ from those described and figured by Dana in having, at the summit of the intestinal region, one very large and two inconspicuous tubercles, instead of three of equal size. They are also much larger, some being nearly two inches in length.

They are found on the reefs at low-water mark, and were collected at the Amakirrima Islands by the officers of the steamer "John Hancock" and by myself at Loo Choo and Ousima.

### 8. TIARINIA DEPRESSA Stimpson

PLATE III, FIG. 2

*Tiarinia depressa* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 217 [24],  
1857.

Carapax in shape much like that of *T. cornigera*; proportion of breadth to length, 1 : 1.5; form depressed; upper surface with tubercles less numerous and more flattened than in the *cornigera*. There is a small marginal spine on each side at the branchial region, above which an arc of four depressed warts extends around the side; the first (posterior) one largest, and placed a little behind the level of the trituberculated cardiac protuberance; the fourth, and smallest, is near the anterior extremity of the branchial region, with a still smaller one before it. A submarginal channel of some depth passes around behind, above the intestinal region. Posteriorly, at the upper or intestinal margin there is a subtriangular median tubercle, with a smaller trilobate one on either side of it; on the lower margin there are four small tubercles. On the stomachal region there are three warts in the median line, the anterior one smallest, and placed some little distance before the others, with a wart on either side of it; behind the posterior one there are two

warts placed close together. The ambulatory feet are depressed, smooth above, their edges not spinulose, but sparsely fringed with stout clavate setæ. Only one specimen of this species was taken—a sterile female—the dimensions of which are: Length, 0.77; breadth, 0.52; length of a foot of second pair, 0.67 inch.

In the characters of the rostrum, orbits, etc., our species much resembles *T. cornigera*. The tooth at the external angle of the basal joint of the external antennæ is, however, less prominent than in that species, and the rostrum curves upward at its slender tip, where the horns are slightly divergent. It is more depressed than *T. tiarata*; the forks of the rostrum are less divergent; the præorbital spine less prominent, and is wanting in the woolly hairs characteristic of that species.

The specimen was taken at the island of Ousima, which forms one of the chain connecting southern Japan with Loo Choo.

#### 9. TIARINIA SPINIGERA Stimpson

PLATE III, FIG. 3

*Tiarinia spinigera* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 217 [24], 1857.

Carapax somewhat elongated, the greatest breadth excluding spines being considerably less than the postorbital length. Upper surface not very convex except at the well-developed gastric region; cardiac region with three tubercles at the summit, placed as usual in the genus; on either side of this on the branchial regions there are three sharp, erect spines, the outer one being lateral, a little larger than the others, and somewhat inclined outward. There is a single longish clavate seta at the summit of each spine. Upper posterior margin with seven small spines, the middle one largest at the summit of the intestinal region; lower posterior margin also with seven spines, but of much smaller size. The sides of the carapax, including the hepatic regions and the posterior half of the upper surface, are covered with small, sharp tubercles occupying the interspaces between the spines and larger warts, while the gastric region, and parts adjacent on either side, although irregularly protuberant, are nearly smooth. Rostrum sharp and very slender, in length equaling two-thirds the interorbital width; horns contiguous throughout their length. Præorbital tooth prominently salient, very slender and sharp, curved upward; a single closed fissure separates it from the somewhat prominent postorbital tooth. The basal article of the external antennæ is broader than long; its antero-exterior

tooth lies close beneath the præorbital tooth, and helps to form the deep tubular orbit, which encloses the eye as in a sheath. The edges of the rostrum and of the external antennæ are, as usual, ciliated; and there are some few crispate setæ on the prominent parts of the carapax anteriorly and at the sides.

In the feet of the anterior pair the carpus and meros are sparingly spinulose above. The ambulatory feet are almost smooth; those of the first pair in the female are scarcely as long as the carapax. The abdomen in the female is tomentose.

Two specimens only of this species were found, both females. The dimensions of the largest are: Length of the carapax, 0.79; breadth, including spines, 0.57 inch.

This species occurred at the islands of Ousima and Tanegasima, of the southern Japanese chain.

#### 10. MICIPPA HAANII Stimpson<sup>1</sup>

*Micippa thalia* DE HAAN, Fauna Japonica, Crust., 98, pl. XXIII, fig. 3.

*Micippa Haanii* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 217 [24], 1857.

The Japanese specimens of this species are said by De Haan to differ from the original specimens of *Cancer thalia*, described by Herbst, in wanting the two spines on the posterior margin of the carapax, and in having a spine on the meros of the ambulatory feet, near its superior extremity. On all of our specimens from the Chinese Sea the characters are the same as those found in De Haan's figure and description, while none present the above-mentioned characters of *C. thalia*. Nor do they agree with the description of Herbst's specimen given by Gerstæcker in the Archiv für Naturgeschichte, vol. XXII, p. 109. Under these circumstances we have been led to consider the species distinct and to propose a new name for De Haan's crustacean.

*M. thalia* Krauss, which inhabits the coast of South Africa, seems also distinct from the Herbstian species.

#### 11. MICIPPA SPINOSA Stimpson

PLATE I, FIG. 2

*Micippa spinosa* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 218 [24], 1857.

Body depressed; proportions of the carapax, breadth to length, as 1 to 1.3; upper surface uneven, crowdedly tuberculated and setose. Spines of the back few in number, but long and slender, with blunt

<sup>1</sup> *Micippa thalia* (Herbst).

extremities. There are three spines on the median line, two of which are on the gastric region, and one, the largest of all, on the cardiac. A large spine on each side on the branchial region, between which and the postorbital tooth, on the lateral margin, there are nine spines, irregular in size and distance. Posterior margin spinulose, three or four spines near the middle being larger than the others. Rostrum inclined at an angle of  $45^{\circ}$ , and bent at its extremity into the vertical plane; it is dilated at the extremity, the corners being broadly rounded and minutely crenulated; at the middle there are two diverging teeth. Ocular peduncles rather short, in length little more than twice their diameter. Orbit with two fissures above, the inner one closed, the outer open, separating the postorbital tooth. The pterygostomian regions are full convex, tuberculated, and not setose. The third joint of the outer maxillipeds is greatly expanded at its antero-exterior angle; the second joint is marked with a longitudinal furrow near its outer margin. The basal joint of the outer antennæ is very broad; its anterior tooth short, with nearly smooth margin; second joint oblong, compressed, with the margin ciliated with long hairs. Chelopoda equaling the carapax in length, smooth and glossy, fawn-colored, with white bases; carpus and hand minutely and obsoletely granulated; fingers with black tips. Ambulatory feet compressed, thickly hairy; the meros with a small terminal spine above. Color of the body pale reddish, rendered indistinct by an accumulation of sordes retained by the setæ. Dimensions: Length of the carapax, 0.75; greatest breadth, 0.59; distance between tips of postorbital teeth, 0.45; length of first pair of ambulatory feet, 0.86 inch.

Specimens of this species were dredged on a muddy bottom in six fathoms, in the harbor of Sidney, or Port Jackson, Australia.

#### 12. MICIPPA HIRTIPES<sup>1</sup> Dana

*Micippa hirtipes* DANA, U. S. Exploring Expedition, Crust., 1, 90, pl. 1, fig. 4.

The following description is drawn up from specimens preserved in spirits; it may be useful, as Dana's specimens were dried. The body is moderately depressed; carapax minutely and somewhat unequally tuberculated above, without spines, except a small one at the branchial region on each side, and a marginal one in front of this; these are continuous with the series of teeth on the antero-lateral margin. The posterior margin is denticulated with granular tuber-

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<sup>1</sup> *Micippa philyra* (Herbst).

cles somewhat larger than those of the surface, the median two being larger and dentiform. The antero-lateral margin curves upward a little and shows nine minute teeth, two of which, in the depression between the hepatic and branchial regions, are much larger than the others. The superior margin of the orbit is two-fissured. The eye-peduncles are exposed throughout their length, and fully reach the tip of the tooth formed by the external angle of the orbit. Rostrum broader than long; its upper surface with two convex ridges; extremity broader than the base, and four-toothed, the middle teeth being short, triangular, and blunt, the lateral ones sharp and curved upward. The movable part of the antennæ is at the base of the rostrum, separated from the orbit only by the narrow, projecting, terminal edge of basal joint, which, seen from above, forms a slender tooth. Below, the surface of this basal joint is smooth.

The upper surface of the body is hairy; the ambulatory feet densely so; hectognathopoda also hairy. First pair of ambulatory feet long. Dactyli much curved. The dimensions of a female specimen are as follows: Length of the carapax, 0.59; greatest breadth, 0.48 inch; proportion, 1 : 1.23; length of first pair of ambulatory feet, 0.64 inch.

Our specimens differ somewhat from Dana's figure in the greater prominence of the tooth of the basal joint of the antennæ, which projects so as to appear conspicuously above. The species is, however, undoubtedly the same. It approaches *M. philyra* in character, but is more hairy, the margins with smaller teeth, the teeth of the rostrum shorter and the outer ones recurved, and the movable part of the antenna not widely separated from the orbit. It has also some resemblance to *M. platipes* Rüppell, but has not the sharp terminal rostral teeth of that species.

Our specimens were taken at the islands of Loo Choo and Ousima. Those of the U. S. Exploring Expedition are from Tongatabu.

#### Genus NAXIA Milne Edwards

##### 13. NAXIA DICANTHA<sup>1</sup> De Haan

*Naxia dicantha* DE HAAN, Fauna Japonica, Crustacea, p. 96, pl. xxiv, fig. 1.

In living specimens of this species the body is covered with sordes; when cleaned it is found to be of a yellowish-brown color above and below, the feet annulated with pale purplish-brown. There is a great diversity in the size of the hand and the shape of the fingers shown

<sup>1</sup> *Halimus diacanthus* (De Haan).



1



5



5a



2



6



3



7



4



8



between large males and those of ordinary or small size, as mentioned by De Haan.

The diversity in the shape of the rostrum in *Naxia serpulifera* and *N. dicantha* does not seem of sufficient importance to warrant a generic separation. The deep orbits, with peculiar fissures widening at the bottom, are characteristic of both, although in *N. dicantha* the inferior fissure is much broader than in the other species. There is, however, in the Japanese species a notch in the margin of the meros of the hectognathopod at the insertion of the carpus, while in *N. serpulifera*, judging from Guérin's figure, that margin is entire.

*Naxia dicantha* was taken by the expedition at the following localities: Hongkong harbor, abundant on shelly bottoms in 10 fathoms; Northern China Sea, in 20 fathoms; Kagoshima Bay, Japan, in 20 fathoms, shelly bottom.

### Genus SCYRA Dana

#### 14. SCYRA COMPRESSIPES Stimpson

PLATE III, FIG. 4

*Scyra compressipes* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 218 [25], 1857.

Carapax irregularly ovate; proportion of breadth to length, 1:1.27 (rostrum and lateral spines included). It is rather depressed posteriorly, well contracted between the hepatic and branchial regions. Gastric region ample, rounded above, and nearly smooth, with the exception of two or three minute tubercles along the median line and one on either side posteriorly. There is a sharp tubercle on each side at the hepatic region, and a short, sharp spine, extending horizontally and somewhat curving forward at the summit of each branchial region. Cardiac and intestinal regions rather small and only moderately elevated. Posterior margin with a slightly prominent tubercle at the middle. Rostrum scarcely as long as broad, laminiform, scarcely contracted at base; horns shorter and less acuminate than in *S. acutifrons*. Præorbital tooth prominent and acute, but rather short. Parts about the head below much as in *S. acutifrons*. The tooth forming the external angle of the orbit is deeply concave below, leaving the orbit at that point widely interrupted. Margin of the pterygostomian region with three small, obtuse, lobe-like teeth; a deep sinus separates this margin from that of the side of the carapax. Feet all much compressed. Meros of chelopoda four-sided or prismatic, obtusely tuberculated along the angles; superior edge with blunt teeth near the base, and one prominent

sharp tooth near the extremity, being one of three large teeth surrounding the insertion of the carpus. Superior and inferior edges of ambulatory feet somewhat setose; the penultimate joints of these feet, however, are smooth and slender. In this and the other known species of the genus the setæ are stout and clavate in form.

The dimensions of a sterile female are: Length of carapax, 0.65; greatest breadth, 0.51 inch.

This species was dredged in the harbor of Hakodadi, Island of Jesso, Japan, on a bottom of weedy sand, at the depth of 6 fathoms.

Only one other species of the genus is known, *S. acutifrons* Dana, which inhabits the opposite coast of the North Pacific.

### Genus DIONE De Haan

#### 15. DIONE AFFINIS<sup>1</sup> De Haan

*Dione affinis* DE HAAN, Fauna Japonica, Crustacea, 94, pl. XXII, fig. 4.

The only specimen taken is young, the dimensions of the carapax being: Length, 0.57; greatest breadth, 0.41; breadth between præ-orbital spines, 0.35 inch. Proportion of this interorbital breadth to the length, 1:1.63. This proportion in De Haan's figure is 1:1.93. Our specimen differs from those described by De Haan in its more depressed form, its narrower and smoother carapax and broader front. There is no tooth within at the base of the movable finger and none on the outer base of the hand. The horns of the rostrum are longer than in the adult *D. affinis*, and the abdomen of the male is not dilated near the base.

Having no opportunities of comparing our specimen with the young of the species to which it is here referred, we do not venture to consider it distinct.

It was taken in a harbor on the northwest coast of the Island of Ousima.

### Genus MITHRAX Leach

#### 16. MITHRAX SUBORBICULARIS<sup>2</sup> Stimpson

PLATE IV, FIG. 1

*Mithrax suborbicularis* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 218 [25], 1857.

This species belongs to the division "Mithrax transversaux" of Milne Edwards. The following description is taken from a sterile female, the only specimen found. Carapax rounded, not narrowed

<sup>1</sup> *Schizophrys aspera* (Milne Edwards).

<sup>2</sup> *Cyclax (Cyclomaia) suborbicularis* (Stimpson).

anteriorly; length and breadth equal; margins dentated with teeth of moderate size. Gastric region broad and convex. Upper surface with about thirty small, nearly equidistant prominent warts; the interspaces granulated. Rostrum formed of two small, sharp, triangular, diverging horns, outside of which, on either side, project three slender spines belonging to the anterior margin of the basal joint of the antennæ. Eyes large. Superior margin of orbit with two deep fissures and three teeth, the middle one of which is short, truncate, with a trifid clove-like apex. The tooth at the external angle of the orbit is rather long and sharp, curving forward; immediately behind this there are two teeth on the antero-lateral margin just in front of the hepatic constriction. Behind this constriction on the lateral margin of the carapax there are six teeth, the posterior ones very small, and placed rather above than *on* the margin. At the posterior extremity of the shell there are two small blunt submarginal teeth. Outer pterygostomian regions with granulated surface, upon which arise a few tubercles. Hectognathopoda and the adjoining triangular surface smooth and ungranulated. Fossæ of the inner antennæ excavated in the inferior side of the horns of the rostrum. Chelopoda small, slender, smooth, and glossy. Ambulatory feet hairy above; three of the joints spinulose; below smooth. Those of the posterior pair nearly smooth above.

The color in the preserved specimen is white, tinged with reddish-brown. Dimensions: Length of carapax, 0.8; greatest breadth, the same; breadth between tips of the larger spines of the antennæ, 0.4; between tips of the spines at outer angle of orbit, 0.57 inch.

It was taken at Selio Island, Gaspar Straits, by Mr. L. M. Squires, of the steamer "John Hancock."

#### Genus CAMPOSCIA Latreille

##### 17. CAMPOSCIA RETUSA Latreille

*Camposcia retusa* LATREILLE, Règne Anim., 2d ed., IV, 60. GUÉRIN, Icon., pl. IX, fig. 1. MILNE EDWARDS, Hist. Nat. des Crust., I, 283, pl. XV, figs. 15, 16; Cuv. R. Anim. Crust., pl. XXXII, fig. 1. ADAMS and WHITE, Voy. Samarang, Crust., p. 6.

The specimen is a fully developed female. It is covered with a thick growth of *ulva*, indicating the sluggish habits of the species. The abdomen does not appear to have been described; it is seven-articulate, depressed, suborbicular, but longer than broad, with a transverse convexity at the middle of each joint, forming a low median ridge, less conspicuous on the first and last joints. The terminal knobs of the rostrum are only the extremities of two slight,

longitudinal, minutely nodulose ridges on its upper surface; between them there is a small tooth or point projecting downward, formed by the emargination. In our specimen the postorbital tooth seems less strong than in Milne Edwards's figure (*Hist. Nat. des Crust.*, pl. xv, figs. 15, 16), and there are no warts on the gastric region.

Dredged from a weedy and sandy bottom in 2 fathoms, in a harbor of Ousima.

### Genus ACHÆUS Leach

#### 18. ACHÆUS JAPONICUS De Haan

*Acheus japonicus* DE HAAN, *Fauna Japonica*, *Crust.*, p. 99, pl. xxix, fig. 3. ADAMS and WHITE, *Voy. Samarang*, *Crust.*, p. 5.

In our specimens the spines of the ocular peduncles are obsolete, and the falciform dactyli of the posterior feet are much curved, forming nearly a semicircle.

Taken in the harbor of Hongkong, China.

#### 19. ACHÆUS LACERTOSUS Stimpson

PLATE III, FIG. 7

*Acheus lacertosus* STIMPSON, *Proc. Acad. Nat. Sci. Phila.*, ix, p. 218 [25], 1857.

The following description is taken from an adult male: Carapax, triangular; proportion of breadth to length, 1:1.8; regions sufficiently prominent; surface smooth and slightly pubescent, without spines. A small, flattened, wing-like projection at the hepatic region. Rostrum as long as broad, with bilobate extremity; its upper surface two longitudinal convexities corresponding to the deeply excavated fossæ below. External antennæ hair-like, longer than the body. Peduncles of the eyes smooth. Chelopoda very large, resembling considerably those of *Myctiris*; they are somewhat longer than the body; meros much swollen and larger than the hand, with two granulated ridges below and one above, the latter bearing also two small spines; carpus with a small tubercle or spine at the summit near its articulation with the meros; there are a few rather long hairs at the inner angles of the carpus and meros; hand somewhat curved, with the fingers small, slender, compressed, and curved, touching each other throughout the length of their denticulated inner edges. The chelopoda are separated below at their bases by a wide depressed space. Ambulatory feet exceedingly slender; those of the first pair longest and nearly three times as long as the body. Feet of the last two pairs with much-curved falciform dactyli; the penult

article subcylindrical and slender. Abdomen consisting of six segments, all of which are exposed by the shortness of the carapax posteriorly; extremity broad. Dimensions of carapax: Length, 0.385; breadth, 0.325 inch.

This species was dredged on a muddy bottom in 6 fathoms, in the harbor of Port Jackson, Australia.

### Genus ACHÆOPSIS Stimpson

*Achæopsis* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 219 [25], 1857.

In this genus the general appearance resembles that of *Achæus*, and the terminal joints of the feet of the posterior three pairs are falciform. As in *Eurypodius*, the eyes are retractile, but without orbits, and the external antennæ are not concealed beneath the rostrum. The antennular fossæ are very large, and excavated in the under side of the horns of the small bifid rostrum. The basal joint of the external antennæ is narrow and placed almost in a vertical plane, as in *Leptopodia*.

#### 20. ACHÆOPSIS SPINULOSUS Stimpson

PLATE III, FIG. 5, 5a

*Achæopsis spinulosus* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 219 [25], 1857.

Description of a developed female. The carapax is rather thick and convex above, the sides rounded; the regions not strongly defined, and rising but little beyond the general surface. The surface is minutely and inconspicuously pubescent. The spines on the upper surface of the carapax are all small, about equal in size, and very sharp and slender; there are three on the gastric region, one placed posteriorly in the median line, the other two on the sides between the median and the postocular spines. The somewhat protuberant summit of the cardiac region is unprovided with a spine, but there are two on each branchial region. Four minute spines on the hepatic region and a few placed along the inferior lateral margin of the carapax. The rostrum is rather longer than it is broad at its base, and divided for more than half its length, with the horns acute. The small, sharp præocular spine points obliquely upward and forward. The ocular peduncles in length equal about half the interorbital space; they bear a slight tooth inferiorly in front and a minute spine at the summit of the eye. The narrow basal joint of the external antennæ curves upward and slightly outward at the base of

the rostrum, and is denticulated along the edge. The surface of the external maxillipeds is ornamented with subspiniform and setose granules, except at the longitudinal sulcus of the ischium-joint; the exposed surface of the palpus is also granulated. Chelopoda rather large, even in the female, and nearly one-half longer than the carapax; they are everywhere spinulose above, except on the fingers of the hand, which are smooth, curved, with their inner margins contiguous, inconspicuously denticulated. Ambulatory feet hairy, somewhat irregularly and minutely spinulose above; terminal joints in the posterior three pairs short, not greatly curved. Dimensions: Length of carapax, 0.36; breadth, 0.28; length of first pair of ambulatory feet, 0.67 inch.

Dredged in Simons Bay, Cape of Good Hope, in 10 fathoms.

### Genus STENORYNCHUS Lamarck

#### 21. STENORYNCHUS PHALANGIUM<sup>1</sup> (Pennant) Milne-Edwards

*Cancer phalangium* PENNANT.<sup>1</sup>

*Cancer rostratus* LINNÆUS, Fauna Suecica, No. 2027.

*Macropodia phalangium* LEACH, Zool. Misc., pl. II.

*Stenorynchus phalangium* MILNE EDWARDS, Hist. Nat. des Crust., I, 279; Cuv. R. Anim. Crust., pl. XXXV, fig. 3.

*Stenorynchus rostratus* BELL, Brit. Crust., p. 2. LILJEBORG, Öfvers. af Kongl. Vet.-Ak. Förhand., 1855, p. 118.

This species was dredged in 15 fathoms, sandy bottom, off the town of Funchal, Madeira.

#### 22. STENORYNCHUS FALCIFER<sup>2</sup> Stimpson

PLATE III, FIG. 8

*Stenorynchus falcifer* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 219 [26], 1857.

Body rather slender, but high and rounded; carapax minutely pubescent; proportion of breadth to length, 1 : 1.79. There are two long erect spines on the upper surface, one at the summit of the gastric, the other on the cardiac region; there are also a few small spines or sharp tubercles on the sides of the body. Rostrum constituting more than one-fourth the length of the carapax, and very slender, composed of two acicular horns, contiguous throughout their length, and so closely pressed against each other that one is usually crowded up over the other, as if twisted. External antennæ

<sup>1</sup> *Macropodia rostrata* (Linnæus).

<sup>2</sup> *Macropodia falcifera* (Stimpson).

not concealed beneath the rostrum; basal joint lateral, or in a vertical plane, with a small spine at the inferior face. Antennulary fossæ large and wide. Eyes saliant, with a sharp minute spine at the summit. Chelopoda in the female and young male hairy and somewhat spinous; meros with a long spine at the summit; carpus with two spines; hand much curved, fingers forming half the length of the hand and denticulated within. Ambulatory feet slender, rather smooth, with a few scattered hairs; a strong spine at the summit of the meros in each pair. Dactyli of the posterior two pairs of feet falciform, as in the genus *Acheus*. Color, brick-red. Dimensions of a female: Length of carapax, 0.61; breadth, 0.35; length of rostrum, 0.19; of first pair of ambulatory feet, 1.75 inches.

It has considerable resemblance to *S. phalangium* in many of its characters, but the two large dorsal spines at once distinguish it. The terminal joints of the last two pairs of feet are falciform, a character not to be found in diagnoses of the genus, but we may observe a strong approach to this form in the posterior dactyli of *S. phalangium* and some other species.

Taken among sea weeds, etc., in 12 fathoms, on a sandy bottom, in Simons Bay, Cape of Good Hope.

#### Genus LEPTOPODIA Leach

##### 23. LEPTOPODIA SAGITTARIA<sup>1</sup> (Fabricius) Leach

*Inachus sagittarius* FABRICIUS, Suppl., 359.

*Leptopodia sagittaria* LEACH, Zoöl. Misc., II, pl. LXVII. MILNE EDWARDS, Hist. Nat. des Crust., I, 276.

This species was dredged in 30 fathoms off the south side of Madeira. It is found on the shores of Florida and the West Indies, and is said by Brullé to occur at the Canary Islands.

#### Genus PERINEA Dana

##### 24. PERINEA TUMIDA Dana

*Perinea tumida* DANA, U. S. Exploring Expedition, Crust., I, 114, pl. IV, fig. 1.

Our specimens agree well with those of Dana, except that in the male the pincers are much smaller and less gaping, while the size of the carapax is the same; this may, however, result from a difference of age and development.

Taken from branches of Madrepora, found below low-water mark near Hilo, Island of Hawaii.

<sup>1</sup> *Stenorynchus sagittarius* (Fabricius).

## Genus PUGETTIA Dana

Having secured specimens of two species of Japanese Maioid crabs, referred by De Haan to the genus *Menæthius*, we find them perfectly similar, in all characters which may be considered generic, to the *Pugettia* of the North American coast. The range of the genus, therefore, extends throughout the North Pacific. In addition to the characters given by Dana for the genus, we may mention the following: There is no postorbital spine, other than that forming the anterior angle of the hepatic expansion. The pterygostomial ridge is denticulated. There is a small tuberculiform tooth at the exterior base of the first joint of the antennæ. The chelopoda are very large in the male.

The lyrate form of the carapax, with two angular projections on either side, otherwise without spines, is quite characteristic. The body of the female is more swollen above than that of the male. The species are generally very clean and neat for Maioids, and free from pubescence.

25. PUGETTIA INCISA<sup>1</sup> (De Haan) Stimpson

*Menæthius incisus* DE HAAN, Fauna Japonica, Crust., p. 98, pl. XXIV, fig. 3. ADAMS and WHITE, Voy. Samarang, Crust., p. 20.

This seems to represent *P. gracilis*. Recent specimens are of a reddish or chestnut color above, white below; pincers brown, tipped with white.

It differs from *P. quadridens* in the less projecting and much less concave hepatic expansions; also in the smaller chelopoda of the male. The fingers of the hand are contiguous almost throughout their length.

It was found on a sandy and weedy bottom, at the depth of 6 fathoms, in the Bay of Hakodadi, Japan.

## 26. PUGETTIA QUADRIDENS (De Haan) Stimpson

*Menæthius quadridens* DE HAAN, Fauna Japonica, Crustacea, p. 97, pl. XXIV, fig. 2. ADAMS and WHITE, Voy. Samarang, Crust., p. 20.

Living specimens are of a sea-green color, with the abdomen speckled with white. The species represents *P. Richii* of the Californian coast.

It was found among sea weeds dragged up from stony bottoms, at the depth of 1 and 2 fathoms, on the coast of China, near Hong-

<sup>1</sup> *Pugettia quadridens* (De Haan).

kong; also on fuci at low-water mark in the harbor of Simoda, Japan.

Genus *MENÆTHIUS* Milne Edwards

27. *MENÆTHIUS SUBSERRATUS*<sup>1</sup> Adams and White

*Menæthius subserratus* ADAMS and WHITE, Voy. Samarang, p. 18, pl. IV, figs. 1, 2. DANA, U. S. Expl. Exped., Crust., I, 122, pl. IV, fig. 7.

This species would seem scarcely to differ from *M. monoceros*, judging from Rüppell's figure, which is a fair representation of some of our Chinese specimens. But the members of this genus are greatly variable and a great number of specimens is required for their accurate determination.

It was taken by the expedition at Hongkong, China, and at the Amakirrima Islands.

It is also reported from the Philippine, Fiji, and Samoan Islands.

28. *MENÆTHIUS DENTATUS*<sup>2</sup> Stimpson

PLATE III, FIG. 6

*Menæthius dentatus* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 219 [26], 1857.

This species has much resemblance to *M. subserratus*, but the lateral teeth and the tubercles of the dorsal surface are much more prominent than in any specimens of that species which have come under our notice. The following description is taken from an adult male: Proportion of breadth of carapax to length, 1 : 1.5. Depressions between the regions deep. The cardiac region is very prominent and ample, occupying one-third the width of the carapax. Lateral teeth sharp and subtriangular; the two teeth on the anterolateral margin prominent, projecting well over the sides of the carapax, and bilobate, with the anterior lobe smallest. The two tubercles on the gastric region are sharply protuberant and covered in front with crispate setæ. The surface is elsewhere clean, with the exception of a slight pubescence on the sides and a dense pilosity on the rostrum. Interorbital space rather narrow, very smooth and flat, with the exception of the bituberculate anterior extremity of the gastric region. Rostrum rather long, curving a little upward toward the extremity. Præorbital teeth very long, pointing forward in a longitudinal direction. Chelopoda large; the hand rather compressed;

<sup>1</sup> *Menæthius monoceros* (Latreille).

<sup>2</sup> *Menæthius monoceros* (Latreille).

fingers short, contiguous at the denticulated exterior third of their length; a broad, blunt tooth at inner base of dactylus. Ambulatory feet rather smooth, glossy; two small setiferous teeth on upper side of meros; sometimes two or three points on the thick carpus. Dimensions: Length of carapax, 0.84; of rostrum, 0.25; of chelopod, 0.96; breadth of carapax, 0.56; interorbital width, 0.2 inch.

Taken at the Amakirrima Isles, near Great Loo Choo, by the officers of the steamer "John Hancock," Captain Stevens.

29. **MENÆTHIUS DEPRESSUS**<sup>1</sup> Dana

*Menæthius depressus* DANA, U. S. Expl. Exped., Crust., I, 121, pl. IV, fig. 6.

The specimens taken are all of small size, although somewhat exceeding in dimensions those described by Dana. The color is a uniform light-green above and below. Eyes black.

Taken on sargassum from rocks near low-water mark at Loo Choo.

Genus **ACANTHONYX** Latreille

30. **ACANTHONYX DENTATUS**<sup>2</sup> Milne Edwards

*Acanthonyx dentatus* MILNE EDWARDS, Hist. Nat. des Crust., I, 343. KRAUSS, Sudafrik. Crust., p. 48.

Living specimens are of an olive color. Found on seaweeds from 12 fathoms, sand, in Simons Bay, Cape of Good Hope.

Genus **EPIALTUS** Milne Edwards

31. **EPIALTUS PRODUCTUS** Randall

*Epialtus productus* RANDALL, Jour. Acad. Nat. Sci. Phila., VIII, 110. DANA, U. S. Expl. Exped., Crust., I, 133, pl. VI, fig. 2. STIMPSON, Crust. and Echin. of the Pacific shores of N. America, Bost. Jour. Nat. Hist., VI.

Found near San Francisco, Cal.

<sup>1</sup> *Menæthius monoceros* (Latreille).

<sup>2</sup> *Dehaanius dentatus* (Milne Edwards).

## PARTHENOPIDÆ

Genus EURYNOME Leach

## 32. EURYNOME LONGIMANA Stimpson

PLATE IV, FIG. 2

*Eurynome longimana* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 220 [26], 1857.

Carapax with the regions distinct, but not deeply separated; proportion of breadth to length, 1:1.38. Upper surface rugose, the rugosities consisting of rounded flattened warts somewhat irregular in size, and sometimes confluent. A large triangular tooth behind the orbit, at the hepatic region; five teeth on the branchial region, four of which are marginal or submarginal, and one erect at the center of the region. Two small spines on the gastric region. Cardiac region rather prominent, oblong. Posterior margin with a slight protuberance on each side. Rostrum deeply bifid; horns long and sharp, somewhat divergent. Orbits and antennæ much as in *E. aspera*, except that the superior orbital fissure is not open. Hectognathopoda roughly granulated. Chelopoda of male nearly twice as long as the carapax, granulated and somewhat spinous; hand rather slender, with three or four stout spines toward extremity on superior inner margin. Pincers deflexed. Ambulatory feet bicarinate above, the carinæ most distinct on the meros, where they are each 3 to 4 toothed.

In the female the carapax is pubescent and more convex than in the male; the chelopoda are very short, and the hand scarce twice as long as broad.

Colors: Carapax above dull red; feet whitish or variegated with pale red; eyes small, black.

Dimensions: Male, length of carapax, 0.47; breadth, 0.34; length of rostrum, 0.12; of chelopod, 0.8 inch; female, length of carapax, 0.39; of chelopod, 0.3.

Dredged in 10 fathoms, on a rocky bottom, among *Gorgonia*, etc., in False Bay, Cape of Good Hope.

## Genus LAMBRUS Leach

33. LAMBRUS RUGOSUS<sup>1</sup> Stimpson

## PLATE IV, FIG. 3

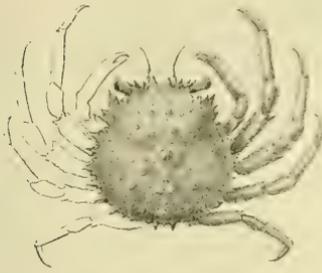
*Lambrus rugosus* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 220 [27], 1857.

Carapax nearly as long as broad, with very irregular and partly tuberculated surface; front with a deep, smooth, longitudinal concavity. An irregularly tuberculated ridge extends on either side obliquely across the branchial region to the posterior of the lateral teeth, enclosing a rather broad and depressed area, in which the granulated cardiac region forms a slight eminence. Beneath the ridge on the branchial region there are three principal tubercles. Lateral margin with about ten teeth, the first at the hepatic edge, rather prominent; the next eight very small, but sharp and deeply cleft, minutely denticulated, and about equal in size; the posterior tooth elevated and separated from the rest by a short space, large and conical, with a denticle on each side at its base. Posterior margin with four or five very small, distant tubercles only. Rostrum oblique, longer than broad at base, tapering, but with rounded extremity; a minute marginal tubercle at its base on each side. Chelopoda of moderate length, rugose, and tuberculated above; meros with two sharp teeth on the front edge. Hand with the upper surface sloping inwards and broadest at the middle, the keels not being parallel; three large tubercular teeth on outer keel, the third being at the insertion of the dactylus; six small teeth on inner keel, the middle one sharply prominent, the others less conspicuous. Inferior surface of chelopoda nearly covered with tubercles, which are smooth, rounded, equal, and but little elevated; of these there are four rows on the infero-exterior surface of the hand. Five or six small teeth on the triangular space at the superior base of the dactylus. Ambulatory feet nearly smooth; a few small spines on the superior edge of the meros.

In the young female the gastric and branchial regions are more deeply separated; the rostrum is shorter and blunter and the tubercles less numerous on the inferior surface of the chelopoda.

The dimensions of a male are as follows: Length of carapax, 0.34; greatest breadth (at the small ninth or penultimate lateral tooth), 0.35; length of rostrum, 0.07; of chelopod, 0.5 inch.

<sup>1</sup> *Parthenope rugosa* (Stimpson).



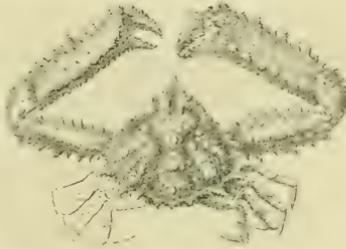
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Dredged off the harbor of Porto Praya, Cape de Verde Islands, in 20 fathoms, among nullipores.

### 34. LAMBRUS LACINIATUS<sup>1</sup> De Haan

*Lambrus laciniatus* DE HAAN, Fauna Japonica, Crust., p. 91, pl. XXII, figs. 2, 3. ADAMS and WHITE, Voy. Samarang, Crust., p. 29.

Recent specimens are of a reddish or yellowish-brown color above, paler and sometimes whitish below. Hands tipped with a dark mahogany color.

Young specimens, the carapax of which is not over two-thirds of an inch in length, are much smoother than the adults, with few tubercles on the surface of the body and none on the flat faces of the chelopoda. The teeth on the margins of the carapax and hands are small, little projecting, and scarcely denticulated.

This species is very common in the seas adjacent to the shores of Southern China, particularly about Hongkong. It inhabits muddy bottoms in from 5 to 20 fathoms. One specimen was taken in 25 fathoms, shelly bottom, near the middle of the Northern China Sea.

### 35. LAMBRUS TUBERCULOSUS<sup>2</sup> Stimpson

PLATE IV, FIG. 4

*Lambrus tuberculosus* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 220 [27], 1857.

In form, length of arms, and general appearance this species is similar to *L. validus*. Proportion of length to breadth of carapax, 1:1.21. Branchial regions separated from the median ones by profound depressions. Surface above everywhere covered with small flattened tubercles of nearly equal size. These tubercles are generally smooth on their flattened upper surfaces, and are each surrounded by a ring or crown of granules, thus resembling the *parvilli* of some kinds of starfishes. Two or three along the median line are larger and more prominent than the others. Lateral margin of the carapax with ten serrated and granulated teeth, the first one a slight lobe at the hepatic region; the posterior two very much larger than the others, sharply projecting, and ramose on all sides with denticulations. Beneath and within the posterior one there is a much smaller one of similar character. Posterior margin with three granulated knobs, the middle one smallest and trilobate. Front deeply

<sup>1</sup> *Parthenope laciniata* (de Haan).

<sup>2</sup> *Parthenope tuberculosa* (Stimpson).

concave above; rostrum subtriangular and pointed, with its sides a little concave. Surface of hectognathopoda and of the pterygostomian regions roughly granulated. Chelopoda with strong, acute, granulated teeth along the keels; teeth varying in size, eleven on the outer and ten on the inner keel of the hand; upper surface of meros and hand also with two intermediate rows of granulated tubercles, either subspiniform or rounded. Infero-interior surface of chelopoda also tuberculated; the tubercles small, flattened, arranged in three or four longitudinal rows. Ambulatory feet very small and weak, compressed, and spinous above; spines in three rows, one at each edge and one along the middle of the upper surface; dactyli smooth. Dimensions of the single specimen found, a male: Length of carapax, 0.66; breadth between tips of lateral teeth, 0.8; breadth excluding these teeth, 0.67; between elbows of chelopoda, 1.8; length of hand, 0.8 inch.

The species is found living in company with *L. laciniatus*, to which it has considerable resemblance, but the character of the very numerous tubercles on the surface of the carapax and arms will serve to distinguish it.

Taken in 15 fathoms, on a bottom of shelly mud, near Hongkong, China.

### 36. CRYPTOPODIA CONTRACTA Stimpson

PLATE IV, FIG. 6, 6a

*Cryptopodia contracta* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 220 [27], 1857.

In this species the carapax is smaller, with less lateral expansion and greater convexity than in any yet described. These and other points in its general appearance indicate an approach to *Lambrus*.

Carapax triangular; proportion of length to breadth, 1:1.45. Lateral angles truncated. Front concave along the median line; rostrum of the usual form, and nearly horizontal, but blunt and smoothly rounded at the extremity. The antero-lateral margin is concave behind the orbit, there being a slight contraction at the hepatic region; behind this point the margin is waved to a minute tooth at the anterior end of the lateral truncation, and crenulated, the crenulations about nine in number. The posterior margin is straight and obsoletely crenulated.

The upper surface of the carapax is strongly convex across the branchial regions, the posterior slope being nearly perpendicular and covered on the sides with depressed tubercles. Cardiac region convex, but not rising so high as the branchial region on either side.

Around and particularly in front of the cardiac region there is a depression. At the summit of the small gastric region four obtuse ridges meet in a slight transverse ridge, the two anterior, less conspicuous ones being those of the front; the two posterior ones more strongly marked, enclosing the median depression, and reaching to the branchial eminences. Chelopoda rather long; hand subprismatic, robust, with the superior crest six-toothed, the outer keel granulated; under surface somewhat convex and regularly tuberculated with stout, flattened tubercles showing a tendency to arrangement in four or five longitudinal rows, those of the outer row smallest. Lower surface of meros also tuberculated. Ambulatory feet compressed, ischium and meros with two spinous keels beneath. Abdomen and sternum with an eroded or somewhat vermiculated surface, but neither granulated nor spinulose.

Color of the animal a dusky orange or light brownish; fingers pale brown. Dimensions of a male: Length of carapax, 0.38; breadth, 0.55; between the elbows, 0.83; length of one of the chelopoda, 0.65 inch.

Taken on a bottom of shelly sand, in 25 fathoms, in the China Sea, about the middle, at latitude 23°.

#### Genus CRYPTOPODIA Milne Edwards

##### 37. CRYPTOPODIA FORNICATA (Fabricius) Milne Edwards

*Parthenope fornicata* FABRICIUS.

*Cryptopodia fornicata* MILNE EDWARDS, Hist. Nat. des Crust., I, 362. DE HAAN, Fauna Japonica, Crust., p. 90, pl. XX, fig. 2. DANA, U. S. Exploring Expedition, Crust., I, 140. GIBBES, Proc. Elliott Soc., I, 32 (wood-cut). VIX ADAMS and WHITE, Voy. Samarang, Crust., pl. VI, fig. 4.

The living animal is cream-colored, with small purplish-brown dots above. Below white, with a pale rose tint. Red punctæ on the inferior surface of the posterior projecting shield of the carapax.

The specimen figured by Adams and White belongs most probably to a distinct species, for the pustulation of the surface in Parthenopoid crabs rather increases than diminishes with age, and the short, thick chelopoda represented are quite different from those of the young specimens taken by us.

*Cryptopodia fornicata* occurred not unfrequently in the harbor of Hongkong, on shelly bottoms, at the depth of about 10 fathoms.

## Genus ÆTHRA Leach

The large basal joint (basiocerite) of the external antennæ in this genus is not soldered to the adjacent parts, but is movable as in *Ceratocarcinus*. This adds another character to those mentioned by De Haan as approximating it to the Parthenopidæ. The two genera are also similar in their short and broad epistome, and the ridges of the palate. Future researches may indicate that they, with one or two other genera, form a group distinct from both *Parthenopidæ* and *Cancridæ*.

## 38. ÆTHRA SCRUPOSA (Linnæus) Milne Edwards

*Cancer scruposus* LINNÆUS.

*Æthra depressa* LAMARCK, An. sans vert., v, 265.

*Æthra scruposa* MILNE EDWARDS, Hist. Nat. des Crust., I, 371; Cuv. R. A., pl. XXXVIII, fig. 2. GUÉRIN, Icon., pl. XII, fig. 3. DE HAAN, loc. cit., p. 81.

Taken among the islands of Gaspar Straits by Mr. L. M. Squires, of the "John Hancock."

## Genus CERATOCARCINUS Adams and White

Dana was the first to give the essential characters of this genus, and to point out the remarkable fact that the basal joint of the antennæ is not soldered to the adjacent parts, as in other genera of Parthenopidæ, and, in fact, almost all Brachyura. This observation we are enabled to confirm from examination of full-grown specimens. The joint is flattened, and, fitting closely in the cavity which receives it, does not interrupt the general surface; so that it is only by the application of force that its mobility is discovered. The "coxocerite" containing the organ of hearing is very small and placed close below the basal joint. The eyes are retractile.

*Harrovia* of Adams and White agrees in all essential characters with *Ceratocarcinus*. In the orbits, antennæ, gnathopoda, and in general appearance they are nearly the same. In their diagnosis of *Harrovia* the authors do not even mention the characters which are of most importance in a generic point of view, their description being confined to details of shape, granulation of surface, dentition of margin, etc. Why they should place the crab among the *Leucosidæ* it would be difficult to decide.

39. *CERATOCARCINUS ALBOLINEATUS*<sup>1</sup> (Adams and White)  
Stimpson

*Harrovia albolineata* ADAMS and WHITE, Voy. Samarang, Crust., p. 55,  
pl. XII, fig. 5.

*Ceratocarcinus albolineatus* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX,  
p. 221 [27], 1857.

Carapax hexagonal in shape, the frontal side being only half the length of the antero-lateral and the posterior side about equal in length to the postero-lateral. Front very slightly convex, emarginate at the middle, the emargination being at the termination of a longitudinal groove or impressed line on the surface of the carapax. On either side of the front a sinus or fissure separates it from the sharp subtriangular præorbital tooth, which projects but very slightly, if at all, beyond the frontal margin. The eyes are retractile, although short and not very mobile. Orbit with two closed fissures above and two notches below. Antero-lateral margin four-toothed (including the angle of the orbit, which is prominent); the posterior or extreme lateral tooth is strongly projecting. The postero-lateral and posterior margins are smooth. Dorsum somewhat convex, nearly smooth, the regions scarcely defined. A small setose eminence on each side of the gastric region, and one on each branchial region just within the lateral tooth. These are not connected by transverse lines in my specimens, although such lines are mentioned by Adams and White. Surface minutely tomentose and granulated; the granulation sharpest and most distinct on the antero-lateral teeth. Chelopoda stout, more than twice as long as the carapax, irregularly granulated; meros with two or three short spines on each side above near the base; carpus with a single small tubercle or spine at the middle of the inner margin; hands smooth, enlarged toward the fingers, which are one-third the length of the hand, and are deflexed as in *Eurynome*. Ambulatory feet minutely and smoothly tomentose, without spines excepting a small blunt one at the summit of the meros.

Colors: Carapax and ambulatory feet pale reddish; pubescence dusky brownish; hands red.

Dimensions of a male: Length of carapax, 0.35; breadth, 0.44; length of a chelopod, 0.96 inch.

Dredged in the harbor of Hongkong, China.

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<sup>1</sup> *Harrovia albolineata* Adams and White.

## ONCINOPIDÆ

## Genus ONCINOPUS De Haan

40. ONCINOPUS SUBPELLUCIDUS<sup>1</sup> Stimpson

*Oncinopus subpellucidus* STIMPSON, Proc. Acad. Nat. Sci. Phila., IX, p. 221 [28], 1857.

This species is of a soft structure and somewhat translucent in life, the shell being very thin. Surface everywhere pubescent. Color yellowish-brown.

It is very closely allied to *O. aranea* De Haan, but seems to differ in the more slender penultimate joints of the first and second pairs of ambulatory feet; the hair on the feet generally is much longer; the rostrum is more deeply emarginated, and the carapax is more expanded at the hepatic regions behind the eyes. From *O. neptunus* Adams and White it differs in the more slender terminal and penultimate joints of the ambulatory feet.

The dimensions of a male are: Length of carapax, 0.48; breadth posteriorly, 0.36; length of ambulatory foot of first pair, 1.45 inches.

Found on soft sponges dredged from a muddy bottom, in 6 fathoms, in Port Jackson, Australia.

## CANCROIDEA

## CANCRIDÆ

## Genus CANCER (Linnæus) Leach

The reasons given by Bell<sup>2</sup> for following Leach in applying the Linnæan name for all crabs to the group called *Platycarcinus* by Milne Edwards are good, and the name is thus used by most recent carcinologists.

The geographical range of the genus is in the cold temperate zone, and not the "hotter parts of America," as stated by Bell. The species are mostly American, two being found on the northeastern coast of the United States, four on that of Oregon and California, and three on that of Chili. Of the two other known species, one inhabits the shores of Great Britain, the other those of New Zealand.

<sup>1</sup> *Oncinopus aranea* (De Haan).

<sup>2</sup> Trans. Zoöl. Soc., I, 332.

41. **CANCER ANTENNARIUS** Stimpson

*Cancer antennarius* STIMPSON, Proc. Cal. Acad. Nat. Sci., 1, 88; Jour. Bost. Soc. Nat. Hist., VI, p. 462 [22], pl. XVIII, 1857.

Carapax convex; proportion of length to breadth in male, 1 : 1.52; in female, 1 : 1.45; greatest breadth at the penultimate antero-lateral tooth. Surface much undulated, very smooth in appearance, but minutely granulated, the granulation being almost obsolete about the middle, but sufficiently well marked toward and at the margin. Antero-lateral margin convex and well rounded, with nine teeth, the first one forming the angle of the orbit; teeth deeply separated, their edges denticulated, their apices curving forward and very sharp, almost uncinatè. Postero-lateral margin with a deep emargination near the extremity, forming a sharp tooth, and another, rather slight, a short distance within the first. These emarginations are much deeper in the young than in the adult. Front sufficiently broad, but not projecting beyond the exterior angle of the orbit; interantennary portion with three well-separated teeth, the middle one being smaller and rather below the lateral ones; præorbital tooth rather prominent. External antennæ very large and hairy, in length equaling two-fifths that of the carapax; apex of basal joint projecting considerably beyond the præorbital tooth. Meros of hectognathopoda subquadrate, a little longer than broad; anterior margin nearly transverse, ciliated with long hairs; angles rounded; notch for insertion of carpal joint deep, abrupt below, continuous with the margin above. The slight ridge on the palate near to and parallel with its inner margin is more sharply prominent in this than in other species. Chelopoda large, particularly in the male; carpus and hand rather short and thick, in the adult smoothly rounded above and microscopically granulated; in the young ornamented with small spiniform tubercles; costæ on the hand well marked and granulated in the young, but almost obsolete in the adult. Fingers in the female sulcated. Ambulatory feet hairy; meros overreaching the margin of the carapax; dactylus with thick brushes of short hair along the angles. Margins of abdomen and other parts on the inferior surface generally, very hairy. Terminal joint of abdomen in the male slender, with somewhat concave sides and bluntly pointed extremity.

Color above dark purplish-brown; below yellowish-white, spotted with red; fingers black. Dimensions of carapax in a male: Length, 2.43; breadth, 3.70; in a female, length, 2.13; breadth, 3.08 inches.

This species is not uncommon on the coast of California, inhabiting rocky bottoms in the laminarian zone.

42. **CANCER GRACILIS** Dana

*Cancer gracilis* DANA, U. S. Exploring Expedition, Crust., I, 153, pl. VII, fig. 2. STIMPSON, Jour. Bost. Soc. Hist., VI, p. 460 [20], 1857.

This species inhabits the whole coast of Oregon and Upper California. The expedition specimen is from Monterey, presented by officers of the Coast Survey.

43. **CANCER MAGISTER** Dana

*Cancer magister* DANA, U. S. Exploring Expedition, Crust., I, 151, pl. VII, fig. I. STIMPSON, Jour. Bost. Soc. Nat. Hist., VI, p. 458 [18], 1857.

Very common in the harbor of San Francisco, Cal. Found on the western coast of North America from Sitka to Monterey.

44. **CANCER PRODUCTUS** Randall

PLATE IV, FIG. 5, 5a

*Cancer productus* RANDALL, Jour. Acad. Nat. Sci. Phila., VIII, 116. DANA, U. S. Exploring Expedition, Crust., I, 156, pl. VII, fig. 3. STIMPSON, Jour. Bost. Soc. Nat. Hist., VI, p. 461 [21], 1857.  
*Platycarcinus productus* GIBBES, Proc. Am. Assoc., 1850, p. 177.

This species was described by Randall from young specimens, which differ much from the adult, both in proportions and markings. Dana also figures an immature specimen, and his description will scarcely apply to the adult, in which the teeth on the front and antero-lateral margin are sufficiently projecting and well separated.

The figure given in the plates represents an adult female.

It was taken in considerable numbers near San Francisco, Cal., where, next to *C. magister*, it is the most common species.

Genus **ETISUS** Leach45. **ETISUS CONVEXUS**<sup>1</sup> Stimpson

PLATE V, FIG. 2

*Etisus convexus* STIMPSON, Proc. Acad. Nat. Sci. Phila., X, p. 31 [29], 1858.

Carapax broad; proportion of length to breadth in the male, 1:1.47; in the female, 1:1.44; above strongly convex; areolets nearly as in *E. levimanus*, but more prominent. Surface somewhat rugose toward the front and sides. Front slightly convex. Antero-

<sup>1</sup> *Etisus levimanus* Randall.

lateral margin with five teeth, including the angle of the orbit; teeth rather prominent, with small, sharp apices; interspaces granulated. Chelopoda of moderate size, nearly smooth; upper surface of carpus and hand somewhat rough in the female; a small tooth at the inner angle of the carpus. Ambulatory feet compressed, and thickly fringed with hair on their edges; terminal joints rough, with spiniform granules, especially on the outer surface. Dimensions of a male: Length of carapax, 0.57; breadth, 0.84; of a female, length, 0.64; breadth, 0.92 inch.

It is allied to *E. lævimanus* of Randall and Dana, but is smaller, with the carapax more convex and the ambulatory feet more hairy. In our species the process from the basal joint of the antennæ quite reaches the orbit, while in *E. lævimanus* this is almost entirely excluded from the orbit.

Found at Simoda, Japan, under stones and among gravel in the littoral zone.

#### Genus CARPILIUS Leach

##### 46. CARPILIUS MACULATUS (Linnæus) Milne Edwards

*Cancer maculatus* LINNÆUS.

*Carpilius maculatus* MILNE EDWARDS, Hist. Nat. des Crust., I, 382; Cuv. R. Anim., pl. XI, fig. 2. DANA, U. S. Exploring Expedition, Crust., I, 160.

Found at Tahiti. This and some other large kinds of crustacea are taken by the natives on the reefs at night. The light of a fire placed at the end of a long beam which projects from the bow of the canoe enables the fisherman to see the crabs out on their nocturnal predatory excursions. During the daytime they remain quiescent in their hiding places among the rocks.

According to Dana this species occurs also at the Paumotu, Raraka, Navigators, and Philippine Islands.

##### 47. CARPILIUS CONVEXUS (Forskål) Rüppell

*Cancer convexus* FORSKÅL, Desc. anim., 88.

*Carpilius convexus* RÜPPELL, Krabben des rothen Meeres, p. 13, pl. III, fig. 2. MILNE EDWARDS, Hist. Nat. des Crust., I, 382, pl. XVI, figs. 9, 10. DANA, U. S. Exploring Expedition, Crust., I, 159, pl. VII, fig. 5.

The coloration is the same in all of the numerous specimens collected by the expedition, and differs from that represented in Dana's figure in the deeper hue of the reddish clouds, which also extend to the margin. There are two conspicuous deep red blotches on the gastric region, which are confluent behind and send off a branch on either side reaching to the orbit. A red patch on the hand, one on

the carpus, and one at each joint of the ambulatory feet. The dimensions of two specimens are as follows: Male, length of carapax, 2.3; breadth, 3.1; female, length, 2.4; breadth, 3.2 inches.

Found on coral reefs about low-water mark. Taken by us at Loo Choo and at Tahiti. It has also been found at most of the coral islands of the Pacific, among the East Indies, and in the Red Sea.

#### Genus LIOMERA Dana

This genus is here taken in a more extended sense than originally intended by Dana, so as to include his genus *Carpilodes* and the *Xantho obtusus* of De Haan. In our specimens of *L. lata* the fingers show more tendency to excavation at the tip than in that described by Dana, and are nearly the same as in *Carpilodes tristis*. In neither of these species, however, is the spoon-shaped cavity as well defined as in *Chlorodius*. This seems to point out the propriety of uniting the two genera of Dana, which, according to the statement of the author, differ only in the character of the fingers. In *Liomera obtusa*, which is intermediate in character between the two above mentioned, the fingers are more excavate than in either, and in a new species described below they are entirely acuminate.

As in allied genera, the third, fourth, and fifth joints of the male abdomen are united.

#### 48. LIOMERA LATA<sup>1</sup> Dana

*Liomera lata* DANA, U. S. Exploring Expedition, Crust., 1, 161, pl. VII, fig. 6.

This species is remarkable for its great breadth, which exceeds that of any other known crab. In our specimen the body is of a light blue color, the feet light red, the fingers black.

It was found at the Amakirrima Group, near Loo Choo, by Mr. L. M. Squires, of the steamer "Hancock."

#### 49. LIOMERA OBTUSA<sup>2</sup> (De Haan) Stimpson

*Xantho obtusus* DE HAAN, Fauna Japonica, Crust., p. 47, pl. XIII, fig. 5.

*Liomera obtusa* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 32 [29], 1858.

Carapax rather less broad than in other species of the genus; proportion of length to breadth, 1:1.63. Anterior margin arcuate; posterior and postero-lateral sides straight, the former but little

<sup>1</sup> *Liomera cinctimana* (White).

<sup>2</sup> *Carpilodes venosus* (Milne Edwards).



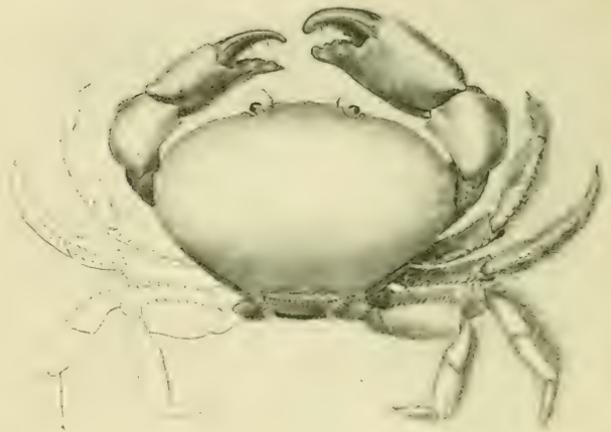
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more than half the length of the latter. Antero-lateral margin regularly convex, four-lobed; the anterior two lobes but little wider and nearly as convex as the posterior two. Front slightly convex. Anterior two-thirds of upper surface areolate, the areolets nearly as in *C. tristis*, but more deeply defined, the longitudinal lines bisecting the lateral areas of the gastric region being particularly conspicuous. Surface minutely granular, as seen under a lens. Chelopoda of male smooth, rather short; carpus with a projecting lobe at the inner angle, behind which there is a small tooth. Excavations at tips of fingers not circumscribed within. Ambulatory feet smooth and glossy, somewhat compressed; penult and antepenult joints with bilobate upper margin. Color uniform deep scarlet; fingers brown, tipped with white; dactyli of ambulatory feet with a white annulation next their corneous tips. Dimensions of a male: Length of carapax, 0.49; breadth, 0.8; length of chelopod, 0.75 inch.

Easily distinguished from *L. tristis* by the peculiar waved character of the upper margin of the feet at the middle joints.

Found under stones on rocky ground, at low-water mark, at Ousima.

#### 50. LIOMERA SUBACUTA Stimpson

PLATE V, FIG. I

*Liomera subacuta* STIMPSON. Proc. Acad. Nat. Sci. Phila., x, p. 32 [29], 1858.

Carapax transversely elliptical in shape; proportion of length to breadth, 1:1.61; surface smooth and glossy, except on the slightly depressed area above the front and orbits, where it is somewhat rugose with minute depressions. The areolets are mostly as in other species of the genus; the longitudinal sulci, however, which bisect the two large gastric areolets, are obsolete except anteriorly, where they form shallow grooves. The depressions at the anterior corners of the cardiac region are rather deep. The extreme lateral lobes (posterior two of the antero-lateral margin) are angular and form conspicuous teeth; the sulci separating them may be traced for a short distance only on the surface of the carapax, the posterior one being only half as long as the next. The remaining or anterior two-thirds of the antero-lateral margin is convex, and indistinctly divided into three scarcely projecting lobes, the middle one smallest. Front slightly projecting and deeply emarginated at the middle. The inner angle of the inferior orbital margin forms a tooth, which projects sufficiently to be easily seen from above. Chelopoda smooth; carpus with two small blunt teeth at its inner angle; hand with a groove on

the outer surface, parallel with and just beneath the upper margin; fingers sulcate, inner margins denticulated, tips sharp. Ambulatory feet glabrous, nearly smooth; superior edge of meros granulated or minutely denticulated.

Color in preserved specimens whitish, tinged with dusky orange. Fingers of a black color, not shading off toward the hand. Dimensions: Length of carapax, 0.57; breadth, 0.92 inch.

It has some resemblance to *L. obtusa* in its smoothness and general proportions, but its lateral lobes are acute and the fingers not at all excavated. It approaches *Xantho*, being less broad than other species of *Liomera*, to which genus it is referred from the character of the markings on the carapax.

Found at Loo Choo.

### Genus LACHNOPODUS Stimpson

In this genus, as in allied forms, the carapax is smooth and posteriorly convex; the antero-lateral margin obtuse, with the teeth, or rather, lobes, but little prominent. At the external angle of the orbit the margin is more strongly puckered than in other genera of the family. The arrangement of the antennæ is as usual in *Carpilus*, *Xantho*, etc. The inner ramus of the internal gnathopoda is not furcate. In the hectognathopoda the ischium is marked with a longitudinal sulcus; the surface of the meros presents a depression near the internal angle, and the anterior margin of this joint is concave. The meros of all the feet is spinous above; the external surface of the hand is sulcated, and the last three joints of the ambulatory feet are thickly setose.

The character of the feet separates this genus from *Liomera* and *Liagora*, in which they are naked.

### 51. LACHNOPODUS RODGERSII Stimpson

PLATE V, FIG. 4

*Lachnopus Rodgersii* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 32 [30], 1858.

A single specimen only, a male, of this species was collected, in which the proportions of the carapax were, length to breadth as 1:1.49. Upper surface convex, smooth. On the antero-lateral margin the two exterior or lateral lobes only are well marked, forming small teeth, sufficiently prominent, although obtuse and distant; the separation between the first and second lobe is scarcely perceptible. Front a little prominent, and emarginate at the middle.

Orbits of moderate size; internal hiatus large. Surface of hecognathopoda smooth; inner margins thickly setose. Chelopoda unequal, the right being the larger; meros spinulose above; carpus with a glossy but somewhat uneven surface, and with two teeth at the inner angle, the upper one largest. Outer surface of hand with two or three longitudinal sulci, deepest in the smaller hand; ridges between the sulci transversely rugose. Ambulatory feet compressed; meros very slightly setose, with a single row of small spines along the superior crest and spinulose on the inferior edges; penultimate joint with two rows of spines above, beneath which there is a shallow excavation; last three joints setose with long yellow hairs.

Color reddish-white or orange in preserved specimens. Dimensions of carapax: Length, 1.04; breadth, 1.55.

This species is respectfully dedicated to Capt. John Rodgers, the cominander of the expedition, to whose interest and zeal in forwarding the researches of the scientific corps the extent and value of the collections are in a great measure due.

It was taken on Bowers Shoal, in Gaspar Straits, during the survey prosecuted by Captain Rodgers in the steamer "John Hancock."

### Genus ATERGATIS De Haan

#### 52. ATERGATIS FLORIDUS<sup>1</sup> (Linnæus) De Haan

*Cancer floridus* LINNÆUS.

*Cancer ocyroe* MILNE EDWARDS, Hist. Nat. des Crust., I, 375.

*Atergatis floridus* DE HAAN, Fauna Japonica, Crust., p. 46. DANA, U. S. Exploring Expedition, Crust., I, 159, pl. VII, fig. 4.

Living specimens are of a dark yellowish-brown color above, with reticulating cream-colored blotches. Below white, tinged with cream color, and a little brownish in parts. Eyes leaden-blue, glossy. Fingers of a dark mahogany color.

Taken by the expedition at Loo Choo, among corals on the outer reefs, near low-water mark; also in Gaspar Straits.

The species also inhabits the seas of southern Japan and China (De Haan), and the Paumotu, Society, Friendly, and Fiji groups of islands (Dana).

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<sup>1</sup> *Atergatis ocyroe* (Herbst).

53. *ATERGATIS INTEGERRIMUS* (Lamarck) De Haan

*Cancer integerrimus* LAMARCK, An. sans vert., v, 273. MILNE EDWARDS, Hist. Nat. des Crust., I, 374.

*Atergatis integerrimus* DE HAAN, Fauna Japonica, Crust., p. 45, pl. XIV, fig. 1. DANA, U. S. Exploring Expedition, Crust., I, 158.

*Atergatis subdivisus* ADAMS and WHITE, Voy. Samarang, Crust., p. 38, pl. VIII, fig. 3.

The living specimen was of a purplish-red color, with small bluish-white angular spots somewhat regularly distributed; below pale reddish. Fingers black; ambulatory feet of the same color as the body.

Found under a stone, at low-water mark, on a rocky shore at the eastern entrance of Hongkong harbor.

Genus *DAIRA* De Haan54. *DAIRA PERLATA* (Herbst) De Haan

*Cancer perlatus* HERBST.

*Cancer variolosus* FABRICIUS, Suppl., p. 338.

*Daira perlatus* DE HAAN, Fauna Japonica, Crust., p. 18.

*Lagostoma perlata* MILNE EDWARDS, Hist. Nat. des Crust., I, 387.

*Daira variolosa* DANA, U. S. Expl. Exped., Crust., I, 203, pl. X, fig. 4.

Found at the Amakirrima Isles, near Loo Choo, by the officers of the steamer "John Hancock," Captain Stevens. Dana reports it from the Samoan Isles. Milne Edwards gives the Atlantic Ocean as its habitat. If this be not a mistake, we may well doubt whether there may not be two species confounded under the name.

Dana rejects Herbst's name *perlata*, remarking that its meaning is not *pearly*, but *very broad*. All names where signification involves an error should undoubtedly be rejected, but in this case we have no reason for deciding with certainty that the latter meaning is not that actually intended by the author.

Genus *ZOZYMUS* Leach55. *ZOZYMUS ÆNEUS*<sup>1</sup> (Linnæus) Leach

*Cancer æneus* LINNÆUS, LAMARCK.

*Cancer floridus* HERBST, FABRICIUS.

*Zozymus æneus* LEACH, DESMAREST, Consid. gen. Crust., p. 104; MILNE EDWARDS, Hist. Nat. des Crust., I, 385; DANA, U. S. Expl. Exped., Crust., I, 192, pl. X, fig. 3.

*Ægle æneus* DE HAAN, Fauna Japonica, Crust., p. 17.

In living specimens taken by us the color was blue above, with the tubercles red; eyes orange; sides of ambulatory feet shaded with

<sup>1</sup> *Zosimus æneus* (Linnæus).

orange. Beneath mostly white. Dimensions: Length, 2.14; breadth, 3.16 inches.

Found on the reefs, near low-water mark, at Loo Choo and at Tahiti. Dana reports it from the Paumotu, Samoan, and East Indian Islands.

### Genus ACTEODES Dana

#### 56. ACTEODES SPECIOSUS<sup>1</sup> Dana

*Acteodes speciosus* DANA, U. S. Expl. Exped., Crust., 1, 198, pl. XI, fig. 4.

The dimensions of one of our specimens, a male, are as follows: Length of carapax, 0.44; breadth, 0.55 inch.

They were found among branches of madrepores drawn up from a depth of two or three fathoms near Hilo, Island of Hawaii. Dana's specimens are from the Samoan Islands.

#### 57. ACTEODES BELLUS<sup>2</sup> Dana

*Acteodes bellus* DANA, U. S. Expl. Exped., Crust., 1, 196, pl. XI, fig. 2.

This species has a resemblance to some species of *Liomera*. Our specimens are much more conspicuously granulated on the feet and anterior parts of the carapax than that figured by Dana.

The carapax and eyes in living examples are of a uniform bright scarlet color. Feet of the same hue but with the extremities white. Fingers brown, tipped with white. Dimensions of a male: Length of carapax, 0.33; breadth, 0.53 inch.

Found among madrepores drawn up from below low-water mark in the harbor "Port Lloyd," Bonin Islands.

#### 58. ACTEODES AFFINIS<sup>3</sup> Dana

*Acteodes affinis* DANA, U. S. Exploring Expedition, Crust., 1, 198, pl. XI, fig. 3.

Our specimens are from Ousima. Those of the U. S. Exploring Expedition from the Paumotu Group.

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<sup>1</sup>*Actæa speciosa* (Dana).

<sup>2</sup>*Actæa bella* (Dana).

<sup>3</sup>*Actæa affinis* (Dana).

59. *ACTEODES TOMENTOSUS*<sup>1</sup> (Milne Edwards) Dana

*Zoëmus tomentosus* MILNE EDWARDS, Hist. Nat. des Crust., I, 385.

*Acteodes tomentosus* DANA, U. S. Expl. Exped., Crust., I, 197.

This crab is of an uniform dark-brown or purplish-brown color, almost black; the eyes blood-red; the antennulæ white at base; the fingers reddish. It may be observed at low water in great numbers on the level outer reefs of Loo Choo, taking refuge, when pursued, in the crevices of the rock. It was also found by the expedition at Ousima, at the Amakirrima Isles, and at Hongkong, China. According to Dana it is also common among the coral islands of the South Pacific and in the Sooloo Sea.

Genus *ACTÆA* (De Haan) Dana60. *ACTÆA PURA*<sup>2</sup> Stimpson

PLATE V, FIG. 7

*Actæa pura* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 32 [30], 1858.

Carapax rather narrow; proportion of length to breadth, 1 : 1.28. Surface of body and feet thickly covered above with granulated subconical tubercles, but everywhere clean and free from pilosity. The tubercles give the surface a hard porcellanous or crystalline appearance like that of some shells. The regions or areolets are not very prominent, being rendered somewhat indistinct by the crowding of the tubercles. Front with the two median lobes prominent. Antero-lateral margin strongly convex, obscurely quadrilobate, lobes tuberculated, the median tubercle in each being sharper and more prominent than the rest. Postero-lateral margin short, concave. Eyes large; outer margin of peduncle granulated. Pterygostomial surface granulous toward the outer margin, but becoming smoother toward the mouth. Hectognathopoda with the surface of the palpus and ischium smooth; inner margin of ischium and surface of meros granulated. Chelopoda large; upper and outer surface tuberculated like the carapax; fingers blackish, sulcate, with tuberculated ridges; their inner edges strongly toothed, tips blunt, curved inward. The tubercles of the ambulatory feet are somewhat smaller than those of the carapax, but more sharply granulous; on the dactyli they become subspiniform and are arranged in longitudinal rows. Inferior surface of the feet, and that of the sternum and abdomen,

<sup>1</sup> *Actæa tomentosa* (Milne Edwards).

<sup>2</sup> *Actæa granulata* (Audouin).

where exposed, ornamented with smooth depressed granules or small tubercles. Surface of sternum between bases of chelopoda pitted.

Of a dark cream color, with purple-brown blotches. Dimensions of a male: Length of carapax, 0.61; width, 0.78 inch.

This species, although common at two or three localities, does not seem to have been described; at least we can find no description agreeing with it. It is an elegant species, with a surface like that of *Buccinum papillosum* or *Monodonta reardonis*.

It is found at depths of 6, 10, and 20 fathoms, on muddy or shelly bottoms, and often among soft sponges. It occurred at Port Jackson, at Hongkong, and in the northern China Sea.

### 61. ACTÆA SUBGLOBOSA Stimpson

PLATE V, FIG. 5

*Actæa subglobosa* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 33 [30], 1858.

This is a very thick, rounded species, and when seen in its usual position, with the feet closely retracted against the body, has an almost globose form. Its surface is everywhere densely villous, excepting certain exposed parts of the lower surface, where the coat seems to have been rubbed off. This is the case on the lower half of the hand, the outer surface of the last two joints of the ambulatory feet, and the more prominent portions of the sternum and abdomen. These parts come in contact with the surface of the cavity in which this sluggish crab habitually rests. The pubescence adheres very strongly to the body and is removed with considerable difficulty.

The carapax is much expanded anteriorly, strongly convex, with an even surface; proportion of length to breadth, 1:1.32. The areolets are scarcely distinguishable, even when the pubescence is removed—when the surface is seen to be sharply though somewhat sparsely granulated. The antero-lateral margin forms a regular curve, apparently smooth, but showing, upon close examination, three deep emarginations or fissures concealed by the villous coat; thus the margin is four-lobed, as in other species. Postero-lateral margin very short, shorter than the posterior margin, and strongly concave. Front with a very deep emargination; median lobes small and placed close together. Subhepatic region smooth, neither granulous nor sulcated; a lanose arch on either side of the mouth. Sternum granulous between the bases of the anterior two pairs of feet. The feet are smooth or only minutely granulous beneath the pubescence. Chelopoda very short and stout; fingers short, black, their white tips crossing each other.

The color in a preserved specimen is dark lemon-yellow above; naked parts below white. Dimensions of a male: Length of carapax, 0.6; breadth, 0.79; from front to lateral angle, 0.5 inch.

Dredged in Hongkong harbor. Also found in a cavity at the base of a mass of *Spoggodia* dredged from a shelly bottom, in 24 fathoms, in the China Sea, latitude 23°.

## 62. *ACTÆA PILOSA* Stimpson

PLATE V, FIG. 6

*Actæa pilosa* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 33 [31], 1858.

The whole surface of the body and feet is hirsute with the exception of the tips of the fingers. The pubescence is rather less dense below than on the upper surface, where there are numerous setæ of greater length interspersed. Carapax convex; proportion of length to breadth, 1:1.33. Anterior margin nearly semicircular in outline and forming more than half the circumference of a circle. Posterolateral margin strongly concave and about equaling the posterior margin in extent. The areolets of the surface may be easily traced, but are not strongly marked, the shallow sulci of separation being filled up with pubescence. The surface of the areolets is covered with sharp granules. Antero-lateral margin four-lobed, angle of orbit not included; the lobes distinct; first lobe small; third and fourth lobes depressed, subtriangular. Lobes of the front prominent, deflexed, with smooth edges. Subhepatic region minutely granulous, but not sulcated. Feet all strongly granulous and hairy on their exposed surfaces. In the chelopoda the fingers are hairy at their bases, longitudinally grooved, and 5-toothed on the inner edge. In the ambulatory feet the antepenult joint is grooved above.

Dimensions: Length of carapax, 0.42; breadth, 0.56 inch.

This species has much resemblance to *A. hirsutissima*, but the carapax is not so deeply areolated, and the subhepatic region is not grooved with sulci proceeding from the notches of the antero-lateral margin.

Taken at Hongkong, China.

## Genus XANTHO Leach

### 63. *XANTHO TRUNCATA* De Haan

*Xantho truncatus* DE HAAN, Fauna Japonica, Crustacea, p. 66, pl XVIII, fig. 4.

In adult specimens collected by us the anterior tooth of the four on the antero-lateral margin is blunt and inconspicuous. The dimen-

sions of a male specimen are: Length of carapax, 0.62; breadth, 0.84 inch.

Found among stones above low-water mark at Simoda, Japan.

#### 64. *XANTHO PARVULA*<sup>1</sup> (Fabricius) Milne Edwards

*Cancer parvulus* FABRICIUS, Ent. Syst., II, 451.

*Xantho parvulus* MILNE EDWARDS, Hist. Nat. des Crust., I, 395. DANA,  
U. S. Exploring Expedition, Crust., I, 170.

A species of *Xantho* agreeing with descriptions of the above species was dredged in the harbor of Porto Praya, Cape de Verde Islands, among nullipores and sand, at a depth of 12 fathoms.

#### Genus *XANTHODES* Dana

In addition to the characters of this genus given by Dana, we may mention that another prominent distinctive mark of the species belonging to it is the shortness or little prominence of the front, which scarcely projects beyond the orbits, while in *Xantho* proper it is considerably protruded.

#### 65. *XANTHODES ELEGANS*<sup>2</sup> Stimpson

PLATE V, FIG. 3

*Xanthodes elegans* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 33 [31], 1858.

Carapax distinctly but not deeply areolate, smoother posteriorly; proportion of length to breadth, 1 : 1.43. Surface glossy but uneven, with projections toward the anterior margins. Antero-lateral margin with four sharp subpapilliform teeth, besides the angle of the orbit, which is not prominent. Orbits moderately large, with three or four small tooth-like projections on the margins. Subhepatic region strongly convex, smooth. Chelopoda with the carpus ornamented with scabriform tubercles; outer surface of hand sulcate, the ridges between the sulci tuberculated; fingers black. Ambulatory feet hairy; antepenult joint rather conspicuously grooved.

Dimensions of a male: Length of carapax, 0.42; breadth, 0.6 inch.

Taken at Simoda, Japan.

<sup>1</sup>*Xantho parvulus* Dana, which is a synonym of *Xanthias melanodactylus* (A. Milne Edwards); not *Xantho parvulus* Milne Edwards, which is a species of *Eurypanopeus*.

<sup>2</sup>*Xanthias elegans* (Stimpson).

## Genus EUXANTHUS Dana

66. EUXANTHUS MELISSA<sup>1</sup> (Herbst) Stimpson

PLATE VI, FIG. 2

*Cancer melissa* HERBST, Naturg. der Krabben und Krebse, III, 7, pl. LL, fig. I.

*Atergatis melissa* WHITE, Cat. Brit. Mus., 1847, p. 14.

*Euxanthus melissa* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 33 [31], 1858.

The only specimen of this species found by us is a male, the dimensions of which are: Length of carapax, 1.61; breadth, 2.54 inches. It was taken at Gaspar Island, in the straits of the same name, by Mr. L. M. Squires, of the steamer "John Hancock."

*Euxanthus nitidus* of Dana (loc. cit., I, 174, pl. VIII, fig. 9) is not improbably the young of this species. The characters in which the female specimen upon which that species was founded differs from the type are only those which might well be the result of differences of age or sex.

## Genus POLYCREMNUS Gerstæcker

This genus was recently established by Gerstæcker (Archiv für Naturgeschichte, XXII, 120) for the reception of the *Cancer ochtodes* of Herbst, a species which was referred to *Panopeus* by Milne Edwards and to *Galene* by Adams and White. Its generic distinctness is, however, sufficiently apparent, and we had named and described it in our notes before seeing the paper in the Archiv. The description then drawn up may without disadvantage be presented here, as it details some characters not mentioned by Gerstæcker.

Carapax subhexagonal, the lateral angles truncated and bidentate, the teeth being equal. Front rather narrow, considerably produced, emarginate at the middle. Antennæ with the basal article joined to a process from the frontal margin, as in *Xantho*, the movable portion placed in the hiatus of the orbit. Antennulæ oblique. Orbit with three closed fissures at the exterior margin, two above and one just beneath the external angle. The orbits are directed obliquely upward and not forward, so that the whole inferior margin, as well as the sharp inner angle, may be seen from above when the eyes are retracted. Epistome of considerable length; as long as in most *Parthenopidæ*. Meros of hectognathopoda broader than long, trun-

<sup>1</sup> *Euxanthopsis exsculpta* (Herbst).

cate, but not notched at the insertion of the carpal joint. The chelopoda are tuberculated; hands broad, with short fingers. Ambulatory feet slender; dactyli pubescent. Abdomen of the male slender, seven-jointed, the third, fourth, and fifth joints not soldered, the terminal joint very long and slender.

It is allied to *Halimede* in shape and in the characters of the front, antennæ, gnathopoda, and abdomen, but the margin of the orbit is without hiatus, and has no inner fissure of the inferior margin.

### 67. POLYCREMNUS VERRUCIFER Stimpson

PLATE VI, FIG. I

*Polycremnus verrucifer* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 33 [31], 1858.

This species differs from *P. ochtodes* Gerstæcker (*Cancer ochtodes*, Herbst, Crust., 1, 158, pl. VIII, fig. 54), in its smaller size and somewhat narrower carapax, the surface of which is also smoother anteriorly. The tubercles of the chelopoda are less capitate in shape and more numerous.

Our specimens agree well in size, color, and general appearance with the figure in the Zoölogy of the Voyage of the Samarang (Crust., pl. x, fig. 2). But they differ in some points mentioned below; and even if identical, we can scarcely suppose the species of Adams and White to be the *Cancer ochtodes* of Herbst, to the young of which it is referred by the English authors. It is constantly smaller, while most of the numerous specimens examined have every appearance of being adults.

In the specimens now under examination the teeth of the antero-lateral margin are granulated below, and there are two minute teeth on the postero-lateral margin behind the large teeth. There is a granulated protuberance on each side just above the lateral extremity of the posterior margin. The carpus and hand are more verrucose than is represented in the figure of Adams and White, much of the outer, as well as the upper, surface being covered with tubercles. The ambulatory feet are somewhat scabrous above, particularly on the meros joint; their sides are smooth; the last two joints are hairy. The abdomen is much more slender, and the third joint more elongated, than in the figure cited. The color in life was yellowish-brown, mottled. Dimensions of a male: Length of carapax, 0.63; breadth, 0.76 inch; ratio, 1:1.2.

This species is not uncommon on bottoms of shelly mud, at the depth of four or five fathoms, near Hongkong, China.

## Genus HALIMEDE De Haan

In this genus the praelabial area is smooth, with no indication of a ridge defining the efferent passage. The orbits have two fissures above and two below, the external inferior fissure forming an hiatus as well marked as in *Panopeus*.

## 68. HALIMEDE FRAGIFER De Haan

*Halimede fragifer* DE HAAN, Fauna Japonica, Crust., p. 47, pl. XIII, fig. 4.

The color in life is, above bluish-gray and white, mottled; below paler.

Dredged from a shelly bottom, in 10 fathoms, near Hongkong, China.

## Genus CHLORODIUS Leach

69. CHLORODIUS CYTHEREA<sup>1</sup> Dana

*Chlorodius cytherea* DANA, U. S. Exploring Expedition, Crust., I, 213, pl. XII, fig. 2.

Taken by us at the Sandwich Islands and at Ousima.

70. CHLORODIUS NIGER<sup>1</sup> (Forskål) Rüppell

*Cancer niger* FORSKÅL.

*Chlorodius niger* RÜPPELL, Krabben des rothen Meeres, p. 20, pl. IV, fig. 7.

MILNE EDWARDS, Hist. Nat. des Crust., p. 401. DANA, U. S. Exploring Expedition, Crust., I, 216, pl. XII, fig. 5.

In living specimens the color is uniform blue-black above; below bluish; articulations of the feet yellowish.

Found by us at the Bonin Islands, at Loo Choo, and at Tahiti, always among living corals, below low-water mark. It is also found in the Red Sea (Rüppell), in the Sooloo Sea, at Mangsi, the Fiji Islands, Tongatabu, Wakes Island, and Upolu (Dana).

71. CHLORODIUS MONTICULOSUS<sup>2</sup> Dana

*Chlorodius monticulosus* DANA, U. S. Expl. Exped., Crust., I, 206, pl. XI, fig. 9.

Of a purplish-brown color in life, variegated with white or yellowish-white. The fingers, and sometimes the whole hand, are deep

<sup>1</sup> *Chlorodiella niger* (Forskål).

<sup>2</sup> *Phymodius unguatus* (Milne Edwards).

brown. Eyes always red. The young are often dark olive with a yellowish pubescence.

Besides the sharp tubercles, a character distinguishing this species from *C. unguulatus* may be found in the front, which in the latter species is deeply sinuous, the median lobes projecting, while in the *monticulosus* it is blunt, often bimarginate, and projects but little.

Found among corals at slight depths at Loo Choo, at the Bonin Islands, and at Tahiti. It also occurs at the Fiji and Navigator Islands, and in Balabac Straits (Dana).

## 72. CHLORODIUS DENTIFRONS<sup>1</sup> Stimpson

PLATE VI, FIG. 5

*Chlorodius dentifrons* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 34 [33], 1858.

Carapax anteriorly expanded; proportion of length to breadth, 1:1.35. The anterior three-fourths of the surface is well areolated; the longitudinal sulci are deeper than those having a transverse direction, particularly on the gastric region, where the two grooves proceeding backward from the front and dividing in two the lateral lobes of this region, are strongly marked, and reach nearly to the posterior margin of the lobes. The more protuberant parts of the areolets, particularly of the lateral ones, are strongly granulated. The transverse raised line crossing the carapax from one lateral tooth to the other is well marked in this species, convex behind, and ciliated. This line marks off the smoother posterior part of the carapax, which constitutes rather less than a fourth part of the whole length. There is also a slight ridge just above and parallel with the posterior margin; this is interrupted at the middle. Antero-lateral margin with four small, sharp equidistant teeth, besides the angle of the orbit. Front rather narrow, considerably projecting, and quadridentate; the lateral teeth a little smaller than the middle ones. Orbital margin with deeper and more strongly marked fissures than are seen in other species, giving it a toothed appearance. Chelopoda of rather small size, even in the male; upper surface rugulose; carpus with two or three small teeth above; hand with one small basal tooth and three or four minute ones along the upper margin; outer surface of hand covered with minute transverse granulose rugæ, as in *C. exaratus*; fingers well curved toward their excavated tips, very little gaping, small-toothed within, and brown in color, the brown of

<sup>1</sup> *Etisodes electra* (Herbst).

the thumb extending on to the hand for some little distance. Ambulatory feet conspicuously hairy; their sides smooth. Dimensions of a male: Length of carapax, 0.33; breadth, 0.45 inch.

It has considerable resemblance to *Cancer electra* Herbst (pl. LI, fig. 6), but the frontal teeth are less prominent and the greatest width is at the penult, and not at the last antero-lateral tooth.

This species was taken at Loo Choo.

### 73. CHLORODIUS EXARATUS<sup>1</sup> Milne Edwards

PLATE VI, FIG. 3-4, 6-9

*Chlorodius exaratus* MILNE EDWARDS, Hist. Nat. des Crust., I, 402; Illust. Cuv., pl. XI, fig. 3. HOMBRON and JACQUINOT, Voy. au Pole Sud, pl. II, fig. 3. DANA, U. S. Expl. Exped., Crust., I, 208.

*Chlorodius sanguineus* MILNE EDWARDS, Hist. Nat. des Crust., I, 402. DANA, U. S. Expl. Exped., Crust., I, 207, pl. XI, fig. II.

*Xantho affinis* DE HAAN, Fauna Japonica, Crust., 48, pl. XIII, fig. 8.

*Xantho lividus* DE HAAN, l. c., 48, pl. XIII, fig. 6.

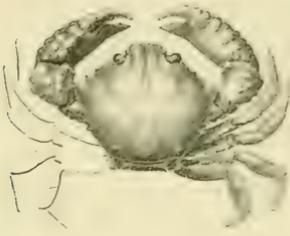
*Xantho distinguendus* DE HAAN, l. c., 48, pl. XIII, fig. 7 (?).

This is the most common of the numerous species of *Chlorodius* found in the eastern seas, and large numbers of specimens were collected by the expedition at different places on the shores of China and at the Japanese and the Pacific islands. It is only after a long and careful study of these specimens that we have arrived at the results set forth in the above synonymy.

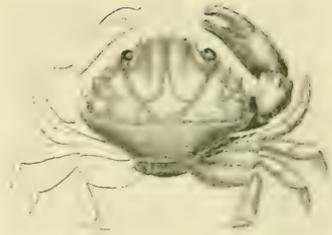
That the *Chlorodius exaratus* of Milne Edwards is a very variable species, and is so considered by the carcinologists at Paris, will be evident from a comparison of the figure in the illustrated edition of the "Règne Animal" with that in the "Voyage au Pole Sud." But one would scarcely be prepared to find so much variety in the character of the surface, the number and shape of the lateral teeth, and the sculpture of the feet, as we see in the present instance, these characters being in other genera and species of the highest specific importance. The varieties described below, however, are found to run into each other in all the characters which at first sight strike the examiner as specific, and several of them are often found living together under circumstances which do not fail to impress the collector with the idea that they are one and the same species.

We are first led to question the distinctness of *C. sanguineus* by finding in a number of specimens from Loo Choo the supplementary tooth posterior to the lateral one, gradually becoming smaller and

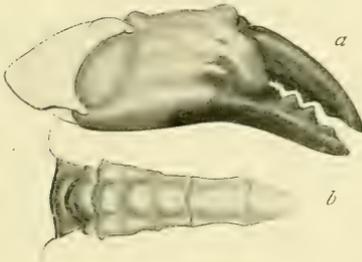
<sup>1</sup> *Leptodius exaratus* Milne Edwards.



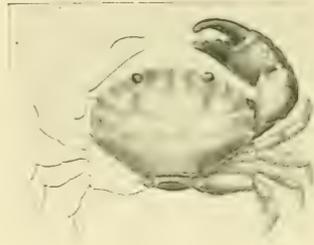
1



5



2



6



3



7



4



8



9



at last entirely disappearing, while in other characters the specimens remain exactly the same. And the figure of *C. exaratus*, in the "Voyage au Pole Sud," certainly presents the characters usually assigned to *C. sanguineus*. Among our specimens it is not difficult to find forms agreeing with De Haan's *Xantho lividus* and *X. affinis*; and these are so connected by intermediate forms that they cannot be specifically separated. Every degree of extent in the front and in the hiatus of the fingers, between the extremes represented by these two varieties, may be found among our specimens. The *Xantho distinguendus* certainly appears at first entirely distinct, the granulation of the carapax and hands, and particularly the sculpture or erosion of the ambulatory feet, seeming to be characters which it would be in vain to seek for in any variety of *C. exaratus*. But we have before us specimens of this form from Hongkong which show gradations toward the type. In some of these the carapax is rather broad, with little or no granulation and a protruded front. In others the granulation of the hand disappears, while that of the carapax remains the same. In others all granulation disappears, and among all these specimens there are some which possess the supplementary tooth, while in others it is wanting.

Future observers, aided by a still greater number of specimens than is now accessible, may succeed in finding constant characters upon which good species may be founded, but the present indications certainly require us to regard as varieties the several forms now to be described.

#### Var. *a*, SANGUINEUS

With a distinct supplementary tooth, formed by the division by a sulcus of the posterior edge of the lateral tooth of the margin; this is much more distinct in the adult than in the young. The antero-lateral teeth are sufficiently prominent, anterior ones blunt. Front much undulated, rather narrow (in extent just half that of the antero-lateral margin), and scarcely protruded beyond the edge of the orbit. Surface of carapax areolate, areolets rather smooth and glossy, shining. Upper and outer surface of chelopoda with reticulating rugæ. Pincers sometimes much curved, moderately gaping, inner edges well toothed; color black, tips white. Ambulatory feet smooth, edges hairy; penult and antepenult joints obsolete grooved above; dactyli granulose.

Found at the Sandwich Islands and at Loo Choo.

Var. *b*, RUGOSUS

## PLATE VI, FIG. 4

With the characters of the preceding, except that the areolets of the carapax, and also the antero-lateral teeth, are much more sharply prominent and rugose. The reticulating rugæ of the chelopoda are granulose, and there is a small tuft of setæ in each of the cup-shaped depressions at the tips of the fingers. This is the largest variety we have met with.

Found at the Bonin Islands.

Var. *c*, PICTUS

## PLATE VI, FIG. 6

Supplementary tooth wanting. Surface of carapax smooth posteriorly; areolets but little prominent except toward the antero-lateral margin. Antero-lateral teeth broad, triangular, not much projecting. Front somewhat broader than in var. *sanguineus* and protruding a little beyond the orbits. Chelopoda short, rugulose, rugæ minutely granulated. Pincers rather short, black, well toothed and contiguous within. Ambulatory feet as in var. *sanguineus*, except that the dactyli are less granulose. Color yellowish, symmetrically clouded above with olivaceous, inclining to brown on the carapax and to red on the feet. Dimensions: Length of carapax, 0.53; breadth, 0.81 inch.

Found at Simoda, Japan.

The variety called *Xantho affinis* by De Haan differs from the *pictus* in its smoother hand and gaping fingers.

Var. *d*, LATIFRONS

Supplementary tooth wanting. Carapax less broad than in other varieties, rather convex, smooth posteriorly; areolets not strongly prominent, but with deep transverse sulci; surface conspicuously rugose and granulated. Antero-lateral teeth angular but not much projecting. Front not protruding, and very broad, equaling in extent the antero-lateral margin excluding the lateral tooth. Chelopoda rugulose; outer surface of hand maculate with small circular red spots. Pincers black, contiguous, toothed. Ambulatory feet as in var. *pictus*. Dimensions: Length of carapax, 0.45; breadth, 0.70 inch.

Found at Loo Choo.

The variety called *X. lividus* by De Haan differs from the *latifrons* only in having white fingers.

Var. *e*, TYPICUS

A variety which may be considered typical, agreeing perfectly with Milne Edwards's original description, and showing in a moderate degree nearly all the characters which are excessively developed in other varieties. It differs from the var. *latifrons* in its narrower front and somewhat gaping pincers.

Found at Ousima, and at other islands in the Chinese and Japanese seas.

Var. *f*, ACUTIDENS

## PLATE VI, FIG. 7

Supplementary tooth wanting. Carapax less broad than in ordinary varieties. Areolets sharply prominent. Antero-lateral teeth strongly projecting and acuminate (*i. e.*, with concave sides), the anterior ones sharper than usual. Front narrow, not much protruded, deeply sinuous, almost quadridentate. Chelopoda stout, rugulose; fingers black, somewhat gaping, not strongly toothed within. Ambulatory feet as in var. *pictus*, but more hairy. Dimensions: Length, 0.532; breadth, 0.8 inch.

Found at Loo Choo.

Var. *g*, CUPULIFER

## PLATE VI, FIG. 8

Carapax as in var. *acutidens* except that the edges of the areolets are more granulous, and the antero-lateral teeth are more prominent. Chelopoda as in var. *rugosus*; fingers somewhat gaping, their tips well excavated, forming large deep spoon-shaped cavities or cups. Dimensions: Length, 0.45; breadth, 0.66 inch.

Found at the Bonin Islands.

Var. *h*, LATUS

## PLATE VI, FIG. 9

Carapax very broad. Antero-lateral teeth strongly prominent, acuminate, their edges with large granules appearing as if denticulated. Surface smooth posteriorly. Areolets not prominent; their surfaces minutely granulose and slightly hairy. The transverse raised line connecting the lateral teeth is distinct, and strongly granulose at the point where it bifurcates to form the supplementary tooth. Front narrow, strongly sinuous, or quadridentate; somewhat protruded. Chelopoda transversely rugulose, and minutely granu-

lated; fingers black, much gaping, within dentate with very small distant teeth. Ambulatory feet as in the preceding varieties. Dimensions: Length, 0.45; breadth, 0.73 inch.

Found at Hongkong.

Var. *i*, GRANULOSUS

PLATE VI, FIG. 3

No supplementary tooth. Carapax broad as in the preceding variety, but with triangular, non-acuminate antero-lateral teeth. Transverse line connecting lateral teeth, distinct. Transverse edges of areolets conspicuously granulated. A granulated ridge, interrupted at the middle, just above and parallel with the posterior margin. Front narrow, strongly protruding. Hands somewhat grooved above; with the outer surface covered with large granules; fingers black, somewhat gaping, with large teeth. Ambulatory feet granulous above; penult and antepenult joints broadly grooved above as if eroded; dactyli granulose and hairy. Dimensions: Length, 0.525; breadth, 0.79 inch.

Found at Hongkong.

74. The variety called *Xantho distinguendus*<sup>1</sup> by De Haan differs from var. *granulosus* only in its narrower form, less protruded front, and more granulous meros joint of the feet.

In all the varieties the black color of the thumb is extended upon the hand, and circumscribed by a waved line having an inward and downward direction.

*Chlorodius floridanus* Gibbes, is by some authors considered a variety of *C. exaratus*. But a constant distinctive character may be found in the thickening or downward protrusion of the median lobes of the front, which is seen in all examples of the American species.

*Chlorodius exaratus* inhabits stony ocean shores, at or above low-water mark.

75. CHLORODIUS GRACILIS<sup>2</sup> Dana

*Chlorodius gracilis* DANA, U. S. Exploring Expedition, Crust., I, 210, pl. XI, fig. 13.

Carapax smooth, areolets not prominent and often indistinct; surface minutely granulose toward the antero-lateral margins. Antero-lateral teeth five in number including the angle of the orbit; they

<sup>1</sup> *Leptodius distinguendus* (de Haan).

<sup>2</sup> *Leptodius gracilis* Dana.

are broad, very slightly projecting; the posterior two angular with their posterior sides six times as long as their anterior sides. Front of moderate width; the interorbital breadth being more than half the width of the carapax. Surface of chelopoda minutely rugulose. Pincers black; the black color of the thumb not extending on to the hand; teeth of inner margins strong. Ambulatory feet as in the typical variety of *C. exaratus*, but less hairy. The abdomen is also as in the last mentioned species.

Color light reddish. Dimensions of a male: Length of carapax, 0.43; breadth, 0.65 inch.

The description is taken from a Chinese specimen. Those from the Japanese islands agree more exactly with Dana's description, and a comparison with the original specimens shows them to be the same.

This may finally prove to be a smooth variety of *C. exaratus*. The specimens all show a system of rugosities upon the chelopoda of the same kind as in that species, although so nearly obsolete that the surface appears smooth. But the present indications, particularly the want of prominence in the antero-lateral teeth, lead us to consider the form specifically distinct.

It was taken by us on the coast of China, near Hongkong, under stones on coarse sand, at low-water mark; also at Ousima and Kikaisima.

#### 76. CHLORODIUS CAVIPES<sup>1</sup> Dana

*Chlorodius cavipes* DANA, U. S. Exploring Expedition, Crust., I, 212, pl. XII, fig. I.

In some of our specimens the superior crest of the meros in the ambulatory feet is bifurcated near the outer extremity, enclosing an additional small triangular cavity.

This species approaches *Actcodes* in form, and is one of the connecting links between the Chlorodinae and the Zozyminae. It might well be generically separated from a genus containing such forms as *C. ungulatus* and *monticulosus*.

Taken at Port Lloyd, Bonin Islands.

#### Genus PILODIUS Dana

In this genus the outer margin of the orbit is more nearly entire than in any other belonging to the group.

---

<sup>1</sup> *Leptodius cavipes* Dana.

77. *PILODIUS NIGROCRINITUS* Stimpson

PLATE VII, FIG. 1

*Pilodius nigrocrinitus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 34 [32], 1858.

The entire upper surface of the body and feet is covered with short setæ, among which many of a black color are conspicuously distributed; there are also longer ones of a yellow color sparingly interspersed. Carapax broad, well areolated; separating grooves deep. Surface of areolets somewhat scabrous. Antero-lateral margin convex, teeth slightly prominent, rounded and denticulated. The front is less prominent than usual and its median emargination is inconspicuous. In the chelopoda the carpus and hand are rough with spiniform granules. In the ambulatory feet the meros is serrated above.

One specimen only was taken, a female, the dimensions of which are: Length of carapax, 0.28; breadth, 0.41 inch; ratio, 1 : 1.46.

It is closely allied to *P. pilumnoides*, but is broader; the antero-lateral margin is convex instead of concave, and its denticulated teeth are rounded, having no central principal denticle, and there is no tooth at the inferior extremity of the penult joint of the feet. It is not improbably the same as *P. pilumnoides* Dana, but cannot be that of Adams and White.

Taken at Simoda, Japan.

78. *PILODIUS GRANULATUS* Stimpson

PLATE VII, FIG. 2

*Pilodius granulatus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 34 [32], 1858.

Carapax broad; proportion of length to breadth in the male, 1 : 1.5. Antero-lateral margin a little shorter than the postero-lateral. Upper surface of carapax well areolated; surface of areolets strongly granulated or tuberculated and pubescent. Teeth of the antero-lateral margin four in number, excluding the angle of the orbit. They are small, denticulated, and acute (particularly the first one), the median denticle in each being sharply prominent and curving forward. Front, orbits, etc., nearly as in *P. pubescens* and *pilumnoides*. Chelopoda tuberculated; carpus armed with sharp tubercles rather larger than those of the hand, and with two small, very sharp teeth or spines at its inner angle; hand with tubercles

somewhat distantly arranged in longitudinal rows; fingers sulcate, the ridges tuberculated at base. The exposed upper surfaces of the ambulatory feet are granulose and thickly pubescent.

Colors: The upper surface is variegated with purple-brown and buff. Fingers reddish-brown. Hand in the male a broad encircling band of brown near the bases of the fingers. Dimensions of a male: Length of carapax, 0.29; breadth, 0.44 inch. Of a female: Length, 0.33; breadth, 0.5 inch.

This species differs from *P. pubescens* in the broader abdomen of the male, the extremity of which is bluntly rounded. From *P. pilumnoides* it differs in the absence of denticulation at the superior edge of the meros joint of the feet.

Found on madrepores, drawn up from a depth of 1 or 2 fathoms, in a bay on the outer side of Hongkong Island.

#### Genus CYMO De Haan

The crabs of this genus are easily recognized by their depressed, suborbicular form and rough, hairy surface, which is almost always obscured by sordes. They have some affinity to the *Trapeziæ* in general appearance and in their habits. The two known species are always found together, and are common on coral everywhere in the warmer latitudes of the Pacific Ocean.

#### 79. CYMO MELANODACTYLUS De Haan

*Cymo melanodactylus* DE HAAN, Fauna Japonica, Crust., p. 22 (no descr.). DANA, U. S. Expl. Exped., Crust., I, 225, pl. XIII, fig. I.

This species is of a dirty buff color, the eyes purplish-brown, the fingers black.

The characters of the front, etc., mentioned by authors as distinguishing this species from *C. andreossyi* are unreliable on account of their variation. In fact, it would seem impossible to separate the two species from characters derived from the carapax alone. The chelopoda, however, afford some good distinctive marks. In *C. melanodactylus* the granules of the outer surface of the hand are arranged in longitudinal rows, those of the middle row and of a row near the upper edge being larger than the others; those of the rows near the upper edge subspiniform and sharp. There are generally numerous red granules on the upper surface of the hand, but none on the outer surface, as in *C. andreossyi*. The fingers are black, with the basal half strongly granulated.

Found on madrepores hooked up in a bay on the east side of Hongkong Island; also at the Bonin Islands. Dana reports it from the Fijis.

**80. CYMO ANDREOSSYI (Savigny) De Haan**

*Pilumnus andreossyi* SAVIGNY, Descr. de l'Égypte, Crust., p. 86, pl. v, fig. 5.

*Cymo andreossyi* DE HAAN, Fauna Japon., Crust., p. 22. DANA, U. S. Expl. Exped., 1, 225, pl. XIII, fig. 2.

In this species the fingers are thick and white and but little granulous at base. The granules of the outer and upper surface of the hand are sharply prominent and irregularly crowded, without any tendency to arrangement in rows; among them a few red ones are scattered.

It was found by us at the Bonin Islands.

## Genus OZIUS Milne Edwards

**81. OZIUS TRUNCATUS Milne Edwards**

*Ozius truncatus* MILNE EDWARDS, Hist. Nat. des Crust., 1, 406, pl. XVI, fig. 11. DANA, U. S. Expl. Exped., Crust., 1, 230, pl. XIII, fig. 4.

The color in life is, above purplish-brown, minutely mottled with white; below paler, inclining to reddish.

Taken in the harbor of Sydney (Port Jackson), Australia, under stones above low-water mark.

**82. OZIUS FRONTALIS<sup>1</sup> Milne Edwards**

PLATE VII, FIG. 4

*Ozius frontalis* MILNE EDWARDS, Hist. Nat. des Crust., 1, 406.

The crab which is referred with much doubt to the above-quoted species of Milne Edwards is of a dark olive or yellowish-brown color in life; pincers black. Dimensions of a female: Length of carapax, 0.57; breadth, 0.97 inch; ratio 1:1.7.

Found under stones on coarse sandy shores above low-water mark in the harbor of Hongkong, China; also at Ousima and Kikaisima.

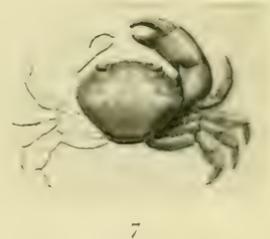
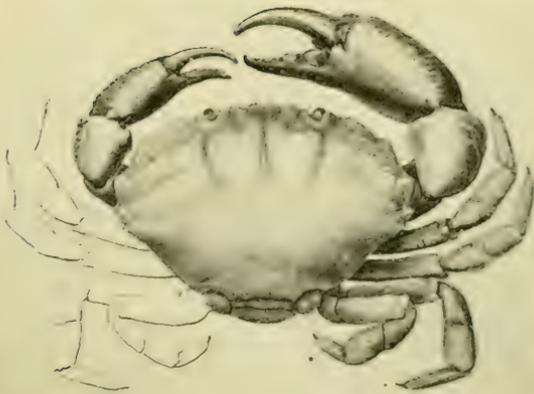
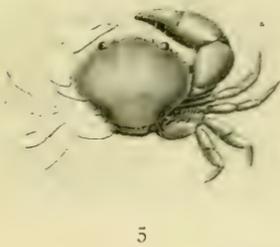
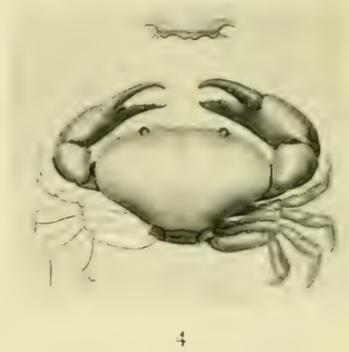
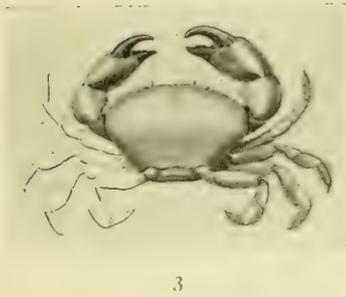
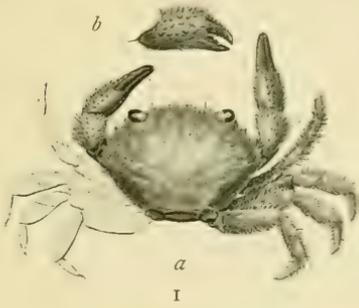
**83. OZIUS RUGULOSUS Stimpson**

PLATE VII, FIG. 6

*Ozius rugulosus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 34 [32], 1858.

Carapax somewhat convex; proportion of length to breadth, 1:1.5. Surface anteriorly rugose and granulose. Front armed with four strong rounded teeth. Antero-lateral margin six-toothed, the pos-

<sup>1</sup>*Epixanthus frontalis* (Milne Edwards).





terior tooth being small and supplementary to the fifth; anterior two teeth very large but much less prominent than the others. Postero-lateral margin short and concave. Inferior surface of the body tomentose. Subhepatic and subbranchial regions of the carapax granulated. Meros of hectognathopoda notched at the anterior margin. Chelopoda unequal in size, the right largest, rugose above with reticulating granular ridges; larger hand with nearly smooth outer surface, fingers gaping and toothed as in *O. truncatus*; smaller hand with the outer and under surface rugose and tomentose, fingers slender, small-toothed, and in contact nearly throughout their length, the tips curved inward. Ambulatory feet granulous above; last three joints densely tomentose, except the tips of the dactyli, which are smooth and glossy, red, and crystalline in appearance.

Color above dark olive, minutely punctate with yellow; below, the pubescence is buff-colored. Larger hand of a clear dark-red color; pincers black. Dimensions of a male: Length of carapax, 0.85; breadth, 1.27 inches. Of a female: Length, 1.25; breadth, 1.86 inches.

Found under stones not far below high-water mark, among gravel, in the harbor of Port Lloyd, Bonin Islands.

### Genus PSEUDOZIUS Dana

#### 84. PSEUDOZIUS MICROPHTHALMUS Stimpson

##### PLATE VII, FIG. 3

*Pseudozius microphthalmus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 35 [32], 1858.

Carapax very broad; proportion of length to breadth, 1:1.7. Upper surface smooth, punctate, and perfectly flat except near the deflected anterior margin, where it is somewhat rugulose, as if slightly eroded. Two impressed lines or sulci on the gastric region, which unite anteriorly and lead toward the frontal emargination, there becoming, however, shallow and nearly obsolete. The inter-antennary front is rather narrow, not projecting, and slightly waved. Teeth of antero-lateral margin nearly obsolete, even less prominent than in *P. planus*; edge obtuse. Orbits and eyes very small. Chelopoda rather short and stout; upper surface minutely and crowdedly punctate; fingers short, black. Ambulatory feet hairy beneath; dactyli thickly pubescent. Dimensions of a female: Length of carapax, 0.43; breadth, 0.72 inch.

This species approaches very closely to *P. planus* Dana, U. S.

Expl. Exped., Crust., 1, 233, but the carapax is flatter, the interantennary front is narrower, and the eyes smaller.

Found at the Bonin Islands.

### Genus SPHÆROZIUS Stimpson

This genus is separated from *Pseudozius* Dana to include his *P. dispar* and one other species. They are characterized by a globose form, narrow carapax, and by the continuity of the frontal and supraorbital margins, which are not separated by a notch, as in most other genera of cancroids. The wide internal hiatus of the orbit is filled by the outer antenna.

### 85. SPHÆROZIUS NITIDUS Stimpson

PLATE VII, FIG. 5, 5a

*Sphærozius nitidus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 35 [32], 1858.

Body small, subglobose; carapax about four-fifths as long as broad, convex, smooth and shining, not areolate, but with an inconspicuous longitudinal sulcus on the gastric region, reaching to the front, which is emarginated and somewhat projecting at the middle. Frontal margin continuous with upper margin of orbit. Teeth of antero-lateral margin four in number, small but acute. Chelopoda unequal, robust, rounded; outer and upper surface of hands granulous; carpus smooth; fingers nearly black and longitudinally grooved on their outer sides. Ambulatory feet somewhat hairy.

Color in life: Carapax dark gray; feet punctate with black. Dimensions of a female specimen: Length of carapax, 0.235; breadth, 0.29 inch.

Allied to *Pseudozius dispar* Dana, *loc. cit.*, 1, 235, pl. XIII, fig. 9, but distinguished from it by its sharper antero-lateral teeth and by the want of tubercles on the hands.

Only one specimen of this species occurred to us; this was found in a cluster of *Spoggodia* which grew on a rock just below low-water mark at the island of Hongkong, China.

### Genus HETEROPANOPE Stimpson

A well-marked group of cancroids is found in the eastern seas, the species of which hitherto discovered have been referred to the genus *Panopeus*, to which they have much resemblance. This genus

is, however, as far as now known, exclusively American, and the oriental forms present certain distinctive characters which cannot be regarded as otherwise than of generic importance.

The carapax is generally like that of *Panopeus*, the sharp, toothed antero-lateral margin being shorter than the postero-lateral; but the front is deflexed, with the median lobes generally prominent. The antero-lateral teeth are in general peculiarly cut, with convex sides; and they are often irregular in size. The hiatus of the infero-exterior angle of the orbit is small and inconspicuous. The hectognathopoda are generally not in contact along their inner margins; and the ridge of the palate, defining the efferent canal, is sharply prominent at the buccal margin. In the abdomen of the male the joints are all distinct, the third, fourth, and fifth not being soldered, as is usually the case in allied genera.

This genus will include *Panopeus dentatus*, *P. caystrus*, and *P. formio* of Adams and White (Voy. Samarang, Crust., pp. 41, 42), and the following new species.

#### 85. HETEROPANOPE GLABRA Stimpson

PLATE VIII, FIG. 1

*Heteropanope glabra* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 35 [33], 1858.

Carapax transverse; proportion of length to breadth, 1:1.55; convex, broad anteriorly; upper surface smooth; frontal margin straight, curving downward, not much projecting, and emarginated at the middle. Antero-lateral margin five-toothed; teeth small; angle of orbit minute, the next two teeth rounded, the last two sharp. Eyes large. Orbit with a small hiatus at the external side beneath; upper and lower margins otherwise entire. Subhepatic regions granulated. There is a thick fringe of hair on the inferior surface of the carapax around the bases of the chelopoda. Surface of hectognathopoda, sternum, and abdomen pubescent. Chelopoda smooth: the right hand largest: fingers much deflexed, crossing each other at their tips. Ambulatory feet slender, slightly hairy.

Dimensions of a male: Length of carapax, 0.32; breadth, 0.495 inch.

It has some resemblance to *P. caystrus* Adams and White, but the teeth of the margin are more deeply cut than in that species.

Found at Hongkong.

87. *HETEROPANOPE AUSTRALIENSIS* Stimpson

PLATE VII, FIG. 7, 7a

*Heteropanope australiensis* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 35 [33], 1858.

Carapax convex; proportion of length to breadth, 1 : 1.51; areolèts indistinct; surface smooth but somewhat uneven anteriorly, and sparingly granulated toward the anterior margins. Antero-lateral margin with four teeth, including that behind the angle of the orbit; teeth acute, the second much larger than, but not so prominent as the third and fourth. A small tooth on the subhepatic region beneath the postorbital tooth. Front somewhat deflexed, prominently rounded and deeply emarginate at the middle; margin minutely serrated. Orbit with the hiatus of the exterior side distinct though narrow; inferior margin denticulated; tooth at inner angle prominent. Subhepatic region granulated. A fringe of hairs around and above the bases of the chelopoda. Surface of abdomen and sternum pubescent. Chelopoda stout, the right one larger; carpus somewhat regularly granulated, with a strong tooth at the inner angle; hands smooth. Ambulatory feet hairy, particularly the dactyli.

Color in life brownish above, mottled with white and bluish-black. Dimensions of a male: Length of carapax, 0.4; breadth, 0.525 inch.

Common among muddy stones above low-water mark, on the shores of the inner harbor of Sydney (Port Jackson), Australia. It is a sluggish crab, and generally found covered with sordes.

88. *HETEROPANOPE EUCRATOIDES* Stimpson

PLATE VIII, FIG. 2, 2a

*Heteropanope eucratoides* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 35 [33], 1858.

One specimen only, a male, of this species exists in the collection. The carapax is narrow, and resembles that of some forms of *Gonoplacidae*; proportion of length to breadth, 1 : 1.25. Upper surface somewhat uneven, especially anteriorly, where there are some transverse, linear, pubescent ridges. Antero-lateral margin very much shorter than the postero-lateral, with three prominent teeth besides the little prominent anterior one, which is coalescent with the angle of the orbit. These three teeth are acute, with convex sides; the middle one is smaller than the others; the posterior one is placed at a somewhat higher level than the middle one, and projects a little

over it. The deep median emargination of the front is at the termination of a longitudinal groove on the anterior surface of the carapax, and close on each side of it the margin projects into a small rounded tooth or lobe. Margins of orbit nearly smooth, the external hiatus being nearly obsolete. Hectognathopoda smooth; their inner margins not in contact, but separated by a sufficiently conspicuous subrhomboidal space in which lie the palpi. Subhepatic and subbranchial regions smooth. Chelopoda large, resembling those of *Eucrate*; meros with a tooth near the summit; carpus smooth, with a small tooth at its inner angle; hands smooth, fingers slender, deflexed, white. Ambulatory feet slender, somewhat hairy, those of the second pair longest. Abdomen and posterior half of sternum minutely pubescent. The abdomen is narrow and tapering.

Dimensions: Length of carapax, 0.32; breadth, 0.4 inch.

The carapax in this species is narrower than in any other form of Xanthidæ. The form, the shortness of the antero-lateral margin, the form of the hands, and some other characters may perhaps indicate a genus distinct from that to which it is here referred. The general appearance is much like that of some forms of Gonoplacidæ and Carcinoplacidæ, but the position of the male verges is the same as in the Cancroids.

Found at Hongkong.

#### Genus PILUMNUS Leach

The numerous species referred to this genus, more than thirty of which have been now described, will probably be found upon critical examination to afford characters which will require its separation into several groups. Some of those described below are placed here with much hesitation, although agreeing with the received diagnosis of the genus.

The basal joint of the external antennæ is somewhat mobile in all the species which we have examined.

#### 89. PILUMNUS VESPERTILIO (Fabricius) Leach

*Cancer vesperitilio* FABRICIUS.

*Pilumnus vesperitilio* LEACH, Trans. Lin. Soc., XI; LATREILLE, Encyc., X, 125; MILNE EDWARDS, Hist. Nat. des Crust., I, 418.

*Pilumnus mus* DANA, U. S. Exploring Expedition, Crust., I, 240; STIMPSON, Proc. Acad. Nat. Sci. Phila., X, p. 36 [33], 1858.

This species is thickly covered with long dirty-greyish hair. The naked parts beneath are white; fingers dark brown; eyes black.

The figure given by Adams and White of their *P. ursulus* looks extremely like this species, but their description does not apply to it.

It is found on the reefs near low-water mark, generally in the crevices of the rock, to which they retreat upon the approach of the observer. It occurred to us at Loo Choo and Ousima and in Gaspar Straits.

The *P. vespertilio* of Dana seems to be a distinct species resembling somewhat *P. scabriculus* of Adams and White. The inferior margins of the hands are granulated and the body and feet are only sparsely covered with long setæ. I would propose to call it *P. danai*.

### 90. PILUMNUS RUFOPUNCTATUS Stimpson

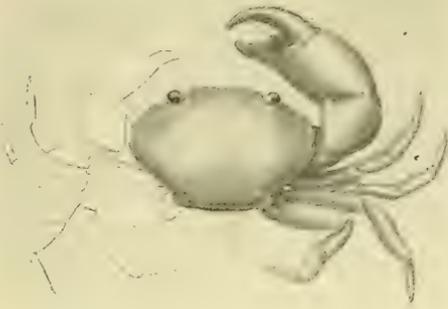
PLATE VIII, FIG. 3

*Pilumnus rufopunctatus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 36 [33], 1858.

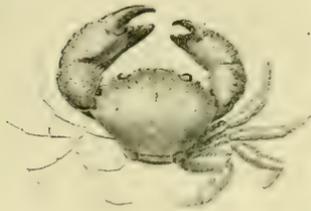
Body and chelopoda pubescent above with very short but rather stout setæ; feet hirsute. Carapax broad; proportion of length to breadth, 1:1.4; surface smooth posteriorly, anteriorly areolate and ornamented with about twenty blood red, subspiniiform granules or small tubercles. Three of these tubercles are placed on the middle of the gastric region, close together in the median line; four, somewhat distant from each other, in an arch parallel with the superior margin of the orbit; one on each side of the group on the gastric region; and one near the lateral tooth; the remainder are scattered between these. Antero-lateral margin with three teeth, the first separated by a wide space from the angle of the orbit, in which space there is a spiniform tubercle (normally the second tooth) upon the subhepatic region, which forms the first of a series of three or four passing beneath the inferior margin of the orbit. Front rather narrow, somewhat deflected; margin denticulated and very slightly emarginated at the middle. Superior margin of orbit with three or four small, irregularly distant teeth; inferior margin six-toothed. Surface of internal suborbital lobe granulated. Chelopoda robust; carpus and hand above and externally covered with sharply projecting subdistant granules; larger hand smooth and glossy below. Sternum smooth, not pubescent.

Color brownish above, with scattered red dots (tubercles) upon the anterior part of the carapax. Larger hand yellowish below; fingers black. Dimensions of a male: Length of carapax, 0.43; breadth, 0.6 inch.

Found among muddy and weedy stones near low-water mark in Port Jackson, Australia.



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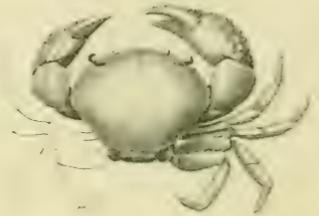
5



2



1a



6



6a



7



7a



91. *PILUMNUS FISSIFRONS* Stimpson

PLATE VIII, FIG. 4

*Pilumnus fissifrons* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 36 [33], 1858.

Body and feet covered with a thick short pubescence, which rises in transverse ridges or tufts on the anterior part of the carapax, corresponding to the areolets. Carapax convex, proportion of length to breadth in the male: 1:1.458; areolate toward the front and antero-lateral margins. Surface beneath the pubescence smooth and glossy. A prominent, sharp tubercle on the surface near the third antero-lateral tooth; and another, very small near the fifth or posterior tooth. Antero-lateral margin five-toothed; angle of orbit sharply prominent; a second tooth inferior, or subhepatic; posterior three teeth acute and projecting. Front rather narrow, deeply divided at the middle by an emargination or fissure; lobes much projecting, and rounded. Upper margin of orbit two-notched; lower margin minutely denticulated, with the inner angle strongly projecting and tooth-like. Hectognathopoda rather short and broad; their surface, as well as that of the neighboring regions, pubescent. Chelopoda unequal; carpus with ten or more small scattered tubercles upon its upper surface; hand sharply granulated above, the granules not crowded, and mostly concealed by the pubescence; below, smooth and glossy. Dimensions of a male: Length of carapax, 0.32; breadth, 0.465 inch.

Found at Port Jackson, Australia.

92. *PILUMNUS VERRUCOSIPES* Stimpson

PLATE VIII, FIG. 5

*Pilumnus verrucosipes* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 36 [34], 1858.

Upper surface of body and feet minutely pubescent, with scattered long clavate setæ, most conspicuous on the margins of the feet. Carapax broad, proportion of length to breadth in the male, 1:1.37. Surface toward the anterior margins somewhat areolate. A strong protuberance on each side near the middle lateral tooth. Antero-lateral margin with three projecting but obtuse teeth, besides the angle of the orbit; and a protuberance on the subhepatic region, some ways beneath the interval between the angle of the orbit and the first of the three teeth. Front with a smooth and clean surface, free from pubescence: it projects a little and is slightly emarginate at the middle. Inferior margin of the orbit thick and protuberant,

particularly at the inner angle. Feet all verrucose above. In the chelopoda the carpus bears nine large verrucæ; hand with five verrucæ on its superior edge; larger hand sparsely granulous externally, smooth and glossy below; smaller hand with outer surface granulous and pubescent. In the ambulatory feet the penult and antepenult joints have each two large warts above. Dimensions of a male: Length of carapax, 0.3; breadth, 0.412 inch.

This species is a true *Pilumnus*, the basal joint of the antennæ being movable and not reaching the front, and the ridge on the palate sufficiently conspicuous.

Found among seaweeds dredged from a sandy bottom, in twelve fathoms, in Simons Bay, Cape of Good Hope.

### 93. PILUMNUS FORFICIGERUS Stimpson

PLATE VIII, FIG. 6, 6a

*Pilumnus forficigerus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 36 [34], 1858.

Carapax smooth, with a velvet-like or minutely tomentose surface. Antero-lateral margin with the three posterior teeth very small; a considerable space between the anterior one and the angle of the orbit. Front broad; median lobes very little prominent and unequally rounded, being less convex externally than at their inner extremity. Postero-lateral sides concave. Surface of hectognathopoda and of the adjacent regions smooth and glossy. Chelopoda of moderate size, minutely tomentose above; carpus smooth; hand covered with irregular but strongly elevated tubercles, which are less numerous and more widely separated on the smaller hand; lower surface of hands glossy and minutely granulated. Fingers of the smaller hand with smooth, sharp, cutting edges, acting like those of shears. Ambulatory feet slender, somewhat hairy.

Colors: Carapax above red, spotted with flake-white; front very dark-red; fingers pale brown. Dimensions of a female: Length of carapax, 0.27; breadth, 0.36 inch.

Found among *Sertulariæ* and *Botrylli* dredged from a sandy bottom, in 30 fathoms, off the east coast of the island of Ousima.

### 94. PILUMNUS LAPILLIMANUS Stimpson

PLATE VIII, FIG. 7, 7a

*Pilumnus lapillimanus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 36 [34], 1858.

Carapax somewhat flattened above and posteriorly; proportion of length to breadth in the male, 1:1.3. Surface areolate; areolets

numerous but not deeply separated, and rendered indistinct by the short pubescence which covers them. Antero-lateral margin with three small teeth, and a slight projection on the subhepatic region between the first tooth and the angle of the orbit. Superior margin of the orbit, and that of the front, denticulated. Front rather broad, nearly straight when viewed from above; median lobes broadly rounded and somewhat projecting downward. Surface of hectognathopoda smooth and glossy. Chelopoda robust; carpus above somewhat pubescent, and papillose toward its inner angle. Hands naked, their upper and outer surfaces covered with conical rose-colored papillæ, somewhat variable in size and so crowded against each other that their bases are polygonal. These papillæ give the hand a beautiful stony or crystalline appearance, its surface being more like that of a shell (*Buccinum papillosum* for instance) than that of a crab. The fingers are also minutely papillose, and slightly grooved longitudinally; both are short; the thumb triangular. The fingers of the left hand are compressed, with thin sharp, nearly smooth cutting edges as in the preceding species. Ambulatory feet tomentose and somewhat hairy above. Abdomen tomentose. Dimensions of a male: Length of carapax, 0.5; breadth, 0.65; of a female; length, 0.48; breadth, 0.65 inch.

Dredged from a shelly and sandy bottom in twenty-five fathoms in the China Sea between Formosa and the Chinese coast.

The character of the fingers of the smaller hand in the two species just described might well form the basis for the establishment of a new genus.

#### 95. PILUMNUS HIRSUTUS Stimpson

PLATE IX, FIG. 1

*Pilumnus hirsutus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 37 [34], 1858.

Body and feet hirsute above, not very thickly, with setæ of variable but moderate length. Carapax scarcely areolate, broad; proportion of length to breadth, 1 : 1.43; surface nearly smooth. Antero-lateral margin short, with four sharp teeth, including the angle of the orbit; no subhepatic tooth. Inferior margin of orbit denticulated. Eyes with rather long peduncles. Front emarginate, with a row of long setæ just above the margin. Chelopoda rather small; larger hand irregularly tuberculose above, smooth below; smaller hand (the left one) spinulose above, and sparsely granulose on the outer side; fingers pale brownish.

Color a clear light brick-red. Beneath pale red; sternum white. Fingers with brown tips. Eyes straw-colored. Dimensions of a female: Length of carapax, 0.31; breadth, 0.43 inch.

The carapax of the specimen taken at Ousima is more swollen than that of the others, and less hairy; there are a few tufts of long hairs, 4 or 6 to each tuft; two on the gastric region are most conspicuous.

De Haan's description of his *P. minutus* (Fauna Japonica, Crust., p. 50) applies very well to our species; but his figure (pl. III, fig. 2) is by no means a good representation of it. The body in that figure is smooth, the feet very slender and little hairy. The postero-lateral margin is represented as convex, while it is rather concave in our species.

Dredged in the Northern China Sea, from a shelly bottom in twenty fathoms. Also found among dead corals taken from a sandy bottom in 30 fathoms of the east coast of Ousima. A single specimen probably of this species was taken at the Bonin Islands.

#### 96. PILUMNUS MARGINATUS Stimpson

PLATE IX, FIG. 2

*Pilumnus marginatus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 37 [34], 1858.

Body and feet pilose above and below; hairs soft and flexible, entangling sordes; feet more densely covered than the carapax. Carapax transverse; proportion of length to breadth, 1:1.3; areolate, areolets not protuberant; surface glossy except at the roughnesses from which the hairs arise. Surface above the front covered with minute asperities. Postero-lateral surface granulated. Antero-lateral and supraorbital margins raised or crested, the former with three teeth besides the angle of the orbit, the first of which is largest and less acute than the others. Median lobes of front very broad and even, not projecting. Outer and upper surface of hands, beneath the pilose covering, rugose with minute asperities and granules; carpus less rough; a small tooth at inner angle of carpus in the smaller chelopod. Dimensions of a male: Length of carapax, 0.275; breadth, 0.355 inch.

Found at Loo Choo.

#### 97. PILUMNUS DORSIPES Stimpson

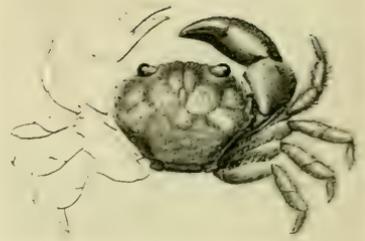
PLATE IX, FIG. 3, 3a

*Pilumnus dorsipes* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 37 [35], 1858.

This globose species has almost the aspect of a *Dromia*, the short feet of the posterior pair being turned up over the back, fitting into



1



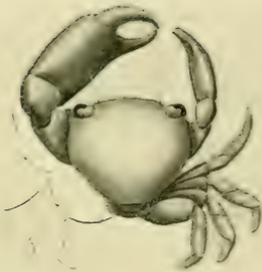
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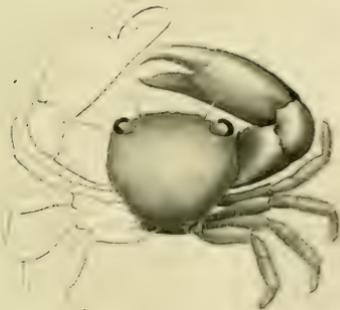
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4a



6



5



7



and covering the deeply concave postero-lateral slopes of the carapax. The outline of the postero-lateral margin is so deeply concave as to form nearly a right angle at the middle. Some other species of the genus, as *P. globosus* Dana, exhibit similar characters, but none in so great a degree.

Carapax strongly convex, transverse; proportion of length to breadth, 1:1.32. Surface rather deeply areolate; areolets granulated and pubescent. Antero-lateral margin four-toothed (the angle of the orbit included); teeth equal, with sharp tips and denticulated margins. The furrows separating the teeth are continued inferiorly for some little distance on the subbranchial region. Median lobes of front rather prominent, equally rounded. Chelopoda large, unequal, minutely pubescent above, that on the left side smaller; hand granulated above on the outer side and on the inner inferior edge, the granules sharply projecting. Carpus with scattered granules, smallest and most crowded on a ridge around the outer base of the hand, within which there is a smooth parallel groove. Ambulatory feet rather short and broad, pubescent and hairy above, nearly smooth below. Abdomen and sternum of male pubescent.

Color of carapax obscured by the pubescence; reddish-brown, with darker spots. Dimensions of a male: Length of carapax, 0.41; breadth, 0.54 inch.

Dredged from a shelly bottom, in 10 fathoms, in the harbor of Hongkong, China.

#### Genus RUPPELLIA Milne Edwards

##### 98. RUPPELLIA ANNULIPES<sup>1</sup> Milne Edwards

*Ruppellia annulipes* MILNE EDWARDS, Hist. Nat. des Crust., I, 422. DANA, U. S. Exploring Expedition, Crust., I, 246, pl. XI, fig. 4.

Our specimens agree perfectly with those of Dana. There is little doubt of their being the same as those of Milne Edwards, notwithstanding the absence of a distinct "crête horizontale" on the teeth of the antero-lateral margins. The dimensions of the single specimen in our collection, a female, are, length of carapax, 0.6; breadth, 0.94 inch.

It was taken at Great Loo Choo Island.

#### Genus ERIPHIA Latreille

The "red-eyes," as our seamen called the crabs of this genus, live in crevices of the rocks above low-water mark, where they seem

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<sup>1</sup> *Lydia annulipes* (Milne Edwards).

permanently lodged. They are often secured with great difficulty, and not without injury to the specimen; for they appear in many cases to be larger than the apertures of their holes, and hence to have increased in size since taking up their residence there. It is probable, however, that, like other crabs, they come out at night to make their predatory excursions.

99. **ERIPHIA LEVIMANA**<sup>1</sup> Latreille

*Eriphia levimana* LATREILLE, GUÉRIN, Icon., pl. III, fig. I. MILNE EDWARDS, Hist. Nat. des Crust., I, 427. DANA, U. S. Exploring Expedition, Crust., I, 249, pl. XIV, fig. 7.

Our specimens are specifically identical with those figured and described by Dana, and, like his, differ somewhat from Guérin's figure. Color, dark red above, bluish-white below. Eyes bright red, with white peduncles.

Found in crevices of rock, on the reefs, at and above low-water mark. It occurred at Loo Choo and at Kikaisima.

It was found by the exploring expedition at the Paumotu, Samoan, Society, and Fiji Islands.

100. **ERIPHIA SMITHII**<sup>2</sup> MacLeay

*Eriphia smithii* MACLEAY, Smith's Illust. Zoöl. S. Afr., Annulosa, p. 60. KRAUSS, Sudafr. Crust., p. 36, pl. II, fig. 3. DANA, U. S. Exploring Exp., Crust., I, 251.

Found in crevices of rocks, about half-tide mark, on the open coast near Hongkong, China.

101. **ERIPHIA SCABRICULA** Dana

*Eriphia scabricula* DANA, U. S. Expl. Exped., Crust., I, 247, pl. XIV, fig. 5.

Taken at Ousima.

The U. S. Exploring Expedition specimens were found at the Fiji and Society Islands and in the Sooloo Sea.

102. **ERIPHIA SPINIFRONS** (Herbst) Latreille

*Cancer spinifrons* HERBST.

*Eriphia spinifrons* LATREILLE; SAVIGNY; DESMAREST; MILNE EDWARDS, Hist. Nat. des Crust., I, 426; Illust. Cuv. R. A., pl. XIV, fig. I.

A single specimen of this species was taken at Madeira; it is a female, the dimensions of the carapax of which are: Length, 0.71;

<sup>1</sup> *Eriphia sebana* (Shaw).

<sup>2</sup> *Eriphia sebana smithii* MacLeay.

breadth, 1.01 inches. It agrees well in most characters with Mediterranean specimens, although we have had no opportunity of comparing it with an individual of the same age. The chief difference is that in our specimen the feet are thickly covered above with stout clavate setæ. The tubercles of the hands are numerous, and rather subspiniform than rounded, although blunt, and the antero-lateral teeth are sharp, spiniform, and not denticulated on their sides.

Genus *TRAPEZIA* Latreille

103. *TRAPEZIA MACULATA*<sup>1</sup> Dana

*Trapezia maculata* DANA, U. S. Exploring Expedition, Crust., 1, 256, pl. xv, fig. 4.

This species seems to approach *T. cymodoce* Dana (non *Cancer cymodoce* Herbst) by imperceptible gradations.

Found on the branches of madrepores taken just below low-water mark at Hilo, Island of Hawaii.

104. *TRAPEZIA RETICULATA*<sup>2</sup> Stimpson

PLATE IX, FIG. 5

*Trapezia reticulata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 37 [35], 1858.

Carapax much broader in the male than in the female. Lateral tooth small and little projecting, but acute. Front sinuous as in *T. cymodoce*. Chelopoda of moderate size, flattened; carpus obtuse; inner margin of meros convex and serrated with five or six teeth, those next the carpus little prominent. Ambulatory feet very sparsely pubescent; dactylus considerably shorter than the penult joint. This species is of a clear wine-yellow color, with a uniform rather close reticulation in fine crimson lines; below, the reticulation appears on the body but not on the feet. Eyes black. Fingers pale brown. Dimensions of a male: Length of carapax, 0.3; breadth, 0.35 inch; female, length, 0.3; breadth, 0.37 inch.

It resembles *T. areolata* Dana, but the areolæ enclosed by the colored network are much smaller and more numerous; the lateral teeth are smaller, and the teeth on the inner angle of the meros much less prominent.

Found on coral drawn up from a depth of one or two fathoms on the west coast of Loo Choo.

<sup>1</sup> *Trapezia cymodoce maculata* (MacLeay).

<sup>2</sup> *Trapezia cymodoce areolata* Dana.

## Genus TETRALIA Dana

## 105. TETRALIA GLABERRIMA Dana

*Tetralia glaberrima* DANA, U. S. Exploring Expedition, Crust., 1, 263, pl. XVI, fig. 3.

Of a pale yellowish, or flesh-color. Eyes dark.

Found in crevices among madrepores taken below low-water mark in a bay on the east side of Hongkong Island; also at the Bonin Islands.

106. TETRALIA LÆVISSIMA<sup>1</sup> Stimpson

PLATE IX, FIG. 4, 4a

*Tetralia lævissima* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 38 [35], 1858.

This species is closely allied to *T. glaberrima*; but the front is scarcely denticulated; the left or larger hand is rather short and thick, glossy, pubescent as usual at the external base; fingers very widely gaping and not toothed within, their tips crossing; dactylus much curved, minutely granulated above. There is a slight tooth at the inner apex of the meros joint in the chelopoda. Dimensions: Length of carapax, 0.273; breadth, 0.298 inch.

Found at Ousima.

## PORTUNIDÆ

107. PORTUNUS STRIGILIS<sup>2</sup> Stimpson

PLATE IX, FIG. 6

*Portunus strigilis* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 38 [35], 1858.

Body and feet everywhere pubescent, but not densely so. Carapax convex, rather narrow; proportion of length to breadth, 1 : 1.07. Surface areolate, and everywhere covered with transverse raised lines, closely arranged and somewhat undulated, smaller and more crowded posteriorly than anteriorly. Antero-lateral margin five-toothed, including the angle of the orbit; teeth of moderate size, the second and fifth generally a little smaller than the others. There is a raised line or slight crest on the postero-lateral margin, continuous with

<sup>1</sup> *Tetralia glaberrima* (Herbst).

<sup>2</sup> *Liocarcinus strigilis* (Stimpson).

the edge of the fifth lateral tooth. Interantennary front broad and projecting, laminiform, very slightly convex; margin waved, indistinctly trilobate, the median lobe smallest. Frontal region somewhat depressed and sparsely granulated. Basal joint of antennæ highly movable, its antero-interior angle scarcely meeting the front; antero-exterior angle dentiform and lying in the hiatus of the orbit. Chelopoda above and below scabrous with slight transverse ridges; hand short, costate exteriorly, and with a spine at the summit near the articulation of the dactylus. A strong sharp spine at the summit of the carpus. Meros with a slight tooth at its inferior extremity. Dactylus of the posterior or natatory feet lanceolate; the margin ciliated with long hairs.

Colors: Carapax dark purplish-brown with a large white patch in the middle; sometimes white with a purplish patch. Feet nearly white except toward their extremities. Dimensions: Length of carapax, 0.28; breadth, 0.3 inch. The specimens described are perhaps immature.

Dredged from a shelly bottom in twenty fathoms in Kagosima Bay, Southern Japan.

### Genus SCYLLA De Haan

#### 108. SCYLLA TRANQUEBARICA<sup>1</sup> (Fabricius) Dana

*Portunus tranquebaricus* FABRICIUS.

*Portunus serratus* RÜPPELL, Krabben des rothen Meeres, p. 19, pl. II, fig. 1.

*Lupa tranquebarica* MILNE EDWARDS, Hist. Nat. des Crust., 1, 448.

*Scylla serrata* DE HAAN, Fauna Japonica, Crust., p. 44. KRAUSS, Sudafr. Crust., p. 25.

*Scylla tranquebarica* DANA, U. S. Expl. Exped., Crust., 1, 270, pl. XVI, fig. 6.

There are two sufficiently distinct varieties of this species. That figured by Rüppell, in which the frontal teeth are sharp, is found on the shores of the continent of Asia, chiefly in muddy estuaries. It may be seen in great numbers in the markets of Hongkong and Canton. The colors in living individuals are as follows: Carapax olive green above, white below; hands often reddish, and spotted with green exteriorly, fingers always red; feet pale greenish, with darker spots below.

In Dana's variety *oceanica* the frontal teeth are blunt, with the median incision deepest; and the posterior tooth of the antero-lateral margin is longer than in the other variety. This form is found among the Pacific Islands, and was taken by us at Loo Choo.

<sup>1</sup> *Scylla serrata* (Forskål).

## Genus LUPA Leach

109. LUPA PELAGICA<sup>1</sup> (Linnæus) Leach

*Cancer pelagicus* LINNÆUS.

*Cancer reticulatus* HERBST.

*Cancer cedo-nulli* HERBST.

*Lupa pelagica* LEACH, MILNE EDWARDS, Hist. Nat. des Crust., I, 450.  
DANA, U. S. Expl. Exped., Crust., I, 271.

*Neptunus pelagicus* DE HAAN, Fauna Japonica, Crust., p. 37, pls. IX, X.

A large number of specimens of this species were collected by the expedition, some of which are of great size. In the large males the carapax is maculated and streaked above with red and pale bluish; and the teeth of the antero-lateral margin have concave rather than convex sides as represented in De Haan's figures.

The females dredged near shore are not maculated, and have a convex, strongly granulated carapax.

This species was dredged on muddy bottoms in 6 to 12 fathoms in the harbors of the Chinese coast, and was found in the markets of Hongkong. It was also seen in calm weather floating or swimming in the middle of the China Sea.

110. LUPA SANGUINOLENTA<sup>2</sup> (Herbst) Desmarest

*Cancer sanguinolenta* HERBST.

*Lupa sanguinolenta* DESMAREST, Crust., p. 99. MILNE EDWARDS, Hist. Nat. des Crust., I, 451; Illust. Cuv. R. A., pl. X, fig. I. DANA, U. S. Expl. Exped., Crust., I, 271.

*Neptunus sanguinolentus* DE HAAN, Fauna Japonica, Crust., p. 38.

Carapax in living individuals sea green above, with three purplish-red spots posteriorly, the middle one largest; each spot margined with dark purplish-brown and surrounded by a ring of white. These spots are constant in size and position, affording a much better specific character than can usually be founded upon colors. The fingers of the hand are blotched with brownish within. Body beneath white.

This species was dredged on muddy bottoms in 6 to 12 fathoms in the bays near Hongkong, China. It was found most abundantly in the month of September.

<sup>1</sup> *Portunus pelagicus* (Linnæus).

<sup>2</sup> *Portunus sanguinolentus* (Linnæus).

111. LUPA SAYI<sup>1</sup> Gibbes

*Lupa pelagica* SAY (non LEACH).

*Lupa sayi* GIBBES, Proc. Am. Assoc., 1850, p. 178. DANA, U. S. Expl. Exped., 1, 273, pl. XVI, fig. 8.

Found in the western parts of the North Atlantic Ocean, generally among gulf-weed. A fine pair, male and female, were taken together, swimming at the surface in N. lat. 33° 43', E. lon. 67° 43'.

## Genus AMPHITRITE De Haan

112. AMPHITRITE GRACILIMANUS<sup>2</sup> Stimpson

## PLATE X, FIG. 3

*Amphitrite gracilimanus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 38 [36], 1858.

Carapax convex; proportion of length to breadth in the male, 1:1.8. Superior surface pubescent, and transversely marked with raised, granulated lines or narrow ridges. Three of these lines cross the gastric region; the foremost interrupted at the middle; the second traversing the whole extent of the region; the posterior one shortest, and placed in the same line with the foremost ridges of the branchial region. Two short ridges on the posterior portion of the branchial region. Cardiac region somewhat prominent, with an interrupted transverse ridge, behind which its surface is granulated. Antero-lateral margin with nine sharp teeth, including the angle of the orbit; posterior tooth about twice as long as the next. Frontal margin with a median fissure, and four equal subtriangular teeth, the median ones very slightly more prominent than the lateral ones. Eyes very large, globular. Upper margin of orbit with two fissures, with an inconspicuous tooth at the outer one, which is considerably removed from the outer angle of the orbit. Inferior fissure of orbit very large. Chelopoda pubescent, elongated in the male; meros broad and thick, narrowing toward the carpus, its upper surface scabrous, with a longitudinal ridge parallel to the posterior margin; anterior margin of meros with four teeth or spines, posterior margin with two spines the outer one terminal, inner one placed far within and connected with the longitudinal ridge; carpus slender, two-spined; hand very slender with prominent longitudinal granulated ridges or costæ and three sharp spines above, two of which are

<sup>1</sup> *Portunus sayi* (Gibbes).

<sup>2</sup> *Portunus (Lupocycloporus) gracilimanus* (Stimpson).

placed near the articulation of the fingers, at a distance from them equal to one-fourth the length of the palm; fingers four-fifths as long as the palm, very slender, and compressed. Ambulatory feet slender, those of the penultimate pair very little longer than those of the posterior pair. Abdomen of male of a triangular form, though rather slender.

Color, in life, pale reddish, mottled or clouded. Dimensions of a male: Length of carapax, 0.68; breadth, 1.22; of a female: length, 0.78; breadth, 1.28 inches.

This species was dredged in considerable numbers on a muddy bottom in sixteen fathoms, off the Chinese coast near Hongkong.

### 113. AMPHITRITE HASTATOIDES<sup>1</sup> (Fabricius) De Haan

*Portunus hastatoides* FABRICIUS.

*Amphitrite hastatoides* DE HAAN, Fauna Japonica, Crust., p. 39, pl. 1, fig. 3.

This species in life is of a dark gray color above, with oblong or linear spots of black; below palish white. The lateral spines are not generally quite as long as in the specimen figured by De Haan. Our largest specimen, a female, has the following dimensions: Length of carapax, 0.875; breadth, 1.7 inches.

Found very abundantly in the harbors and bays about Hongkong Island and vicinity, on muddy bottoms, in 5 to 8 fathoms.

### 114. AMPHITRITE GRACILLIMA<sup>2</sup> Stimpson

PLATE X, FIG. 2

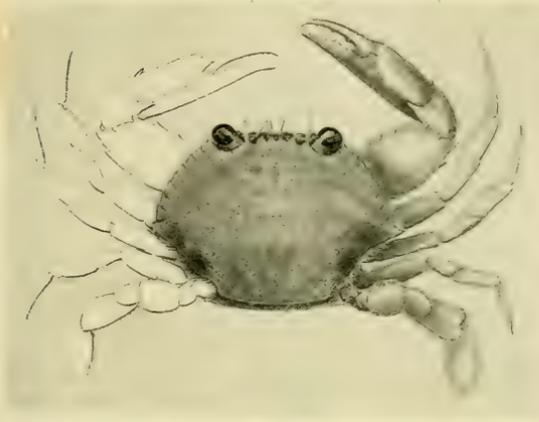
*Amphitrite gracillima* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 38 [36], 1858.

In this small species the lateral spine equals in length more than half the width of the body excluding spines. The teeth of the antero-lateral margin are minute. An acute tooth or short spine at the posterior corner of the carapax. Third pair of ambulatory feet long.

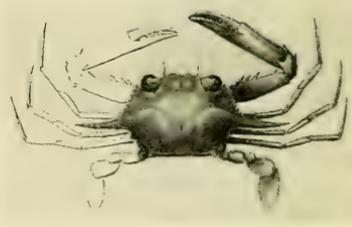
The distinctions between this and several allied species may be stated thus: From *A. longispina* and *A. vigilans* it differs in having but one spine near the base of the fingers on the upper side of the hand. From *A. tenuipes*, which it resembles in the length of the ambulatory feet, it differs in the spines at the posterior corners of the carapax. And from *A. hastatoides* it differs in its more slender

<sup>1</sup> *Portunus (Achelous) hastatoides* (Fabricius).

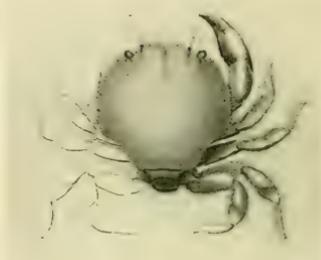
<sup>2</sup> *Portunus (Achelous) gracillimus* (Stimpson).



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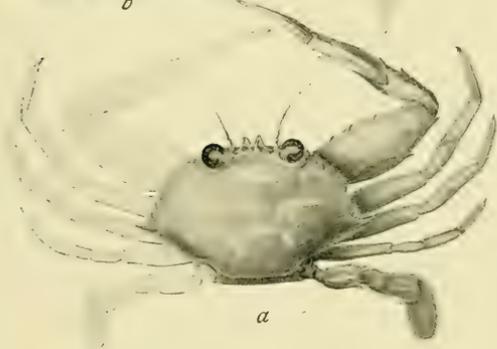


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c

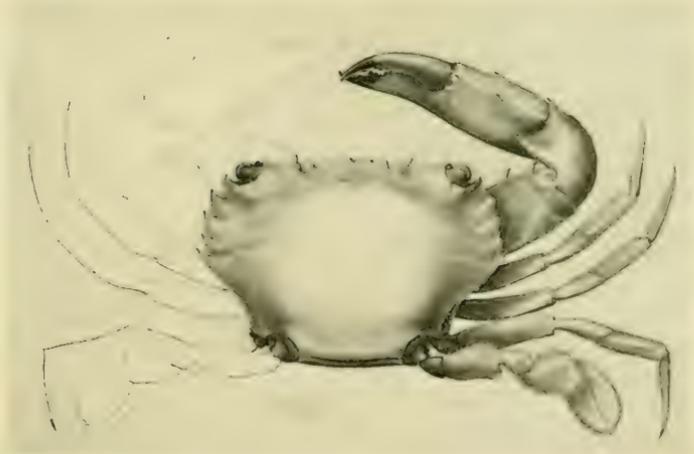


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6a



chelopoda, longer lateral spines and ambulatory feet, by the presence of a tooth on the superior margin of the orbit, and in having the lateral teeth or lobes of the interantennal front more prominent than the median ones.

This species is of a white color, punctate with dark-brown. The only specimen taken is probably young.

Dredged on a muddy bottom in "Ten-fathom-hole" in the harbor of Port Lloyd, Bonin Islands.

#### 115. AMPHITRITE HAANII<sup>1</sup> Stimpson

*Amphitrite gladiator* DE HAAN, Fauna Japonica, Crust., p. 39, pl. 1, fig. 5.  
(non *Lupa gladiator* MILNE EDWARDS).

*Amphitrite haanii* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 38 [36], 1858.

The *Lupa gladiator* of Milne Edwards is described by him as "peu ou point granuleuse," and therefore can scarcely be the same as the species figured by De Haan, for which we propose a separate designation.

The general color is orange or reddish, sometimes mottled with white. The granules are often crimson. There are often bright purple spots at the articulations of the posterior pair of feet.

It was taken by us at the following localities: In the China Sea, in the parallel of 23° N., in 20 fathoms, sandy bottom; at Tanegashima, in 12 fathoms, on clean white sand; in Kagosima Bay, at the depth of 15 fathoms.

#### 116. AMPHITRITE MEDIA<sup>2</sup> Stimpson

##### PLATE X, FIG. 1

*Amphitrite media* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 39 [36], 1858.

This species is closely allied to *A. haanii* in general appearance, in the character of the front, the granulated areas of the carapax, etc., but appears constantly to differ in the smaller size of the lateral spine or posterior antero-lateral tooth, which is never more than twice as long as the next one. And the antero-lateral teeth in both of De Haan's figures are much more widely separated than in our species, in which they are close together and curved forward. The median teeth of the interantennal front are equal in size to the lateral

<sup>1</sup> *Portunus (Achelous) gladiator* (Fabricius).

<sup>2</sup> Combined, by Alcock, with the preceding species.

ones; in this our species differs from *A. speciosa*. In the chelopoda of the female the meros joint is very broad and rather short. Dimensions of a female: Length of carapax, 0.88; breadth, 1.32 inches.

Found among floating wood in Gaspar Straits by Mr. L. M. Squires, of the steamer "John Hancock."

#### 117. AMPHITRITE SPECIOSA<sup>1</sup> Dana

*Amphitrite gladiator* DE HAAN, Fauna Japonica, Crust., pl. XVIII, fig. 1 (?).

*Amphitrite speciosa* DANA, U. S. Exploring Expedition, Crust., 1, 276, pl. XVII, fig. 1.

The longitudinal impressed line on the meros-joint of the chelopoda is as usual present in this species, although accidentally omitted in Dana's figure.

The color in living specimens is dark gray, mottled with white.

It was taken by us at Tanega-sima from a clean white sand bottom, in 12 fathoms; also at Loo Choo.

The specimens of Dana are from the Fijis.

#### Genus CHARYBDIS De Haan

#### 118. CHARYBDIS ANISODON De Haan

##### PLATE XII, FIG. 1

*Charybdis anisodon* DE HAAN, Fauna Japonica, Crust., p. 42.

This species is easily recognized by its glabrous surface and thick two-spined hand. The color in life is palish green above, white below.

Taken by the trawl from a muddy bottom, in 6 fathoms, in a sheltered bay near Hongkong, China.

#### 119. CHARYBDIS CRUCIFERA<sup>2</sup> (Fabricius) Dana

*Portunus crucifer* FABRICIUS, Suppl., p. 364; HERBST, Naturg. der Krabben und Krebse, pl. XXX, fig. 1.

*Thalamita crucifera* MILNE EDWARDS, Hist. Nat. des Crust., 1, 462.

*Oceanus crucifer* DE HAAN, Fauna Japonica, Crust., p. 40.

*Charybdis crucifera* DANA, U. S. Expl. Exped., Crust., 1, 286, pl. XVII, fig. 11 (?).

Color of carapax in life purplish-red, with oblong reddish-brown patches. Below pale yellowish or white. Feet above of a palish

<sup>1</sup> *Portunus (Achelous) granulatus* (Milne Edwards).

<sup>2</sup> *Charybdis cruciata* (Herbst).

dirty orange color, mottled with red. Pincers tipped with mahogany.

Very common in the vicinity of Hongkong, China, on muddy bottoms, in 6 to 20 fathoms.

#### 120. CHARYBDIS VARIEGATA De Haan

PLATE IX, FIG. 7

*Charybdis variegata* DE HAAN, Fauna Japonica, Crust., p. 42, pl. I, fig. 2.

Our specimens agree very well with the species to which they are here referred, although much better with the figure than with the description of De Haan. There are some differences, however, which it is important to mention. The four median teeth of the front in our specimens are sufficiently well separated from the others; in *C. variegata* they are said not to be so separated. The hand is conspicuously rugose with transverse ridges (squamosa), a character not mentioned in De Haan's diagnosis. And the antero-lateral margin is rather more convex than is represented in the figure.

The frontal teeth are not "aiguës et également espacées," as in *Thalamita callianassa* Milne Edwards (non *Cancer callianassa* Herbst).

Several specimens were dredged in the northern part of the China Sea.

#### 121. CHARYBDIS SEXDENTATA<sup>1</sup> (Herbst) De Haan

*Cancer sexdentatus* HERBST, Naturg. der Krabben und Krebse, pl. 7, fig. 52.

*Thalamita sexdentata* R PPEL, Krabben des rothen Meeres, p. 4, pl. I, fig. 1.

*Charybdis sexdentata* DE HAAN, Fauna Japonica, Crust., p. 41, pl. XII, fig. 1.

Easily distinguished by its sharp frontal and antero-lateral teeth, the posterior one of which is considerably more projecting than the others. Some specimens are glossy and others pubescent. In the glossy specimens the hands are also naked and the costæ ungranulated. The color is deep green.

In our specimens the incisions separating the middle four teeth from the others are a little deeper than the other frontal notches, and the penult joint of the natatory feet is always conspicuously spinulose along the inferior edge.

Found among rocks and stones on coarse, sandy ground, at and near low-water mark, in a bay near Hongkong, China.

<sup>1</sup> *Charybdis japonica* (A. Milne Edwards).

122. *CHARYBDIS GRANULATA*<sup>1</sup> De Haan

*Charybdis granulata* DE HAAN, Fauna Japonica, Crust., p. 42, pl. I, fig. 1.

Colors in life: Pubescence of upper surface brownish; some white spots among the warts or granules, which are bright red. Below bluish, mottled with white and pale red.

Dimensions of a male: Length of carapax, 2.36; breadth, 3.4 inches.

Dredged in 10 fathoms, shelly mud, in the channels of Hongkong Harbor.

123. *CHARYBDIS MILES* De Haan

*Charybdis miles* DE HAAN, Fauna Japonica, Crust., p. 41, pl. XI, fig. 1.

A single specimen only was collected, a female, the dimensions of which are: Length of carapax, 1.65; breadth, 2.27 inches; proportion, 1:1.37. It is thus a little narrower than those measured by De Haan, in which the proportion stands 1:1.445.

Taken at Hongkong, China, a point at which the Portunidae seem to reach their maximum development in size and in numbers, both of species and individuals.

124. *CHARYBDIS TRUNCATA* (Fabricius) Stimpson

*Portunus truncatus* FABRICIUS, Suppl., p. 365.

*Thalamita truncata* MILNE EDWARDS, Hist. Nat. des Crust., I, 463. DE HAAN, Fauna Japonica, Crust., p. 43, pl. II, fig. 3, pl. XII, fig. 3.<sup>2</sup>

*Charybdis truncata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 39 [37], 1858.

This species seems to have much more affinity with *Charybdis* than with the genus *Thalamita*, to which it is referred by De Haan. Among the very numerous specimens in our collection there are none so large (two inches in breadth) as those mentioned by Milne Edwards. And the description of this latter zoölogist applies by no means as well to our specimens as do the figures and description of De Haan.

Colors in life: Carapax above dirty greenish; feet with transverse bars or patches of reddish-brown; below white.

Very common in Hongkong Harbor.

<sup>1</sup> *Charybdis natator* (Herbst).

<sup>2</sup> In pl. XII, fig. 3, of de Haan the male is the true *truncatus* of Fabricius; the female is *C. subornata* Ortmann.

## Genus THALAMITA Latreille

## 125. THALAMITA ADMETE (Herbst) Milne Edwards

*Cancer admete* HERBST.

*Thalamita admete* MILNE EDWARDS, Hist. Nat. des Crust., 1, 459; Illust. Cuv. R. A., pl IX, fig. 2. DANA, U. S. Expl. Exped., Crust., 1, 281, pl. XVII, fig. 5.

Found at the Island of Ousima. A young specimen, probably of this species, occurred in 5 fathoms, black sand, in Kagosima Bay.

## 126. THALAMITA INTEGRA Dana

*Thalamita integra* DANA, U. S. Exploring Expedition, Crust., 1, 282, pl. XVII, fig. 6.

Color in life: Glaucous with white dots, as if sprinkled with sand; below white; pincers dark brown, tipped with white.

Taken on a sandy bottom, in six fathoms, in Katonaisima Straits, Ousima. Young specimens, probably of this species, occurred at Kikaisima and at the Bonin Islands. Dana found it at the Paumotu and Hawaiian Islands.

## 127. THALAMITA SIMA Milne Edwards (?)

## PLATE XI, FIG. 2

*Thalamita sima* MILNE EDWARDS, Hist. Nat. des Crust., 1, 460.

The description of *T. sima* given by Milne Edwards is very short, and it is by no means certain that the species here referred to is the same.

The following description is taken from a large male, one of the very numerous specimens collected by the expedition at Hongkong. The proportion of length to breadth in the carapax is 1:1.65. Upper surface moderately convex at the middle and posteriorly, pubescent and marked with several transverse granulated lines. Interorbital front equaling half the width of the carapax and simply emarginated as in *T. admete*, but advanced a little at the median notch. Antero-lateral margin more or less oblique and armed with five sharp teeth, including the angle of the orbit: the fifth or posterior tooth larger; the fourth a little smaller than the rest. Hectognathopoda and pterygostomial regions pubescent. Chelopoda large, strongly spinose and squamose; the subsquamiform transverse ridges, with granulated and pubescent margins, are shorter and more irregular above

than below; on the lower surface they are most regular and nearly continuous, being interrupted only at the median groove. Anterior margin of meros-joint with two strong curved teeth near the dentiform outer angle, and six or eight small tuberculiform teeth toward the base; four small tubercles on the surface above and between the large teeth. No teeth on the outer side of the meros, which is only squamose. Carpus strongly squamose and pubescent; a strong spine at the summit and three small ones on the outer surface. Hand with five spines above and two or three costæ on the outer surface; fingers strongly grooved, the ridges between the grooves smooth and glossy. Ambulatory feet pubescent; penult and antepenult joints grooved; penult joint of natatory feet with no spines on its posterior margin, terminal joint with the sharp tip projecting considerably beyond the margin.

Colors in life: Above, obscured by the pubescence, blackish and whitish mottled; below, bluish; mouth and parts adjacent, reddish; pincers with black blotch at the middle, tips white. Dimensions of the male: Length of carapax, 1.5; breadth, 2.48 inches.

De Haan's *T. arcuatus* is perhaps the young of our species, but the hands are described as smooth below.

Found abundantly in sheltered bays near Hongkong, China, on muddy bottoms, in 4 to 6 fathoms; it also occurred in Gaspar Straits and at Simoda, Japan.

### 128. THALAMITA CRENATA Rüppell

PLATE X, FIG. 6, 6a

*Thalamita crenata* RÜPPELL, Krabben des rothen Meeres, p. 6, pl. v. fig. 2.  
MILNE EDWARDS, Hist. Nat. des Crust., I, 461 (?).

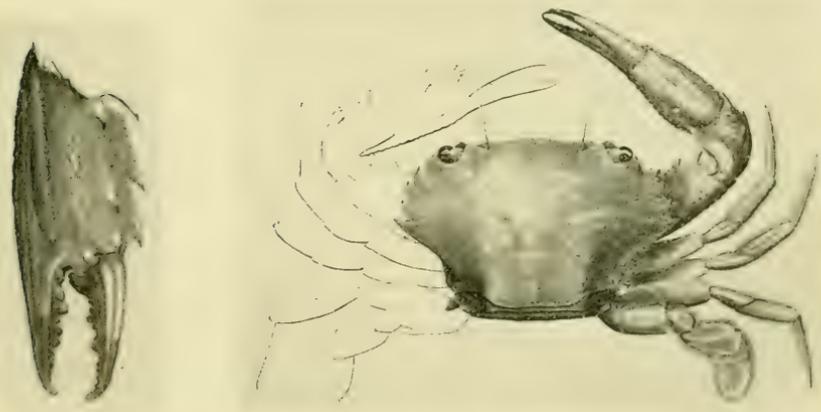
Carapax glossy, free from pubescence except toward the margins. Crest of basal joint of antennæ not projecting beyond the frontal margin. Outer surface of hand smooth. In some of our specimens, as in those of Rüppell, there are a few spines on the posterior border of the penult joint of the natatory feet. Color in life dark green above, paler below; pincers dark red, with yellowish teeth.

Taken in a seine from a small muddy creek in Napa Harbor, Loo Choo, where it seems to be abundant; also found at Hongkong.

There are evidently two species confounded under the name *T. crenata*, and we are somewhat in doubt as to which species the name should be applied. Rüppell's figure certainly represents the smoother species, rather than that called *T. crenata* by Dana, which latter, however, may not improbably be the *T. crenata* of Milne Edwards,



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who compares it with *T. admete*, to which species Dana's crab approximates much more closely than that of Rüppell.

The German naturalist seems to have priority in the use of the term *crenata*, for, although he refers to Latreille for the name, we can nowhere find a description by the latter author.

### 129. THALAMITA DANÆ Stimpson

PLATE XI, FIG. 1, 1A

*Thalamita crenata* DANA, U. S. Exploring Expedition, Crust., I, '282, pl. XVII, fig. 7.

*Thalamita danæ* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 39 [37], 1858.

Easily distinguished from *T. crenata* by the granulous and costate outer surface of the hand and the more deeply cut teeth of the front. It approaches more closely *T. crassimana* Dana (*prymna* De Haan). The crest of the basal joint of the antennæ projects beyond the frontal margin.

Color in life dark purplish-red or brick-red above, much lighter below.

Found under stones on coarse sandy ground, above low-water mark, in the harbor of Hongkong, China.

### 130. THALAMITA PICTA Stimpson

PLATE X, FIG. 5

*Thalamita picta* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 39 [37], 1858.

This is a small, prettily-colored species, of which two specimens only were obtained. The proportion of length to breadth in the carapax of the male is 1:1.58. Upper surface pubescent and marked with transverse raised lines arranged as in *T. danæ*, the lateral lobes of the anterior set of lines on the gastric region being behind the median ones, and not in the same range as in *T. crassimana*. Antero-lateral margin a little oblique, five-toothed, including the angle of the orbit, the fourth tooth much smaller than the fifth, which nearly equals the third in size. Frontal margin a little prominent at the middle and deeply crenated, with six lobes (excluding the præorbital teeth), the median two lobes small and rounded, the next ones broad, the external ones small and pointed. Basal joint of external antennæ with a short, sharply compressed, smooth-edged laminiform crest, the middle portion of which projects beyond the front. Chelopoda squamose and pubescent above; spines nearly as in *T. danæ*: spine at inner angle of carpus very long; hand costate

externally. Inferior edge of penult joint of natatory feet with seven distinct, rather large spinules.

Color in life grayish and yellowish mottled. An oblong crimson patch on the anterior part of the carapax extending between the eyes and a smaller crimson patch posteriorly. Pincers with two or three dark-brown annulations; tips white. Dimensions of a male: Length of carapax, 0.47; breadth, 0.745 inch.

Found among boulders and stones above low-water mark in Foukow Bay, Island of Ousima.

### 131. THALAMITA CRASSIMANA<sup>1</sup> Dana

*Thalamita prymna* DE HAAN, Fauna Japonica, Crust., p. 43, pl. XII, fig. 2  
(non HERBST et MILNE EDWARDS).

*Thalamita crassimana* DANA, U. S. Exploring Expedition, Crust., 1, 284,  
pl. XVII, fig. 9.

Found at Loo Choo, in muddy bays, just below low-water mark.

### Genus ANISOPUS De Haan

We may retain the name *Anisopus* for those species of *Platyonichus* in which the median tooth of the front is bifid and the teeth of the antero-lateral margin approximated.

### 132. ANISOPUS PUNCTATUS<sup>2</sup> De Haan

*Anisopus punctatus* DE HAAN, Fauna Japonica, Crust., p. 44, pl. II, fig. I.

Color in life reddish, from clouds of reddish-brown punctæ. Carapax with a clear blue spot at each posterior corner; also a W-shaped blue spot, with a dark-red patch in front of it, at the middle.

It is taken with seines on the sandy shores of Hakodadi Bay, Island of Jesso, and is used as food by the inhabitants. It was also obtained from the fishermen off the northeast coast of Nippon, where it seems to be very common.

<sup>1</sup> *Thalamita prymna* (Herbst).

<sup>2</sup> *Ovalipes bipustulatus* (Milne Edwards).

## CORYSTOIDEA

## Genus TRICHOCERA De Haan

133. TRICHOCERA GIBBOSULA<sup>1</sup> De Haan

*Trichocera gibbosula* DE HAAN, Fauna Japonica, Crust., p. 45, pl. II, fig. 4, pl. XIII, fig. 3.

Our single specimen is small, about one-third of an inch in length. The rostrum is more projecting and the protuberances of the dorsal surface of the carapax much sharper than is represented in De Haan's figures. There is little doubt, however, that it is only the young of the species above cited.

Dredged from a sandy bottom, in 30 fathoms, off the northeast coast of Nippon.

## Genus KRAUSSIA Dana

## 134. KRAUSSIA NITIDA Stimpson

PLATE X, FIG. 4

*Kraussia nitida* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 40 [37], 1858.

Carapax suborbicular; proportion of length to breadth, 1:1.12. Upper surface glossy and nearly smooth; obsoletely crenulate-lineolate. Interantennal front much projecting, divided into two lobes by a deep median emargination or fissure; each lobe is also nearly divided in two by an excavation of less depth. Margins of front ciliated. Superior margin of orbit with a deep fissure near the inner side. There are five short longitudinal impressed lines on the anterior part of the carapax, terminating in the fissures of the front and orbits. Antero-lateral margin ciliated, smooth in appearance, but minutely crenulated, and with three or four inconspicuous emarginations indicating the normal teeth. Postero-lateral margin very short and concave. Chelopoda nearly smooth; hand above obsoletely lineolated; dactylus with longitudinal ridges above, somewhat crenulated near the base; a minute spine on the front of the carpus and one near the summit of the meros-joint. Posterior feet with long hairs on their margins.

Color in life white; carapax sometimes cream-colored, and often streaked with flesh color. Pincers brown. Dimensions of a male: Length of carapax, 0.32; breadth, 0.36 inch.

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<sup>1</sup> *Cancer gibbosulus* (De Haan).

It differs from *K. integer* Dana (*Xantho integer* De Haan) in its narrower carapax and more projecting front; from *K. rugulosa* and *K. porcellana* in the want of spines on the antero-lateral margin.

Dredged in 20 fathoms, black sand, in Kagosima Bay, Japan; also in the northern China Sea, latitude 23°, from 24 fathoms, shelly sand.

Genus CHEIROGONUS Latreille

135. CHEIROGONUS ACUTIDENS<sup>1</sup> Stimpson

PLATE XII, FIG. 3

*Cheirogonus acutidens* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 40 [37], 1858.

Carapax rather narrow; proportion of length to distance between tips of lateral teeth, 1 : 1.26. Surface covered with setiferous tubercles, mostly transverse, as in other species of the genus. Lateral tooth slender, sharp, the principal or middle one very long, a small intermediate tooth at the base of the principal one behind. Between the teeth and sometimes on their edges there are a few small spini-form denticles. Interantennal front or rostrum with a deep median sinus and a smaller sinus or excavation at the tip of each fork, as in *C. hippocarcinoides*. Antennæ more than one-third as long as the carapax. Feet all squamose or scabrous and setose. Chelopoda somewhat spinous above; hand costate externally, the costæ sharply tuberculated.

Color in life light brick-red above; paler, inclining to yellowish, below. Some specimens are of an orange color, but always dusky. Pincers dark brown. Dimensions of a male: Length of carapax, 1.45; breadth between tips of lateral teeth, 1.83 inches. It grows to a length of three inches, but the larger specimens, of which several were collected, were accidentally lost.

It may be distinguished from *C. hippocarcinoides* as found on the west coast of America, as well as from *Telmessus serratus* White, by the greater length and acuteness of the lateral teeth, particularly the larger one; also by the existence of a small intermediate tooth behind the large one.

This crab is very common in the Bay of Hakodadi, in northern Japan. It is commonly taken with the seine on sandy shores, but often occurs on gravelly beaches above low-water mark. In June the young, of half an inch to an inch in length, were much more

<sup>1</sup> *Telmessus acutidens* (Stimpson).



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abundant than adults, and were taken with the dredge in 4 fathoms, weedy sand.

In the time of Steller a species of *Cheirogonus* was so abundant in Avatcha Bay (Kamchatka) that it formed a common article of food among the inhabitants. At the present time, however, it has entirely or nearly disappeared, as we did not succeed in obtaining a specimen; nor do the naturalists of Beechey's voyage mention having found it.

### Genus NAUTILOCORYSTES Milne Edwards

The name *Dicera*, proposed for this genus by De Haan and retained by Krauss and Dana, was published before that of Milne Edwards. The name given by the latter naturalist is, however, retained, as *Dicera* was several times preoccupied as a generic term in zoölogy, and once among the Articulatés.

#### 136. NAUTILOCORYSTES OCELLATUS<sup>1</sup> Milne Edwards

*Dicera octodentata* DE HAAN, Fauna Japonica, Crust., p. 15 (no descr.).

KRAUSS, Sudafr. Crust., p. 27.

*Nautilocorystes ocellatus* MILNE EDWARDS, Hist. Nat. des Crust., II, 149.

Dredged on a sandy bottom, in 12 fathoms, in Simons Bay, Cape of Good Hope.

## OCYPODOIDEA

### CARCINOPLACIDÆ

#### Genus PILUMNOPLAX Stimpson

This genus was instituted for a group of small Carcinoplacidæ having much the aspect of *Pilumnus* in their shape and frequent setose covering, but easily distinguished by the depressed form and great posterior breadth of the carapax as well as by the character of the male organs. The antero-lateral margin is very short; the eyes and orbits very small and rounded. The facial and oral members are nearly as in *Pilumnus*. The basal joint of the antennæ is movable, and does not reach the frontal margin. The meros-joint of the external maxillipeds is nearly square. The palate is on each side divided by a ridge more or less distinct. The chelipeds are generally short. The ambulatory feet are long and slender, those of the penultimate pair usually the longest; the dactyli flattened, and in the

<sup>1</sup> *Nautilocorystes octodentatus* (De Haan).

last pair of feet curved upward. The "hebdosternite," or last joint of the sternum, is entirely covered by the base of the abdomen in the male and nearly covered in the female. The male organs are large, arising from the coxal joints of the posterior feet, and are concealed beneath the abdomen, but they do not immediately enter the abdominal appendages, being conducted to them in a depression of the sternum scarcely deep enough to be called a canal. The male abdomen is very narrow except at the base, where it rather abruptly widens to cover the last joint of the sternum and interjacent organs; the segments are all distinct, none soldered.

This genus differs from *Carcinoplax* in its narrower carapax and short chelipeds; from *Pseudorhombila* in its flattened dactyli. The species are all inhabitants of the Chinese and Japanese seas.

### 137. PILUMNOPLAX SULCATIFRONS Stimpson

*Pilumnoplax sulcatifrons* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 93 [39], 1858.

The following description was drawn up from a male, which, as it happens, is the only male specimen of the genus met with during the exploration:

Carapax moderately convex in front, posteriorly flattened; proportion of length to breadth, 1:1.26. A slight longitudinal ridge or angle on each side above and parallel with the postero-lateral margin. The upper surface is naked and nearly smooth, not granulated; the regions scarcely distinct. A curved sulcus extends somewhat irregularly from the depressed genital region to the lateral tooth. The median frontal sulcus is rather deep, posteriorly bifurcating on the pregastric region. Front broad, straight, little projecting, and notched at the middle. The frontal margin is double, or divided by a well-marked transverse sulcus. The antennary notches are deep. Antennæ naked, very slender, and nearly half as long as the carapax. Antero-lateral margin very short, posteriorly continuous with the postero-lateral; it is four-toothed, including the angle of the orbit, the third tooth largest and a little raised. Latero-inferior regions convex; horizontal suture deep. External maxillipeds smooth and glossy. Chelipeds moderately large, smooth; meros with a tooth close to its superior extremity; carpus lanose externally around base of hand; hand short, glossy; fingers longer than palm, crossing at the tips, moderately toothed within; immovable finger margined below with a slight crest exteriorly. Ambulatory feet smooth, long, very slender, somewhat compressed and slightly hairy; penult and

terminal joints sulcated. Dimensions: Length of carapax, 0.325; breadth, 0.41 inch.

In a specimen of somewhat larger size, which appears to be the female of this species, the carapax is smoother and more convex, the antero-lateral margin more oblique and the chelipeds nearly as large in proportion as in the male.

They were found below low-water mark in the harbor of Hongkong.

### 138. PILUMNOPLAX LONGIPES Stimpson

*Pilumnoplx longipes* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 93 [39], 1858.

Female specimens only of this species were found. Carapax depressed, subquadrate, nearly as broad posteriorly as the broadest part. Proportion of length to breadth, 1:1.435. The flat upper surface is smooth and even, and pubescent. Antero-lateral margin very short, rounded, somewhat acutely crested, and armed with four or five minute, inconspicuous teeth. Orbit small, with the external margins entire and a little raised or projecting. Front very broad, deflexed, and emarginate at the middle; a supramarginal line of long setæ. Subhepatic regions smooth and glossy. Outer maxillipeds villose. Chelipeds with the outer surface of the carpus, hand, and fingers thickly hairy; fingers rather long and slender, with curving tips, and irregularly toothed inner margins. Ambulatory feet hairy, very long, penultimate pair longest; dactyli of the last pair long and curved. Abdomen elongate-triangular. Lower surface of body, abdomen, etc., lanose. Dimensions of the carapax: Length, 0.195; breadth, 0.28 inch.

Found at Ousima.

### 139. PILUMNOPLAX SCULPTA Stimpson

PLATE XI, FIG. 3

*Pilumnoplx sculpta* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 93 [39], 1858.

The following description is taken from female specimens: Body and feet setose and sparsely hairy. Carapax almost quadrangular, very broad posteriorly. Proportion of length to breadth, 1:1.27. Back deeply sculptured with very numerous anastomosing grooves, dividing the surface into narrow curved areolets and giving it a somewhat vermiculated appearance. The most conspicuous areolets

are two smooth, oblong longitudinal ones on the anterior part of the gastric region just behind the front. These, as well as two near the anterior corners of the carapax, are very prominent. Lateral margin anteriorly with five tuberculiform or paxilliform teeth, the posterior two smooth, the two next anteriorly prominent and setose, the anterior one small, forming the angle of the orbit. Front deflexed, with a supramarginal fringe of long hairs; margin curved and notched at the middle. Eye peduncles setose. The grooves separating the posterior teeth of the lateral margin are continued for a considerable distance upon the sub-branchial region, passing obliquely forward. Chelipeds with the meros and carpus deeply sculptured with setose grooves, dividing the upper side of each joint into five or six prominent, smooth, wart-like protuberances. A small, sharp tooth at the inner angle of the carpus. Outer surface of hand with a setose coating, beneath which there are minute sharp granules showing a tendency to arrangement in longitudinal rows. Ambulatory feet longitudinally grooved. Dimensions: Length of carapax, 0.22; breadth, 0.28 inch.

This species occurred at Ousima.

#### 140. PILUMNOPLAX CILIATA Stimpson

*Pilumnoplax ciliata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 94 [40], 1858.

Description of a female: Anterior margins of body and feet densely ciliated with long hair-like setæ. Carapax broad, somewhat narrowed and flattened posteriorly. Proportion of length to breadth, 1:1.58. Upper surface even and nearly smooth, pubescent, a few granules distantly scattered toward the margins. Seven short longitudinal sulci on the frontal and supraorbital regions, the median one arising from the frontal emargination. Front broad, with a supramarginal series of long setæ continuous with those on the orbital and antero-lateral margins. Orbit with two deep fissures at the outer side, one above and one below the exterior angle; a slight fissure also on the superior margin. Antero-lateral margin with three deep notches dividing four teeth, the anterior one being confounded with the angle of the orbit; teeth all broadly truncated with the exception of the posterior one, which is small and sharp. Subhepatic region behind the orbit eroded or rugose. Basal joint of antennæ rather short. Chelipeds short, equal; meros with a thin, sharp, irregularly dentated superior crest; carpus hairy, with the inner angle acute; hand sharply granulated and setose, with the exception of its inner

surface and a space externally at the base of the fingers, which appears as if worn smooth; setæ of superior margin very long; fingers somewhat deflexed, rounded, a little gaping, deeply sulcated within, externally partly granulated. Ambulatory feet compressed, those of the penult pair longest; superior margins of last three joints ciliated; meros-joint with a smooth, sharp, thin superior crest. Dactylus of posterior pair short, little more than half as long as that of penult pair, and somewhat curved. Dimensions of carapax: Length, 0.38; breadth, 0.6 inch.

Of this curious species a single specimen only was obtained. It is much broader than other species of the genus, and were it not for its deeply toothed and ciliated antero-lateral margin and its short chelipeds might well be referred to *Carcinoplax*.

It was found in the port of Simoda, Japan.

#### 141. CARCINOPLAX EBURNEA Stimpson

*Carcinoplax eburneus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 94 [40], 1858.

This is a very small species, of which, however, a sufficient number of examples were taken to illustrate it fully. The carapax is very broad, with a hard, smooth, ivory-like surface. Proportion of length to breadth, 1:1.75. Sides evenly rounded, tumid, with a slightly raised horizontal marginal line or crest, the antero-lateral portion of which is armed with two or three very minute, inconspicuous teeth. Front broad, straight, slightly pointed at the middle. Orbits small, rounded, margins entire. Subhepatic regions swollen. Palate divided by a ridge on either side. Buccal area short, very broad in front and narrowed behind. External maxillipeds nearly as in *C. longimana*, except that the exognath is broader, with a spiniform tooth, and the outer margin of the endognath is deeply concave; the meros is much broader than the ischium and much produced at its external apex or auricle; finally the palpus is rather endarthroid than goniarthroid. Chelipeds long and slender, with glossy surface; meros slightly hairy on the edges; carpus small; hand elongated with a smoothly-rounded and somewhat swollen palm; fingers slender, as long as the palm, sharply dentated within, teeth small, tips hooked, crossing each other. Ambulatory feet slender, with hairy edges. Abdomen of the male triangular, median segments soldered, margin toothed at base. Abdomen of the female triangular.

The color in life is pale brownish or yellowish; three diverging white streaks on the posterior part of the carapax; chelipeds darker:

beneath white. Dimensions of the carapax in a male: Length, 0.16; breadth, 0.28 inch.

It was dredged from a muddy bottom, in the "ten-fathom hole," at Port Lloyd. Bonin Islands.

### Genus HETEROPLAX Stimpson

This genus is allied to *Carcinoplax* in the character of the male organs, and to *Gonoplax* in the shape of the carapax and the form of the orbits. The carapax is trapezoidal, the facial region occupying nearly its whole width anteriorly. Front rather broad, notched on either side at the insertion of the antennæ. Eye-peduncles stout and of moderate length. Antennæ long and slender, the basal joint movable, narrow, elongated, its outer apex filling the hiatus of the orbit and nearly excluding the flagellum therefrom. Epistome ample. Palatal ridge sufficiently distinct at the anterior buccal margin. External maxillipeds resembling those of *Gonoplax*, with gonioarthroid palpus. Chelipeds short, robust; fingers oblique. Ambulatory feet slender, the third pair longest; dactylus compressed. Abdomen of the male very narrow, but expanded at base so as to cover the posterior segment of the sternum and reach the coxæ of the posterior feet. The virgulæ, or male organs, arise from these coxal joints, but reach the abdominal appendages through shallow grooves on the sternum.

The species are found on the coast of China.

#### 142. HETEROPLAX DENTATA Stimpson

*Heteroplax dentata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 94 [40], 1858.

Carapax narrow, a little broader at the principal lateral tooth than at the angle of the orbit. Proportion of length to breadth, 1:1.27. Surface smooth and glossy; regions inconspicuous. Hepatic region depressed. Antero-lateral and postero-lateral margins nearly continuous, the former very short, with four unequal teeth, the third tooth much the largest and most prominent, placed at a higher level than the second and projecting over it; fourth or posterior tooth inconspicuous, formed only by a slight emargination. Front straight, somewhat bimarginate; no median notch. Eyes large. Chelipeds short, smooth, and glossy; a small tooth near the summit of the meros-joint and one at the inner angle of the carpus, and a tuft of pubescence on the outer surface at the juncture of the carpus and hand.

The colors in life are as follows: Carapax gray or brown, whitish posteriorly, and with a transverse narrow white band behind the eyes. The frontal region and feet punctate with red. The species presents little or no variation in color. Dimensions of the carapax in a male: Length, 0.3; breadth, 0.383 inch.

Found in considerable numbers on shelly bottoms, in 10 and 15 fathoms, among the islands on the coast of China near Hongkong.

#### 143. HETEROPLAX TRANSVERSA Stimpson

*Heteroplax transversa* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 94 [40], 1858.

This species is allied to *H. dentata*, but may be distinguished by its much broader carapax, the proportion of length to breadth in which is 1:1.46. The principal lateral tooth is smaller but acute; the tooth forming the angle of the orbit is more prominent, and the second tooth almost obsolete. The ocular peduncles are longer. Colors as in the preceding species. Dimensions of carapax in a male: Length, 0.26; breadth, 0.38 inch.

Taken in the harbor of Hongkong.<sup>1</sup>

### MACROPHTHALMIDÆ

#### Genus MACROPHTHALMUS Latreille

#### 149. MACROPHTHALMUS TELESCOPICUS (Owen) Dana

*Gelasimus telescopicus* OWEN, Voy. Beechey, Zoöl., 78, pl. XXIV, fig. 1.

*Macrophthalmus compressipes* RANDALL, Jour. Acad. Nat. Sci. Phila., VIII, 123.

*Macrophthalmus podophthalmus* EYDOUX and SOULEYET, Voy. Bonite, Crust., pl. III, fig. 67. MILNE EDWARDS, Mém. Carcin., 119.

*Macrophthalmus telescopicus* DANA, U. S. Exploring Expedition, Crust., I, 314.

The color of the (young) specimens taken by us was pale grayish with whitish mottlings: darker anteriorly. They were dredged from a depth of 10 fathoms on a sandy mud bottom in the harbor of Napa, Loo Choo.

<sup>1</sup>The family Rhizopidæ, comprising two pages of Stimpson's "Prodromus" and Nos. 144 to 148, inclusive, of the species, is missing from the manuscript of this report; also the illustrations of this family, as well as of other Oeypodoidea. This gap existed in 1875, when the manuscript was examined by Prof. Sidney I. Smith, and it is probable that the missing parts were removed by Dr. Stimpson himself for further study and were destroyed in the Chicago fire in 1871.

150. *MACROPHTHALMUS SERRATUS* White

PLATE XIII, FIG. 3

*Macrophthalmus serratus* WHITE, Voy. Samarang, Crust., p. 51.

Our species agrees pretty well with White's description of his *M. serratus*, but as no figure of that species is given and as the description itself is short and unsatisfactory we do not consider the identification as certain.

In our specimens the carapax is broader posteriorly than at the angles of the orbits. Proportion of length to breadth, 1:1.4. Surface granulose, with the exception of a smooth space at the middle of the gastric region. Lateral margin quadridentate, the small fourth or posterior tooth being only the anterior extremity of a slight crest which margins the posterior third of the side. Ambulatory feet not pectinated, but villous, the hair short and soft. It differs from *M. simplicipes* in the want of tubercles on the carapax, and from *M. affinis* in being narrower anteriorly and having a more strongly dentate margin. Living specimens were brownish or dust-colored above, white below. The dimensions of a male are: Length of carapax, 0.85; breadth, 1.19 inches.

A small *Lepas* is found in considerable numbers upon the feet of this species.

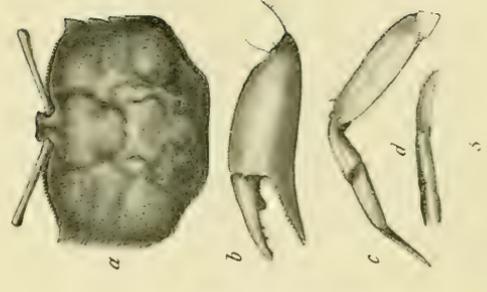
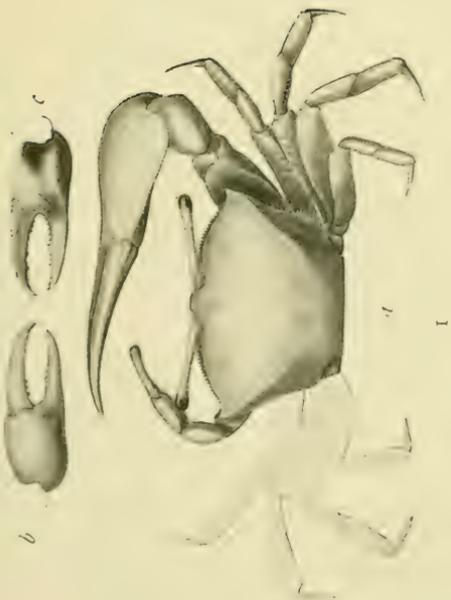
It was dredged in abundance on muddy bottoms, in 4 to 10 fathoms, in and near the harbor of Hongkong.

151. *MACROPHTHALMUS DENTATUS* Stimpson

PLATE XIII, FIG. 1

*Macrophthalmus dentatus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 97 [43], 1858.

Carapax broad, length to breadth as 1:1.67. Upper surface naked, uneven, but smooth and glossy, except toward the postero-lateral angle, where there are two slightly raised, plicated longitudinal ridges. Lateral margin armed with teeth nearly throughout its length; teeth four in number, small, except the anterior one, which forms the angle of the orbit and is long and acute. Front very narrow. Eyes long, but falling short of the extremity of the orbital angle. Chelipeds angular, but everywhere smooth and glossy; fingers short; immovable finger very short, armed within by a large triangular tooth at the middle, which bears a denticle on its anterior side; dactylus with a tooth at the base and another small but well-separated one near the



+

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base. Ambulatory feet smooth, scarcely at all hairy; meros with a small spine near its superior extremity.

The color in life is bluish-gray with darker mottlings; below white. Dimensions of the carapax in a male: Length, 0.31; breadth between tips of orbital angles or teeth, 0.52 inch.

This crab, like some of its congeners, feigns death when caught, remaining perfectly quiescent, with its feet outstretched, as if in asphyxia.

It is found on mud bottoms, in 6 fathoms, in the bays near Hong-kong.

### 152. *MACROPHTHALMUS CONVEXUS* Stimpson

#### PLATE XIII, FIG. 2

*Macrophthalmus convexus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 97 [43], 1858.

Carapax broadest at the external angles of the orbits, convex, especially posteriorly; length to breadth as 1:1.74. Surface smooth and glossy, except toward the lateral margins, where it is somewhat granulose. Regions distinct. Two granulous protuberances in a longitudinal line on the branchial region near the postero-lateral corners of the carapax. Sides crested, with two emarginations anteriorly, the posterior one inconspicuous. Tooth forming the angle of the orbit sharply prominent. Orbits somewhat oblique; inferior margin serrated. Hands and fingers pilose within. The fingers each bear a tooth on the inner margin near the base, as in *M. pacificus*. Ambulatory feet smooth; tooth near summit of meros very small. Male organs long and slender.

Dimensions of the male specimen, which is perhaps immature: Length of carapax, 0.34; breadth, 0.59 inch.

Found at Loo Choo.

### 153. *MACROPHTHALMUS PACIFICUS* Dana

*Macrophthalmus pacificus* DANA, U. S. Exploring Expedition, Crust., 1, 314, pl. XIX, fig. 4.

Found at Loo Choo.

### Genus *CHÆNOSTOMA* Stimpson

The chief character of the genus *Cleistostoma*, as understood by Dana, is found in the large relative size of the meros-joint of the external maxillipeds, which nearly equals the ischium in length. In

his *C. boscii* (viz *Macrophthalmus boscii* Auct.) this character is apparent, but the maxillipeds are widely gaping, while in De Haan's *Cleistostoma* they fit close to each other along the inner edges—a character from which the name of the genus was derived. In Milne Edwards's *Euplax*, which would include, according to the French naturalist, the true *M. boscii*, the maxillipeds are said to resemble those of *Macrophthalmus*, where the meros is much smaller than the ischium. So that Dana's species will not strictly belong to either genus, and we have ventured to arrange it, with one other before undescribed, under a new generic name.

The carapax resembles that of *Euplax*, but the eyes and their peduncles are considerably larger and thicker than in that genus.

#### 154. CHÆNOSTOMA ORIENTALE<sup>1</sup> Stimpson

*Cleistostoma boscii* DANA, U. S. Expl. Exped., Crust., 1, 313, pl. XIX, fig. 3.  
*Chænostoma orientale* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 97  
 [43], 1858.

This species differs from the *Macrophthalmus boscii* of Savigny in the larger meros-joint of the external maxillipeds. The oblique concavity on the surface of this joint is also deeper.

It was found by us among the Loo Choo Islands.

#### 155. CHÆNOSTOMA CRASSIMANUS<sup>2</sup> Stimpson

*Chænostoma crassimanus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 97  
 [43], 1858.

The following is a description of a male: Carapax quadrilateral, areolated, more convex posteriorly than anteriorly. Length to breadth as 1:1.31. A deep and narrow longitudinal furrow on the pregastric region, bifurcating posteriorly. Surface uneven, rough and hairy toward the lateral margins, but smooth and glossy near the middle. Lateral margin not denticulated; there is, however, a slight emargination behind the tooth forming the angle of the orbit. The eyes are large, with thick peduncles, and reach slightly beyond the extremity of the orbit. The front is broad, deflexed, and broadly subtruncate below. Infraorbital margin minutely crenulated. The anterior margin of the buccal area is deeply sinuous, the angles being filled up by a protruding lobe, leaving a broad and deep sinus in the middle, the margin of which is straight and salient; this sinus is

<sup>1</sup> *Euplax boscii* (Audouin).

<sup>2</sup> *Euplax crassimanus* (Stimpson).

filled by the palpi of the outer maxillipeds. There is no piliferous crest on the outer maxillipeds, which are rather broad and gaping, so as to leave a rhomboidal space between; the meros-joint is but little longer than broad. Chelipeds robust, smooth externally, hairy within; hand very thick, and about three-fourths as broad as long, with glossy outer surface; fingers short, acute; dactylus armed with a strong tooth at the middle of the inner edge; immovable finger minutely crenulated on the inner edge. Ambulatory feet compressed, slightly canaliculated above, nearly smooth; meros-joint very hairy, the other joints almost naked. Abdomen sufficiently broad, oblong, not much tapering, seven-jointed; third joint swollen on each side of the median line. Dimensions of carapax: Length, 0.26; breadth, 0.341 inch.

The above description includes some generic characters, but is given in full for the better illustration of the genus.

A single specimen was taken at Loo Choo.

#### 156. METAPLAX LONGIPES Stimpson

*Metaplex longipes* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 97 [43], 1858.

One specimen only, a male, of this species was collected, of which the following is a description. Carapax small in proportion to the length and size of the limbs. Proportion of length to breadth, 1:1.33. The greatest breadth is across the middle. Surface somewhat uneven, but glossy and punctate about the middle and anterior portions. There are two conspicuous areolets on each side, marked off by transverse depressions arising from the lateral fissures. On the postero-lateral slope the surface is pubescent and marked with two striæ or raised lines proceeding from marginal fissures; the anterior stria transverse, the posterior one oblique. Front very broad. Frontal region deeply and broadly excavated longitudinally along the middle. Lateral margin three-notched, the first or anterior notch very deep, separating a strong tooth, which is somewhat turned up; the other notches very slight. Eyes stout, of moderate length. Infra-orbital margin seven-lobed, lobes rounded, smooth, glossy, decreasing in size outwardly, the innermost lobe being the largest and most projecting, somewhat curving downward. Epistome ample, convex. Antero-inferior regions granulated and sulcated near the mouth, pubescent near the lateral margins. Beneath the infraorbital margin the sulcus is very deep, and under the internal lobe of this margin there is a deep cavity. External maxillipeds rhomboidally gaping, profoundly sulcated, making the inner oblique piliferous crest very

prominent. Chelipeds moderately elongated; meros serrulated along the angles; hand smooth, oblong, a little inflated within; fingers gaping, evenly denticulated within; tips excavated internally, with sharp corneous outer edges for nipping or cutting. Ambulatory feet long, smooth, pubescent at base, the first and last pairs reaching only to the penult joints of the middle pairs, which joints are everywhere thickly pubescent; dactyli somewhat compressed, five-sided or quinquecostate, tapering to slender sharp extremities. Abdomen with all the segments distinct; terminal joint abruptly smaller than the penult. The margin of the sternum is raised into a crest around the terminal abdominal segment. Dimensions of the carapax: Length, 0.46; breadth, 0.61 inch. Length of ambulatory feet of the second pair, 1.38 inches.

This species differs from *M. distinctus* in the lobation of the infra-orbital margin, and from *M. indicus* in its narrower carapax and the distinct segmentation of the abdomen.

Found in Hongkong Harbor.

#### Genus ILYOPLAX Stimpson

Body tetragonal, very thick. Carapax very little indurated. Front, antennæ, antennulæ, and orbits nearly as in *Macrophthalmus*; the front is, however, broader than in that genus. Eye-peduncles sufficiently long. External maxillipeds saillant, not gaping; exognath concealed, palpigerous; meros of endognath large, longer than broad, and longer than the ischium; ischium ornamented with an oblique, almost transverse piliferous line placed close to the commissure of the meros; palpus rather prosarthroid than exarthroid, projecting as in *Macrophthalmus*. Chelipeds equal. Ambulatory feet rather stout, those of the second pair conspicuously the longest; meros-joints with membranaceous sides, or tympana occupying the entire faces; dactyli very small and slender. Sternum and male abdomen nearly as in *Macrophthalmus*.

This genus, although properly belonging to the family in which it is here placed, in its thick body, soft structure, and tympanum-like surfaces of the thigh-joints, will form a connecting link between the *Macrophthalmidæ* and the *Dotillidæ*.

It is an inhabitant of brackish waters on the shores of southeastern Asia.

#### 157. ILYOPLAX TENELLA Stimpson

*Ilyoplax tenella* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 98 [44], 1858.

Carapax nearly quadrangular, length to breadth as 1:1.54. Antero-lateral angles obtuse. Sides slightly convex and bordered by an

acute raised line or crest, which bifurcates at about the middle, the inferior fork, which is most prominent, passing to the base of the second pair of ambulatory feet, while the superior fork, which is more distinctly setose, passes to the base of the last pair. The surface of the carapax is indistinctly areolated, smooth and glossy along the median line, but toward the lateral margins somewhat uneven, with transverse tuberculated and setose lines; the tubercles not very conspicuous, but more so in some specimens than in others. Frontal region longitudinally furrowed at the middle. The corners of the front are dilated a little beneath the bases of the eye-peduncles. Latero-inferior regions not sulcated, but evenly covered with fine setiferous granules. Chelipeds rather large; hand smooth; fingers deflexed, slender, as long as the palm and curved inward as in *Helæcius*, with somewhat excavated extremities; dactylus with a strong tooth near the middle. Ambulatory feet partly tomentose and setose above; meros-joint in the first and second pairs densely tomentose on the posterior face.

Color dark brownish-olive above, bluish-white below; feet paler; chelipeds reddish; fingers in the male white. Dimensions of a male: Length of carapax, 0.27; breadth, 0.415 inch.

Found at Whampo, China, along the banks of the Canton River (brackish water), living in holes in the mud, exposed at low water.

## DOTILLIDÆ.

### Genus DOTILLA Stimpson

The name *Doto*, originally proposed for this genus by De Haan, was previously used, as long ago as 1815, by Oken for a genus of nudibranchiate mollusks. A new designation was therefore proposed in the Proceedings of the Philadelphia Academy for April, 1858.

#### 158. DOTILLA MYCTIROIDES Stimpson

*Doto myctiroides* MILNE EDWARDS, Mém. Carcin., 116, pl. IV, fig. 24.

*Dotilla myctiroides* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 98 [44], 1858.

The chelopoda in this species are greatly elongated. The compressed meros-joint of the ambulatory feet is dilated and bears a very large oblong tympanum or membranaceous disk. The fourth joint of the male abdomen has an abrupt, setose extremity, somewhat like that of the penult joint in *Myctiris*.

Our specimen was taken in Gaspar Straits by Mr. Squires, of the steamer "John Hancock."

159. *SCOPIMERA TUBERCULATA* Stimpson

*Scopimera tuberculata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 98  
[44], 1858.

Carapax broad, but much narrower on the dorsal surface than at the bases of the anterior ambulatory feet. Length to greatest breadth as 1 : 1.66. Surface uneven, the branchial and hepatic regions being separated from each other and from the gastric and postmedian regions by well-marked though irregular sulci. The upper surface, with the exception of the broad and smooth postmedian region, is everywhere studded with protuberances and tubercles, irregular in their size and distance from each other. The lateral margins of the back are prominent, ciliated, and passing backward and downward are continuous with the suprapedal margins of the carapax. On each side beneath the dorsal margins there is a deep, smooth longitudinal sulcus. The sides are covered with setiferous granules, most crowded below. Orbits ample, oblique, well excavated, external angle forming a small tooth. External maxillipeds convex; meros partly granulated, more than half as large as ischium, and joined to it by an oblique suture; palpus rather exarthroid than prosarthroid, but joined at the summit of the meros. Chelipeds equal, elongated, more than twice as long as the carapax, but shorter than the first pair of ambulatory feet. Ambulatory feet tapering, sparsely fringed below with stiff blackish hairs; tympana nearly as in *S. globosa* or *Doto myctiroides*. Abdomen as in *S. globosa*. Dimensions of the body in a male: Length, 0.36; breadth at base of second ambulatory feet, 0.6 inch.

This species approaches *Doto* somewhat in character. It differs from De Haan's *S. globosa* in the character of the upper surface of the carapax and in the obliquity of the meros-joint in the outer maxillipeds.

It lives in holes in sandy-mud flats at and above low-water mark. Found in the inner harbor of Simoda, Japan.

## MYCTIRIDÆ

Genus MYCTIRIS Latreille

160. *MYCTIRIS LONGICARPUS* Latreille

*Myctiris longicarpus* LATREILLE, Encyc. Méth., Ins., pl. CCXCVII, fig. 3.

MILNE EDWARDS, Hist. Nat. des Crust., II, 37; Mém. Carcin., 118.

DANA, U. S. Expl. Exped., Crust., I, 389.

This crab, when alive, is of an opaque light-blue color above and bluish-white below. The feet are white except at the joints, which

are pale reddish. It is very common on the shores of Botany Bay and Port Jackson, Australia, living on sandy beaches, in holes of slight depth, generally much above low-water mark. It is called "soldier crab" by the colonists.

161. *MYCTIRIS BREVIDACTYLUS* Stimpson

PLATE XIII, FIG. 4

*Myctiris brevidactylus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 99 [45], 1858.

Carapax short, globular, nearly smooth. Breadth to length as 1 : 1.06. Branchial regions but little inflated, microscopically granulated. On the posterior or depressed portion of the gastric region there are two short, longitudinal depressed lines, parallel, one on each side. There is a short, slender, blunt spine on each side near the external angle of the orbit. Chelipeds nearly as in *M. longicarpus*, but stouter. Ambulatory feet also stouter than in the species just mentioned, with short and thick dactyli. The dactylus in the posterior pair is curved upward near the extremity, and trigonal in shape, with the angles ciliated.

Color of the carapax whitish blue, deeper about the middle of the back. Feet white, pale reddish near their bases. Dimensions of a male: Length of carapax, 0.682; breadth, 0.639 inch.

This species is easily distinguished from *M. longicarpus*, which it much resembles in general appearance, by the shorter and thicker terminal joints of the ambulatory feet. It may prove to be the *M. deflexifrons* of De Haan, but we can nowhere find a description of this species.

It is found in great numbers on low sandy-mud shores and flats in the lower half of the littoral zone. It occurred to us at Hongkong and among the Loo Choo Islands.

162. *MYCTIRIS PLATYCHELES* Milne Edwards

PLATE XIII, FIG. 5

*Myctiris platycheles* MILNE EDWARDS, Mélanges Carcinologiques, p. 118.

The description of Milne Edwards is as follows: "Carapace couverte de petits points granuleux, très espacés et très saillants. Pattes courtes et larges.—Port Western." It is not inconsistent with the characters of our crab, but there are several prominent distinctive characters not mentioned which render the identification, based upon so short a diagnosis, somewhat uncertain.

The branchial regions are prominently inflated above, forming subglobose projections, which are much more conspicuously granulated than the rest of the carapax. The gastric region is nearly smooth, bearing only a few scattered granuliform "points." In the compressed ambulatory feet the penult joint bears two prominent carinæ, the dactylus four carinæ. The meros-joint is somewhat inflated and granulated. The hectognathopoda are greatly expanded and protruding, so as to lie in planes almost longitudinally vertical. The rostrum is more pointed than in *M. longicarpus*, and there is a granulated projection instead of a spine exterior to the orbit. Color in life as in *M. longicarpus*. Size also about the same. Our specimens were taken on the shores of Botany Bay, in the third subregion of the littoral zone.

It is perhaps the same as *M. subverrucatus* White (Cat. Brit. Mus., 1847, p. 34), of which no description has been published. If it should prove distinct we would propose the name *M. prostoma*.

## OCYPODIDÆ

### Genus GELASIMUS Latreille

#### 163. GELASIMUS VOCANS<sup>1</sup> (Rumph) Milne Edwards

*Cancer vocans* RUMPH (fide MILNE EDWARDS).

*Gelasimus nitidus* DANA, U. S. Expl. Exped., Crust., I, 316, pl. XIX, fig. 5.

*Gelasimus vocans* MILNE EDWARDS, Mél. Carcin., 109, pl. III, fig. 4.

Color of carapax in life bluish-gray or olivaceous, rather dark; sometimes mottled with white. Below bluish-white. Feet paler. Large hand white or light gray above, yellowish-green or deep orange below. Small hand bluish.

Found in its holes on coarse sandy shores not far below high-water mark in Napa Harbor, Loo Choo, and Hongkong Harbor, China.

#### 164. GELASIMUS DUBIUS<sup>2</sup> Stimpson

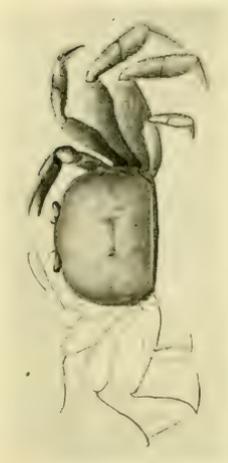
### PLATE XIV, FIG. 4

*Gelasimus dubius* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 99 [45], 1858.

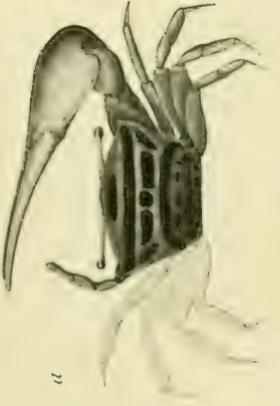
This species resembles *G. vocans* in shape and in the characters of the front, etc., except that the carapax is more narrowed posteriorly;

<sup>1</sup> *Uca marionis nitida* (Dana).

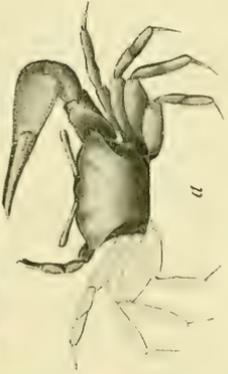
<sup>2</sup> *Uca dubia* (Stimpson).



1



2



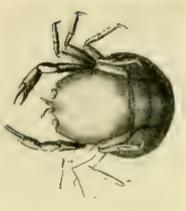
3



b



b



8



7



a

t



the frontal sulcus is deeper and the orbits more oblique. Length of the carapax to its breadth as 1:1.57. Antero-lateral angles very sharply prominent. Outer extremity of the crenulated inferior margin of the orbit angular. In the large cheliped the superior margin of the meros-joint is spinulose or denticulated at and near the summit, but there is no sharp conical tooth, as in *G. vocans*. The greater hand is well developed; outer surface of palm granulated or small-tuberculated; crest on the inner surface nearly as in *G. vocans*, but less prominent; fingers neither very broad nor much compressed, their external surface marked with a longitudinal sulcus, their inner margins irregularly denticulated, with two or three larger conical teeth. Meros-joint of ambulatory feet rather broad; dactyli as in *G. vocans*. Dimensions of a male: Length of carapax, 0.522; breadth, 0.82; length of great hand, 1.22; breadth, 0.44 inch.

This species differs from *G. acutus* in the more distinct regions of the carapax, the less distinct marginal lines, and in the compressed and hairy dactyli. It is perhaps the same as *G. forcipatus* Adams and White (Voy. Samarang, Crust., p. 50), but that species is described as having very distinct marginal lines on the sides.

It was found at Loo Choo in the usual station of the genus.

#### 165. *GELASIMUS ACUTUS*<sup>1</sup> Stimpson

PLATE XIV, FIG. 3

*Gelasimus acutus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 99 [45], 1858.

Carapax convex, very broad anteriorly and much contracted behind. Length to breadth as 1:1.72. Front as broad as in *G. tetragonon* and not dilated below. Antero-lateral angles acute. Surface smooth and nearly even; regions indistinct. Marginal lines very well marked. Inferior margin of orbit crenulated only toward its angular external extremity. A convex protuberance on the floor of the orbit at its inner extremity corresponds to the "lobe sous-orbitaire interne" of Milne Edwards. Beneath the infraorbital margin, separated by a smooth furrow, there is another distinct crest, nearly parallel to it. Large cheliped of the male moderately developed; outer surface of carpus and hand prominently granulated. Hand well armed within, the crests not very prominent, but tuberculated; fingers short, no longer than the palm, both sulcated externally, their inner margins rather strongly denticulated, teeth nearly

<sup>1</sup> *Uca dussumieri* (Milne Edwards).

equal, a single larger one at the middle on the lower finger. Ambulatory feet smooth, naked; meros compressed, dilated; dactyli small and slender. Color white. Dimensions of the male: Length of carapax, 0.39; breadth, 0.67; length of greater hand, 0.83; breadth, 0.36 inch.

It differs from *G. forcipatus* Adams and White in having no "dilated lobe between the eyes" and no great tooth near the end of the fingers. The meros-joints of the walking-feet are less dilated than in *G. brevipes*.

Taken at Macao, China.

166. *GELASIMUS SPLENDIDUS*<sup>1</sup> Stimpson

PLATE XIV, FIG. 2

*Gelasimus splendidus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 99 [45], 1858.

Carapax strongly convex in a longitudinal sense, its median dorsal outline forming almost a semicircle. It is very broad anteriorly (broadest at the prominent angles of the orbits) and considerably narrowed behind. Length to breadth as 1 : 1.6. Branchial regions not inflated. The lines bordering the anterior and antero-lateral margins are sharply raised. Front very broad, somewhat truncated below. The supraorbital margin is but slightly undulated, most so near its exterior extremity; both crests are minutely crenulated, and the lower or anterior crest is less convex than usual. The peduncles of the eyes are not very long, the eye falling a little short of the exterior extremity of the orbit. The exterior angle of the crenulated inferior margin of the orbit is broadly rounded, as in *G. palustris*. The large cheliped of the male is well developed; meros with obtuse, granulated angles, and no very prominent tooth at the summit; hand minutely granulated, with palm about two-thirds as long as the fingers, not strongly armed within, the inferior oblique crest prominent with a single row of granules, the crest at base of fingers nearly obsolete, the superior crest not bifurcated and scarcely tuberculated; fingers slender, smooth, strongly gaping, their inner margins evenly curved and minutely toothed, with two or three conical teeth a little larger than the rest; extremity of immovable finger longitudinally emarginated. Ambulatory feet naked; meros of moderate width; dactylus short, not compressed.

Colors: The carapax is of a light opaque-blue color, transversely

<sup>1</sup> *Uca splendida* (Stimpson).

banded and spotted with black. Large cheliped pale red. Feet purplish, mottled. External maxillipeds light blue. Lower surface of body very pale bluish. Dimensions of a male: Length of carapax, 0.49; breadth, 0.78; length of large hand, 1.35; breadth, 0.48 inch.

This species is remarkable for its convexity and for the prominence, without acuteness, of the anterior angles of the carapax. It is allied to *G. gaimardi* and to *G. latreillei* of Milne Edwards (*Mélanges Carcinologiques*, p. 114), and may prove identical with one of these species, but the descriptions as yet published are too short for certain identification. From the first-mentioned species ours would appear to differ in having the front less prolonged and rounded below, and from the second in the greater length and the dentition of the pincers.

Our species inhabits salt marshes on the shores of Hongkong Harbor.

167. *GELASIMUS PULCHELLUS*<sup>1</sup> Stimpson

PLATE XV, FIG. 1

*Gelasimus pulchellus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 100 [46], 1858.

Of this species several male specimens were collected. They are all of small size, but have the appearance of being nearly full grown. Carapax strongly convex, narrowed behind, broad in front, where it is prominent at the middle. Length to breadth as 1:1.51. Antero-lateral angles acute, prominent. Marginal lines sufficiently distinct. Front prominent, broad, rounded below. Eye-peduncles long, the eyes reaching nearly, if not quite, to the extremities of the orbits. Outer angle of the acutely crenulated inferior margin of the orbit rounded. Large cheliped with nearly smooth surfaces, obsoletely granulated; hand armed within, the inferior crest prominent, granulated, the superior crest very sparsely granulated. There are two parallel crests at the base of the fingers, each ornamented with a single row of small tubercles. On the outer surface of the hand at the base of the immovable finger there is a small depressed area or shallow pit, like a cicatrix, of an ovate or triangular form, which is always present and affords a good specific character. The fingers are rather short, slightly compressed; the sides smooth; the inner margins denticulated, with two or three somewhat larger, conical teeth interspersed; one of these larger teeth is situated close to the

<sup>1</sup> *Uca pulchella* (Stimpson).

extremity of the immovable finger. The ambulatory feet are slightly hairy, the dactyli somewhat compressed.

The carapax is painted with deep blue markings; the large claw is light red. Dimensions of the male: Length of carapax, 0.398; breadth, 0.605; length of larger hand, 0.89; breadth, 0.33 inch.

This species is allied to *G. annulipes* in the shape of the carapax, etc. The double crest at the base of the fingers on the inner surface of the hand, and the cicatrix on the outer surface, will serve to distinguish it.

It is common at the Island of Tahiti, on the sandy and muddy banks of the lagoons.

#### 168. GELASIMUS LACTEUS<sup>1</sup> De Haan

*Gelasimus lacteus* DE HAAN, Fauna Japonica, Crust., 54, pl. xv, fig. 5.  
MILNE EDWARDS, Mél. Carcin., 114, pl. iv, fig. 16.

This species is remarkable for its great breadth posteriorly. The interocular front is broad. The color in life is chalky white.

Found living in its holes in mud, among stones, above low-water mark on the shores of Cum-sing-moon and Macao, China.

#### Genus OCYPODE Fabricius

#### 169. OCYPODE CURSOR<sup>2</sup> (Belon) De Haan

*Cancer cursor* BELON (fide MILNE EDWARDS).

*Ocyhode ippeus* OLIVIER, MILNE EDWARDS, Hist. Nat. des Crust., II, 47.

*Ocyhode cursor* DE HAAN, Fauna Japonica, Crust., 29. MILNE EDWARDS, Mél. Carcin, 106.

Taken at Porto Praya, Cape de Verde Islands. Habits as usual in the genus.

#### 170. OCYPODE CERATOPHTHALMA (Pallas) Fabricius

##### PLATE XII, FIG. 2

*Cancer ceratophthalmus* PALLAS.

*Ocyhode ceratophthalmus* FABRICIUS, Suppl., 347. DESMAREST, Consid. sur les Crust., 121, pl. XII, fig. 1. MILNE EDWARDS, Hist. Nat. des Crust., p. 48; Illust. Cuv. R. A. Crust., pl. xvii; Mél. Carcin., 105.

*Ocyhode brevicornis* DANA, U. S. Expl. Exped., Crust., I, 326, pl. xx, fig. 3.

The length of the terminal process, or horn of the eye, affords no distinctive character in the genus *Ocyhode*, as this is generally want-

<sup>1</sup> *Uca lactea* (de Haan).

<sup>2</sup> *Ocyhode ippeus* Olivier.

ing in the young, and increases in size with age. This fact seems to have been first noticed by Gerstæcker. The examination of numerous specimens of all ages, taken in the harbor of Hongkong, enables us to determine that the growth of the process may commence earlier in some specimens than in others, but never before the body of the individual reaches the length of two-thirds of an inch. So that specific distinctions must rest mainly upon other characters, for a difference in the length of the horn, even in specimens of the same age or size, does not necessarily indicate specific diversity.

It is probable that several spurious species have been founded upon the different ages of *O. ceratophthalma*, to designate which, however, an examination of the original specimens of the various authors is necessary.

The figures represent the appearance of the eye at different ages.

This species in life is of a yellowish-white or light-gray color, often finely punctate, and in the adult marked with two oblong brown spots near the middle of the carapax. The parts about the mouth are blotched with reddish-brown. Eye-peduncles brownish. Hands white. There is sometimes a red spot on the third joint of the feet.

It was found by us at Hongkong, Loo Choo, the Bonin Islands, the Hawaiian Islands, and at Tahiti. It lives, like its congeners, in holes in the beaches at and above high-water mark.

#### 171. OCYPODE CONVEXA Stimpson

PLATE XV, FIG. 3

*Ocyrode convexa* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 100 [46], 1858.

A single specimen only, a female, of this species was taken, which may be thus described: Carapax much swollen, posteriorly broad and spreading over the bases of the feet. Proportion of length to breadth, 1:1.07. Surface nearly smooth, the granules with which it is covered being much flattened. Antero-lateral angles prominent, acute; the margin immediately behind these angles straight or slightly concave. Internal suborbital lobe slender, dentiform, bifurcated. Infraorbital margin with a notch near the middle. Buccal area large, with convex sides. External maxillipeds strongly protuberant, not closely fitting to each other within; their surface nearly smooth, and more or less glossy; meros but little depressed at the middle. Larger hand rather short and broad, dilated below; fingers much compressed; outer surface depressed-granulated; edges small toothed. Fingers of the smaller hand compressed and produced.

with somewhat truncated extremities. Ambulatory feet, with the exception of the terminal joints, naked, nearly smooth, but slightly rugose, the rugæ being similar in character to those in *O. ceratophthalma*, but much less strongly developed. Abdomen (of the female) with the penult joint deeply sinuated; the terminal joint set in the bottom of the sinus, and reaching fully to, or a little beyond, the bases of the maxillipeds. Dimensions of the carapax: Length, 0.92; breadth, between the orbital angles, 0.96 inch.

It differs from *O. cordimana* in the character of the maxillipeds, smaller hand and feet.

Found at Simoda, Japan.

### 172. OCYPODE CORDIMANA Desmarest

PLATE XV, FIG. 2

*Ocylope cordimana* DESMAREST, Consid. sur les Crust., 121. MILNE EDWARDS, Mél. Carcin., p. 107.

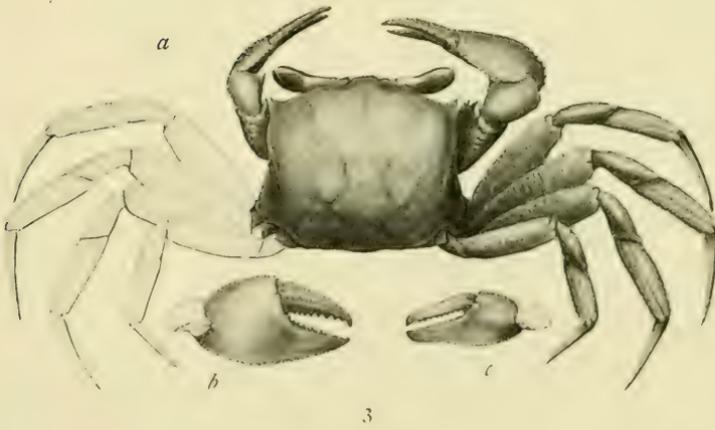
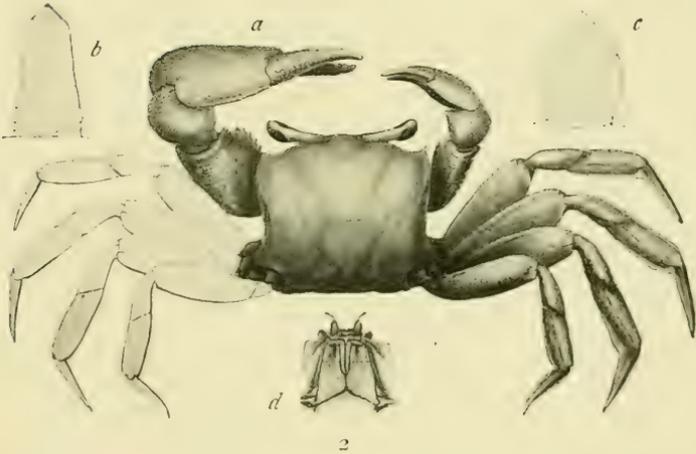
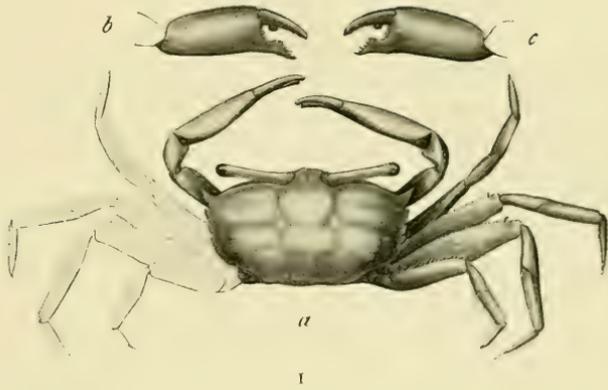
The species here referred to *O. cordimana*, is distinguished by its convex, faintly granulated carapax, little oblique orbits, little prominent orbital angle, immediately behind which the lateral margin is convex. The dentiform internal suborbital lobe is compressed, rather broad and smooth, not denticulated. The buccal area is small, narrowed anteriorly, with straight sides, and is neatly covered by the external maxillipeds, which are not protuberant, as in most species. The surface of the maxillipeds is glossy, with a few sparsely scattered granules or points; the meros-joint is depressed in the middle, with a ridge on either side, as in *O. ceratophthalma*, but not much granulated. The feet are nearly smooth, although there are indications, on the meros- and carpus-joints, of the spinules mentioned in Milne Edwards's description. They are somewhat pilose toward their extremities. Dactylus of last pair much curved upward and outward. Abdomen of the male much broader than in other species.

Found at Hongkong and at Loo Choo.

### 173. OCYPODE LÆVIS Dana

*Ocylope lævis* DANA, U. S. Expl. Exped., Crust., 1, 325, pl. xx, fig. 2.

A small, well marked species, easily distinguished by the character of the larger hand, which is much dilated below, and has very short and thick fingers. Our specimen is somewhat larger than those found by Dana.



CRABS OF THE NORTH PACIFIC EXPLORING EXPEDITION



It is distinguished from *O. cordimana* by the projecting orbital angles and by the smoothness of the edges of the hands.

Taken at Hilo, Island of Hawaii.

## GECARCINIDÆ

### Genus CARDISOMA Latreille

#### 174. *CARDISOMA GUANHUMI* (Marcgrave) Latreille

*Cancer guanhumi* MARCGRAVE.

*Cardisoma guanhumi* LATREILLE; MILNE EDWARDS, Hist. Nat. des Crust., II, 24; Illust. Civ. R. A., Crust., pl. xx; Mèl. Carcin, p. 170.

A male individual, probably of this species, was found in its hole in a cocoanut grove near the town of Porto Praya, Cape de Verde Islands. In this specimen the carapax is exceedingly smooth, both above and at the sides, and the antero-lateral line can scarcely be traced; these characters we find in adult males of *C. guanhumi* from the American shores. But in these western specimens one of the hands is greatly developed in size, with broadly gaping fingers, while in the expedition specimen the hands resemble those of the young of *C. guanhumi*, in which the lateral line is distinct. The wide difference in locality would lead us to consider the species different, but we do not venture to separate it without seeing additional examples.

#### 175. *CARDISOMA OBESUM*<sup>1</sup> Dana

*Cardisoma obesum* DANA, U. S. Expl. Exped., Crust., I, 375, pl. xxiv, fig. 1.  
*Cardisoma urvillei* MILNE EDWARDS, Mélanges Carcinologiques, p. 170.

This species was found living in holes in the gardens and along the streets in great numbers at Papiete, Island of Tahiti.

#### 176. *CARDISOMA HIRTIPES*<sup>2</sup> Dana

*Cardisoma hirtipes* DANA, U. S. Expl. Exped., Crust., I, 376, pl. xxiv, fig. 2.

Color in life reddish-brown; feet and inferior surface yellow. We can discover no essential difference between the Loo Choo specimen and those described by Dana from the Fiji Islands, with the single exception that in ours, which is a male, the left hand is much larger than the right, while in Dana's the hands are equal.

<sup>1</sup> *Cardisoma carnifex* (Herbst).

<sup>2</sup> *Cardisoma rotundum* (Quoy and Gaimard).

*C. frontalis* Milne Edwards (Mél. Carcin., p. 170) must be closely allied to, if not identical with, this species, but appears to have two more complete rows of spines on the upper side of the penult joint of the walking-feet.

This species was found in the paddy-fields at Loo Choo. The fields lie mostly under water, and the animal probably burrows in their banks.

## BOSCIADÆ

### Genus POTAMOCARCINUS Milne Edwards

#### 177. POTAMOCARCINUS ARMATUS<sup>1</sup> Milne Edwards

*Potamocarcinus armatus* MILNE EDWARDS, Arch. du Museum d'Hist. Nat., VII, p. 174, pl. XIII, fig. 3.

We have but one specimen of this species, a small male, half an inch in length. It differs somewhat from the large female described by Milne Edwards, in that the carapax is punctated and, toward the lateral margins, somewhat granulated. The second and third antero-lateral teeth are bifid. Dactyli scarcely quadrangular, almost rounded; also smaller and less spinulose.

It was found at Omotepec Island, in Lake Nicaragua, by Mr. Charles Wright, botanist of the expedition.

## THELPHUSIDÆ

### Genus GEOTHELPHUSA Stimpson

This name is proposed for that group of *Thelphusa* which is characterized by the obsolescence of the postfrontal crest and the epi-branchial teeth of the antero-lateral margins. In the shape of the carapax they have some resemblance to the Gecarcinidæ, and they approximate to that family also in their habits, frequenting the dry land much more constantly than the typical *Thelphusa*.

#### 178. GEOTHELPHUSA DEHAANI<sup>2</sup> Stimpson

PLATE XVII, FIG. 2

*Thelphusa berardi* DE HAAN, Fauna Japonica, Crust., p. 52, pl. VI, fig. 2 (non Auct.).

*Thelphusa dehaanii* WHITE, Cat. Brit. Mus., 1847, p. 30. MILNE EDWARDS, Mél. Carcin., p. 178.

<sup>1</sup> *Potamocarcinus nicaraguensis* Rathbun.

<sup>2</sup> *Potamon (Potamonautes) dehaanii* (White).

*Geothelphusa dehaani* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 101 [47], 1858.

We give below the measurements of our specimen, a male. The antepenult joint of the feet is not pilose:

Length of the carapax, 1.5; breadth, 1.9; length of greater hand, 2.02; breadth, 1.1; length of smaller hand, 1.2; breadth, 0.53 inch.

It was found on one of the Amakirrima Islands (near Loo Choo) by the officers of the "John Hancock."

#### 179. GEOTHELPHUSA OBTUSIPES<sup>1</sup> Stimpson

*Geothelphusa obtusipes* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 101 [47], 1858.

Two females of this species were found. Carapax much flattened above and posteriorly; anteriorly much curved. Length to breadth as 1:1.26. Surface regular, covered with crowded punctations. Anterior gastric lobules more prominent than in *G. dehaani*. Transverse suture at the middle of the carapax deeply impressed. Sides rugose, with transverse striæ; antero-lateral crest prominent crenulated. The carpus-joint in the chelipeds is somewhat rugose above, within small-tuberculated and bidentate, the inferior tooth small; the hands and fingers are sparsely tuberculated. Ambulatory feet slender; penult joint spinulose above and below; dactyli crowdedly spinulose, especially toward the extremities, the terminal unguiculus not reaching beyond the tips of the adjacent spinules, which gives the tips of the feet an obtuse appearance.

Dimensions of the carapax: Length, 0.722; breadth, 0.915 inch.

Found on the Island of Ousima.

#### Genus THELPHUSA Latreille

#### 180. THELPHUSA PERLATA<sup>2</sup> Milne Edwards

*Thelphusa perlata* MILNE EDWARDS, Hist. Nat. des Crust., II, 13. KRAUSS, Sudafr. Crust., p. 37.

This crab was caught in a small stream near Constantia, Cape of Good Hope.

<sup>1</sup> *Potamon (Geothelphusa) obtusipes* (Stimpson).

<sup>2</sup> *Potamon (Potamonantes) perlatus* (Milne Edwards).

## Genus PARATHELPHUSA Milne Edwards

181. PARATHELPHUSA SINENSIS<sup>1</sup> Milne Edwards

*Parathelphusa sinensis* MILNE EDWARDS, Archives du Museum d'Hist. Nat., VII, 173, pl. XIII, fig. 2; Mél. Carcin., p. 179.

Carapax strongly convex, four-fifths as long as broad, scarcely narrowed posteriorly. Postfrontal crest interrupted. Antero-lateral margin short, four-toothed, including the angle of the orbit; teeth about equal, sharply projecting, with smooth margins. The distance from the orbital tooth to the tip of the posterior tooth equals one-fourth the width of the carapax. Front horizontal, projecting, broad, lightly undulated, margin not at all angular over the antennæ. Postero-lateral surface striated transversely; striæ about eight in number. Subhepatic region tuberculated behind the orbit; tubercles somewhat irregularly arranged, small, subequal, and angular. Chelipeds minutely rugate transversely; a small spine on the meros and one on the carpus. Meros-joint of ambulatory feet bearing a sharp spine near the summit.

Color in life dark brownish-olive above; the middle of the carapax and the feet punctate with red. Below pale ferruginous. Dimensions of one of our specimens, a female: Length of carapax, 1.08; breadth, 1.36 inches.

Taken in the river at Whampoa, China. Milne Edwards gives "Mers de la Chine" as the habitat. But it is certainly an inhabitant of fresh, or at least brackish, waters.

## GRAPSIDÆ

## Genus METOPOGRAPSUS Milne Edwards

182. METOPOGRAPSUS THUKUHAR<sup>2</sup> Milne Edwards

*Grapsus thukuhar* OWEN, Zoöl. of Beechey's Voy., p. 80, pl. XXIV, fig. 3.

*Pachygrapsus parallelus* RANDALL, Jour. Acad. Nat. Sci. Phila., VIII, 124.

*Goniograpsus thukuhar* DANA, U. S. Expl. Exped., Crust., I, 344.

*Metopograpsus thukuhar* MILNE EDWARDS, Mélanges Carcinologiques, p.

131.

In this species the internal suborbital lobe sometimes joins the front, but there is usually a sufficiently distinct though narrow hiatus between them.

<sup>1</sup> *Potamon (Parathelphusa) sinensis* (Milne Edwards).

<sup>2</sup> *Metopograpsus messor* (Forskål).

The color in life is bluish-gray above, clouded with blackish punctæ. Sometimes entirely black. Outer and under sides of hands reticulated with purplish. Below white.

It inhabits the shores of protected harbors, among stones. A lighter-colored variety lives in sandy coves, along the edges of salt marshes. It also frequents the vicinity of the mouths of small streams.

Found by us at Loo Choo, at the Bonin Islands, the Hawaiian Islands, and at Tahiti. The species appears to be found at all the tropical Pacific islands, both north and south of the equator.

### 183. METOPOGRAPSUS QUADRIDENTATUS Stimpson

PLATE XVI, FIG. 2

*Metopograpsus quadridentatus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 102 [48], 1858.

Carapax quadrangular; proportion of length to breadth, 1:1.22. It is considerably narrowed behind, rather smooth, glossy, very moderately striated anteriorly and at the sides; the posterior half perfectly smooth about the middle. Pregastric lobules little prominent. Frontal region smooth, concave or transversely shallow, channel-shaped. Front broad; margin undulated and sharply crenulated. Lateral margin with one very sharp tooth behind the orbital angle. Inner margin of meros-joint of the chelipeds with three or four small tuberculiform teeth near the base and four acute teeth at the anterior angle, the outer tooth very prominent, compressed, with convex outer margin. Carpus with somewhat scabrous or squamous upper surface, and a short, vertical 2- or 3-toothed crest at the inner angle. Hand obsoletely squamous or tuberculous above, below, and within; outer surface smooth. Ambulatory feet sparsely hairy toward extremities; terminal spines or teeth of meros, above and below, strong and sharp. Dimensions of the male: Length of carapax, 0.74; breadth, 0.9; breadth of front, 0.54; length of ambulatory foot of the second pair, 1.4 inches.

The only other quadridentate *Metopograpsus* known is *M. oceanicus* Milne Edwards (*Grapsus oceanicus* Hombr. and Jacq., Voy. au Pole Sud, Crust., pl. VI, fig. 9), from which the species above described differs widely in its smoother carapax and hands.

It was found at Cum-sing-moon, near Macao, China, running about between tide marks.

## Genus PACHYGRAPSUS (Randall) Stimpson

**184. PACHYGRAPSUS MARMORATUS Stimpson**

*Cancer marmoratus* FABRICIUS, HERBST.

*Grapsus varius* LATREILLE, MILNE EDWARDS, Hist. Nat. des Crust., II, 88.

*Goniograpsus varius* DANA, U. S. Expl. Exped., Crust., I, 344.

*Leptograpsus marmoratus* MILNE EDWARDS, Mélanges Carcinologiques,  
p. 137.

*Pachygrapsus marmoratus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x,  
p. 102 [48], 1858.

Our specimens are small, none reaching the length of one inch, and they are more depressed than any Mediterranean specimens which have come under our notice.

They were found at the Island of Madeira.

**185. PACHYGRAPSUS CRASSIPES Randall.**

*Pachygrapsus crassipes* RANDALL, Jour. Acad. Nat. Sci. Phila., VIII, 127.  
STIMPSON, Crust. Pacif. Coast N. A., p. 27.

Taken by us at Simoda, Japan. I am unable to find a distinguishing character, however minute, between the specimens from Japan and those from California.

**186. PACHYGRAPSUS SIMPLEX<sup>1</sup> Stimpson**

*Goniograpsus simplex* DANA, U. S. Exploring Expedition, Crust., I, 344,  
pl. XXI, fig. 8.

*Pachygrapsus simplex* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 102  
[48], 1858.

Our specimens of this species were taken at Madeira. They agree exactly with those of Dana, who gives, with a doubt, Rio Janeiro as the locality of his specimens. But they were probably also from Madeira, as the U. S. Exploring Expedition stopped at that island several days before proceeding to Rio.

**187. PACHYGRAPSUS INNOTATUS<sup>2</sup> Stimpson**

*Goniograpsus innotatus* DANA, U. S. Expl. Exped., Crust., I, 345, pl. XXI,  
fig. 9.

*Pachygrapsus innotatus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 102  
[48], 1858.

Our specimens agree in every respect with those of Dana, except in the more rugose carpus.

<sup>1</sup> *Pachygrapsus maurus* Lucas.

<sup>2</sup> *Pachygrapsus transversus* Gibbes.

They were found in clefts of the surf-washed rocks above low-water mark at Funchal, Madeira. The remark with regard to the reputed locality of the last species applies equally well to this.

**188. PACHYGRAPSUS LÆVIMANUS<sup>1</sup> Stimpson**

*Pachygrapsus lævimanus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 102 [48], 1858.

This species has much resemblance to *P. innotatus* and *P. rugulosus* of the Atlantic shores, but the carapax is somewhat narrower and smoother, the carpus nearly smooth, and the raised line on the outer surface of the hand, parallel to its lower margin, is obsolete or nearly so. The hiatus between the suborbital lobe and the front is much wider and the basal joint of the antennæ broader. The ground color of the carapax is bluish-white, but this tint is almost concealed by crowded transverse black lines and blotches. Feet brownish. Beneath nearly white. Dimensions of the carapax in a male: Length, 0.54; breadth, 0.65 inch. Proportion, 1:1.204.

It was found among stones at half-tide in Sydney Harbor (Port Jackson), Australia.

**189. PACHYGRAPSUS PLICATUS Stimpson**

*Grapsus plicatus* MILNE EDWARDS, Hist. Nat. des Crust., II, 89; Mélanges Carcinologiques, p. 136.

*Goniograpsus plicatus* DANA, U. S. Expl. Exped., Crust., I, 343.

A single specimen, a female, was found at Loo Choo. In this the transverse plications are much more strongly marked than in specimens from the Hawaiian Islands, particularly those on the superior surface of the meros-joint of the posterior pair of feet.

Genus LEPTOGRAPSUS (Milne Edwards) Stimpson

**190. LEPTOGRAPSUS VARIEGATUS (Fabricius) Milne Edwards**

*Cancer variegatus* FABRICIUS.

*Grapsus variegatus* LATREILLE, MILNE EDWARDS, Hist. Nat. des Crust., II, 87.

*Leptograpsus variegatus* MILNE EDWARDS, Mélanges Carcinologiques, p. 137.

Colors in life: The carapax is bluish-gray, everywhere transversely lineated and blotched with black; feet often reddish.

This species was found in considerable numbers at Port Jackson, Australia, running over the rocks at and above half-tide mark.

<sup>1</sup>*Pachygrapsus transversus* Gibbs.

## Genus GRAPSUS (Lamarck) Milne Edwards

191. GRAPSUS RUDIS<sup>1</sup> Milne Edwards

*Grapsus rudis* MILNE EDWARDS, Hist. Nat. des Crust., II, 87; Mélanges Carcinologiques, p. 134.

*Grapsus hirtus* RANDALL, Jour. Acad. Nat. Sci. Phila., VIII, 124.

Colors of the adult in life: Carapax above dark olive, with scattered patches of white dots; below, mouth and parts adjacent reddish, with the exception of the epistome and meros-joint of the maxillipeds, which are bluish. Abdomen bluish-white. Feet reddish above, greenish-white below. Hands externally of a deep blood color; tips of fingers white. In the largest of our specimens, a female, the carapax measured 2.73 inches in length and 2.8 inches in breadth.

This crab runs with greater velocity than any other seen during the cruise. It is very abundant about the larger rocks, and the young are sometimes found on stony and pebbly beaches. Found by us in Port Lloyd, Bonin Islands.

## 192. GRAPSUS STRIGOSUS (Herbst) Latreille

*Cancer strigosus* HERBST.

*Grapsus strigosus* LATREILLE, MILNE EDWARDS, Hist. Nat. des Crust., II, 87; Mél. Carcin., p. 135.

*Goniopsis strigosus* DE HAAN, Fauna Jap., Crust., 33.

In this species the ambulatory feet are broad and shorter than twice the breadth of the carapax. The posterior half of the carapax at the middle, for more than one-third its breadth, is quite smooth. The color in life is reddish and bluish above, mottled; below white.

It was found in the usual station on ocean shores at Loo Choo, Hongkong, and in Gaspar Straits.

193. GRAPSUS WEBBI<sup>2</sup> Milne Edwards

*Grapsus strigosus* BRULLÉ, Webb and Berthelot, Canaries, Crust., p. 15.

*Grapsus webbi* MILNE EDWARDS, Mélanges Carcinologiques, p. 133.

Found in Porto Praya, Cape de Verde Islands; also common at Madeira.

<sup>1</sup> *Grapsus grapsus tenuicrustatus* (Herbst).

<sup>2</sup> *Grapsus grapsus* (Linnæus).



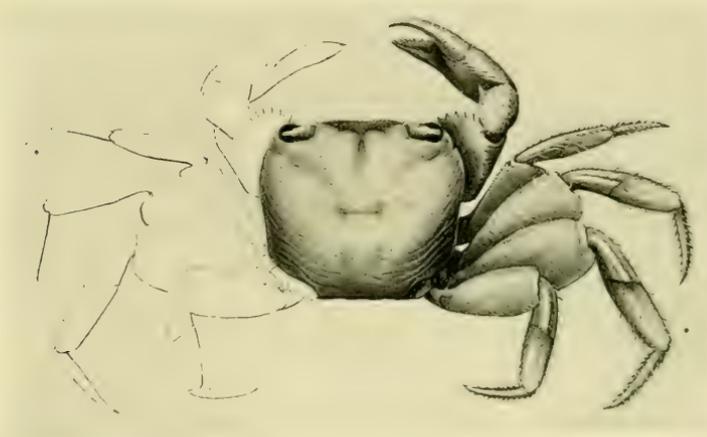
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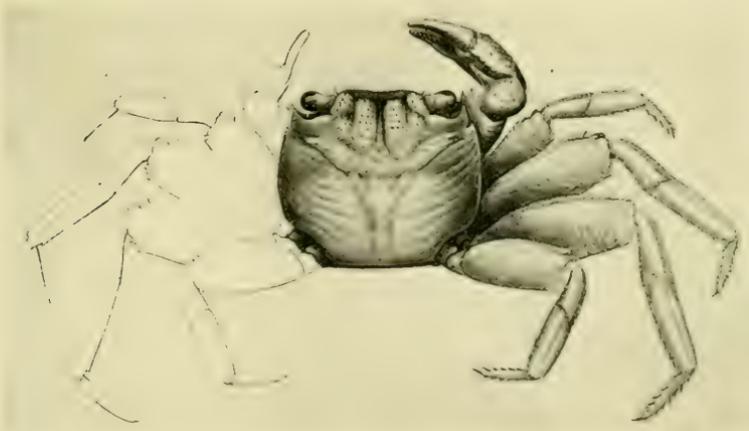
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194. *GRAPSUS LONGIPES*<sup>1</sup> Stimpson

*Grapsus longipes* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 102 [48], 1858.

This species is closely allied to *G. strigosus*, the carapax showing nearly the same characters in every respect, except in being somewhat narrower anteriorly and a little more depressed across the median region. In the proportions of the ambulatory feet, however, considerable difference is perceptible, as they are much more slender than in *G. strigosus*, and more than twice the breadth of the carapax in length. The dactyli are more spinulose than in *G. longitarsis* Dana, the front more expanded, the gastric region less tuberculous, and the teeth or spines at the inferior extremity of the meros of the walking feet longer. The dimensions of a male specimen are as follows: Length of carapax, 1.22; breadth, 1.34 inches.

It was found at Kikaisima and at Hongkong.

195. *GRAPSUS SUBQUADRATUS*<sup>2</sup> Stimpson

PLATE XVI, FIG. 4

*Grapsus subquadratus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 103 [49], 1858.

Allied to *G. strigosus* in the characters of the epistome, etc. Carapax subquadrate; length to breadth, as 1:1.13. It is broader in front than in *G. strigosus*, and the sides are less arcuated. The transverse striæ of the branchial regions are strongly marked, and extend across nearly the whole width of the carapax, leaving only the narrow depressed postcardiac region smooth, and even this portion of the surface is obsoletely squamous. Pregastric region strongly tuberculated, tubercles very numerous and subcristiform. Frontal region short and considerably tuberculated. Frontal margin crenulated. Inner tooth of carpus spiniform, very long, slender, and sharp. Ambulatory feet in length equaling just twice the width of the carapax; spines at inferior extremity of meros rather strong; dactyli longer than in *G. strigosus*. Dimensions of carapax in the male: Length, 1.11; breadth, 1.26 inches.

It is allied to *G. longitarsis* in the character of the front and dactyli, but the branchial striæ are much more produced inward.

It was found under stones below half-tide mark on the ocean shore at Hilo, Island of Hawaii.

<sup>1</sup> *Grapsus strigosus* (Herbst).

<sup>2</sup> *Grapsus longitarsis* Dana.

## Genus GEOGRAPSUS Stimpson

The characters of this genus are given in the synopsis, page 101 [47]. It is sufficiently distinguished from *Grapsus* proper, in which it is included by Milne Edwards, not only by its terrestrial habits (which seem to have been hitherto unknown), but also in the shorter, thicker body, shorter suborbital lobes, smaller antennæ, and the smoothly rounded inferior extremity of the meros-joint of the walking feet.

196. GEOGRAPSUS RUBIDUS<sup>1</sup> Stimpson

PLATE XVI, FIG. 3, 3a

*Geograpsus rubidus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 103 [49], 1858.

Carapax moderately convex, widening considerably immediately behind the second lateral tooth, so that the sides are anteriorly convex and posteriorly slightly concave. Proportion of length to breadth, 1:1.17. Transverse striæ sharp, both anteriorly and posteriorly. Anterior gastric lobules sufficiently prominent. Frontal margin rather strongly crenulated. Surface of the meros-joint of the outer maxillipeds conspicuously striated. Meros-joint of chelipeds broad, with seven generally equal teeth on its anterior margin. Upper surface of hand obliquely striated, striæ tuberculated. Lower surface of hand marked with strong, regular, somewhat distant striæ. Ambulatory feet sparsely provided with long setæ; the meros very thin and much dilated; dactyli as long as or longer than the penult joint.

In life the carapax is of a deep red or mahogany color above, shining, becoming rather yellowish or orange toward the margins. Feet paler. Hands often yellow. Color beneath yellowish-white. Dimensions of the carapax in a male: Length, 1.12; breadth, 1.31 inches.

This species is allied to *G. crinipes* Dana, in its long dactyli, but may be distinguished by its more convex sides and the stronger and more distant striæ on the inferior surface of the hand.

It was found on Peel Island, one of the Bonin group, in October. It usually occurred among damp leaves or under stones, most frequently along the banks of mountain streams. It was sometimes found near the seashore, and occasionally at great elevations.

<sup>1</sup>*Geograpsus grayi* (Milne Edwards).

## Genus NAUTILOGRAPSUS Milne Edwards

197. NAUTILOGRAPSUS MINUTUS<sup>1</sup> Milne Edwards

*Cancer minutus* LINNÆUS.

*Grapsus cinereus* SAY.

*Nautilograpsus minutus* MILNE EDWARDS, Hist. Nat. des Crust., II, 90;  
Mél. Carcin., p. 140.

*Planes minutus* BELL, DANA, U. S. Expl. Exped., Crust., I, 346.

Our largest specimen, a male, has the following dimensions: Length of carapax, 0.74; breadth, 0.79 inch. It is, therefore, not "beaucoup plus longue que large," as stated by Milne Edwards. The tooth behind the orbital angle is often nearly obsolete.

It is common on floating logs, seaweed (*Sargassum*), etc., in the North Atlantic between the 20th and 36th parallels of latitude. We did not observe it in the South Atlantic.

198. NAUTILOGRAPSUS ANGUSTATUS<sup>1</sup> Stimpson

PLATE XVI, FIG. 1

*Nautilograpsus angustatus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 103 [49], 1858.

Carapax smooth, narrow; proportion of breadth to length, 1:1.14. Branchial regions lightly striated transversely. Gastric lobules sufficiently distinct, but not prominent. Front narrow, much advanced, its margin lightly sinuated. Frontal region concave. Lateral margins nearly straight, parallel; a single small tooth behind the orbital tooth; margin acute between the teeth and for a little distance behind the posterior tooth, terminating at a slight oblique sulcus on the branchial region, perhaps indicating a third, obsolete tooth. Behind this point the margins are obtuse. Ambulatory feet rather less broad than in other species of the genus. The dimensions of our unique (female) specimen, which is probably immature, are: Length of carapax, 0.24; breadth, 0.21 inch.

It differs from *N. pusillus* in its less prominent second marginal tooth; from *N. cyaneus* in its more advanced front and less smooth surface. From both these species, and from *N. minutus*, it differs in its narrower carapax.

It was taken in the North Pacific Ocean, in latitude 34° N., longitude 151° W.

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<sup>1</sup> *Planes minutus* (Linnæus).

## Genus PLAGUSIA Latreille

199. PLAGUSIA TOMENTOSA<sup>1</sup> Milne Edwards

*Cancer chabrus* LINNÆUS, Syst. Nat., 1044 (*vide* WHITE).

*Plagusia tomentosa* MILNE EDWARDS, Hist. Nat. des Crust., II, 92. McLEAY, in Smith's Illust. Zool. S. Afr., Annulosa, p. 66. DANA, U. S. Expl. Exped., Crust., I, 370.

*Plagusia capensis* DE HAAN, Fauna Jap., Crust., p. 58.

*Plagusia chabrus* WHITE, Cat. Brit. Mus., 1847, p. 42.

White refers this species, perhaps justly, to the *Cancer chabrus* of Linnæus. But the identification does not appear to rest upon comparison of the original specimens, and until this is made we prefer to use a name to which we can refer with certainty.

It is rather common about the rocks at half-tide in Simon's Bay, Cape of Good Hope.

## 200. PLAGUSIA DENTIPES De Haan

*Plagusia dentipes* DE HAAN, Fauna Japonica, Crustacea, p. 58, pl. VIII, fig. I. MILNE EDWARDS, Mélanges Carcinologiques, p. 144.

Young specimens, probably of this species, were taken at Simoda.

201. PLAGUSIA SQUAMOSA<sup>2</sup> (Herbst) Dana

*Cancer squamosus* HERBST, Naturg. d. Krabben u. Krebse, I, 260, pl. XX, fig. 113.

*Plagusia squamosa* DANA (non M. EDW.), U. S. Expl. Exped., Crust., I, 368.

The Atlantic form differs constantly from the East Indian species usually called *Plagusia squamosa* in the dentation of the superior lobe or crest of the ischium-joint of the second and third ambulatory feet, which is always armed with two or three teeth. Herbst's figure represents this species, to which we would therefore restrict his name *squamosus*, notwithstanding that he gives the East Indies as its habitat.

It is common at Madeira.

202. PLAGUSIA ORIENTALIS<sup>3</sup> Stimpson

? *Plagusia tuberculata* LAMARCK, An. s. vert., v, 247.

*Plagusia squamosa* MILNE EDWARDS, Hist. Nat. des Crust., II, 94; Mél. Carcin., 144.

<sup>1</sup> *Plagusia chabrus* (Linnæus).

<sup>2</sup> *Plagusia depressa* (Fabricius).

<sup>3</sup> *Plagusia tuberculata* Lamarck.

*Plagusia orientalis* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 103 [49], 1858.

In this species the superior lobe of the ischium in the second and third pairs of walking feet is prominent and dentiform, but never denticulated—at least not in any of the specimens which we have seen.

The name *P. tuberculata* was applied by Lamarck by mistake to a specimen in which the pubescence had been rubbed off the carapax. This specimen may have belonged to this species, but in the uncertainty we have thought best to apply a new name.

The species was found by us at the Hawaiian Islands and on the outer shores of Hongkong.

### 203. PLAGUSIA DEPRESSA<sup>1</sup> (Fabricius) Latreille

*Cancer depressus* FABRICIUS, Suppl., 343. HERBST, Naturg. d. Krabben u. Krebse, I, 117, pl. III, fig. 35.

*Grapsus depressus* LATREILLE, Hist. Crust. et Ins., VI, 66.

*Plagusia immaculata* LAMARCK, An. s. vert., v, 247.

*Plagusia depressa* LATREILLE, Encyc. Méth., x, 147. MILNE EDWARDS, Hist. Nat. des Crust., II, 93; Mél. Carcin., p. 145. DANA, U. S. Expl. Exped., Crust., I, 369.

*Philyra depressa* DE HAAN, Fauna Jap., Crust., 31.

This species in life is elegantly variegated with crimson and yellowish. Specimens from Hongkong and Loo Choo are much smoother than others. Besides these localities, it was found by Mr. Squires, of the "Hancock," abundantly in Gaspar Strait, sometimes "attached to floating wood," and by Lieut. Van Wycke, of the "Porpoise," at Tomboro, or New Ireland.

### Genus ACANTHOPUS De Haan

#### 204. ACANTHOPUS PLANISSIMUS<sup>2</sup> (Herbst) Dana

*Cancer planissimus* HERBST, Naturg. d. Krabben u. Krebse, III, 3, pl. LIX, fig. 3.

*Plagusia clavimana* DESMAREST, MILNE EDWARDS, et al.

*Acanthopus clavimanus* DE HAAN, Fauna Jap., Crust., p. 30.

*Acanthopus planissimus* DANA, U. S. Expl. Exped., Crust., I, 373. MILNE EDWARDS, Mél. Carcin., p. 146.

The following are the life colors of a specimen from Port Lloyd, found by Mr. Kern: Carapax above bright red, inclining to orange, with median bluish-white line, from which two bluish-white patches

<sup>1</sup> ? *Plagusia tuberculata* Lamarck.

<sup>2</sup> *Percnon planissimum* (Herbst).

diverge obliquely forward. Feet lineated with darker red. Below everywhere bluish-white.

It was found in the Pacific at Port Lloyd, Bonin Islands, and at Hawaii; in the Atlantic at Madeira. We cannot distinguish the Madeira specimens from those found in the Pacific by any constant character, though it is not improbable that such will be found when a sufficiently large series of examples from both regions shall be examined.

These crabs are found under stones on ocean shores, and are very active, sliding out of sight very quickly when exposed in their haunts.

### Genus VARUNA Milne Edwards

#### 205. VARUNA LITTERATA (Fabricius) Milne Edwards

*Cancer litteratus* FABRICIUS, HERBST, Naturg. d. Krabben u. Krebse, III, 58, pl. XLVIII, fig. 4.

*Varuna litterata* MILNE EDWARDS, Dict. class. d'Hist. Nat., XVI, 511, 1830; Hist. Nat. des Crust., II, 95; Mél. Carcin., 142.

*Trichopus litteratus* DE HAAN, Fauna Jap., Crust., 32. DANA, U. S. Expl. Exped., Crust., I, 336.

Among a large number of specimens collected by the expedition there are none with spines upon the anterior margin of the meros-joint in the chelipeds. Perhaps this is a character only found in old males, as there are no males in our collection much exceeding an inch in length, although we have many large females.

The coloration is very uniform in this species—yellowish-brown above and light yellow below; the feet paler.

It was taken very abundantly during summer about the mouth of the Canton River, in brackish water, and sometimes as far up as the city of Canton. It was usually found swimming at the surface, but sometimes on the muddy banks above low-water mark.

Specimens were also found among floating wood in Gaspar Strait by Captain Rodgers, then in the steamer "Hancock."

### Genus ERIOCHIRUS De Haan

#### 206. ERIOCHIRUS JAPONICUS<sup>1</sup> De Haan

*Eriocheir japonicus* DE HAAN, Fauna Japonica, Crust., 59, pl. XVII.

*Eriocheirus japonicus* MILNE EDWARDS, Mélanges Carcinologiques, p. 142.

In life the color is above very dark brownish-gray, closely punctate; below white, or cream-colored.

<sup>1</sup> *Eriocheir japonicus* de Haan.

It was taken in the seine on sandy shores near the mouths of streams in the Bay of Hakodadi, Island of Jesso.

207. **ERIOCHIRUS RECTUS**<sup>1</sup> Stimpson

*Eriochirus rectus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 103 [49], 1858.

Carapax depressed, broad posteriorly, narrowing anteriorly; length to greatest breadth as 1 : 1.06. Surface somewhat uneven, as in *E. japonicus*, but smooth and punctate. Pregastric lobules little salient. Front waved, indistinctly four-lobed; median sinus very shallow. Lateral margins nearly straight, converging; four teeth on each side, the posterior one rudimentary. Outer maxillipeds and pterygostomian regions pubescent. Chelipeds of moderate size; meros with granulated edges, the tooth near its summit very small; carpus with the encircling ridge of upper surface pubescent, and the tooth at the inner angle small; hand with a thick tuft of hair on outer surface; fingers strongly sulcated. The first three ambulatory feet are slender toward their extremities. The meros-joint of the ambulatory feet is ciliated above. The dactyli are shorter than in *E. japonicus* and less curved. Dimensions of the unique female specimen described: Length of carapax, 0.92; breadth, 0.975; length of third ambulatory foot, 2 inches.

It is allied to *E. japonicus*, but is more depressed, and easily distinguished by its straight converging sides and less distinctly lobed front.

Taken near Macao, China.

Genus **HETEROGRAPSUS** (Lucas) Milne Edwards

This genus was first proposed by Lucas in 1849, but has only recently been illustrated and placed on a firm basis by Milne Edwards, in his "Mélanges Carcinologiques." The genus *Hemigrapsus* of Dana is composed in part of *Heterograpsi*, but his *Hemigrapsus crassimanus* and *H. affinis* seem to us to belong more properly to *Cyrtograpsus* of the same author, a very distinct and well-marked genus (notwithstanding it is disregarded by Milne Edwards), forming a passage to the Varunaceæ. *Pseudograpsus nudus* and *P. oregonensis* of Dana will fall into this genus. In these crabs the meros of the outer maxillipeds is not auriculated, as in *Pseudograpsus* proper.

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<sup>1</sup>*Eriochir rectus* Stimpson.

208. *HETEROGRAPSUS PENICILLATUS*<sup>1</sup> (De Haan) Stimpson

*Eriocheir penicillatus* DE HAAN, Fauna Japonica, Crust., 60, pl. XI, fig. 6.  
*Heterograpsus penicillatus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p.  
 104 [50], 1858.

Distinguished from *H. crenulatus* and allied species by the lanosity of the hands; from *H. oregonensis* in its nearly straight and dilated front.

This species lives at and above low-water mark on sandy or muddy shores. It was found in great abundance in a muddy estuary at Simoda, Japan; also under stones on coarse sand in a bay on the coast of China, opposite Hongkong.

209. *HETEROGRAPSUS OREGONENSIS*<sup>2</sup> (Dana) Stimpson

*Pseudograpsus oregonensis* DANA, U. S. Expl. Exped., Crust., I, 334, pl. XX, fig. 6. STIMPSON, Crust. Pacific Coast N. Am., p. 28.

In this species the external side of the meros-joint of the outer maxillipeds is scarcely at all dilated, but other characters indicate a true affinity with *Heterograpsus*.

Found on sandy or muddy shores in sheltered bays, above low-water mark. Taken by us at San Francisco.

210. *HETEROGRAPSUS SANGUINEUS*<sup>3</sup> (De Haan) Milne Edwards

*Grapsus sanguineus* DE HAAN, Fauna Japonica, Crust., p. 58, pl. XVI, fig. 3.  
*Heterograpsus sanguineus* MILNE EDWARDS, Mélanges Carcinologiques,  
 p. 159.

Closely allied to *H. sexdentatus* and *H. nudus*, but differs from both in the smoothness of the infraorbital crest, which is only microscopically crenulated. It has no hairs or lanose spots on the hands.

A single specimen from China differs from North Japanese examples in its somewhat hairy feet, etc., and perhaps belongs to a distinct species. The coloration of this specimen is as follows: Above, dark porphyry purple, minutely mottled. A few small white spots on the feet. Below white, except the feet, which are pale purplish toward their extremities.

It was found among stones at low-water mark on the shores of a bay near Hongkong.

<sup>1</sup> *Hemigrapsus penicillatus* (De Haan).

<sup>2</sup> *Hemigrapsus oregonensis* (Dana).

<sup>3</sup> *Hemigrapsus sanguineus* (De Haan).

Typical examples of the species were taken abundantly on the shores of the Straits of Sangar by Messrs. Brooks and Kern, and by the officers of the "Hancock."

### 211. HETEROGRAPSUS NUDUS<sup>1</sup> (Dana) Stimpson

*Pseudograpsus nudus* DANA, U. S. Expl. Exped., Crust., 1, 335, pl. xx, fig. 7. STIMPSON, Pacific Coast N. A., Crust., p. 29.

*Heterograpsus marmoratus* MILNE EDWARDS, Mél. Carcin., p. 159.

*Heterograpsus nudus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 104 [50], 1858.

Found about the entrance of San Francisco Bay, among rocks and stones, not far below high-water mark.

### Genus PSEUDOGRAPSUS Milne Edwards

### 212. PSEUDOGRAPSUS ALBUS Stimpson

*Pseudograpsus albus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 104 [50], 1858.

Small; carapax much flattened, smooth and glossy; proportion of length to breadth, 1:1.14. Epigastric lobules distinct. Posterior cardiac region defined. Front broad, depressed, nearly horizontal. Frontal margin thickened, straight or slightly convex, sufficiently projecting. Antero-lateral margin with two slight emarginations behind the angle of the orbit, indicating three minute teeth. External maxillipeds with the external angle of the meros-joint dilated and rounded. Chelipeds short, smooth, and glossy; inner angle of carpus prominent, acute; hand smooth on both sides, palm much shorter than the carpus; a tuft of short hair on the outside between the bases of the fingers. Ambulatory feet flattened, smooth, with neither granules nor spines on any part; penult and terminal joints somewhat hairy below; dactyli tapering, sulcated. Abdomen of the male rather narrow, tapering; penult joint subpentagonal, terminal joint oblong.

Color white, with a few scattered grayish dots and punctæ. Dimensions of a male: Length of carapax, 0.27; breadth, 0.282 inch.

Found under stones above low-water mark, on gravel, in a small harbor on the southern side of Kikaisima.

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<sup>1</sup> *Hemigrapsus nudus* (Dana)

Genus PLATYGRAPSUS<sup>1</sup> Stimpson

This name was proposed in the Proceedings of the Academy of Natural Sciences of Philadelphia for the genus called *Platynotus* by De Haan, this latter name having several times been previously used, and more than once for articulates.

213. PLATYGRAPSUS DEPRESSUS<sup>2</sup> (De Haan) Stimpson

*Platynotus depressus* DE HAAN, Fauna Japonica, Crust., 63, pl. VIII, fig. 2.  
MILNE EDWARDS, Mém. Carcin., p. 165.

Easily recognized by its flat, glossy carapax, which is of a brownish color, often variegated with yellowish white, purple, red, or black. The greatest breadth is at the second lateral tooth.

De Haan's figure of this species is poor, contrary to the usual accuracy seen in his work, and his description is defective in some points. The dactyli of the posterior pair of feet are not trigonal, but depressed and sulcated. The inner angle of the carpus is rounded only in very old specimens; in those of moderate size and in the young this angle forms a sharp tooth or short spine. Finally the species is not found "in fluviis montanis," but is a true marine form, living on gravelly shores above low-water mark.

It is the most common crab found on the shores of Japan, its geographical limits extending from 42° north latitude to the coast of China, in latitude 23° N. We took it at Hongkong, at Loo Choo, Ousima, and Kikaisima, at the Bonin Islands, Kagosima Bay, Simoda, the northeast coast of Nippon, and in Hakodadi Bay.

It seems to reach a larger size progressively as we go north, the largest being from Hakodadi, in one of which the carapax measures 1.02 inches in length and 1.23 inches in breadth. The Loo Choo specimens are remarkable in being of a deep purplish-red color, with feet tipped with orange, fingers tipped with white.

214. PLATYGRAPSUS CONVEXIUSCULUS<sup>3</sup> Stimpson

PLATE XVII, FIG. 3

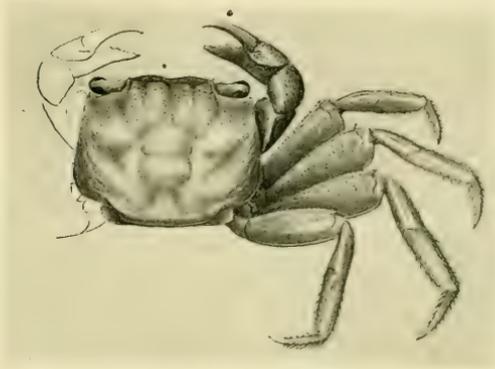
*Platygrapsus convexiusculus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 104 [50], 1858.

This species will be best described by a comparison with *P. depressus*, to which it is very closely allied. The carapax is broader and

<sup>1</sup> *Gatice* Gistel, Natur. Thierreichs, p. x, 1848, substituted for *Platynotus* de Haan, preoccupied.

<sup>2</sup> *Gatice depressus* (De Haan).

<sup>3</sup> *Gatice convexiusculus* (Stimpson).



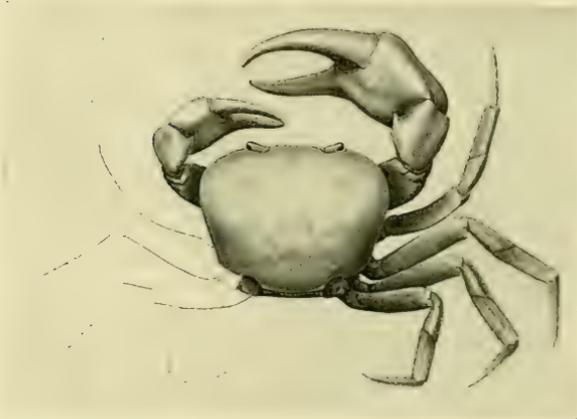
1



1a



1b



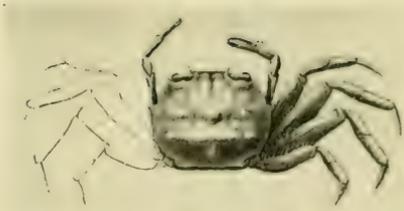
2



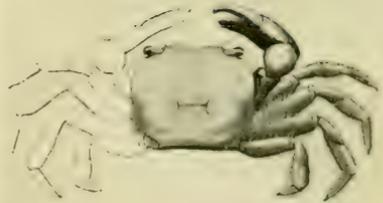
3



3a



4



5



less depressed, the posterior portion being a little convex transversely. The surface is somewhat uneven, but smooth and glabrous. The gastric lobes are more prominent. Front broader, more inclined, and less projecting, with the median sinus broader and deeper. The second lateral tooth is sharp, more projecting, and more widely separated from the first or orbital angle. The infraorbital margin is more coarsely crenated. In other respects it is like *P. depressus*. Dimensions of a male: Length of carapax, 0.42; breadth, 0.51 inch. Proportion, 1:1.21.

Found at Loo Choo.

### Genus PTYCHOGNATHUS Stimpson

Carapax flat above; antero-lateral margins acute, emarginated. Buccal area and maxillipeds very broad, but narrowed posteriorly. Exognath of outer maxillipeds greatly developed, as broad as the ischium of the endognath. No piliferous crest on the endognath; commissure of ischium and meros transverse; meros not as long, but twice as broad as the ischium, and very strongly auriculated at the antero-external angle, the auricle being nearly as large as the main body of the joint. Feet as in *Pseudograpsus*, etc.; hand not piliferous. Last joint of the sternum considerably exposed on either side of the abdomen. Abdomen of the male rather narrow. Terminal joint of female abdomen free.

This genus is founded on a single species from the eastern seas, which is remarkable for the flatness of its dorsal surface. It is allied to *Pseudograpsus* and to *Platygrapsus*, but sufficiently distinct from both in the character of its outer maxillipeds, from the former by the great breadth of these members, and from the latter by the transverse commissure of the endognath.

### 215. PTYCHOGNATHUS GLABER Stimpson

PLATE XVII, FIG. 5, 5a

*Ptychognathus glaber* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 104 [50], 1858.

Carapax perfectly flat above, not at all deflexed anteriorly, and very little sloped at the postero-lateral margins. Proportion of length to breadth, 1:1.21. The H-shaped suture at the middle is deeply impressed. Gastric lobules obsolete. Surface smooth, punctate. Front broad, margin waved and grooved. Antero-lateral margin bidentate, there being one slight emargination behind the

angle of the orbit. The external suborbital lobe is obsolete. Infra-orbital crest inconspicuously crenulated. In the outer maxillipeds the exognath is always smooth; the endognath sometimes pubescent. Chelipeds large, smooth; meros with ciliated margins; carpus obtuse within; hand broad, little convex, smooth within; fingers somewhat gaping, denticulated within. Ambulatory feet sparsely hairy, tomentose toward their extremities; dactyli robust, sulcated. Color dark yellowish brown, often covered with a blackish incrustation. Dimensions of a male: Length of carapax, 0.56; breadth, 0.68 inch.

This species lives in holes in gravelly mud, along the shores of ponds of brackish water, at the mouths of streams. Found in Port Lloyd, Bonin Island.

### Genus ACMÆOPLEURA Stimpson

In the characters of the orbits, antennæ, abdomen, etc., this genus agrees with *Cyclograpsus*—at least with that section of it in which the orbits are nearly complete below. The lateral margins of the carapax are entire. The outer maxillipeds, however, nearly resemble those of *Heterograpsus*, being destitute of an oblique piliferous crest; their sides are straight; the meros-joint is square, equaling the ischium in length, and marked on its surface with a somewhat oblique sulcus which is not continued on to the ischium; the palpus is prosarthroid, and finally the exognath is narrow. The hands are lanose at or between the bases of the fingers.

This genus, being founded upon a single small specimen, needs further illustration. The characters above mentioned forbid its being included in any genus previously described.

### 216. ACMÆOPLEURA PARVULA Stimpson

PLATE XI, FIG. 4

*Acmaeopleura parvula* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 105 [51], 1858.

Carapax flat, broadest at the antero-lateral angles. Length to breadth as 1:1.105. Surface smooth, except anteriorly, where it is minutely rugate and moderately curving downward. Median gastric sulcus distinct. Front rather prominent, its margin somewhat convex. Antero-lateral margin acute. Infraorbital crest broadly 3- or 4-lobed; lobes smooth. Chelipeds equal, smooth externally; hand with three or four strong granules at the middle of the inner surface and a lanose surface externally between the bases of the

fingers. Ambulatory feet slender, setose; setæ very short, arranged on the superior longitudinal crests, there being one of these on the meros and two or three on the next three joints; a few long fine hairs below. Abdomen of the male tapering; penult joint pentagonal.

Color in life above light opaque red, brightest on the chelipeds. The surface is clean and shining. Dimensions of the carapax in the male: Length, 0.19; breadth, 0.21 inch.

Found under stones among pebbles in the third subregion of the littoral zone, on ocean shores at the Island of Ousima.

### Genus CYCLOGRAPUS Milne Edwards

#### 217. CYCLOGRAPUS LONGIPES Stimpson

*Cyclograpsus longipes* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 105 [51], 1858.

Carapax subtrapezoidal; much narrowed anteriorly, and much flattened above. Length to posterior breadth as 1:1.21. Surface smooth and glabrous except toward the margins and frontal region, where it is minutely rugate transversely. Epigastric lobules distinct, though not prominent. On the antero-lateral margins there are often obscure indications of two or three obsolete teeth. Orbits nearly complete below, as in *C. integer*. Infraorbital crest 3- or 4-lobed externally. Oblique crest of outer maxillipeds on the ischium-joint passing almost longitudinally close to the margin. Chelipeds short; hand inflated, smooth within and without. Ambulatory feet very slender, more than twice as long as the carapax; meros minutely rugulose transversely; penult joint and dactylus setose; dactylus long, cylindrical, not tapering, and sulcated. Abdomen of the male rather narrow, somewhat tapering, but less so than in *C. punctatus*; last joint much narrower than the penult. The form of the abdomen is between that of *C. cinereus* and *C. punctatus*. It is in life fawn-colored above, darker anteriorly; below much paler; abdomen whitish. Eyes of a dark mahogany color. Dimensions of a male: Length of carapax, 0.28; breadth, posteriorly, 0.34; length of second pair of ambulatory feet, 0.63 inch.

Found under stones at the depth of one fathom, on coral gravel, in Port Lloyd, Bonin Islands.

218. *CYCLOGRAPSPUS PUNCTATUS* Milne Edwards

*Cyclograpsus punctatus* MILNE EDWARDS, Hist. Nat. des Crust., II, 78;  
Mél. Carcin., p. 163.

*Gnathochasmus barbatus* McLEAY, in Smith's Illust. Zoöl. S. Africa, Crust.,  
pl. III.

Living specimens are of a purplish-brown color, with black punctæ.

It lives among rocks and stones on sandy shores, in the third sub-region of the littoral zone. Found at Simon's Bay, Cape of Good Hope; also in the harbor of Hongkong, China.

219. *CYCLOGRAPSPUS AUDOUINI* Milne Edwards

*Cyclograpsus audouini* MILNE EDWARDS, Hist. Nat. des Crust., II, 78; Mél.  
Carcin., p. 163.

Our specimens belong in all probability to the species here quoted, but the distinctions of species in this genus are so slight that it may well be different. The dactyli of the walking feet are much thicker than in the specimens referred to *C. audouini* by Dana.

The color in life was red, much darker on the anterior part of the carapax; in some specimens there were minute white markings. Hands paler; feet rather dark above. Below, body and members white. The dimensions of the largest specimen, a male, are: Length of carapax, 0.88; breadth, 1.09 inches.

It is common under stones above half-tide mark in Port Jackson or Sydney Harbor, Australia.

## Genus CHASMAGNATHUS De Haan

The genus *Chasmagnathus* is very closely allied to *Helice*, and we can see no sufficient reason for placing these genera in separate families, as is done by Milne Edwards in his "Mélanges Carcinologiques." The arcuated sides of *Chasmagnathus* is almost the only character in which it resembles the Cyclograpsaceæ. The jugal regions are as distinctly reticulated as in *Sesarma*; the front, orbits, antennæ, etc., are as in *Helice*, and the outer maxillipeds only differ from those of the latter genus in being more elongated.

The species described by Dana are intermediate between *Chasmagnathus* and *Helice*, and some of them seem to belong properly to the latter genus.

**220. CHASMAGNATHUS CONVEXUS De Haan**

*Chasmagnathus convexus* DE HAAN, Fauna Japonica, Crust., p. 56, pl. VII, fig. 5. MILNE EDWARDS, Mélanges Carcinologiques, p. 166.

Our specimen is a male, a little smaller than that figured by De Haan. In this the lateral margins are sufficiently arcuated and their notches rather broad. The granules of the surface are smaller.

It was taken in the paddy fields, which are more or less covered with fresh water, at Loo Choo.

## Genus HELICE De Haan

**221. HELICE TRIDENS De Haan**

*Helice tridens* DE HAAN, Fauna Japonica, Crust., p. 57, pl. XI, fig. 2, and XV, fig. 6. MILNE EDWARDS, Mél. Carcin., p. 155.

Taken on the shores of a muddy estuary at Simoda, Japan; also at Ousima and Loo Choo.

## Genus SESARMA Say

**222. SESARMA INTERMEDIA (De Haan) Milne Edwards**

*Pachysoma intermedium* DE HAAN, Fauna Japonica, Crust., p. 61, pl. XVI, fig. 5.

*Sesarma intermedia* MILNE EDWARDS, Mél. Carcin., p. 152.

The specimens which are here referred to *S. intermedia* are somewhat broader than those of the species figured by De Haan, and the hand is more rugose above. With the exception of the marginal tooth behind the orbital angle, they resemble in nearly every respect *S. dehaani*, of which this is possibly a variety.

The color in life was yellowish-gray, mottled with brownish. Hands white.

Found in paddy fields and in mud along fresh water ditches on the shores of the island of Ousima; also taken at Simoda and at Hongkong.

**223. SESARMA SINENSIS Milne Edwards**

*Sesarma sinensis* MILNE EDWARDS, Mélanges Carcinologiques, p. 152.

This species is briefly described by Milne Edwards as follows: "Carapace presque carrée et faiblement sillonnée. Mains arrondies en dessus et verruqueuses, mais sans crêtes pectinées. Pattes grêles,

à dactylopodites très allongés, comprimés et épineux.—Mers de Chine.”

Our crab agrees pretty well with this description. The hand is, however, rather tuberculated than verrucose, and the armature of the dactyli consists rather of very stiff setæ than spines, as they are flexible, and jet black in color.

The carapax is considerably flattened above, and less uneven than is usual. The anterior margins of the epigastric lobules are in the same straight line. The feet are slender, with narrow meros-joints. Color yellowish brown, mottled.

Found on marshy shores in the harbor of Hongkong, China.

#### 224. *SESARMA BIDENS* (De Haan) Dana

*Pachysoma bidens* DE HAAN, Fauna Jap., Crust., p. 60, pl. XVI, fig. 4, and XI, fig. 4.

*Sesarma bidens* DANA, U. S. Expl. Exped., Crust., I, 353. MILNE EDWARDS, Mél. Carcin., p. 151.

Inhabits muddy estuaries. Taken at Simoda and at Hongkong. From the former locality we have but one specimen, a female, in which the oblique superior crests of the hand are scarcely pectinated, and there are only small tubercles on the superior edge of the movable finger.

The Hongkong specimens agree in every respect with De Haan's species except that the meros-joints of the walking feet are somewhat less dilated and the carapax less abundantly setose anteriorly.

#### 225. *SESARMA DEHAANI* Milne Edwards

*Pachysoma quadratum* DE HAAN, Fauna Jap., Crust., p. 62, pl. VIII, fig. 3.  
*Sesarma dehaani* MILNE EDWARDS, Mél. Carcin., p. 150.

Color in life yellowish, clouded with black anteriorly and with olive posteriorly. Beneath yellowish-green; meros of chelipeds reddish. Hands lemon colored. In specimens from Whampoa the hands were white externally and the eyes bright yellow. The carapax is sometimes bright purplish anteriorly.

Of this species the largest and finest specimens (in some of which the carapax measured 1.83 inches in length and 1.95 inches in breadth) were found at Port Lloyd, Bonin Islands, where they live in holes in the banks of fresh-water streams near their embouchure. It is a very courageous animal, defending itself successfully from the attacks of small dogs. It also occurred in brackish water at Whampoa, China, and at Simoda, in Japan.

226. *SESARMA PICTA* (De Haan) Milne Edwards

*Pachysoma pictum* DE HAAN, Fauna Jap., Crust., p. 61, pl. xvi, fig. 6.

*Sesarma picta* MILNE EDWARDS, Mél. Carcin., p. 150.

Found at Ousima.

227. *SESARMA RUPICOLA* Stimpson

PLATE XVII, FIG. 1, 1a, 1b

*Sesarma rupicola* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 106 [52], 1858.

Carapax depressed, quadrate, much broader than long; proportion of length to breadth, 1 : 1.19. Surface very uneven, anteriorly transversely rugulose. Anterior gastric lobules well marked; those of the middle pair with oval spaces at the summits, as if eroded. Frontal region somewhat minutely tuberculated; frontal margin waved. Lateral margins straight, entire, but sometimes with obscure indications of two or three teeth, best seen in a side view. Epistome partly granulated. Chelipeds (of female) of moderate size; inner edge of meros crenulated as far as the triangular tooth at the apex, anterior edge nearly smooth; surface of carpus with short granulated rugæ. Hand on the outer surface smooth toward the extremities, but granulated above and posteriorly; granules small, those of the superior surface arranged in three or four oblique but nearly longitudinal rows, not parallel; a small, sharp, denticulated tooth on the upper edge of the hand at the base of the dactylus; inner surface granulated, granules scattered; dactylus ornamented above with two or three longitudinal rows of very small tubercles. Ambulatory feet rather long; meros only moderately dilated; last two joints moderately provided with short, stiff hairs.

In life carapax black, with a few small bluish-white blotches; feet pale grayish, mottled. Below bluish-grey. Fingers and lower surface of the hand pale reddish-white. Dimensions of the female: Length of carapax, 0.78; breadth, 0.92 inch.

It is closely allied to *S. affinis*, but differs from this as well as from *S. quadrata* in its less dilated meros-joints, from *S. picta* in its less oblique and non-pectinated crests of the hand and non-plicated finger. There is also no tuberculated ridge on the inner surface of the hand.

This species differs in its habits from most of the genus *Sesarma*. It lives among rocks at about half-tide, on shores more or less exposed to the surf. Found in Fou-kow Bay, in the island of Ousima.

228. **SESARMA ANGUSTIPES** Dana

*Sesarma angustipes* DANA, U. S. Expl. Exped., Crust., I, 353, pl. XXII, fig. 7.

Found at Greytown or San Juan, on the eastern coast of Central America, by Mr. Charles Wright, botanist of the expedition.

229. **SESARMA VESTITA** Stimpson

PLATE XIII, FIG. 6

*Sesarma vestita* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 106 [52], 1858.

In this species the form is depressed, and the body and feet are covered above with setæ or hairs, irregular in length, but short, entangling sordes, and mostly arranged in transverse lines. Carapax quadrate, broadest anteriorly, at the sharp orbital angles, which project considerably. Proportion of length to breadth, 1 : 1.03. Surface uneven, with smooth, low prominences. Sides in a vertical sense rounded, except just behind the orbital angle; the line separating the dorsum from the reticulated latero-inferior regions is, however, distinctly raised. There are no lateral teeth behind the orbital angle. Anterior gastric lobules convex, smooth, the middle ones much the largest. Frontal region short, uneven, glossy; the margin waved. Outer maxillipeds small. Chelipeds small, even in the male; inner edge of meros smooth, but with the projecting angle near its inner extremity slightly denticulated; carpus nearly smooth; hand with two or three slight, nearly transverse superior crests, that near the base of the dactylus longest and most prominent; fingers externally smooth; dactylus with acute superior edge. Ambulatory feet moderately long; meros large, much dilated, with subscabrous surface, its extero-inferior angle rounded and denticulated, the other joints toward extremity slender; dactyli very slender, smooth, with sharp, much-curved tips.

Color in life greenish-gray, mottled; feet somewhat annulated. Dimensions of a female: Length of carapax, 0.29; breadth, 0.3 inch.

Found under stones on a gravelly beach in a small harbor of Kikaisima; also at Ousima.

## Genus HOLOMETOPUS Milne Edwards

230. HOLOMETOPUS HÆMATOCHEIR<sup>1</sup> (De Haan) Milne Edwards

*Pachysoma hæmatocheir* DE HAAN, Fauna Jap., Crust., p. 67, pl. VII, fig. 4.  
*Holometopus hæmatocheir* MILNE EDWARDS, Mél. Carcin., p. 154.

The post-frontal ridge, although straight, is always separated into four divisions by slight emarginations, indicating the normal proto-gastric lobules.

Found on the shores of a muddy estuary at Simoda; also at Ousima and at Hongkong.

## CAMPTANDRIIDÆ

## Genus CAMPTANDRIUM Stimpson

Carapax subhexagonal, facial region in breadth equalling two-thirds that of the carapax, front scarcely exceeding in extent a fourth part of the width of the carapax; its margin strongly waved in the perpendicular plane, but nearly straight when seen from above. Antero-lateral margin oblique, straight or slightly concave, armed with three small somewhat distant teeth, the third or lateral tooth prominent, and projecting directly outward. Postero-lateral margin convex. Posterior margin about equal in length to the anterior margin or width of facial region. Upper surface unequal, with three or four interrupted transverse ridges, which are very prominent and somewhat pubescent in the male, but much less distinct in the female; gastric region small; the anterior median lobules sufficiently prominent; hepatic regions large; genital and cardiac regions very broad. Eyes of moderate length; orbits transverse, with large infero-exterior sinus; internal suborbital lobe small, dentiform, not joining the front; inferior margin of orbit and infraorbital crest approximated, and not produced exteriorly beyond the outer angle of the orbit. Antennulæ oblique, in deep fossettes. Antennæ short; the basal joint small, rounded; third joint lying in the internal hiatus of the orbit. Epistome of moderate extent. Latero-inferior regions smooth. Anterior margin of buccal area deeply waved in the vertical plane; median septum strongly prominent. Palate abbreviated, smooth. External maxillipeds rather short and broad, smooth, squarish, not gaping; exognath palpigerous, but not bearing a tooth

<sup>1</sup> *Sesarma hæmatocheir* (De Haan).

on its inner margin, slender and half concealed beneath the endognath, the portion next the ischium only being exposed to view; endognath broad, ischium quadrate; meros-joint equaling the ischium in length and much broader than long, broadly auriculated at the external angle, the auricle protruding forward and not sideways; palp prosarthroid, inserted at the bottom of the sinus in the anterior side of the meros. Chelipeds rather small and weak, unarmed; those of the female with fingers resembling those of the female *Gelasimus*. Ambulatory feet slender, unarmed, smooth, pubescent near the base; meros-joint with a ridge on the posterior surface parallel with the superior margin; dactyli slender, obliquely compressed, shortly ciliated. Sternum broad; its posterior joint widely exposed on either side of the abdomen, its arcuated anterior margin next the mouth projecting, laminiform, like a septum, for the better separation of the mouth from the extremity of the abdomen. Abdomen of the male somewhat tapering, but not dilated at the base, strongly constricted or sinuated on each side at the middle; terminal joint not narrower at the base than the penultimate joint. The male abdominal appendages of the first pair are long, slender, bent or geniculated beyond the middle, where there is a strong tubercle or papilla on the convex side, and contorted toward their extremities; those of the second pair slender, minute. Abdomen of the female broad, covering the whole of the sternum with the exception of its postero-lateral corners; terminal joint broad and scarcely free, the sides of the penult joint being a little expanded so as to enclose its base in a shallow sinus.

This genus inhabits the Chinese seas.

In the form of the carapax approaches somewhat *Cyrtograpsus* Dana, but the characters of the male abdomen, length of eyes, etc., would remove it from the *Grapsidæ*.

### 231. CAMPTANDRIUM SEXDENTATUM Stimpson

PLATE XVII, FIG. 4

*Camptandrium sexdentatum* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 107 [53], 1858.

The trivial characters of this species may be gathered mostly from the generic description preceding. Reprehensible as the practice which we now follow may be in general, it was thought advisable in the present case, where the characters of the animal exclude it from all known families, by which their generic or specific value might be determined. We have therefore given under the head of the genus

as complete a general description of the crab as the number and nature of our specimens would admit. Of these there are five, only one of which is a male, and that a young individual. From the largest of the females the following measurements were taken: Length of carapax, 0.265; breadth, 0.32 inch. Proportion, 1:1.21. The color in life was brownish-gray.

They were dredged from a muddy bottom at the depth of six fathoms, in bays of the coast near Hongkong, China.

## ASTHENOGNATHIDÆ

### Genus ASTHENOGNATHUS Stimpson

This genus is described from a female specimen, the only one which we were fortunate enough to discover. In the form of the carapax and the relative size of the feet it has considerable resemblance to *Pinnixa*. The carapax is transverse, very broad posteriorly, subtruncate anteriorly, with the antero-lateral angles, however, obtuse. The margins are entire. Surface very smooth and even, but seen under the lens to be granulated. The facial region occupies half the width of the carapax. Front deflexed, of moderate extent. Eyes small, movable, with thick peduncles; orbits not very deep. Internal suborbital lobe almost obsolete. Infraorbital crest sufficiently remote from the suborbital margin, prominent and smooth. Antennulæ transverse, situated in deep fossettes. Antennæ sufficiently long, very slender, traversing the inner hiatus of the orbit. Epistome of moderate extent. Palate smooth, with no median septum. Buccal area of moderate size, arcuated in front. External maxillipeds slender and weak, gaping so much as to be considerably remote from each other, with not even the palpi in contact; exognath exposed; ischium of the endognath larger than the meros; meros subquadrate, lightly grooved or excavated on outer surface; palpus exarthroid rather than prosarthroid; dactylus minute, ciliated. Chelipeds small, meros with a setigerous protuberance on the middle of its upper edge; hand moderately compressed, slender, acute above, margined below with a crest; fingers acute, compressed, sulcated, a little longer than the palm, their inner edges scarcely toothed. Ambulatory feet of the second and third pairs very thick, as in *Pinnixa*; those of the fourth pair slender, scarcely overreaching the meros-joint of the preceding pair. Sternum broad, covered by the female abdomen except at the margins and the postero-lateral angles. Terminal joint of the abdomen small rhomboidal.

## 232. ASTHENOGNATHUS INÆQUIPES Stimpson

PLATE XIV, FIG. 1

*Asthenognathus inæquipes* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 107 [53], 1858.

The remarks under the head of *Camptandrium sexdentatum* will apply with equal justice to this species.

The specimen is lead colored. Its dimensions are: Length of carapax, 0.29; breadth, 0.375 inch. Proportion, 1 : 1.28.

It was dredged from a sandy-mud bottom in thirty fathoms, off the east coast of Nippon, in latitude 38° N.

## XENOPHTHALMIDÆ

## Genus XENOPHTHALMUS White

This genus is very imperfectly described by White, like many others instituted by him. We give below a few of its more important characters, by which it will be seen that it is not properly included in the Pinnotheridæ, but is the type of a new family. The equality in size between the meros and ischium-joints of the outer maxillipeds is a prominent distinctive feature, since the most important family character of the Pinnotheridæ is the rudimentary state of the ischium. Milne Edwards, in including the genus in that family ("Mélanges Carcinologiques," p. 186), was probably guided only by the figure and descriptions of White.

The carapax is notched at the margin on each side, as if constricted. Antennulæ minute; fossettes very shallow, or none. Antennæ robust. Eyes minute, movable, placed longitudinally in deep chinks, and apparently destitute of black pigment. We have failed to observe the "cylindrical tooth" spoken of by White. As in *Hymenosoma*, there is no distinct epistome. In the outer maxillipeds the ischium equals the meros in size; the palpus is spirally twisted; dactylus in form resembling that of *Pinnotheres*. The chelipeds are very small, even in the male. The anterior margin of the sternum projects in the form of a thin laminiform crest, and is separated from the adjacent parts—bases of the maxillipeds and feet, etc.—by a very deep chink or fissure. The verges are sternal. The male abdomen is oblong, not dilated at the base, but of nearly the same breadth throughout; a slight contraction at the fifth joint; extremity obtuse, reaching quite to the anterior margin of the sternum.

233. *XENOPHTHALMUS PINNOTHEROIDES* White

*Xenopthalmus pinnotheroides* WHITE, Ann. and Mag. Nat. Hist., XVIII, 177; Voy. Samarang, Crust., p. 63, pl. XII, fig. 3. MILNE EDWARDS, Mém. Carcin., p. 187.

Our specimen was dredged in the harbor of Hongkong from a muddy bottom, in six fathoms.

## PINNOTHERIDÆ

## Genus PINNOTHERES Latreille

234. *PINNOTHERES OBSCURUS* Stimpson

*Pinnotheres obscurus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 108 [54], 1858.

The only specimen in our possession is a female, of which the following is a description: Carapax broad, inclining to subtrapezoidal in form, but rounded at the angles and more or less convex on every side. Proportion of length to greatest breadth, 1:1.36. Surface naked, glossy. Hepatic regions forming rather prominent corners to the carapax; their upper surface depressed. Front very slightly projecting beyond the antero-lateral angles, and much deflexed, truncated below with a nearly straight margin. Outer maxillipeds large, meros curved, very oblique, with smooth and glossy surface, and the margin somewhat hairy at the anterior half of the inner side; palpus very small, hairy, not reaching beyond the inner angle of the meros; carpal joint thick; dactylus slender, subcylindrical, attached to the penult-joint rather beyond the middle and projecting beyond its extremity. Ambulatory feet nearly equal in length, those of the last two pairs a little longer; dactyli of the first two pairs short; that of the third pair long, curved inward; that of the last pair nearly as long as the penult joint, and very slender, nearly straight, tapering, styliiform, with hairy margin.

Color dark brown. Length of the carapax, 0.33; breadth, 0.45 inch.

Found at Hongkong.

235. *PINNOTHERES BONINENSIS* Stimpson

*Pinnotheres boninensis* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 108 [54], 1858.

Description of a female. Carapax rather broad, truncate before. Proportion of length to breadth, 1:1.25. Surface naked. Front

not protruded. Outer maxillipeds pilose, hairs plumose; palpus short; penult joint with extremity almost pointed; dactylus minute, joined at about the middle of the penult joint. Ambulatory feet of the third pair longest; dactyli of the first and second pairs short, equal; those of the third pair very long and tapering to a fine point; those of the last pair also long. Dimensions of the carapax: Length, 0.168; breadth, 0.211 inch.

Found in small oysters from the rocks at the Bonin Islands.

### 236. PINNOTHERES PARVULUS Stimpson

*Pinnotheres parvulus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 108 [54], 1858.

Description of the female: Carapax narrower than in *P. pisum*; front nearly the same as in the female of that species. Outer maxillipeds rather hairy; exognath, excluding its palp, a little less than half as long as the meros-joint of the endognath; penult joint of endognath twice as long as carpus; dactylus slender, reaching to the extremity of the penult joint. Ambulatory feet toward extremities hairy; those of the last two pairs longer than the first two, and with proportionally longer dactyli. Length of the carapax, 0.14 inch.

A specimen of this species was found in each and every example of the small bivalve *Meroë quadrata*, of which several were dredged from a sandy bottom in twenty-six fathoms, in the China Sea, at about latitude 23° N.

### Genus PINNIXA White

The best known species of this very distinct genus are natives of the American coast, but they will undoubtedly be found to be numerous at the proper latitudes in all parts of the globe, when sought for in their peculiar lurking places. They are parasitic in their habits, like the *Pinnotheres*, which they so much resemble in the structure of their jaw-feet; but in place of living with the bivalve mollusk in his shell, they prefer the society of marine worms and worm-like Holothuridæ, in the tubes or holes of which they are generally found. In their transversely elongated shape they are well adapted for slipping about in such cavities. One South Carolinian species lives in the tubes of *Chatopterus*, another in the hole of the large *Arenicola*, and the larger of the expedition species was found in the hole of a *Caudina*.

The *Pinnothera faba* of Dana is intermediate in its characters between *Pinnotheres* and *Pinnixa*, but has the maxillipeds of the

latter genus. Its habits, when observed, will throw much light upon its affinities.

The species of this genus, as far as known, differ from each other by strongly marked characters.

### 237. PINNIXA TUMIDA Stimpson

*Pinnixa tumida* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 108 [54], 1858.

Of this species three examples are found among our collections, all females, to which the following description will apply: The body is transversely cylindrical, and very much swollen. The greatest breadth of the carapax is at the bases of the third pair of ambulatory feet. Length to breadth as 1:1.83. Surface smooth. There is no antero-lateral crest and no transverse ridge posteriorly, as are seen in most species. The median depression is shallow. Front narrow. Outer maxillipeds closely fitting to each other and to the margin of the buccal area; palpus large; dactylus attached near the base of the penult joint, overreaching it but little at the extremity, and, like that joint, provided with a long pencil of hairs. Chelipeds moderately large; meros and carpus-joints thickly hairy within; hand externally smooth; fingers gaping; dactylus oblique, with a tooth at the middle; immovable finger, with minutely serrated inner margin and a subterminal tooth forming a notch for the reception of the tip of the dactylus. Ambulatory feet hairy, those of the third pair longest; those of the first and second pairs slender; last two pairs stout and thick; dactyli slender, with five or six longitudinal carinae. Female abdomen convex, covering the whole of the sternum with the exception of its posterior corners; surface along the middle most prominent.

Color in life: Above blackish, with a few bluish-white spots posteriorly and at the sides; below bluish-white, often inclining to a darker hue, like "neutral tint." Dimensions of the carapax: Length, 0.3; breadth, 0.55 inch.

Found in the holes of *Caudina* (a Holothurian) on sandy beaches in the fourth or lowest subregion of the littoral zone, in the Bay of Hakodadi, Japan.

### 238. PINNIXA PENULTIPEDALIS Stimpson

*Pinnixa penultipedalis* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 108 [54], 1858.

Description of the single female specimen: Body rather depressed, and very broad; proportion of length to breadth, 1:2.11. Carapax

with a transverse ridge near the posterior extremity, smoothly rounded, and but little elevated, traversing the whole breadth of the carapax. Surface smooth and glossy. Front not deflexed. Chelipeds hairy; hand small, slender, tapering toward the straight, slender fingers, which are not gaping and not at all deflexed. Ambulatory feet of the second pair scarcely larger than the first pair; the meros-joint hairy, remaining joints toward extremities smooth and naked. The feet of the penultimate pair are very large and thick, smooth; meros four-fifths as broad as long, its superior edge somewhat acute, indistinctly granulated toward the base, its infero-posterior surface minutely granulated. Last pair of feet small, ciliated. The surface of the sides of the carapax or antero-inferior regions and around the bases of the feet is hairy. There is a transverse, ciliated line across the abdomen at its second joint, extending between the bases of the penultimate pair of feet. In life the carapax is dark gray, mottled with black. Its dimensions are: Length, 0.132; breadth, 0.28 inch.

Found among dead shells on a muddy bottom in ten fathoms, in the harbor of Hongkong, China.

## HYMENOSOMIDÆ

### Genus HYMENOSOMA Leach

#### 239. HYMENOSOMA ORBICULARE Leach

*Hymenosoma orbiculare* LEACH, DESMAREST, Consid. sur les Crust., p. 163, pl. XXVI, fig. 1. MILNE EDWARDS, Hist. Nat. des Crust., II, p. 36, pl. XIV bis, fig. 13; Illust. Cuv. R. A., pl. XXXV, fig. 1; Mém. Carcin., p. 188.

The published figures of this species must in many respects be imperfect, as they show great discrepancies.

Found at the Cape of Good Hope, in False Bay, on sandy bottoms, in ten fathoms.

#### 240. HYMENOSOMA GEOMETRICUM Stimpson

*Hymenosoma geometricum* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 108 [54], 1858.

The only specimen before us is a male, in which the breadth, measured at the bases of the first pair of ambulatory feet, is exactly equal to the length of the carapax. The body is much flattened above and below. The carapax is indurated, and everywhere uniformly granulated above. Dorsal area broadly ovate, encircled by an elevated, granulated ridge, and divided into ten areolets by nar-

row linear sulci, somewhat as in Desmarest's figure of *H. orbiculare* (Consid. sur les Crust., pl. xxvi, fig. 1). The anterior three areolets are very large, and occupy most of the surface; postmedian areolet protuberant at its middle; posterior two areolets very small, much broader than long. The hepatic areolets are also small. Rostrum slender, elongate-triangular, pointing obliquely upward at an angle of  $45^{\circ}$ . There is a small elevated præorbital tooth on either side at the base of the rostrum. The two teeth at the infero-exterior angle of the orbit are sharp, and there is a small but prominent lateral tooth or spine on the surface of the hepatic region behind the orbit, behind which there is a smooth excavation, and behind this again a granulated protuberance. Posteriorly the inferior margin of the carapax forms two prominent projections or teeth, the base of the abdomen lying in the sinus between them. The outer maxillipeds are very slender, with the ischium-joint nearly as long as the meros and not as broad. Chelipeds clavate, granulated above like the carapax; hand short, with inflated, subglobose palm, which is smooth and glabrous exteriorly; fingers short; dactylus one-toothed near the middle within. Ambulatory feet very long and slender, those of the second pair twice as long as the carapax. The feet are sparsely provided with fine, inconspicuous hairs. The dactyli are very slender, not flattened, and taper to a fine, almost hair-like extremity.

The color in life is reddish. Dimensions of the male: Length of carapax, 0.318; breadth at bases of first pair of ambulatory feet, 0.318; greatest breadth of dorsal area, 0.24; length of ambulatory feet of second pair, 0.66 inch.

This species is certainly distinct from *H. orbiculare*, if the published figures and descriptions of that species are to be relied upon. Besides less important characters, the sharp lateral teeth on the hepatic region and the slenderness of the ischium-joint of the outer maxillipeds will be sufficient to distinguish it. Unfortunately we have no specimens of the true *H. orbiculare* upon which to found a comparison, as the examples which were taken at the Cape, and identified with that species at the time, were all lost by accident.

Our specimen was dredged from a sandy bottom in twelve fathoms, in Simons Bay, Cape of Good Hope.

#### Genus HALICARCINUS White

The epistome in this genus is sufficiently well defined. The new species discovered by us seems to form a passage to *Elamene*, from which *Halicarcinus* would seem to be best distinguished by the want

of a septum between the antennulæ and the equality in size of the meros and ischium-joints of the outer maxillipeds. The orbits appear nearly the same in both. Characters derived from the orbits and eyes (as "retractile" and "non-retractile") are as difficult of apprehension here as among some Maioids.

**241. HALICARCINUS OVATUS Stimpson**

*Halicarcinus ovatus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 109 [55], 1858.

Carapax subovate, narrowing before. Length and breadth nearly equal. Upper surface smooth, flattened in the male, somewhat convex in the female. Regions generally sufficiently distinct, separated by linear sulci. Lateral margins angular, with a small acute tooth at each angle, of which there are two on each side of the carapax. Front prominent, with three deeply cut, closely appressed, equal, flattened teeth projecting from beneath the straight supra-frontal margin, but nearly at the same level. Internal antennæ large. Epistome moderately large. Buccal area of moderate size, closed in front; maxillipeds somewhat convex or protuberant. Chelipeds of male subclavate, smooth, sparsely hairy within; meros with a small tooth at summit; hand with rounded, swollen palm and rather slender fingers minutely serrated within. Ambulatory feet long and slender, naked; a small, sharp tooth at the summit of the meros-joint. The feet of the middle pairs are a little more than twice as long as the carapax. Dactyli falciform, and slender from the base throughout. Abdomen of the male contracted near the extremity; terminal joint subcordate, obtuse. Dimensions of carapax in a male: Length, 0.251; breadth, 0.252 inch.

Taken in Port Jackson, Australia.

Genus TRIGONOPLAX Milne Edwards

**242. TRIGONOPLAX TRUNCATA Stimpson**

*Trigonoplax truncata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 109 [55], 1858.

Carapax not indurated, rounded-ovate, smooth, above flat or slightly concave in the male, slightly convex in the female. Proportion of length to breadth, 1:1.07. Regions scarcely distinct. Lateral margin with two or three equidistant inconspicuous angles, better marked in the female than in the male, but seldom dentigerous. Posterior margin straight or slightly convex. The sharp margins

of the carapax anteriorly and laterally project very considerably in a horizontal direction, concealing the eyes, antennæ, and bases of the feet. They project most anteriorly in the adult female. Front sufficiently prominent, broadly truncated; interantennular septum strongly projecting. Antennulæ small. The inferior surface, against which the eyes rest, is considerably hollowed out for their reception. Buccal area small in the female. Outer maxillipeds nearly as in *T. unguiformis*. Chelipeds of the male long, smoothly rounded; meros slender; hand oblong, inflated; fingers somewhat excavated within throughout their length. Ambulatory feet slender, smooth, naked, a small spine at the superior extremity of the meros and carpus-joints; dactyli greatly compressed, strongly falciform, not tapering, but of equal breadth even to their tips. Abdomen of the male somewhat elongated, triangular, its extremity reaching nearer to the mouth than is the case in *T. unguiformis*.

Color in life dark purplish-red above, with four white spots on the carapax—two at the bases of the posterior pair of feet, and two smaller ones in front of them. Dimensions of a male: Length of carapax, 0.21; breadth, 0.225; length of cheliped, 0.4; of ambulatory foot of second pair, 0.56. In the female: Length of carapax, 0.298; breadth, 0.362 inch.

Found under stones at low-water mark, in weedy rock pools. Also dredged in eight fathoms, sandy bottom. It occurred at Ousima and among the reefs opposite Napa, Loo Choo.

#### Genus RHYNCHOPLAX Stimpson

This genus resembles *Trigonoplax* in form. The body is triangular, but less depressed, and longer than broad. Lateral margin bidentate. Rostrum arising from beneath the anterior margin of the dorsum, tridentate, the median tooth largest, elongated, bent upward; the lateral teeth minute and sharp. Antennulæ rather large, approximated, not separated by a septum. Eyes not retractile. Extraorbital spine small. Subhepatic region prominent, with somewhat acute summit. Epistome large. Ischium-joint of the external maxillipeds scarcely larger than the meros. Chelipeds of the male large and strong, scarcely shorter than the walking feet. Ambulatory feet of the first pair longest; dactyli of all falciform, much curved. Abdomen of the male oblong and lightly contracted toward the extremity.

This genus approaches still nearer to the Maioids than *Trigonoplax*, but, like that, is excluded from that division by its sternal verges.

243. *RHYNCHOPLAX MESSOR* Stimpson

*Rhynchoplax messor* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 109 [55], 1858.

In this species the carapax is sufficiently indurated. The proportion of breadth to length in the male specimen described is 1:1.1. Carapax triangular, somewhat convex; surface smooth but uneven, with a few scattered setæ. Gastric and cardiac regions somewhat protuberant; branchial regions often depressed. Lateral teeth small but sharp and prominent. Median tooth of the rostrum flattened, spatuliform, equaling in length about one-fifth that of the carapax and pointing obliquely upward. Chelipeds claviform, sparsely setose; meros with four or five teeth on the superior edge; carpus with three or four small blunt teeth above; hand smoothly rounded, with one very small tooth on the middle of the upper side; inner surface about the bases of the fingers thickly lanose. Ambulatory feet slender, each joint dentigerous at the middle and at the outer extremity, with the exception of the dactyli which are of moderate length, and strongly sickle-shaped.

Color purplish-brown and yellowish, variegated. Dimensions of the carapax: Length, 0.241; breadth, 0.22; length of cheliped, 0.42; of first pair of ambulatory feet, 0.455 inch.

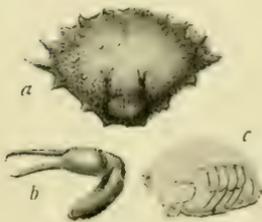
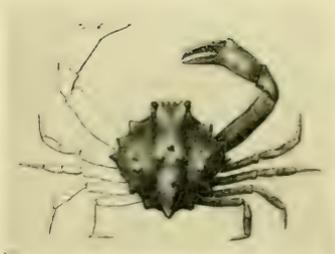
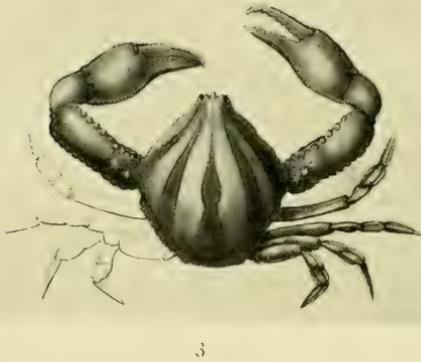
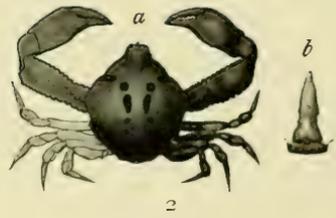
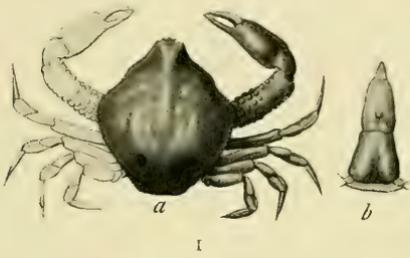
This crab, like all others of the family, dies when placed in spirits in such a state of brittle rigidity, with feet outstretched and easily separated, that it is almost impossible to preserve a perfect specimen.

It was taken at Simoda, at low-water mark.

244. *RHYNCHOPLAX SETIROSTRIS* Stimpson

*Rhynchoplax setirostris* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 109 [55], 1858.

Description of a female: Carapax but little indurated, ovate, flattened; proportion of breadth to length, 1:1.08. Surface nearly smooth; sparsely and inconspicuously setose. Regions sufficiently distinct about the middle, separated by linear sulci. Lateral margins of the dorsum raised; posterior-lateral tooth spiniform, sharply prominent; anterior tooth not prominent. Dorsal margin distinct across the base of the rostrum. Median tooth of rostrum styliform, slender and setose; lateral teeth extremely slender and sharp. Chelipeds weak; meros with a tooth at the summit; hand slender; fingers as long as the palm. Ambulatory feet very slender, minutely





setose; teeth as in the preceding species, but more minute and sharper; dactyli longer than in the preceding species and more slender, those of the posterior pair of feet much more curved than the rest. Dimensions of the carapax: Length, 0.19; breadth, 0.175 inch.

Found at Hongkong, China.

## LEUCOSIDEA

### Genus LEUCOSIA (Fabricius) Leach

The species of this genus which have recently become known are very numerous, and although the distinctive marks are generally so slight as to be determined with difficulty from descriptions or figures, they are nevertheless perfectly plain and satisfactory when seen in the specimens themselves. The doubts thrown upon the validity of some of the numerous species of Bell by certain German authors are entirely unfounded; for several characters of a kind which, in other genera of Brachyura, are merely indicative of variety or individual peculiarities, here become of specific importance. Color, for instance—usually and very properly disregarded as being variable and of no specific value in most crabs—is in the genus *Leucosia* a constant and important character.

In *Leucosia* the plane of the chelipeds is much more oblique to the plane of the carapax than in most crabs, so that in their usual position the anterior extremity is much elevated. They have usually been delineated in this position, so that the post-brachial angle of the inferior lateral margin cannot be seen. In our drawings we have endeavored to represent the carapax in its own plane.

In the larger pair of male abdominal appendages the spiral is well marked, and shows in the different species a number of turns varying from one and a half to eight or ten.

#### 245. LEUCOSIA VITTATA<sup>1</sup> Stimpson

PLATE XVIII, FIG. 3, 3a

*Leucosia vittata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 159 [57], 1858.

Carapax rhomboidal, strongly convex; breadth to length as 1:1.14. Surface punctate. Margins crenulated; granules of antero-lateral margins not conspicuous from above. Posterior margin straight, granulated, obtuse in the adult, rather projecting in the

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<sup>1</sup> *Leucosides vittata* (Stimpson).

young, with a sharp tooth at each extremity. Front sufficiently projecting, tridentate, the median tooth a little more prominent than the lateral ones. Thoracic sinus very deep, pubescent, with no tubercles, its antero-exterior notch reaching the margin of the carapax, its inner notch deep and narrow, reaching nearer to the base of the exognath of the outer maxillipeds than in most other species. The meros-joint of the chelipeds is somewhat contracted and pubescent about the base, and ornamented along the margins with tubercles rather sparsely distributed. There are no tubercles on its upper surface excepting five close to the base, almost concealed by the pubescence, of which two are large; beneath there are a few tubercles scattered near the base. The hand is large. Ambulatory feet with somewhat dilated joints. Tubercle of the penult joint of the abdomen minute. The male abdomen resembles that of *L. rhomboidalis*, but is more slender and tapering. The male abdominal appendages show two or three turns in their spiral.

Colors in life: The carapax is bluish-white, with a median dorsal band of reddish becoming broader posteriorly, and two oblique bands of red on each side diverging from the front, and also widening posteriorly. Feet clouded transversely with reddish, almost annulated. Beneath the body is white, and the feet paler than above. Dimensions of the carapax in a male: Length, 0.97; breadth, 0.85 inch.

This species differs from *L. craniolaris* in the pubescence at the base of the arms; from *L. rhomboidalis*, to which it is still more closely allied, in its distinctly tridentate front.

It was taken with the trawl from muddy bottoms, in four or five fathoms, in the bays on the Chinese coast, near Hongkong.

• 246. *LEUCOSIA MACULATA*<sup>1</sup> Stimpson

PLATE XVIII, FIG. 2

*Leucosia maculata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 159 [57], 1858.

This species is much smaller than any other of the group of *Leucosia* to which it belongs. The carapax is rhomboidal, smooth and glossy, longer than broad, in the proportion of 1:1.16. The front is tridentate, with tips a little deflexed; the median tooth is much the largest and most prominent, the lateral ones being scarcely prominent enough to be considered teeth. Thoracic sinus very deep,

<sup>1</sup>*Leucosides rhomboidalis* (De Haan).

pubescent, not tuberculated, with no notch at the antero-interior angle, which is broadly rounded. Posterior margin convex, not projecting, lightly granulated; angles obtuse. Meros-joint of the chelipeds as in *L. vittata*, with the base pubescent; the marginal tubercles are, however, more crowded. In the abdomen of the male the antepenult joint is contracted toward its extremity, and there is a constriction at the commissure of this joint with the penult. The tubercle of the penult joint is sufficiently large, and the surface in front of it excavated. The male abdominal appendages are spiral, with two turns.

The life colors are as follows: Carapax bluish-brown, becoming paler posteriorly, and spotted with red, there being five small spots on each side of the median line, placed in arcuated series, which diverge anteriorly. Chelipeds bluish-brown; walking feet white, barred with red. Dimensions of the carapax in a male: Length, 0.58; breadth, 0.5 inch.

This species also is allied to *L. rhomboidalis*, but differs in the form of the abdomen.

It was dredged in considerable numbers on a shelly-mud bottom, in twenty fathoms, off the coast of China, near Hongkong.

#### 247. LEUCOSIA PARVIMANA<sup>1</sup> Stimpson

PLATE XVIII, FIG. 1

*Leucosia parvimana* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, 159 [57], 1858.

Carapax longer than broad, in the proportion of 1:1.15; very convex posteriorly; sides rounded; surface near the antero-lateral margins concave. Apex (or anterior extremity) compressed and much directed upward. Front projecting beyond the orbits, tridentate, the median tooth most prominent. Antero-lateral margin moderately crenulated, not extending further back than the first pair of ambulatory feet. Postero-lateral or inferior margin inconspicuously crenulated. Posterior margin obtuse, minutely crenulated above, smooth and glossy beneath. Thoracic sinus shallow, anteriorly abbreviated, but with deep notches at the corners, and ornamented with three large and two or three small tubercles above the base of the arm. The meros-joint of the chelipeds is tuberculated above on the basal half, as in *L. pallida*, the tubercles rather large; below, about the anterior edge, it is crowdedly tuberculated. The hand is

<sup>1</sup> *Leucosides parvimana* (Stimpson).

small, with the external edge acute; inner edge obtuse, slightly crenulated above; fingers short and weak, much gaping, and smooth within. The dactyli of the ambulatory feet are slender, not dilated, as in some species.

Beneath the surface is milk white and polished, shining. The sutures of the sternum are deeply impressed, and its postero-lateral angles tuberculiform. The abdomen of the male is moderately broad, the antepenult joint protuberant on either side of the median line; penult joint with convex sides, and armed with a sharp tubercle near the middle, pointing backward. The male abdominal appendages exhibit a beautifully close sharp spiral of seven or eight turns.

This species is of a pale buff color, clouded with darker gray on the anterior part of the carapax, which is also variegated with three white spots on each side of the median line, and two dark spots posteriorly. Dimensions of the carapax in the male: Length, 0.84; breadth, 0.73 inch.

This species approaches nearest to *L. pallida* Bell, from which it may be distinguished in its less strongly crenulated margins, in having only three large tubercles in the thoracic sinus, and in its more slender dactyli.

Taken near Selio Island, in Gaspar Strait, by Capt. John Rodgers, of the steamer "Hancock."

#### 248. LEUCOSIA HÆMATOSTICTA<sup>1</sup> Adams and White

*Leucosiā hæmatosticta* ADAMS and WHITE, Voy. Samarang, Crust., p. 54, pl. XII, fig. 2.

In our specimen the front is more projecting than in the figure above quoted, and subtriangular. The posterior margin is also convex. In the living animal the anterior half of the carapax was bluish-white, the posterior half dotted with red; a band of crowded red punctæ across the middle, interrupted at the median dorsal line. Below white, with a few scattered red dots.

It was dredged from shelly-sand in twenty fathoms, in Kagosima Bay, Japan.

#### Genus MYRA Leach

#### 249. MYRA FUGAX<sup>2</sup> (Fabricius) Leach

*Leucosia fugax* FABRICIUS, Suppl., p. 351.

*Myra fugax* LEACH, Zoöl. Misc., III, 24. MILNE EDWARDS, Hist. Nat. des

<sup>1</sup> *Leucosides hæmatosticta* (A. & W.).

<sup>2</sup> *Persephona fugax* (Fabricius).

Crust., II, p. 126. DE HAAN, Fauna Japonica, Crust., p. 134, pl. XXXIII fig. 1.

Our specimens agree much better with De Haan's figures than with those of Milne Edwards in the illustrations to the recent edition of Cuvier's "Règne Animal." In the young female the abdomen is scarcely wider than in the male. The color in life is pale brick red above, clouded with bluish; below whitish.

It is common on mud and shelly-mud in five to twelve fathoms, in Hongkong Harbor; also taken in twenty-five fathoms, sand, in the China Sea, near latitude 23° N.

#### 250. MYRA AFFINIS<sup>1</sup> Bell

*Myra affinis* BELL, Lin. Trans., XXI, 296.

A young female specimen referable to this species is found among our collections, in which, however, the surface is but little granulated, as in *M. fugax*, to which it is very closely allied. But the teeth at the posterior extremity of the carapax are obtuse, and the middle one is short (perhaps worn).

The specimen in life was of a dusky brick-red color above; sides and feet paler and variegated with white; beneath white.

It was dredged from a shelly bottom in twenty fathoms, in Kagosima Bay, Japan.

#### Genus PHILYRA Leach

#### 251. PHILYRA TUBERCULOSA Stimpson

PLATE XVIII, FIG. 5

*Philyra tuberculosa* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 159 [58], 1858.

Description of a female: Carapax convex, broadly rhomboidal, almost orbicular, but longer than broad; proportion, 1:1.05. Outline angular. Surface uneven. Branchial, postero-gastric, genital, and cardiac regions protuberant and closely tuberculated. Margins granulated. Posterior margin transverse. Front concave, smooth, shorter than the epistome. Hepatic or pterygostomial angle prominent, its ridges granulated. Outer maxillipeds somewhat rugose, and ornamented with a ciliated line parallel to the inner margin. Chelipeds short; meros strongly granulated, except at the middle

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<sup>1</sup> *Persephona affinis* (Bell).

near the extremity; hand nearly smooth, punctate, with no granulated lines within; fingers deeply sulcated, gaping at the base. Sternum closely tuberculated. Abdomen smooth, with the exception of the first and second joints, and a transverse line on the third, which are granulated. Color in life yellowish-gray. Dimensions of the carapax: Length, 0.49; breadth, 0.47 inch.

Found on coarse sand bottoms, just below low-water mark, at spring tides, in bays of the Chinese coast, near Hongkong.

#### 252. PHILYRA PLATYCHEIRA De Haan

*Philyra platycheira* DE HAAN, Fauna Japonica, Crust., p. 135, pl. XXXIII, fig. 6.

De Haan's figure does not show the marginal granules, which are, however, mentioned in his description. The surface of the carapax, besides being punctated, is seen under the microscope to be granulated, most conspicuously so posteriorly. The color in life is a clear dark bluish-gray above, white below.

It was dredged by us from a muddy bottom at the depth of six fathoms, in Hongkong Harbor.

#### 253. PHILYRA UNIDENTATA Stimpson

PLATE XVIII, FIG. 4

*Philyra unidentata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 159 [58], 1858.

Carapax (in the female) suborbicular, longer than broad; proportion, 1:1.08. It is a little produced anteriorly. The lateral and posterior margins are rounded, continuous, and crenulated, the crenulations being small, equal, and obtuse. Surface perfectly smooth and glabrous. Front unidentate at the middle, but on each side straight and considerably shorter than the epistome. Outer maxillipeds flat; ischium of endognath with an inconspicuous ciliated line along the middle parallel to its inner margin. Chelipeds less than twice as long as the carapax; meros with large tubercles above on the basal two-thirds, the rest smooth; below the meros is closely small-tuberculated, except the middle and anterior portions; hand sufficiently convex; fingers short, somewhat depressed, touching each other at the terminal third only of their length; their inner margins acute, obsoletely one- or three-toothed.

Colors in life: Carapax very pale reddish-brown, with a median stripe and portions of the margin of a bluish-white color. Feet

bluish-white, banded with pale red; inner half of fingers light red. Below white. Dimensions of the carapax: Length, 0.54; breadth, 0.5 inch.

Dredged from a sandy bottom in twenty-five fathoms, in the northern part of the China Sea, latitude 23° N.

Genus EBALIA Leach

254. EBALIA MADEIRENSIS Stimpson

PLATE XVIII, FIG. 7

*Ebalia madeirensis* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 159 [58], 1858.

We have but one specimen, a female, of this species. The carapax is suboctagonal, or rhomboidal, with the angles truncated, the lateral ones obliquely. It is broader than long, in the proportion of 1 : 1.07. Both the antero-lateral and the postero-lateral margins are slightly concave. The carapax is very convex across the middle, and there is a narrow median carina extending from the front to the sharply prominent and granulated cardiac tubercle. The branchial regions are prominent, irregularly granulated about their summits, the outer granules large and sharp. Front concave, minutely granulated. Posterior margin nearly straight, its surface granulated. Surface of the carapax, except at the points mentioned above, smooth and glabrous. There is a minute spine at the summit of the pterygostomian angle. The surface of the outer maxillipeds is obsolete granulated. Chelipeds granulated, the marginal granules few, distant, and subspiniform; the meros-joint more than twice as long as broad.

Dimensions of the carapax: Length, 0.28; breadth, 0.3 inch.

Dredged from a coarse sandy bottom in twenty fathoms, in Funchal Bay, Madeira.

Genus PHLYXIA Bell

255. PHLYXIA QUADRIDENTATA (Gray) Stimpson

PLATE XVIII, FIG. 6

*Ebalia quadridentata* GRAY, Zool. Misc., p. 40.

*Phlyxia quadridentata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 159 [58], 1858.

This species is much like *P. crassipes* Bell (Lin. Trans., XXI, pl. XXXIV, fig. 2) in its quadridentate front and tuberculated dorsum, but the carapax is broader, the front less produced, and the surface

minutely granulated. In the female the tubercles of the carapax are less prominent and more obtuse than in the male. The outer maxillipeds, as well as the sternum, are microscopically granulated. The chelipeds are shorter and more slender than in *P. crassipes*; the hand smooth; the fingers short, sulcated, and minutely denticulated within, but with no large tooth. The ambulatory feet are more slender. In life the carapax was mottled with white and bluish-gray; the feet and chelipeds usually annulated or banded. The dimensions of a female are: Length of carapax, 0.4; breadth, 0.38 inch.

On shelly ground in two fathoms, near the mouth of Port Jackson, Australia.

### Genus ARCANIA Leach

#### 256. ARCANIA GLOBATA Stimpson

PLATE XVIII, FIG. 9

*Arcania globata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 160 [58], 1858.

Of this species two females were taken, to which the following description will apply: Breadth to length as 1:1.05. The carapax, leaving out the protruded front, is regularly and evenly globular—the regions not being circumscribed—and thickly covered above with small, sharp, scarcely granulated spines, ten of which, around the margins, are a little longer than the others. A median spine on the post-cardiac region is also somewhat larger than the others. Between the two large spines on the posterior margin there are two small ones. Frontal region nearly smooth, posteriorly minutely spinulose; frontal margin regularly concave, arcuated, terminating in a small tooth at each extremity. Chelipeds closely granulated, granules mostly subspiniform, those of the hand much smaller than those of the meros-joint. Fingers slender, as long as the palm. Ambulatory feet smooth.

Color in life pale brick red above, with a longitudinal wedge of white margined with brown, the apex of which is at the middle of the carapax, the base covering the front. Beneath white, tinted with reddish. Dimensions of the carapax: Length, 0.46; breadth, spines included, 0.44 inch.

The carapax in one of the specimens is somewhat more depressed.

It differs from *A. erinaceus* in wanting spines on the ambulatory feet; from *A. tuberculata* and *A. levimana* in having sharp instead of tuberculiform spines.

It was dredged in sixteen fathoms, on shelly and gravelly mud, off the coast of China, near Soon-Koo and Hongkong Islands; also in the North China Sea, in latitude  $23^{\circ}$  N., at the depth of twenty-five fathoms.

### Genus IPHIS Leach

#### 257. IPHIS SEPTEMSPINOSA<sup>1</sup> (Herbst) Leach

*Cancer septemspinosus* HERBST, Naturg. d. Krabben und Krebse, I, pl. xx, fig. 112.

*Leucosia septemspinosa* FABRICIUS.

*Iphis septemspinosa* LEACH, MILNE EDWARDS, Hist. Nat. des Crust., II, 139; Illust. Cuv. R. A., Crust., pl. xxv, fig. 4. BELL, Lin. Trans., XXI, 311.

The color in life is pale brick-red above, white below. In one of our specimens the width between the tips of the lateral spines is 2.15 inches. In the young these spines are proportionally shorter.

Several specimens were taken in the trawl on a muddy bottom in twenty fathoms, off the coast of China, near Hongkong.

### Genus IPHICULUS Adams and White

The affinities of the crustaceans upon which this genus was founded have been hitherto a matter of conjecture only, owing to the imperfect manner in which it was characterized by its original describers, and their doubtful reference of it to two very distinct groups of Brachyura, the Parthenopidæ and the Leucosidea. They place it, indeed, among their descriptions of Leucosidea, but say in their note that "it appears, among the Parthenopidæ, to hold the same place as *Orcophorus* does among the Leucosidæ." While, curiously enough, the generic name which they have applied to it is a diminutive of that of its nearest congener *Iphis*, and thus indicates its true position.

Dana, having only the figures of Adams and White to judge from—the characters of the antennæ, maxillipeds, and other essential parts generally not being mentioned in their description—considered it allied to or identical with *Polydectus*,<sup>2</sup> from the similar character of the hand, in which the long, slender fingers are armed with needle-like spines along their inner margins. This kind of

<sup>1</sup> *Arcania septemspinosa* (Fabricius).

<sup>2</sup> U. S. Exploring Expedition, Crust., I.

hand, however, is not uncommonly seen among true Leucosidea, such as *Nursilia dentata* and *Myrodes eudactylus*, for instance.

Bell does not include the *Iphiculus* in his "Monograph of the Leucosidæ," although he states that it is "most probably associated with them."<sup>1</sup>

From the structure of the maxillipeds and other important parts, this crab seems evidently allied to *Iphis* and *Oreophorus*. Its carapax is indeed much broader than in any other Leucosidian genus, the front is not all produced, and the epistome is quite large; but the spines of the carapax are much like those of *Iphis*, though differing in number and position. This is best shown when the body is denuded of pubescence, as in pl. XVIII, fig. 8a.

With regard to the mouth parts we may observe the following points: The mandibles resemble those of *Iphis*, but the apex of the corona is obtusely rounded. The maxillipeds of the inner pairs are exactly like those of *Iphis*. The outer maxillipeds are much shorter than is usual in the tribe, each of them being more than half as broad as long. They are convex, much bending upward anteriorly to follow the curve of the body. The exognath is somewhat shorter than the endognath, and nearly two-thirds as broad; the apices of these two branches are separated by the inner wall of the pterygostomial channel, which here projects strongly between them. The surface of the exognath is sharply granulated at the middle and toward the outer margin, which is straight; its apex is obtuse. The endognath longitudinally sulcated or divided into two portions, the inner half being depressed and smooth, the outer prominent and granulated; the meros is triangular, less than two-thirds as long as the ischium; the commissure of these two joints is oblique, and angular at the middle. The pterygostomial channels are deep; the walls at the anterior extremity strongly projecting and arcuated, interrupted at the exterior angle by a very deep notch, rounded and somewhat widened at the bottom, and near the interior angle by a shallower notch, separating the main length of the inner margin from the dilated lobe at its anterior extremity. The anterior margin of the palate is dilated, much projecting at the middle, but not as far as the extremities of the pterygostomial channels.

The orbits are nearly transverse, but the eyes can be thrown forward into a longitudinal direction.

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<sup>1</sup> Lin. Trans., XXI, 312.

258. *IPHICULUS SPONGIOSUS* Adams and White

PLATE XVIII, FIG. 8

*Iphiculus spongiosus* ADAMS and WHITE, Voy. Samarang, Crust., 57, pl. XIII, fig. 5.

It is covered with a villous coat of a dirty buff color, paler below, with a transverse band of purple-brown at the epistome.

When captured it feigns death like a spider, contracting or folding up all its members closely against the body in a very compact form, to which the shape of the sides of the body shows an adaptation.

It was dredged on muddy bottoms, sometimes on muddy gravel, in from ten to twenty fathoms, in the bays and channels of the Chinese coast, near Hongkong.

Genus *OREOPHORUS* Rüppell259. *OREOPHORUS RUGOSUS* Stimpson

PLATE XIX, FIG. 6, 6a

*Oreophorus rugosus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 161 [59], 1858.

Carapax subpentagonal, and much broader than long, in the proportion of 1:1.38. It is rugose, as if eroded or vermiculated, with a series of oblong pits parallel to the antero-lateral margins, and a longitudinal series on each side of and almost circumscribing the cardiac region. Front narrow, prominent. Branchial regions much projecting laterally, somewhat concave, and partly covered with flattened or subcapitate tubercles, which extend to the posterior margin of the carapax, where they become confluent. Chelipeds rugose, eroded, and irregularly protuberant; fingers sulcated, of moderate breadth, concave on the upper or inner side, and with sharp curved tips placed laterally; immovable finger broader than the dactylus. Ambulatory feet moderately tuberculated along their edges, the tubercles small. Abdomen covered with small rounded tubercles, not crowded, and marked with two interrupted impressed lines down the middle, which circumscribe the median carina, which is, however, less convex than the sides.

This species is of an ashy-white hue, but much discolored by sordes. The dimensions of the female specimen above described are: Length of carapax, 0.48; breadth, 0.662 inch.

It is perhaps specifically the same as the example figured by Adams and White in pl. VI, fig. 2, of the Crustacea of the Voyage of the Samarang, which is considered by the authors to be the young of their *O. reticulatus*.

Found at Loo Choo.

### Genus NURSIA Leach

#### 260. NURSIA PLICATA<sup>1</sup> (Herbst) Bell

*Cancer plicatus* HERBST, Naturg. d. Krabben u. Krebse, III, pl. 59, fig. 2.

*Nursia hardwickii* LEACH, Zoöl. Misc., III, p. 20.

*Nursia plicata* BELL, Lin. Trans., XXI, 307, pl. XXXIV, fig. 4.

The middle portion of the carapax in our specimens is closely granulated, and sometimes the ridges also. The hand is depressed, and nearly smooth; the fingers sulcated. In life the color of the carapax above is partly pale brick-red and partly yellowish-white; the arms are reddish; the hands pale buff.

It was dredged in considerable numbers from shelly bottoms in six to ten fathoms, in the channel of Hongkong Harbor.

#### 261. NURSILIA DENTATA Bell

*Nursilia dentata* BELL, Lin. Trans., XXI, 309, pl. XXXIV, fig. 6.

In the male specimen taken by us we notice the following characters. The posterior branchial angle and ridge are acutely prominent, forming a sharp up-curved tooth at the margin, which is almost as prominent as the lateral tooth anterior to it. The front is broader than in Bell's figure, and the teeth more projecting. Eyes protractile to a considerable length. Antennulæ very long, nearly half as long as the carapax; their fossæ very deep. The external maxillipeds are not gaping, as in the female, according to Bell; the surface of the exognath is granulated; ischium of endognath with a longitudinal ridge along the middle; meros excavated. Chelipeds as in the female. Abdominal segments as in *Nursia*; penult joint with a tooth near its extremity, pointing backward. The abdominal appendages of the first pair are bifurcated at their extremities.

Color in life white. Dimensions of the carapax: Length, 0.27; breadth, 0.29 inch.

The difference in the outer maxillipeds is so great that were it not for the exact correspondence of some other characters we should

<sup>1</sup> *Nursia hardwickii* Leach.

consider it specifically, or even generically, different from *Nursilia dentata*. It certainly shows a much greater difference between the male and female than is noticed in other genera of the family. The variation, however, when it exists, is usually found in the outer maxillipeds, as the ciliated ridge in the female, etc.

Our specimen was dredged in ten fathoms, sandy bottom, in the straits separating Katonasima from Ousima.

### CRYPTOCNEMIDÆ

A small but well-marked group of Leucosidea may be separated under this title, including the genus *Tlos* White (which we conclude to be a Leucosidian, notwithstanding Bell's footnote<sup>1</sup>), and the three new genera described below. They are analogous to *Cryptopodia* among Parthenopidæ and to *Cryptolithodes* among the Lithodidæ, being characterized by a broad, flattened, or even concave, carapax, the margins of which are expanded and lamelliform, projecting so much as to conceal the ambulatory feet for the whole or a part of their length. The chelipeds are, as in *Cryptopodia*, large, depressed and always exposed. The apex of the outer maxillipeds is sharply triangular, projecting much beyond the extremity of the exognath, and dividing the epistome into halves. The exognath is generally dilated, and its outer margin more or less arcuated. The basal joint of the outer maxillipeds is rather small. The pterygostomial channels are broadly excavated, with the inner margin distinct and projecting only at the anterior extremity, posteriorly sloping off smoothly inwards. The orbits are small and deep, and the outer antennæ obsolete, or nearly so. In the male abdomen the segments seem to be mostly soldered together, the first and last being, however, always distinct.

The crabs of this family would appear to have their nearest allies among ordinary Leucosidæ in *Orcophorus*, *Nursia*, and *Nursilia*.

### Genus CARCINASPIS Stimpson

Carapax suborbicular, depressed, nearly flat, broader than long, broadly rounded but not expanded posteriorly. Sides expanded, but not projecting sufficiently to conceal entirely even the meros-joints of the ambulatory feet. Front rostrate; rostrum short, broadly truncated. Eyes concealed beneath the carapax. Orbits very deep, round, without fissures, closed within and not communi-

<sup>1</sup> Lin. Trans., XXI, p. 278.

cating with the antennular fossettes. These fossettes are transverse, ovate in shape, small and complete. The epistome is sufficiently large on either side of the apex of the maxillipeds which divides it. Buccal area as broad as long. Pterygostomial channels notched at the antero-exterior side. Exognath of the outer maxillipeds small, much narrower than the endognath; meros-joint of endognath three-fourths as long as the ischium. Chelipeds robust, not crested; fingers nearly longitudinal. In the female abdomen the segments from the third to the sixth are soldered, and the second segment is produced into a point on either side. The sternum is broad.

262. *CARCINASPIS MARGINATUS* Stimpson

PLATE XIV, FIG. 7

*Carcinaspis marginatus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 161 [59], 1858.

In the female specimen which we have before us the proportion of length to breadth in the carapax is 1:1.12. The carapax is smooth and glabrous above, slightly convex and punctate at the middle, and margined with a double series of minute granules. Rostrum produced, slightly elevated. Beneath the subhepatic regions the margins of the outer maxillipeds and sternum are closely granulated, the granules rather flattened. Chelipeds robust, angular, the surfaces smooth, the upper surface margined on either side, like the carapax, with a double series of granules, the inferior keel often punctate or inconspicuously granulated. Fingers of the hand sulcated, half as long as the palm. Ambulatory feet rather broad; meros uncarinate above; remaining joints to extremities bicarinate, upper carina most prominent; dactyli as long as the penult joint and with acute extremities.

In life carapax red; feet white. Dimensions of the carapax: Length, 0.25; breadth, 0.28 inch.

Found under stones at low-water mark, on rocky shores, at the Cape of Good Hope.

Genus *CRYPTOCNEMUS* Stimpson

The carapax is broad and pentagonal in shape, or perhaps better described as triangular, with the lateral angles truncated. It has broad laminiform expansions posteriorly and at the sides, concealing the ambulatory feet, with the exception of their extremities when extended. The lateral expansions and the front are bent upward,

so that the upper surface is concave on either side of the dorsal convexity, which is almost carinate along the middle. The front is rostrate; the rostrum broad and triangular, pointing obliquely upward. Orbits minute, round, with entire margins. Antennular fossæ oblique. External antennæ nearly obsolete, or represented only by one or two joints at the base. Epistome sufficiently large. Buccal area as broad as long. Anterior margins of the pterygostomian channel entire. Exognath of the outer maxillipeds dilated, as broad as the endognath, its outer margin broadly and regularly arcuated. Meros-joint of the endognath two-thirds as long as the ischium. Chelipeds with laminiform crests at the edges; fingers of the hand short. Dactyli of the ambulatory feet very narrow. Sternum broad. Abdomen of the male narrow-triangular, geniculated near the base (where, however, there is no *joint*) in a right angle, its segments all confluent with the exception of the first and last.

This little crab has much resemblance to a *Cryptopodia*, and in its natural position the main body of the carapax anteriorly is directed obliquely upward and forward at an angle of  $45^{\circ}$ .

### 263. CRYPTOCNEMUS PENTAGONUS Stimpson

PLATE XIV, FIG. 5, 6

*Cryptocnemus pentagonus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 162 [60], 1858.

Carapax much broader than long in the proportion of 1:1.45. The length of the postero-lateral side is one-half that of the antero-lateral. The surface is perfectly smooth and glabrous, and convex anteriorly, with a slight longitudinal ridge or carina running from the tip of the rostrum to the middle of the gastric region. The small cardiac region is slightly prominent. The rostrum is elevated to an angle of about  $60^{\circ}$  with the horizon; tip almost acute; sides convex. The outer maxillipeds and all the lower surfaces of the body are smooth and glossy. The chelipeds are flattened, with glabrous surfaces; the marginal laminae very much expanded, that of the hand being wider than the slight thickening which constitutes its body, and deeply notched on the outer side near the fingers. The fingers are one-third as long as the palm; immovable finger broad; dactylus sulcated. Ambulatory feet crested with laminae; dactyli very slender. Color of preserved specimen white. Dimensions of the carapax in the male: Length, 0.2; breadth, 0.29 inch.

Dredged from shelly mud in twenty fathoms, in Kagosima Bay, Japan.

Genus *ONYCHOMORPHA* Stimpson

Carapax flat, unguiform, longer than broad, posteriorly broadly expanded and laminiform, anteriorly narrowing. Front very short, truncated, non-rostrate, and scarcely as prominent as the epistome. Orbits very minute, deeply notched or fissured at the middle above, and with a small hiatus within. Antennulary fossæ oblique. Epistome very small. External antennæ obsolete. Buccal area longer than broad. Anterior margins of pterygostomial channel entire. Basal joint of outer maxillipeds very small; exognath much broader than endognath, with arcuated outer margin; endognath very slender, its apex projecting less far beyond that of the exognath than in the other genera of this family; ischium-joint shorter than the meros. Chelipeds much depressed, hand almost laminiform, fingers very short, oblique, almost transverse. Sternum of moderate breadth. Abdomen of the male subtriangular, broad and tumid near the base, sides toward extremity a little concave, segments confluent except at base and extremity.

This genus is easily recognized by the great expansion posteriorly of the carapax and the non-rostrate front.

264. *ONYCHOMORPHA LAMELLIGERA* Stimpson

PLATE XIX, FIG. 8, 8a

*Onychomorpha lamelligera* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 162 [60], 1858.

Carapax almost laminiform, somewhat lyre-shaped, broadest at the posterior extremity, narrowing anteriorly, and deeply sinuated or contracted at the level of the third pair of feet. Breadth to length as 1:1.1. Front very short; margin straight. Antero-lateral and posterior margins somewhat curved, convex. Upper surface glabrous, lightly convex about the middle, depressed and faintly radiated toward the margins. Pregastric region depressed below the level of the front. Outer maxillipeds and lower surfaces of the body smooth. Chelipeds smooth; meros trigonal but depressed, with sharp edges; carpus small, with acute exterior edge; hand much dilated, lamelliform, pubescent at inner edges and lower surface; fingers deeply sulcated, constituting one-fourth the length of the hand. Ambulatory feet slender, with no laminiform expansion; dactyli slender as in *Cryptocnemus pentagonus*. Abdomen of the male with a sharp tooth at the extremity of the penult joint and

a rounded swelling or convexity of the surface on each side near the base. Dimensions of the carapax in the male: Length, 0.242; breadth at the posterior extremity, 0.22 inch.

It was dredged from a shelly-mud bottom in ten fathoms, in Hongkong Harbor, China.

## CALAPPIDEA

### Genus CALAPPA Fabricius

#### 265. CALAPPA CRISTATA<sup>1</sup> Fabricius

*Calappa cristata* FABRICIUS, Suppl., 346; MILNE EDWARDS, Hist. Nat. des Crust., II, 105.

*Lophos philargius* DE HAAN.

In life the color is pale brick-red above, the surface being covered with crowded punctæ of that color. The eyes are longitudinally striped with black, the stripes or lines being about seven in number. A large, well-defined deep red spot on the carpus, and one on the front of the hand. Inner side of hand with red spots or blotches arranged in lines. Lower side of brachia deep red. Inferior surface of body white, with the exception of two oblique red lines on each cheek.

It is not uncommon on muddy bottoms at about six fathoms depth in the vicinity of Hongkong, China. It occurred abundantly in May, 1854, but none were found later in the season. Taken also at Loo Choo.

#### 266. CALAPPA TUBERCULATA<sup>2</sup> Fabricius

*Calappa tuberculata* FABRICIUS, Suppl., 345. HERBST, Naturg. d. Krabben u. Krebse, I, 204, pl. XIII, fig. 78. DESMAREST, Consid. sur les Crust., 109, pl. X, fig. I. MILNE EDWARDS, Hist. Nat. des Crust., II, 106. DANA, U. S. Expl. Exped., Crust., I, 393.

*Calappa hepatica* DE HAAN, Fauna Jap., Crust., p. 70.

Found by the expedition in Gaspar Strait and at Loo Choo.

<sup>1</sup> *Calappa philargius* (Linnæus).

<sup>2</sup> *Calappa hepatica* (Linnæus).

## Genus CYCLOËS De Haan

267. CYCLOËS CRISTATA<sup>1</sup> (Brullé) Stimpson

PLATE XIX, FIG. 7

*Cryptosoma cristata* BRULLÉ, in MILNE EDWARDS, Hist. Nat. des Crust., II, 110; in WEBB and BERTHELOT, Hist. Canaries, Crust.

*Cycloës cristata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 162 [60], 1858.

Dredged in twenty fathoms, coarse sandy bottom, in Funchal Bay, Madeira.

## Genus MATUTA Fabricius.

268. MATUTA LUNARIS<sup>2</sup> (Herbst) Leach

*Cancer lunaris* HERBST, Naturg. d. Krabben u. Krebse, III, p. 43, pl. XLVIII, fig. 6.

*Matuta lunaris* LEACH, MILNE EDWARDS, Hist. Nat. des Crust., II, 114. DANA, U. S. Expl. Exped., Crust., I, 395.

In the living specimen the carapax is bluish-white, delicately reticulated with threads of dark red dots. A large white spot on the gastric region. Feet pale whitish, with a few red-dotted lines. Eyes gray, tipped with white; peduncles white. Below pure white.

Taken with the seine on sandy beaches in Port Lloyd, Bonin Island.

A specimen was also found swimming off Rosario Island. This was of a dark purplish-red color, minutely reticulated with yellow-dotted threads.

269. MATUTA VICTOR<sup>3</sup> Fabricius

*Matuta victor* FABRICIUS, Suppl., 369. MILNE EDWARDS, Hist. Nat. des Crust., II, 115; Illust. Cuv. R. A., Crust., pl. VII, fig. I. DANA, U. S. Expl. Exped., Crust., I, 395.

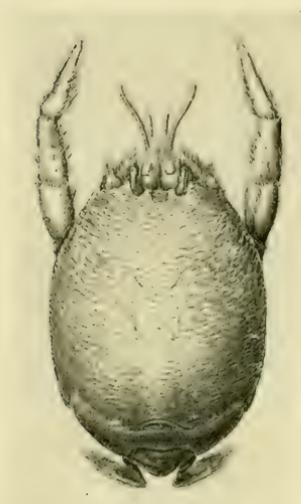
In life carapax bluish or yellowish, with numerous scattered red dots. Feet yellowish, with large red dots at the joints. Beneath white.

Found on coarse sand, a fathom below low-water mark, at Hong-kong; also dredged in the North China Sea.

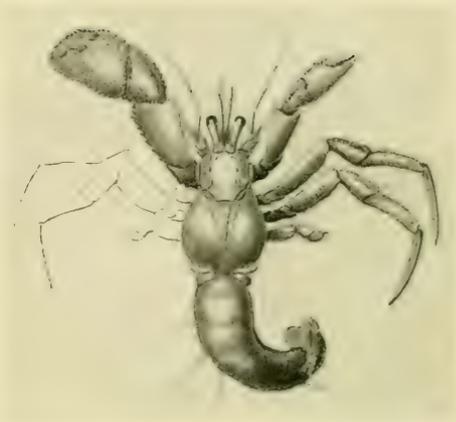
<sup>1</sup> *Cycloës dentata* (Brullé).

<sup>2</sup> Probably *Matuta planipes* Fabricius.

<sup>3</sup> Probably *Matuta lunaris* (Forskål).



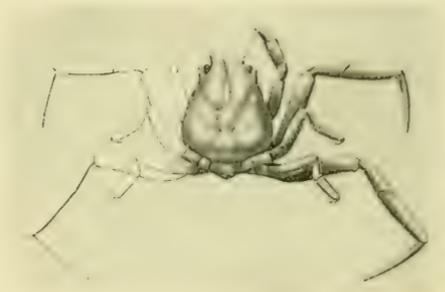
1



2



3



4



3a



5



6



7



8



8a



6a



## DORIPPIDÆ

## Genus DORIPPE Fabricius

270. DORIPPE QUADRIDENS<sup>1</sup> Fabricius

*Dorippe quadridens* FABRICIUS, Suppl., 361. DE HAAN, Fauna Japonica, Crust., 121, pl. XXXI, fig. 3.

*Dorippe quadridentata* MILNE EDWARDS, Hist. Nat. des Crust., II, 156.

The so-called teeth of the abdomen in this species are large, round, glossy tubercles, of a bright orange color, and very conspicuous among the rough hairy coatings which cover the general surface of the body. The bare surfaces of the last two joints of the chelipeds and long ambulatory feet are also of a deep orange color in life. Beneath the naked parts are white.

In the examination of a considerable number of specimens we find that the eyes in the young are very long, reaching beyond the tips of the extra-orbital spines, while in full-grown individuals they do not reach even to the extremities of these spines.

Dredged in six and eight fathoms, on gravelly-mud bottoms, in Hongkong Harbor.<sup>2</sup>

## 272. DORIPPE JAPONICA Von Siebold

*Dorippe japonica* VON SIEBOLD, Spicilegia Faunæ Japonicæ, 14. DE HAAN, Fauna Jap., Crust., p. 122, pl. XXXI, fig. 1.

Fragments of a large male of this species, including the peculiar hand, were dredged in the harbor of Hakodadi.

## 273. DORIPPE GRANULATA De Haan

*Dorippe granulata* DE HAAN, Fauna Japonica, Crust., p. 122, pl. XXXI, fig. 2.

Color in life reddish above, white below.

Dredged on a mud bottom in six fathoms in the Bay of Hakodadi, Japan; also in thirty fathoms off the northeast coast of Nippon, and in ten fathoms in Hongkong Harbor.

<sup>1</sup> *Dorippe dorsipes* (Linnaeus).

<sup>2</sup> No. 271, *Dorippe facchino*, is missing from the manuscript.—Editor.

## Genus ETHUSA Roux

274. ETHUSA SEXDENTATA<sup>1</sup> (Stimpson)

PLATE XIX, FIG. 4

*Dorippe sexdentata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 163  
[61], 1858.

Of this small species a single male individual was obtained. It presents characters which may, upon further examination, warrant its separation from the typical *Ethusa*. The carapax is narrowed forwards; proportion of breadth to length, 1 : 1.13. The surface is uneven, but not granulated. Inter-ocular front quadridentate; teeth very sharp, subequal, in two pairs separated by the median notch. Extra-ocular teeth sharp and spiniform, about equal to the frontal teeth in size, but not reaching to the level of their tips. Infra-orbital spine obsolete. External maxillipeds naked, longitudinally sulcated; meros nearly as broad as ischium. Inner maxillipeds as in *Dorippe*. The epignath of the outer maxillipeds plays in a large afferent cavity at the base of the pterygostomial region, which is not, however, separated, as in *Dorippe*, from the open space at the base of the chelipeds. The feet are slender, rounded and roughened with slight asperities.

In life carapax pale yellowish-gray; feet pale brownish; fingers of the hand white. Dimensions of the carapax: Length, 0.275; breadth, 0.242 inch.

It was dredged from a shelly bottom in twenty fathoms, in Kagosima Bay, Japan.

## Genus TYMOLUS Stimpson

Body oblong. Carapax much shorter than the body, rounded, abruptly contracted anteriorly, the facial region being narrow and protruding. Hepatic and branchial regions ample, swollen. Afferent branchial opening normal in position, at the anterior base of the chelipeds. Front quadridentate. Between the median teeth of the front a small tooth may be seen from above, which constitutes the wall of the apex or anterior extremity of the buccal area and encloses the tips of the outer maxillipeds. Orbits deep, longitudinal;

<sup>1</sup>This species was first transferred to the genus *Ethusa* by Stimpson, on the cover of one of the separates of the "Prodromus" (teste S. I. Smith).

superior fissure or notch deep; inferior fissure occupied by a tooth. Eyes small and protractile, as in the Leucosidea. Antennulæ sufficiently long, without fossettes, and situated in the large inner hiatus of the orbit. Antennæ short, placed in the lower angle of the orbital hiatus, beneath the antennulæ. External maxillipeds very much elongated, slightly gaping, but accurately fitting the margins of the buccal area and anteriorly concealing the apices of the inner maxillipeds; exognath very narrow, and barely overreaching the ischium of the endognath anteriorly; meros of endognath broader than the ischium, longitudinally sulcated along the middle and much produced anteriorly, its pointed apex reaching the front; palpus concealed as in the Leucosidea. Ambulatory feet as in *Dorippe*, but with the dactyli scarcely falciform and non-costate. Abdomen nearly as in *Dorippe*, but sexarticulate, and with the last joint dilated. The male verges are in the coxæ of the last pair of feet.

In the shape of the carapax this curious form resembles *Homola*. In general appearance and the structure of the feet, the posterior two pairs of which are turned up over the back and prehensile, it is closely allied to *Dorippe*. But the character of the external maxillipeds and the position of the afferent branchial openings would far remove it from this latter genus, and even entitle it to rank as a distinct family.

### 275. TYMOLUS JAPONICUS Stimpson

PLATE XIX, FIG. 3, 3a

*Tymolus japonicus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 163 [61], 1858.

Carapax nearly as long as broad, conspicuously areolated, the surface minutely granulated. Sides convex, tridentate, the first tooth at the summit of the hepatic region, the other two somewhat smaller than the first, and placed rather close together on the branchial region. Teeth of the front small but sharp, the two median ones most projecting. Chelipeds of the male rough with granules and spinules and some short setæ; a strong spine at the summit of the carpus; hand short and high; fingers large, longer than the palm, concave within. Ambulatory feet very slender.

Color above bluish-gray in life, below dirty light brownish. Dimensions of the carapax in a male: Length, 0.235; breadth, 0.24 inch.

This pretty little species was dredged on a shelly bottom in eight fathoms, in the Bay of Hakodadi.<sup>1</sup>

## ANOMURA

### TELEOSOMI

#### Genus DROMIDIA Stimpson

The group which we have separated from *Dromia*, under the generic title of *Dromidia*, is very closely allied to the old genus restricted, in form and general appearance. The following characters may be mentioned as distinguishing it, some of which, however, may not prove to be of generic value when additional species shall be discovered. The carapax is convex and pilose, the hair or setæ being often of considerable length. The front is narrow, and the hepatic regions more or less concave or excavated anteriorly. The palate is marked by a strong ridge on either side. The posterior feet are similar to those of *Dromia*, but the last pair is generally longer than the penult pair. The appendages to the penult joint of the abdomen are minute and concealed. In the sternum of the female the copulatory sulci are produced, and approximated at their extremities in a more or less tuberculiform projection situated between the bases of the chelipeds.

In the typical species, *D. hirsutissima*, the palpus of the outer maxillipeds is articulated to the meros rather at its apex than at its inner angle, as noticed by De Haan. This, however, results from the elongation of the meros-joint and the obliquity of its anterior margin. It does not seem to be a character of much importance, and is not seen in other species of the genus.

As in former descriptions of *Dromia* no mention is made of characters which are here considered generic, it will be impossible to arrange all of the known species into groups without a re-examination of the specimens; but we conjecture that *D. globosa*, *gibbosa*, *unidentata*, and *rotunda* will be found to belong in the present genus.

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#### <sup>1</sup> HAPALOCARCINIDÆ

##### HAPALOCARCINUS MARSUPIALIS Stimpson

##### PLATE XIV, FIG. 8

Proc. Boston Soc. Nat. Hist., vi, p. 412, 1859. Rathbun, Bull. U. S. Fish Comm. for 1903, part III, p. 892, 1906.

Not mentioned in the manuscript of this report.

Hilo, Hawaii, 1 fathom (Stimpson).

276. *DROMIDIA SPONGIOSA* Stimpson

PLATE XX, FIG. 1

*Dromidia spongiosa* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 238 [76], 1858.

The only specimen obtained of this small species is a female. With the exception of the fingers of the chelipeds, the entire surface is covered with a dense and firm envelope of pubescence, sponge-like in appearance. On the carapax this covering is distinctly marked with shallow pits or depressions corresponding with those of the surface beneath, which is glabrous, and minutely punctate. The front is triangular, pointed, and very much deflexed, much projecting downward, and deeply channeled longitudinally, so that it presents a bicuspid appearance from above. Its margins are smooth, though flexuose, arching over the antennæ, and presenting a slight tooth at the inner angle of the orbit. There is no tooth on the superior margin of the orbit, and none at its external angle, although at this latter point there is a fissure. The antero-lateral margin is entire, strongly convex, and bears a small tooth at the lateral emargination. The meros-joint of the external maxillipeds is oblique at the anterior margin, though less so than in *D. hirsutissima*. Chelipeds of moderate size, with a smooth surface; hand rather short; fingers not deflexed, and bare of pubescence except at their bases; both fingers toothed within. Feet of the fourth pair very short, compressed, and truncate at the tip; fifth pair more slender and longer. Abdomen (of the female) long, with a narrow, obtuse median carina separating two longitudinal smooth channels; appendages of the penult joint concealed; terminal joint large, one-half longer than the penult. Color in life reddish. Length of the carapax in our specimen, 0.42; breadth, 0.52 inch.

This species resembles somewhat *D. unidentata* Rüppell and *D. rotunda* MacLeay, from which it differs (judging from published accounts) in the want of tubercles at the angles of the orbits, in the toothed dactylus of the chelipeds, and in the shape of the meros-joint of the outer maxillipeds. *D. unidentata* is represented in Rüppell's figure as having two or three spiniform processes beside the dactylus, at the extremity of the penult joint, in the fourth and fifth pairs of feet, which is not the case in our species, nor in any other *Dromia* which we have seen.

Our species was dredged from a rocky bottom in twenty fathoms, in False Bay, Cape of Good Hope.

277. *DROMIDIA EXCAVATA* Stimpson

*Dromidia excavata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 239 [77], 1858.

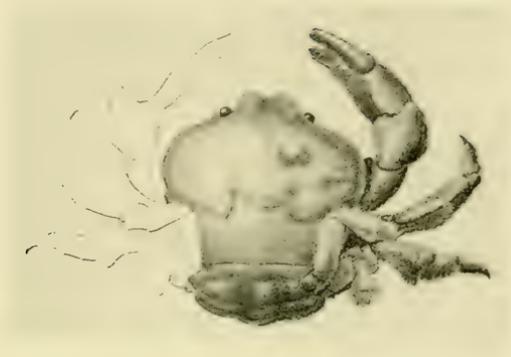
The following description was taken from a young female specimen. The body and feet are covered with pubescence which is longest beneath. Carapax smooth, strongly and regularly convex, equally so anteriorly as posteriorly. The sides are nearly parallel, so that it has a quadrate appearance, were it not for the protrusion of the front. The sides of the carapax below the sulcus, where protected by the retracted feet, are membranaceous. This is probably a mark of immaturity. The subhepatic regions are deeply excavated in front. Front small, bifid as seen from above, but with a smaller, slender, curved, acute, median tooth below; tooth over eye peduncle small, external orbital angle not dentiform. No teeth on anterolateral margin except that forming the external angle of the hepatic excavation and that at the deep lateral sulcus. The anterior margin of the meros-joint in the external maxillipeds is oblique and the external angle obtuse. Chelipeds small, angular, but with smooth surfaces; carpus protuberant and with a strong superior tooth; hand without teeth; fingers compressed nearly as long as the palm. Hair on the outer side of the hand dense, arranged in longitudinal lines. Ambulatory feet of moderate length, fifth pair longer than the fourth. Abdomen of the female with an obtuse carina. On the inferior surface of the body the thick, hairy covering is excavated in numerous pits or concavities, at the bottoms of which the protuberant parts of the abdomen and foot-bases appear, almost bare of pubescence. Color brownish; fingers of chelipeds pale crimson. Length of carapax, 0.37; breadth, 0.35 inch.

In our specimen, which is evidently a young one, the copulatory sulci are indistinct, and produced only to the fifth sternal segment.

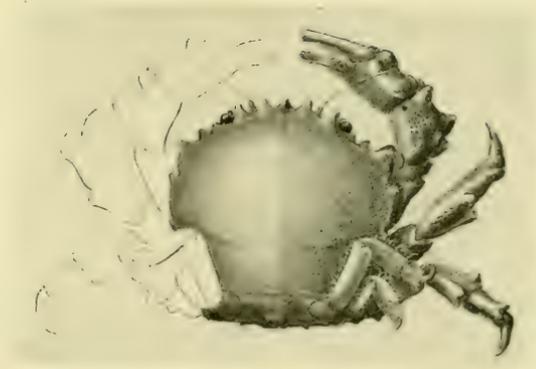
It was found among soft sponges dredged in six fathoms, on a muddy bottom, in Port Jackson, Australia.

Genus *CRYPTODROMIA* Stimpson

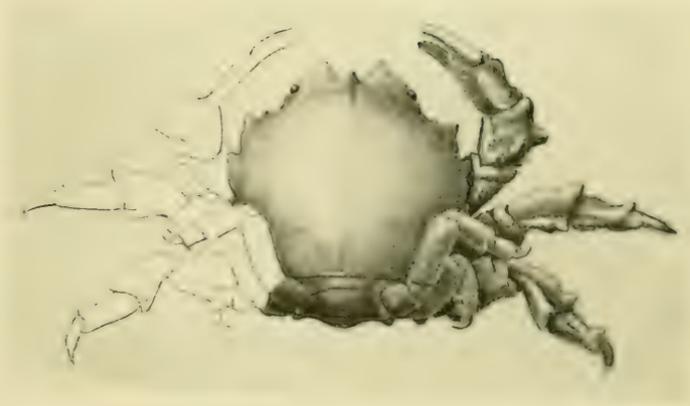
This name has been proposed for a group of small species which are very numerous in the East Indian and Pacific seas. They are littoral in their habits, and always found concealed in some foreign living body, generally a compound ascidian. They are easily recognized by their size and aspect, being small, subglobular, and covered with a very short pubescence only. The carapax is generally a little



1



2



3



broader than long, with a rather broad front. Teeth of antero-lateral margin often bifurcated. Palate armed with a ridge on each side. External maxillipeds as in *Dromia*. Feet as in *Dromia*, but always more or less nodose. Posterior pair longer than the penult pair. The copulatory sulci of the female sternum are remote from each other, and terminate in the fourth segment (that of the second pair of feet), each in a little tubercle. The abdomen is generally armed with nodiform or spiniform projections. The male abdomen is sufficiently broad, with free (unsoldered) segments; appendages to the penult joint conspicuous; terminal joint usually broader than long.

The *Dromia nodipes* of Lamarck and *D. lateralis* of Gray belong to this genus, and perhaps also *D. fallax* and *D. caput-mortuum*. These species have not yet been fully described, however, and in the uncertainty we name as the type *C. coronata*, described below.

#### 278. CRYPTODROMIA CORONATA Stimpson

PLATE XX, FIG. 2

*Cryptodromia coronata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 239 [77], 1858.

Carapax broader than long, evenly convex; surface minutely roughened with grains and covered with a very short but strongly adhering pubescence. Front very broad, 5-toothed, teeth large and sharply projecting, subequal; middle one somewhat smaller than the others and placed at a lower level; outer or lateral ones situated on the superior margin of the orbit. The inferior orbital tooth is nearly equal in size to those of the front. External hiatus or notch of orbit not deep; tooth at external angle scarcely prominent. Antero-lateral margin 5-toothed, but with two teeth only showing prominently, the posterior tooth being as small as the angle of the orbit, and the second tooth being at a much lower level than the others, and on the subhepatic region. The two large teeth are slightly bilobed, the anterior lobe in each being a sharp tooth, but the posterior one broadly rounded. Feet nodose; tubercles not very numerous, but prominent; interspaces reticulated. This reticulation is best seen on the outer surface of the hand, which is entirely covered by it. Chelipeds equal. Fingers very strongly gaping, dentate at tips; dactylus slightly compressed, with a broad, deep sulcus on the front or outer surface, and 2-3-dentate on the inner edge toward base. The feet of the last pair are considerably longer than those of the penult pair. Male abdomen rather broad; last joint much broader than

long; penult joint narrower; third and fourth joints each with four spines, the spines short, those of the fourth joint most prominent; a short spine on each side at the posterior angles of the fifth joint. Color lemon-yellow or orange, sometimes blotched with brown on the dorsal aspect. Fingers of chelipeds carmine. Length of carapax in the male, 0.525; breadth, 0.56 inch.

The back was covered by a close-grained sponge.

It was found among madrepores at the depth of a fathom, in Port Lloyd, Bonin Island.

### 279. *CRYPTODROMIA LATERALIS* (Gray) Stimpson

PLATE XX, FIG. 3

*Dromia lateralis* GRAY, Zoölogical Miscellany, p. 40.

Our specimens agree with the description above cited, except in dimensions, which are, according to Gray: "Length, 7; breadth,  $6\frac{1}{2}$  lines." In ours the carapax is broader than long. But Gray may have measured the body as protruding beyond the carapax behind.

The front is large, very strongly projecting, and bicuspid. Color uniform, light yellowish-brown.

Found at low-water mark on rocky and stony ground and among sponges, in six fathoms, muddy bottom, Port Jackson, Australia.

### 280. *CRYPTODROMIA TUBERCULATA* Stimpson

PLATE XXI, FIG. 6

*Cryptodromia tuberculata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 239 [77], 1858.

Carapax broad, smooth, scarcely at all pubescent. Front broad, little prominent, 5-toothed, including the præorbital teeth; teeth subequal, obtuse; median tooth most acute and prominent. Lateral margins 4-toothed; the first two teeth strong and tuberculiform; the third low and elongated, but deeply separated from the second and fourth; the fourth situated at the lateral sulcus. First tooth separated by a considerable interval from the orbital angle. On the subhepatic region there is an arched row of tubercles or teeth extending from the extero-inferior corner of the orbit to the second lateral tooth; these tubercles diminish in size outward; the two nearest the eye are very strongly prominent and are nearly as large as the lateral teeth. There are also two teeth in a transverse row next to the anterior angle of the buccal area. Chelipeds strongly

tuberculated, with conical tubercles; on the carpus there are three or four large and about ten small tubercles. On the hand there are twenty to twenty-five tubercles, variable in size, mostly on the external surface. The inside of the hand is densely pubescent. Fingers in the male gaping, much compressed, and tapering towards the extremities. The first and second pairs of ambulatory feet are sharply verrucose, four or five of these teeth or verrucae on the superior margin of the carpal joint. Abdomen of the female, with the third, fourth, and fifth joints each armed with four tubercles, two in the middle and one on either side. These tubercles are sometimes seen also in the male abdomen, but less constantly than in the female. The color is much obscured, but appears to be, in living specimens, a dark neutral tint, mottled with greenish; fingers white. Length of carapax in the male, 0.43; breadth, 0.52 inch.

Found at Selio Island in Gaspar Strait, at the Island of Kikaisima, and on the shores of Kagosima Bay. At the latter place it occurred under stones, among boulders, in the middle divisions of the littoral zone.

#### 231. CRYPTODROMIA TUMIDA Stimpson

*Cryptodromia tumida* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 240 [78], 1858.

Carapax smooth, short-pubescent, convex, extremely tumid at the gastric and hepatic regions, the dorsum rising abruptly behind the front. The front is like that of *C. tuberculata*, but the lateral teeth (of the three interocular ones) are more prominent than the middle one. Antero-lateral margin with three small equal tuberculiform teeth besides the fourth or usual one at the lateral sulcus, which is much behind the third. One strong tubercle on the subhepatic region in the interval between the orbit and the first lateral tooth. One tubercle at the antero-lateral angle of buccal area. Chelipeds sparsely verrucose; three or four tubercles on the carpus; four on the hand above, two at the base, and two nearly obsolete at the juncture of the dactylus; outer surface of the hand smooth or with some longitudinal lines of obsolete granules. Fingers in the male very much gaping, touching only at the tips; in the females compressed and not gaping. Ambulatory feet of the first and second pairs irregularly protuberant, scarcely verrucose; upper margin of carpal joint on the inner side strongly convex and smooth. Abdomen of both sexes smooth, the tubercles, if any, being obsolete in our specimens. Color in preserved specimens yellowish; fingers crimson at the middle. Length of the carapax in the female, 0.38; breadth, 0.45 inch.

Found in Foukow Bay, on the northwest side of the island of Ousima.

282. **CRYPTODROMIA CANALICULATA** Stimpson

*Cryptodromia canaliculata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x., p. 240 [78], 1858.

Carapax convex, uneven, and distinctly channeled parallel to the frontal and antero-lateral margins, the channel being rather broad and rendered more conspicuous by being nearly destitute of the pubescence which covers the rest of the surface. Transverse sulcus deep between the gastric and cardiac regions. Front much projecting; median tooth and the two next prominent, acute; præorbital teeth much smaller and less prominent; external angle of orbit acute. Antero-lateral margin three-toothed, including the posterior or sulcus tooth; the first tooth is much the strongest and sharpest, and between this tooth and the angle of the orbit there is a ridge concave in outline. A strong concavity on the subhepatic region is well circumscribed by this ridge and another ridge, which extends between the strong subhepatic tooth and the second lateral tooth. The suborbital tooth is also very prominent. Feet much pubescent and stout-hairy; chelipeds nearly as in *C. tumida*, but with the longitudinal ridges on outer surface of hand more strongly defined; fingers much compressed. Ambulatory feet of the first and second pairs very angular and subverrucose, but not tuberculated; upper side of carpal joint depressed, almost concave. Abdomen smooth, that of the male with a deep sinus on each side at the penult joint. This species is of a dirty buff color. Length of the carapax in a female, 0.31; breadth, 0.36 inch.

One individual was found carrying upon its back a piece of seaweed (*Padina*); the others all used compound ascidians.

Inhabits rocky shores, among seaweeds, in the lowest division of the littoral zone. Taken in Gaspar Strait by Captain Rodgers; also at Loo Choo and Kikaisima by other members of the expedition.

Genus DROMIA Fabricius

This genus as restricted will contain those species like *D. vulgaris*, *D. rumphii*, and *D. lator*, in which the palate is smooth, and the sternal sulci of the female are not approximated, and produced only to the fourth sternal segment, between the bases of the second pair of feet. The carapax is transverse, convex, and pilose. The front is rather narrow and prominent. Hepatic regions not excavated. In

the external maxillipeds the palpus is inserted at the internal angle of the meros, the anterior margin of which is consequently transverse. The feet are of moderate size, with the meros-joint not dilated; fingers of the first pair with calcareous apices. The feet of the posterior two pairs are smaller and shorter than the rest, though about equaling each other in length. They have subcheliform extremities, the penult joint being armed with a spiniform process nearly as long as the minute sharp dactylus. The abdomen is unarmed; that of the male is rather narrow, with its penult joint contracted, appendages conspicuous.

The species are of large size, and the adult individuals do not appear to carry about with them any protecting body.

Found in the warmer seas of both oceans. Type, *D. vulgaris*.

### 283. DROMIA RUMPHII<sup>1</sup> Fabricius

PLATE XXI, FIG. 7

*Cancer dromia* LINNÆUS (?).

*Dromia rumphii* FABRICIUS, Suppl., 359. MILNE EDWARDS, Hist. Nat. des Crust., II, 174.

This large species is common on muddy bottoms in from four to ten fathoms in the harbor of Hongkong, China. In one of our specimens, a male, the carapax measures 3.4 inches in length and 4.05 inches in breadth. It is everywhere covered with a thick coat of short dark-brown hairs or bristles. The carapax beneath this coat is reddish. Fingers bare, red.

In De Haan's figure of this species (Fauna Jap., Crust., pl. xxxii) the penult joint of the male abdomen is represented of about the same breadth as the fifth and seventh, while in our examples it is considerably narrower. The first and second ambulatory feet are also shorter than he has figured them.

### Genus PSEUDODROMIA Stimpson

The carapax is narrow, much longer than broad, convex, and pubescent. In the specimen upon which the genus is founded the shell is but little indurated posteriorly. The facial region is more than half as wide as the carapax. Front triangular, very prominent, almost rostriform. The epistome or interantennular triangle is not soldered to the front as in allied genera. Palate armed with

<sup>1</sup> *Dromia dormia* (Linnæus).

ridges. In the external maxillipeds the external angle of the meros is obtusely rounded and the palpus rather large. The feet are similar to those of *Dromia* in character, but those of the fifth pair are of great length, longer than the second pair. For want of female specimens we cannot ascertain the character of the copulatory sulci. The male abdomen is unarmed, elongated, tapering to a point, with its joints all free; appendages of penult joint minute; terminal joint triangular, much longer than broad.

The narrow carapax and very long posterior feet will serve to distinguish this genus.

#### 284. PSEUDODROMIA LATENS Stimpson

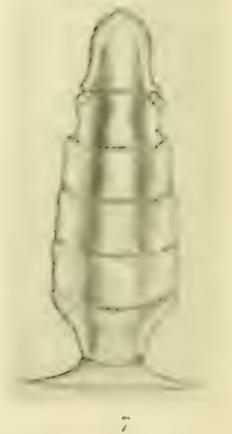
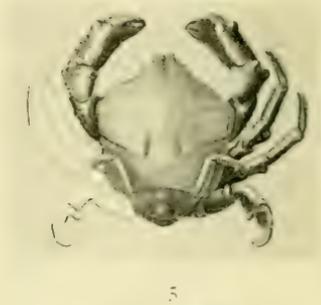
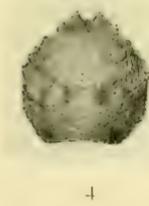
PLATE XXI, FIG. 3

*Pseudodromia latens* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 240 [78], 1858.

The description is drawn up from a single specimen, a male, perhaps young. The body is mostly covered with a short pubescence, becoming longer, however, on the edges of the feet. The back of the carapax is smooth and glabrous, in some parts nearly destitute of pubescence. Carapax elongated, contracted a little at the lateral sulci and at the facial region and dilated a little near the posterior extremity. Lateral margins smooth, no tooth even at lateral sulcus. Interantennary front very narrow, rostriform, triangular, deflexed; apex obscurely tridentate and setose. A slight angle, but no tooth over eye peduncle, and no tooth on the external or inferior side of the orbit. The hiatus of interantennular septum is very narrow, but extends all the way back, entirely disjoining the epistome from the front. Chelipeds smooth, rounded; fingers toothed as usual in *Dromia*, but very sharp. Ambulatory feet also smooth, their terminal nails very long and sharp. When folded the last pair of feet are thrown forward of the second pair, and reach quite to their extremities. The male abdomen is long and tapering, last joint with acuminate extremity. Color yellowish-white. Length of the carapax, 0.38; breadth, 0.27; length of posterior pair of feet, 0.39 inch.

This animal can draw itself deeply into its thin "jacket" or covering (a compound tunicary), and pucker up the aperture so as to be entirely concealed.

It was dredged in twelve fathoms on a sandy bottom in Simons Bay, Cape of Good Hope.



CRABS OF THE NORTH PACIFIC EXPLORING EXPEDITION



## Genus PETALOMERA Stimpson

The carapax in this genus is oblong or subovate, longer than broad, and with the exception of the epimera well indurated. The epimera, or sides beneath the lateral sulci, are membranaceous, being protected by the expansions of the meros-joints of the feet. The front is prominent and tridentate. Lateral margins convex, with no prominent angle. The facial region is sufficiently broad, with the antennæ closely packed and flattened on their outer sides, showing an even surface. Buccal area rather small, neatly filled by the external maxillipeds, and much broader anteriorly than posteriorly. Palate armed with ridges. Anterior margin of meros-joint of external maxillipeds oblique. The meros-joints of the anterior three pairs of feet are dilated above with rounded lamelliform expansions. The extremities of the fingers of the chelipeds are cochleariform and corneous. The posterior two pairs of feet are much like those of *Dromia*, the last pair longest.

## 285. PETALOMERA GRANULATA Stimpson

## PLATE XXI, FIG. 4

*Petalomera granulata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 240 [78], 1858.

Carapax convex, sparsely but conspicuously granulated. The lateral sulcus is situated at the posterior third of the length. Frontal median tooth inferior and very small; lateral ones very prominent; supraorbital tooth small; outer orbital fissure closed. Three small inconspicuous granulated teeth on the antero-lateral margin, between the scarcely prominent orbital angle and the lateral sulcus, the first one subhepatic. A small process on the second joint of the external antennæ. Feet all granulated except the posterior pair, which are smooth. Chelipeds granulated and crested; crest of carpus spinulose; a tubercle at the summit of the carpus and one at that of the hand. The fingers are short, not gaping, with a transverse or oblique ridge on the outer surface defining the corneous tips, and having some resemblance in the side view to the bill of the *Mormon*, or puffin. The superior margin of the lamellar dilatation in the meros-joints of the feet is smooth and sharp. Color in life orange, with reddish clouds. Length of the carapax in the male, 0.36; breadth, 0.33 inch.

Taken from a shelly bottom in twenty fathoms, in Kagosima Bay, Japan.

Genus CONCHÆCETES Stimpson

This genus is founded upon the old *Cancer artificiosus* of Herbst, which, like Guérin's *Hypoconcha*, uses a valve of the shell of some acephalous mollusk for its transportable covering and hiding place. Its posterior feet present, therefore, modifications specially adapted for securing this kind of habitaculum.

The carapax is depressed, subpentagonal in shape, and nearly naked. The dorsal sulci are conspicuous. Besides the usual sulci arising from postero-lateral notches, there is another, of considerable depth, extending from the antero-lateral corner of the carapax to the transverse gastro-cardiac suture. The front is rather narrow. The palate is armed with ridges. The feet of the fourth pair are robust, thicker than those of the second and third pairs, and nearly as long; the dactylus is large and hook-shaped, recurving upon an obtuse process of the penult joint at its base. The feet of the fifth or last pair are very slender, and their extremities are not subcheli-form, having only a minute, somewhat twisted dactylus. Our only female specimen is immature, but the sternal sulci seem to be like those of *Dromia* proper. The male abdomen is of moderate breadth, with the fifth and sixth joints apparently soldered together, although the commissure is distinct; appendages to penult joint rounded; terminal joint subcordate, as broad as long.

The only species known is an inhabitant of the East Indian seas.

286. CONCHÆCETES ARTIFICIOSUS (Herbst) Stimpson

PLATE XXI, FIG. 5

*Cancer artificiosus* HERBST, Naturg. d. Krabben und Krebse, III, 54, pl. LVIII, fig. 5.

*Conchæcetes artificiosus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 240 [78], 1858.

About one inch in length, of a light buff color above, with a little pale red on the posterior part of the carapax; beneath darker; fingers and dactyli of the feet reddish-white. Surface minutely pubescent. It is found in valves of *Cytherea*, etc.

Taken sparingly in eight and ten fathoms on the shelly bottom of the channel between Hongkong Island and the Chinese main.

## RANINIDEA

## Genus COSMONOTUS White

## 287. COSMONOTUS GRAYII Adams and White

*Cosmonotus grayii* ADAMS and WHITE, Voy. Samarang, Crust., p. 60, pl. XIII, fig. 3.

As this curious crustacean is not fully described in the work above cited, some of its more important characters will be noted here. The antennæ are nearly as in *Ranilia*. The eyes are seated at the extremities of very long compressed peduncles, somewhat dilated toward the base, and retractile backward into oblique orbits, reaching to the antero-lateral angles of the carapax at the level of the middle of the outer maxillipeds. The whole outer surface of these maxillipeds is squamose or roughened with arcuated and ciliated lineolæ; but there is no oblique ciliated crest on the ischium, as in *Ranilia* and *Notopus*; meros-joint as long as the ischium; exognath sufficiently broad and reaching a little beyond the tip of the ischium. Sternum, as in *Ranilia*, narrow between the bases of the second pair of feet. Last joint of abdomen in the female free.

The carapax was of a palish brick-red color in life, with a median line of white. Feet and inferior surface white.

Our specimen of this species was caught with the "deep-sea clams" on a sandy bottom in ninety fathoms, off the northeast extremity of Formosa, eighty miles from land.

## SCHIZOSOMI

## PORCELLANIDEA

## Genus PETROLISTHES Stimpson

Carapax depressed, subovate, not broader than long. Front triangular, with a more or less undulated margin, which may be either smooth or dentated. There is often a small tooth or lobe on each side at the base of the triangular main body of the front. Eyes rather large. The coxal joint of antennæ is small, not reaching the superior margin of the carapax, and often concealed beneath the corner of the subhepatic shield, but sometimes its inner angle is exposed in the form of a tooth beneath the eye. The movable part of the antenna is thus not excluded from the orbit, but works freely in

its external hiatus, coming in contact with the eye. The movable peduncle of the antennæ is more or less crested. The epimeral pieces of the carapax are posteriorly continuous and entire. Chelipeds broad and depressed. Dactyli of the ambulatory feet of the normal form—that is, short and robust—without supplementary unguicles.

The name *Pisidia* of Leach can properly be retained neither for *Petrolisthes* nor for *Porcellana* restricted, since Leach's genus was founded upon a purely fanciful character, and about half its species will go in one of those genera and half in the other.

The species of *Petrolisthes* are very numerous, inhabiting the tropical and temperate zones in both oceans. They are strictly littoral in station. The following species, heretofore described, may be classed here, *P. violacea* being considered the type:

*Porcellana violacea* Guérin.  
*valida* Dana.  
*rupicola* Stimpson.  
*elongata* M. Edw.  
*japonica* De Haan.  
*asiatica* Gray.  
*polita* Gray.  
*armata* Gibbes.  
*maculata* M. Edw.  
*lamarckii* M. Edw.  
*speciosa* Dana.  
*scabricula* Dana.

*Porcellana dentata* M. Edw.  
*tomentosa* Dana.  
*boscii* Savigny.  
*galathina* Bosc.  
*hirsuta* Gray.  
*edwardsii* De S.  
*tuberculata* Guér.  
*tuberculifrons* M. E. & L.  
*tuberculosa* M. Edw.  
*acanthophora* M. E. & L.  
*coccinea* Owen.

## 288. PETROLISTHES SPECIOSUS (Dana) Stimpson

PLATE XXII, FIG. 2

*Porcellana speciosa* DANA, U. S. Expl. Exped., Crust., I, 417, pl. xxvi, fig. 8.

*Petrolisthes speciosus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 241 [79], 1858.

This species in life is of a purplish or reddish-brown color above, with a bluish-white hoariness in old specimens. Beneath deep crimson. It is sometimes found of a much larger size than is mentioned by Dana; thus, in a specimen from Japan, the carapax measures 0.61 inch in length and 0.575 in breadth; the hand 1.05 in length. Most specimens differ somewhat from Dana's figure, as follows: The angles are less rounded and the carpus in the right cheliped has fewer teeth on the anterior margin, is not so closely serrated on the posterior margin, and is more prominent at the external angle.

It is very common on the shores of the Western Pacific, ranging in station from low-water mark to above half-tide level on rocky and stony ground. It was found by us in Kagosima Bay, at the Bonin Islands, at Ousima, and on the outer shore of Hongkong Island.

289. *PETROLISTHES PUBESCENS* Stimpson

PLATE XXII, FIG. 3

*Petrolisthes pubescens* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 241 [79], 1858

The carapax and feet are everywhere pubescent above. The margins of the feet, and particularly the outer margin of the hands, are densely ciliated. Carapax subovate, very slightly longer than broad, sides rounded, and not margined with an elevated line, but armed with a minute spine in the post-orbital sinus. Front somewhat trilobate; median lobe largest, rounded, and sufficiently prominent. Suborbital margin not deeply concave. Basal crest of outer antennæ much projecting. External apex of the ischium in the external maxillipeds not produced. The chelipeds above are nearly smooth beneath the pubescence, but in part minutely and sparsely spinulose; meros spinulose above; front margin of carpus five- or six-toothed, the tooth being alternately large and small, the large ones sometimes denticulated, inner tooth largest, no tooth on the part next the hand; a few spinules along the posterior side of the carpus; outer margin of the hand armed with ten small spines above the marginal series of cilia; superior edge of dactylus denticulated. Upper margin of the meros-joint in the ambulatory feet spinulose. Color above bluish-white, distantly and regularly spotted with purplish-brown, the carapax having four spots about the middle and others about the margin; feet each with four or five spots; beneath white. Length of carapax in the male, 0.31; breadth, 0.295; length of larger hand, 0.46; breadth, 0.19 inch.

Very near to *P. tomentosa* Dana (loc. cit., 1, 420, pl. xxvi, fig. 10), but the carapax is broader, with a more depressed and even surface; the outer margin of the hand is spinulose along the whole length; the outer maxillipeds are not smooth, but transversely lined, and the meros of the ambulatory feet is spinulose above for the whole length.

Found under large stones on the ocean shore of Foukow Bay, Ousima.

290. *PETROLISTHES HASTATUS* Stimpson

PLATE XXII, FIG. 4

*Petrolisthes hastatus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 241 [79], 1858.

Carapax above and posteriorly depressed and smooth, anteriorly and at the sides transversely striolated. Front triangular and prominent, with the longitudinal furrows sufficiently deep. Marginal lines not conspicuous; no spine behind the orbit. Crest of the basal joints of the outer antennæ prominent, bilobate; inner lobe acute, outer one rounded. Chelipeds regularly but not very strongly granulated above; posterior margin of carpus not spinulose, but produced into a rather long, curved spine at its outer extremity; anterior margin of carpus armed with three or four elongated but not very prominent teeth. Ambulatory feet hairy; meros sparsely spinulose above. Outer apex of ischium in the external maxillipeds not produced. Color olive, variable in depth in different individuals, and often minutely mottled with white. Length of carapax in the male, 0.47; breadth, 0.46 inch.

Found in a small harbor at Kikaisima; also at Ousima.

291. *PETROLISTHES JAPONICUS* (De Haan) Stimpson

*Porcellana japonica* DE HAAN, Fauna Japonica, Crust., 199, pl. I, fig. 5.

*Petrolisthes japonicus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 241 [79], 1858.

In life this species is of a dark olive color above and bluish-white below.

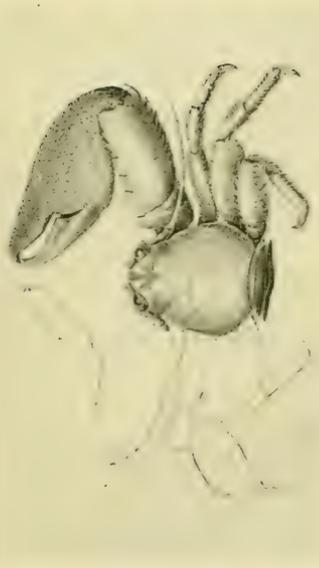
It inhabits the lower levels of the littoral zone, and occurred at Simoda in Japan, at the Bonin Islands, at Kikaisima, at the Amakirrima Islands, and at Hongkong, in China.

Genus *RAPHIDOPUS* Stimpson

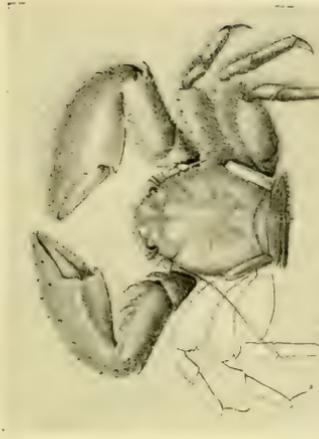
In this form, so distinct from the ordinary *Porcellana*, the carapax is rounded, broader than long, and a little projecting at the sides. The front is transverse, not prominent, and tridentate. The eyes are very small and deep-seated. The first or coxal joint of the external antennæ is very large, joining the superior margin of the carapax, and much produced, far removing the movable portion of the antennæ from the orbit. The external maxillipeds are of the usual form; the ischium, however, is short, very much dilated and



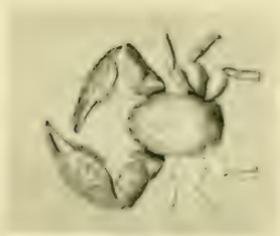
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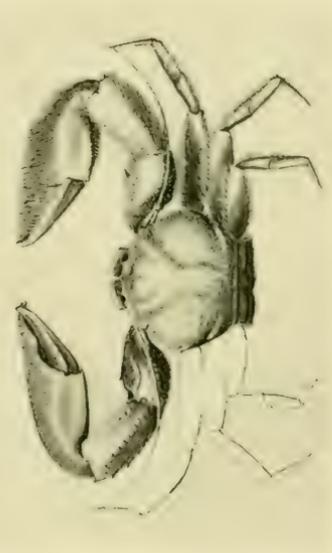
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rounded within, and its external apex is not produced. The chelipeds are not broad and depressed, but thick; the hands are about equal, but not large, so that they do not touch each other when the chelipeds are folded against the face. Finally the dactyli of the ambulatory feet are of a shape remarkably different from anything yet observed in the family; instead of the short, thick, curved form observed in all other genera, we have a straight, slender, elongated terminal joint shaped like a stiletto or a flattened needle, and sharply pointed, but without any indication of a distinct unguiculus. This form of feet is well adapted to the habits of the animal, enabling it to move with facility through the soft mud in which it lives.

It is an inhabitant of moderately deep water, and the only known species is found in the Chinese seas.

## 2 2. RAPHIDOPUS CILIATUS Stimpson

PLATE XXII, FIG. 5

*Raphidopus ciliatus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 241 [79], 1858.

Sides of the body and margins of the feet thickly ciliated with long, fine hairs. Carapax pubescent, somewhat areolated; surface a little uneven, and transversely rugate. Lateral margin strongly convex, with a fissure behind the base of the external antennæ, two small teeth or spines near the middle, and a spine on the posterolateral margin at the extremity of a short oblique ridge. Frontal teeth minute, the median one most prominent. Anterior margin but slightly sinuated at the orbits. Latero-inferior regions of the carapax strongly striated or longitudinally ridged, especially posteriorly; ridges few in number and subdistant. The external antennæ are four or five times as long as the carapax and folded backwards. Chelipeds large, angular, and very hairy; meros large, more than two-thirds as long as the carpus, roughened above and armed below with a single long, sharp, curved spine; carpus about two-thirds as long as the hand, roughened above, with a median longitudinal spinulated ridge, its anterior margin not dilated, slightly concave and serrulated; its posterior margin convex and armed with five spinules; smaller hand elongated, subtriangular, with three longitudinal obtuse ridges, minutely crenulated or spinulated, on the upper surface; fingers longer than the palm, not gaping, tips much curved, crossing each other, inner edges minutely denticulated but not toothed; inner edge of immovable finger slightly dilated. In the larger hand the dactylus is suberistate above, with a slightly promi-

ment tooth on the crest near the middle, and is armed with a tooth within near the base; the immovable finger bears a strong tooth at the middle of its inner edge. Ambulatory feet long, slender, slightly compressed; meros not dilated; dactyli as long as the penult joint, and slightly sulcated on one side toward extremities; dactylus of last pair of feet shorter than the others. Color white or pale yellowish-brown, obscured by sordes. Length of carapax in the female, 0.3; breadth, 0.39; length of hand, 0.5.

Taken abundantly with the trawl on a muddy bottom in six fathoms, in a bay on the coast of China opposite Hongkong.

### Genus PACHYCHELES Stimpson

This genus is readily recognized by its peculiar habit. Its form is less depressed than in *Petrolisthes*, and, while the carapax is smooth, the chelipeds are thick and coarse in appearance, short, and irregularly protuberant or granulated above. The carapax is rounded-ovate, at least as broad as long, with the lateral margins marked by an elevated line, the front somewhat deflexed, a little prominent at the middle, and subacute, but never dentated, with its apex concealed by pubescence. The epimeral pieces of the carapax are not soldered, but separated by membranaceous interspaces, the posterior square piece being particularly well defined. In this latter point this genus differs from all the others of the family. The first joint of the external antennæ is sufficiently well developed in its internal angle, touching, though not joining, the superior margin of the carapax, and excluding the movable portion from the orbit; it is, however, not produced outward or backward, as in *Porcellana* proper and allied genera. The carpus of the chelipeds is remarkably short and broad. Dactyli of the ambulatory feet normal in form.

The genus is littoral in its habits, and is an inhabitant of the temperate and warm-temperate zones in the Pacific and Indian Oceans.

*Porcellana grossimana* of Guérin may be considered the type of this genus, which also includes the *P. monilifera* of Dana and *P. natalensis* Krauss.

### 293. PACHYCHELES PECTINICARPUS Stimpson

#### PLATE XXIII, FIG. 5

*Pachycheles pectiniceps* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 242 [80], 1858.

Carapax broad, somewhat depressed in the middle, smooth and glabrous, but obsoletely striated toward the sides. Sinus of the posterior margin very shallow. Protogastric lobules sufficiently

prominent. Front little prominent, pubescent. Chelipeds granulated, not sulcated; larger granules sometimes obscurely arranged in rows; carpus much broader than long, with its anterior margin convex and pectinated with about eight small, equal spiniform teeth. Fingers of the larger hand gaping and pubescent within. This species is of a uniform cream color. Length of the carapax, 0.3; breadth, 0.345; length of greater hand, 0.37; breadth, 0.225 inch.

Found under stones on rocky ground in the third subregion of the littoral zone, on the shore of Ly-i-moon passage, near Hongkong, China.

#### 294. *PACHYCHELES STEVENSII* Stimpson

PLATE XXIII, FIG. 6

*Pachycheles stevensii* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 242 [80], 1858.

Carapax broad-ovate, smooth, not areolated, in the middle glabrous and punctate, at the sides slightly striated transversely, and anteriorly obsolete granulated. Sinus of the posterior margin shallow, broadly rounded. Front sufficiently prominent, triangular, slightly pubescent. Chelipeds robust, granulated. In the greater cheliped the meros is transversely striated above; the carpus broad and granulated, the granules unequal, the larger ones being sometimes arranged in more or less regular longitudinal rows; anterior margin of the carpus three-toothed, the teeth being prominent, truncated, and denticulated, and the inner tooth bifurcated; hand granulated, granules of the margins very prominent and lobulated; fingers not gaping; immovable finger triangular, a little pubescent within at the base; dactylus with marginal granules less prominent than those of the palm. In the smaller cheliped the anterior margin of the carpus is convex, prominent, and not deeply tridentate; the hand is longitudinally bisulcated on its upper surface, and the fingers are not tomentose. The ambulatory feet are provided with stout, short hairs; dactyli robust, with curved, almost hook-like extremities. Length of the carapax in the female, 0.5; breadth, 0.525; length of greater hand, 0.64; breadth, 0.36 inch.

Found on the west coast of Jesso by Capt. H. K. Stevens, of the steamer "J. Hancock."

Genus PORCELLANA Lamarck restricted

We have restricted the name *Porcellana* to that group which includes most of the old Lamarckian species, and of which *P. platycheles* may be considered the type. The carapax is generally longer

than broad, with the lateral margins more or less acute and projecting, never smoothly rounded. The front is large, prominent, and dented. The orbits are deep. The first joint of the antennæ is large, joining the superior margin of the carapax, projecting within in the form of a triangular tooth or point, and much produced outward, far removing the movable joints from the orbit. The chelipeds vary in form, being sometimes broad and depressed, and sometimes narrow with a contorted hand; the anterior margin of the short carpus is generally prominent or unilobate next its juncture with the meros. The dactyli of the ambulatory feet are of normal form, but generally rather longer than in allied genera.

A group of small species, with one of the hands much twisted and its fingers excavated, shows some other differences which serve to distinguish it from the typical group founded on the *P. platycheles* and similar forms. They might form a distinct genus (to which the name *Streptocheirus* would be applicable), but they are so intimately connected with the others in the more essential characters that it is thought best not to separate them here.

The geographical range of the genus is wide, as it seems to be represented in all seas of the temperate and torrid zones. It is the only genus of its family which occurs in the European waters.

The following known species belong to this genus:

*Porcellana platycheles* Lamk.

*sayii* Gray.

*pilosa* M. Edw.

*ocellata* Gibbes.

*longicornis* M. Edw.

*Porcellana dehaani* Krauss.

*armata* Dana.

*spinifrons* M. Edw.

*suluensis* Dana.

### 295. PORCELLANA ORNATA Stimpson

*Porcellana ornata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 242 [80], 1858.

Carapax subovate; surface anteriorly areolated; protogastric and hepatic lobules particularly prominent. Lateral margins obsoletely 2-3-denticulated. Supraorbital margins deeply excavated. Frontal region with a deep median sulcus. Front with a large median triangular tooth with concave sides; margins minutely serrated or denticulated. Chelipeds moderately broad and flat, nearly equal, sculptured above with ridges, somewhat irregularly tuberculated; beneath obsoletely and distantly squamulated; carpus oblong, quadrate, with two longitudinal granulated ridges on its surface, and with its anterior margin straight and smooth except at its inner extremity, where there is a small denticulated lobe; posterior margin of the

carpus denticulated; hand broad and flat, not twisted, with a rather prominent median ridge and an acute, smooth, ciliated outer margin; fingers short, not gaping; dactylus a little longer than the other finger. Ambulatory feet somewhat hairy. Length of the carapax in the male, 0.26; breadth, 0.235; length of hand, 0.36; breadth, 0.18 inch.

Found at Hongkong, China.

296. *PORCELLANA SERRATIFRONS* Stimpson

PLATE XXIII, FIG. 2

*Porcellana serratifrons* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 242 [80], 1858.

Carapax scarcely convex, nearly smooth, glabrous, occasionally pubescent in parts, anteriorly contracted, posteriorly broadly rounded, and slightly striated towards the sides. Lateral margin acute, turning inwards a little on the surface of the carapax at the lateral notch. There is a small, sharp spiniform tooth at the middle of the lateral margin, and sometimes a minute one in front of it, a spine over the insertion of the external antennæ, and another minute one just behind the external angle of the orbit, which is acute. Beneath this angle there is another spine. Front tridentate; teeth prominent, triangular; middle tooth largest, but not much more prominent than the others; margins minutely serrated. The bases of both pairs of antennæ are spinuligerous. Latero-inferior or epimeral regions of the carapax strongly striated. Outer maxillipeds transversely striated; meros longer than the ischium. Chelipeds of the male glabrous, punctated; angle of the meros prominent, minutely bidentate; carpus three-toothed on each side, with the teeth small, the terminal ones of the series acute; anterior margin of the carpus sometimes five-toothed; hand with the median angular ridge generally little prominent and obtuse; fingers twisted into nearly vertical plane, and pilose within. Smaller hand less twisted than the larger one; its outer margin spinulose; extremity of immovable finger deeply bifid. Hand of the female pubescent externally and with its median ridge tuberculated. Color in life grayish-brown; anterior part of carapax, and sometimes the chelipeds, mottled with dark blood-red. Length of the carapax in the male, 0.32; breadth, 0.32; length of greater hand, 0.53; breadth, 0.19 inch.

Dredged in the circumlittoral zone in the harbor of Hongkong.

297. *PORCELLANA DISPAR* Stimpson

PLATE XXIII, FIG. 3

*Porcellana dispar* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 242 [80], 1858.

Carapax somewhat uneven, but glabrous; sides pubescent; lateral margin acute, forming a prominent angle and turning inward a little just behind the lateral notch, and armed with some minute teeth near the middle; a small tooth or spine above at the insertion of the second joint of the antennæ. Orbital margin less concave than in most species. The front, as seen from above, is straight or slightly convex, but in the front view is seen to be acutely sinuated or deflexed at the middle. Chelipeds very unequal, the greater one with a smooth surface; carpus angular or ridged in the middle and with its anterior margin undulated; hand broad, smooth, not twisted, naked, fingers punctate; dactylus curved, one-toothed within. In the small cheliped the median ridge of the carpus is prominent and its anterior margin bidentate; the hand is very angular, with median ridge acutely prominent, the outer margin pubescent and the fingers twisted into a vertical plane, much curved, excavated and lanose within. Color in life pale brick-red; fingers dark purplish. Length of carapax in the male, 0.24; breadth, 0.22; length of greater hand, 0.38; breadth, 0.18; length of smaller hand, 0.29; breadth, 0.1 inch.

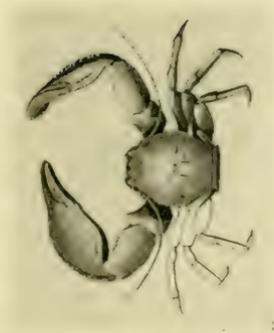
Found under stones in the fourth subregion of the littoral zone at Garden Island, in Port Jackson, Australia.

298. *PORCELLANA LATIFRONS* Stimpson

PLATE XXIII, FIG. 4

*Porcellana latifrons* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 243 [81], 1858.

Carapax subquadrate, longer than broad, slightly convex, smooth; lateral margins acute, but not projecting, and armed with three or four minute spines near the middle, and a larger spine, very sharp and directed forward, above the insertion of the external antennæ. Surface at the frontal region minutely rugate, rugæ transverse. Front very broad, projecting, laminiiform, trilobate; median lobe largest, quadridentate, and scarcely more projecting than the lateral lobes, which are bidentate; thus the entire frontal margin is eight-toothed; teeth acute. Eyes large, directed sideways. First joint of external antennæ much produced; flagellum nearly naked. External



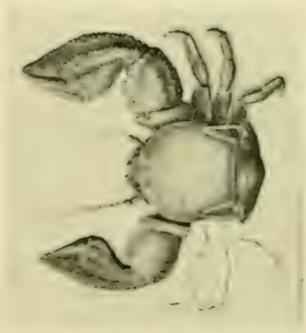
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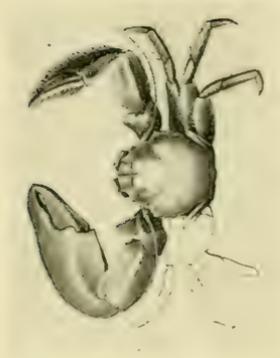
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maxillipeds rather long and slender. Chelipeds nearly smooth, minutely reticulated above; carpus large, with the front and back margins each armed with three small teeth; palm of the hand with a row of little spines contiguous to the margin; fingers twisted into an almost vertical plane, and tomentose within; fingers of the larger hand each one-toothed within; those of the smaller hand excavated. The color in life is very variable; it is generally dark greenish, often brownish maculated with white. Length of carapax in the male, 0.25; breadth, 0.22 inch.

This species is very closely allied, if not identical, with the *P. armata* of Dana, 1852 (not of Gibbes, 1850), but appears to differ in its broader front, the middle portion of which is quadridentate and its upper surface not so deeply concave.

Found among net-weed on a sandy bottom in three fathoms, in the strait between the islands Katonaisima and Ousima; also on madrepores taken at one fathom depth on the east side of Hong-kong.

#### 299. PORCELLANA STREPTOCHELES Stimpson

PLATE XXIII. FIG. 1

*Porcellana streptocheles* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 243 [81], 1858.

Carapax regularly though very slightly convex; surface glabrous, obsoletely striated, nearly smooth, but scarcely even, the proto-gastric globules being sufficiently prominent. Lateral margin convex, acute, and irregularly denticulated in the middle, two of the little teeth being larger than the rest. The front is neither broad nor prominent, but deeply tridentate; teeth acute; middle tooth deflexed and slightly larger, but no more prominent than the lateral ones, and bearing a slight tooth or angle on each side; lateral teeth sharply triangular. Eyes small. Latero-inferior regions of the carapax longitudinally striated. External maxillipeds slender; ischium small. Chelipeds large, unequal; tooth or summit of meros very prominent; carpus smooth, with the front and back margins each obsoletely 2-3-toothed; smaller hand with a median longitudinal ridge or angular prominence, outer margin obsoletely denticulated, pincers twisted into a vertical plane, broadly excavated and pilose within; extremity of immovable finger emarginated. In the larger hand the dactylus is oblique, shorter than the other finger and bidentate within; immovable finger unidentate within; tips curved. The meros-joints of the ambulatory feet are slender, and almost smooth on the superior margin.

This species, when living, is of a deep blood-red color, which is seen under the lens to consist of crowded dots or punctæ, less numerous on the dorsal surface, where it is consequently lighter. Length of the carapax in the male, 0.23; breadth, 0.215; length of greater hand, 0.39; breadth, 0.16 inch.

This species is common in from six to twelve fathoms on sandy bottoms in Simons Bay, Cape of Good Hope.

It differs from *P. dehaani* Krauss, also from the Cape, in its naked carapax, broader front, with a less prominent median tooth, and non-denticulated superantennary margin.

### 300. PORCELLANA PULCHRA Stimpson

PLATE XXII, FIG. 1

*Porcellana pulchra* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 243 [81], 1858.

Carapax rather convex, with an even surface, apparently smooth, but seen on close examination to be for the most part minutely and closely lineolated in a transverse direction. Lateral margin regularly though slightly convex, expanded with a reflexed laminiform crest. Front very much projecting and laminiform, tridentate; median tooth much the largest, triangular, and acutely pointed; lateral teeth small, acute. External angle of the orbit acute, minutely serrated. Flagellum of external antennæ almost naked, joints oblong. Latero-inferior regions somewhat concave. Chelipeds rather small and slender; angle at summit of meros very prominent; upper surface of carpus and hand with a median longitudinal ridge; a single tooth on the front margin of the carpus; hand triangular, slender at the base, its outer margin nearly straight, acute, ciliated, inner margin forming a ridge continuous with that of the dactylus. Ambulatory feet sparsely provided with plumose setæ; meros minutely serrulated above; dactylus half the length of the penult joint. The meros-joint of the posterior or abnormal feet is short. The colors in life are as follows: Carapax bluish-brown, often with a white median dorsal line; feet brownish clouded, darkest at the middle of each joint; basal joints white. Length of carapax in the female, 0.24; breadth, 0.23. Only two specimens were found, both females.

Dredged from a muddy bottom in six fathoms, in Hongkong Harbor.

Genus PORCELLANELLA White

In the genus for which we have retained the above name, because White's typical species *P. triloba* belongs to it, the body is generally

naked, with a polished and elegantly colored surface. The carapax is considerably longer than broad, with parallel sides. The gastric lobules are not perceptible. The front is horizontal, continuous with the upper surface of the carapax, laminiiform, much projecting and tridentate. The external antennæ are similar to those of *Porcellana* proper in the character of the basal joints. The scaphognath of the external maxillipeds is dilated externally at the base, and attenuated toward the extremity. The chelipeds are smooth, with unarmed margins; carpus very short; hand sufficiently elongated. The ambulatory feet are small, with a thick meros-joint and a short, compressed multiunguiculate dactylus.

These animals are parasitic in their habits, the armature of the dactyli of the ambulatory feet enabling them to cling firmly to the zoöphyte upon which they live. This form of dactylus seems to be indicative of a lower grade, being commonly seen in *Galathea* and some *Macroura*, but never seen among the *Brachyura*.

The genus inhabits the warm eastern seas, in water of moderate depth.

### 301. PORCELLANELLA PICTA Stimpson

#### PLATE XXII, FIG. 6

*Porcellanella picta* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 243 [81], 1858.

Carapax oblong, depressed, smooth and even, glabrous, faintly striated anteriorly and at the sides. Lateral margin scarcely acute, but distinct, with the epimeral suture running close beneath it. Front laminiiform, tridentate, teeth acute, median tooth much larger and more projecting than the lateral ones. Surface of the frontal region transversely striated. External antennæ more than twice as long as the carapax; coxal joint acutely prominent at its inner angle. Epimera or latero-inferior regions of the carapax obliquely striated. Chelipeds rather slender, sufficiently thick, somewhat rounded, smooth, and glossy like the carapax; anterior angles of ischium and meros produced, acute; carpus small, with smooth margins; hand elongated, contracted at the base, and ornamented within by a line of pubescence extending longitudinally from between the bases of the fingers to the middle of the palm; fingers slender, tapering and irregularly curved, as if distorted; dactylus of larger hand much shorter than the immovable finger. Ambulatory feet small, smooth, glossy, almost naked; inner edge of dactylus armed with four sharp unguicles, the middle one largest. In the terminal joint of the abdo-

men the central triangular piece is small, while the lateral pieces are very large. The color in life is white, with a few large, blue, margined spots or ocelli on the hands and the anterior portion of the carapax. Length of the carapax in the male, 0.425; breadth, 0.34; length of greater hand, 0.59; breadth, 0.2 inch.

This species is found in considerable numbers hiding between the leaves of the common *Pennatula* on muddy bottoms in six fathoms, in the bays opposite Hongkong, China.

### Genus POLYONYX Stimpson

This genus is closely allied to *Megalobrachium* in form and general appearance, but differs in the character of the terminal joints of its feet and its habits. It also resembles *Pisosoma*, but may be distinguished by the enlargement of the coxal joint of the antennæ.

Carapax rounded-oval, as broad as or broader than long, convex, and smooth. Sides strongly convex and obtuse. Front rather narrow, straight, and not prominent. Eyes minute. First joint of antennulæ not toothed, but flattened or truncate at the outer surface. Coxal joint of antennæ as in *Porcellana*, etc., but very much elongated. Chelipeds smooth; meros-joint large. When the chelipeds are folded or retracted the hands do not touch each other. The dactyli of the ambulatory feet are very short and broad, rounded and armed with two or more unguicles on the inner edge.

The typical species of this genus, *P. macrocheles* (Gibbes), is known to be parasitic, living in the tubes of large worms. The habits of the other two species, *P. biungulatus* and *sinensis*, are not certainly known, but are probably similar. They inhabit sandy or muddy places, sometimes above low-water mark, but often in water of considerable depth. Found in the warm parts of both oceans.

### 302. POLYONYX SINENSIS Stimpson

PLATE XIX, FIG. 5

*Polyonyx sinensis* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 244 [82], 1858.

Carapax convex, of a subquadrate form, with the corners rounded; surface smooth, but faintly striated near the margins. Front rather broad, scarcely perceptibly convex. Chelipeds very unequal, smooth, and glossy; in the larger one the meros is more than one-half as large as the carpus, and not dilated anteriorly; carpus almost as long as the hand, with its anterior margin expanded into a laminiform

dilatation, broadest toward the hand; hand thick, short-ciliated exteriorly, and with a few hairs about the middle within; fingers short, slightly unidentate within, tips curved; dactylus shorter than the immovable finger. Ambulatory feet slender, naked; one or two small spinules on the inferior edge of the penult joint; dactyli with one or two minute unguicles besides the principal one. In life this species is of a clear, pale bluish-gray color, with large spots of a neutral tint or sepia color. Length of the carapax in the male, 0.15; breadth, 0.2; length of the larger cheliped, 0.52 inch.

It was dredged from a bottom of shelly sand in twenty-six fathoms, in the China Sea, under the twenty-third parallel of north latitude.

### Genus REMIPES Latreille

#### 303. REMIPES TESTUDINARIUS<sup>1</sup> Latreille

##### PLATE XIX, FIG. I

*Remipes testudinarius* LATREILLE, Gen. Crust. et Ins., v, 1, p. 45. MILNE EDWARDS, Illust. Cuv. R. A., Crust., pl. XLII, fig. 1.

Our specimens are broad and depressed, with a single row of ciliated pits or impressed lineolæ along the postero-lateral margin. Color above bluish-gray, minutely clouded; below white. We figure one of our specimens, in order to indicate with more certainty the species we have in hand, which we cannot certainly identify with *R. testudinarius*, a species known to us only from the descriptions and figures of European authors, who do not always agree in their statements with regard to it. The figure in the "Règne Animal," referred to above, is a good representation of the largest of our specimens. But Milne Edwards gives Austrália as the habitat of the species.

The expedition specimens were found on the sandy shore of a bay on the eastern side of the island of Ousima.

### Genus MASTIGOPUS Stimpson

This genus is remarkable for the form of its anterior feet (for which the name chelipeds would here be inapplicable), which resemble more antennæ than feet, as seen in other genera of Decapoda. It is allied to *Remipes* in form and general character, but the body is more slender. The carapax is elongated and toothed at the

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<sup>1</sup>*Hippa adactyla* Fabricius.

antero-lateral margins. The front is tridentate. The antennæ are short, as in *Remipes*. The antennulæ are also short, with the inferior flagellum very small, almost rudimentary. The external maxillipeds are nearly as in *Hippa*, with exarthroid palpus; the apex of the meros-joint is, however, truncated. In the anterior feet the basal or peduncular joints resemble those of *Hippa* and *Remipes*, but the terminal joint is flagelliform—that is, long, slender, and multiarticulate. The ambulatory feet and the abdomen resemble those of *Remipes*, but the external lamella, in the appendages to the penult joint, is much shorter than the internal one.

304. *MASTIGOPUS GRACILIS*<sup>1</sup> Stimpson

PLATE XXI, FIG. I

*Mastigopus gracilis* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 244  
[82], 1858.

Carapax strongly convex in its transverse outline; surface even, but scabrous with asperities, which consist of short transverse impressed lines, minutely setose, and most strongly marked anteriorly. Front with three sharp teeth, median one triangular and nearly as prominent as the lateral ones, which are long, slender, and acute. Antero-lateral margin armed with six subspiniform teeth, the anterior one longest, the rest progressively diminishing. Eyes very long and slender, more than half as long as the antennulæ, which are one-third as long as the carapax. External maxillipeds oblong, nearly rectangular, half as broad as long; their surface flat and nearly smooth, glabrous, with a few scattered punctæ. The basal or peduncular joints of the anterior feet are short, smooth, and nearly naked; penult and antepenult cylindrical; terminal segment or flagellum longer than the carapax, and consisting of twelve elongated joints, with a ring of long setæ at each articulation. Ambulatory feet moderately hairy. Terminal joint of the abdomen lanceolate, thick, with two longitudinal ridges or angles at the base and a deep median sulcus toward the extremity, which is acuminate. The colors in life are as follows: Carapax dark olive, becoming paler at the middle, and brownish at the margins. Front often reddish. A white band crosses the carapax at its posterior extremity. Abdomen bluish, with transverse lead-colored bands at the middle segments. Members all white, with the exception of the external antennæ, which are pale blue. Body beneath, white. Length of the carapax

<sup>1</sup> *Mastigochirus gracilis* Stimpson.

in the male, 0.52; breadth, 0.36; length of the anterior feet, 1.05 inches.

This curious animal was found somewhat abundantly in the sandy bottom of the China Sea, at the depth of twenty fathoms, under the twenty-third parallel of north latitude.<sup>1</sup>

## LITHODIDEA

### Genus ECHINOCERUS White

#### 306. ECHINOCERUS CIBARIUS<sup>2</sup> White

*Echinocerus cibarius* WHITE, Proc. Zoöl. Soc., 1848, p. 47, Annulosa, pls. II, III. STIMPSON, Crust. and Echin. Pacific Coast of N. America, p. 36, Bost. Jour. Nat. Hist., VI.

*Lopholithodes mandtii* BRANDT, Bulletin physico-mathém. de l'Acad. de St. Pétersb., VII, 174.

Specimens of this species were presented to Lieutenant Gibson at Sitka for the expedition.

#### 307. ECHINOCERUS SETIMANUS<sup>3</sup> (Gibbons) Stimpson

*Ctenorhinus setimanus* GIBBONS, Proc. Cal. Acad. Nat. Sci., I, 48.

*Echidnocerus setimanus* STIMPSON, Crust. and Echin. Pacific Coast of N. Am., p. 37, Bost. Jour. Nat. Hist., VI.

This species, if distinct, differs from the preceding only in the obtuseness of its dorsal and lateral tubercles.

Two specimens were purchased in the market of San Francisco, Cal. They are obtained rarely in deep water near the Farallone Islands, and so strange are they in appearance that the fishermen always obtain a good price for them as "curiosities."

### Genus HAPALOGASTER Brandt

This genus was first instituted by Brandt in the Bulletin of the St. Petersburg Academy for a Sitka species, *H. mertensii*. He does not allude to the *Lomis dentata* of De Haan, which is evidently congeneric. It is distinguished from *Lomis* and *Dermaturus* by the

<sup>1</sup> 305. HIPPA ANALOGA Stimpson

Not mentioned in the manuscript of this report.

<sup>2</sup> *Lopholithodes mandtii* Brandt.

dilatation of the last two joints of the external maxillipeds. The abdomen, as described for *H. mertensii*, is in some points different from that of *H. dentatus* and *H. cavicauda*, in which two species it is more nearly as described for *Dermaturus*. Although the greater part of the abdomen in the male is soft and coriaceous, yet the segments can be traced, and each segment is indicated by a small, round, indurated piece on each side. The female abdomen is unsymmetrical, as in *Lithodes*, with its segments on the left side a little indurated, corneous, and smooth.

This genus is peculiar to the Northern Pacific Ocean.

308. **HAPALOGASTER DENTATA**<sup>1</sup> (De Haan) Stimpson

*Lomis dentata* DE HAAN, Fauna Japonica, Crust., 219, pl. XLVIII, fig. 2.

*Hapalogaster dentata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 245 [83], 1858.

The flat lanceolate acicle or movable scale of the external antennæ is regarded as a spine in De Haan's description. The median frontal tooth is subspiniiform in the adult, but broader and blunter in the young. The color in life is dark reddish brown.

It is extremely abundant on the shores of Hakodadi Bay, Island of Jesso, inhabiting weedy and stony shores just above low-water mark. It also occurs at Simoda.

PAGURIDEA

Genus CENOBITA Latreille

309. **CENOBITA PURPUREA** Stimpson

*Cenobita purpurea* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 245 [83], 1858.

Carapax convex, strongly swollen or tumid just behind the front, which is contracted. The surface of the anterior or gastric region is sparsely granulated anteriorly; posteriorly the granules become more numerous, sharp, and setigerous. Branchial regions not much projecting, their lateral margins nearly straight. Eyes much projecting, minutely granulated above, and with the apex sharply projecting, forming a right angle. Ophthalmic scales sharp, not denticulated. Feet moderately hairy on the edges, and thickly hairy below toward their extremities. The upper surfaces of the feet are

<sup>1</sup> *Lomis dentata* De Haan.

mostly smooth and glabrous, except toward their edges and extremities, where they are sharp-granulated or short-spinulose. The larger hand is thus granulated, the granules being very small, with sharp black apices; they are numerous above and on the fingers, but sparsely distributed on the outer surface. The dactyli of the ambulatory feet are spinulose and hairy; those of the right side are somewhat flattened, but not angular. In the third foot of the left side the carpal joint is produced at the inferior angle; and the last two joints are depressed externally, but not flat, and have a smooth punctate surface; the dactylus is convex and spinulose within. The processes from the coxæ of the fifth pair of feet in the male are very much produced, that on the right one being longest and equaling in length the fourth pair of feet.

This species is of a deep purple color, inclining to blue, rarely dark olive. The posterior part of the carapax is lighter, with four longitudinal mahogany-colored stripes, the two inner ones forming a lyre-shaped mark. Teeth of the inner surfaces of the fingers white. Length of the animal, 4 inches; length of the carapax, 1.5; of the gastric or anterior region, 0.96; breadth of the front, 0.31; greatest breadth, across branchial regions, 0.87 inch.

It differs from *C. perlata*, as figured by Milne Edwards in the illustrations to the "Règne Animal," and as described by De Haan, in the smooth external surface of the last two joints of the third foot on the left side, and in its more hairy feet. The apex of the left-hand male organ, or coxal process of the last pair of feet, is scarcely *truncated*, as described by De Haan for *C. perlata*, but is deeply excised on the outer side of the apex, as if a square piece had been cut out.

Found in considerable numbers at the Bonin Islands, on the sides of the hills surrounding Port Lloyd. It was also taken at the Amakirrima Islands by Mr. Squires.

### 310. CENOBITA RUGOSA Milne Edwards

*Cenobita rugosa* MILNE EDWARDS, Hist. Nat. des Crust., II, 241. DE HAAN, Fauna Jap., Crust., p. 212. DANA, U. S. Expl. Exped., Crust., I, 471, pl. XXX, fig. 1.

*Cenobita clypeata* OWEN, Zool. of Beechey's Voy., p. 85, pl. XXV, fig. 1.

Of an olive color in life. Anterior part of carapax with four brownish spots. A longitudinal median line of brown on the second joint in each foot. The front of the larger hand and the outer surface of the third foot of the left side are pale red.

Taken by us at the Bonin Islands and at Tahiti.

## 311. CENOBITA CAVIPES Stimpson

*Cenobita cavipes* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 245 [83], 1858.

Anterior region of the carapax scarcely longer than the posterior. Branchial regions slightly concave in the lateral margins, but strongly projecting at the posterior angles. Surface of the anterior region almost flattened, smooth and punctate in the middle, but scabrous toward the sides and hairy near the margins. Frontal lateral teeth sharp, apiculated, and placed a little within the lateral extremities of the front. Eyes long, compressed, and scabriculous above; apices bluntly rounded; cornea projecting a little beyond the extremity of the superior process of the peduncle. Ophthalmic scales with acute apices and entire margins. Feet nearly naked, above nearly smooth, but spinulose toward their extremities. Greater hand granulated above and for a short distance on the outer surface, but perfectly polished on the mahogany-colored area below. The granules are white, oblong, flattened, and placed three or four diameters distant from each other; those of the superior margin of the hand are apiculated in black at the distal extremity. Dactylus of the third foot of the right side nearly cylindrical, not at all angular. Third foot of the left side angular; penult joint with its upper surface flat and horizontally dilated outward toward the juncture of the dactylus, forming a prominent ridge, its outer surface anteriorly smooth and a little concave, posteriorly convex and minutely granulated; its lower margin anteriorly convex, posteriorly concave; dactylus quadrangular, on the outer surface smooth, and deeply concave toward the base, above flattened, and within flattened or concave between the ridges, which are spinulose. Posterior coxæ of the male not produced. Length about three inches. Length of the carapax, 0.95; length of gastric region, 0.5; breadth of front, measured between tips of lateral spines, 0.22; greatest breadth, across branchial regions, 0.66 inch.

This is perhaps the same as *C. compressa* De Haan (l. c., p. 213), but the upper and outer surface of the hand is hardly "tenuissime granulato." The lateral margins of the branchial regions are not convex, as described for *C. compressa* of Milne Edwards. From *C. rugosa* it differs in the coxæ of the posterior feet of the male, which are not produced.

Found at Loo Choo, in groves near the seashore, in company with *C. rugosa*.

## Genus DIOGENES Dana

We submit the following amended character of this genus:

Ophthalmic ring exposed between the bases of the eye-peduncles, and armed with a bracteole which is often produced and rostriform. Aciculum or basal scale of the external antennæ broad at the base and sometimes bifid; flagellum ciliated. Chelipeds unequal, the left larger, with the commissure between carpus and hand vertical and marginal; hand short and broad, oblique; the fingers oblique, with calcareous, acuminate tips. Dactyli of the second and third pairs of feet long.

The species are inhabitants of the warmer seas, and are most numerous among the Asiatic islands. The following is a list of the species already known:

<i>D. miles</i> Dana	<i>D. spinifrons</i> (De Haan) Stm.
<i>custos</i> Dana	<i>edwardsii</i> (De Haan) Stm.
<i>diaphanus</i> (Fabr.) Stm.	<i>arenarius</i> (Lucas) Stm.

## 312. DIOGENES CUSTOS (Fabricius) Dana

*Pagurus custos* FABRICIUS, MILNE EDWARDS, Hist. Nat. des Crust., II, 236.  
*Diogenes custos* DANA.

Taken at Port Jackson, Australia.

## 313. DIOGENES BREVIROSTRIS Stimpson

PLATE XIX, FIG. 2

*Diogenes brevirostris* STIMPSON, Proc. Acad. Nat. Sci. Phila., X, p. 245  
[83], 1858.

Carapax much smoother than in *D. custos*, but somewhat roughened at the sides. Lateral margin of the anterior region armed with five or six spinules. Ophthalmic rostrum smooth, and much shorter than the ophthalmic scales. The eyes, ophthalmic scales, and acicles are nearly like those of *D. edwardsii*. The teeth or points of the frontal margins are all obtuse; the lateral ones most prominent. Great cheliped naked, roughened above with minute subspiniform granules; below glabrous, but obsoletely granulated; superior margin of carpus and hand serrated with small teeth, ten in number, on the carpus; hand with an oblique, infero-posterior crest on the outer surface, armed with seven or eight small spines; inferior margin of hand sharp-granulated; dactylus longitudinally costate above, costæ granulated. Right or smaller cheliped hairy; carpus grooved above.

and with its superior margin armed with sharp spines. Ambulatory feet slender, overreaching the chelipeds; antepenult joint with denticulated margin; penult nearly smooth above; dactylus hairy, compressed, and, as usual, sulcated. Length, 1.25; length of carapax, 0.29; breadth of front, 0.135; length of great cheliped, 0.45 inch.

From *D. custos*, which it resembles in the character of the greater cheliped, this species differs in its shorter rostrum and the smooth superior surface of the penult joint of the ambulatory feet.

Dredged in twelve fathoms on a sandy bottom in Simons Bay, Cape of Good Hope.

### 314. *DIOGENES EDWARDSII* (De Haan) Stimpson

PLATE XXIV, FIG. 1

*Pagurus edwardsii* DE HAAN, Fauna Jap., Crust., 211, pl. 1, fig. 1.

*Diogenes edwardsii* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 246 [84], 1858.

The ophthalmic rostrum is minute and very narrow, scarcely perceptible to the naked eye. The acicle is short, triangular, and spinulose. Genital apertures of the male on the inner surface of the coxæ. In living specimens the carapax was of a pale red color; feet annulated with pale reddish brown; larger hand white; abdomen yellow, with pale-red sides. Our largest specimen is one and one-half inches in length.

In De Haan's figure the dactyli of the ambulatory feet are represented too short and very much too broad; they are in reality very long and slender, one-half longer than the penult joint.

In this species we have another instance of the economic relation which we so often see existing between a crustacean and a polyp. Upon the outer surface of the greater hand, in all the specimens we have seen, there is seated a small species of actinian. That this is not accidental, we infer, not only from the occurrence of the polyp upon all our specimens of the crab, and its non-occurrence elsewhere; but from the fact that there is a special adaptation of the outer surface of the hand to receive such a parasite; it has a smooth, oval area occupying two-thirds of the surface, and partly surrounded by an elevated ridge. The polyp undoubtedly derives much advantage from this position, so near the food-seizing members of the crab—certainly enough to compensate for any hard knocks its tough body may receive; but what advantage may inure to the crab is here less perceptible than in the case of *Cancerisocia* and *Dorippe*. The surface of the claw to which the polyp is at-

tached appears to be as hard as the rest, and in no need of extraneous protection.

This species is not uncommon in the China Sea, beneath the twenty-third parallel of north latitude, where we obtained several from a sandy bottom in twenty to thirty fathoms. It also occurred at Hongkong.

### 315. *DIOGENES PENICILLATUS* Stimpson

*Diogenes penicillatus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 246 [84], 1858.

Anterior part of the carapax smooth in the middle, but toward the sides roughened with irregular scale-like projections, the edges of which are serrated and minutely setose. Lateral teeth or points of the front acuminate, and more prominent than the middle one, which is obtusely rounded. The movable or ophthalmic rostrum is small, spiniform, and very acute, reaching scarcely to the extremity of the ophthalmic scales. Eyes in length equaling about two-thirds the width of the front, reaching a little beyond the extremity of the penult joint of the peduncle of the antennæ, and much beyond the acicle; cornea not dilated. Ophthalmic scales broad, with the external margin arcuated, and the apex 2-3-spinulose. Acicle elongate-triangular, armed on the inner side with six or seven aculeiform spines. Flagellum of the antennæ ciliated below. Left cheliped stout and broad, shaped much as in *D. edwardsii*, and shorter than the ambulatory feet; all three edges of the meros-joint crenulated; carpus and hand sharp-granulated on the outer surface, and covered with flattened granules on the inner surface; carpus armed with a spine at the superior and one at the inferior apex, and with its upper margin 10-12-denticulated; hand oblique, with two parallel rows of small teeth or spines above, one at the margin, the other just below it on the outer surface. The outer or perpendicular surface of the hand is thickly penicillate with fine silky hair, equaling in length about the thickness of the hand, the penicillated area being defined posteriorly by a transverse spinous crest, which separates it from a smooth, naked groove at the juncture of the carpus. The dactylus of this cheliped is like the hand, armed with short spines on its superior edge. The length of the animal is about 1 inch; length of carapax, 0.26; breadth of front, 0.13; length of great cheliped, 0.34 inch.

It was dredged from a sandy bottom in thirty fathoms off the east coast of Nippon, in latitude 38° N.

## Genus PAGURUS Fabricius

To this genus we assign the following characters: Front without any tooth or point at the middle. Ophthalmic ring exposed between the bases of the eyes, and bearing a bracteole. Eyes more or less thick; ophthalmic scales with broad apices. Aciculum of the antennæ short and stout; flagellum long, naked. Chelipeds unequal, the left largest; hinges of the hand marginal; fingers moving in a vertical plane, and with corneous, somewhat excavated apices.

This genus belongs to the tropical and subtropical seas of both oceans. The following is a list of the species already known:

<i>Pagurus punctulatus</i> Oliv.	<i>Pagurus pedunculatus</i> Herbst.
<i>spinimanus</i> M. Edw.	<i>carinatus</i> Randall.
<i>affinis</i> M. Edw.	<i>asper</i> De Haan
<i>guttatus</i> Oliv.	<i>cavipes</i> White.
<i>setifer</i> M. Edw.	<i>venosus</i> M. Edw.
<i>euopsis</i> Dana.	<i>sinistripes</i> Stm.
<i>fabimanus</i> Dana.	<i>callidus</i> Roux.
<i>scabrimanus</i> Dana.	<i>striatus</i> Latr.
<i>difformis</i> M. Edw.	<i>imbricatus</i> M. Edw.
<i>asperus</i> Berthold.	<i>strigimanus</i> White.
<i>gemmatus</i> M. Edw.	<i>ornatus</i> Roux.
<i>impressus</i> De Haan.	<i>scutellatus</i> M. Edw.

316. PAGURUS ASPER<sup>1</sup> De Haan

*Pagurus asper* DE HAAN (non MILNE EDWARDS), Fauna Jap., Crust., 208, pl. XLIX, fig. 4 (1850). DANA, U. S. Expl. Exped., Crust., 1, 450.

This species, when alive, was of a slag-red or light brick-red color; eye-peduncles with a white ring around the base of the cornea, which shows a reflected blue crescent at the summit in some lights.

De Haan's *P. asper* was published about two years after that of Milne Edwards, but we forbear to change the name, as the latter is a *Clibanarius*.

Our specimens were found on stony ground just above low-water mark, at the island of Ousima.

317. PAGURUS DIFFORMIS<sup>2</sup> Milne Edwards

*Pagurus deformis* MILNE EDWARDS, An. Sci. Nat. 2d Ser., VI, 272, pl. XIII, fig. 4; Hist. Nat. des Crust., II, 222.

*Pagurus difformis* DANA, loc. cit., I, 449.

Found at Ousima.

<sup>1</sup> *Dardanus haanii* Rathbun.

<sup>2</sup> *Dardanus pedunculatus* (Herbst).

318. *PAGURUS SCULPTIPES*<sup>1</sup> Stimpson

*Pagurus sculptipes* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 246 [84], 1858.

Carapax anteriorly naked and glabrous, marked nearly as in *P. punctulatus*. The lateral triangular points of the front (those between the bases of the eyes and antennæ) are rather strongly prominent. Eye-peduncles equaling the anterior margin of the carapax in length, but a little shorter than the third joint of the antennulæ. Ophthalmic scales large, with four minute equal spiniform teeth near the apex. Peduncle of the antennæ shorter than the eyes; acicle small and slender. Feet spinulose or granulose above, and moderately invested with long hair. Left cheliped rather short, a little overreaching the penult joint of the first ambulatory feet, its margins regularly crenulated; lower surface smooth. In the left-hand foot of the third pair the last two joints are broad and deeply excavated on the outer side, with crenulated and thickly ciliated margins, and a median longitudinal ridge, the surface near the superior margin and between the median ridge and the lower margin being elegantly sculptured with transverse striæ or impressed lines corresponding to the crenulations of the edges. General length in a male specimen, 1.5; length of carapax, 0.34; breadth of front, 0.165 inch.

It has the general appearance of *P. punctulatus* and the concave left foot of *P. setifer*. The concavity of the foot, however, is in the latter species smooth.

It was found in Kagosima Bay, Japan.

319. *PAGURUS PUNCTULATUS*<sup>2</sup> Olivier

*Pagurus punctulatus* OLIVIER, Encyc. Méth., VIII, 641. MILNE EDWARDS, Hist. Nat. des Crust., II, 222. DANA, U. S. Expl. Exp., Crust., I, 451, pl. XXVIII, fig. 4.

Color in life deep red (carapax orange), everywhere sparsely covered with blue dots or small round spots.

Found on the reefs at low-water mark at Loo Choo; also taken in Gaspar Straits by Mr. L. M. Squires.

<sup>1</sup> *Dardanus sculptipes* (Stimpson).

<sup>2</sup> *Dardanus megistos* (Herbst).

320. *PAGURUS STRIATUS*<sup>1</sup> Latreille

*Pagurus striatus* LATREILLE, Hist. des Crust., VI, 163. MILNE EDWARDS, Hist. Nat. des Crust., II, 218.

If this be the *Cancer arrosor* of Herbst, which is quoted for it by all European authors, we are at a loss to know why that name is not adopted.

Found in a *Cassis sulcosa* taken off the south side of Madeira, near Funchal, in thirty fathoms.

321. *PAGURUS PLATYTHORAX*<sup>2</sup> Stimpson

*Pagurus platythorax* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 246 [84], 1858.

Body much depressed. Carapax above naked, smooth, and glossy. Eyes large, reaching beyond the tips of the peduncles of the antennæ and antennulæ. Ophthalmic scales with a tooth on the inner margin near the base; apex bidentate. Acicle very small. External maxillipeds slender, somewhat flattened, a little separated at their bases, which are exposed, their attachment to the triangular offset forming the apex of the sternum being distinctly visible, not contracted inward and concealed as in other species; exognath slender. Feet coarsely hairy. Chelipeds small, equal; carpus and hand not spinulose, but roughened above and externally at the bases of the hairs. Ambulatory feet depressed, not spinous. Genital aperture of the male on the inner slope of the coxa, and not fringed. Sternum broad, flat, triangular, and broadly exposed between the chelipeds; no suture between the segments corresponding to the chelipeds and the first ambulatory feet. Terminal lobes of the caudal segment equal. General length, 1.4; length of carapax, 0.32; breadth of front, 0.28; length of chelipeds, 0.45; length of eye, 0.17 inch.

This species is always found in a cone or strombus, its depressed form being a special adaptation for the occupation of the narrow cavities of such shells. The remarkable characters of the sternum, etc., result directly from the form of the body, and the general widening of its parts, and cannot be considered as of generic value, particularly as all that set of characters upon which the genera are based in the family are those of the true *Pagurus*.

*Pagurus platythorax* is allied to *P. fabimamus* and *P. scabrimanus*,

<sup>1</sup> *Dardanus arrosor* (Herbst).

<sup>2</sup> *Dardanus platythorax* (Stimpson).

described by Dana, from the eastern seas. From both these it may be distinguished by its equal hands and broad, flat sternum.

It was found at Loo Choo.

### Genus ANICULUS Dana

Front acute at the middle. Ophthalmic ring barely exposed, but protected by a bracteole. Antennæ slender; aciculum short, robust; flagellum naked. Chelipeds very short, equal; commissure of the hand vertical, but with the hinges marginal; fingers moving in a vertical plane, with excavated corneous tips.

This genus is found only in the Pacific and neighboring seas, and is restricted to the torrid and warm-temperate zones. The species are *A. typicus* Dana (*Pagurus aniculus* Fabr.), *A. ursus* (*Pagurus ursus* Oliv.), and *A. elegans* Stm.

#### 322. ANICULUS TYPICUS<sup>1</sup> Dana.

*Pagurus aniculus* FABRICIUS, Suppl., 411. MILNE EDWARDS, Hist. Nat. des Crust., II, 230. DE HAAN, Fauna Jap., Cr., 209.

*Aniculus typicus* DANA, U. S. Expl. Exped., Crust., 1, 461, pl. XXIX, fig. 1.

In our specimen the rostrum is much less acute than in those described by Dana. It was taken at Simoda, Japan.

### Genus CALCINUS Dana

Front acute at the middle. Ophthalmic ring concealed. Aciculum of the antennæ short; flagellum naked. Chelipeds unequal, the left larger; commissure of the hand vertical, but with its hinges almost marginal; fingers moving in a vertical plane, and with excavated calcareous apices. Dactyli of the second and third pairs of feet short.

Its geographical range is in the tropical parts of both oceans. The following is a list of the species:

*Calcinus tibicen* (Herbst) Dana.  
*chilensis* (M. Edw.).  
*obscurus* Stm.  
*lividus* (M. Edw.).  
*sulcatus* (M. Edw.).

*Calcinus gaimardii* (M. Edw.) Dana.  
*elegans* (M. Edw.) Dana.  
*latens* (Randall) Dana.  
*crisimanus* (M. Edw.).

<sup>1</sup> *Aniculus aniculus* (Fabricius).

323. **CALCINUS TIBICEN**<sup>1</sup> (Herbst) Dana

*Cancer tibicen* HERBST, Naturg. d. Krabben u. Krebse, II, 25, pl. XXIII, fig. 7.

*Pagurus tibicen* LATREILLE, MILNE EDWARDS, Règne Anim., Crust., pl. XLIV, fig. 3.

*Calcinus tibicen* DANA, U. S. Expl. Exped., Crust., I, 457.

The colors in life are as follows: Antennæ bright red. Antennulæ, eyes, and ophthalmic scales blue. Carapax bluish-gray. Feet purplish-brown. Hands tipped with white, the larger one more than half white. Ambulatory feet annulated with white near their extremities; two joints near the base with a longitudinal red stripe. In a variety from Ousima the large hand was wholly white.

It is a common littoral species everywhere in the middle and western Pacific. Found by us at the Bonins, at Loo Choo, and at Ousima.

324. **CALCINUS LATENS** (Randall) Dana

*Pagurus latens* RANDALL, Jour. Acad. Nat. Sci. Phila., VIII, 135.

*Calcinus latens* DANA, U. S. Expl. Exped., Crust., I, 459, pl. XXVIII, fig. II.

Found at Loo Choo.

325. **CALCINUS ELEGANS** (Milne Edwards) Dana

*Pagurus elegans* MILNE EDWARDS, Hist. Nat. des Crust., II, 229.

*Pagurus pictus* OWEN, Beechey's Voy. Zoöl., p. 83, pl. XXV, fig. 2.

*Pagurus decorus* RANDALL, Jour. Acad. Nat. Sci. Phila., VIII, 135.

*Calcinus elegans* DANA, U. S. Expl. Exped., Crust., I, 458, pl. XXVIII, fig. 10.

Characterized by its fine coloration, the tuberculated fingers; and the thick brushes on the under sides of the third pair of feet near their extremities, which are very conspicuous in fresh specimens.

Genus **CLIBANARIUS** Dana

Front acute at the middle. Ophthalmic ring concealed. Eyes long. Aciculum stout. Chelipeds similar in form and subequal; commissure of the hand vertical, with the hinges median, not marginal; fingers moving in a horizontal plane, with excavated corneous apices.

<sup>1</sup> *Calcinus lavimanus* (Randall).

Its geographical range is in the warm temperate and tropical parts of both oceans. The species are as follows:

<i>Clibanarius vulgaris</i> Dana	<i>Clibanarius tæniatus</i> (M. Edw.).
<i>oculatus</i> (M. Edw.).	<i>cruentatus</i> (M. Edw.).
<i>crassimanus</i> (M. Edw.).	<i>aculcatus</i> (M. Edw.).
<i>tuberculosus</i> (M. Edw.).	<i>elongatus</i> (M. Edw.).
<i>tricolor</i> (Gibbes).	<i>asper</i> (M. Edw.).
<i>lineatus</i> (M. Edw.) Dana.	<i>aquabilis</i> Dana.
<i>striolatus</i> Dana.	<i>zebra</i> Dana.
<i>nigritarsis</i> (Lucas).	<i>virescens</i> (Krauss) Dana.
<i>vittatus</i> (Bosc).	<i>brasiliensis</i> Dana.
<i>panamensis</i> Stm.	<i>antillensis</i> Stm.
<i>sclopetarius</i> (Herbst).	<i>corallinus</i> (M. Edw.).
<i>longitarsis</i> (De Haan) Dana.	<i>globosimanus</i> Dana.
<i>inæqualis</i> (De Haan).	<i>humilis</i> Dana.
<i>symmetricus</i> (Randall) Dana.	<i>pacificus</i> Stm.

### 326. CLIBANARIUS LONGITARSIS (De Haan) Dana

*Pagurus longitarsis* DE HAAN, Fauna Jap., Crust., 211, pl. 1, fig. 3.

*Clibanarius longitarsis* DANA, U. S. Expl. Exped., Crust., 1, 464.

This species occurred at Loo Choo.

### 327. CLIBANARIUS VULGARIS<sup>1</sup> Dana

*Cancer clibanarius* HERBST, Naturg. der Krabben u. Krebse, II, 20, pl. XXIII, fig. 1.

*Pagurus clibanarius* LATREILLE, Hist. des Crust. et des Ins., VI, 167.

*Clibanarius vulgaris* DANA, U. S. Expl. Exped., Crust., 1, 462.

The largest of our specimens is three inches in length. The dactyli of the ambulatory feet are considerably longer than the preceding joint, as is represented in Herbst's figure. Milne Edwards, however, in describing this species (Hist. Nat. des Crust., II, 227), says "Tarse court." There is also in our specimens no distinct furrow separating the rostriform tooth from the front, as mentioned by that author. So that it is probable that he had before him a distinct species, and we have therefore not quoted his description.

There is a longitudinal furrow on the outer surface of the dactylus of the third pair of feet. The color of the living animal is a dark purple-brown; back of the carapax dirty whitish. Abdomen dark, with a light-red median line. Peduncles of the eye with two longitudinal white vittæ. Hands with minute white spots on a dark ground. Feet with three white or light-red vittæ, the two outer vittæ diverging from the base of the superior one.

<sup>1</sup> *Clibanarius clibanarius* (Herbst).

Our specimens were found in dead shells of a thick, short strombus. When alive they had a peculiar strong odor, exactly like that of ripe cocoanut milk.

They were found in Hongkong Harbor, on a muddy bottom, in four fathoms; also in Gaspar Straits.

### 328. CLIBANARIUS STRIOLATUS Dana

*Clibanarius striolatus* DANA, U. S. Expl. Exped., Crust., I, 463, pl. XXIX, fig. 3.

The following is a description of some specimens, which we find by comparison to be the same as Dana's: Carapax rather narrow, and convex anteriorly. Front with a post-marginal furrow. Ocular peduncles very long, as long as or longer than the anterior region of the carapax, and overreaching the third joint of antennulæ. Ophthalmic scales triangular, deeply notched exteriorly near the apex, and provided with several long, stout hairs. Hands equal, somewhat spinous, and very hairy above; five strong spines on the superior margin of the palm. Ambulatory feet longitudinally vitate, with six red stripes (counted on the penult joint), narrower than their interspaces. Dactyli very slender, in length just equaling the penult joint. Length one and a half inches. Length of the carapax along the median line, 0.525; breadth of anterior extremity, 0.225 inch.

Found at Loo Choo.

### 329. CLIBANARIUS GLOBOSOMANUS<sup>1</sup> Dana

*Clibanarius globoso-manus* DANA, Proc. Acad. Nat. Sci. Phila., v, 271.

*Clibanarius corallinus?* DANA, U. S. Expl. Exped., Crust., I, 468, pl. XXIX, fig. 8.

We prefer to retain Professor Dana's name for this species until opportunities occur for a more certain identification of it with M. Edwards's *corallinus*.

It is abundant on the reefs at Loo Choo.

### 330. CLIBANARIUS ÆQUABILIS Dana

*Clibanarius æquabilis* DANA, U. S. Expl. Exped., Crust., I, 464, pl. XXIX, fig. 4.

In small shells dredged in from twelve to twenty fathoms, sandy bottom, in Funchal Bay, Madeira.

<sup>1</sup> *Clibanarius corallinus* (Milne Edwards).

331. *CLIBANARIUS PACIFICUS* Stimpson

*Clibanarius pacificus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 247 [85], 1858.

This species approaches so closely to *C. æquabilis* that a long examination was necessary before any specific difference was apparent. The feet are, however, more hairy than in that species, the dactyli of the ambulatory feet are somewhat longer, and the lower surfaces of the hands generally smoother. When the hands differ in size, as they sometimes do slightly, the right is generally the larger. Our species is of a very dark bluish-olive color; ambulatory feet bright yellow; fingers of the hand red. It is littoral, and thus differs much both in color and station from *C. æquabilis*. Our largest specimen is a male, one and a quarter inches in length. The length of the carapax in the median line is 0.39; breadth of front, 0.16 inch.

It differs from *Pagurus inæqualis* De Haan in its equal and more spinous hands.

Found among rocks in the lowest subregion of the littoral zone at Tanega-sima and Ousima.

## Genus PAGURISTES Dana

It is remarkable that a form so distinct as *Paguristes* should have been so long suffered to remain in the old genus *Pagurus*, while the peculiarities of its external generative apparatus, in both male and female, were well known. We have here the only hermit crab in which the first two pairs of abdominal members are developed into organs subservient to generation. In the male these are adapted to the purposes of generation, as in the Brachyura, though their form is more like those of *Astacus*, and they have a similar position on the lower surface of the abdomen near its base. In the female the anterior pair of appendages is small and situated at the base of the abdomen, and there is a broad, oblique expansion or sac on the left side of its soft body formed by a folding of the integument at the posterior margin of the fourth segment, enclosing a pouch which serves to contain the eggs.

The other essential characters of the genus may be stated as follows: Eyes long. Antennæ short; acicle robust. Chelipeds similar in shape and generally subequal; commissure of the hand vertical; fingers moving in a horizontal plane. Feet of the fourth pair not subcheliform.

It has a wide geographical distribution, species being found in all

seas except those of the frigid and subfrigid zones. The species already known are as follows:

<i>Paguristes hirtus</i> Dana.	<i>Paguristes gonagrus</i> (M. Edw.).
<i>tomentosus</i> (M. Edw.).	<i>pilosus</i> (M. Edw.).
<i>turgidus</i> Stm.	<i>frontalis</i> (M. Edw.).
<i>weddelli</i> (M. Edw.).	<i>longirostris</i> Dana.
<i>maculatus</i> (Risso.).	<i>brevicornis</i> (Guérin).
<i>gamianus</i> (M. Edw.).	<i>depressus</i> Stm.
<i>setosus</i> (M. Edw.).	

### 332. PAGURISTES DIGITALIS Stimpson

PLATE XXV, FIG. 1

*Paguristes digitalis* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 247 [85], 1858.

The carapax is nearly naked about the middle. It is narrowed before and somewhat dilated behind. The cardiac scutella or indurated median plate of the posterior part is somewhat halberd-shaped, being narrowed at the middle and a little widened toward its pointed extremity. The sides of the anterior portion of the carapax are more deeply sinuated than in most species. The rostriform point of the front is elongated, and very sharp, reaching a little beyond the bases of the ophthalmic scales, and carinated along the middle. Eyes very long and slender, slightly longer than the front, and not quite reaching to the extremity of the peduncle of the antennulæ; peduncle naked, excepting a slight tuft of setæ at the superior base. Apex of the ophthalmic scale short, acute, with one denticle on the outer margin. The outer maxillipeds are long, reaching beyond the eyes. Chelipeds equal, resembling much those of *P. hirtus*, *turgidus*, etc., in character, the carpus and hand being spinous and hairy above, the spines rather numerous, with black corneous tips; hand rather broad and flattened above, with immovable finger depressed; inner edges of the fingers corneous for the terminal half of their length; dactylus angular, with the outer surface flat, elegantly and minutely sculptured with oblique pectiniform crests about seven in number. Posterior feet hairy; those of the second pair spinous above, with the dactylus more than one-half longer than the preceding joint. The dorsal integument of the male abdomen is considerably indurated, forming a thin, flexible plate to each segment; posterior angle of that covering the second segment much projecting and overlapping the third. Lobes of the terminal segment almost symmetrical in both male and female. The callous areolæ forming the "chafing gear" on the inferior surfaces of the thorax and feet are

less well marked than in *P. turgidus*. The color of the animal, in alcoholic specimens, is light brick-red; in parts whitish; eye peduncles with a red vitta. Length, three inches; length of carapax in the male, 0.81; breadth of the front, 0.4; length of cheliped, 1.17 inches.

Found at Hakodadi, on the island of Jesso. It much resembles *P. turgidus* from the opposite coast of the Pacific, from which it may be distinguished by the sculptured surface of the movable finger of the hand.

### 333. PAGURISTES SEMINUDUS Stimpson

*Paguristes seminudus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 247 [85], 1858.

The carapax, front, eye-peduncles, and antennæ in this species are naked, or nearly so. Anterior region of the carapax rather large, much longer than the posterior, with a punctate surface, and armed with a few minute spines at the sides. Median plate or cardiac scutella of the posterior region rather short, somewhat contracted near the base, and blunt at the posterior extremity. Rostrum long and slender, tapering, with its very sharp extremity curving downward and reaching beyond the middle of the ophthalmic scales. Frontal sinuses very deep for the reception of the bases of the eye peduncles. Eyes very stout for the genus, but long, considerably longer than the front is wide, and much overreaching the peduncle of the antennulæ. Apex of the ophthalmic scale slender, very sharp, curving outward; margins entire, smooth, and naked. Antennæ shorter than the carapax; flagellum sparsely provided with fine, short hairs; acicle large and nearly naked, reaching to middle of eye-peduncles. Outer maxillipeds not reaching to the extremities of the eyes. Chelipeds similar in form, but unequal (the left larger); carpus and hand densely hairy and spinulose, spines small, calcareous, those of the superior edge largest; fingers naked above, but hairy exteriorly, and armed within with sharp cutting edges for their whole length; apices acute, black; inferior side of hand tumid, minutely and sparsely subspinulose. Ambulatory feet rather slender; penult and antepenult joints spinous above; dactyli above and on the lower inner edge hairy. Fourth pair of feet rather long, with the scabrous surface on the penult joint very small. No chafing disks or areolæ on the lower surface of the body or feet. Terminal segment of abdomen much elongated; left lobe most produced. Color olive or brownish; antennæ annulated; maxillipeds spotted with white; tips of all the feet white. Length, 1.78; length of cara-

pax, 0.44; breadth of front, 0.22; length of eye, 0.23; of cheliped, 0.7 inch.

Found on rocky shores at half-tide, in Kagosima Bay, Japan.

### Genus SPIROPAGURUS Stimpson

Carapax depressed, anteriorly sufficiently indurated, but posteriorly membranaceous, the cardiaco-branchial sutures being, however, strengthened by linear corneous strips. Eyes short, with the cornea dilated. Antennæ large; acicle slender from its base. Left virgula or genital organ of the left coxa of the fifth pair of feet in the male, persistently exerted to a considerable length, slender, compressed, spiral, and membranaceous, with the superior margin strengthened by a corneous strip. Last segment of the abdomen bifid at the extremity; margins of the forks serrated.

In most characters besides those mentioned in the above description this genus agrees with *Eupagurus*, the maxillipeds being remote at base, with small coxæ; the chelipeds more or less unequal, with the right one largest, and the fourth pair of feet scarcely subcheli-form, sometimes nearly simple, with compressed dactylus. Its most remarkable characteristic is seen in the exerted left genital organ of the male, forming a "spire" or coil of one or two turns. Something of this kind is seen in some *Cenobitæ*, in which, however, the coxæ are produced on both sides, although to a different length, and indurated.

The genus was founded upon the *Pagurus spiriger* of De Haan, which was, until recently, the only known species. The Leyden carcinologist mentions the "spire," but has not, apparently, recognized its identity with the male genital organ.

Only one other species is known, *S. dispar* Stm., which inhabits the Caribbean Sea.

#### 334. SPIROPAGURUS SPIRIGER (De Haan) Stimpson

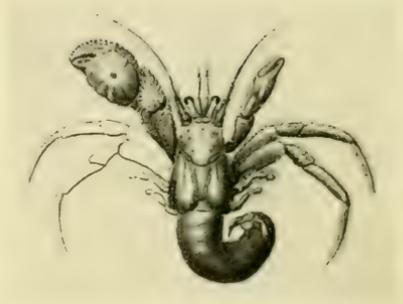
*Pagurus spiriger* DE HAAN, Fauna Japonica, Crust., 206, pl. XLIX, fig. 2.

*Spiropagurus spiriger* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 248 [86], 1858.

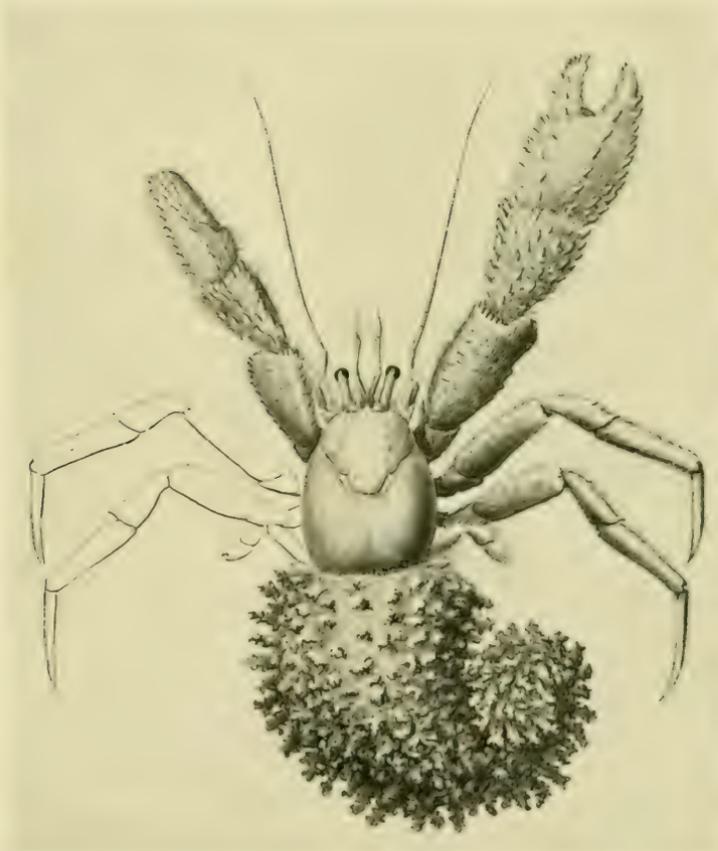
The following specific characters may be mentioned in addition to those given by De Haan: The median and lateral points of the front are obtuse. Posterior part of the carapax longer than the anterior part and lineolated or squamose in appearance; squamæ minutely crenulated. Ophthalmic scales large, broad, and obtuse. Flagella of the antennæ almost entirely naked, and overreaching the ambu-



2



I



3



latory feet. Fingers of the hands slender, with acute margins microscopically pectinated with short setæ; margin of immovable finger also armed with eight minute distant teeth; that of movable finger smooth. Dactyli of the ambulatory feet very long and compressed, adapted for swimming. The animal is of a pale fawn color when alive; sometimes slightly reddish.

This species swims freely, even carrying its shell, by striking the water with its ciliated feet. Our specimens were taken from a muddy bottom in sixteen fathoms off the Chinese coast near Hong-kong.

#### Genus EUPAGURUS Brandt (emended)

In this genus and *Spiropagurus* we find a character of the external maxillipeds which seems to be of considerable importance, although overlooked by those who have previously written upon the family of Paguridæ. In all other genera these maxillipeds are closely approximated at the base, the coxæ being greatly dilated, with their inner surfaces closely applied to each other. In the present genus the coxæ are small, very short, and no larger than the second or basis-joint of the maxilliped, being at the same time widely removed from each other, showing between the prominent margin of the second sternal segment, which is often armed with teeth or spiniform processes. The exognath of the maxillipeds is broader than in the ordinary forms of Paguridæ.

Other characters of *Eupagurus* are the following: Front acute at the middle. Ophthalmic ring exposed, but without a bracteole or indurated plate between the bases of the eyes. Aciculum of the antennæ elongated, slender even from the base; flagellum long. External maxillipeds rather large. Chelipeds dissimilar in form and unequal, the right largest; commissure of the hand horizontal, with the hinges marginal; fingers moving in a horizontal plane. Fourth pair of feet scarcely subcheliform.

This genus inhabits the temperate and frigid zones of both hemispheres. A large number of species is found, both in the North Atlantic and the North Pacific Oceans. In two or three rare instances species occur in the subtropical parts of the Atlantic. The following is a list of the species already known:

*Eupagurus bernhardus* (Lin.).

*ochotensis* Brandt.

*chiroacanthus* (Liljeb.).

*forbesi* (Bell).

*sculptimanus* (Lucas).

*Eupagurus angulatus* (Risso).

*meticulosus* (Roux).

*alatus* (Fabr.).

*pubescens* (Kröyer).

*kroyeri* Stm.

<i>Eupagurus lævis</i> (Thompson).	<i>Eupagurus hirsutiusculus</i> (Dana).
<i>hyndmanni</i> (Thompson).	<i>samuелиs</i> Stm.
<i>ulidianus</i> (Thompson).	<i>granosimanus</i> Stm.
<i>spinimanus</i> (Lucas).	<i>scabriculus</i> (Dana).
<i>cuanensis</i> (Thompson).	<i>middendorffii</i> Brandt.
<i>prideauxii</i> (Leach).	<i>conformis</i> (De Haan).
<i>brevipes</i> (M. Edw.).	<i>cristatus</i> (M. Edw.).
<i>perlatus</i> (M. Edw.).	<i>novi-zelandiæ</i> (Dana).
<i>obesicarpus</i> (Dana).	<i>tenuimanus</i> (Dana).
<i>gayi</i> (Nicolet).	<i>criniticornis</i> (Dana).
<i>villosus</i> (Nicolet).	<i>operculatus</i> Stm.
<i>forceps</i> (M. Edw.).	<i>brevidactylus</i> Stm.
<i>truncatulus</i> (Raf.).	<i>pollicaris</i> (Say).
<i>mertensii</i> Brandt.	<i>comptus</i> (White).
<i>splendescens</i> (Owen).	<i>rubro-vittatus</i> (Lucas).

335. EUPAGURUS MEGALOPS<sup>1</sup> Stimpson

PLATE XXIV, FIG. 2

*Eupagurus megalops* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 248 [86], 1858.

Carapax naked; anterior region smooth, glossy, and flattened. Median lobe or tooth of front broad, obtuse, and less prominent than the lateral teeth. Eyes rather remote from each other, shorter than the peduncle of the antennæ by one-third the length of the latter, and with the cornea greatly swollen, so that its diameter is nearly twice that of the peduncle at its base. The acicle of the antennæ is slender from its base, slightly ciliated, and reaches the extremity of the eye; the flagellum is naked, and reaches beyond the ambulatory feet for a fourth of its length. Chelipeds ciliated on the margins; the right one a little shorter than (that is, overreached by) the ambulatory feet; carpus oblong, one-half longer than broad, above sharp-granulous and setose, the setæ short and arising from the anterior bases of the granules; hand broader than carpus, but scarcely more than half as broad as long, tapering and depressed, but convex along the middle; upper surface of the hand roughened with sharp granules smaller than those of the carpus, and very sparsely scattered, there being very few on the convex middle portion of the hand, but more at the sides; fingers hairy, much shorter than the palm, and with calcareous, hooked tips. Left cheliped slender; carpus trigonal, superior keel spinulose and separated by a longitudinal groove from another keel situated to the right and beneath it; hand as long as the carpus of the right cheliped; palm convex and obsoletely

<sup>1</sup> *Pagurus megalops* (Stimpson).

bicarinated, carinæ granulated; fingers elongated, depressed, and somewhat curving downward. The whole upper surface of the hands, excepting the fingers, is sometimes pubescent. Beneath the chelipeds are uniformly and crowdedly granulated, and often pubescent. Ambulatory feet nearly naked; upper surfaces smooth, glossy, and punctate; upper margins spinulose; dactyli contorted, longer than the greater hand, extremely slender, sulcated longitudinally on the inner surface, and ciliated above near their extremities. In the third foot of the right side the penult joint is twice as long as the one preceding it. Length of a male specimen, 1.7; length of carapax, 0.36; breadth of front, 0.2 inch.

This can scarcely be the *Pagurus conformis* of De Haan, who, in his description of the chelipeds of that species, says, "Pedis minoris carpo non spinoso." It is closely allied to *E. gracilipes*, but the eyes are larger and the hands ciliated.

It was dredged from a sandy and shelly bottom at twenty-six fathoms, in the North China Sea, under the twenty-third parallel of latitude.

### 336. EUPAGURUS GRACILIPES<sup>1</sup> Stimpson

*Eupagurus gracilipes* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 248 [86], 1858.

Rostriform point large, strongly prominent, and acute. Eyes very short and thick, shorter than the acicle, and but little over half as long as the peduncle of the antennæ; cornea much inflated; base of the peduncle contracted. Flagellum of the antennæ naked; acicle rather small, with flat upper surface, and both edges somewhat hairy. Right cheliped long and slender, but considerably shorter than the ambulatory feet; carpus oblong, proportion of breadth to length, 1:1.5, with the surface subspinulose, as in *E. bernhardus*; hand much depressed, thin, elongated-ovate, half as broad as long, convex in the middle, but concave near the thin margins; nearly smooth above, but sparsely ornamented with minute depressed granules; outer margin of the hand somewhat expanded and crenulated; fingers smooth, depressed, with hooked calcareous tips crossing each other; dactylus carinated at the superior margin. Ambulatory feet as in *E. bernhardus*, but with more slender dactyli. General length, 1.8; length of carapax, 0.35; breadth of front, 0.19 inch.

It differs from *E. splendescens* and *E. mertensii* in the longer ambulatory feet, the terminal joints of which reach much beyond the

<sup>1</sup> *Pagurus gracilipes* (Stimpson).

left hand; from *E. bernhardus* in the shorter eyes, the more elongated and slender feet, and the smoother, flattened hand with lamelliform outer edge.

It was dredged off the east coast of Nippon, in north latitude about  $38^{\circ}$ , at the depth of thirty fathoms. Found also in Hakodadi Bay.

### 337. EUPAGURUS OCHOTENSIS<sup>1</sup> Brandt

*Pagurus (Eupagurus) bernhardus*, var. *C*, *spiniimana* BRANDT, Sibirische Reise, Zoöl., p. 108.

*Pagurus (Eupagurus) ochotensis* BRANDT, loc. cit.

*Bernhardus armatus* DANA, U. S. Expl. Exped., Crust., I, 442, pl. XXVII, fig. 2.

*Eupagurus armatus* STIMPSON, Crust. and Echin. Pacific Coast of N. Am., Bost. Jour. Nat. Hist.

The acicle of the outer antennæ in this species is remarkable for its trigonal form and its naked, glossy, iridescent surfaces. The dactyli of the ambulatory feet are long, naked, and as much twisted as in *E. bernhardus*.

We found two adult specimens in Hakodadi Bay, the largest over four inches in length. The original specimen of Dana's *B. armatus* differs from ours in one point only—the greater hand is more elongated and more rounded at its extremity. This, however, is probably nothing more than a mark of immaturity or variety, as other species are often variable in the proportions of the carpus and hand, so that this may be regarded as one of the species common to both sides of the North Pacific Ocean.

### 338. EUPAGURUS CONSTANS<sup>2</sup> Stimpson

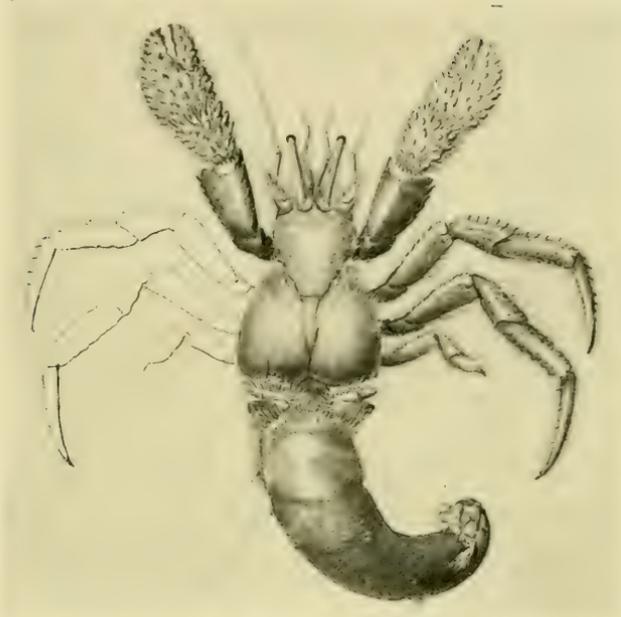
PLATE XXIV, FIG. 3

*Eupagurus constans* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 248 [86], 1858.

Body broad and thick; abdomen rather small; sternum somewhat narrower than in *E. bernhardus*. Anterior part of the carapax convex, much indurated, with two arcuated, converging rows of fascicles of setæ, almost obliterated in old specimens. Rostriform point prominent and rather sharp; angle about  $60^{\circ}$ . Lateral teeth (between eyes and antennæ) acuminate, less prominent than the rostrum. Eyes rather long, but not reaching to the extremity of the

<sup>1</sup> *Pagurus ochotensis* Brandt.

<sup>2</sup> *Pagurus constans* (Stimpson).



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peduncle of the antennæ; peduncles rather stout; cornea scarcely dilated. Acicle long, hairy, and reaching beyond the eyes. On the margin of the second sternal segment, between the bases of the outer maxillipeds, there are two sharp teeth or spines. The right cheliped is very large, reaching much beyond the extremities of the ambulatory feet; ischium-joint with a long, sharp spine at the inner apex; carpus a little longer than broad at its anterior extremity and somewhat longer than the palm of the hand; hand flattened above; fingers shorter than the palm and ornamented above, along their inner margins, with a closely set series of tufts of setæ directed inward. There is a deep notch in the outline of the hand at the outer base of the dactylus. The left cheliped is about one-half as wide as the right, and reaches beyond the base of the right dactylus. In the armature of the surface the chelipeds are much alike; the surface of the meros-joint is unarmed, but sparsely clothed with short series of hairs arising from slight transverse squamiform ridges; the anterior margin of the meros is armed above with comb-like teeth, three in the left, six in the right cheliped; carpus and hand spinous and densely covered with pubescence arising to the tips of the spines. These spines cover the whole upper surface of the carpus; they are strong, sharp, about  $1/15$  inch in length in adult specimens. On the right hand they form a median and two marginal rows; on the left hand one median row continued on the immovable finger, one row on the outer margin, and a few scattered at the inner base. Between the spines there are small setiferous tubercles.

The ambulatory feet are slender, sparsely hairy in transverse fascicles, and armed with one or two spines on the superior edge of the carpus; dactyli long and slender, longer than the penult joint, not twisted, and sparsely armed with short, stiff hairs; terminal unguiculi very short. Dactylus of the right ambulatory foot of the first pair longer than the carpus of the right cheliped. Feet of the fourth pair very broad, compressed, long-ciliated above; dactylus very short, scarcely overreaching the tip of the process of the penult joint or hand. Color orange, minutely mottled on the body; feet barred above with dark red. Length, about 3.6; length of carapax, 0.8; breadth of front (between bases of outer antennæ), 0.4; length of great cheliped, 2.3 inches.

This species, contrary to the usual practice among hermit crabs, never leaves the habitation (a small shell) it has first selected. In the enlargement of its domicile (carcinœcium) to suit its own growth, it is assisted by a little architect, a hydroid polyp (*Hydractinia sodalis* Stm.), about half an inch in length, which in consider-

able numbers molds its corneous base over the body of the crab, receiving for its reward and sustenance the fragments which float off at the banquet of its voracious companion, as well as free transportation along the sea bottom. The shell thus formed is spiral, with depressed whorls, laxly convoluted and resembling somewhat a *Delphinula*, and often about an inch and a half in length. It is externally muricated with stout processes from one-tenth to one-half an inch in height, one-twentieth in thickness, and more or less branched at the top. Embedded in its apex we find the minute shell, seldom over one-third of an inch in length, which served the hermit for a cell when young.

The same thing was observed by J. E. Gray (see *Zoölogist*, 1, 204) to occur sometimes with the common *Eupagurus bernhardus*; and on our own coast shells inhabited by *Paguri* are often seen leaving the margin at the mouth, continued out to some extent by the addition of the crustaceous or coriaceous polypidom of *Hydractinia*. With *Eup. constans*, however, this is a constant characteristic, and to such an extent that the entire shell seems to be composed of the adventitious substance.

Several specimens of this curious species were dredged from a rocky bottom in four fathoms in Hakodadi Bay, Northern Japan.

### 339. EUPAGURUS PECTINATUS<sup>1</sup> Stimpson

*Eupagurus pectinatus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 249 [87], 1858.

On the anterior part of the carapax there are two series of fascicles of hair, as in *E. constans*, enclosing an oval naked space at the middle; also two or three scattering tufts outside of this space posteriorly. On the posterior part there are some tufts on the median and postero-lateral surfaces. Rostriform point small but very acute, and not much projecting. Lateral points or teeth of front acuminate, their tips spiniform, directed a little outward, and projecting nearly as far forward as the rostrum. Eyes long and slender, reaching to the tips of the peduncles of the antennæ and overreaching the hairy acicle; cornea not dilated. Ophthalmic scales with slender acuminate apex. Flagellum of antennæ reaching beyond the tips of the chelipeds; joints minute, setose. Chelipeds considerably shorter than the ambulatory feet; meros with smooth or slightly squamous surface, and with its anterior margin armed above with 2-4 parallel spines like the teeth of a comb; carpus and hand spinous

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<sup>1</sup> *Pagurus pectinatus* (Stimpson).

and hairy, the spines long, erect, subequal, and acute, the hair fine, long, and clean, two or three times as long as the spines. Carpus of the right cheliped not longer than broad, but slightly longer than the palm of the hand; its postero-exterior slope smooth; its antero-interior corner spinous; hand slightly convex, regularly covered with spines arranged in eight longitudinal series, those of the outer margin longer, pectiniform, curving upward; fingers depressed, shorter than the palm, and with acuminate corneous tips; spines on outer margin of dactylus long and pectiniform. In the left cheliped the carpus has two longitudinal rows of spines above, separated by a smooth, flattened space; hand convex, spinous, with the median spines longest; fingers nearly devoid of spines. Ambulatory feet stout, overreaching the chelipeds; last three joints broad, long-ciliated above; dactyli compressed, very broad, not contorted, with the sides longitudinally grooved, the upper edge and inner side hairy, and the inferior margin armed with a series of ten black corneous spines; unguicle or tip stout and sharp, black. Dactylus of fourth pair of feet large, reaching much beyond the hand-process, and with a sharp, curved, black unguiculus. Length of the animal, three inches; length of carapax, 0.7; breadth of front, 0.34; length of greater cheliped, 1.42 inch.

It has much general resemblance to *E. constans*, but is easily distinguished by its shorter chelipeds, broader hairy dactyli of the ambulatory feet, and much larger dactylus of the fourth pair of feet.

Found at Hakodadi, Japan.

### 340. EUPAGURUS TRIGONOCHEIRUS<sup>1</sup> Stimpson

PLATE XXVI, FIG. 2

*Eupagurus trigonocheirus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 249 [87], 1858.

This is a large species, allied to *E. pubescens*, but having more strongly marked characters. The characters mentioned in the following description are those in which it is observed to differ from that species.

The body and feet are more or less hirsute, in some individuals densely so, in others very little so, with the chelipeds nearly naked. The chelipeds are granulated; granules on carpus spiniform. Right hand less than twice as long as broad. Right carpus very thick and broad, broader than the hand, and shorter than in *E. pubescens*.

<sup>1</sup> *Pagurus trigonocheirus* (Stimpson).

Fingers of the right hand stout, with corneous tips. Left hand large, three-fourths as large as the right, broadly trigonal; carina very prominent, denticulated, and situated far to the right of the middle; oblique exterior surface of the hand broadly expanded, concave, and much dilated at the extero-inferior margin. Ambulatory feet of the right side overreaching the right cheliped. Color reddish; feet orange, inclining to clay color, transversely barred with darker. Eggs of the female black. Length about four inches.

This species is common in the Behring Sea. Found at low-water mark on gravel and in ten fathoms, mud bottom, in Seniavine Straits; in twenty fathoms, shelly bottom, in the Arctic Ocean north of Behring Straits; also in Awatska Bay.

### 341. EUPAGURUS PUBESCENS<sup>1</sup> Brandt

*Pagurus pubescens* KRÖYER, Tidsskrift, II, 251 (partim).

*Pagurus (Eupagurus) pubescens* BRANDT, in Middendorff's Sibirische Reise, Zoöl., p. III.

*Bernhardus pubescens* STIMPSON, Mar. Inv. Gr. Manan, 59.

Among our boreal and arctic crustacea we find two closely allied species confounded under the name of *Pagurus pubescens*. Krøyer's description in the Tidsskrift applies almost equally well to both. Nor does his figure in the "Voyage en Skandinavie, en Laponnie," etc. (Crust., pl. II, fig. 1), appear to be an accurate representation of either species.

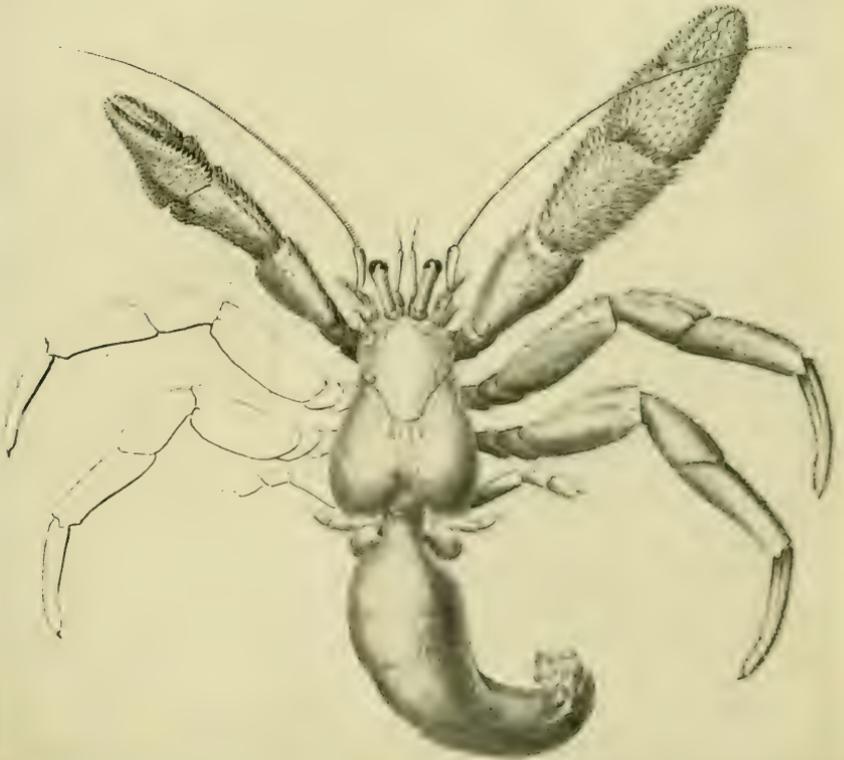
The following is a short special description of the form to which we would hereafter restrict the name *pubescens*, as it is by far the most hairy of the two in thus agreeing with the Tidsskrift description ("pilis flavis dense obsitis"), although not with the figure above quoted.

Body and feet thickly hirsute with long hair. Chelipeds spinulose, spinules rather large and sharply prominent. Right carpus elongated, scarcely broader than the hand. Right hand generally twice as long as broad, but varying much in its proportions; dactylus with corneous tip. Left hand small, not dilated extero-inferiorly; carina median, little prominent, obtuse, and armed with two rows of spinules. Ambulatory feet of the right side in the adult falling short of the extremity of the right hand. Dactyli of the ambulatory feet much curved, and, as in all the species of this group, a little contorted, with the outer side longitudinally grooved. Color usually reddish, with orange abdomen. Carapax pale red. Hands deep red;

<sup>1</sup> *Pagurus pubescens* Krøyer.



1



2



tips of fingers paler. Ambulatory feet red, with three or four broad, bluish-white transverse bars. Length usually about two or three inches.

The expedition specimen was taken on a muddy bottom in ten fathoms in Awatska Bay, Kamchatka. It is identical with those found on the northeast coast of America.

### 342. EUPAGURUS PILOSIPES<sup>1</sup> Stimpson

*Eupagurus pilosipes* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 249 [87], 1858.

Rostriform point of the front setose. Feet very hairy. Right cheliped spinulose above; carpus with a smooth, shallow longitudinal groove near the inner margin, which is spinous; hand elongated, tapering, sparsely but regularly covered with spiniform tubercles. Left cheliped spinulose above; carpus distinctly grooved; fingers of the hand twice as long as the palm, and broadly gaping. Ambulatory feet longitudinally vittate with red; dactyli a little shorter than the penult joint. Length, one inch.

It is very near *E. hirsutiussculus*, but the ambulatory feet are vittate with red throughout, the fingers of the smaller hand gaping, and the granules of the large cheliped spiniform. It differs from *E. samuelis* in its narrower and more tapering right hand; from *E. pubescens* in the more slender left hand and much shorter dactyli of the ambulatory feet.

Found at Loo Choo.

### 343. EUPAGURUS HIRSUTIUSCULUS<sup>2</sup> (Dana) Stimpson

*Bernhardus hirsutiussculus* DANA, U. S. Expl. Exped., Crust., 1, 443, pl. xxvii, fig. 3.

*Eupagurus hirsutiussculus* STIMPSON, Crust. et Echin. Pacific Coast of N. Am., p. 44, Bost. Jour. Nat. Hist.

This species was first described by Dana from specimens taken on the west coast of North America. We add below remarks upon some points which become necessary to distinguish it from allied species herein described.

It is a variable species, usually very hairy, particularly on the ambulatory feet; the chelipeds are often almost naked. It also varies somewhat in the proportions of the carpus and hand in the right

<sup>1</sup> *Pagurus pilosipes* (Stimpson).

<sup>2</sup> *Pagurus hirsutiussculus* (Dana).

cheliped, and in the shape of the hand, which is, however, usually tapering toward the fingers, so that the immovable finger is narrow, with a nearly straight outer margin.

The rostriform point is smaller and less prominent than in Dana's figure, but sharp and distinct. The right cheliped is elongated, does not reach to the extremities of the right ambulatory feet; the granules of its upper surface are distinct and well separated, though not generally very prominent; those of the carpus are sharper or scabrimform, and always setose at their bases; the dactylus is ornamented with a row of granules parallel to its outer margin, not represented in Dana's figure. The small cheliped is convex and distinctly grooved longitudinally above, particularly on the carpus, where the groove is defined on either side by a spinous crest, the superior crest being by far the most prominent. Fingers of the smaller hand not gaping, and not over a third or half longer than the palm. Beneath the meros-joint is hairy in both chelipeds. In the small cheliped the sides of this joint are prominent and denticulated with subequal teeth; the surface is granulated. In the larger cheliped this joint is sparsely granulated, one granule or tubercle situated near the apex of the ischium being larger than the rest, but not projecting.

Neither the shape of the anterior part of the carapax nor the granulation of the chelipeds is well represented in the figure taken from the U. S. Exploring Expedition specimen.

It differs from *E. pubescens* in the armature of the hands, which are not spinous, but granulated, and in the shorter dactyli of the ambulatory feet, which are very little longer than the penult joint, and show a longitudinal red stripe on each side.

It is found at Hakodadi, in Japan, in the same abundance as on the opposite shore of the North Pacific.

#### 344. EUPAGURUS SAMUELIS<sup>1</sup> Stimpson

*Eupagurus samuelis* STIMPSON, Crust. and Echin. Pacific Coast of N. Am., p. 42, Bost. Jour. Nat. Hist.; Notes on N. American Crust., 44, pl. 1, fig. 8.

Closely allied to *E. hirsutiunculus*. The rostriform point is slender, sharp, and distinct in some specimens, but generally obtuse or hidden by a tuft of setæ. The feet are hairy, but much less so than in *hirsutiunculus*; chelipeds usually naked. On the lower surface of the meros-joint in the chelipeds there is a remarkably prominent tubercle, sometimes sharp, but usually blunt, situated near the mid-

<sup>1</sup> *Pagurus samuelis* (Stimpson).

dle in the greater and on the angular prominence to the left in the smaller cheliped. There is sometimes another tubercle by the side of the first in the greater cheliped. The larger hand is broad and somewhat depressed, with the outer margin arcuated, acute, and denticulated; its surface is evenly covered with small, equal, sharply prominent but obtuse granules; fingers generally with corneous tips pretty distinct; dactylus with a series of larger granules above parallel to its outer margin. The smaller cheliped is like that of *E. hirsutiunculus*, but is almost trigonal, with a less distinct longitudinal groove; carpus spinous above; fingers not twice as long as palm, and not gaping. The ambulatory feet are long, those of the right side overreaching the tip of the right hand; dactyli stout, and somewhat shorter than the penult joint. Colors: Carapax red, with a median and two or three lateral bluish stripes. The colors on the feet are arranged by rings or bars, instead of vittæ; in alcoholic specimens these are blue and red; fingers of chelipeds bluish. Length usually one inch; length of anterior region of carapax, 0.25; breadth, 0.21 inch.

Found at Kagosima, Simoda, and Hakodadi, in Japan, as well as on the coast of California.

### 345. EUPAGURUS ANGUSTUS<sup>1</sup> Stimpson

*Eupagurus angustus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 250 [88], 1858.

The body in this species is narrow, as in some *Clibanarii*. Feet, with the exception of the right cheliped, moderately pilose, with long, fine hair. Rostriform point short and broad, but acute. Eyes rather long, reaching nearly to the extremities of the peduncles of the antennæ; cornea very little dilated. Ophthalmic scales with acuminate apex. Acicle small and short, falling much short of the extremities of the eyes. Flagellum of the antennæ long, naked, reaching far beyond the tips of the walking feet. Great cheliped much elongated, reaching a little beyond the ambulatory feet, naked except at the base, and everywhere covered above with minute equal spiniform granules; carpus two-thirds as broad as long, and three-fourths as long as the hand, including the fingers; hand convex, a little broader than the carpus, and tapering toward the fingers; fingers small, hardly more than one-half as long as the palm; tips calcareous; dactylus with a granulated longitudinal groove along the back, separating two rows of somewhat larger granules. Beneath

<sup>1</sup> *Pagurus angustus* (Stimpson).

the greater cheliped is granulated; meros-joint with a single prominent tubercle near the middle. The small cheliped extends to or a little beyond the extremity of the greater carpus; it is ridged along the middle, spinulose and hairy; spinules longest on the carpus; hand rather swollen exteriorly, with a depression on the right side of the palm above; fingers long and somewhat gaping. Ambulatory feet rather compressed; superior edge of carpal joint armed with four or five spinules; dactyli not contorted, slightly longer than the penult joint; unguicle or tip long and slender.

The colors in the alcoholic specimen are light yellow and red, arranged in broad, transverse bands or annulations on the feet; middle of the dactyli whitish, base and tips red. Length of the animal, 1.6; length of carapax, 0.35; breadth of front, 0.16; length of right cheliped, 0.96 inch.

Allied to *E. granosimanus* of the opposite shores of the Pacific, from which it differs in its narrower carapax, more acute and prominent rostriform point, and in the sharper granules of the right cheliped.

Found at the island of Kikaisima, in a small harbor on its southern coast.

#### 346. EUPAGURUS MIDDENDORFFII<sup>1</sup> Brandt

*Pagurus (Eupagurus) middendorffii* BRANDT, in Middendorff's Sibirische Reise, Zoölogie, p. 108, pl. v, figs. 1-16.

This species is easily recognized among other North Pacific *Eupaguri* by the smooth and even surface of its chelipeds, and its very slender ambulatory feet. There are no tubercles on the lower surface of the meros-joint of the great cheliped.

Our specimens were found in Hakodadi Bay, Japan.

#### 347. EUPAGURUS JAPONICUS<sup>2</sup> Stimpson

PLATE XXV, FIG. 2

*Eupagurus japonicus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 250 [88], 1858.

The following is a description of a male: Anterior region of the carapax well indurated, convex, and glabrous. Rostriform point of the front very prominent and acute; lateral points also prominent and minutely apiculated. The median region is broad, and the chan-

<sup>1</sup> *Pagurus middendorffii* Brandt.

<sup>2</sup> *Pagurus japonicus* (Stimpson).

nels bounding it laterally are, as usual, occupied with fascicles of hair, largest anteriorly. Eyes more than half as long as the front is wide; cornea a little dilated. Apical portion of the ophthalmic scale oblong, constricted at the base, but not acuminate at the extremity, and marked above by a median longitudinal impressed line occupied by short setæ. Acicle of the antennæ long, overreaching the eyes, and thickly clothed with tufts of hairs on its upper or inner edge; flagellum short, setose at the joints. Exognath of the outer maxillipeds broad.

The chelipeds, both right and left, are large and much longer than the contiguous ambulatory feet. Right cheliped densely clothed above with soft and rather short hair; meros smooth above and unarmed at the superior margin, but beneath very much dilated and hairy, with the right margin pectinated, the left most expanded and ciliated with long hairs; upper surface of carpus and hand covered with small scabriform granules, from the bases of which the hairs arise; carpus as long as the palm of the hand, armed with several small purple spines at the inner margin and near the antero-interior corner, and marked along the middle with a smooth groove; hand large, a little more than twice as long as broad; palm with a row of minute spines down the middle; exterior margin of immovable finger denticulated with spiniform teeth; dorsal carina of dactylus armed with a series of twelve bluish teeth. The left cheliped is also scabrous and hairy; meros and carpus almost or quite equal to those of the right cheliped in length, but much narrower and more compressed; lower outer margins of meros and carpus and upper margin of carpus spinous; hand somewhat tetragonal, carinated at the middle above, and at the outer margin; upper carina spinous. Ambulatory feet short and stout, thickly hairy above, but not spinulose; dactyli broad, not contorted, and shorter than the penult joint; ungues very large and strong. Color inclining to orange or minutely mottled with red and yellow; ambulatory feet broadly annulated with deeper red. Length of the animal, about 3.2; length of carapax, 0.83; breadth of front, 0.38; length of greater cheliped, 2.08 inches.

It somewhat resembles the *Pagurus lanuginosus* of De Haan, in which species, however, the ambulatory feet overreach the chelipeds and "manu pedum secundorum tarsis parum brevior." In our species the hand, even the left hand, is longer than the longest "tarsus."

Our specimens were found at Simoda.

348. *EUPAGURUS SINUATUS*<sup>1</sup> Stimpson

PLATE XXVI, FIG. 1

*Eupagurus sinuatus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 250 [88], 1858.

Upon the anterior region of the carapax there are the usual two series of setose pits extending on either side, from the base of the eye to the middle of the lateral suture. Rostriform tooth acute, prominent; lateral teeth of front acuminate. Eyes stout, shorter than the acicles; cornea a little dilated. Apex of ophthalmic scales elongated and slender. The greater cheliped reaches to the tips of the walking feet; surface granulated and covered with a short pubescence; inner margin with a deep sinus at the juncture of the carpus and the hand and another at the juncture of the dactylus with the hand; carpus subtriangular, sparsely spinous above, with a smooth strip in the middle and a spinose inner margin; hand broad in the female, with a median, and marginal rows of subspiniiform granules larger than the rest; dactylus above armed with a median series of sharp tubercles. Small cheliped subtrigonal, hirsute, and granulated; carpus with a spinous edge and a longitudinal smooth channel above; hand not spinous, but with a blunt carina running from the base to the immovable finger. In both chelipeds the meros is deeply excavated beneath, with the margins long-ciliated; the right margin spinose. Ambulatory feet hairy, but not spinose above; tarsi rather broad, not twisted, and armed with corneous spinules. Color of alcoholic specimens reddish. General length of a male specimen, 2.2; length of carapax, 0.6; breadth of front, measured as usual, between the outer bases of the antennæ, 0.3; length of greater cheliped, 1.28 inches.

Found in Port Jackson, Australia.

349. *EUPAGURUS TRICARINATUS*<sup>2</sup> Stimpson

*Eupagurus tricarinatus* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 251 [89], 1858.

Eyes rather remote from each other, and pretty large and stout, in length about equaling the peduncle of the antennæ, but overreaching the acicle; cornea considerably dilated; peduncle constricted at base. There is no distinct median or rostriform point to the carapax, but the bracteole or interocular plate of the ophthalmic ring is consider-

<sup>1</sup> *Pagurus sinuatus* (Stimpson).

<sup>2</sup> *Pagurus tricarinatus* (Stimpson).

ably developed. Feet naked or nearly so. Chelipeds shorter than the ambulatory feet; the right one but little larger than the left; hand in both with three sharp, denticulated longitudinal keels or crests, two marginal, and one median one continued on the immovable finger; carpus slightly pilose, flattened or obsoletely grooved above, with two slight crenated keels. Ambulatory feet very slender, naked; dactyli not contorted, and much longer than the penult joint. Colors: Body dark brownish in front, paler posteriorly; feet transversely banded with reddish and olive; chelipeds white. General length of the animal, half an inch; length of the carapax, 0.11; breadth of the front, 0.07; length of the right cheliped, 0.17 inch.

Dredged in five fathoms, black sand, in Kagosima Bay, Japan.

### 350. EUPAGURUS ACANTHOLEPIS<sup>1</sup> Stimpson

*Eupagurus acantholepis* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 251 [89], 1858.

Of this species we have only a small female specimen, perhaps young. The rostriform tooth is obsolete. The ophthalmic ring is shielded above by a bifurcated bracteole. The eyes are slender, and overreach the peduncles of the antennæ, equaling in length the breadth of the front, and curving outward; cornea not dilated; ophthalmic scales small, bidentate or bifurcated; teeth or forks spini-form. Flagellum of antennæ shorter than the feet. Acicle very small. Feet slender, sparsely hirsute with long hairs. Chelipeds slender, but much shorter than the ambulatory feet, and spinulose above; the right one largest; carpus somewhat grooved above; hands a little depressed, and armed with a median and two marginal rows of spines; spines of the left cheliped longest. Dactyli of the ambulatory feet not contorted, but compressed, almost falciform; unguicles slender. Fourth pair of feet not didactyle; penult joint expanded. On the right side of the abdomen near its base there is a conical process, the skin of which at its apex is somewhat indurated or corneous. Length of the animal, about one inch; length of carapax, 0.21; breadth of front, 0.12; length of eye, 0.12; length of right cheliped, 0.35; of the right ambulatory foot, 0.53 inch.

This species, as will be seen from the description, presents some peculiarities which may require its subsequent removal from the genus *Eupagurus*, although it has most of the more essential characters of that genus—the remoteness of the external maxillipeds, etc. It is desirable that the male should be examined.

Dredged in eight fathoms, mud, in Port Jackson, Australia.

<sup>1</sup> *Pagurus acantholepis* (Stimpson).

## Genus GALATHEA Fabricius

In the male of this genus the genital organs of the fifth coxæ are not exerted. The segments of the abdomen are all provided with appendages; those of the first two pairs are copulative, and those of the next four pairs are of small size, simple and flattened.

This genus is found in all seas of the old world. It is remarkable that no species is found in the American waters except those of the frigid zones, although it is represented on the west coast by the genus *Pleuronchodes*. The following is a list of species known besides those herein described:

*Galathea strigosa* Fabr.

*squamifera* Leach.

*nexa* Embleton.

*andrewsi* Kinahan.

*tridentata* Esmark.

*intermedia* Liljeb.

*serricornis* Lovén.

*Galathea latirostris* Dana.

*spinosirostris* Dana.

*vitiensis* Dana.

*longirostris* Dana.

*elegans* White.

*integrastrostris* Dana.

## 351. GALATHEA AUSTRALIENSIS Stimpson

*Galathea australiensis* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 251 [89], 1858.

Carapax rather short and broad; broad posteriorly; surface strigose and pubescent; pubescence rather long; gastric region moderately well defined and two-spined in front; lateral or marginal spines sharp, eight in number on each side, including two at the insertion of the antenna, one above and one below. Rostrum broad, triangular, with four long, deeply cut spiniform teeth on each side; surface thickly pubescent. Chelipeds moderately robust, scabrous and setose above, and with a few spines on the margin; fingers depressed, not gaping, and together nearly as broad as the palm; their inner margins armed with one or two slight teeth. Color reddish, with some bluish on the carapax; fingers of the hands tipped with dark purplish-brown.

The above description was taken from a female specimen, the dimensions of which are: Length of the carapax (rostrum included), 0.29; breadth, 0.215; length of the rostrum, 0.09; of the chelipeds, 0.56 inch.

It was found among sponges dredged from a muddy bottom in six fathoms in Port Jackson, Australia.

352. *GALATHEA LABIDOLEPTA* Stimpson

*Galathea labidolepta* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 251 [89], 1858.

Carapax rather short, narrowing anteriorly; surface strigose and much pubescent; gastric region not distinctly circumscribed, and armed with two little spines anteriorly; lateral margin armed with eight minute spines, including two at insertion of antenna. Rostrum long, triangular, acute, and armed on each side with four small, very slender teeth, including that situated above the eye. No other tooth on the supraorbital margin. Outer angle of orbit acute. Chelipeds rather stout; upper surface uniformly roughened with short spines and setæ; margins armed with a few spines, of which there are two short and one long one near the inner apex of the meros, and one long one at that of the carpus; hand with a thick palm, but very slender fingers, which together are much narrower than the palm, straight, and not toothed. Ambulatory feet spinulose and very sparsely hairy; meros-joint sufficiently broad, and provided on superior margin with about ten weak spines; lower margin of dactylus armed with four small teeth, each bearing one movable spinule. Colors: Carapax dark red, margined with white; abdomen variegated with reddish and yellowish, with a white median spot on each of the first two segments; feet punctatè with blue. The dimensions of a male specimen are: Length of the carapax, 0.32; breadth, 0.21; length of rostrum, 0.11; of chelipeds, 0.58 inch. Females are generally larger, the carapax in one being 0.4 inch in length.

Dredged from a sandy bottom in twelve fathoms in Simons Bay, Cape of Good Hope.

353. *GALATHEA ORIENTALIS* Stimpson

*Galathea orientalis* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 252 [90], 1858.

The following description is that of a male. Carapax rather long and narrow, becoming narrower anteriorly; surface, as usual, strigose; pubescence on the strigæ very short; gastric region not distinctly defined and two-spined in front, spines minute; lateral margin armed with six teeth or spines, including that above the insertion of the antenna, but not the small inferior one. Rostrum large, subtriangular, and rather broad; surface naked; sides somewhat convex and each armed with three acute equal teeth and one much smaller one at the base. Eyes large. The tooth forming the external angle of the orbit is minute, sharp, and placed rather within than an-

teriorly to the prominent first lateral tooth. Chelipeds long, spinulose, and sparsely provided with long hairs; marginal spines longest; carpus with one strong spine on the inner side and a smaller one behind it; hand rather depressed, uniformly roughened above with asperities or short, broad spinules; fingers scarcely gaping; two low teeth on the inner margin of the dactylus and one on that of the immovable finger corresponding to the interspace between them. Meros-joint of the ambulatory feet rather narrow, with its superior margin armed with equal, closely arranged spinules; dactylus with a short supplementary unguiform tooth on the inner margin above the true unguiculus. Dimensions: Length of carapax, 0.26; breadth, 0.19; length of rostrum, 0.09; of chelipeds, 0.6 inch.

Females have more slender chelipeds, armed with longer spines, and with the fingers scarcely toothed within.

The species is of a bright red color, with a median white stripe on the back. Feet pale orange.

It differs from *G. vitiensis* in its larger rostrum, the non-circumscribed gastric area, and the sharper external orbital angle; from *G. latirostris* in its rostrum, which is longer, not subovate, and more acutely toothed; from *G. spinosirostris* in its longer chelipeds, with fewer spines on the inner side of the carpus.

Dredged from a shelly bottom in twenty-five fathoms in Lyimoon Passage, near Hongkong, China.

Specimens probably of this species were obtained in the China Sea, also at Ousima and in Kagosima Bay, which differ somewhat from the above, the males having a somewhat longer and more tapering carapax, with the gastric region better circumscribed; the chelipeds longer and often with gaping fingers, bearing a sharply prominent tooth on the dactylus and none on the immovable finger. This form appears to be connected with the type by intermediate gradations, but if distinct might be named *G. longimana*.

#### 354. GALATHEA ACANTHOMERA Stimpson

*Galathea acanthomera* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 252 [90], 1858.

This species resembles *G. orientalis* in the shape and armature of the carapax and rostrum, except that the basal teeth of the rostrum are larger. The chelipeds in our only specimen are wanting. The ambulatory feet resemble those of *G. spinosirostris*. They are stout and fringed above with plumose hairs; the meros-joint is broad, with eleven stout spines on the superior edge, with the outer surface deeply marked with pubescent strigæ, and with a spine at the inferior extremity; the carpus is four-spined above, and the dactylus

is less than half as long as the penult joint, and armed below with a minute supplementary unguiculus. The upper surface of the abdomen is sparsely clothed with long hairs. Color grayish. Length of carapax, 0.22; breadth, 0.18; length of rostrum, 0.07 inch.

It differs from *G. spinosirostris* in its longer rostrum and in the plumose character of the setæ on the ambulatory feet.

Found among coral at the depth of one fathom in Port Lloyd, Bonin Islands.

### 355. GALATHEA PUBESCENS Stimpson

*Galathea pubescens* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 252 [90], 1858.

Carapax regularly or evenly convex, not much narrowed before; surface deeply strigose and conspicuously pubescent, the hairs or ciliæ of each ridge being nearly long enough to reach the next ridge. Gastric region not well defined, and armed near the middle anteriorly with three small spines, the median one situated a little behind the other two. Lateral margins armed as in *G. orientalis*. Rostrum large, acutely triangular, densely pubescent above, and 4-toothed on each margin; teeth very sharp, and raking forward. There is sometimes a supplementary tooth between the basal tooth and the second. Chelipeds linear, very slender, sparsely setose and spinulose, but with spines smaller and less numerous than in *G. orientalis*. Sometimes there is, however, a strong spine on the carpus. Fingers of the hand flattened, parallel, not at all gaping, and not as long as the palm. Ambulatory feet of moderate length; superior edge of meros-joint armed with seven or eight very slender subdistant spinules; dactylus about half as long as the penult joint. Abdomen pubescent. Color reddish, sometimes with darker mottlings, and a median dorsal white stripe. In one specimen the length of the carapax was 0.22; breadth, 0.16 inch. In another, a female, length of carapax, 0.22; breadth, 0.13; length of rostrum, 0.08; length of chelipeds, 0.4 inch.

It was dredged from a sandy bottom in thirty-three fathoms on the east coast of Ousima; also in twenty-five fathoms, coarse sand and shells, off the headland of Hakodadi, Island of Jesso, Japan.

### 356. GALATHEA SUBSQAMATA Stimpson

*Galathea subsquamata* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 252 [90], 1858.

Carapax depressed, scarcely narrowed anteriorly. The transverse strigæ are few in number (only three on the cardiac region), the

secondary ones being obsolete; but they are very deeply cut, especially at the middle of the carapax. On the gastric region and at the sides these strigæ are undulated, and sometimes partially interrupted, so as to resemble broad scales. Their edges are scarcely pubescent, and there are only a few scattered setæ on the surface. The gastric and hepatic regions are not very distinctly circumscribed. On the front and sides of the gastric region there are eight or ten small spinules scattered. Lateral margin seven-toothed, excluding the angle of the orbit, which is situated far inward, as in *G. orientalis*. Rostrum exactly triangular in shape, of the usual breadth, and armed with four very sharp and deeply cut teeth on each side. Spines on the base of the antennulæ very long, reaching almost to the tip of the rostrum. Chelipeds of moderate size, armed with small subequal spines regularly distributed; carpus and meros with two or three longer spines within; hand more slender than carpus; fingers parallel, depressed, not gaping, and not toothed. In the ambulatory feet the meros is slender, and ten-spined above; dactylus with a short, stout tooth on the inner or lower margin. Length of carapax in a male, 0.26; breadth, 0.16; length of rostrum, 0.1; of chelipeds, 0.56 inch.

Found at Ousima.

### 357. GALATHEA GRANDIROSTRIS Stimpson

*Galathea grandirostris* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 252 [90], 1858.

Carapax evenly convex; strigose; strigæ about twelve in number between the base of the rostrum and the posterior margin, and ciliated with short hairs, equaling in length one-third the distance between the ridges. Some of the strigæ are interrupted, and that which crosses the posterior part of the gastric region is undulated. Gastric region not circumscribed. Lateral margin nine-toothed. Rostrum greatly elongated; surface roughened and pubescent; margins each serrated with about six small distant teeth almost obsolete. Chelipeds stout, roughened with transverse scabrosities and short setose; two or three spines at the inner apex of the meros and of the carpus; no spines on the hand; fingers moderately pilose and not gaping. The surface of the ambulatory feet is ornamented with transverse ciliated striæ, about six in number on the meros-joint. Color purple-brown, very dark; carapax and abdomen above with two longitudinal yellowish-white vittæ; chelipeds with one median stripe; ambulatory feet transversely barred. Length of carapax in a male (rostrum included), 0.342; breadth, 0.19; length of rostrum,

0.16; breadth of rostrum at base, 0.06; length of chelipeds, 0.53 inch.

With *G. longirostris* Dana and *G. elegans* White it forms a group which will perhaps be found to have a generic value, and be separated from *Galathea* proper. From these two species ours differs in its larger rostrum and in other characters.

It was dredged from a black sand bottom at five fathoms depth in Kagosima Bay, Japan.

### Genus MUNIDA Leach

Differs from *Galathea* in the character of its front, which is armed with three spines, the median longest. The species of *Munida* are all very closely allied to each other. They are found in both temperate zones and in both oceans. Only three species are known, *M. bamffia* White, *M. subrugosa* Dana, and the following.

#### 358. MUNIDA JAPONICA Stimpson

*Munida japonica* STIMPSON, Proc. Acad. Nat. Sci. Phila., x, p. 252 [90], 1858.

The carapax is oblong. The lateral margin is armed near the middle with five spinules, and the spines above and behind the base of the antenna are no larger than these lateral spinules. There is a pencil of brilliant setæ on the margin beneath the sinus of the transverse suture, and a few such pencils on the sides of the abdomen. Frontal spines needle-shaped, the lateral ones nearly half as long as the middle one. There is a series of thirteen spinules extending across the front part of the gastric region, of which two, one on each side of the middle, are larger than the others. On each side of the gastric region there are three spines on the surface, about half way from the lateral margin to the median line. Chelipeds very long, straight, subcylindrical, scabrous, with a few scattered spinules; fingers long, very slender, and straight, those of the left hand gaping at the base. Antennæ a little longer than the chelipeds. Color a rather dark red, mottled with light red and white. The feet show a tendency to annulation. This description is drawn up from a male specimen, the dimensions of which are: Length of carapax, 0.48; breadth, 0.28; length of median frontal spine, or rostrum, 0.18; length of chelipeds, 1.3 inches.

Dredged from a shelly bottom in twenty fathoms in Kagosima Bay, Japan.

## EXPLANATION OF PLATES.

## PLATE I.

- FIG. 1. *Doclea gracilipes*, natural size.  
 2. *Micippa spinosa*,  $\times 2/3$ .  
 3. *Micropisa ovata*,  $\delta$ ,  $\times 2$ .  
 3a. Ventral view of anterior half,  $\times 5$ .  
 4. *Doclea canalifera*,  $\delta$ ,  $\times 4/5$ .

## PLATE II.

- FIG. 1. *Hyas latifrons*,  $\delta$ ,  $\times 2/3$ .  
 1a. Carapace of young specimen, natural size.

## PLATE III.

- FIG. 1. *Tiarinia cornigera*,  $\delta$ , natural size.  
 2. *Tiarinia depressa*,  $\varphi$ , natural size.  
 3. *Tiarinia spinigera*,  $\varphi$ , natural size.  
 4. *Scyra compressipes*,  $\varphi$ , natural size.  
 5. *Achæopsis spinulosus*,  $\varphi$ , natural size.  
 5a. Carapace of  $\varphi$ ,  $\times 2$ .  
 6. *Menæthius dentatus*, natural size.  
 7. *Achæus lacertosus*,  $\delta$ , natural size.  
 8. *Stenorynchus falcifer*,  $\varphi$ , natural size.

## PLATE IV.

- FIG. 1. *Mithrax suborbicularis*, natural size.  
 2. *Eurynome longimana*,  $\delta$ , natural size.  
 3. *Lambrus rugosus*,  $\delta$ , natural size.  
 4. *Lambrus tuberculosus*,  $\delta$ , natural size.  
 5. *Cancer productus*,  $\varphi$ ,  $\times 2/3$ .  
 5a. Buccal and antennal region.  
 6. *Cryptopodia contracta*,  $\delta$ , natural size.  
 6a. Ventral view.

## PLATE V.

- FIG. 1. *Liomera subacuta*,  $\varphi$ , natural size.  
 2. *Etisus convexus*,  $\varphi$ , natural size.  
 3. *Xanthodes elegans*,  $\varphi$ , natural size.  
 4. *Lachnopus rodgersii*,  $\varphi$ , natural size.  
 5. *Actæa subglobosa*,  $\delta$ , natural size.  
 6. *Actæa pilosa*,  $\delta$ ,  $\times 2$ .  
 7. *Actæa pura*,  $\varphi$ , natural size.

## PLATE VI.

- FIG. 1. *Polycrémnus verrucifer*, ♂, natural size.  
 2. *Euxanthus melissa*, ♂, natural size. a. Right chela. b. Abdomen.  
 3. *Chlorodius exaratus* var. *granulosus*, ♂, natural size.  
 4. *Chlorodius exaratus* var. *rugosus*, ♂, natural size.  
 5. *Chlorodius dentifrons*, ♂,  $\times 2$ .  
 6. *Chlorodius exaratus* var. *pictus*, ♂, natural size.  
 7. *Chlorodius exaratus* var. *acutidens*, ♂, natural size.  
 8. *Chlorodius exaratus* var. *cupulifer*, chelæ, natural size.  
 9. *Chlorodius exaratus* var. *latus*, ♂, natural size.

## PLATE VII.

- FIG. 1. *Pilodius nigrocinnitus*, ♀,  $\times 2$ . a. Dorsal view. b. Right chela.  
 2. *Pilodius granulatus*, ♂,  $\times 2$ .  
 3. *Pseudozius microphthalmus*, ♀, natural size.  
 4. *Ozius frontalis*, ♂, natural size.  
 5. *Sphærozius nitidus*, ♀,  $\times 2$ .  
 5a. Front view.  
 6. *Ozius rugulosus*, ♀,  $\times 4/5$ .  
 7. *Heteropanope australiensis*, ♂, natural size.  
 7a. Outline of carapace,  $\times 2$ .

## PLATE VIII.

- FIG. 1. *Heteropanope glabra*, ♂,  $\times 2$ .  
 2. *Heteropanope eucratoides*, ♂,  $\times 2$ .  
 2a. Chelæ,  $\times 2$ .  
 3. *Pilumnus rufopunctatus*, ♂, natural size.  
 4. *Pilumnus fissifrons*, ♂,  $\times 2$ .  
 5. *Pilumnus verrucosipes*,  $\times 2$ .  
 6. *Pilumnus forficigerus*, ♀,  $\times 2$ .  
 6a. Chelæ,  $\times 2$ .  
 7. *Pilumnus lapillimanus*, ♂, natural size.  
 7a. Chelæ, natural size.

## PLATE IX.

- FIG. 1. *Pilumnus hirsutus*, ♂,  $\times 2$ .  
 2. *Pilumnus marginatus*, ♂,  $\times 2$ .  
 3. *Pilumnus dorsipes*, natural size.  
 3a. ♂, natural size, showing feet in dorsal position.  
 4. *Tetralia lævissima*, ♂,  $\times 2$ .  
 4a. Left chela,  $\times 2$ .  
 5. *Trapezia reticulata*, ♂,  $\times 2$ .  
 6. *Portunus strigilis*,  $\times 2$ .  
 7. *Charybdis variegata*, carapace of ♂,  $\times 2$ .

## PLATE X.

- FIG. 1. *Amphitrite media*, ♀, natural size.  
 2. *Amphitrite gracillima*, ♂, × 2.  
 3. *Amphitrite gracilimanus*, ♂, natural size. a. Dorsal view. b. Right chela and carpus. c. Abdomen.  
 4. *Kraussia nitida*, ♂, × 2.  
 5. *Thalamita picta*, ♂, natural size.  
 6. *Thalamita crenata*, ♂, × 2/3.  
 6a. Right chela.

## PLATE XI.

- FIG. 1. *Thalamita danae*, ♀, × 4/5.  
 1a. Right chela.  
 2. *Thalamita sima*, ♂, × 2/3.  
 3. *Pilumnoplax sculpta*, ♀, × 2.  
 4. *Acmaopleura parvula*, ♂, × 2.

## PLATE XII.

- FIG. 1. *Charybdis anisodon*, ♂, × 2/3.  
 2. *Ocyropode ceratophthalma*, eyes of three specimens, largest and smallest ♂, medium ♀.  
 3. *Cheirogonus acutidens*, slightly enlarged.

## PLATE XIII.

- FIG. 1. *Macrophthalmus dentatus*, ♂, × 2. a. Dorsal view. b. Right chela. c. Left chela.  
 2. *Macrophthalmus convexus*, ♂, × 2. a. Dorsal view. b. Left chela.  
 3. *Macrophthalmus serratus*, ♂, natural size. a. Carapace. b. Left hand. c. Ambulatory leg. d. Extremity of leg.  
 4. *Myctiris brevidactylus*, ♂, natural size.  
 5. *Myctiris platycheles*, ♂, natural size.  
 6. *Sesarma vestita*, upper view of left chela, × 3.

## PLATE XIV.

- FIG. 1. *Asthenognathus inaequipes*, ♀, × 2.  
 2. *Gelasimus splendidus*, ♂, natural size. a. Dorsal view. b. Inner side of large chela. c. Outer side of large chela.  
 3. *Gelasimus acutus*, ♂, natural size. a. Dorsal view. b. Outer side of large chela. c. Inner side of large chela.  
 4. *Gelasimus dubius*, ♂, natural size. a. Dorsal view. b. Outer side of large chela.  
 5. *Cryptocnemus pentagonus*, × 2. a. Rear view. b. Side view.  
 6. *Cryptocnemus pentagonus*, ♂, × 2. a. Dorsal view. b. Ambulatory leg.  
 7. *Carcinaspis marginatus*, ♀, × 2.  
 8. *Hapalocarcinus marsupialis*, ♀, × 2.

## PLATE XV.

- FIG. 1. *Gelasimus pulchellus*, ♂. a. Dorsal view,  $\times 2$ . b. Outer side of large chela, natural size. c. Inner side of large chela, natural size.
2. *Ocyrode cordimana*, ♂, natural size. a. Dorsal view. b. Abdomen of male. c. Abdomen of female. d. Buccal area.
3. *Ocyrode convexa*, natural size. a. Dorsal view. b. Right chela. c. Left chela.

## PLATE XVI.

- FIG. 1. *Nautilograpsus angustatus*,  $\times 2$ .
2. *Metopograpsus quadridentatus*, inner face of right arm of ♂, natural size.
3. *Geograpsus rubidus*, ♂,  $\times 4/5$ .
- 3a. Lower view of left chela of ♂, natural size.
4. *Grapsus subquadratus*, ♂,  $\times 4/5$ .

## PLATE XVII.

- FIG. 1. *Sesarma ruficollis*, natural size.
- 1a. Upper view of right chela and wrist of ♀, natural size.
- 1b. Upper view of palm and base of dactylus of ♀,  $\times 2$ .
2. *Gothelphusa dehaani*, ♂,  $\times 1/2$ .
3. *Platygrapsus convexiusculus*, ♀, natural size.
4. *Camptandrium sexdentatum*, ♀,  $\times 2$ .
5. *Ptychognathus glaber*, ♂, natural size.
- 5a. Buccal area.

## PLATE XVIII.

- FIG. 1. *Leucosia parvimana*, ♂, natural size. a. Dorsal view. b. Abdomen of male.
2. *Leucosia maculata*, ♂, natural size. a. Dorsal view. b. Abdomen.
3. *Leucosia vittata*, ♂, natural size.
- 3a. Carapace of young ♂, natural size.
4. *Philyra unidentata*, ♀, natural size.
5. *Philyra tuberculosa*, ♀, natural size.
6. *Phylaxia quadridentata*, ♂,  $\times 2$ .
7. *Ebalia madeirensis*, ♀,  $\times 2$ .
8. *Iphiculus spongiosus*, natural size. a. Carapace. b. Left chela. c. Side view.
9. *Arcania globata*, ♀, natural size.

## PLATE XIX.

- FIG. 1. *Remipes testudinarius*, natural size.
2. *Diogenes brevirostris*, ♂,  $\times 2$ .
3. *Tymolus japonicus*, ♂,  $\times 2$ .
- 3a. Carapace of ♀,  $\times 2$ .
4. *Ethusa sexdentata*, ♂,  $\times 2$ .
5. *Polyonyx sincensis*, ♂,  $\times 2$ .

FIG. 6. *Orcophorus rugosus*, ♀, natural size.

6a. Abdomen of ♀.

7. *Cycloës cristata*, ♂, × 2.

8. *Onychomorpha lamelligera*, ♂, × 2.

8a. Ambulatory leg.

PLATE XX.

FIG. 1. *Dromidia spongiosa*, ♀, natural size.

2. *Cryptodromia coronata*, ♂, × 2.

3. *Cryptodromia lateralis*, ♂, × 2.

PLATE XXI.

FIG. 1. *Mastigopus gracilis*, × 2.

2. *Hippa analoga*, ♀, natural size. a. Dorsal view. b. Side view of carapace.

3. *Pseudodromia latens*, ♂, natural size.

4. *Petalomera granulata*, carapace, × 2.

5. *Conchæcetes artificiosus*, ♂, natural size.

6. *Cryptodromia tuberculata*, ♂, natural size.

7. *Dromia rumphii*, abdomen of ♂, hairs removed.

PLATE XXII.

FIG. 1. *Porcellana pulchra*, ♀, × 3.

2. *Petrolisthes speciosus*, ♂, natural size.

3. *Petrolisthes pubescens*, ♂, × 2.

4. *Petrolisthes hastatus*, ♂, natural size.

5. *Raphidopus ciliatus*, ♀, × 2.

6. *Porcellanella picta*, ♂, natural size.

PLATE XXIII.

FIG. 1. *Porcellana streptocheles*, ♂, × 2.

2. *Porcellana serratifrons*, ♂, × 2.

3. *Porcellana dispar*, ♂, × 2.

4. *Porcellana latifrons*, ♂, × 2.

5. *Pachycheles pectiniscarpus*, × 2.

6. *Pachycheles stevensii*, ♀, natural size.

PLATE XXIV.

FIG. 1. *Diogenes edwardsii*, ♂, natural size.

2. *Eupagurus megalops*, natural size.

3. *Eupagurus constans*, ♂, natural size.

PLATE XXV.

FIG. 1. *Paguristes digitalis*, ♂, natural size, Hakodadi.

2. *Eupagurus japonicus*, ♂, natural size.

PLATE XXVI.

FIG. 1. *Eupagurus sinuatus*, ♀, natural size, Port Jackson.

2. *Eupagurus trigonocheirus*, natural size.











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