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# CONSPECTUS CRUSTACEORUM,

QUÆ IN ORBIS TERRARUM CIRCUMNAVIGATIONE,

7

CAROLO WILKES

E CLASSE REIPUBLICÆ FŒDERATÆ DUCE,

LIBRARY  
DIVISION OF ZOOLOGY

LEXIT ET DESCRIPSIT

pt 1

James Dwight  
(JACOBUS D.) DANA.



EX ACADEMIÆ ARTIUM SCIENTIARUMQUE AMERICANÆ NUNTIIS.

INVERTEBRATE  
ZOOLOGY  
Crustacea

CANTABRIGIÆ:

TYPIS METCALF ET SOC. UNIV. TYPOGRAPH.

1847-49.

## CONTENTS

1. 1848. *Conspectus Crustaceourm quae in Orbis Terrarum circumnavigatione, Carolo Wilkes e classe Reipublicae Faederatae Duce. Pars. I. Crustacea Copepoda (Cyclopacea).*
2. <sup>1849</sup>~~1852~~. *Conspectus Crustaceorum quae in Orbis Terrarum circumnavigatione, Carlos Wilkes e Classe Reipublicae, Faederatae Duce, Pars II. Copepods.*
3. 1852. *Conspectus crustaceorum quae in Orbis Terrarum circumnavigatione, Carolo Wilkes e Classe Reipublicae Faederatae Duce, Pts. III, Amphipoda, No. 1*
4. ~~1849~~. *Conspectus Crustaceorum quae in Orbis Terrarum Circumnavigatione, Carolo Wilkes e Classe Reipublicae Faederatae Duce, Isopoda*
5. 1850. *Conspectus Crustaceorum quae in Orbis Terrarum circumnavigatione Carolo Wilkes e Classe Reipublicae, Faed. Duce, Pt. V, Schizopoda, No. 1*
6. 1851. *Conspectus Crust. quae in Orb. Terr. Circ. Carlos Wilkes e Clas. Reip. Faed. Duce, Lexit et Descripsit, Pars VI.*
7. 1849. *Conspectus Crust. Orb. Terr. Circ. Carlos Wilkes Clas. Reip. Faed. Duce, Entomostraca.*
8. 1851. *Consp. Crust. Orb. Terr. Circ., Carlos Wilkes Reip. Faed. Duce. Crustacea Grapsoidea (Cyclometopa, Edwardsii)*
9. 1851. *Con. Crust. Orb. Terr. Circ., Carlos Wilkes, Reip. Faed. Duce, Paguridea.*
10. 1852. *Con. Crust. Orb. Terr. Circ., Carlos Wil. Clas. Rep. Faed. Duce. Including the Paguridea, continued, & subtrive Megalopidea, and the Macrourea.*



11. [Pt. 11.] Paguridea, continued, Megalopidea and Macrourea.

Amer. Jour. Sci. & Arts, 2nd Ser.,  
Vol. XIV, July 1852, pp. 116-125. Abstract  
of a paper in the Proc. Acad. Nat. Sci.,  
Phila., 1852, pp. 6-28.

12. [Pt. 12.] Crustacea Cancroidea & Corystoidea.

Proc. Acad. Nat. Sci., Phila., Vol.  
VI, 1852-53, pp. 73-86.

✓ 13. Art. IX. Notice of some Genera of Cyclopacea. \*

~~Silliman Journ.~~, Vol. I, <sup>No. 1</sup> 1846, pp. 225-230.

*Amer. Jour. Sci. & Arts, ser. 2*

✓ 14. Synopsis of the genera of Gammaracea.

Amer. Jour. Sci. & Arts, 2nd Series, Vol. VIII,  
No. 22, 1849, pp. 135-140.

✓ 15. 2. Gammaracea.

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No. 22, 1849, p. 428.

✓ 16. A new genus of Orchestidae.

Amer. Jour. Sci. & Arts, 2nd Ser., Vol. IX,  
p. 185.

✓ 17. Art. XII. On the markings of the carapax of crabs.

~~Silliman Journ.~~ XI, 1851, pp. 95-99.

*Amer. Jour. Sci. & Arts*

✓ 18. On the classification of the Maioid Crustacea or  
Oxyrhyncha.

Amer. Jour. Sci. & Arts, 2nd Ser., Vol. XI,  
1851, pp. 425-434.

✓ 19. On the classification of the Cancroidea.

Amer. Jour. Sci. & Arts, Vol. XII, 2nd Ser.,  
1851, pp. 121-131.

✓ 20. On the classification of the Crustacea Grapsoidea.

Amer. Jour. Sci. & Arts., Vol. XII, 2nd Ser.,  
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- ✓ 21. On the classification of the Corystoidea, Paguridea, etc.

*also 7a.*  
Amer. Jour. Sci. & Arts, 2nd Ser., Vol. XIII, 1852, pp. 119-124.

*2 copies bound in*

- ✓ 22. On the classification of the Crustacea Choristopoda or Tetradeapoda.

Silliman Jour., Vol. XIV, 1852, pp. 297-316.

- ✓ 23. On the geographical distribution of Crustacea.

Amer. Jour. Sci. & Arts, 2nd Ser., Vol. XVIII, 1854, pp. 1-45, map.

- ✓ 24. A review of the classification of Crustacea with reference to certain principles of classification.

Amer. Jour. Sci. & Arts, 2nd Ser., Vol. XXII, 1856, pp. 1-17.

# CONSPECTUS CRUSTACEORUM, ETC.

(Conventui exhibita die 4 Maii, 1847.)

## Pars I. — CRUSTACEA COPEPODA (CYCLOPACEA\*).

### Familia I. CYCLOPIDÆ.

*Oculi* duo simplices tantum. *Palpi* mandibulorum maxillarumque breves aut obsoleti. *Sacculi ovigeri* duo.

\* Cyclopaceorum organa sunt : —

*Cephalo-thorax* 4 – 7-articulatus. *Abdomen* 1 – 6-articulatum, carapace non tectum.

*Frons* sæpissimè rostrata, rostro aut simplice, aut furcato, aut transversim emarginato, aut appendicibus instructo.

*Oculi* duo simplices, pigmento aut connati aut disjuncti; quoque quibusdam, oculi duo coaliti sub capite insistentes; aliis, oculi lenticulis duobus grandibus, uno oblato, uno prolato, constructi.

*Antennæ anticæ* 4 – 28-articulatæ, aut simplices, aut appendiculatæ; *posticæ*, 2 – 5-articulatæ et sæpe ramum ferentes, aliis apice setigeræ, aliis subcheliformes.

*Mandibulæ* apice dentatæ, sæpius palpigeræ.

*Maxillæ* duæ setosæ; sæpe palpigeræ, palpo sive parvulo et vix discernendo, sive setas diffusas ferente.

*Maxillipedes* duo, aliis parvi et parcius setigeri, aliis crassiores et valde setigeri, setis spinulosis.

*Pedes antici* duo simplices, aut obsolescentes, aut elongati, aliis setigeri setis non spinulosis, aliis subcheliformes.

*Pedes biremes* decem; octo anteriores sæpius natatorii, sed duo antici interdum subprehensiles; duo posteriores plurimum obsoleti aut parvuli; in quibusdam masculinis pergrandes et uno ambove prehensiles.

Abdomini pertinentes ad basin sæpissimè *pedes spurii*, sive obsolescentes, sive oblongi et setis armati; ad extremum, styli caudales duo, unusquisque 4 – 6 setis plerumque plumosis instructus.

Ad segmentum cephalo-thoracis *septem*-articulati primum, antennæ quatuor pertinent; ad secundum, mandibula, maxillæ, et maxillipedes; ad tertium, pedes quatuor antici; (cephalo-thorace *quadri*-articulato, hæc tota ad segmentum anticum pertinent;) ad segmenta sequentia, singulatim, duo pedes biremes.

## Genus I. CYCLOPS.

*Antennæ maris anticæ* subcheliformes aut articulo geniculante instructæ.

1. CYCLOPS BRASILIENSIS. — C. cephalo-thorace posticè obtuso, abdominem longitudine superante; antennis anticis in utroque sexu elongatis (cephalo-thorace longioribus), articulis primo secundoque majoribus et setis oblongis apice instructis, setis antennarum aliis brevibus; antennis *maris* 7-articulatis, articulis tribus basalibus crassissimis, reliquis teretibus, *feminæ*, 14-articulatis, teretibus; stylis caudalibus oblongis, tres articulos abdominis ultimos simul sumtos fere æquantibus, setâ secundâ \* fere abdominis longitudine, primâ dimidio brevior.

*Hab.* Rio Janeiro.

2. CYCLOPS CURTICAUDUS. — C. *feminæ* cephalo-thorace posticè obtuso, abdominem longitudine valde superante; antennis anticis dimidio cephalo-thorace valde longioribus, 13–14-articulatis, articulis brevibus, quinque basalibus non oblongis; setis antennarum † inæqualibus, *posterioribus* articulorum penultimi et præantepenultimi longioribus (quatuor articulos ultimos simul sumtos longitudine æquantibus), *anterioribus* perbrevibus; stylis caudalibus prælongis, dimidio abdomine vix brevioribus, setis curtis, secundâ tertiâque subæquis et stylo paulo longioribus.

*Long.*  $\frac{1}{20}$ " — *Hab.* Valparaiso, Chile.

3. CYCLOPS PUBESCENS. — C. cephalo-thorace pubescente, abdominem longitudine vix superante, posticè subacuto; antennis anticis *feminæ* dimidii cephalo-thoracis longitudine, 8–9-articulatis, setis totis brevibus; antennis *maris* brevioribus, tribus articulis basalibus curtis, quarto crassissimo subovato, dimidii antennæ longitudine, ultimo (forsan duplice) tenui brevique, digitiformi; stylis caudalibus abdomine quadruplo brevioribus, setâ secundâ abdomine longiore, primâ brevissimâ.

*Long.*  $\frac{1}{24}$ " — *Hab.* Valparaiso, Chile.

4. CYCLOPS MACLEAYI. — C. *feminæ* cephalo-thorace abdomine valde longiore; antennis anticis longis (cephalo-thoracem æquantibus),

\* Setarum caudalium interior est nobis *prima*, et sequentes ordine, *secunda*, *tertia*, et cet.

† Setæ antennarum plerumque valent ad species distinguendum, et præcipuè illæ articulorum ultimorum. Articulos 2, 3, aut 4, ultimum præcedentes, *subultimos* sæpe vocamus; et eorum setæ, *anteriores* et *posteriores*, scrutandæ et comparandæ.

ad basin paulo crassioribus, articulo secundo oblongo, 5–6 sequentes brevissimos simul sumtos longitudine fere æquante, 10 reliquis paulum oblongis, septimo longiore, setis articuli secundi et septimi parum elongatis, duorum subultimorum\* totis brevibus, ultimi articulum longitudine vix superantibus; stylis caudalibus tenuibus, duos articulos abdominis longitudine æquantibus, setâ secundâ abdomine brevior, primâ fere styli longitudine.

*Long.*  $\frac{1}{24}$ " — *Hab.* in vicin. Sydney, N. S. W.

5. CYCLOPS VITIENSIS. — C. *feminæ* cephalo-thorace posticè fere obtuso, abdominem longitudine vix superante, nudo; antennis anticis longis, cephalo-thoracis longitudine, multi-articulatis, articulo primo crasso, oblongo, secundo dimidio minore, 6 sequentibus perbrevibus; setis antennarum inæqualibus, articularum primi secundique paulo longioribus, ultimi et 3 subultimorum posterioribus subæqualibus, articulo suoque paulo longioribus, setis anterioribus subultimorum perbrevibus; stylis oblongis, vix duorum articularum abdominis longitudine, setâ secundâ abdomine paulo longiore.

*Long.*  $\frac{1}{24}$ " — *Hab.* in Vanua Lebu, ad Insulas Viti.

## Familia II. — HARPACTIDÆ.

*Oculi* duo simplices tantum. *Palpi* mandibulorum maxillarumque parvuli, aut obsoleti, setis diffusis non instructi. *Sacculus ovigerus* unicus. *Antennæ posticæ* setis habitu digitorum apice instructæ.

### Genus I. HARPACTICUS. *Milne Edwards.*

*Frons* subrostrata, appendicibus nullis. *Antennæ anticæ maris* subcheliformes, aut articulo geniculante instructæ; *feminæ* basi 2–5 articulata et quasi curto flagello sæpius minutè 5-articulato compositæ, apice basis appendicem brevem ferentes. *Cephalo-thorax* 4-articulatus. *Pedes antici* subcheliformes mediocres.

SYN. — Arpacticus, et Cyclopsina partim (C. castor, excluso), *M. Edwards.* — Nauplius, *Philippi.* — Canthocarpus, *Westwood.* — Doris, *Koch.* — Canthocarpus et Arpacticus, non Cyclopsina, *Baird.*

1. HARPACTICUS VIRESCENS. — H. cephalo-thorace ovato, anticè rotundato et breviter rostrato, segmentis posticè non acutis, abdomine paululum subito angustiore et posticè sensim decrescente, 5-articulato; antennis anticis brevibus, dimidii cephalo-thoracis longitudine, 9-articulatis, articulis basalibus quatuor, crassiusculis, secundo maximo, setis

\* Vide, ante, p. 4 (150), notam †.

perbrevibus; pedibus anticis parvis, digito dimidii articuli secundi longitudine; stylis caudalibus brevissimis, paulum divaricatis, setâ secundâ corporis longitudine, primâ tertiâque subæquis abdomine valde brevioribus.

*Long.*  $\frac{1}{20}$ ". — *Hab.* Madeira, in litora insulæ.

2. HARPACTICUS CONCINNUS. — H. *feminæ* cephalo-thorace longè ovato, segmentis posticè acutis; abdomine subito paulum angustiore, lato, lateribus bene recto, 6-articulato, parce decrescente, articulo primo brevissimo; antennis anticis brevibus, 9-articulatis, articulis basalibus quatuor, attenuatis, setis brevibus, apice paulum longis (flagellum longitudine æquantibus); pedibus anticis parvis, articulo secundo infra obtuso-angulato et digitum longitudine duplo superante; stylis caudalibus brevissimis, parum divaricatis, setâ secundâ corpore paulum brevioribus, tertiâ fere dimidio minore, reliquis brevissimis.

*Long.*  $\frac{1}{20}$ ". — *Hab.* in mari Pacifico prope Valparaiso.

3. HARPACTICUS SACER. — H. cephalo-thorace ovato, anticè subdeltoideo, segmentis posticè obtuso, dimidio longitudine latiore; abdomine subito multo angustiore, et brevioribus quam cephalo-thorax, 6-articulato, articulo primo brevi; antennis anticis brevibus, *feminæ* 9-articulatis, articulis basalibus quatuor, setis totis brevibus, *maris* articulo quinto (6?) crassissimo, subovato, margine anteriore subrecto, digito 2-articulato duabus setis minutis ad apicem instructo; pedibus anticis parvis digito tenui, largè dimidii articuli secundi longitudine; stylis caudalibus brevissimis, parum divaricatis, setâ secundâ corporis longitudine, tertiâ dimidio brevioribus, primâ perbrevis.

*Long.*  $\frac{1}{16}$ ". — *Hab.* in litora ad Valparaiso.

4. HARPACTICUS LINEARIS. — H. corpore fere lineari, abdomine non angustiore, posticè parum attenuato; antennis anticis brevissimis, 7-articulatis, articulis basalibus duobus crassissimis, primo majore, secundo perbrevis, setis totis brevibus; stylis caudæ styloformibus, articulo abdominis ultimo longioribus, parum divaricatis, setâ secundâ longitudine fere dimidii corporis.

*Long.*  $\frac{1}{20}$ ". — *Hab.* in mari, ad Insulas Viti.

5. HARPACTICUS ROSEUS. — H. corpore fere lineari, abdomine non angustiore, antennis perbrevibus et tenuissimis, basi non crassioribus, setis totis brevibus; stylis caudalibus brevibus, non divaricatis, setâ secundâ corpore longiore, spinulosâ.

*Long.*  $\frac{1}{30}$ ". — *Hab.* in mari Sulu.

6. *HARPACTICUS ACUTIFRONS*. — *H. maris* cephalo-thorace angustè elliptico, anticè acuto, posticè obtuso; abdomine subito angustiore, 6-articulato, posticè valde attenuato, articulo ultimo angustissimo; antennis anticis brevibus, 3 articulis basalibus non oblongis, tertio minimo, quarto crassissimo et cylindrico prope dimidii antennæ longitudine, quinto (forsan duplice), digitiformi, parvulo; antennis juxta basin et ad apicem breviter setigeris; stylis caudalibus minutis non divaricatis, setâ dimidio corporis parum longiore, strictè appressâ, nudâ.

*Long.*  $\frac{1}{24}$ ". — *Hab.* in mari prope Tierra del Fuego.

Genus II. *CLYTEMNESTRA*. (*Dana.*)

*Frons* subrostrata, appendicibus nullis. *Antennæ anticæ* flexiles; *maris*, non subcheliformes. *Pedes antici* permagni, subcheliformes.

OBS. Non *Arpacticus* Bairdii: *Cyclops chelifer* Arpacticis pertinet. Magnitudo pedium anticorum character genericum non bene validum, nisi pergrandes, quoque pro antennis geniculatis in coitu usitati sunt; ideoque est antennæ *maris* Clytemnestræ non subcheliformes.

*CLYTEMNESTRA SCUTELLATA*. — *C.* rostro subacuto; cephalo-thoracis segmento antico lato, posticè utrinque dilatato, tribus segmentis sequentibus subito angustioribus margine posteriore valde arcuatis et lateribus posticè productis et subacutis; abdomine 6-articulato, articulis subæquis, decrescentibus; antennis anticis elongatis 8 (9?)-articulatis, articulo quinto (sexto?) arcuato, sequente oblongo et apice cum appendice instructo (?), reliquis tribus oblongis; setis longis divaricatis, duabus apicalibus fere antennæ longitudine; pedibus anticis pergrandibus, articulo secundo subclavato, digito tenui arcuato fere articuli secundi longitudine.

*Long.*  $\frac{1}{24}$ ". — *Hab.* in mari Pacifico, ad lat. 18° S., long. 124° W.; etiam at Insulas Kingsmills; in mari Sinense.

Genus III. *SETELLA*. (*Dana.*)

*Corpus* angustissimum fere lineare, anticè attenuatum et subacutum, et fronte appendices duas parvulas falciformes subtus gerens. *Antennæ anticæ* flexiles, appendice brevi instructæ, setis brevibus; *maris* non subcheliformes. *Pedes antici* mediocres aut parvi. *Pedes proximè sequentes* lateraliter porrecti, apice breviter setigeri. *Pedes abdominis* elongati et longè setigeri. *Setæ caudales* duæ

longissimæ, (in speciebus scrutatis corpore valde longiores, spinulosæ, et strictè appressæ,) reliquæ brevissimæ. (Tubum cibarium sæpius læte rubrum.)

1. *SETELLA TENUICORNIS*. — *S. antennis* anticis fere corporis longitudine, articulis duobus basalibus valde crassioribus, secundo oblongo, reliquis teretibus gracillimis, tertio longissimo, quarto cum appendice instructo; ramis pedis biremis antichi subæquis, longiore 3-articulato, articulis fere æquis; pedibus abdominis cum 5 – 6 setis elongatis subæquis instructis; setis caudalibus corpore fere duplo longioribus.

*Long.*  $\frac{1}{5}$ " setis caudalibus exclusis. — *Hab.* in mari Atlantico meridionali.

2. *SETELLA LONGICAUDA*. — *S. maris* (?) antennis anticis basi non crassioribus, 7-aut 8-articulatis, articulo quarto paululum arcuato (postice convexo) et cum appendice instructo, tertio fere duplo longiore quam quartus aut secundus; ramo longiore pedis biremis antichi 3-articulato, articulo primo valde brevissimo; pedum abdominis ramo exteriori brevissimè setigero, interiore duabus setis spinulosis instructo, apicem abdominis fere attingentibus; setis caudalibus corpore largè duplo longioribus.

*Long.*  $\frac{1}{4}$ ". — *Hab.* in mari Atlantico meridionali.

3. *SETELLA GRACILIS*. — *S. feminae* antennis anticis gracillimis usque ad basin, rectis, inter sese prope 130° divaricatis, articulo primo obsoleto, secundo quartum æquante et dimidio tertio longiore, quarto non arcuato; digito pedis antichi dimidio articulo secundo longiore; setis caudalibus fere duplo corpore longioribus.

*Long.*  $\frac{1}{4}$ ". — *Hab.* in mari Pacifico juxta insulas Kermadec et Tonga.

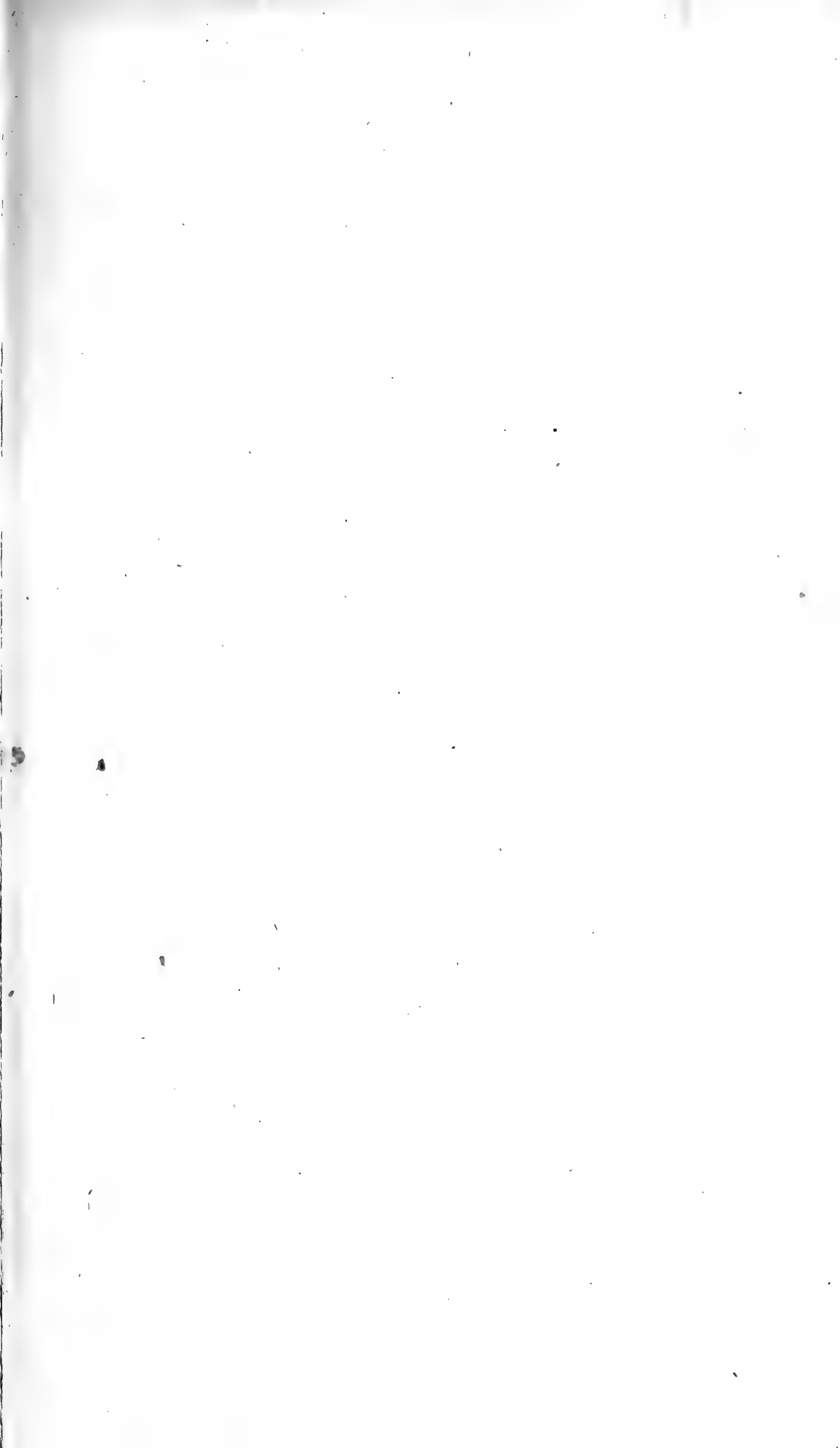
4. *SETELLA CRASSICORNIS*. — *S. maris* (?) antennis anticis crassioribus, rectis, inter sese 130° divaricatis, articulo primo obsoleto, secundo tertioque brevibus, quarto appendiculato, hoc etiam sexto ultimoque tertium longitudine duplo superante; digito pedis antichi dimidii articuli secundi longitudine; setis caudalibus prope sesqui corporis longitudine.

*Long.*  $\frac{1}{4}$ ". — *Hab.* in mari Sinense.

5. *SETELLA ACICULUS*. — *S. feminae* antennis crassiusculis fere rectè divaricatis, ad basin paulum curvatis, articulo primo perbrevis, secundo quartum longitudine æquante et longiore quam tertii dimidium; pedis antichi digito dimidii articuli secundi longitudine; setis caudalibus sesqui corporis longitudine.

*Hab.* in mari Indico, prope Fretum Sundæ.







219  
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# CONSPECTUS CRUSTACEORUM, ETC.

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(CONVENTUI EXHIBITA DIE 8 NOV., 1849.)

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*Conspectus Crustaceorum quæ in Orbis Terrarum circumnavigatione, CAROLO WILKES e Classe Reipublicæ Fæderatæ Duce, lexit et descripsit* JACOBUS D. DANA. Pars II.\*

## Familia III. CALANIDÆ.

*Oculi* simplices; etiam sæpe alii duo inferiores deorsum spectantes.

*Pedes mandibulares maxillaresque* articulati et longe setigeri. *Sacculus oviger* unicus. *Antennæ anticæ* elongatæ, non appendiculatæ.

*Antennæ posticæ* apice setigeræ.

Genera notis sequentibus distinguenda: † —

\* Vide Partem I., Vol. I. p. 149.

† Membra pedalia Cyclopæorum ordine sequentia: —

I. *Pedes mandibulares* duo (membra cephalothoracis, ad normam, quarta, — ct. iv.).

II. *Maxillæ* duæ (ct. v.).

III. *Maxillipedes* (vel *maxillæ*) duo (ct. vi.).

IV. *Pedes antici* (vel *maxillipedes*) duo (ct. vii.).

V., VI., VII., VIII., et sæpe IX. *Pedes biremes* octo vel decem (ct. viii., ix., x., xi., xii.).

- Oculis inferioribus nullis.
- |   |                                                                    |                                                                                                                                          |                                                                                                           |               |                                                                                                                   |             |
|---|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------|-------------|
| { | Antennis anticis nec angulo flexis, nec articulatione geniculatis. | {                                                                                                                                        | Pedibus posticis (ct. xii.) non prehensilibus, sæpe obsoletis.                                            | {             | Pedibus anticis (ct. vii.) majoribus quam maxillipedes (ct. vi.), lateraliter porrectis, non geniculatis. . . . . | 1. CALANUS. |
|   |                                                                    |                                                                                                                                          | Pedibus anticis minoribus quam maxillipedes. Maxillipedibus sub corpore geniculatis. Abdomine longissimo. | 2. SCRIBELLA. |                                                                                                                   |             |
|   |                                                                    | Pedibus posticis elongatis, subulatis, uno subprehensili; pedibus anticis duplo geniculatis, sub corpore gestis, apice deflexis. . . . . | 3. EUCHÆTA.                                                                                               |               |                                                                                                                   |             |
- Antennis anticis angulo levissimè flexis, nunquam articulatione geniculatis. Pedibus posticis *maris* prehensilibus. . . . . 4. UNDINA.
- |   |                                                 |   |                                                                          |                |
|---|-------------------------------------------------|---|--------------------------------------------------------------------------|----------------|
| { | Antennâ anticâ <i>maris</i> dextrâ geniculante. | { | Maxillipedibus duplo geniculatis, inflexis, setis longis, nudis. . . . . | 5. CANDACE.    |
|   |                                                 | { | Max. rectis, setis longis, setulosis. . . . .                            | 6. CYCLOPSINA. |
- Oculis superioribus nullis, inferioribus grandibus. Antennâ anticâ dextrâ *maris* geniculante; aliis *Culano* affinibus. . . . . 7. CATOPIA.
- Oculis inferioribus et superioribus.
- |   |                                                                                                                                           |                                                                                                                     |
|---|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| { | Antennâ anticâ dextrâ <i>maris</i> non geniculante, ambabus flexilibus, setis diffusis. Pedibus posticis parvulis, unarticulatis. . . . . | 8. ACARTIA.                                                                                                         |
|   |                                                                                                                                           | Antennâ anticâ dextrâ <i>maris</i> geniculante; setis non diffusis. Pede postico dextro crasso, prehensili. . . . . |

Genus I. CALANUS. (*Leach.*)

*Rostrum* furcatum. *Antennæ anticæ* sive leviter curvatæ, sive rectæ, *maris* non geniculantes. *Pedes postici* (ct. xii.) obsolescentes, *maris* non prehensiles. *Pedes antici* (ct. vii.) elongati, latè porrecti, maxillipedibus (ct. vi.) majores, non geniculati. *Oculi inferiores* nulli. Cephalothorax 4-5-articulatus. *Rami antennarum posticarum* subæqui, ramo brevior ad apicem 3-setis instructo, in dorso setigero.\*

In ambiguis, etiam numeri (*scil.* ct. iv., ct. v., *etc.*) sæpe subjuncti.

Mandibulum articulus pedis mandibularis primus est, et "palpi" articuli sequentes pedis reliqui sunt.

\* Species optime distinguendæ sunt:—

1. Per gestum antennarum anticarum; etiam per setas, præcipuè apicales et subapicales; per longitudinem et numerum articulorum:
2. Per maxillipedes, et pedes anticos:
3. Per pedes posticos thoracicos:
4. Per numerum segmentorum cephalothoracis, et characteres segmentorum antici posticque:

SYN. — Cyclops, Müller. — Calanus, Leach. — Cetoichilus? Roussel de Vauzème.

I. SETÆ ANTENNARUM ANTICARUM APICALES SUBAPICALIBUS LONGIORES.

A. *Styli caudales curti.*

1. CALANUS ROTUNDATUS. — Frons rotundata. Cephalothorax 4-articulatus, crassus, posticè obtusus. Antennæ anticæ corpore vix breviores, 24-articulatæ, duplo curvatæ, apicibus fronte paulo posteriores, articulo ultimo elongato; setis apicalibus articulum æquantibus, anticis apice remotis, setis subapicalibus minutis. Styli caudales brevissimi; setis inæquis, secundis abdomine longioribus et apice divaricatis.

*Long.*  $\frac{1}{12}$ ". — *Hab.* in mari Pacifico, lat. aust.  $32^{\circ} 24'$ , long. occ.  $166^{\circ}$ ; lat. bor.  $3^{\circ}$ , long. orient.  $176^{\circ}$ ; lat. bor.  $28^{\circ}$ , long. orient.  $171^{\circ} 30'$ . — *Lect.* die 9 Ap., 1840; die 19 Ap., 1841; et die 17 Maii, 1841.

2. CALANUS COMPTUS. — Frons rotundata. Cephalothorax 4-articulatus, posticè obtusus. Antennæ anticæ tenuissimæ, cephalothorace paulo longiores, fermè 24-articulatæ, duplo curvatæ, apicibus fronte posteriores, articulo ultimo elongato (forsan duplici); setis apicalibus articulum fere æquantibus, anticis apice remotis, posticâ penultimâ articuli longitudine, anticâ penultimâ et antepenultimis minutis. Styli caudales breves; setis strictis, rectis, duobus paulum longioribus.

*Long.*  $\frac{1}{12}$ ". — *Hab.* in mari Pacifico, lat. bor.  $40^{\circ}$ , long. occ.  $157^{\circ}$ ; lat. bor.  $45^{\circ}$ , long. occ.  $156^{\circ}$ ; lat. aust.  $21\frac{1}{2}^{\circ}$ , long. occ.  $136^{\circ}$ . — *Lect.* diebus 2, 6 Jul., 1841; 13 Aug., 1839.

3. CALANUS NUDUS. — Frons rotundata, prominulus. Cephalothorax 4-articulatus, posticè subacutus. Antennæ anticæ cephalothorace vix longiores, fermè 18-articulatæ, articulo ultimo non longiore; setis totis brevissimis, apicalibus articulo non longioribus, et anticis apice vix remotis, subapicalibus minutis. Styli caudales paulum oblongi, setis rectis, strictis, abdomine non longioribus.

*Long.*  $\frac{1}{20}$ ". — *Hab.* in mari Atlantico, lat. bor.  $8^{\circ} - 0^{\circ}$ , long. occ.  $21^{\circ} - 18^{\circ}$ , et lat. aust.  $0^{\circ} - 6^{\circ}$ , long. occ.  $18^{\circ} - 25^{\circ}$ . — *Lect.* diebus 20, 22, 25 Oct., et 1, 3, 5, 8, 12 Nov., 1838.

4. CALANUS MAGELLANICUS. — Frons rotundata. Cephalothorax 4-

5. Per stylos caudales et eorum setas:

Articulatio cephalothoracis non valet *genera* distinguere. Numerus segmentorum abdominis per ætatem variat, et vix valet *species* distinguere.

articulatus, posticè obtusus. Antennæ anticæ corpore breviores, duplo curvatæ, apicibus fronte valde posteriores, articulis quatuor ultimis brevibus, subæquis; setis totis perbrevibus, apicalibus articulo\* brevioribus, anticis apice remotis, subapicalibus posticis minutis, anticis obsoletis. Styli caudales perbreves, setis abdominem fere æquantibus.

*Long.*  $\frac{1}{4}$ "'. — *Hab.* in mari Pacifico, lat. aust.  $52^\circ$ , prope Patagoniam. Lect. die 27 Mar., 1839.

5. *CALANUS CRASSUS*. — Frons rotundata. Cephalothorax crassus, 4-articulatus, posticè vix subacutus. Antennæ anticæ corpore breviores, apicibus fronte valde posteriores, setis brevibus, apicalibus paulo longioribus, subapicalibus minutis, aut obsoletis. Styli caudales perbreves, setis subæquis abdomine paulo brevioribus.

*Long.*  $\frac{1}{6}$ "'. — *Hab.* in mari Atlantico, lat. aust.  $9^\circ$ , long. occident.  $17^\circ 30'$ . — Lect. die 9 Maii, 1842.

6. *CALANUS FURCICAUDUS*. — Frons triangulata. Cephalothorax 4-articulatus, capite subito angustatus, posticè obtusus. Antennæ anticæ corpore paulo breviores, duplo curvatæ, apicibus fronte posteriores, fermè 24 (26?)-articulatæ; articulo ultimo paulo longiore; setis brevibus, prope basin numerosis, apicalibus articulo paulo longioribus et anticis apice parcè remotis, subapicalibus minutis. Styli caudales setæque latè divaricati, setis inæquis, secundis abdomine longioribus.

*Long.*  $\frac{1}{2}$ "'. — *Hab.* in mari Pacifico, lat. bor.  $3^\circ$ , long. orient.  $173^\circ$ . — Lect. die 28 Ap., 1841.

7. *CALANUS ARCUICORNIS*. — Frons obtusa. Cephalothorax 4-articulatus, capite angustatus, posticè subacutus. Antennæ anticæ cephalothorace vix longiores, leviter arcuatæ, apicibus fronte vix posteriores, articulis 4 ultimis subæquis, setis perbrevibus, apicalibus articulo valde brevioribus, duabus uncinatis, subapicalibus obsoletis, prope basin paucis brevibus uncinatis. Abdomen angustum, lineare. Styli caudales breves, setis strictis, rectis, abdominis longitudine.

*Long.*  $\frac{1}{6}$ "'. — *Hab.* in mari Pacifico, lat. aust.  $32^\circ 24'$ , long. orient.  $178^\circ 15'$ . — Lect. die 9 Ap., 1840.

#### B. *Styli caudales valde elongati.*

8. *CALANUS TURBINATUS*. — Frons obtusa. Cephalothorax anticè crassus, posticè attenuatus (idcirco, segmentum posticum abdomine

\* In his, "setæ articulo breviores" et aliis similibus, articulus ille has setas gerens *passim* intelligentus.

parcè latius) obtusiusculus. Antennæ anticæ duplo leviter curvatæ, corpore breviores, tenuissimæ, articulis 5 ultimis subæquis; setis totis perbrevis, apicalibus subapicalibusque articulo non longioribus. Styli caudales tenues, paralleli, setis dimidio brevioribus.

*Long.*  $\frac{1}{12}$ " — *Hab.* in mari "Sulu." — *Lect.* die 29 Jan., 1842.

9. CALANUS STYLIFER. — Frons truncata. Cephalothorax curtus, posticè abdomine valde latior et longè acutus, 5-articulatus, segmento ultimo brevissimo. Antennæ anticæ duplo paululum curvatæ, apicibus fronte non posteriores; setis perbrevis, apicalibus et penultimâ posticâ fere articuli longitudine, penultimâ anticâ et antepenultimis brevissimis. Styli caudales tenues, fere abdominis longitudine, recti, paralleli, setis non longioribus, unâ valde externâ.

*Long.*  $\frac{1}{12}$ " — *Hab.* in mari Atlantico, lat. aust. 23° – 24°, long. occ. 41° – 43°. — *Lect.* die 19 Nov., 1838, et 9 Jan., 1839.

10. CALANUS CURTUS. — *C. stylifero* similis, sed curtior. Cephalothorax 5-articulatus, segmentis 4 posticis subæquis. Antennæ anticæ corpore paululo longiores,\* tenuissimæ, duplo paululum curvatæ, apicibus fronte vix anteriores; setis perbrevis, apicali anticâ longiore, articulum non superante. Styli caudales tenues, fere abdominis longitudine, vix recti, setis non longioribus, flexuosis, unâ valde externâ.

*Long.*  $\frac{1}{20}$ " — *Hab.* in mari "Sulu"; etiam freto Sundæ. — *Lect.* die 27 Jan., et die 2 Mar., 1842.

11. CALANUS SCUTELLATUS. — Latè depressus. Cephalothorax 4-articulatus, segmento antico anticè fortè arcuato, posticè latè producto et acuto, segmento postico utrinque longè acuto, et divaricato. Antennæ anticæ corpore paululo longiores, duplo curvatæ, apicibus fronte vix anteriores; setis brevibus, apicali anticâ penultimâque posticâ articuli longitudine, aliis subapicalibus perbrevis. Styli caudales tenues, fere abdominis longitudine, parcè divaricati.

*Long.*  $\frac{1}{16}$ " — *Hab.* in mari "Sulu." — *Lect.* die 27 Jan., 1842.

## II. SETÆ ANTENNARUM ANTICARUM APICALES SUBAPICALIBUS NON LONGIORES.

A. *Setæ caudales totæ mediocres. Frons obtusa, non elongata.*

a. Cephalothorax 4-articulatus.

12. CALANUS PAVO. — Frons subtriangulata, obtusa. Cephalothorax posticè obtusus. Antennæ anticæ corpore dimidio longiores, duplo

\* I. e. stylis exclusis, ut passim.

curvatæ, articulo ultimo longiore, setis longiusculis. Abdomen brevissimum. Styli caudales breves, divaricati, setis fere corporis longitudine, latis, eleganter plumiformibus, flabellatim divaricatis.

*Long.*  $\frac{1}{24}$ " — *Hab.* in mari Atlantico, lat. bor.  $12^\circ$ , long. occ.  $24^\circ$ . — Lect. die 9 Oct., 1838.

13. CALANUS LEVIS. — Frons obtusa. Cephalothorax mediocris, posticè subacutus. Antennæ anticæ corpore vix longiores, duplo leviter curvatæ, apicibus fronte non anteriores; setis brevibus, 4–5 remotis longioribus, apicalibus et anticâ penultimâ fere articuli longitudine, posticis penultimâ antepenultimâque paulo longioribus, subæquis, anticâ antepenultimâ obsoletâ. Styli caudales parce oblongi, setis rectis, appressis, abdominis longitudine.

*Long.*  $\frac{1}{26}$ " — *Hab.* in mari Atlantico juxta "Rio de Janeiro." — Lect. die 7 Jan., 1839.

14. CALANUS MEDIUS. — Frons rotundata. Cephalothorax posticè obtusus. Antennæ anticæ cephalothorace paulo longiores, duplo curvatæ, apicibus fronte posteriores; setis perbrevibus, 4–5 remotis longioribus, posticâ apicali et anticâ penultimâ largè articuli longitudine, posticâ penultimâ paulo brevior, posticâ antepenultimâ duplo longiore. Styli caudales breves, setis appressis, abdomine brevioribus.

*Long.*  $\frac{1}{18}$ " — *Hab.* in mari Pacifico, lat. bor.  $44^\circ$ , long. occ.  $153^\circ$ . — Lect. die 6 Jul., 1841.

15. CALANUS PLACIDUS. — Frons rotundata. Cephalothorax posticè obtusus. Antennæ anticæ corporis longitudine, duplo leviter curvatæ, apicibus fronte paulo posteriores; setis apicalibus brevibus, posticis penultimâ antepenultimâque valde elongatis, anticâ penultimâ dimidio brevior. Styli caudales breves.

*Long.*  $\frac{1}{12}$ " — *Hab.* in mari Pacifico, prope insulas "Kingsmill"; etiam lat. bor.  $40^\circ$ , long. occ.  $157^\circ$ . — Lect. die 30 Ap., et 2 Jul., 1841.

16. CALANUS RECTICORNIS. — Frons obtusa. Cephalothorax posticè rotundatus. Antennæ anticæ corpore longiores, rectissimæ, apicibus fronte non anteriores, articulo primo (2?) crassè oblongo, ultimo paulum demisso; setis brevibus, articuli secundi subelongatâ, articuli antepenultimi posticâ longiore (= 4 artic.), penultimis posticâ et anticâ paulo brevioribus, apicali posticâ minore, articulo longiore, duabus aliis apicalibus brevibus et subuncinatis. Styli caudales breves; setis mediocribus, parcè diffusis.

*Long.*  $\frac{1}{12}$ " — *Hab.* in mari "Sulu." — Lect. die 1 Feb., 1842.



## b. Cephalothorax 5-6-articulatus.

1. *Cephalothorax posticè obtusus aut breviter subacutus*.\*

17. CALANUS SETULIGERUS. — Frons rotundata. Cephalothorax 5 (6?)-articulatus, posticè obtusus, articulis subæquis. Antennæ anticæ corpore paulo longiores, duplo curvatæ, setis prope basin plerumque duplo longioribus quam articuli et numerosis, setâ articuli sexti (forsan quinti) longiore, setis duabus posticis subapicalibus longis, subæquis, apicalibus brevibus, anticâ penultimâ longiore quam articulus. Styli caudales perbreves; setis mediocribus, parcè diffusis, secundis fere duplo longioribus.

*Long.*  $\frac{1}{16}$ " — *Hab.* in mari Atlantico, lat. bor.  $6^{\circ} - 9^{\circ}$ , long. occ.  $21^{\circ} - 24^{\circ}$ . — *Lect.* diebus 13 - 18 Oct., 1838.

18. CALANUS PELLUCIDUS. — Frons rotundata. Cephalothorax 5-articulatus, posticè obtusus, articulo ultimo brevi. Antennæ anticæ corporis longitudine, setis subapicalibus posticis longiusculis. Styli caudales oblongi.

*Long.*  $\frac{1}{24}$ " — *Hab.* in mari Atlantico, lat. bor.  $14\frac{1}{2}^{\circ}$ , long. occ.  $21^{\circ}$ . — *Lect.* die 5 Oct., 1838.

19. CALANUS AFFINIS. — Frons rotundata. Cephalothorax 5-articulatus, posticè obtusus, articulis posticis subæquis. Antennæ anticæ corporis longitudine, apicibus fronte posteriores; setis brevibus, duabus posticis subapicalibus prælongis, anticâ penultimâ dimidio brevior, apicalibus brevibus. Styli caudales perbreves, setis diffusis, secundis fere duplo longioribus quam primæ.

*Long.*  $\frac{1}{12}$ " — *Hab.* in mari prope insulam "Sumatra." — *Lect.* die 3 Mar., 1842.

20. CALANUS FLAVIPES. — Frons triangulata, vix prominula. Cephalothorax 5-articulatus, posticè attenuatus, obtusus aut subacutus. Antennæ anticæ corpore paulo longiores, duplo leviter curvatæ, apicibus fronte vix posteriores; setas *affini* similes. Styli caudales oblongi, setis mediocribus, non diffusis. Abdomen 2-articulatum; — an adultum?

*Long.*  $\frac{1}{10}$ " — *Hab.* in mari Atlantico, prope "Rio de Janeiro." — *Lect.* die 7 Jan., 1839.

21. CALANUS TENUICORNIS. — Frons rotundata. Cephalothorax 5-articulatus, posticè obtusus, articulis posticis subæquis. Antennæ anticæ sesqui corporis longitudine, tenuissimæ, duplo levissimè curvatæ,

\* Anguli postici cephalothoracis adulti sæpe elongati et subacuti aut acuti.

apicibus fronte vix posteriores, articulis tribus ultimis subæquis; setis brevibus, articuli tertii setâ longiore, setis duabus posticis subapicalibus prælongis, anticâ penultimâ prope dimidio brevior, apicalibus brevibus. Styli caudales oblongi (latitudine duplo longiores).

*Long.*  $\frac{1}{12}$ " — *Hab.* in mari Pacifico, lat. bor.  $40^{\circ}$ , long. occ.  $157^{\circ}$ . — *Lect.* die 2 Jul., 1841.

22. CALANUS SANGUINEUS. — Frons rotundata. Cephalothorax 5-articulatus, posticè obtusus aut subacutus, articulis posticis subæquis. Antennæ anticæ corporis longitudine, fere rectæ, apicibus fronte vix posteriores; setis brevibus, articuli tertii longiore, subapicalibus *tenuicorni* fere similibus. Styli caudales paulum oblongi, setis mediocribus, diffusis, secundis longioribus.

*Long.*  $\frac{1}{10}$ " — *Hab.* in mari Pacifico, lat. bor.  $32^{\circ}$ , long. occ.  $175^{\circ}$ ; lat. bor.  $44^{\circ}$ , long. occ.  $153^{\circ}$ ; forsân in mari "Sulu." — *Lect.* die 28 Maii, et die 6 Jul., 1841, etiam die 28 Jan., 1842. — *Var. perspicax* (oculus transversim reniformis) in mari "Viti," Jul., 1840.

23. CALANUS MUNDUS. — Frons rotundata. Cephalothorax posticè obtusus, 5-articulatus, articulis posticis subæquis. Antennæ anticæ corpore parcè longiores, bene rectæ, apicibus fronte non posteriores, articulo primo (2do?) crassè oblongo et setis inflexis instructo; setis perbrevis, articuli secundi longiore, apicalibus brevibus, posticâ antepenultimâ longâ, posticâ penultimâ duplo brevior, anticâ penultimâ paulo minore (articulum æquante), anticâ antepenultimâ minutâ. Abdomen 4-5-articulatum. Styli caudales breves, setis appressis, secundis longioribus.

*Long.*  $\frac{1}{10}$ " — *Hab.* in mari Pacifico, lat. bor.  $44^{\circ}$ , long. occ.  $154^{\circ}$ .

*C. recticorni* affinis; sed cephalothorax 5-articulatus.

24. CALANUS INAURITUS. — Frons rotundata. Cephalothorax posticè obtusus, 5-articulatus, articulo ultimo brevissimo. Antennæ anticæ fere rectæ, corpore paulo breviores, articulo primo valde elongato (an duplice?) tribus setis pendulis subclavatis et aliis setis brevibus uncinatis instructo, setis apicalibus et anticis subapicalibus perbrevis, subapicalibus posticis articulo vix longioribus, inæquis. Styli caudales breves, setis parcè diffusis aut appressis.

*Hab.* in mari Atlantico, lat. bor.  $6^{\circ}$ , long. occ.  $21^{\circ}$ . — *Lect.* die 22 Oct., 1838.

2. *Cephalothorax posticè acutus, angulis posticis abdomini appressis.*

25. CALANUS SIMPLICICAUDUS. — Frons obtusa. Cephalothorax 5-

articulatus, segmento postico angusto et posticè brevissimè acuto. Antennæ anticæ corpore paulo longiores, basi arcuatæ, alioque fere rectæ, apicibus fronte parcè posteriores; setis brevibus, duabus subapicalibus posticis longis, inæquis, anticâ penultimâ duplo brevior, apicalibus brevibus. Abdomen 2-articulatum: (an adultum?). Styli caudales paulum oblongi.

*Hab.* in mari Pacifico, lat. bor.  $45^{\circ}$ , long. occ.  $153^{\circ}$ .

*C. flavipedi* abdominem et angustum articulum cephalothoracis posticum affinis; antennarum anticarum setas apicales subapicalesque *C. sanguineo* similis.

26. CALANUS APPRESSUS. — Frons obtusa. Cephalothorax posticè attenuatus, angulis posticis elongatè acutis abdominem appressis, 5-articulatus, articulis posticis longitudine subæquis. Antennæ anticæ corpore paulo longiores, duplo leviter curvatæ, articulo ultimo valde graciliore quam penultimus; setis brevibus, duabus posticis subapicalibus prælongis, subæquis, strenuis, anticâ penultimâ duplo brevior, apicalibus articulo non longioribus. Styli caudales breves; setis secundis longioribus.

*Long.*  $\frac{1}{12}''$ . — *Hab.* in mari Pacifico, lat. bor.  $25^{\circ}$ , long. orient.  $167^{\circ}$ ; in mari juxta "Sumatra"; etiam lat. aust.  $30^{\circ}$ , long. orient.  $13^{\circ}$ . — *Lect.* die 14 Maii, 1841, et die 4 Mar., et 21 Apr., 1842.

3. *Cephalothorax posticè longè acutus, angulis posticis remotis.*

27. CALANUS COMMUNIS. — Frons rotundata. Cephalothorax posticè longè acutus, 5-articulatus, articulis posticis subæquis. Antennæ anticæ corpore paulo longiores, duplo leviter curvatæ, apicibus fronte non anteriores, setis apicalibus brevibus, duabus posticis subapicalibus longis, subæquis, anticâ penultimâ quadruplo brevior, setis totis aliis brevibus. Styli caudales perbreves, setis secundis duplo longioribus.

*Long.*  $\frac{1}{10}''$ . — *Hab.* in mari Atlantico, inter lat. bor.  $8^{\circ}$  et lat. aust.  $5^{\circ}$ , long. occ.  $23^{\circ} - 15^{\circ}$ ; etiam, lat. aust.  $4\frac{1}{2}^{\circ} - 1^{\circ}$ , long. occ.  $25^{\circ} - 30\frac{1}{2}^{\circ}$ . — *Lect.* diebus 18, 20, 27, 31 Oct., 2, 3, 8, 12 Nov., 1838; 13, 16 Maii, 1842.

*C. affini* similis; sed anguli postici cephalothoracis longè acuti. An distinctio vera?

28. CALANUS AMÆNUS. — *C. communi* antennas anticæ setasque caudales affinis. Cephalothorax 5-articulatus, sed articulo ultimo brevissimo; angulis posticis longè acutis.

*Long.*  $\frac{1}{10}$ " — *Hab.* in mari Pacifico prope insulas "Samoa," et in mari "Sulu." — *Lect.* die 26 Feb., 1841, et die 1 Feb., 1842.

29. *CALANUS BELLUS.* — *Frons* rotundata. *Cephalothorax* posticè longè acutus, 5-articulatus, articulis posticis subæquis. *Antennæ* anticæ corpore paululo longiores, vix duplo curvatæ, apicibus fronte non anteriores; setis brevibus, tertii articuli longâ, duabus posticis subapicalibus longis, subæquis, apicalibus brevibus, anticâ penultimâ paulo longiore. *Styli* caudales breves, setis diffusis, secundis fere duplo longioribus.

*Long.*  $\frac{1}{8}$ " — *Hab.* in mari "Sulu," et freto "Banca." — *Lect.* die 2 Feb., et die 2 Mar., 1842.

*C. setuligero* affinis; sed anguli postici cephalothoracis non obtusi, et setæ caudales valde diffusiores. *C. communi* similis; sed seta tertii articuli antennarum anticarum longa est.

B. *Setæ caudales secundæ longissimæ. Frons sive obtusa, sive triangulato-acuta; rostro longè furcato, brachiis setiformibus.*

30. *CALANUS GRACILIS.* — *Gracilis.* *Frons* rotundata. *Cephalothorax* elongatus, 5-articulatus, posticè obtusus, articulis posticis subæquis. *Antennæ* anticæ sesqui corpore longiores, rectæ,  $160^\circ$  inter sese divaricatæ; setis brevibus, duabus posticis subapicalibus longis, apicalibus et anticis subapicalibus brevibus. *Abdomen* curtum, 4-articulatum. *Styli* caudales breves, setis secundis dimidio corporis longioribus.

*Long.*  $\frac{1}{8}$ " — *Hab.* in mari Atlantico, lat. aust.  $4\frac{1}{2}^\circ$ , long. occ.  $25^\circ$ . — *Lect.* die 13 Maii, 1842.

31. *CALANUS ELONGATUS.* — *Elongatus.* *Frons* breviter triangulata subacuta, rostro longè et tenuiter furcato. *Cephalothorax* 4-articulatus, anticè angustatus, posticè obtusus. *Antennæ* anticæ sesqui corporis longitudine, rectæ, et latissimè divaricatæ, apicibus fronte vix anteriores, articulo penultimo abbreviato; setis plerumque brevibus, paucis remotis longiusculis, apicalibus diffusis articulo longioribus, subapicalibus posticis longis, inæquis, anticâ penultimâ minus dimidio brevior, anticâ antepenultimâ obsoletâ. *Antennæ* posticæ ramo curto 2-articulatæ. *Abdomen* curtissimum. *Styli* caudales brevissimi.

*Long.*  $\frac{1}{5}$ " — *Hab.* in mari "Sulu." — *Lect.* die 1 Feb., 1842.

32. *CALANUS ATTENUATUS.* — *Elongatus.* *Frons* triangulata, acuta, rostro longè et tenuiter furcato. *Cephalothorax* anticè valde angustatus, posticè obtusus, 5-articulatus, articulo ultimo brevi. *Antennæ* anticæ corpore valde longiores, prope basin arcuatæ, alioque rectæ et

latissimè divaricatæ, apicibus fronte paulo anteriores, articulo penultimo abbreviato; setis vix brevibus, plerumque fractis, fere æquis, apicalibus et subapicalibus inæquis longiusculis, anticâ antepenultimâ obsoletâ. Antennæ posticæ ramo curto multiarticulato. Abdomen curtissimum. Styli caudales perbreves, setis secundis dimidio corporis longioribus.

*Long.*  $\frac{1}{8}$ " — *Hab.* in mari Pacifico, prope insulas "Kingsmill"; etiam in mari Sinensis. — *Lect.* die 13 Ap., 1841, et die 15 Feb., 1842.

C. *Frons valde elongata; rostro breviter valdeque furcato. Setæ caudales secundæ longissimæ (?)*.

33. CALANUS ROSTRIFRONS. — Gracillimus. Frons valde elongata, subacuta. Cephalothorax anticè paulo angustior, posticè rotundatus, 5-articulatus, articulo postico brevi, articulis penultimo antepenultimoque posticè acutis. Antennæ anticæ corpore valde longiores, leviter arcuatæ, latè divaricatæ, apicibus fronte anteriores, setâ articuli secundi longiusculâ, setis apicalibus articulo vix longioribus, duabus subapicalibus posticis longis. Abdomen curtum. Styli caudales latitudine fere duplo longiores; setis latissimè diffusis.

*Long.*  $\frac{1}{8}$ " — *Hab.* in mari "Sulu." — *Lect.* die 2 Feb., 1842.

34. CALANUS CORNUTUS. — Gracillimus. Frons valde elongata, subacuta. Cephalothorax posticè rotundatus, 5-articulatus, articulo postico fere obsoleto, articulis tribus precedentibus posticè acutis. Antennæ anticæ sesqui corporis longitudine, fere rectæ, vix arcuatæ, apicibus fronte paululo anterioribus; setâ articuli tertii longiusculâ, setis apicalibus et penultimis brevibus, posticâ antepenultimâ longiore. Abdomen curtum. Styli caudales elongati; setis valde diffusis.

*Long.*  $\frac{1}{8}$ " — *Hab.* in mari Atlantico, lat. bor. 1°, long. occ. 18°. — *Lect.* die 3 Nov., 1838.

#### Genus II. SCRIBELLA. (*Dana.*)

*Antennæ anticæ* elongatæ, pauci-articulatæ, longè setigeræ, setis diffusis, *maris* non geniculantes. *Antennæ posticæ* simplices (?). *Maxillipedes* (ct. vi.) maximi, pedibus proximis majores, 4-articulati, geniculati et prorsum flexi. *Oculi inferiores* nulli. *Cephalothorax* 4-5-articulatus, capite non discreto. *Abdomen* valde elongatum, cephalothorace non brevius. *Styli caudales* oblongi, divaricati. [Sæpius, e basi pedis biremis, seta grandis lateraliter porrecta.]

SYN. — Scribella, D., Amer. Jour. Sci., Ser. 2da, I. 227.

1. *SCRIBELLA SCRIBA*. — Antennæ anticæ latè ( $130^\circ$ ) divaricatæ, fere corporis longitudine, 7-articulatæ, articulis secundo, quarto et duabus ultimis brevioribus, setis longissimis. Seta pedium biremium externa grandis, eleganter plumiformis. Abdomen 5-articulatum, cephalothorace longius, setis basalibus duabus longiusculis rectis. Styli caudales tenues, setâ externâ fere styli longitudine.

*Long.*  $\frac{1}{20}$ " — *Hab.* in mari Atlantico, lat. bor.  $4\frac{1}{2}^\circ - 7^\circ$ , long. occ.  $20^\circ - 22^\circ$ ; et lat. aust.  $1^\circ$ , long. occ.  $30^\circ 30'$ . — *Lect.* diebus 22, 23, 24, 26 Oct., 1838, 16 Maii, 1842. Forsan in mari Pacifico, prope insulas "Kingsmill"; an eadem species? — *Lect.* Ap., 1841.

2. *SCRIBELLA SETIGER*. — Antennæ anticæ fere corporis longitudine, latè divaricatæ, 7-articulatæ, articulis 3 ultimis brevissimis, tertio quartoque prælongis, setis longissimis. Seta pedium biremium externa longa, nuda, tenuissimè subclavata. Abdomen 5-articulatum, segmentis subæquis, setis basalibus duabus, unâ prælongâ, alterâ brevi. Styli caudales tenues, setâ externâ valde longiore quam stylus et prope basin styli insitâ.

*Long.*  $\frac{1}{20}$ " — *Hab.* in mari Pacifico, prope insulas "Kingsmill." — *Lect.* die 18 Ap., 1841.

3. *SCRIBELLA ABBREVIATA*. — Antennæ anticæ latè divaricatæ, 7-articulatæ, articulis duabus ultimis brevibus, tertio, quarto, quintoque subæquis. Setæ externæ pedium biremium obsoletæ (an distinctio sexualis?). Abdomen 4-articulatum setis basalibus dimidio abdominis valde brevioribus, subæquis, curvatis. Styli caudales paulum divaricati; setâ externâ perbrevis. — An *S. setigeræ* femina? Vix credo.

*Long.*  $\frac{1}{24}$ " — *Hab.* in mari Pacifico, prope "Tierra del Fuego"; etiam lat. aust.  $24^\circ$ , long. occ.  $175^\circ$ ; lat. bor.  $44\frac{1}{2}^\circ$ , long. occ.  $153^\circ$ . — *Lect.* die 21 Jan., 1839; die 21 Ap., 1840; die 7 Jul., 1841.

### Genus III. EUCHÆTA. (*Philippi*.)

*Frons* acuta. *Rostrum* transversim emarginatum. *Antennæ anticæ* duplo leviter curvatæ, nunquam minimè angulo flexæ, *maris* non geniculantes. *Pedes postici* (ct. xii.) ambo *maris* valde elongati, subulati. *Pedes antici* (ct. vii.) maxillipedibus (ct. vi.) majores, duplo geniculati et sub corpore gesti, penecillum setarum nudarum reflexum ferentes. *Oculi inferiores* nulli. *Cephalothorax* 4-5-articulatus, capite non discreto.

*SYN.* — *Euchæta*, *Philippi*, Archiv für Naturgeschichte, Vol. IX. p. 55.

1. *EUCHÆTA COMMUNIS*. — Cephalothorax nudus, 4-articulatus, posticè obtusus. *Feminæ*: antennæ anticæ corpore vix breviores, setis paucis remotis prælongis, rectis, et aliis duabus flexis longissimis, apicalibus prælongis, posticâ antepenultimâ fere articuli longitudine. Setæ caudales rectæ, secundâ sæpius corporis longitudine. Ova cærulea. *Maris*: antennæ anticæ corpore paulo breviores, angulo levissimè flexæ, setis brevibus, paucis articulum apicalem vix superantibus. Pedes postici longissimi, longè subulati. Setæ caudales abdominis longitudine.

*Long.*  $\frac{1}{8}$ " — *Hab.* in mari Atlantico, lat. bor.  $9^{\circ} - 0^{\circ}$ , long. occ.  $17^{\circ} - 23^{\circ}$ , et lat. aust.  $0^{\circ} - 13^{\circ}$ , long. occ.  $17^{\circ} - 32^{\circ}$ . — *Lect.* diebus 15, 18, 20, 24, 26, 27, 29, 30, 31 Oct., et 1, 3, 5, 9, 12 Nov., 1838; etiam die 11 Maii, 1842.

2. *EUCHÆTA CONCINNA*. — Cephalothorax nudus, ellipticus, capite lateraliter arcuatus, angulis posticis paulum productus et obtusus; *femina* 4-articulatus, *maris* 5-articulatus articulo postico perbrevis. Antennæ anticæ corpore paulo breviores, *feminæ*, *marisque* iis *E. communis* fere similes, setâ antepenultimâ posticâ brevissimâ. Setæ caudales abdomine breviores, secundâ *feminæ* fere corporis longitudine, *maris* abdomen paulo superantibus.

*Long.*  $\frac{1}{10}$ " — *Hab.* in freto "Banca." — *Lect.* die 1 Mar., 1842.

3. *EUCHÆTA PUBESCENS*. — *Feminæ*: Cephalothorax pubescens, capite lateraliter angulatus, 5-articulatus, articulo postico perbrevis, subacuto. Antennæ anticæ corpore paulo breviores, setas *E. communis* fere similes, setis antepenultimis brevissimis. Pedes antici apice 5-articulati et subelongati. Abdomen 4-articulatum, articulo primo secundum longitudine duplo superante. Seta caudalis secunda fermè corporis longitudine.

*Long.*  $\frac{1}{12}$ " — *Hab.* in mari Pacifico, in Archipel. "Paumotu." — *Lect.* die 29 Aug., 1839.

4. *EUCHÆTA DIADEMA*. — *Feminæ*: Cephalothorax pubescens, capite lateraliter angulatus, 4-articulatus, posticè obtusus. Antennæ anticæ fere corporis longitudine, setas *E. communis* fere similes, setâ posticâ penultimâ dimidium posticæ apicalis superante, setis antepenultimis brevissimis. Pedes antici apice 5 - 7 articulati, perbreves. Abdomen elongatum, articulo primo secundum longitudine paulo superante. Seta caudalis secunda corpore longior, nuda.

*Long.*  $\frac{1}{7}$ " — *Hab.* in mari Pacifico, prope insulas "Kingsmill." — *Lect.* diebus 23, 24, 25 Mar., 1841.

Genus IV. UNDINA. (*Dana.*)

*Antennæ anticæ* ante medium angulo leviter flexæ, apicibus fronte posteriores, *maris* non geniculantes. *Pedes postici* (ct. xii.) *maris* grandes, dextro subcheliformi. *Pedes antici* (ct. vii.) elongati, maxillipedibus sæpe majores et valde porrecti, non geniculati. *Oculi inferiores* nulli. *Cephalothorax* 4-5-articulatus, capite non discreto.

1. UNDINA VULGARIS. — Frons obtusa. Cephalothorax 4-articulatus, posticè rotundatus. *Antennæ anticæ* corporis longitudine, ad articulum octavum leviter reflexæ; setis brevibus, setâ articuli tertii longâ, flexâ, setis apicalibus perbrevibus, unâ uncinatâ, posticâ antepenultimâ longiusculâ, penultimis anticâ posticâque paulo brevioribus, hâc ad extremitatem uncinulatâ. Abdomen 5-articulatum. Styli caudales breves, setâ secundâ duplo longiore.

*Long.*  $\frac{1}{12}$ " — *Hab.* in freto "Banca," juxta insulam "Sumatra"; etiam in mari Atlantico, lat. aust.  $4^{\circ}$  —  $9^{\circ}$ , long. occ.  $17\frac{1}{2}^{\circ}$  —  $25^{\circ}$ . — *Lect.* die 1 Mar., et diebus 9, 13 Maii, 1842.

2. UNDINA SIMPLEX. — Frons obtusa. Cephalothorax posticè rotundatus, 5-articulatus, articulo ultimo brevior. *Antennæ anticæ* corporis longitudine, articulo primo elongato; setis perbrevibus, setâ articuli secundi longiusculâ, flexâ, setis penultimis articuli longitudine et rectis, posticâ antepenultimâ dimidio longiore, apicalibus minutis, unâ uncinatâ.

*Long.*  $\frac{1}{20}$ " — *Hab.* in mari Pacifico, prope insulas "Kingsmill," et lat. bor.  $25^{\circ}$ , long. orient.  $167^{\circ}$ . — *Lect.* die 25 Mar., et die 14 Maii, 1841.

3. UNDINA INORNATA. — Frons rotundata. Cephalothorax posticè vix acutus, 5-articulatus, articulo postico brevi. *Antennæ anticæ* corporis longitudine, setis perbrevibus, setâ articuli secundi (tertii?) longiusculâ, rectâ, setâ apicali posticâ articuli longitudine, anticâ penultimâ sublongâ, posticâ brevi, posticâ antepenultimâ articulum vix superante. Styli caudales parcè oblongi.

*Long.*  $\frac{1}{12}$ " — *Hab.* in mari Atlantico, lat. bor.  $4^{\circ}$ , long. occ.  $19^{\circ}$ . — *Lect.* die 27 Oct., 1838.

Genus V. CANDACE. (*Dana.*)

*Frons* quadrata. *Oculi inferiores* obsoleti. *Antennæ anticæ* regulariter et breviter setigeræ, transversæ; dextrâ *maris* articulatione geniculante. *Maxillipedes* (ct. vi.) pedibus proximis majores, duplo



geniculantes et inflexi, 4 articulati, setis nudis, longis. *Pedes postici maris* dispares, dextro prehensili. *Abdomen* mediocre. *Styli caudales* breves, setis strictè appressis. [Animal sæpius partim nigrescens.]

SYN. — Candace, D., Amer. Jour. Sci., Ser. 2da, I. 228. 1846.

1. CANDACE ORNATA. — *Maris*: Cephalothorax 5-articulatus, articulis posticis quatuor, angulis posticis longè acutis, dextro longiore, Antennæ e basi arcuatæ, alioque rectè transversæ, corpore parcè breviores, articulo secundo paulum oblongo; setis brevibus, quorum paucis secundo articulo parcè longioribus, apicali posticâ articuli longitudine, posticâ penultimâ paulo longiore, anticâ penultimâ brevior. Antennarum posticarum ramus brevis tenuis, valde brevior. Pes posticus dexter mediocris, articulo ultimo subuncinato, appendice laterali subcorneâ, articulum uncinatum longitudine superante.

*Long.*  $\frac{1}{8}$ " — *Hab.* in mari Atlantico, lat. bor.  $9^{\circ}$  —  $7^{\circ}$ , long. occ.  $19^{\circ}$  —  $21^{\circ}$ ; etiam lat. aust.  $6^{\circ}$ , long. occ.  $24^{\circ}$ . — Lect. diebus 13, 18 Oct., 8 Nov., 1838.

2. CANDACE PACHYDACTYLA. — *Maris*: Cephalothorax 4-articulatus, angulis posticis longè acutis et setâ minutâ extus instructis. Antennæ anticæ fermè corporis longitudine, 23-articulatæ, e basi arcuatæ, deinde rectè transversæ; dextrâ 21-articulatâ, medio incrassulatâ, articulo geniculationem præcedente valde elongato, et versus apicem subtilissimè pectinato, sequente non brevior. Antennarum posticarum rami longitudine subæqui. Pes posticus dexter crassus, apice rotundatus, appendice laterali crassè falcatâ, obtusâ.

*Long.*  $\frac{1}{12}$ " — *Hab.* in mari Atlantico, lat. aust.  $1^{\circ}$  —  $11^{\circ}$ , long. occ.  $14^{\circ}$  —  $30^{\circ}$ . — Lect. diebus 7, 9, 13, 16 Maii, 1842.

3. CANDACE ETHIOPICA. — *Maris*: *C. ornata* antennas anticas et cephalothoracem affinis. Cephalothorax 4-articulatus. Antennæ anticæ e basi arcuatæ; articulo antennæ dextræ articulationem geniculantem precedente omnino subtilissimè pectinato. Pes posticus dexter subclavatus, obtusus, setâ elongatâ, appendice laterali setaceâ, longâ, corneâ, flexâ. Antennarum posticarum ramus brevis parvus.

*Long.*  $\frac{1}{12}$ " — *Hab.* in mari Pacifico, lat. aust.  $18^{\circ}$ , long. occ.  $124^{\circ}$ ; lect. die 8 Aug., 1839: lat. bor.  $15^{\circ}$ , long.  $180^{\circ}$ ; lect. Dec., 1841.

4. CANDACE CURTA. — *Maris*: *C. ornata* similis. Cephalothorax 5-articulatus, posticè acutus. Pes posticus dexter apice subulatus, appendice laterali curtâ, spiniformi. Antennæ anticæ corpore parcè lon-

giores, a basi arcuatæ; articulis 13, 14, 15, 16, 17 antennæ dextræ in-crassulatis, articulo 17 elongato apice prominulo, partim subtilissimè pectinato, sequentibus sex brevibus, et tenuissimis.

*Long.*  $\frac{1}{2}$ " — *Hab.* in mari Pacifico prope "Valparaiso." — *Lect.* die 10 Ap., 1839.

5. CANDACE AUCTA. — *Femina*: Cephalothorax 5-6-articulatus, posticè subacutus aut obtusus. Antennæ anticæ fere corporis longitudine, e basi arcuatæ, apice prorsum parcè flexæ, articulo secundo longo et crasso. Abdomen 2-3-articulatum.

*Long.*  $\frac{1}{4}$ " — *Hab.* in mari Pacifico, lat. aust. 9°, long. occ. 174°; etiam prope insulas "Kingsmill"; quoque in mari "Sulu." — *Lect.* die 26 Jan., 1841; die 14 Ap., 1841; Dec., 1841; die 28 Jan., 1842.

6. CANDACE TRUNCATA. — *Femina*: Cephalothorax posticè truncatus. Antennæ anticæ corporis longitudine, prope articulum sextum flexæ, deinde rectè transversæ et tenuissimæ; articulo secundo crasso, non longiore quam articulus tertius quartusve.

*Long.*  $\frac{1}{2}$ " — *Hab.* in mari Pacifico, prope insulas "Samoa" et "Kingsmill," et in mari "Sulu." — *Lect.* die 25 Mar., et die 1 Ap., 1841; die 2 Feb., 1842.

Genus VI. CYCLOPSINA. (*Milne Edwards.*)

*Rostrum furcatum.* *Antennæ anticæ* sive rectæ, sive leviter curvatæ, *maris* dextrâ articulatione geniculante. *Maxillipedes* (ct. vi.) pedibus proximis majores, non geniculati, setis longis spinulosis instructi. *Oculi inferiores* nulli. *Cephalothorax* 4-7 articulatus, capite sæpe discreto. *Antennæ posticæ* iisdem *Calani* similes. *Pes posticus dexter maris* grandis et prehensilis. [Maxillipedes, et *maris* antennam anticam dextram pedemque posticum dextrum, *Pontellæ* affinis; antennam posticam, oculos, et habitum, *Calano* similis. *Si oculi inferiores* adsunt, species *Pontellæ* pertinent.]

*SYN.* — Cyclopsina (C. castor), *Milne Edwards.* — Cetochilus? *Roussel de Vauzème.* — Monoculus (M. Castor), *Jurine.* — Cyclops (C. castor), *Desmarest.* — Dioptomus (D. castor), *Westwood.* — Non Cyclopsina *Bairdii.*

1. CYCLOPSINA LONGICORNIS. — Frons rotundata. Cephalothorax posticè obtusus, 5-articulatus, articulis posticis æquis. Antennæ anticæ sesqui corporis longitudine, rectiusculæ, setis brevibus, duabus subapicalibus posticis prælongis, subæquis, apicalibus perbrevis, anticâ penultimâ articuli longitudine. Styli caudales breves.

*Long.*  $\frac{1}{8}$ " — *Hab.* in mari Atlantico, lat. aust.  $4^{\circ}$ , long. occ.  $21^{\circ}$ . — Lect. die 7 Nov., 1838. — An *Cetochilo septentrionali* (Goodsir) affinis?

2. *CYCLOPSINA CALANINA*. — Gracilis. Frons triangulata. Cephalothorax posticè obtusus, 6-articulatus, capite vix discreto, articulis posticis æquis. Antennæ anticæ corpore longiores, tenuissimæ, rectiusculæ, apicibus fronte non posteriores; setis brevibus, apicalibus anticis articuli longitudine, subapicalibus totis valde brevioribus; antenna *maris* dextra medio leviter incrassata. Styli caudales elongati, divaricati.

*Long.*  $\frac{1}{10}$ " — *Hab.* in mari Pacifico, prope insulam "El Gran Co-cal." — Lect. die 25 Mar., 1841.

3. *CYCLOPSINA TENUICORNIS*. — *Maris*: Frons triangulata. Cephalothorax posticè fere obtusus, 7-articulatus, capite discreto, articulis posticis æquis. Antennæ anticæ corpore longiores, apicibus fronte vix anteriores, tenuissimæ, rectiusculæ, setis brevibus, anticis apicalibus fere articuli longitudine, posticâ penultimâ paulo longiore. Abdomen 3-articulatum. Styli caudales elongati divaricati.

*Long.*  $\frac{1}{16}$ " — *Hab.* in mari Pacifico, prope insulam "Depeyster"; lect. die 22 Mar., 1841. Etiam (?) in Archip. "Paumotu"; lect. Aug. 13, 1839.

4. *CYCLOPSINA GRACILIS*. — *Maris*: Antennæ anticæ corpore valde longiores; abdomen 4-articulatum; aliis *C. tenuicorni* similis.

*Long.*  $\frac{1}{16}$ " — *Hab.* in mari Pacifico, lat. bor.  $25^{\circ}$ , long. orient.  $167^{\circ}$ . — Lect. die 14 Maii, 1841. — An var. *C. tenuicornis*.

#### Genus VII. CATOPIA.

Antennas posticas et antennarum habitum anticarum *Calano* affinis.

Antennam anticam *maris* dextram *Pontellæ* affinis. Oculi superiores nulli; oculus inferior unicus (?).

*CATOPIA FURCATA*. — Gracilis. Caput quadratum, non discretum. Cephalothorax 4-articulatus, posticè 4-dentatus, dentibus acutis, externis longioribus. Styli caudales oblongi, divaricati. Antennæ anticæ corpore longiores, duplo curvatæ, apicibus fronte non anteriores; setis totis brevibus.

*Long.*  $\frac{1}{16}$ " — *Hab.* in freto "Banka." — Lect. die 2 Mar., 1842.

#### Genus VIII. ACARTIA. (*Dana.*)

*Antennæ anticæ* rectiusculæ, flexiles, setis irregulariter diffusis, dextrâ *maris* non geniculante. *Maxillipedes* (ct. vi.) pedibus proximis majores, recti, setis setulosis longis instructi. *Pedes postici* (ct. xii.)

parvuli, uni-articulati, 2 setas divaricatas gerentes. *Oculi* duo inferiores et duo superiores. *Setæ caudales* mediocres.

1. *ACARTIA LIMPIDA*. — Gracilis. Frons triangulata. Cephalothorax posticè obtusus, 5-articulatus, capite discreto. Antennæ anticæ latè divaricatæ, rectiusculæ, vix corporis longitudine, 7-8-articulatæ, articulis ultimis tribus brevibus, precedentibus longis; setis prælongis, penultimâ posticâ dimidio brevior quam apicales. Styli caudales oblongi, tenues.

*Long.*  $\frac{1}{20}$ " — *Hab.* prope Patagoniam. — *Lect.* diebus 14, 15 Jan., 1839.

2. *ACARTIA NEGLIGENS*. — Gracillima. Frons triangulata. Cephalothorax angustus, posticè minutè apiculatus, capite fere discreto. Antennæ anticæ fere corporis longitudine, tenuissimæ, latissimè divaricatæ, apicibus fronte paulo anteriores, 7-9-articulatæ, articulis tribus ultimis brevibus; setis prælongis, posticâ penultimâ apicales æquante. Styli caudales tenuissimi, oblongi, setis latè divaricatis.

*Long.*  $\frac{1}{16}$ " — *Hab.* in mari Pacifico, prope insulas "Kingsmill," et lat. bor. 28°, long. orient. 171°. — *Lect.* diebus 15 Ap., et 17 Maii, 1841.

3. *ACARTIA TONSA*. — Frons rotundata. Cephalothorax posticè obtusus, 6-articulatus, capite discreto. Antennæ anticæ multiarticulatæ, rectæ, apicibus fronte non anteriores, setis plerumque brevibus, paucis longiusculis (3-4-articulos simul sumtos longitudine æquantibus). Styli caudales perbreves.

*Long.*  $\frac{1}{18}$ " — *Hab.* in "Port Jackson" Novi-Hollandiæ. — *Lect.* Mar., 1840.

4. *ACARTIA LAXA*. — Gracilis. Frons rotundata. Cephalothorax 4-articulatus, capite non discreto, posticè longè acutus. Antennæ anticæ, rectiusculæ, corpore paulo longiores, nusquam fronte anteriores, multiarticulatæ, articulo primo longiore, setis longiusculis, valde inæquis. Abdomen breve. Styli caudales paulum oblongi, setis latissimè diffusis, abdomine non longioribus.

*Long.*  $\frac{1}{15}$ " — *Hab.* in mari "Sulu," et freto "Banka." — *Lect.* diebus 2 Feb., et 2 Mar., 1842.

#### Genus IX. PONTELLA.

*Rostrum* furcatum. *Oculi* duo superiores, pigmentis sive coalitis sive remotis; duo inferiores coaliti. *Antennæ anticæ* multiarticulatæ, setis non diffusis, antennâ dextrâ maris geniculante. *Cephalo-*

*thorax* 4-7-articulatus, segmento cephalico sæpe discreto. *Maxillipedes* (ct. vi.) grandes, recti, setis longis, setulosis. *Pedes antici* (ct. vii.) minores. *Pes posticus* (ct. xii.) *dexter maris* crassus, prehensilis.

SYN. — *Pontia*, *Milne Edwards*.\* — *Irenæus*, *Goodsir*. — *Broteas*, *Lovén*.

I. PONTELLÆ CALANOIDEÆ. ANTENNÆ ANTICÆ DUPLO CURVATÆ, AD APICES FRONTE NON ANTERIORES. ANTENNÆ POSTICÆ, AD APICEM RAMI MINORIS, 3-SETIGERÆ.

1. PONTELLA ELLIPTICA. — *Feminæ*: Frons rotundata. Cephalothorax crassus, 4-articulatus, capite inermis, angulis posticis acutis, remotis. Oculi superiores remotiusculi, inferiores minuti. Antennæ anticæ duplo curvatæ, apicibus fronte valde posterioribus, corpore breviores, setis brevibus, subapicalibus perbrevibus, apicalibus vix articuli longitudine. Styli caudales oblongi, setis valde inæquis. (Cærulea, dorso sæpe argentea.)

*Long.*  $\frac{1}{16}$ " — *Hab.* in freto "Banka." — Lect. die 2 Mar., 1842.

2. PONTELLA BRACHIATA. — *Maris*: Frons subtriangulata. Cephalothorax 6-7-articulatus anticè angustior, inermis, angulis posticis acutis, remotis. Oculi superiores remotiusculi aut coaliti. Antennæ anticæ corporis longitudine, duplo curvatæ, apicibus fronte non anterioribus, setis brevibus, posticâ penultimâ articulum longitudine fere duplo superante, anticâ apicali brevior, aliis apicalibus et subapicalibus brevioribus; antenna dextra medio paulum incrassata, fere 23-articulata, duabus articulis medianis anticè unidentatis, articulo antepenultimum præcedente elongato, duplice. Pes posticus dexter maximus, digito elongato, rectè inflexo.

*Long.*  $\frac{1}{12}$ " — *Hab.* in mari Pacifico, lat aust. 42°, long. occ. 78° 45'; lect. die 3 Ap., 1839. In syrtis "Lagulhas"; lect. die 8 Ap., 1842. — *Feminæ* (an ejus speciei?) frons vix triangulata; styli caudales divaricati; abdomen 3-articulatum (*maris* 4); anguli postici cephalothoracis divaricati. — Lect. in syrtis "Lagulhas" die 8 Ap., 1842.

II. ANTENNÆ ANTICÆ AD APICES FRONTE ANTERIORES.

A. *Caput lateribus inerme.*

1. Cephalothorax posticè obtusus aut brevissimè acutus.

3. PONTELLA PLUMATA. — *Feminæ*: Frons rotundata. Cephalo-

\* *Pontia* Papilionum generis vocabulum, itaque *Pontella* hic scripsa.

thorax curtus, obesus, 6-articulatus, capite discreto, segmento postico perbrevis, et posticè vix acuto. Antennæ anticæ corpore paulo longiores, latè divaricatæ, fere rectæ, setis raris sublongis, apicalibus articulo plus duplo longioribus, subapicalibus brevioribus. Antennæ posticæ ramos valde inæquæ, setis ramorum et palporum sequentium fere corporis longitudine, instar plumarum. Styli caudales parce oblongi.

*Long.*  $\frac{1}{2}$ ". — *Hab.* in mari Atlantico, lat. bor.  $5^{\circ}$ , long. occ.  $21^{\circ}$ .

4. PONTELLA TURGIDA. — Frons rotundata. Cephalothorax crassus, obesus, 5–6 articulatus, capite discretus, posticè obtusus. Oculi superiores approximati. Antennæ anticæ corporis longitudine, fermè 21-articulatæ,  $60^{\circ}$ – $90^{\circ}$  divaricatæ et prope medium obsoletè reflexæ; setis brevibus, penultimâ posticâ longiore quam apicales aut aliæ subapicales. Antennæ posticæ ramos valde inæquæ, setis longis. Styli caudales oblongi. — *Maris* antenna antica dextra 10–12-articulata, articulo submediano latè subovato et apice acuto, articulis tribus sequentibus valde elongatis, ultimo triplice.

*Long.*  $\frac{1}{4}$ ". — *Hab.* in mari Atlantico, lat. bor.  $8\frac{1}{2}^{\circ}$ – $0^{\circ}$ , long. occ.  $23^{\circ}$ – $18^{\circ}$ ; lect. diebus 15, 22, 23, 26 Oct., 1838. Lat. aust.  $1^{\circ}$ – $4\frac{1}{2}^{\circ}$ , long. occ.  $17\frac{1}{2}^{\circ}$ – $21\frac{1}{2}^{\circ}$ ; lect. diebus 5, 6, 7 Nov., 1838. Lat. aust.  $4^{\circ}$   $30'$ , long. occ.  $25^{\circ}$ ; lect. die 13 Maii, 1842. Lat. bor.  $0^{\circ}$   $15'$ , long. occ.  $31^{\circ}$ ; lect. die 17 Maii, 1842. In mari Pacifico prope insulas "Kingsmill"; lect. diebus 13, 28 Ap., 1841. In syrtis "Lagulhas"; lect. die 8 Ap., 1842.

5. PONTELLA CURTA. — Frons rotundata. Cephalothorax curtus, crassiusculus, 5-articulatus, capite discreto, angulis posticis brevissimè acutis. Antennæ anticæ corpore breviores, rectæ,  $105^{\circ}$  divaricatæ, setis brevibus, apicali anticâ longiore. Antennæ posticæ ramos valde inæquæ, minore plus dimidio brevioribus. Styli caudales oblongi, non divaricati.

*Long.*  $\frac{1}{6}$ ". — *Hab.* prope insulam "Mindoro" et in freto "Sunda"; lect. diebus 24 Jan. et 4 Mar., 1842. In syrtis "Lagulhas"; lect. die 8 Ap., 1842.

6. PONTELLA CONTRACTA. — Frons rotundata. Cephalothorax 6–7-articulatus, capite discreto, angulis posticis brevissimè acutis, segmento postico fere obsoleto. Antennæ anticæ cephalothorace non longiores,  $100^{\circ}$ – $110^{\circ}$  divaricatæ, rectæ, fermè 17-articulatæ, setis brevibus, apicali anticâ longiore. Rami antennarum posticarum valde inæqui. Styli caudales elongati. [Abdomen 2-articulatum.]

*Long.*  $\frac{1}{8}$ ". — *Hab.* in mari Pacifico, lat. aust.  $18\frac{1}{4}^{\circ}$ , long. occ.  $124^{\circ}$

30'; lect. die 7 Aug., 1839. An eadem species in mari Atlantico, lat. aust. 2°, long. occ. 20°; lect. die 6 Nov., 1838.

7. PONTELLA MEDIA. — Frons rotundata. Cephalothorax 5-articulatus, segmento postico brevissimo et valde angusto, non acuto, capite vix discreto. Oculi superiores remotiusculi, inferiores parvuli. Antennæ anticæ corporis longitudine, duplo curvatæ, fere transversæ, apicibus fronte anteriores, setis brevibus, rectis, apicalibus articuli longitudine, posticâ penultimâ parce longiore, aliis subapicalibus brevioribus. Styli caudales oblongi. [Abdomen 2-articulatum.]

*Long.*  $\frac{1}{20}$ ". — *Hab.* in mari "Sulu"; lect. die 27 Jan., 1842.

8. PONTELLA CRISPATA. — *Feminæ*: Frons subtriangulata, obtusa. Cephalothorax 7-articulatus, segmento postico brevissimo, obtuso aut subacuto. Oculi superiores remotiusculi, inferiores mediocres. Antennæ anticæ vix corporis longitudine, latè divaricatæ, apicibus fronte valde anterioribus et prorsum curvatis; setis brevibus, prope basin confertis et paucis uncinatis, apicalibus et posticâ antepenultimâ articulo parce longioribus, posticâ penultimâ paulo longiore. Styli caudales parce oblongi, setis subæquis. [Abdomen 4-articulatum.]

*Long.*  $\frac{1}{15}$ ". — *Hab.* in mari *Pacifico*, prope insulas "Kingsmill"; lect. diebus 22, 26 Mar., 1841. In mari *Atlantico*, lat. bor.  $8\frac{1}{2}$ °, long. occ. 23° 45'; lect. die 15 Oct., 1838.

9. PONTELLA DETRUNCATA. — Frons obtusa. Cephalothorax 5-6-articulatus, capite discreto, angulis posticis rectè truncatis et extus brevissimè acutis. Antennæ anticæ 22-24-articulatæ, vix corporis longitudine, late divaricatæ, apicibus fronte valde anterioribus et prorsum curvatis; setis brevibus, rectis, posticâ penultimâ longiore quam apicales vel aliæ subapicales. Styli caudales breves. Antenna dextra *maris*, medio incrassata, subteres, 12-13-articulata, articulo tertio elongato, obsoletè articulo septimo (octavo?) brevi et subtriangulato duabus sequentibus tenuibus, longis. Pes posticus dexter *maris* crassissimè cheliformis, manu subovatâ, pollice laterali, obtuso, dimidio brevior, digito elongato, tenui et curvato.

*Long.*  $\frac{1}{12}$ " -  $\frac{1}{16}$ ". — *Hab.* in mari *Pacifico*, lat. aust. 26° 8', long. occ. 178°; lect. die 18 Ap., 1840. Lat. aust. 5° 20', long. orient. 175° 30'; lect. die 25 Mar., 1841: etiam prope insulas "Kingsmill."

10. PONTELLA SIMPLEX. — Frons obtusiuscula. Cephalothorax subgracilis, capite obsoletè discreto, segmento postico brevè et perangusto. Oculi superiores, subremoti, inferiores mediocres. Antennæ anticæ

cephalothorace breviores, 9-articulatæ, 100° divaricatæ; setis totis brevibus. Styli caudales elongati. [Abdomen 2-articulatum. An specimen adultum?]

*Long.*  $\frac{1}{20}$ "'. — *Hab.* in mari Pacifico, lat. aust. 32° 24', long. orient. 178°. — *Lect.* die 9 Ap., 1840.

11. PONTELLA EXIGUA. — Gracilis. Frons obtusa. Cephalothorax 6-articulatus, capite discreto, segmento postico brevi, obtuso. Oculi inferiores maximi, valde elongati, subclaviformi. Antennæ anticæ corpore valde breviores, 120° (?) divaricatæ, setis perbrevibus, apicali anticâ longiore, subapicalibus brevibus. Antennæ posticæ tenues, ramo majore plus duplo longiore. Styli caudales oblongi. [An adultum? Abdomen 2-articulatum.]

*Long.*  $\frac{1}{30}$ "'. — *Hab.* in mari Atlantico, lat. bor. 7½° et 4¾°, long. occ. 23¾° et 19°; *lect.* diebus 16, 24 Oct., 1838.

2. Cephalothorax posticè productus et acutus.

\* *Seta antennarum anticarum apicalis setis subapicalibus brevior.*

12. PONTELLA AGILIS. — *Femina*: *P. crispata* antennas similis. Anguli postici cephalothoracis acuti, fronte rotundatâ. Setæ antennarum anticarum fere rectæ prope basin confertæ. — Forsan *P. crispata* cephalothorax interdum posticè acutus et species non differt.

*Long.*  $\frac{1}{8}$ "'. — *Hab.* in mari Atlantico, lat. aust. 19½°, long. occ. 38¾°; *lect.* die 17 Nov., 1838: etiam (?) lat. bor. 9¼°, long. occ. 24° 18'.

13. PONTELLA ACUTIFRONS. — *Maris*: *P. crispata* et *agili* similis. Anguli postici cephalothoracis acuti. Frons acuta et prominens; rostro longissimè furcato et valde inflexo. Setæ antennarum anticarum rectæ, prope basin fere articuli secundi longitudine, posticâ penultimâ plus duplo longiore quam apicales. Antenna dextra medio incrassulata, subteres 12–13-articulata; articulis secundo et quinto æquis, septimo brevissimo, octavo valde elongato, subattenuato, recto, fere duplo longiore quam nono; nono ad apicem anticam instar spinæ valde producto; articulis sequentibus (ultimis) tribus, normalibus. Pes posticus dexter latissimè cheliformis, manu subquadratâ, pollice breviter spiniformi, digito recto, apice minuto inflexo, valde brevior quam manus.

*Long.*  $\frac{1}{7}$ "'. — *Hab.* in mari Pacifico, prope insulam "El Gran Canal," lat. aust. 5° 40', long. orient. 175° 30'; etiam prope insulas "Kingsmill"; *lect.* diebus 25 Mar., 1 Ap., 1841.

14. PONTELLA ACUTA. — Frons longè acuta, rostro brevi, vix inflexo.



Cephalothorax 5-articulatus, capite discreto, angulis posticis elongatis, acutis. Oculi superiores remoti, inferiores parvi. Antennæ anticæ subtransversæ, fere corporis longitudine, fermè 21 – 22-articulatæ, apicibus fronte paulo anterioribus, et prorsum leviter curvatis, setis prope basin confertis longiusculis, posticâ penultimâ duplo longiore quàm articulus, apicalibus et aliis subapicalibus brevioribus. Styli caudales oblongi. Antenna dextra *maris* subteres, fermè 13-articulata, articulo secundo longo, 6 sequentibus brevibus, proximis duobus elongatis et tenuibus, parce arcuatis, subæquis, 3 proximis (ultimis) normalibus. Pes posticus dexter *maris* latus, manu apice late orbiculatâ, pollice nullo, digito vix manus longitudine, paulum inflexo. [Cyanea. Abdomen 4-articulatum.]

*Long.*  $\frac{1}{10}$ " — *Hab.* prope insulam "Mindoro"; lect. die 24 Jan., 1842. In mari Sinensi; lect. die 15 Feb., 1842.

† *Seta antennarum anticarum apicalis subapicalibus longior.*

15. PONTELLA RUBESCENS. — *Feminæ*: Frons rotundata. Cephalothorax 6-articulatus, capite discreto, segmento septimo obsoleto, angulis posticis acutis. Oculi superiores remoti; inferiores pigmentum bilobati. Antennæ anticæ fere 120° divaricatæ et rectæ; setis brevibus, apicali vix longiore quam articulus. Ramus major antennarum posticarum fere triplo longior. Styli caudales elongati, paralleli. [Abdomen 3-articulatum.]

*Long.*  $\frac{1}{15}$ " — *Hab.* in mari Pacifico, prope insulam "Upolu"; lect. die 24 Feb., 1841. Prope insulam "El Gran Cocal"; lect. die 25 Mar., 1841.

16. PONTELLA EMERITA. — *Feminæ*: Crassa. Frons obtusa. Cephalothorax 6 – 7-articulatus, capite discreto, angulis posticis longè acutis, segmento postico brevi. Oculi superiores remoti. Antennæ anticæ cephalothorace vix longiores, fermè 100° divaricatæ, rectæ. Ramus major antennarum posticarum fere quadruplo longior. Styli caudales breves. [Abdomen 2-articulatum segmentis subæquis.]

*Long.*  $\frac{1}{10}$ " — *Hab.* in mari prope Promontorium Bonæ Spei; lect. die 12 Ap., 1842.

17. PONTELLA REGALIS. — *Feminæ*: Crassissima. Frons rotundata. Cephalothorax 5 – 6-articulatus, angulis posticis longè acutis, capite discreto brevi. Oculi superiores remoti, inferiores parvi. Antennæ anticæ cephalothorace breviores, 100° – 110° divaricatæ, duplo leviter curvatæ. Ramus major antennarum posticarum quadruplo longior.

Styli caudales brevissimi. [Abdomen 2-articulatum, segmento secundo brevi.]

Long.  $\frac{1}{7}$ " — *Hab.* in mari "Sulu"; lect. die 27 Jan., 1842.

18. PONTELLA PERSPICAX. — *Frons* rotundata. Cephalothorax 6-articulatus, capite discreto, segmento postico non brevior, angulis posticis longè acutis. Oculi inferiores grandes et prorsum valde elongati. Antennæ anticæ corpore valde breviores,  $100^{\circ}$  –  $110^{\circ}$  divaricatæ, fermè 21-articulatæ, ante medium obsoletè flexæ. Styli caudales elongati. Antenna antica dextra *maris* 9 – 10-articulata, articulo quarto lato, subovato. Pes posticus dexter vix crassus; manu angustâ, breviusculâ, digito vix longiore acuminato, pollice setiformi, longissimo, reflexo. [Abdomen 5-articulatum.]

Long.  $\frac{1}{12}$ " — *Hab.* in mari Atlantico, lat. aust.  $0^{\circ} 40'$ , long. occ.  $18^{\circ}$ ; lect. die 3 Nov., 1838. Forsan, lat. bor.  $7^{\circ} 25'$ , long. occ.  $20^{\circ}$ ; lect. die 17 Oct., 1838.

19. PONTELLA STRENUA. — *Maris*: *Frons* acutiuscula. Cephalothorax 5 – 6-articulatus, angulis posticis longe acutis, capite discreto. Oculi superiores remoti, inferiores mediocres. Antennæ anticæ fere corporis longitudine,  $80^{\circ}$  –  $90^{\circ}$  divaricatæ, 17 – 18 articulatæ, ad medium obsoletè flexæ. Ramus major antennarum posticarum fere triplo longior. Styli caudales breves. Antenna antica dextra *maris* 12 – 14-articulata, articulo mediano subovato, apice antico acuto. Pes posticus dexter crassiusculus, manu ovali, brevior quam carpus, pollice tenuissimo, acuto, parcè longior, digito mediocri, subulato, rectiusculo. [Abdomen 5-articulatum.]

Long.  $\frac{1}{12}$ " — *Hab.* in mari Pacifico, lat. aust.  $3^{\circ}$ , long. orient.  $175^{\circ}$ .

20. PONTELLA PROTENSA. — *Maris*: Crassa. *Frons* rotundata. Cephalothorax 5 – 6-articulatus, capite discreto, brevi, angulis posticis longè acutis. Oculi superiores remoti, inferiores mediocres. Antennæ anticæ basi vix  $60^{\circ}$  divaricatæ et medio fere  $70^{\circ}$ . Ramus antennarum posticarum major plus quadruplo longior. Styli caudales oblongi. Antenna *maris* antica dextra *P. strenuæ* similis. [Abdomen 5-articulatum.]

Long.  $\frac{1}{16}$ " — *Hab.* in fretis "Banka" et "Sunda"; lect. diebus 1, 4 Mar., 1842.

B. *Caput lateribus armatum.*

21. PONTELLA HEBES. — *Feminæ*: *Frons* truncata. Cephalothorax 4-articulatus, posticè rotundatus. Oculi superiores disjuncti, infe-

riores parvi. Antennæ anticæ fere corporis longitudine, transversæ, apicibus fronte paulo anterioribus, prorsum parce curvatis, prope basin setis confertis longiusculis, et unâ sublongâ mobili. Setis apicalibus articuli longitudine, posticâ penultimâ paulo longiore, aliis subapicalibus brevibus. Styli caudales vix oblongi. [Abdomen 3-articulatum.]

*Long.*  $\frac{1}{16}$ " — *Hab.* prope insulam "Sumatra"; lect. die 3 Mar., 1842.

22. PONTELLA FRIVOLA. — *Feminae* *P. hebetis* similis. Sed cephalothorax posticè acutus; abdomen 4-articulatum. An species differt? — *Long.*  $\frac{1}{16}$ ". *Hab.* prope insulam "Sumatra"; lect. die 3 Mar., 1842.

*Maris* (an hæc species?) antenna antica dextra 9-articulata, subteres, incrassulata, articulis 2, 3, 4, 5, 6 totis longis, 3 sequentibus (ultimis) normalibus, articulo quarto longiore et crassiore, subcylindrico. Antennæ posticæ tenuissimæ, ramis fere æquis. Abdomen 4-articulatum, tenue; stylis parce oblongis. Anguli postici cephalothoracis acuti, dextro longiore. — *Long.*  $\frac{1}{12}$ ". *Hab.* in mari "Sulu"; lect. die 28 Jan., 1842.

23. PONTELLA DETONSA. — Caput discretum, subtriangulatum, fronte obtusiusculâ. Cephalothorax 7-articulatus, segmento septimo brevissimo, posticè obtuso aut obtusiusculo. Oculi superiores remoti, inferiores subgrandes, vix elongati. Antennæ anticæ cephalothorace breviores, rectæ, fere 100° divaricatæ, 20–22-articulatæ, setis totis perbrevibus. Styli caudales elongati, vix divaricati. Antenna dextra *maris* paululum incrassata, teretiuscula, fermè 20-articulata. [Cyanea; interdum dorso margaritacea. Abdomen 3-articulatum.]

*Long.*  $\frac{1}{8}$ " —  $\frac{1}{15}$ ". — *Hab.* in mari Pacifico, lat. aust. 18° 10', long. occ. 125° 20'; lect. die 8 Aug., 1839. Lat. aust. 12° 45', long. occ. 171°; lect. die 5 Feb., 1841. Lat. aust. 11°, long. occ. 170°; lect. die 1 Feb., 1841. Lat. aust. 5° 30', long. orient. 175° 50', prope insulam "El Gran Cocal"; lect. die 25 Mar., 1841. Prope insulam "Mindoro"; lect. die 24 Jan., 1842.

24. PONTELLA ARGENTEA. — Caput discretum, subtriangulatum, fronte obtusum. Cephalothorax 5 (–6)-articulatus, posticè brevissimè acutus articulis tribus posticis subæquis. Oculi superiores remoti, inferiores subgrandes non elongati. Antennæ anticæ cephalothorace breviores, fere 90° divaricatæ et levissimè incurvatæ, 18–20-articulatæ, setis totis perbrevibus, duabus apicalibus subuncinatis. Styli caudales parce oblongi. [Viridescens, dorso argentea. Abdomen 3-articulatum.]

*Long.*  $\frac{1}{12}$ " — *Hab.* in mari Atlantico, lat. aust.  $40^{\circ} 35'$ , long. occ.  $60^{\circ}$ , prope "Rio Negro." — *Lect.* die 24 Jan., 1839.

25. PONTELLA SPECIOSA. — Caput discretum, subtriangulatum, fronte obtusum. Cephalothorax 5-7-articulatus, posticè acutus aut obtusiusculus. Oculi superiores remoti, inferiores mediocres. Antennæ anticæ cephalothoracis longitudine, fere rectæ, prope  $110^{\circ}$  divaricatæ, 21-22-articulatæ; setis brevibus, apicali anticâ et penultimâ posticâ longioribus, articulum paulo superantibus. Styli caudales oblongi. Antenna dextra *maris* pauci-articulata, articulo quinto latè ovato. Pes posticus dexter *maris* crassus, manu latâ apice truncatâ et obtusè dentatâ, pollice e basi manus producto, elongato, spiniformi, digito prælongo, incurvato. [*Maris* cephalothorax 6-articulatus, et abdomen 4-articulatum; color viridis, dorso argenteus. *Feminæ* cephalothorax 7-articulatus, segmento ultimo brevissimo; abdomen 3-articulatum; color ochreus, medio lætè ruber.]

*Long.*  $\frac{1}{12}$ " — *Hab.* prope fretum Sundæ; *lect.* die 4 Mar., 1842.

26. PONTELLA PRINCEPS. — *Feminæ*: Caput discretum, subtriangulatum, fronte obtusiusculum. Cephalothorax 6-articulatum, posticè longè acutus, articulis tribus posticis subæquis. Oculi superiores remoti; inferiores mediocres parce elongati. Antennæ anticæ cephalothorace parce breviores, rectiusculæ, fermè  $110^{\circ}$  divaricatæ, setis brevibus, apicali anticâ longiore. Styli caudales perbreves. [*Cyanea*, dorso margaritacea. Abdomen 4-articulatum, distortum.]

*Long.*  $\frac{1}{4}$ " — *Hab.* in mari Pacifico, prope insulam "Tongatabu"; *lect.* die 29 Mar., 1840.

27. PONTELLA FERA. — Caput vix discretum, subtriangulatum, fronte rotundatum. Cephalothorax 6-7-articulatus, posticè obtusus aut obtusiusculus, segmento postico brevissimo. Oculi superiores remoti, inferiores grandes, non elongati. Antennæ anticæ vix cephalothoracis longitudine, fermè 21-articulatæ,  $130^{\circ}$  divaricatæ, setis prope basin sublongis, confertis, aliis brevibus, apicali anticâ et penultimâ posticâ articulo vix longiore. Styli caudales elongati, divaricati. Antenna antica dextra *maris* subteres 11-12-articulata, articulo secundo longo, tertio brevissimo, quarto sub quintum producto, proximo spinam inversam ferente. Pes posticus dexter *maris* tenuis, manu subcylindricâ, digito tenuissimo, ad apicem spatulato et concavo.

*Long.*  $\frac{1}{12}$ " — *Hab.* in mari Pacifico, lat. aust.  $11^{\circ} - 12^{\circ} 45'$ , long. occ.  $170^{\circ} - 171^{\circ}$ ; *lect.* diebus 1, 5 Feb., 1840.

## Familia IV. CORYCÆIDÆ.

*Oculi* duo grandes plus minusve remoti, lenticulis duabus prolatis maximis, et corneis oblatis instar conspicillorum, constructi; quoque duo oculi connati minutissimi. *Antennæ anticæ* pauci-articulatæ, simplicissimæ. *Antennæ posticæ* simplicissimæ. *Pedes mandibulares maxillaresque* brevissimi. *Sacculi ovigeri* duo.

## Genus I. CORYCÆUS.

*Corpus* crassum, anticè rotundatum. *Conspicilla* fronte affixa. *Antennæ posticæ* pedibus anticis majores. *Pedes anticæ* sexu vix dissimiles digito subuncinato tenuique confecti. *Abdomen* pauci-articulatum, appendicibus basi nullis, stylis caudæ styliformibus.

## 1. ANTENNÆ POSTICÆ MACRODACTYLÆ, DIGITO NON BREVIORE QUAM CARPUS.\*

A. *Setæ caudales stylis valde breviores*. [*Cephalothorax posticè (ad segmentum tertium) acutus, segmento quarto minore.*]

1. CORYCÆUS GRACILIS. — Cephalothorax gracilis, ventre non carinato. Antennæ anticæ breviter setulosæ. Conspicilla fere contigua. Antennarum posticarum carpus digito brevior, setâ longâ, setulosâ. Abdomen uni-articulatum, apice subcylindrico fere triplo longius, basi angustum. Styli caudales abdomine breviores, setis brevissimis.

*Long.*  $\frac{1}{30}$ " — *Hab.* in mari Atlantico, lat. bor. 1° 30', long. occ. 18° 20', et lat. aust. 2° 20', long. occ. 20°.

2. CORYCÆUS DECURTATUS. — Cephalothorax ventre carinatus. Antennæ anticæ breviter setulosæ. Conspicilla fere contigua. Antennarum posticarum carpus digito brevior setâ nudâ elongatâ, etiam setâ alterâ setulosâ brevior. Abdomen basi crassum, apice subcylindrico fere quadruplo longius. Styli caudales vix dimidii abdominis longitudine, setis brevissimis.

*Hab.* in mari Pacifico, prope insulam "Duke of Clarence."

3. CORYCÆUS DEPLUMATUS. — Conspicilla remotiuscula. Antennæ anticæ brevissimè setulosæ, 7-articulatæ. Antennarum posticarum car-

\* *Carpus* est articulus elongatus antennarum posticarum secundus (aut primus et secundus simul sumti). *Digitus* articulis tertio quartoque compositus, plus minusve discretis. *Carpus* setâ longâ sive nudâ sive setulosâ ad basin ornatus, et sæpe unâ duabusve lateralibus aut apicalibus.

pus digito brevior, setâ setulosâ longâ, et aliâ nudâ. Abdomen uni-articulatum, tenue. Styli caudales vix dimidii abdominis longitudine; setis plus dimidio brevioribus.

*Hab.* in mari Atlantico, lat. bor.  $9^{\circ} 20'$ , long. occ.  $24^{\circ} 15'$ .

4. *CORYCÆUS VARIUS*. — Cephalothorax crassus. Conspicilla remotiuscula. Antennæ anticæ longè setulosæ. Antennarum posticarum carpus digito brevior, setâ longâ, nudâ. Abdomen 2-articulatum, segmento secundo cylindrico, brevior quam primum. Styli caudales abdomine paulo breviores, setis dimidio brevioribus.

*Long.*  $\frac{1}{5}''$ . — *Hab.* in mari Atlantico, lat. bor.  $7^{\circ} 25'$ , long. occ.  $22^{\circ}$ ; lat. aust.  $1^{\circ} - 7^{\circ}$ , long. occ.  $18^{\circ} - 21^{\circ}$ . In mari Pacifico, lat. aust.  $15^{\circ} 30'$ , long. occ.  $138^{\circ} 30'$ ; lat. aust.  $33^{\circ}$ , long. orient.  $153^{\circ} 30'$ , prope Australiam; quoque prope insulas "Ladrones."

5. *CORYCÆUS LONGISTYLIS*. — Cephalothorax crassus. Conspicilla remotiuscula. Antennæ anticæ longè setulosæ. Antennarum posticarum carpus digito vix brevior, ad apicem internum dentiformis, nudus et acutus, setâ basali longâ, nudâ; digito setam nudam ad basin ferente. Abdomen uni-articulatum, dimidio apicali cylindrico. Styli caudales tenues, abdomine valde longiores, setis perbrevibus.

*Long.*  $\frac{1}{10}''$ . — *Hab.* in mari Sinensi.

B. *Setæ caudales stylis non valde breviores, sæpe longiores.*

\* Cephalothorax posticè obtusus.

6. *CORYCÆUS OBTUSUS*. — Conspicilla lata. Antennæ anticæ tenues, setis longiusculis. Antennarum posticarum carpus digito non brevior, setâ longâ nudâ. Abdomen 2-articulatum, subtus ad basin apiculatum, segmento secundo dimidium primi longitudine superante. Styli caudales dimidii abdominis longitudine, setis stylo parce longioribus.

*Long.*  $\frac{1}{30}''$ . — *Hab.* in mari Pacifico, prope insulam "El Gran Cal."

† Cephalothorax posticè acutus.

7. *CORYCÆUS CRASSIUSCULUS*. — Cephalothorax crassiusculus, segmento quarto posticè subacuto. Conspicilla contigua. Antennarum posticarum carpus digito vix brevior, setâ nudâ. Abdomen uni-articulatum, apice subcylindrico fere dimidio brevior quam pars basalis elliptica. Styli caudales dimidium abdominis longitudine superantes, setis paulo longioribus.

*Long.*  $\frac{1}{20}''$ . — *Hab.* in mari "Sulu," prope insulam "Panay." †

8. *CORYCÆUS LATICEPS*. — Cephalothorax crassus, segmento quarto breviter acuto. Conspicilla remotiuscula. Antennæ anticæ 7-articulatæ, setis dimidio brevioribus. Antennarum posticarum carpus digito paulo brevior, setâ longâ, nudâ. Abdomen 2-articulatum; segmento secundo cylindrico, dimidio brevior. Styli caudales dimidio abdominis breviores, setis parce longioribus.

*Long.*  $\frac{1}{20}$ "'. — *Hab.* in mari Atlantico, lat. bor.  $4^{\circ} - 5^{\circ}$ , long. occ.  $19^{\circ} - 22^{\circ}$ , et lat. aust.  $0^{\circ} 15' - 1^{\circ}$ , long. occ.  $18^{\circ} 30'$ , et  $31^{\circ}$ .

9. *CORYCÆUS VITREUS*. — Cephalothorax crassus, segmento quarto brevissimè acuto. Conspicilla remotiuscula. Antennæ anticæ longè setulosæ. Antennarum posticarum carpus digito vix brevior, setâ nudâ, longâ. Abdomen 2-articulatum, apice cylindrico brevi. Styli caudales dimidii abdominis longitudine, setis stylos paulum superantibus.

*Long.*  $\frac{1}{15}$ "'. — *Hab.* in mari Pacifico, lat. aust.  $18^{\circ}$ , long. occ.  $124^{\circ} 30'$ .

10. *CORYCÆUS AGILIS*. — Cephalothorax crassiusculus, segmento quarto subrectangulato. Conspicilla remotiuscula. Antennæ anticæ breviter setulosæ. Antennarum posticarum carpus digito paulo brevior, setâ longâ, nudâ. Abdomen 2-articulatum, crassum, segmento secundo tenuiter subcylindrico, paulo brevior quam primum. Styli caudales tenuissimi, dimidio abdominis longiores, setâ paulo brevior.

*Long.*  $\frac{1}{30}$ "'. — *Hab.* in mari Pacifico, prope insulam "Tongatabu."

11. *CORYCÆUS ORIENTALIS*. — Cephalothorax crassus, segmento quarto rectangulato, subacuto. Conspicilla remota. Antennæ anticæ breviter setulosæ. Antennarum posticarum carpus digito paulo longior, setâ longâ, nudâ, digito articulis duabus subæquis composito. Abdomen 2-articulatum, ad basin infra rectangulatum. Styli caudales breves, setis vix longioribus.

*Long.*  $\frac{1}{20}$ "'. — *Hab.* in mari "Sulu," prope insulam "Panay."

## 2. ANTENNÆ POSTICÆ MICRODACTYLÆ, DIGITUS CARPO BREVIOR.

### A. *Seta carpi antennarum posticarum nuda.*

\* Styli caudales abdomine non breviores.

*Digitus carpo paulo brevior.*

12. *CORYCÆUS LAUTUS*. — Cephalothorax ad segmentum quartum obtusus. Conspicilla remotiuscula. Antennæ anticæ longissimè setulosæ. Antennarum posticarum carpus digito paulo longior, setâ longâ, nudâ, digito subæquè 2-articulato, et ad basin setam nudam longam fe-

rente. Abdomen 2-articulatum, segmentis fere æquis. Styli caudales tenuissimi, abdomine valde longiores, setis perbrevibus.

*Long.*  $\frac{1}{15}$ "'. — *Hab.* in mari Pacifico, prope insulas "Kingsmill."

*Digitus carpo valde brevior, uncinatus.*

13. *CORYCÆUS SPECIOSUS*. — Cephalothorax ad segmentum quartum longè acutus. Conspicilla non contigua. Antennæ anticæ setis longissimæ. Abdomen 2-articulatum, articulo primo crasso, secundo cylindrico, dimidio brevior. Styli caudales abdomine longiores, divaricati, setis brevibus. [Pedes biremes 4 posteriores utrinque protensi.]

*Long.*  $\frac{1}{16}$ "'. — *Hab.* in mari Atlantico, lat. bor.  $5^{\circ} - 7^{\circ}$ , long. occ.  $21^{\circ} - 22^{\circ}$ .

14. *CORYCÆUS REMIGER*. — Cephalothorax ad segmentum quartum longè acutus. Conspicilla remota, parvula. Antennæ anticæ setis longissimæ. Abdomen 3-articulatum, segmento ultimo subito angustiore, cylindrico. Styli caudales fermè abdominis longitudine, divaricatæ, setis stylo paulo brevioribus. (*C. specioso* pedes biremes similis.)

*Long.*  $\frac{1}{15}$ "'. — *Hab.* in mari Atlantico, lat. aust.  $11^{\circ}$ , long. occ.  $29^{\circ}$ .

† Styli caudales abdomine breviores. [Cephalothorax posticè (ad segmentum tertium) longè acutus.]

15. *CORYCÆUS LATUS*. — Cephalothorax crassus, segmento quarto posticè longè acuto. Conspicilla remota. Antennæ anticæ mediocriter setigeræ. Abdomen crassum, posticè attenuatum, segmento ultimo subcylindrico. Styli caudales dimidio abdominis breviores, divaricati, setis paulo longioribus.

*Long.*  $\frac{1}{24}$ "'. — *Hab.* in mari Atlantico, lat. bor.  $3^{\circ} 45' - 4^{\circ} 20'$ , long. occ.  $19^{\circ} 30' - 18^{\circ} 30'$ ; etiam lat. aust.  $6^{\circ} 20'$ , long. occ.  $24^{\circ}$ .

16. *CORYCÆUS VENUSTUS*. — Cephalothorax mediocris, segmento quarto breviter acuto. Conspicilla remotiuscula. Antennæ anticæ longè setigeræ. Antennarum posticarum carpus digito fere duplo longior, apice interno dentiformi, setâ longâ, nudâ, digito subæque 2-articulato. Abdomen 2-articulatum, segmento primo paulo latiore et longiore. Styli caudales abdomine paulo breviores, divaricatæ, setis abdominis longitudine.

*Long.*  $\frac{1}{16}$ "'. — *Hab.* in mari Pacifico, prope insulas "Kingsmill."

B. *Seta carpi antennarum posticarum setulosa*. [Cephalothorax posticè longè acutus.]

17. *CORYCÆUS PELLUCIDUS*. — Cephalothorax gracilis, ventre max-



imè carinato. Conspicilla fere contigua. Antennæ anticæ 7-articulatæ, setis fere brevibus. Antennarum posticarum carpus ad apicem internum apiculatus, digito brevi. Abdomen 1-articulatum, apice obliquè truncato. Styli caudales dimidio abdominis longiores, setis vix majoribus.

*Long.*  $\frac{1}{5}''$ . — *Hab.* in mari Atlantico, lat. bor.  $4^{\circ} - 7^{\circ}$ , long. occ.  $19^{\circ} 30' - 21^{\circ} 30'$ ; quoque lat. aust.  $2^{\circ} 20'$ , long. occ.  $20^{\circ}$ .

18. CORYCÆUS CONCINNUS. — *C. pellucido* similis. Cephalothorax paulo crassior; abdomen gracilius; styli breviores, dimidium abdominis longitudine non superantes. Antennæ anticæ 3-articulatæ.

*Long.*  $\frac{1}{5}''$ . — *Hab.* in mari Pacifico, lat. aust.  $15^{\circ} 35'$ , long. occ.  $138^{\circ} 30'$ ; quoque leucas 80 ab insulâ "Tongatabu" versus austrum.

19. CORYCÆUS PRODUCTUS. — Antennæ anticæ 5-7-articulatæ, brevissimè setulosæ. Antennarum posticarum carpus ad apicem acutus, et digitus brevis, 3-articulatus. Abdomen elongatum, ad apicem oblique non truncatum. Styli caudales dimidio breviores, setis stylo paulo longioribus.

*Long.*  $\frac{1}{8}''$ . — *Hab.* in mari Atlantico, lat. bor.  $8^{\circ} 35'$ , long. occ.  $23^{\circ} 40'$ .

20. CORYCÆUS LONGICAUDATUS. — Cephalothorax mediocris, segmento quarto longè acuto. Conspicilla fere contigua. Antennæ anticæ 7-articulatæ, setis longiusculis, antennâ brevioribus. Antennarum posticarum carpus ad apicem internum acutus, et digitus parvulus, 3-articulatus. Abdomen mediocre, subellipticum. Styli caudales longiores, setis dimidio brevioribus.

*Long.*  $\frac{1}{8}''$ . — *Hab.* in mari Atlantico, lat. bor.  $5^{\circ} - 0^{\circ} 50'$ , long. occ.  $18^{\circ} - 20^{\circ}$ ; quoque lat. aust.  $2^{\circ} 20'$ , long. occ.  $20^{\circ}$ .

## Genus II. ANTARIA.

*Corpus* crassum, anticè rotundatum. *Conspicilla* fronte affixa. *Antennæ posticæ* parvæ, ad apicem breviter setigeræ, pedibus anticis (ct. vii.) non majores, carpo posticè angulato. *Pedes anticæ* sexu vix dissimiles (?), digito tenui subuncinato. *Abdomen* pauci-articulatum. [Cephalothorax posticè obtusus.]

1. ANTARIA CRASSIMANA. — *Pedes anticæ* pervalidi, antennis posticis valde majores, articulo secundo abdomen longitudine fere æquante. Abdomen 3-articulatum, segmentis primo tertioque perbrevibus. Styli caudales abdomine triplo et setæ duplo breviores.

*Long.*  $\frac{1}{30}$ " — *Hab.* in mari Atlantico, lat. bor.  $1^{\circ}$ , long. aust.  $18^{\circ}$ .

2. ANTARIA GRACILIS. — Conspicilla remota. Pedes antichi mediores, antennis posticis paululo majores. Abdomen sensim attenuatum. Styli caudales abdomine quadruplo breviores, setis dimidio abdominis longioribus.

*Long.*  $\frac{1}{20}$ " — *Hab.* in mari Atlantico, lat. bor.  $5^{\circ} - 7^{\circ}$ , long. occ.  $21^{\circ} - 22^{\circ}$ ; lat. aust.  $2^{\circ} 20'$ , long. occ.  $20^{\circ}$ .

3. ANTARIA OBTUSA. — Conspicilla remota, parvula. Pedes antichi parvuli, antennis posticis paululo majores. Abdomen sensim attenuatum, apice obsolete 3-articulatum. Styli caudales dimidio abdominis paulo breviores, setis longiores. Cephalothorax posticè rotundatus.

*Long.*  $\frac{1}{20}$ " — *Hab.* in mari "Sulu," prope insulam "Panay."

#### Genus III. COPILIA.

*Corpus* depressum, fronte latè quadratum, et conspicilla ad angulos anticos gerens. *Antennæ posticæ* digitiformes, digito elongato, subulato. *Abdomen* pauci-articulatum appendicibus ad basin nullis.

1. COPILIA MIRABILIS. — Cephalothorax fronte latus, parce excavatus posticè paulo latior, segmentis posticis latere obtusis, posticè ad apicem dorsalem spinigero. *Antennæ posticæ* ad articulum primum setulosæ, digito longo. *Abdomen* tenue, cephalothoracis dimidio brevius, obsolete 5-articulatum. Styli abdomine longiores, tenuissimi.

*Long.*  $\frac{1}{16}$ " — *Hab.* in mari Pacifico, prope insulas "Kingsmill."

2. COPILIA QUADRATA. — Cephalothorax anticè bene quadratus, fronte parce excavatus, segmentis latere obtusis, postico brevissimo. *Abdomen* 4-articulatum, tenue, segmentis secundo tertioque non longioribus quam primum, quarto dimidium abdominis longitudine superante et lateribus parce excavato. Styli abdomine longiores, tenuissimi.

*Hab.* in mari Pacifico, lat. aust.  $15^{\circ} 20'$ , long. occ.  $148^{\circ}$ ; quoque lat. bor., prope long. orient.  $165^{\circ}$ .

#### Genus IV. SAPPHIRINA.

*Corpus* depressum. *Sexus* antennis posticas stylosque caudales similes, et abdomen, pedesque antichi (*vel* maxillipedes, ct. vii.) dissimiles. *Antennæ posticæ* pediformes, digito tenui, 2-articulato, ad apicem unguiculato. *Abdomen feminae* 5-6-articulatum, thorace subito angustius, appendices breves ad basin latere gerens; *maris* 4-5-articulatum, thorace subito non angustius, appendicibus nullis.

*Pedes antici maris* digitum elongati, *feminæ* breves. *Styli* caudales laminati. — *Mares* sæpe lætè opalini aut fulgidè metallini, interdum cærulei. *Feminæ* sæpius incoloratæ, plus minusve pellucidæ; interdum opacæ et azuleæ.

1. *Conspicilla conjuncta*.

1. SAPPHIRINA IRIS. — Antennæ posticæ abbreviatæ, digito dimidii carpi longitudine. Lamellæ caudales tenuiter falciformes, divaricati; setis tribus, duabus apicalibus dimidio styli longioribus, alterâ externâ. — *Feminæ*: Corpus gracillimum valde elongatum (latitudine maximâ plus quintuplo longius). Conspicilla fronte insita. Abdomen 6-articulatum, segmento primo sequentibus vix angustiore. *Maris*: Corpus lineari-ellipticum, anticè rotundatum. Conspicilla inferiora, fronte remotiuscula.

*Long.*  $\frac{1}{3}$ " — *Hab.* in mari Pacifico, lat. aust.  $41^{\circ}$ , long. occ.  $76^{\circ} 24'$ .

2. SAPPHIRINA ANGUSTA. — Digitus antennarum posticarum carpo valde (non duplo) brevior. Lamellæ caudales elongatæ, subovatæ, ad apicem internum prominulo, subacuto; setis quatuor, duabus apicalibus dimidio lamellæ brevioribus, aliis duabus externis brevioribus. — *Feminæ*: Corpus valde elongatum (latitudine maximâ fere quadruplo longius). Conspicilla fronte insita. Abdomen 6-articulatum, segmento primo angustiore, tertio, quarto, quintoque lunatis et latus acutis, primo secundoque fere æquis.

*Long.*  $\frac{1}{8}$ " — *Hab.* in mari Pacifico, lat. aust.  $43^{\circ}$ , long. occ.  $78^{\circ} 45'$ ; etiam ad syrtas "Lagullas," lat. aust.  $35^{\circ} 50'$ , long. orient.  $23^{\circ}$ .

3. SAPPHIRINA ELONGATA. — Digitus antennarum posticarum tenuis, dimidio brevior quam carpus. Lamellæ caudales latæ, breviter ovatæ, apice interno vix prominulo, setis quatuor, totis dimidio lamellæ breviores. — *Feminæ*: Corpus angustè elongatum, valde convexum. Conspicilla fronte insita. Abdomen 5-articulatum, segmento primo parvulo, secundo majore sed valde minore quam sequens, sublunato.

*Long.*  $\frac{1}{10}$ " — *Hab.* in mari Pacifico, lat. bor.  $15^{\circ}$ , long. orient.  $179^{\circ}$ .

4. SAPPHIRINA METALLINA. — Lamellæ caudales fere rectangulatæ, apice subtruncatæ, setis quatuor apicalibus subæquis, parcè brevioribus quam lamellæ. — *Maris*: Corpus valde depressum, angustato-ellipticum, 9-articulatum, segmento ultimo tecto, primo oblongo, quarto dimidio brevior quam quintum.

*Long.*  $\frac{1}{10}$ " — *Hab.* in mari Pacifico, prope insulas "Kingsmill."

5. SAPPHIRINA CORUSCANS. — Digitus antennarum posticarum paulo

brevior quam carpus, tenuis, unguiculo elongato. Lamellæ caudales subovatae, ad apicem rotundatae, apice interno setam brevem gerente, setis aliis quatuor, totis brevibus (lamellâ fere quadruplo brevioribus). — *Maris*: Corpus depressum, elongato-ovatum, posticè angustatum, segmento primo (fere duplice) parce oblongo, aliis segmentis fere similibus. Conspicilla fronte insita, prominentia.

*Long.*  $\frac{1}{16}$ ". — *Hab.* in mari Pacifico, lat. aust.  $18^{\circ} 10'$ , long. occ.  $125^{\circ} 30'$ .

6. SAPPHIRINA INÆQUALIS. — Digitus antennarum posticarum carpo non brevior, tenuis, unguiculo brevi. Lamellæ caudales oblongæ, subovatae, apice interno prominulo, subacuto, setis quatuor, setis dimidio lamellæ non longioribus. — *Feminae*: Corpus longè ovatum, segmentis cephalothoracis tribus ultimis dissimilibus, segmento ultimo brevior et latere acuto, penultimo obtuso. Conspicilla fronte insita. Abdomen 6-articulatum, segmento primo fere obsoleto aut tecto, secundo posticè acuto.

*Long.*  $\frac{1}{12}$ ". — *Hab.* in mari Pacifico, lat. aust.  $43^{\circ}$ , long. occ.  $78^{\circ} 45'$ .

7. SAPPHIRINA OVATA. — Digitus antennarum posticarum fermè longitudine carpi, articulis duabus digiti subæquis. Lamellæ caudales graciles, lanceolatae, parce divaricatae; setis 4-5, unâ internâ, unâ aut duabus apicalibus, et aliis duabus externis, totis dimidio lamellæ valde brevioribus. — *Feminae*: Corpus valde depressum. Cephalothorax ovatus, segmento antico paulo oblongo, segmentis duobus ultimis latere rotundatis, ultimo angustiore. Conspicilla fronte insita. Abdomen elongato-ellipticum, 5-articulatum, segmento primo non angustiore. — Rubescens.

*Long.*  $\frac{1}{12}$ ". — *Hab.* in freto "Balabac," prope insulam "Borneo."

8. SAPPHIRINA SPLENDENS. — Digitus antennarum posticarum tenuis, carpo vix brevior. Lamellæ caudales ovato-rotundatae, apice interno acuto; setis quatuor, duabus apicalibus dimidio lamellæ non longioribus, aliis externis. — *Maris*: Corpus valde depressum, ovatum. Conspicilla fronte insita. Segmento primo (vix duplice) transverso, aliis longitudine subæquis, latere obtusis.

*Long.*  $\frac{1}{15}$ ". — *Hab.* in mari Pacifico, prope insulam "Assumption," lat. bor.  $19^{\circ} 30'$ , long. orient.  $144^{\circ} 30'$ .

9. SAPPHIRINA OVALIS. — Digitus antennarum posticarum crassus, carpo fere longior, articulis digiti valde inæquis, unguiculo dimidium digiti longitudine æquante. Lamellæ caudales ovatae, setis quinque, unâ

internâ, duabus apicalibus, et aliis externis, totis paulo brevioribus quam lamellæ. — *Feminæ*: Corpus valde convexum. Cephalothorax ellipticus, 5-articulatus, segmento antico non oblongo, postico parvo. Conspicilla fronte insita. Abdomen 5-articulatum, segmento primo minore, latere truncato, tertio quartoque lunatis. — Opaca, azulea.

*Hab.* in mari Pacifico, propè insulam “Tongatabu,” versus Austrum.

10. SAPPHIRINA DETONSA. — Digitus antennarum posticarum tenuis, carpo paulo brevior, unguiculo dimidii digiti longitudine. Lamellæ caudales approximatae, subovatæ, latitudine plus duplo longiores, setis brevissimis (obsolescentibus). — *Feminæ*: Corpus valde convexum. Cephalothorax ellipticus, 5-articulatus, segmento primo non oblongo, aliis latera obtusis. Conspicilla fronte insita. Abdomen 5-articulatum, segmento primo fere obsoleto aut tecto, secundo latere obtuso, tertio quartoque lunatis. — Translucens, brunnescens.

*Long.*  $\frac{1}{15}$ ”. — *Hab.* in mari Pacifico, lat. aust. 15°, long. occ. 138° 45’.

11. SAPPHIRINA INDIGOTICA. — Digitus antennarum posticarum tenuis, fere carpi longitudine, et unguiculo fere dimidii digiti. Lamellæ caudales subovatæ, apice interno vix prominulo, setis quatuor, duabus apicalibus, aliis externis, totis dimidio lamellæ vix brevioribus. — *Feminæ*: Corpus valde convexum. Cephalothorax ellipticus. Conspicilla fronte insita. Abdomen 6-articulatum, segmento primo parvulo, tertio, quarto, quintoque lunatis. — Opaca, et azulea.

*Long.*  $\frac{1}{16}$ ”. — *Hab.* in mari Pacifico, lat. bor. 28°, long. orient. 177°.

12. SAPPHIRINA ORIENTALIS. — Digitus antennarum posticarum tenuis, fermè carpi longitudine, unguiculo minus dimidio digiti. Lamellæ caudales breviter ovatae, prope apicem internum dente acuto armatae, setis quatuor, duabus apicalibus, aliis externis, totis brevibus, vix dimidii lamellæ longitudine. — *Maris*: Corpus valde depressum, subovatum, 10-articulatum, segmento antico latiore et paulo transverso, aliis sensim angustioribus. Conspicilla fronte insita. — *Feminæ* (?): Corpus convexum. Cephalothorax ellipticus, 5-articulatus, segmento antico non transverso, postico ad latus truncato, angulis posticis acutis. Conspicilla fronte insita. Abdomen 6-articulatum, segmento primo minore, lateribus truncatis, secundo lateribus rotundatis, tribus sequentibus lunatis. — *Maris* color, opalinus; *feminæ* indigoticus, opacus.

*Long.*  $\frac{1}{10}$ ”. — *Hab.* in mari “Sulu.”

2. *Conspicilla non contigua.*

13. SAPPHIRINA OVATO-LANCEOLATA. — Digitus antennarum posticarum dimidio carpi paulo longior, articulis duabus digiti valde inæquis. Lamellæ caudales latitudine duplo longiores, non divaricatæ, setis quinque, totis brevibus, unâ brevissimâ ad apicem internum insitâ. — *Maris*: Corpus ovato-lanceolatum, 10-articulatum, segmento antico vix oblongo, tribus penultimis lunatis et latera subacutis aut obtusis. Conspicilla subremota, inferiora, et fronte remota. Splendidè opalina. *Long.*  $\frac{1}{7}$ "'. — *Femina*: Corpus ovato-lanceolatum, abdomine (articulo primo brevissimo excluso) vix angustiore. Cephalothorax 4-articulatus, segmento antico fere duplice, aliis inter sese similibus, latere obtusis. Conspicilla remotiuscula, fronte insita. Abdominis segmenta secundum tertium quartumque latè sublunata ea latere subacuta. — Vix diaphana. — *Long.*  $\frac{1}{16}$ "'.

*Hab.* in mari Atlantico, prope "Rio de Janeiro"; quoque lat. aust. 23°, long. occ. 41°.

14. SAPPHIRINA GEMMA. — Digitus antennarum posticarum carpo parce brevior, tenuis, articulis duabus digiti valde inæquis, unguiculo brevi. Lamellæ caudales subellipticæ, latitudine duplo longiores, ad apicem internum minutè apiculato, setis quatuor, brevibus, duabus apicalibus, aliis externis. — *Femina*: Corpus gracillimum, elongatum. Cephalothorax 5-articulatus articulatione primâ fere obsoletâ, segmento antico parce oblongo, posticis inter sese similibus, sensim minoribus. Abdomen valde angustius, 6-articulatum, segmentis primo secundoque subæquis, sequentibus vix lunatis. Conspicilla remotiuscula, inferiora, prope frontem insita. — *Maris*: Corpus oblongo-subellipticum 10-articulatum, segmento antico paulo transverso, posticis ad latis non acutis. Conspicilla remotiuscula, inferiora et fronte remota. — Color *maris* opalinus et flammeus; *femina* nullus, sacculorum pallidè cyaneus.

*Long.*  $\frac{1}{8}$ "'. — *Hab.* in mari Australis, ad syrtas "Lagullas." — An *Sapphirina indicatori* pertinet?

15. SAPPHIRINA BELLA. — Digitus antennarum posticarum tenuis, fermè carpi longitudine, articulis digiti fere æquis, unguiculo parvulo. Lamellæ caudales divaricatæ, angustæ, lanceolatæ, setis quatuor, duabus apicalibus, aliis externis, totis perbrevibus. — *Maris*: Corpus ovatum, 9-articulatum, segmento ultimo tecto, antico parce oblongo, ad latus totis obtusis. Conspicilla parvula, remotiuscula, inferiora, prope frontem insita. — Splendidè versicolor.

*Long.*  $\frac{1}{15}$ "'. — *Hab.* in mari Pacifico, prope insulas "Kingsmill."

16. SAPPHIRINA OPALINA. — Digitus antennarum posticarum tenuis, carpo fere longior, unguiculo brevi. Lamellæ caudales suborbiculatæ, apice interno producto, acuto, setis dimidio lamellæ vix longioribus. — *Maris*: Corpus ovatum, 10-articulatum, articulatione primâ fere obsoletâ, segmento postico tecto, quatuor penultimis latere ad angulos posticos acutis. Conspicilla remotiuscula, fronte insita. — Splendide opalina.

*Long.*  $\frac{1}{8}$ " — *Hab.* in mari Atlantico, lat. bor.  $1^{\circ} - 0^{\circ}$ , long. occ.  $17^{\circ} - 18^{\circ}$ ; quoque lat. aust.  $4^{\circ} 30'$ , long. occ.  $25^{\circ}$ .

17. SAPPHIRINA VERSICOLOR. — Digitus antennarum posticarum tenuis, carpo vix longior, unguiculo longiusculo (dimidium digiti longitudine fere æquante). Lamellæ caudales latæ, latitudine breviores, apice interno producto et acuto, setis quatuor, brevissimis. — *Maris*: Corpus ovatum, 10-articulatum, segmento antico transverso, semicirculari, aliis longitudine subæquis, quatuor penultimis ad latera minutè acutis. Conspicilla remotiuscula, fronte insita. — Opalina. — *S. opalinæ* affinis.

*Long.*  $\frac{1}{10}$ " — *Hab.* in mari Atlantico, prope "Rio de Janeiro," lat. aust.  $24^{\circ}$ , long. occ.  $43^{\circ}$ .

18. SAPPHIRINA TENELLA. — Digitus antennarum posticarum tenuis, carpo longior, unguiculo parvulo. Lamellæ caudales latitudine duplo longiores, setis dimidio lamellæ valde breviores, unâ ad apicem internum fere obsoletâ. — *Feminæ*: Cephalothorax ovatus, 5-articulatus, articulatione primâ fere obsoletâ, segmento antico non transverso, posticis inter sese similibus, angulo postico subacuto. Abdomen angustum, 6-articulatum, segmento primo brevissimo, secundo latere obtuso, tribus sequentibus lunatis. Conspicilla remotiuscula, fronte insita. — *Maris*: Corpus longe ovatum, 10-articulatum, posticè segmentis sensim minoribus, segmento antico semicirculari, lateribus obtusis. Conspicilla remotiuscula, fronte insita. — *Maris* corpus diaphanum, pulchrè versicolor; *feminæ* subdiaphanum, non coloratum.

*Long.*  $\frac{1}{12}$ " —  $\frac{1}{15}$ ". — *Hab.* in mari Atlantico, lat. aust.  $20^{\circ} - 23^{\circ}$ , long. occ.  $38^{\circ} 45' - 41^{\circ}$ ; quoque lat. aust.  $4\frac{1}{2}^{\circ}$ , long. occ.  $25^{\circ}$ ; quoque lat. aust.  $24^{\circ}$ , long. occ.  $43^{\circ}$ . — An *S. fulgenti* (M. Edwardsii) pertinet?

19. SAPPHIRINA OBESA. — Lamellæ caudales latæ, subellipticæ latitudine non duplo longiores, setis brevissimis, fere obsoletis, unâ ad apicem internum vix dispiciendâ. — *Feminæ*: Cephalothorax latè subovatus, convexus 5-articulatus, segmento antico transverso, ultimis duobus duplo brevioribus quam tertio, quarto ad angulos rotundato, quinto ad angulos subacuto. Abdomen 5-articulatum, segmento primo brevissi-

mo, tribus sequentibus lunatis. Conspicilla remotiuscula, fronte insita. — Brunnescens.

*Long.*  $\frac{1}{16}$ " — *Hab.* in mari Pacifico, prope insulas "Kingsmill."

20. SAPPHIRINA OBTUSA. — Lamellæ caudales elongatæ, non divaricatæ, setis dimidio lamellæ valde brevioribus. — *Femina*: Cephalothorax convexus, 4-articulatus, ad frontem subtruncatus, segmento antico oblongo, lateribus fere parallelis, angulis posticis rotundatis, segmentis aliis dissimilibus, secundo ad latus truncato, tertio rotundato, quarto (vel ultimo) medium ad latus angulato. Abdomen angustum, 5-articulatum, segmento primo parvulo, tribus sequentibus sublunatis. — Rubescens.

*Long.*  $\frac{1}{15}$ " — *Hab.* in mari Pacifico, lat. aust. 43°, long. occ. 78° 45'.

#### Familia V. MIRACIDÆ.

*Oculi* duo conspicillis maximis constructi. *Antennæ posticæ* ad apicem setigeræ. *Pedes mandibulares maxillaresque* brevissimi. *Abdomen* feminae (an maris quoque?) 6-articulatum. *Sacculus ovigerus* unicus.

#### Genus MIRACIA.

*Corpus* elongatum, non depressum, ad frontem duas appendices falci-formes subtus gerens. *Antennæ anticæ* appendiculatæ, flexiles et non geniculantes. *Pedes antici* (ct. vii.) mediocres, uni-unguiculati; *pedes* duo sequentes biremes, lateraliter porrecti. *Pedes abdominis* longè setigeri. *Setæ caudales* elongatæ. — *Setellæ* affinis, sed conspicilla oculorum diversæ.

1. MIRACIA EFFERATA. — *Corpus* 10-articulatum, segmento antico valde latiore, aliis sensim attenuatis. Conspicilla fronte insita, maxima, valde prominentia, contigua. *Antennæ anticæ* mediocres, 7-articulatæ, articulis tertio quinto septimoque brevibus. *Styli caudales* oblongi, setis duplo longioribus. — Cyanea.

*Long.*  $\frac{1}{16}$ " — *Hab.* in mari Atlantico, lat. bor. 4° - 7°, long. occ. 20° - 21° 30'; quoque lat. aust. 4° 30', long. occ. 25°.

2. MIRACIA GRACILIS. — *Corpus* gracile, sensim posticè attenuatum, 10-articulatum, segmento antico non latiore. Conspicilla maxima, paulo prominentia, fronte insita. *Antennæ anticæ* tenuissimæ, articulis secundo, quarto, duobusque ultimis brevibus. *Styli caudales* oblongi, setis quadruplo longioribus, fere corporis longitudine. — Cyanea et viridis.

*Long.*  $\frac{1}{16}$ " — *Hab.* in mari Pacifico, lat. aust. 32° 24', long. orient. 177°; quoque prope insulam "Sunday."



## Tribus 2. DAPHNIACEA (vel Cladocera).

*Corpus* testâ plerumque tectum, capite antennisque posticis sæpius exclusis. *Pedes* plures natatorii. *Antennæ anticæ* sæpe obsoletæ, raro elongatæ. *Oculus* compositus. [Membra tota cephalothoracis mandibularia, maxillaria, pediformiaque 12 - 16.]

Tribûs hujus familiæ sunt : —

1. PENILIDÆ. — *Pedes* duodecim. *Antennæ anticæ* obsolescentes.
2. DAPHNIDÆ. — *Pedes* decem. *Antennæ anticæ* sive obsoletæ sive uni-articulatæ.
3. BOSMINIDÆ. — *Pedes* decem. *Antennæ anticæ* elongatæ, multi-articulatæ.
4. POLYPHEMIDÆ. — *Pedes* octo. *Antennæ anticæ* obsolescentes.

## Familia I. PENILIDÆ.

## Genus PENILIA. (D.)

*Caput* discretum, longe rostratum. *Antennæ posticæ* grandes, ramis duobus 2-articulatis. *Abdomen* non inflexum, stylis duobus corneis confectum.

1. PENILIA AVIROSTRIS. — Testa dorso valde tumida, posticè latè bicuspidata et ad medium profundè excavata, marginibus infero posticoque per denticulos eleganter armata. *Setæ* appendicium abdominis dorsalium stylis caudalibus breviores.

*Long.*  $\frac{1}{20}$ " — *Hab.* in porto "Rio Janeiro." — *Lect.* die 24 Dec., 1838.

2. PENILIA ORIENTALIS. — Testa dorso tumida, posticè latè bicuspidata, ad medium paulo excavata, marginibus infero posticoque per denticulos eleganter armata. *Setæ* appendicium abdominis dorsalium stylis caudalibus fere duplo longiores.

*Long.*  $\frac{1}{16}$ " — *Hab.* prope fretum "Sunda." — *Lect.* die 5 Mar., 1842.

## Familia II. DAPHNIDÆ.

## Genus I. DAPHNIA.

*Abdomen* inflexum. *Antennæ anticæ* obsolescentes. *Antennæ posticæ* birameæ, ramis 3 - 4-articulatis. *Intestina* non convoluta.

1. DAPHNIA TEXTILIS. — Valde tumida, subglobosa, paulo oblonga,

post medium paulo latior, posticè breviter subtriangulata, obtusa. Caput breve, brevissimè acutèque rostratum, *supernè visum* breviter subtriangulatum, obtusum. Rami antennarum valde inæqui, tri-articulati. Testa reticulata areolis bene hexagonis.

*Hab.* in stagnis prope portum "Sandal wood" ad insulam "Vanua Lebu" in archipelago "Viti."

2. *DAPHNIA AUSTRALIENSIS*. — Valde tumida, paulo oblonga, capite per constrictionem vix discreto; post medium altior, posticè subtriangulata, obtusa, dorso postico subtilissimè denticulato. Caput breve, *supernè visum* triangulatum, obtusum. Rami antennarum posticarum subæqui, setis longiusculis. Testa reticulata, areolis longè angustissimèque linearibus, obliquis, prope marginem valde latioribus.

*Hab.* in stagnis prope urbem "Sydney" Novi-Hollandiæ.

3. *DAPHNIA MACRURA*. — Gracilis, elongata, testâ posticè aculeo-productâ, aculeo tenui, paulo brevior quam corpus. Caput grande, corpore non humilior, supra non discretum infra nec rostratum; fronte *latere visâ* rotundatâ, *supernè visâ* bene acutâ. Corpus ad margines dorsales infero-posticosque et aculeus subtilissimè denticulati.

*Hab.* in stagnis prope urbem "Sydney" Novi-Hollandiæ.

#### Genus II. SIDA.

*Abdomen* rectum. *Antennæ anticæ* fere obsoletæ. *Antennæ posticæ* birameæ, ramo uno 2-articulato. *Intestina* non convoluta.

*SIDA ANGUSTA*. — Angusto-oblonga, posticè parce altior et rotundato-truncata, capite valde discreto, fere oblongo, paulo humilior quam corpus, fronte obtusâ. *Abdomen* testâ fere omnino tectum. *Antennæ anticæ* fere corporis longitudine, ramis basi brevioribus, 2 et 3-articulatis, uno ramo setis paucis ciliato.

*Hab.* in stagnis ad insulam "Vanua Lebu."

#### Genus III. LYNCEUS.

*Abdomen* inflexum. *Intestina* convoluta. *Antennæ anticæ* fere obsoletæ. *Antennæ posticæ* parvæ.

*LYNCEUS LATIFRONS*. — Valde tumidus; *latere visus* rotundatus, capite indiscreto, brevissimo, rostrato, rostro gracili, acuto, ad corpus strictè appresso; *supernè visus*, fronte latissimè truncatâ parce angustiore quam corpus, latere postico breviter triangulato et obtuso.

*Hab.* in stagnis ad insulam "Vanua Lebu."

## Familia IV. POLYPHEMIDÆ.

Pedes octo. Oculus maximus.

## Genus POLYPHEMUS.

*Caput* discretum, magnum. *Antennæ* birameæ, validæ.

POLYPHEMUS BREVICAUDIS. — Testa posticè tumida rotundata. Caput oblongum (paulo brevius quam testa reliqua), conoideum, anticè latius et globulare. Rami antennarum subæqui 3-articulati, parce setigeri. Pedes crassi. Abdomen non inflexum, breve, crassum, parce exsertum, furcatum, ad apicem acutum.

*Long.*  $\frac{1}{30}$ " — *Hab.* in mari Atlantico, lat. aust. 41°, long. occ. 62°. — *Lect.* die 25 Jan., 1839.

## Tribus 3. CYPRIDACEA (vel Ostracoda).

*Corpus* testâ bivalvi omnino tectum, posticè incurvatum, capite antennisque nunquam exclusis. *Pedes* nulli biremes nec natatorii. *Oculi* vel simplices vel compositi. *Antennæ* quatuor. [Membra cephalothoracis mandibularia, maxillaria, pediformiaque numero decem.]

## Genus I. CYPRIS. (Müller.)

*Testa* integra, ad frontem nec perforata nec incisa. *Oculus* unicus. *Antennæ anticæ* setigeræ, subnatoriaræ. *Antennæ posticæ* subpediformes, setigeræ. *Pedes mandibulares* 3-5-articulati. *Maxillæ* quatuor, breves. *Pedes* quatuor, duo uncinis longi confecti, duo sequentes graciles, 4-5-articulati, ad ova pertinentes.

1. CYPRIS SPECIOSA. — Oblonga, subovata, anticè angustior, subtus fere recta, vix excavata, alioque bene arcuata, altitudine latior et plus duplo longior; ad marginem anticum pubescens, posticum breviter ciliata. Flava et lætè viridis, areis flavis paucis imperfectis viridi circumdatis.

*Hab.* in stagnis prope urbem "Rio de Janeiro." — *Lect.* Dec., 1838.

2. CYPRIS ALBIDA. — *Latere visa*, breviter subelliptica, extremitates fere æqua, latè rotundata, subtus recta, supra obsoletè gibbosa; triplo longior quam latitudo, non duplo longior quam altitudo, margine pubescente. Oculus margine superno remotus. Albido-margaritacea, posticè et supernè paulo brunnea.

*Long.*  $\frac{1}{24}$ " — *Hab.* in stagnis prope "Valparaiso."

3. CYPRIS CHILENSIS. — *Latere visa*, subovata, post medium parce altior, subtus paululo arcuata, dorsum vix gibbosa, triplo longior quam latitudo, duplo longior quam altitudo, marginibus antico infero posticoque pubescentibus. Antennæ anticæ 7-articulatæ, setis dimidio corporis vix longioribus.

Long.  $\frac{1}{16}$ ". — *Hab.* in stagnis prope "Valparaiso."

4. CYPRIS PUBESCENS. — Brevis; *latere visa*, latissimè fabiformis, subtus recta, extremitatibus latè et æque rotundatis, dorso bene arcuato; *supernè visa*, latè ovata, fronte subacuta; ad totam superficiem pubescens. Antennæ anticæ 7-articulatæ, setis vix longioribus quam 5 articuli ultimi simul sumti. Antennæ posticæ crassiusculæ, articulo ultimo fere dimidii penultimi longitudine, setam longam ad apicem gerente, penultimo ad apicem longè setigero. — Pallidè olivacea.

*Hab.* in stagnis prope urbem "Sydney" Novi-Hollandiæ.

5. CYPRIS VITIENSIS. — Longè subfabiformis; *latere visa*, altitudine plus duplo longior, subtus recta, dorsum arcuata, ante medium paulo altior, extremitate anticâ latius rotundatâ; *supernè visa*, subelliptica, ante medium vix latior, anticè subacuta, posticè rotundata, latitudine duplo longior; ad totam superficiem pubescens. Antennæ anticæ 7-articulatæ, articulis quinque ultimis inter sese longitudine fere æquis, setis antennâ brevioribus.

Long.  $\frac{1}{40}$ ". — *Hab.* in stagnis prope portum "Nailoa," ad insulam "Vanua Lebu," in archipelago "Viti."

## Genus II. CYPRIDINA. (*Milne Edwards.*)

*Testa* breviter rostrata corpus omnino tegens, et clausa. *Oculi* duo compositi, remoti. *Antennæ anticæ* setis paucis inæquis ad apicem instructæ, setis rectis, sæpe divaricantibus, vix natatoriis. *Antennæ posticæ* 5-7 articulis brevissimis longè et plumosè setigeris confectæ. *Pedes mandibulares* 5-articulati, digitiformes, apicem unguiculati. *Maxillæ* sex, breves, breviter setigeræ, paris secundi laminam ciliatam ad basin gerentes, setis longis, plumosis. *Pedes* duo, longissimè vermiformes, omnino flexiles, ad ova pertinentes, ad apicem setis spinulosis partim reversis armati. *Abdomen* spinulis biseriatis confectum.

1. CYPRIDINA LUTEOLA. — Compresso-ovoidea; *latere visa*, latè elliptica, anticè breviter rostrata, fronte non prominulâ, marginibus aliis arcuatis, posticè non gibboso; *supernè visa*, angusto-ovata, anticè acuta,

posticè rotundata. Digitus pedis mandibularis ad basin crassus, sensim attenuatus. Antennæ anticæ ad apicem 4-5-setigeræ, setis antennâ non longioribus. — Luteola.

*Long.*  $\frac{1}{12}$ " — *Hab.* in mari "Sulu."

2. CYPRIDINA PUNCTATA. — Compresso-ovoidea, punctata; *latere visa*, latè ovalis, posticè gibbosa, infra supraque æquè arcuata, anticè breviter rostrata, fronte prominulâ, rostro gracili, acuminato; *supernè visa*, angusto-elliptica, extremitatibus rotundatis. Spinulæ caudales decem.

*Hab.* in mari "Sulu."

3. CYPRIDINA OLIVACEA. — Subovoidea; *latere visa*, oblongo-subelliptica, dorsum parçè arcuata, posticè truncata et sparsim ciliata, anticè rostrata, rostro ad apicem rectangulato, fronte prominente; *supernè visa*, longè ovata, anticè obtusa, posticè subtruncata. Antennæ anticæ setis corpore longioribus ad apicem instructæ. Spinulæ caudales octo. — Olivacea.

*Long.*  $\frac{1}{10}$ " — *Hab.* in mari "Sulu."

4. CYPRIDINA GIBBOSA. — *Latere visa*, angusto-subovata, infra supraque arcuata, posticè valde gibbosa, anticè breviter rostrata, rostro acuto, fronte prominulâ. Antennæ anticæ tribus setis longis aliisque brevioribus ad apicem instructæ, setis antennâ paulo brevioribus. Spinulæ caudales sexdecim. — Fere incolorata. Phosphorescens.

*Long.*  $\frac{1}{20}$ " — *Hab.* in mari Pacifico, lat. aust.  $15^{\circ} 20'$ , long. occ.  $148^{\circ}$ . — Lect. die 10 Sept., 1839.

5. CYPRIDINA FORMOSA. — Compresso-ovoidea; *latere visa*, breviter elliptica, infra supraque valde arcuata, margine postico interrupto, non gibboso; *supernè visa*, angusto-elliptica, extremitatibus obtusis. Antennæ anticæ longè setigeræ, setis antennâ parçè longioribus. Pedes mandibulares digitum tenues. Spinulæ caudales decem. — Pallidè purpurea et maculis lætè purpureis notata.

*Long.*  $\frac{1}{10}$ " — *Hab.* in mari Pacifico, prope insulam "Upolu." — Lect. die 26 Feb., 1841.

### Genus III. CONCHÆCIA. (*Dana.*)

*Testa* interdum breviter rostrata, corpus omnino tegens, fronte apertâ.

*Oculi* simplices. *Antennæ anticæ* 3-4-articulatæ, apicem longè setigeræ. *Spiculum* inter antennas sarcosum, simplex, exsertile. *Antennæ posticæ* 5-7-articulatæ, articulis brevissimis longè setigeris connectæ, ramo altero brevi. *Pedes mandibulares* fermè 5-articulati,

non unguiculati, apice interno articuli primi sæpius etiam basi interno secundi simul corneis (instar mandibulæ) et denticulatis. *Maxilla* quatuor. *Pedes* quatuor, tenues. *Abdomen* spinulis biseriatis confectum.

1. CONCHÆCIA AGILIS. — *Supernè visa*, longè ovata, anticè rotundata, posticè acuta; *latere visa*, oblonga, subrectangulata, anticè paulo altior, frontem instar rostri paulo producta, posticè rectè truncata angulo superno acutè rectangulato. Spiculum sagitto-capitatum. Antennæ anticæ 3-articulatæ, setis rectis ad apicem curvatis, unâ crassiore et prope apicem subtilissimè denticulatâ. Pedes mandibulares 5-articulati, articulo secundo valde oblongo, recto, sequentibus sensim attenuatis. — Viridescens.

*Long.*  $\frac{1}{26}$ "'. — *Hab.* in mari Atlantico, lat. bor.  $0^{\circ} - 4^{\circ}$ , long. occ.  $17^{\circ} 30' - 20^{\circ} 10'$ ; lat. aust.  $0^{\circ} - 6^{\circ}$ , long. occ.  $17^{\circ} 30' - 24^{\circ}$ . — Lect. diebus 25, 26, 27, 29 Oct., et 2, 3, 5, 8 Nov., 1838.

2. CONCHÆCIA ROSTRATA. — *C. agili* similis. — Pedes mandibulares sensim non attenuati, articulis duobus apicalibus fere æquis, vix oblongis, setis longis. Pedes penultimi ultimis duplo longiores longèque setigeri.

*Hab.* in mari Pacifico, prope insulas "Kingsmill."

3. CONCHÆCIA BREVIROSTRIS. — *Supernè visa*, brevissimè elliptica, extremitatibus subacutis; *latere visa* literæ  $\ominus$  formam similis, dorsam fere recta, posticè rotundata, fronte prominulâ, et truncatâ. Antennæ anticæ setis inæquis, setâ longiore curvatâ prope apicem incrassatâ, nudâ. Spiculum capite cylindrico. Antennæ posticæ 7-articulatæ, articulo secundo non duplo longiore quam sequentes simul sumti. — Albida. Testa lineis parallelis subtilissimè notata.

*Long.*  $\frac{1}{16}$ "'. — *Hab.* in mari Atlantico, lat. aust.  $23^{\circ}$ , long. occ.  $41^{\circ} 10'$ . — Lect. die 19 Nov., 1838.

4. CONCHÆCIA INFLATA. — *Supernè visa*, brevissimè ovata, frontem rotundata, posticè subacuta; *latere visa* subrotundata, dorsum fere recta, literæ  $\ominus$  formam similis, angulis rotundatis, fronte obsolete prominulâ. Spiculum cylindricum. Antennæ anticæ 3-articulatæ, setis longis, unâ subclavatâ, nudâ. Antennæ posticæ 7-articulatæ, articulo secundo plus duplo longiore quam 5 ultimi simul sumti. Pedes mandibulares 5-articulati, articulo secundo brevi, non longiore quam tertius, basi longè et crassè producto, primo ad apicem pariter producto, his processibus duobus corneis denticulatis instar mandibulæ.

*Long.*  $\frac{1}{15}$ " — *Hab.* in mari Atlantico, lat. aust.  $1^{\circ}$ , long. occ.  $18^{\circ}$ ; et lat. aust.  $11^{\circ}$ , long. occ.  $12^{\circ}$ . — *Lect.* die 5 Nov., 1838, et die 6 Maii, 1842.

## SUBORDO 2. CORMOSTOMATA.

*Os* rostriformis. — Tribus quatuor sequentes : —

- I. MONSTRILLACEA. — Corpus elongatum (Cyclopi simile). Maxillæ pedesque antici obsoleti. Pedes postici octo natatorii.
- II. CALIGACEA. — Corpus sæpius depressum. Maxillæ pedesque toti numero 12 – 14, octo pedes ultimi plerumque natatorii, plurimi testâ tecti.
- III. LERNÆACEA. — Corpus depressum aut vermiforme. Antennæ pedesque partim obsoleti.
- IV. NYMPHACEA. — Corpus breve, araneiforme, abdomine obsolescente.

### Tribus I. MONSTRILLACEA.

Genus MONSTRILLA. (*Dana.*)

*Cephalothorax* fere cylindricus, 4-articulatus. *Abdomen* 5 – 6-articulatum. *Antennæ* duæ. *Oculi* duo simplices; quoque oculus inferior sicut *Pontellis*. *Truncus buccalis* parvulus subconicus, maxillis pedibusve non munitus. *Pedes* octo, natatorii.

MONSTRILLA VIRIDIS. — Gracilis, posticè attenuata. *Oculi* remoti. *Antennæ* 5-articulatæ, setis antennâ brevioribus. *Abdomen* 5-articulatum, segmento secundo brevior quam primus vel secundus. *Styli* caudales oblongi, parvi, divaricati, setis 5 subæquis, diffusis. — Lætè graminea.

*Long.*  $\frac{1}{5}$ " — *Hab.* in mari "Sulu." — *Lect.* die 3 Feb., 1842.

### Tribus 2. CALIGACEA.

Familiæ quinque sequentes : —

1. ARGULIDÆ. — Corpus anticè latè peltatum. Ovarium externum nullum. Pedes antici largè tubulati, suctatorii.
2. CALIGIDÆ. — Corpus anticè latè peltatum. Ovarium externum tubiforme, rectum, ovis uniseriatis. Pedes quatuor antici subprehensiles. *Antennæ* posticæ carapace tectæ.

3. DICHELESTIDÆ. — Corpus depressum, valde angustum. Antennæ posticæ carapace non tectæ. Ovarium externum tubiforme, ovis uniseriatis.

4. ERGASILIDÆ. — *Corycæis* affines. Corpus vix depressum, plus minusve Cyclopiforme. Antennæ posticæ carapace non tectæ. Ovarium externum elongatum aut sacculiforme, ovis non uniseriatis.

5. NICOTHOIDÆ. — Corpus plerumque Cyclopiforme, sed e lateribus longissimè alatum. Ovarium externum sacculiforme, ovis non uniseriatis.

## Familia II. CALIGIDÆ.

Subfamilia Caligidarum nobis sunt : —

1. CALIGINÆ. — Truncus buccalis subovatus, obtusus. *Maxilla* trunco remotiusculæ, posticè aculeo-elongatæ. *Tubum* ovigerum externum rectum. Corpus anticè latius. (Genera sunt *Caligus*, *Lepeophtheirus*, *Chalimus*, *Caligeria*, *Calistes*.)

2. PANDARINÆ. — Truncus buccalis tenuis acuminatus. Maxillæ ad truncum appressæ, parvulæ, lamellatæ. *Tubum* ovigerum externum rectum. Corpus posticè interdum latius. (Genera sunt *Pandarus*, *Trebius*, *Nogagus*, *Specilligus*, *Dinematura*, *Phyllophora*, *Euryphora*, *Lepidopus*.)

3. CECROPINÆ. — Truncus buccalis tenuis, acuminatus. Maxillæ ad truncum appressæ. *Tubum* ovigerum externum sub testam convolutum. Corpus posticè latius. (Genera sunt *Cecrops*, *Læmargus*.)

Caligaceorum segmenta corporis auctoribus sæpe malè data. Segmentum abdominis anticum, ovarium externum gestans, thoracis posticum sæpe vocatum.\* In Cyclopais Caligaceisque ovarium externum ad segmentum secundum abdominis normalem semper pertinet. Si hæc animalia Cyclopais Crustaceisque aliis comparentur, affinitates veras educemus. Tabula sequens, membris ordine enumeratis, hæc comparisonem exhibet.

\* Vide *Hist. Nat. des Crustaces*, par M. Milne Edwards, III. 445 et seq.



SEGMENTA.*	ASTACUS.	LUCIFER.	CYCLOPS.	PONTELLA.	CALIGUS.	PENILIA.	DAPHNIA.	CYPRIS.
<b>1. Cephalothoracis.</b>								
I.	Oculi	Oculi	00	00	00	00	00	00
II.	Ant. I.	Ant. I.	Ant. I.	Ant. I.	Ant. I.	Ant. I.	Ant. I.	Ant. I.
III.	Ant. II.	Ant. II.	Ant. II.	Ant. II.	Ant. II.	Ant. II.	Ant. II.	Ant. II.
IV.	Mand.	Mand.	Mand.	Mand.	Mand.	Mand.	Mand.	Mand.
V.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.
VI.	Max.	Max.	Maxd.	Maxd.	P. verg.	P. nat.	P. nat.	Maxd.
VII.	Maxd.	Maxd.	P. preh.	P. preh.	P. preh.	P. nat.	P. nat.	P. nat.
VIII.	Maxd.	Maxd.	P. nat.	P. nat.	P. nat.	P. nat.	P. nat.	P. nat.
IX.	Maxd.	P. subnat.	P. nat.	P. nat.	P. nat.	P. nat.	P. nat.	P. nat.
X.	P. chel.	P. subnat.	P. nat.	P. nat.	P. nat.	P. nat.	P. nat.	P. nat.
XI.	P. verg.	P. subnat.	P. nat.	P. nat.	P. nat.	P. nat.	P. nat.	P. nat.
XII.	P. verg.	P. subnat.	0 vel 00	P. gent.	00	00	00	00
XIII.	P. verg.	0	00	00	00	00	00	00
XIV.	P. verg.	0	00	00	00	00	00	00
<b>2. Abdominis.</b>								
I.	P. rud.	P. rud.	0 vel P. rud.	0 vel 00	0 vel 00	P. rud.	0 vel P. rud.	0 vel 00
II.	P. rud.	P. rud.	0	0	0	0	0	0
III.	P. rud.	P. rud.	0	0	0	0	0	0
IV.	P. rud.	P. rud.	0	0	0	0	0	0
V.	P. rud.	P. rud.	0	0	0	0	0	0
VI.	App. caud.	App. caud.	App. caud.	App. caud.	App. caud.	App. caud.	App. caud.	App. caud.
VII.	0	0	00	00	00	00	00	00

\* Hæc tabula abbreviaciones sequentes continet : —

<i>Ant.</i>	Antennæ.	<i>P.</i>	Pedes.	<i>Preh.</i>	Prehensiles.
<i>Mand.</i>	Mandibulæ.	<i>Chel.</i>	Cheliformes.	<i>Ovar.</i>	Ovariani vel ovarium.
<i>Max.</i>	Maxillæ.	<i>Verg.</i>	Vergiformes.	<i>Rud.</i>	Rudimentarii.
<i>Maxd.</i>	Maxillipedes.	<i>Nat.</i>	Natororii.	<i>Caud.</i>	Caudales.

Segmenti membra obsoleta, 0 significat ; segmentum membraque ambo simul obsoleta, 00.

Subfamilia 1. CALIGINÆ.

Genus I. CALIGUS.

*Cephalothorax* 2-articulatus ; segmento antico latè peltato, fronte discis duobus suctatoriis plerumque instructâ ; postico parvulo, non alato. *Oculi* simplices pigmento unico conjuncti. *Antennæ posticæ* prehensiles, et extus basin sæpius spinâ crassâ munitæ. *Pedes* duo antici

vergiformes, bifidi; \* duo proximi sequentes subprehensiles digito acuto confecti; sex sequentes natatorii; duo reliqui simplices, vergiformes. Venter furculâ parvulâ armatus. *Abdomen* 2-3-articulatum, appendicibus caudalibus sublamellatis, marginem setigeris. [Sexus, antennas posticas, pedes paris secundi, et formam abdominis, valde dissimiles.]

1. CALIGUS THYMNI. — Carapax oblongus, discis suclatoriiis subfrontem munitus. *Abdomen* 3-articulatum, segmento primo ad basin lato, sequentibus duplo latiore; ano valde prominente. Styli caudales parvuli, ad angulos abdominis posticos insiti, anum vix superantes. Antennæ posticæ spinâ extus basin non munitæ. Furcula simplex, brachiis divergentibus, subacutis. — *Femina*: *Abdominis* segmentum primum oblongum, lateribus rectis et posticè parce divergentibus, angulis posticis prominentibus; segmentis duobus sequentibus simul sumtis elongatis, et fere longioribus. — *Maris*: *Abdominis* segmentum primum subquadratum, angulis posticis vix prominentibus, segmentis sequentibus simul sumtis brevioribus.

*Long.*  $\frac{3}{8}$ " — *Hab.* in corpus *Thymni pelamys* mari Atlantico, lat. bor. 27°, long. occ. 19° 30'. — Lect. die 27 Sept., 1838.

2. CALIGUS PRODUCTUS. — *Femina*: Carapax ovatus, discis suclatoriiis subfrontem munitus. Segmentum secundum angustum. *Abdomen* 3-articulatum, segmento primo ad basin perangusto; ano non prominulo. Styli caudales parce oblongi, terminales. Antennæ posticæ ad basin posticè acutæ et extus basin spinâ munitæ. Furcula simplex, brachiis parce divergentibus, tenuibus, acutis. — Segmentum abdominis anticum oblongum, subellipticum, angulis posticis longè crassèque productis, sequentibus angustis, fere lineatis.

*Long.*  $\frac{1}{4}$ " — *Hab.* intus operculum *Thymni pelamys*, in mari Atlantico, lat. bor. 27°, long. occ. 19° 30'. — Lect. die 27 Sept., 1838.

3. CALIGUS GRACILIS. — *Femina*: Carapax oblongus, fere ellipticus, discis suclatoriiis rotundatis. Segmentum secundum transversum, brevissimum. *Abdomen* 2-articulatum, segmento antico fere quadrato, postico angustiore, parce oblongo, posticè truncato. Styli caudales terminales, paulo oblongi. Furcula ventralis simplex, brachiis divergentibus, truncatis. Antennæ posticæ spinâ oblongâ extus basin munitæ.

*Long.*  $\frac{1}{6}$ " — *Hab.* in corpus Serrani, in mari juxta "Rio de Janeiro."

\* Extremitas bifida articulo tertio et apice secundi elongato composita.

4. CALIGUS (LEPEOPHTHEIRUS) BAGRI. — Carapax subrotundatus, discis suclatoriiis non munitus : segmentum secundum fere oblongum. Abdomen 3-articulatum, segmento primo valde latiore ; segmentis duobus posticis simul sumtis oblongis, ano prominente. Styli caudales parvuli ad angulos abdominis posticos insiti, anum vix superantes. Antennæ posticæ spinâ extus basin non munitæ. Furcula simplex, brachiis divergentibus, subacutis. — *Feminæ* : Abdominis segmentum primum valde oblongum, posticè truncatum, anticè angustius, lateribus parallelis. — *Maris* : Segmentum abdominis primum latum, paulo oblongum, subhexagonum. Pedes paris secundi crassissimi, digito acuto setâque internâ armato, margine manûs interno fere recto, pollice nullo.

*Long.*  $\frac{1}{4}$ " — *Hab.* in corpus et intus opercula Bagri, juxta " Rio de Janeiro." — *Lect.* Nov., 1838.

Genus II. CALISTES. (*Dana.*)

*Caligo* similis. *Cephalothorax* 2-articulatus, segmento postico non alato. *Pedes duo postici* biramei, subnatatorii.

*Trebio* affinis, ced cephalothorax non 3-articulatus et maxillæ nec lamellares, nec ad truncum buccalem appressæ.

CALISTES TRIGONIS. — *Feminæ* : Cephalothorax subrotundatus, discis suclatoriiis nullis. Segmentum secundum parvum, lateribus rotundatis. Abdomen 3-articulatum, segmento primo lato, sequentibus lineatis, ano vix prominente. Styli caudales styliformes, oblongi. Antennæ posticæ spinâ corneâ longâ extus basin munitæ. Furcula simplex, brachiis parallelis. Maxillæ posticè aculeo-furcatæ. Pedes postici natatorii, ramis 3-articulatis, parce subæquis, setis longis. — Segmentum abdominis primum subquadratum, angulis rotundatis, duobus sequentibus fere æquis et simul sumtis non brevioribus quam primum, lineatis.

*Long.*  $\frac{1}{4}$ " — *Hab.* in corpus speciei Trigonis. — *Lect.* juxta " Rio de Janeiro," Dec., 1838.

Genus III. CALIGERIA. (*Dana.*)

*Caligo* similis. *Cephalothorax* 2-articulatus, segmento postico bialato. *Pedes duo postici* biramei, setis brevibus, non natatoriiis.

CALIGERIA BELLA. — *Feminæ* : Cephalothorax rotundatus, discis suclatoriiis nullis. Segmentum secundum transversum, angulos posticos alatum, alis latis, approximatis, margine toto arcuato. Abdomen 3-

articulatum, segmento primo lato, tertio posticè truncato, lamellis caudalibus latis, paulo oblongis, contiguis, setis lamellâ brevioribus, fere æquis. Furcula simplex, tenuis, basi angustissimo, brachiis divergentibus. Pedes postici ténues, ramis valde inæquis, ramo breviorè 2-articulato, altero 3-articulato. — Segmentum abdominis primum paulo oblongum, subellipticum, angulis posticis rotundatis, segmentis sequentibus dimidio angustioribus, non oblongis, subæquis.

*Hab.* in branchias speciei Thynni, in mari Atlantico, lat. aust. 11°, long. occ. 14°. — Lect. die 7 Maii, 1842.

## Subfamilia 2. PANDARINÆ.

### Genus I. NOGAGUS. (*Leach.*)

*Cephalothorax* 4-articulatus, fronte arcuatâ, segmento secundo ad latera posticè producto, duobus sequentibus non alatis. *Abdomen* stylis brevibus sublamellatis setigerisque confectum. *Oculi* simplices, remotiusculi; (an quoque oculus subtilissimus intermedius?). *Pedes* paris secundi crassè cheliformes; pedes natatorii octo, grandes.

NOGAGUS VALIDUS. — *Femina?* Carapax paulo oblongus, ellipticus, segmento secundo ad latera posticè producto, segmentis duobus sequentibus transversis. Pedes secundi paris crassissimè cheliformes, pollice brevi, truncato, digito obtuso. Abdomen 2-articulatum, segmento antico subquadrato, angulis posticis prominulis; segmento postico brevì, transverso, angulis posticis truncatis. Styli caudales latè lamellati, paulo oblongo, setis tribus plumosis.

*Hab.* in corpus Squali, mari Pacifico prope Novi-Zealandiam. — Lect. die 15 Ap., 1840.

### Genus II. SPECILLIGUS. (*Dana.*)

*Nogago* segmenta cephalothoracis pedesque affinis. *Oculi* duo remotiusculi, et *conspicillis grandibus instructi*, eisque Sapphirinæ similes.

SPECILLIGUS CURTICAUDUS. — *Femina?* Carapax oblongo-ellipticus, anticè arcuatus, discis suctatoriis post antennam anticam munitus. Segmentum secundum ad latera posticè productum, tertium quarto latius et dimidio carapacis parce latius. Pedes secundi paris crassissimè cheliformes, pollice brevi truncato, digito obtuso. Abdomen 2-articu-

latum, segmento antico paulo oblongo, angulis posticis truncatis et setam minutam gerentibus, segmento postico brevi, ano prominente; stylis parvulis, triangulatis, ad angulos insitis, anum non superantibus, setis tribus, plumosis.

*Hab.* in corpus Squali, mari Pacifico prope Novi-Zelandiam. — *Lect.* die 15 Ap., 1840.

Genus III. PANDARUS. (*Leach.*)

*Cephalothorax* 4-articulatus, carapace grandi, segmentis sequentibus transversis, secundo ad latera alate producto, tertio quartoque posticè alatis, et bilobatis. *Abdomen* 2-3-articulatum, segmento ultimo tecto, secundo posticè rotundato et utrinque stylis caudalibus sæpius munito. *Pedes* paris secundi crassè cheliformes; natatorii octo, setis brevissimis. *Oculi* duo, remotiusculi. *Styli caudales* styliiformes, acuti, subnudi.

1. PANDARUS CONCINNUS. — Carapax paulo oblongus, ellipticus, posticè truncatus et dentatus, angulis posticis paululo elongatis, obtusis. Segmentum secundum brevissimum, alis divaricatis, subrectangulatis, angulis posticis subacutis. Segmenta duo sequentia transversa, subæqua, lobis rotundatis acutè sejunctis. Abdomen 3-articulatum, segmento antico lato, postice profundè excavato, lateribus arcuatis, angulis posticis acutis, bene divaricatis. Styli caudales non tecti.

*Hab.* in corpus Squali, mari Pacifico juxta insulam "Tongatabu."

2. PANDARUS SATYRUS. — Carapax vix oblongus, posticè sensim latior, angulis posticis parce prominentibus, margine postico integro, antico obsolete denticulato. Segmentum secundum brevissimum, alis divaricatis, oblongo-ellipticis. Segmenta cephalothoracis sequentia transversa, primo minore, lobis rotundatis acutè sejunctis. Abdomen 3-articulatum, articulo antico grandi, posticè angusto-excavato, lateribus fere rectis, parce deinde subito angustioribus et angulis posticis internis acutis; segmento secundo dimidio vix angustiore, oblongo, obovato. Styli caudales non tecti.

*Long.* 5". — *Hab.* in corpus Squali, mari Pacifico juxta insulam "Tongatabu."

3. PANDARUS BREVICAUDUS. — Carapax vix oblongus, subellipticus, posticè valde excavatus, angulis posticis longè productis, obtusis. Segmenta sequentia tria transversa. Alæ segmenti secundi non divaricatæ, posticè obtusæ. Segmenta tertium quartumque abdomine non latiora,

marginè dorsali postico latè excavato. Segmentum abdominis anticum subquadratum, angulis posticis obliquè truncatis et setâ minutâ extus instructis, posticè angustum, subtruncatum; segmentum secundum parvulum, transversum stylis triplo longioribus.

*Long.*  $\frac{1}{4}$ " — *Hab.* in corpus Squali, mari Pacifico prope Novi-Zealandiam.

Genus IV. DINEMATURA. (*Latreille.*)

*Cephalothorax* 3-articulatus, segmento secundo parvo, testâ tertii dorsali posticè valde expansâ et profundè bilobatâ, eoque elytrideâ. *Abdomen* 2-articulatum, carapace paulo angustius, oblongus, segmento antico maximo, posticè bilobato, postico parvulo, celato. *Styli caudales* lamellati, terminales.

DINEMATURA BRACCATA. — Carapax fere rotundatus, abdomine latior, discis suclatoriiis post antennas munitus; posticè quadrilobatus, lobis duobus internis angustis, curvatis, subacutis. Segmentum secundum transversum, ad latus subacutum. Segmenti alæ tertii vix oblongæ, dimidii abdominis longitudine, posticè parce latiores, angulis rotundatis, margine postico fere recto. Segmentum abdominis primum profundè bilobatum, secundum quadratum. *Styli caudales* grandes, subovati, abdominis extremitatem paulo superantes, setis paucis brevissimis.

*Long.*  $\frac{1}{2}$ " — *Hab.* in corpus Squali, mari Pacifico juxta insulam "Tongatabu."

Genus V. LEPIDOPUS. (*Dana.*)

*Corpus* anticè non latius. *Cephalothorax* 3-articulatus, carapace minore quam abdomen, segmentis duobus sequentibus posticè largè bilateralis. *Abdomen* 2-articulatum, segmento postico parvulo, celato, antico maximo et posticè bilobato. *Antennæ posticæ* articulo tenui falciformi confectæ. *Pedes paris secundi superficie terminali latâ prehensili squamatâ instructi.* *Pedes natatorii* quatuor ultimi similes, latè lamellati.

LEPIDOPUS ARMATUS. — Corpus oblongum, posticè sensim latius. Carapax subquadratus, posticè paulo latior, margine postico vix arcuato. Segmenta duo sequentia subæqua, alis grandibus, fere rotundatis. Abdomen oblongum, carapace valde longius, posticè non angustius, paulo bilobatum, lobis rotundatis. *Antennæ posticæ* ad apicem longè falciformes et denticulis biseriatis armatæ, articulo penultimo subquadrato.

Pedes paris secundi grandes, articulo penultimo ad apicem spinigero, ultimo crassissimo, superficie terminali oblongâ, squamatâ, squamulis spinulâ armatis.

*Long.*  $\frac{1}{3}$ " — *Hab.* in corpus speciei Musteli (Squalorum familiæ). — *Lect.* ad urbem "Rio de Janeiro."

#### Tribus 4. NYMPHACEA.

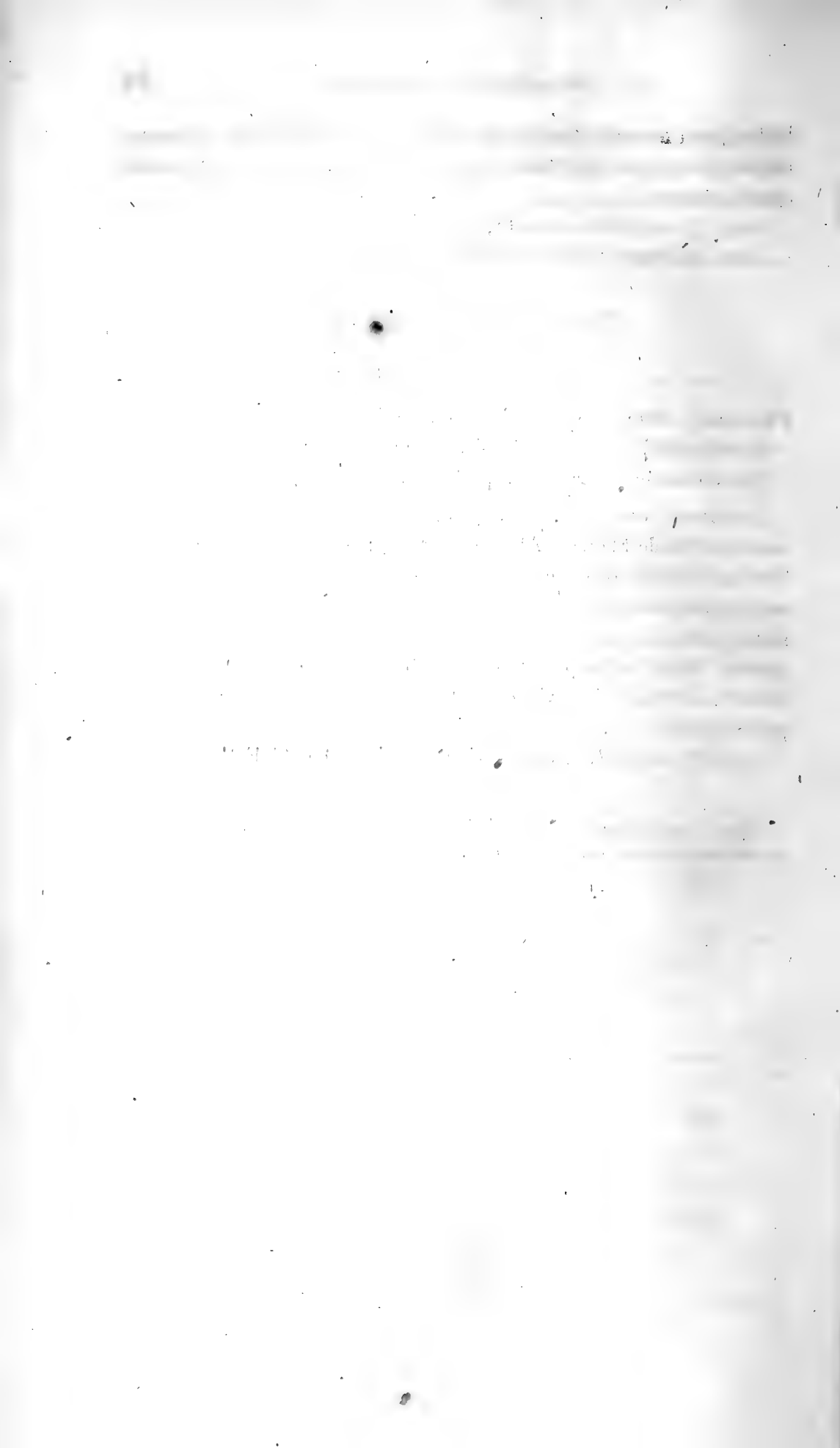
Genus ASTRIDIUM. (*Dana.*)

*Pycnogono* affinis. *Caput* duobus maxillipedibus subtus instructum parvulis, debilibus, apice obtusis, non prehensilibus. *Pedes* octo unguiculo confecti. *Abdomen* perbrevis.

ASTRIDIVM ORIENTALE. — Cephalothorax stellatus, segmentis medio connatis, deinde liberis. Abdomen breve, posticè angustius, obtusum. Truncus buccalis oblongus, subcylindricus, corpore vix brevior. Segmentum corporis primum anticè non transversum, posticè angustius et deinde utrinque longè productum instar rami brevis,\* et pedes anticos gerens. Maxillipedes parvuli, obsoletè 3-articulati, obtusi. Pedes crassiusculi, articulo primo vix oblongo, sequentibus sex subæquis, tertio paulo brevior.

*Long.*  $\frac{1}{8}$ " — *Hab.* in mari "Sulu." — *Lect.* die 11 Feb., 1842.

\* Hæc pars postica segmenti primi segmentum corporis secundum vere est, quamvis articulatione verâ non sejuncta.





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CONSPECTUS CRUSTACEORUM, ETC.

AMPHIPODA. No. I.

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*Conspectus Crustaceorum quæ in Orbis Terrarum circumnavigatione,*  
 CAROLO WILKES e Classe Reipublicæ Fœderatæ Duce, lexit et de-  
 scripsit JACOBUS D. DANA. Pars III.\*

Subtribus I. GAMMARACEA.

Familia I. ORCHESTIDÆ.

*Palpus mandibularis* obsoletus. *Corpus* compressum, epimeris latis.  
*Styli caudales* duo postici breviores.

Genus I. TALITRUS. (*Latreille.*)

*Pedes* primi styliformes, secundi vel non subcheliformes vel manu debilissimâ confecti. *Antennæ* primæ basi inferiorum breviores.

1. TALITRUS NOVI-ZEALANDIÆ. — Epimera grandia, nuda, spinulis minutis marginem armata. *Antennæ* 2dæ dimidii corporis longitudine, setis brevissimis, (latitudine antennæ duplo brevioribus); flagello vix longiore quam basis, articulis transversis. *Antennæ* 1mæ basi 2darum non duplo breviores. *Pedes* 1mi validiusculi, elongati; 2di paulo breviores, articulo ultimo obtuso, fere brevior quam penultimus, digito obsoleto(?). *Pedes* 10 postici densè setosi, 6 postici valde inæqui, 7mis duplo longioribus quam 5ti, articulo primo latissimo.

*Long.* 10''' — *Hab.* in portu "Bay of Islands" Novi-Zealandiæ.

2. TALITRUS GRACILIS. — Epimera grandia. *Antennæ* 2dæ dimidio corporis valde longiores, setis brevissimis (latitudine antennæ duplo brevioribus); flagello multo longiore quam basis, articulis paulo oblongis. *Antennæ* 1mæ basi secundarum triplo breviores. *Pedes* 1mi validiusculi, ungue parvulo, articulis 2do 3tio 4to 5to subæquis. *Pedes* 2di paulo breviores, articulo penultimo posticè triangulato; ultimo lamellato, fere nudo, apicem rotundato, margine antico parce excavato et versus apicem digitum minutum gerente. *Pedes* 3tii 4tis valde longiores. *Pedes* 6 postici paulo graciles, fasciculatim setulosi, articulo primo anguste elliptico; pedibus 7mis multo longioribus quam 5ti.

*Long.* 5''' — 6''' — *Hab.* in sabulis litoralibus insulæ freti "Balabac."

3. TALITRUS ORNATUS. — Segmenta corporis lævia. Epimera lata, per sulcos subtiles areolata. *Antennæ* 2dæ dimidio corporis paulo

\* Vide supra, p. 61.

breviores, flagello vix longiore quam basis, articulis parce oblongis, setis brevissimis. Antennæ 1mæ basi secundarum fere triplo breviores, 5-7-articulatæ. Pedes 1mi validiusculi, secundis multo longiores, ungue valido. Pedes 2di debiles, manu parvulâ subellipticâ, apice subacutâ, digito dorsali, minuto, apicem non attingente. Pedes sequentes subsetosi, 4ti 5ti subæqui, 7mi 6tis longiores, articulis primis pedum sex posticorum scalpturis.

*Long.* 6'''-9''' — *Hab.* in sabulis litoralibus prope "Valparaiso."

Genus II. TALITRONUS. (*Dana.*)

Pedes secundi manu valido prehensili confecti. Alias *Talitro* similis.

1. TALITRONUS INSCULPTUS. — Segmenta corporis glabra, lineis elevatis granulisve seriatis transversim notata. Epimera lata sparsim sculpto-granulosa. Antennæ 2dæ dimidio corporis non breviores, fere nudæ, articulo basis ultimo fere duplo longiore quam penultimus, flagello non longiore quam basis. Antennæ 1mæ dimidio basis 2darum breviores. Pedes 1mi subgraciles, ungue fere recto. Pedes 2di validi, manu latâ, subtriangulatâ, palmâ obliquâ rectiusculâ medium emarginatâ, digito perlongo (dimidio manus valde longiore). Pedes 3tii quartis longiores, 6ti 7mique subæqui.

*Long.* 9''' — *Hab.* in sabulis litoralibus prope "Valparaiso."

Genus III. ORCHESTIA. (*Leach.*)

*Pedes primi, secundique* subcheliformes, manu debili aut validâ confecti. *Antennæ primæ* basi secundarum breviores. *Maxillipedes* apicem obtusi.

1. ORCHESTIA SYLVICOLA. — Epimera sat angusta. Antennæ 2dæ tenues, dimidii corporis longitudine; flagello longiore quam basis, articulis oblongis, setis articulo parce brevioribus. Antennæ 1mæ basi 2darum dimidio breviores. Pedes 4 antichi debiles; 2di paulo grandiores, manu oblongâ, subellipticâ, antrorsum reflexâ, apicem rotundatâ, digito minuto, marginem inferiorem versus medium affixo. Pedes 4 sequentes subæqui, ungue parvulo. Pedes 6 ultimi paulo inæqui, setis brevibus, articulo primo 5torum oblongo, 7morum latissimo.

*Long.* 6'''-8''' — *Hab.* in cratere extincto "Taiamai" Novi-Zealandiæ.

2. ORCHESTIA TENUIS. — Epimera sat angusta. Antennæ 2dæ tenues, dimidii corporis longitudine; flagello tenuissimo, valde longiore

quam basis, articulis oblongis, cylindricis, setis articulo vix brevioribus. Antennæ 1mæ basi 2darum vix breviores. Pedes 4 antici debiles; primi minimi; secundi parvuli, manu minutâ, oblongâ, retrorsum inflexâ, extremitate dimidio truncatâ, apice postico producto et obtuso, digito minuto, non laterali. Pedes 4 sequentes parvuli, 4tis brevioribus. Pedes 6 postici valde inæqui, 7mis fere duplo longioribus quam 5ti; setis brevibus.

*Long.* 6''' — *Hab.* apud oras sinus "Bay of Islands" Novi-Zealandiæ.

3. ORCHESTIA RECTIMANUS. — Epimera sat lata, marginem minutè setulosa, quinta perangusta. Antennæ 2dæ dimidii corporis longitudine, setis minutis (latitudine articuli non longioribus); flagello parce longiore quam basis, articulis paulo oblongis, setis perbrevibus. Antennæ 1mæ, basi 2darum breviores. Pedes 4 antici debiles, 1mis subtilissimè unguiculatis; 2dis paulo longioribus, manu parvulâ rectâ, spatulatâ, apicem rotundatâ, digito minuto laterali prope apicem affixo. Pedes 4 sequentes subæqui. Pedes 6 ultimi non multo inæqui, setis perbrevibus, articulo primo latissimo, margine postico setuloso.

*Long.* 3''' — 4''' — *Hab.* in humidulis, insulæ Tahiti, ad altitudinem ped. 1500, mari remotis.

4. ORCHESTIA SPINIPALMA. — Epimera sat angusta, quintis parce angustioribus quam quarta. Antennæ 2dæ dimidii corporis longitudine, setis minutissimis; flagello basin longitudine æquante, articulis plerumque paulo oblongis. Antennæ 1mæ minutæ, basi secundarum quadruplo breviores. Pedes 1mi parvuli, debiles, manu oblongâ, minutâ, breviorè quam articulus precedens, apicem rectè truncatâ. Pedes 2di validi, manu subovatâ, margine inferiore (palmâ) versus apicem parce excavato, spinulis armato, digito elongato, paulo breviorè quam manus. Pedes sequentes tenues; 4 proximis subæquis; 4 ultimis subæquis; setis perbrevibus.

*Long.* 6''' — *Hab.* apud oras insulæ "Tongatabu."

5. ORCHESTIA SCUTIGERULA. — Epimera sat lata, quintis angustioribus quam quarta. Antennæ 2dæ breves, corpore triplò breviores; flagello moniliformi, parce longiore quam basis. Pedis 7mi articulus primus ellipticus et *laminam crassam grandem latè ellipticam posticè gerente*; setis perpaucis perbrevibus. Pedes 1mi parvuli, manu subtriangulatâ, apice transversâ. Pedes 2di validi, manu latâ, subtriangulatâ, anticè arcuatâ, palmâ obliquè transversâ, fere rectâ, angulo

infero acuto; digito longo. Pedes 4 sequentes sat longi, subæqui, 6 ultimi sensim increscentes.

*Long.* 9''' - 11''' . — *Hab.* ad oras sinus "Nassau," Fuegiæ, inter Algas rejectas.

6. ORCHESTIA NITIDA. — Epimera mediocria, quinta quartis minora. Antennæ 2dæ dimidio corporis breviores; flagello longiore quam basis, moniliformi. Antennæ 1mæ dimidio basis secundarum parce longiores. Pedes 1mi parvuli, manu subsecuriformi, apice truncato, latiore. Pedes 2di validi, manu subovatâ, palmâ rectâ dimidio manus longiore, digito longo (palmam longitudine æquante). Pedes 4 sequentes subæqui; reliqui breviusculi, sensim increscentes, articulo primo lato, margine subtilissimè serrulato.

*Long.* 4''' . — *Hab.* in mari prope oras sinus "Nassau," Fuegiæ, inter Algas natantes.

7. ORCHESTIA DISPAR. — Epimera mediocria, quinta valde angusta. Antennæ 2dæ vix dimidii corporis longitudine; flagello longiore quam basis, articulis vix oblongis, setis brevissimis. Antennæ 1mæ basi secundarum breviores. Pedes 1mi parvuli, manu apicem latiore, obliquè truncatâ et excavatâ. Pedes 2di validi, manu subobovatâ, obliquè truncatâ, palmâ paulo sinuosâ, pubescente. Pedes 3tii 4tis parce longiores; 7mi 6tis paulo breviores, *articulis tertio quartoque incrassatis, et valde compressis.*

*Long.* 6''' - 7''' . — *Hab.* ad oras Illawarræ, Australiæ.

8. ORCHESTIA QUADRIMANUS. — Epimera sat lata, 5ta 4tis minora. Antennæ 2dæ dimidio corporis paulo breviores, bene setulosæ; flagello parce longiore quam basis, articulis non oblongis, cylindricis. Antennæ 1mæ basi 2darum fere dimidio breviores. Pedes 1mi parvuli, manu fere triangulatâ, apicem truncatâ, paululo excavatâ. Pedes 2di validi, manu subquadratâ, paulo oblongâ, palmâ apicali, transversâ, paulo excavatâ. Pedes 3tii 4ti debiles subæqui; 5ti 6ti 7mi similes, valde inæqui (7mis duplo longioribus quam 5ti), sensim increscentes, breviter setosæ.

*Long.* 7''' . — *Hab.* ad oras Illawarræ, Australiæ Orientalis.

9. ORCHESTIA SERRULATA. — Epimera lata, quinta anticè quartis non angustiora. Antennæ 2dæ fermè dimidii corporis longitudine; flagello vix longiore quam basis, articulis non oblongis, setis fere obsoletis. Pedes 1mi parvuli, manu subtriangulatâ, paulo oblongâ, apicem latiore transversâ parce excavatâ. Pedes 2di validi, manu

grandi, subellipticâ, palmâ infero-subapicali, excavatâ, subtilissimè spinulosâ, angulo infero rotundato. Pedes 3<sup>ti</sup> 4<sup>ti</sup> tenues, subæqui; 5<sup>ti</sup> 6<sup>ti</sup> 7<sup>mi</sup> sensim increscentes, articulo primo latissimo, margine postico serrulato, antico 2-3 setis minutis armato.

*Long.* 9<sup>'''</sup> - 10<sup>'''</sup>. — *Hab.* ad oras insularum "Black Rocks" in sinu "Bay of Islands" Novi-Zelandiæ.

Genus IV. ALLORCHESTES. (*Dana.*)

*Pedes primi secundique* subcheliformes. *Antennæ primæ* breviores, basi secundarum longiores. *Maxillipedes* apicem unguiculati.

1. ALLORCHESTES COMPRESSA. — Epimera latissima, quarta maxima, quinta perangusta. Antennæ 2dæ crassiusculæ, basi fere quadruplo longiore quam flagellum. Antennæ 1mæ 2dis paulo breviores, flagello fere duplo longiore quam basis. Pedes 1<sup>mi</sup> parvuli, manu vix oblongâ, apicem obliquè truncatâ et paulo excavatâ. Pedes 2<sup>di</sup> validi, manu subovatâ, palmâ rectâ, fere nudâ, digito longo. Pedes 3<sup>ti</sup> 4<sup>ti</sup> longi, subæqui; sex sequentes paulo inæqui, breviusculi, sensim increscentes, articulo primo latissimo, setis sparsis, minutissimis.

*Long.* 7<sup>'''</sup> - 8<sup>'''</sup>. — *Hab.* ad oras Illawarræ, Australiæ Orientalis.

2. ALLORCHESTES VERTICILLATA. — Epimera sat angusta, quinta perangusta. Antennæ 2dæ 1<sup>mi</sup>s fere duplo longiores, plus dimidio corporis breviores, flagello fermè duplo longiore quam basis, 14-articulato, articulis parce oblongis, setis densè verticillatis, brevibus. Pedes 1<sup>mi</sup> parvuli, manu oblongâ, dorsum fere rectâ, infra versus apicem obliquâ. Pedes 2<sup>di</sup> validi, manu ovatâ, palmâ rectiusculâ, pubescente, digito longo. Pedes 3<sup>ti</sup> 4<sup>ti</sup> sat longi, subæqui; 5<sup>ti</sup> 6<sup>ti</sup> 7<sup>mi</sup> subæqui, 5<sup>tis</sup> paulo brevioribus, articulo primo lato, setis sparsis, brevibus.

*Long.* 4<sup>'''</sup>. — *Hab.* apud oras prope Valparaiso.

3. ALLORCHESTES HIRTIPALMA. — Epimera lata, quinta perangusta. Antennæ 2dæ corpore plus dimidio breviores; flagello plus duplo longiore quam basis, infra densè breviter villosa, articulis non oblongis. Antennæ 1mæ 2dis paulo breviores. Pedes 1<sup>mi</sup> parvuli, manu oblongâ, apicem oblique truncatâ. Pedes 2<sup>di</sup> validi, manu subovatâ, infra subtruncatâ et hirtâ, palmâ paulo depressâ, rectiusculâ, digito longo. Pedes 4<sup>ti</sup> ultimi subæqui, quinti breviores.

*Hab.* apud oras prope Valparaiso, et insulæ "San Lorenzo."

4. ALLORCHESTES GRACILIS. — Epimera mediocria, quinta perangusta. Antennæ tenuissimæ: 2dæ dimidii corporis longitudine;

flagello multo longiore quam basis, articulis oblongis, setis perbrevibus, paucis : 1mæ dimidio breviores, basi 2darum paulo longiores. Pedes 1mi parvuli, manu trapezoidali, obliquè truncatâ, palmâ rectâ, pubescente. Pedes 2di validi, manu subovatâ, palmâ rectiusculâ, breviter sparsim hirsutiusculâ, angulo infero obsoleto ; digito longo ; articulo tertio brevi, infra acutè producto. Pedes 3tii 4ti subæqui ; 6 ultimi sat breves sensim increscentes, articulo primo lato, setis sparsis brevissimis.

*Long.* 6''' - 8''' . — *Hab.* in mari prope oras insulæ “ Tongatabu.”

5. ALLORCHĒSTES PERUVIANA. — Epimera sat lata, quinta perangusta. Antennæ 2dæ dimidii corporis longitudine ; flagello duplo longiore quam basis, fermè 14-articulato, articulis parce oblongis, setis perbrevibus. Antennæ 1mæ 2dis paulo breviores, flagello 10 - 12-articulato, fere nudo. Pedes 1mi sat parvi, manu oblongâ, dorsum rectâ, apicem obliquè truncatâ. Pedes 2di validiusculi, manu angustâ, dorsum rectâ, apicem valde obliquè truncatâ ; margine infero omnino hirsutâ ; digito brevi. Pedes 3tii 4ti sat longi, subæqui ; 6ti 7mi subæqui, non perlongi, 5ti parce breviores.

*Long.* 4''' . — *Hab.* ad oras prope Valparaiso, inter Algas rejectas.

6. ALLORCHĒSTES HUMILIS. — Epimera sat lata, quinta perangusta. Antennæ breves : 2dæ corpore fere triplo breviores, flagello brevior quam basis, 9 - 10-articulato, setis totis brevissimis : 1mæ 2dis paulo breviores, flagello 6 - 8-articulato. Pedes 1mi parvi, manu oblongâ, angustâ, dorsum fere rectâ, apicem obliquâ. Pedes 2di validiusculi, manu angustâ et versus basin angustante, apicem obliquè truncatâ et hirsutiusculâ, margine infero versus basin nudo, ad medium subemarginato et hirtello ; digito brevi. Pedes 3tii 4ti tenues, subæqui ; 6 sequentes sat breves, subæqui, 5ti breviores, articulo primo fere orbiculari, setis paucis brevissimis.

*Long.* 4''' . — *Hab.* in mari apud oras portus “ Jackson ” Australiæ Orientalis.

7. ALLORCHĒSTES AUSTRALIS. — Epimera grandia, quinta perangusta. Antennæ sat breves : 2dæ corpore plus duplo breviores ; flagello paulo longiore quam basis, 12 - 14-articulato, articulis vix oblongis, setis fere obsoletis : 1mæ 2dis paulo breviores, flagello fermè 14-articulato. Pedes 1mi parvuli, manu apicem paulo latiore, rectè truncatâ. Pedes 2di validi, manu subovatâ, palmâ paulo excavatâ, nudâ ; angulo infero minutè setuligero. Pedes sequentes breves : 3tii



4ti tenues : 5ti 6ti 7mi sensim increscentes, setis brevissimis ; articulo primo perlato.

*Long.* 6''' . — *Hab.* ad oras Illawarræ, Australiæ Orientalis.

8. ALLORCHESTES BREVICORNIS. — Epimera mediocria, quinta perangusta. Antennæ breves : 2dæ corpore triplo breviores ; flagello longiore quam basis, articulis vix oblongis setis brevissimis : 1mæ breviores. Pedes 1mi parvuli, manu rectangulatâ, apicem rectè truncatâ. Pedes 2di sat parvi, manu perangusto-ovatâ, infra fascibus setarum parvulis paucis ornati, palmâ brevi, paulo impressâ, rectâ. Pedes 3tii 4ti debiles ; 5ti 6ti 7mi sat breves ; 4 ultimi subæqui, setis minutis, paucis.

*Long.* 5''' . — *Hab.* ad oras sinus " Bay of Islands " Novi-Zealandiæ.

9. ALLORCHESTES NOVI-ZEALANDIÆ. — Corpus valde compressum, epimeris latissimis. Antennæ fere æquæ, tenuissimæ : 2dæ fere dimidii corporis longitudine ; flagello duplo longiore quam basis, 12–14-articulato, articulis oblongis, setis brevissimis, paucis : 1mæ parce breviores, flagello fermè 16-articulato. Pedes 4 antichi parvuli (an feminae tantum ?) manu primâ apicem paulo latiore, truncatâ, digito brevissimo ; secundâ parce majore obliquè truncatâ, trapezoidali, marginibus fere rectis ; articulo precedente apicem inferiorem valde producto, processu angusto manum appresso. Pedes 6 ultimi sat breves, 5tis paulo brevioribus.

*Long.* 5''' . — *Hab.* ad oras sinus " Bay of Islands " Novi-Zealandiæ.

10. ALLORCHESTES INTREPIDA. — Corpus valde compressum, epimeris 8 latissimis, 6 posticis angustissimis. Antennæ 2dæ dimidii corporis longitudine ; flagello tenuissimo, parce longiore quam basis, articulis oblongis tenuibus, setis fere obsoletis : 1mæ multum breviores, flagello plus duplo longiore quam basis. Pedes 1mi parvuli, manu apicem transversâ et non latiore, emarginatâ, digito valde longiore quam margo apicalis (vel palma), articulo precedente infra producto et acuto. Pedes 2di validi, manu subovatâ, dorso fere recto, palmâ parce impressâ hirsutiusculâ, digito longo : *feminae* manu angustâ apicem rectè truncatâ, digito brevi ; articulo precedente infra longe acuto. Pedes 3tii 4ti subæqui ; 6 ultimi sensim increscentes.

*Long.* 3''' – 4''' . — *Hab.* ad oras portus " Parua " in sinu " Bay of Islands " Novi-Zealandiæ.

11. ALLORCHESTES ORIENTALIS. — Epimera lata. Antennæ 2dæ dimidii corporis longitudine ; flagello fere duplo longiore quam basis,

moniliformi, 14-articulato, articulis oblongis, setis brevibus. Antennæ 1mæ paulo breviores, flagello moniliformi, 7-articulato. Pedes 1mi parvuli, manu subellipticâ. Pedes 2di validiusculi, manu subovatâ, palmâ parce excavatâ, minutè sparsim setulosâ; digito longo; articulo precedente angusto, proximo infra subacuto, non producto. Pedes 6 postici sensim increscentes, setis paucis, minutis.

*Long.* 3<sup>'''</sup>. — *Hab.* in mari "Sulu."

12. ALLORCHESTES? GRAMINEA. — Epimera mediocria. Antennæ 2dæ corpore plus duplo breviores; flagello moniliformi, multo longiore quam basis, setis minutis. Antennæ 1mæ 2dis breviores, flagello ferme 14-articulato. Pedes 1mi parvuli; manu angustâ; digito crasso, styliformi. Pedes 2di validi, manu angustè subovatâ, infra fere rectâ, palmâ non excavatâ, digito longo; articulo precedente infra non producto. Pedes 3tii 4ti sat longi, subæqui; 5tii 6ti 7mi paulo inæqui, sensim increscentes, fere nudi.

*Long.* 6<sup>'''</sup> — 7<sup>'''</sup>. — *Hab.* in portu "Rio de Janeiro."

## Familia II. GAMMARIDÆ.

*Mandibulæ* palpigeræ. *Corpus* sæpius compressum. *Antennæ* flagello confectæ, non pediformes. *Styli caudales* duo postici sive longi sive breves. *Animalia saltatoria vel natatoria.*

### Subfamilia I. LYSIANASSINÆ.

*Antennæ primæ* basin crassæ. *Epimera* grandia. Pedes sex postici non prehensiles.

#### Genus I. LYSIANASSA.

*Pedes* subcheliformes nulli secundis interdum exceptis, sex posticis directionem similibus. *Antennæ primæ* appendiculatæ.

1. LYSIANASSA BRASILIENSIS. — Corpus valde compressum, epimeris latissimis. Oculi reniformes. Antennæ 1mæ breves, corpore quadruplo breviores; flagello duplo longiore quam basis, fermè 10-articulato, appendice 7-articulato. Antennæ 2dæ dimidio corporis valde longiores, sæpe epimeris celatæ, basi brevi et geniculante. Pedes 4 antiqui similes, tenues; 3tii 4tis longiores; 5ti 6ti 7mi similes, sensim increscentes, articulo primo marginem posticum serrulato.

*Long.* 3<sup>'''</sup>. — *Hab.* ad oras portus "Rio de Janeiro."

## Genus II. URISTES. (Dana.)

*Pedes primi* subcheliformes; *secundi* articulo styliformi confecti; *terti*  
*quartique* brevissimi; reliqui non prehensiles; similes. *Antennæ*  
*primæ* non appendiculatæ.

URISTES GIGAS. — Corpus compressum, epimeris latissimis. An-  
tennæ subæquæ, crassiusculæ, dimidio corporis breviores: 1mæ parce  
breviores, flagello processibus obtusis infra breviter fimbriato, articulis  
transversis: 2dæ paulo graciliores, flagello fere triplo longiore quam  
basis, processibus minutis triangulatis supra ornato, articulis non ob-  
longis. *Pedes* 1mi 2dis breviores, manu parvulâ, angustâ, oblique  
truncatâ, digito brevi. *Pedes* 2di 5-articulati, articulo ultimo elongato,  
styliformi, acuto. *Pedes* 7mi 6tis paulo breviores. Segmentum  
abdominis antepenultimum posticè acutum.

*Long.* 9''' — *Hab.* in mari Antartico: tubo cibario piscis lecta.

## Genus III. STENIA. (Dana.)

*Pedes primi* secundique subcheliformes; reliqui non prehensiles.  
*Antennæ primæ* non appendiculatæ. *Corpus* compressum.

STENIA MAGELLANICA. — Corpus valde compressum. Oculi reni-  
formes. *Antennæ* 2dæ 1mis plus duplo longiores, dimidii corporis  
longitudine, fere nudi, basi brevi. *Antennæ* 1mæ nudæ, flagello lon-  
giora quam basis. *Pedes* 4 antici parvuli, similes, 1mi parce minores,  
manu parvulâ, angustâ, apicem obliquâ, digito minuto. *Pedes* 3tii  
4tique æqui; 6ti 7mique æqui, articulo primo lato et posticè serrulato.  
Abdominis segmentum ultimum oblongum, emarginatum.

*Long.* 4''' — 6''' — *Hab.* in mari portus " Good Success " Fuegiæ.

## Subfamilia II. GAMMARINÆ.

*Antennæ primæ* basin tenues. *Epimera* sive grandia, sive angusta.  
*Pedes sex postici* non prehensiles.

## Genus I. GAMMARUS.

*Pedes primi* secundique subcheliformes, digito uni-articulato, reliqui  
non prehensiles, sex posticis similibus. *Antennæ* secundæ sub primas  
insitæ, primæ appendiculatæ.

## I. MANUS PEDUM 2DORUM POLLICE ELONGATO NON ARMATA.

1. *Abdominis segmenta dorsum plus minusve spinulosa aut denticulata.*

1. GAMMARUS ASPER. — *Epimera* lata. Segmenta abdominis tota

dorsum inæque denticulata. Oculi subrotundati. Antennæ 2dæ dimidio corporis parce longiores, tenues, flagello brevior quam basis, articulis oblongis, setis conspicuis, divaricatis. Antennæ 1mæ æque setulosæ, articulo primo paulum crasso, oblongo, appendice 3-articulato. Manus 1ma parvula, oblonga, attenuata. Manus 2da validiuscula, angusta, versus apicem sensim angustior, dorsum recta, infra supraque valde hirsuta, digito dimidio brevior.

*Long.* 6". — *Hab.* in mari "Sulu."

2. GAMMARUS SULUENSIS. — *Femina*: Segmenta abdominis primum secundumque in marginem posticum dorsalem 2-3-dentata, quartum etiam 2-acutum. Oculi subrotundati. Antennæ 1mæ corporis longitudine; flagello longior quam basis, articulis oblongis, setis non brevioribus, appendice brevissimo, 3-articulato. Antennæ 2dæ fere dimidio breviores, flagello plus duplo brevior quam basis, basi parce brevior quam antennarum basis 2darum. Pedes 4 antiqui subæqui, parvi; manu 1mâ parvulâ, apicem latiore, truncatâ; 2dâ paulo majore, oblongâ, apicem truncatâ, non latiore. Pedes sex postici paulo inæqui, setis paucis remotis, apicalibus longiusculis.

*Long.* 4" - 5". — *Hab.* in mari "Sulu" prope oras insulæ, inter Algas natantes.

3. GAMMARUS ALBIDUS. — Epimera latiuscula. Abdominis segmenta primum secundum quartumque dorso uni-spinosa. Antennæ 1mæ dimidio corporis valde longiores, flagello longior quam basis, fere 21-articulato, articulis oblongis, setis vix brevioribus, appendice brevi, 3-articulato. Antennæ 2dæ tenuissimæ, fere dimidio breviores, flagello brevior quam basis, fermè 8-articulato. Pedes *femina* 4 antiqui subæqui, parvi; manu 1mâ parvulâ, oblongâ, apicem fere rotundatâ, non latiore; 2dâ parce longior, fere lineari, infra hirsutâ; *maris* 2dâ crassâ, latè oblongâ, versus basin sensim paulo angustior, infra parce hirsutiusculâ apicem obliquè truncatâ, palmâ apicali, paulo excavatâ. Pedes 6 postici subæqui, hirsuti.

*Long.* 5". — *Hab.* in lacu insulæ "Tongatabu."

2. *Abdomen non dentatum nec spinulosum.*

a. *Margo frontis lateralis ophthalmicus saliens.*

4. GAMMARUS HIRSUTICORNIS. — Epimera lata. Antennæ infra setosæ; 1mæ dimidio corporis breviores, flagello basis longitudinem fere æquante, appendice 3-articulato: 2dæ paulo breviores, articulis ba-

salibus quatuor subæquis, flagello breviorè quam basis. Pedes 4 antichi parvuli, 6 postici sensim increscentes, setis brevibus sparsis. An femina ?

*Long.* 3''' — 4''' . — *Hab.* ad oras insulæ " Enchados," in portu " Rio de Janeiro."

5. *GAMMARUS EMISSITIUS.* — Gracilis, epimeris mediocribus. Caput oblongum, lateribus anticè productum. Antennæ setosæ, 1mæ dimidio corporis vix longiores, articulis primo tertioque subæquis; flagello breviorè quam basis, fermè 7-articulato, appendice 3-articulato. Antennæ 2dæ breviores, basi vix breviorè quam basis 1marum; flagello breviorè quam basis, fermè 7-articulato. Manus 1ma parvula angustissima; secunda valida, subovata, sparsim setosa, dorso parce arcuato, palmâ non excavatâ, digito mediocri. Pedes 6 postici sensim increscentes, setis paucis; quinti quartis breviores.

*Long.* 4''' . — *Hab.* in mari " Sulu."

b. Margo frontis lateralis ophthalmicus non prominentes.

6. *GAMMARUS TENUIS.* — Gracilis, epimeris angustis. Caput utrinque obsoletè prominulum. Antennæ 1mæ corpore paulo breviores, teretes, tenuissimæ, flagello parce longiorè quam basis, 14-articulato, setuloso, appendice brevissimo. Antennæ 2dæ valde breviores, setis longioribus; basi valde longiorè quam basis 1marum, articulis 2 ultimis longis subæquis; flagello 5-articulato, non longiorè quam articulus basis ultimus. Manus 1ma valida, lata et oblonga basin paulo angustior, apicem obliquè truncata, palmâ non excavatâ, digito mediocri. Manus 2da parvula (an feminæ?) ovata. Pedes 7mi 6tis valde longiores, sparsim setosi.

*Long.* 3''' . — *Hab.* in mari " Sulu."

7. *GAMMARUS FURCICORNIS.* — Gracilis, epimeris angustis; sparsim pubescens. Caput fere oblongum. Antennæ 1mæ corpore breviores, articulo primo crasso, oblongo; flagello terete, parce longiorè quam basis, fermè 14-articulato, sparsim setuloso; appendice dimidio breviorè, 5-articulato. Antennæ 2dæ valde breviores, basi vix breviorè quam basis 1marum, flagello brevi, parce longiorè quam articulus tertius, 7-10-articulato. Manus 1ma parvula, subovata. Manus 2da valida, lata et oblonga, trapezoidea, apicem parce latior, fere rectè truncata, infra setuligera, palmâ apicali, non excavatâ. Pedes 6 postici subæqui, 7mis paulo longioribus, setis numerosis.

*Long.* 3''' . — *Hab.* ad oras insulæ in mari " Sulu."

8. GAMMARUS TENELLUS. — Gracilis, epimeris angustis. Oculi orbiculati, parvuli. Antennæ 1mæ dimidii corporis longitudine, articulo primo tenui, flagello parce longiore quam basis, setis perbrevibus, appendice fere dimidio brevior. Antennæ 2dæ tenuissimæ, breves, basi paulo brevior quam basis 1marum, flagello non longiore quam articulus basis ultimus. Manus 1ma parvula, subovata, dorsum rectiuscula. Manus 2da valida, lata, oblonga, subrectangulata, basin paulo angustior, apicem fere rectè truncata, sparsim setulosa, palmâ non excavatâ. Pedes 6ti 7mis longiores, quinti valde breviores, setis paulo sparsis.

*Long.* 4<sup>'''</sup>. — *Hab.* in Archipelagine "Viti."

9. GAMMARUS ORIENTALIS. — Gracilis, epimeris angustis. Oculi orbiculati. Antennæ validiusculæ, basi longo, flagello brevi (an adulto?). Pedes 1mi validiusculi, manu mediocri, subellipticâ, dorsum fere rectâ, infra arcuatâ, hirsutâ, digito longo. Manus 2da valida, subovata, palmâ erosâ vel 2-3 dentatâ remotè hirsutâ, digito longo. Pedes sex postici sensim paulo increscentes, setis paucis.

*Long.* 2½<sup>'''</sup> - 3<sup>'''</sup>. — *Hab.* in mari prope fretum Sundæ.

II. MANUS UNA PARIS SECUNDI VALIDISSIME CHELIFORMIS, POLLICE VALDE ELONGATO; ALTERA PARVULA. (*Gen.* MÆRA, *Leachii.*)

1. *Dorsum abdominis nudum.* [Palma 3-dentata.]

10. GAMMARUS (MÆRA) QUADRIMANUS. — Gracilis, epimeris perangustis. Antennæ 1mæ dimidii corporis longitudine, basi longiore quam flagellum, articulis primo secundo subæquis, longis, flagello pubescente, appendice parce longiore quam dimidium flagelli. Antennæ 2dæ breviores, basi brevior quam basis 1marum, flagello perbrevis. Manus 1ma parvula oblonga, infra hirsuta, basin angusta, palmâ obliquâ. Manus 2da validissima, subquadrata, palmâ apicali, transversâ, tridentatâ, pollice acuto, tenui, digito acuto. Pedes 7mi 6tis parce breviores, articulis apicem posticum densè pilosis.

*Hab.* in Archipelagine "Viti."

2. *Dorsum abdominis armatum.* [Manus major subtriangulata, palmâ 2-dentatâ, dentibus obtusis.]

11. GAMMARUS (MÆRA) VALIDUS. — Gracilis, epimeris angustis. Oculi rotundati. Antennæ tenuissimæ: 1mæ corporis longitudine, articulo secundo longiore, flagello vix longiore quam basis, appendice

brevi, 3-5-articulato: 2dæ paulo breviores, basi parce longiore quam basis Imarum, flagello dimidio brevior. Manus Ima parvula. Manus secunda *dextra* validissima, basin latè rotundata, apice superno non prominente, rectangulato; *sinistra* parvula, angusta, acuminata, infra pubescens. Pedes 6 postici subsetosi.

*Long.*  $2\frac{1}{2}''' - 3'''$ . — *Hab.* in mari juxta "Singapore."

12. GAMMARUS (MÆRA) SETIPES. — Gracilis, epimeris perangustis. Oculi orbiculati. Antennæ corporis longitudine: Imæ paulo majores, articulo secundo longiore, flagello longiore quam basis, appendice 5-articulato: 2dæ longæ, basi multo longiore quam basis Imarum, articulo primo infra producto, flagello brevior quam basis. Manus secunda *dextra* validissima, basin angusta, apicem non prominens, fere rectangulata; *sinistra* parvula, basin angustior, apicem truncata. Pedes 6 postici subæqui, 6tis parce longioribus, articulis breviter et sparsim setosis, tertio postice serrato.

*Long.*  $4'''$ . — *Hab.* in portu "Rio de Janeiro."

13. GAMMARUS (MÆRA) PILOSUS. — Gracilis, epimeris angustis. Antennæ subæquæ, corpore breviores; Imæ paulo longiores, flagello longiore quam basis; 2dæ graciliores, basi longiore quam basis Imarum, flagello brevior quam suis basis. Manus secunda *sinistra* validissima, basin rotundata, apice superno prominulo; *dextra* parvula, apicem obliquè truncata. Pedes 6 postici subæqui, longè pilosi, articulo tertio posticè fere integro.

*Long.*  $6'''$ . — *Hab.* in portu "Rio de Janeiro."

## Genus II. AMPHITOË.

*Gammaro* affinis. *Antennæ* superiores non appendiculatæ.

### A. ANTENNÆ SUPERIORES LONGIORES.

#### I. MARGO FRONTIS LATERALIS OPHTHALMICUS SALIENS.

1. AMPHITOE PECULANS. — Gracilis, epimeris angustis, marginem sparsim ciliatis. Antennæ subæquæ; flagellis non longioribus quam bases, teretibus, articulis oblongis, setis inferioribus longiusculis. Manus prima validiuscula, breviter subtriangulata, carpo non minore, inversim triangulato, (formâ carpi manusque simul sumtorum ellipticâ,) anticè et posticè hirsuta. Manus secunda valida, oblonga, elliptica, palmâ non excavatâ, hirsutâ, carpo hirsuto, triangulato infra anguste producto, hoc processu manum non appresso, digito longiusculo. Pedes 3tii 4ti

æqui, breves, articulo primo fere orbiculato; 5ti vix longiores; 6ti 7mi subæqui, 7mis longioribus, setis sparsis, articulo primo oblongo.

*Hab.* in mari "Sulu."

## II. MARGO FRONTIS LATERALIS OPHTHALMICUS SALIENS.

### a. *Oculi reniformes.*

2. AMPHITOE FISSICAUDA. — Corpus compressum, epimeris latis. Abdominis segmentum ultimum fere usque ad basin fissum. Antennæ subæquæ; 1mæ parce longiores, dimidii corporis longitudine, basi multo brevioribus quam flagellum et parce brevioribus quam basis 2darum, setis inferioribus longiusculis. Pedes 1mi parvuli, manu parce oblongâ, apicem obliquâ et non latiore. Manus secunda mediocris, angusta, infra ciliata, digito perbrevis. Pedes 6 postici subæqui, non longi, setis brevibus.

*Hab.* in mari juxta oras prope urbem "Valparaiso."

3. AMPHITOE PUBESCENS. — Corpus compressum, sparsim pubescens, epimeris latis. Abdominis segmentum ultimum brevius, emarginatum. Antennæ 1mæ dimidio corporis valde longiores, flagello vix brevioribus quam basis, setis numerosis; 2dæ dimidio fere breviores, dense hirsuti, basi fere duplo longiore quam flagellum. Manus 1ma parvula, angusta, apicem angustior. Manus 2da versus apicem angustior, dorsum recta, infra hirsuta, palmâ non impressâ, digito longiusculo. Pedes 6 postici longi, subæqui, setis rigidis, articulo primo lato.

*Long.* 4''' — *Hab.* apud insulam "Pitt" Archipelaginis "Kingsmills."

### b. *Oculi non reniformes, fere orbiculati.*

#### 1. Palma manus secundæ lateralis. (*Gen.* MELITA, *Leachii.*)

4. AMPHITOE (MELITA) INÆQUISTYLIS. — Epimera mediocria. Antennæ 1mæ fere corporis longitudine, setis brevibus, divaricatis, verticillatis, flagello paulo longiore quam basis, terete, articulis cylindricis. Antennæ 2dæ valde breviores, basi longiore quam basis 1marum, flagello multo brevioribus. Pedes primi parvuli, manu brevi, apicem latiore, truncatâ; secundi validiusculi, manu oblongâ, subobovatâ, apicem paulo obliquâ, digito brevi, in latus manus claudente. Pedes 6 postici sensim parce increscentes, 6ti 7mi fere æqui, articulo primo angusto. Styli postici longiores.

*Long.* 4''' — *Hab.* in sinu "Bay of Islands" Novi-Zelandiæ.



## 2. Palma manus secundæ marginalis.

\* *Epimera quinta quartis valde angustiora.*

5. AMPHITOE PERUVIANA. — Corpus compressum. Antennæ 1mæ corpore parce breviores, articulis tribus basalibus subæquis, flagello paulo longiore quam basis, setis perbrevis, non divaricatis. Antennæ 2dæ basi 1marum parce longiores, basi longiore quam flagellum. Manus 1ma parva, apicem oblique truncata, parce latior. Manus 2da validiuscula basin latior, apicem angusta, palmâ vix excavatâ, digito breviusculo. Pedes 6 postici sensim parce incrementales, non longi, setis brevibus, articulo primo latissimo. Styli caudales 2di 3tiis non longiores.

*Long.* 5''' — 6''' . — *Hab.* apud oras insulæ "San Lorenzo," Peru.

6. AMPHITOE TENUICORNIS. — *Epimera* latiuscula. Antennæ per-tenuæ: 1mæ dimidio corporis longiores, articulo secundo multo longiore, flagello paulo longiore quam basis, setis parce longioribus quam articuli: 2dæ parce breviores, basi longiore sive quam flagellum sive quam basis 1marum, articulis 3tio 4to subæquis. Manus 1ma parvula, oblonga, obovata, pubescens, apicem rotundata, digito sub apicem infixio. Manus 2da validiuscula oblonga, subelliptica, dorsum rectiuscula, infra dense hirsuta, palmâ non excavatâ, digito majusculo. Pedes 3tii 4tique perbreves. Pedes 5ti 6ti 7mi subæqui. Styli ultimi perbreves.

*Long.* 4''' — 5''' . — *Hab.* in sinu "Bay of Islands" Novi-Zelandiæ.

7. AMPHITOE INDICA. — *Femina*: Corpus crassiusculum, epimeris mediocribus, segmento abdominis 4to apicem acuto. Antennæ 1mæ dimidio corporis longiores, articulo primo longiore, flagello longiore quam basis, setis breviusculis. Antennæ 2dæ dimidio breviores, tenues, flagello vix brevioribus quam basis. Manus prima parvula, oblonga, acuminata; 2da formam similis, parce major, palmâ non excavatâ, digito dimidii manus longitudine. Pedes 3tii 4tique tenues, non breviores, 6ti 7mi subæqui, 5ti breviores, articulo primo lato. Styli postici elongati.

*Long.* 4''' . — *Hab.* apud oras insulæ in freto "Balabac" juxta Borneo.

8. AMPHITOE RUBELLA. — Corpus crassiusculum, epimeris latis. Antennæ 1mæ dimidio corporis longiores, articulo secundo multo longiore, flagello fere duplo longiore quam basis, articulis longis, setis perpaucis, brevibus. Antennæ 2dæ 1mis breviores, basi multo longiore

quam basis 1marum, flagello articulum precedentem fere æquante. Manus 1ma parvula, oblonga, angusta, apicem angustiore. Manus 2da valida, lata, subrectangulata, apicem transversa, palmâ apicali, excavatâ, angulo infero acuto, digito mediocri. Pedes 3tii 4ti breves; 6ti 7mi subæqui, 5ti multo breviores, setis sparsis, articulo primo latiusculo.

*Long.* 3<sup>'''</sup>. — *Hab.* in Archipelagine "Sulu."

9. AMPHITOE FUCORUM. — Antennæ longiusculæ, 2dæ paulo breviores, basi fere duplo longiore quam basis 1marum, flagello non longiore quam suus basis. Manus 1ma parva, apicem latior, obliqua; 2da fere elliptica, marginibus arcuatis, digito duplo brevior quam manus. Pedes 4 sequentes non breviores, subæqui; 5ti breviores; 6ti 7mi subæqui.

*Hab.* in mari Atlantico inter Algas natantes.

\* \* *Epimera quinta quartis vix angustiora.*

10. AMPHITOE TONGENSIS. — Corpus compressum nudum, epimeris latis, 5tis magnis. Antennæ 1mæ corpore breviores, articulo secundo longiore, flagello fere duplo longiore quam basis, fermè 40-articulato. Antennæ 2dæ paulo breviores, basi longiore quam basis 1marum, flagellum suum fere æquante, setis flagelli paris secundi longioribus. Manus 1ma parva, subelliptica, dorsum fere recta. Manus 2da oblonga, infra arcuata, hirsuta, supra rectiuscula, digito brevi, carpo infra producto sed non acuto. Pedes 6 postici valde inæqui, sensim incrementes.

*Long.* 6<sup>'''</sup>. — *Hab.* apud oras insulæ "Tongatabu."

11. AMPHITOE PEREGRINA. — *Femina?* Corpus gracile, epimeris latiusculis, 5tis magnis, margine sparsim ciliato. Antennæ 1mæ fermè dimidii corporis longitudine, articulo primo longiore, flagello duplo longiore quam basis, 12-articulatis, setis brevibus numerosis. Antennæ 2dæ fere dimidio breviores, basi longiore quam basis superiorum, flagello 6-articulato, subulato, paulo brevior quam basis. Manus 1ma 2da subæquæ, parvulæ, oblongæ, infra arcuatæ, digito minuto. Pedes 3tii 4ti non breviores, subæqui; 5ti 6ti 7mi non longi, sensim parce incrementes, setis minutis, articulo primo lato.

*Long.* 3<sup>'''</sup>. — *Hab.* inter Algas natantes maris alti prope "Valparaiso."

12. AMPHITOE BREVIPES. — Corpus compressum, epimeris latis, quintis maximis, subquadratis. Antennæ 1mæ dimidio corporis paulo

longiores, articulo primo longiore, flagello plus duplo longiore quam basis, fere nudo. Antennæ 2dæ dimidium 1marum longitudinem parce superantes, basi longiore quam basis 1marum, flagello brevi (multo brevior quam basis), subulato, infra hirsuto. Manus 1ma 2da *feminæ* subæquæ, parvulæ, breves, apicem rectè truncatæ et non latiores; palmâ apicali, digito, minuto; 2da *maris* valida, subovata, dorsum rectiuscula, prope apicem internum unidentata, digito longo. Pedes 3tii 4ti subæqui; 5ti 6ti 7mi breviusculi, sensim increscentes, articulo primo lato.

Microcheli, generi non vero, ut mihi videtur, femina *A. brevipedis* forsân pertinet.

B. ANTENNÆ SUPERIORES BREVIORES. (Genus IPHIMEDIA, *Rathke*.)

13. IPHIMEDIA SIMPLEX. — Corpus compressum, nudum, epimeris latis, quintis angustis. Antennæ 2dæ dimidii corporis longitudine, basi brevi, flagello fere nudo, plus duplo longiore, articulis perbrevibus. Antennæ 1mæ paulo breviores, basi vix brevior quam basis 1marum. Pedes toti breves: manus 1ma mediocris, angusto-ovata, apicem subacuta; 2da (*feminæ*?) minor, formam similis. Pedes 3tii 4ti subæqui, 2dis longiores; reliqui 6 subæqui, setis brevissimis, articulo primo latissimo, margine postico obsoletè serrulato.

*Long.* 4''' — 5'''. — *Hab.* apud oras insulæ "Hermite" Fuegiæ.

14. IPHIMEDIA (ACANTHOSOMA, *Owen*) NODOSA. — Corpus crassiusculum, testâ subcalcareâ, fronte minutè rostratâ, abdomine dentato-carinato, segmentis corporis 4 anticis marginem integris, quinto sinuoso, sequentibus plus minus spinoso-dentatis aut acuto-nodososis segmentis quatuor ultimis exceptis; epimeris tribus anticis integris, obtusis, 4tis latis, posticè 2-dentatis, tribus sequentibus angustis, posticè acutis. Articulus primus pedum posticorum grandis, subquadratus postice uni-dentatus, angulum posticum acutus. Antennæ 2dæ dimidio corporis breviores, nudæ; 1mæ paulo breviores. Pedes nudi; 4 antichi (*feminæ*?) parvuli, manubus minutis subæquis; 6 postici subæqui, articulo tertio triangulato, apice postico producto et acuto.

*Long.* 4'''. — *Hab.* apud oras insulæ "Hermite" Fuegiæ.

Genus III. CÆDICERUS. (*Kröyer*.)

*Amphitoe* pedes 4 anticos membraque buccalia affinis. Pedes septimi valde elongati, tenues, fere filiformes. Epimera mediocria.

CÆDICERUS NOVI-ZEALANDIÆ. — Parvulus. Antennæ 1mæ dimidio

corporis breviores, teretes, articulis oblongis; 2dæ fere duplo longiores, flagello fermè 21-articulato, fere duplo longiore quam basis. Pedes 7mi corporis longitudine, extremitate styliiformi, minutè pubescente: 4 antici inæqui, manubus ovatis, manu 1mâ parvulâ, 2dâ validiusculâ, palmâ paulo excavatâ, digito sat longo. Pedes 3tii 4ti tenues, parvuli; sequentes articulum primum angusti.

*Long.* 2<sup>'''</sup>. — *Hab.* in sinu " Bay of Islands " Novi-Zealandiæ.

Genus IV. ERICHTHONIUS? (*M. Edwards.*)

*Antennæ* elongatæ. *Pedes* primi plus minusve cheliformes, secundi valde cheliformes, digito biarticulato, pollice prominente. *Epimera* sat angusta aut latiuscula. *Cauda* subsaltatoria.

Erichthonii gressorii (caudâ non saltatoriâ), *M. Edwardsio* auctoritate, et epimera carentes. Forsan genus hic descriptum Erichthonio discrepat et novum. Hoc credente, genus *Pyctilus* (α πύκτης, *pugil*) in manuscriptis auctore institutum est.

1. ERICHTHONIUS (PYCTILUS?) MACRODACTYLUS. — Corpus gracilis, epimeris mediocribus, capite oblongo, margine frontis ophthalmico producto. *Antennæ* elongatæ; 2dæ corpore breviores, articulis 3tio 4toque subæquis, longis, flagello paulo breviorè quam basis, fermè 10-articulato, setis perbrevibus. Manus 1ma elliptica, 2-articulata, (articulo primo majore) digito brevi. Manus 2da validissîma, paulo < forma, pollice prælongo, acuto, digito longiorè quam manus, articulis duobus subæquis, utroque pollicis longitudinem æquante, apicem acuto, sparsim breviter hirsuto. Pedes 3tii 4ti subæqui; 5ti breves, articulo primo posticè acutè producto; 6ti 7mi paulo inæqui, postici longiores.

*Hab.* in mari Indiæ Orientalis.

2. ERICHTHONIUS (PYCTILUS?) PUGNAX. — *Antennarum* basis 1marum flagello vix longior. Manus secunda validissîma oblonga, marginibus antico posticoque fere parallelis, pollice brevi, bifurcato; digito elongato, articulis duobus inæquis primo crassiorè et longiorè, intus parce eroso et sparsim hirsutiusculo, duplo longiorè quam pollex.

*Hab.* in mari Indiæ Orientalis.

Familia III. COROPHIDÆ.

*Corpus* plus minusve depressum, lineare, abdomine recto, articulos normali, epimeris angustissîmis vel obsoletis. *Mandibulæ* palpigeræ. *Antennæ* pediformes. *Animalia* gressoria.

## Genus I. COROPHIUM.

*Pedes* secundi non subcheliformes digito nullo 2-articulato. *Antennæ* 2dæ flagellis carentes.

COROPHIUM QUADRICEPS. — Caput quadratum. Abdomen posticè rotundatum. *Pedes* 4 antichi similes, primis minoribus. *Pedes* 5ti 4tis breviores, articulo primo non setoso; 7mi tenues, articulo primo setoso, setis longiusculis, plumosis. *Antennæ* (an adultæ?) subæquæ; 1mæ parce breviores, 7-articulatæ, articulo primo longiore; 2dæ crassiusculæ, 7-articulatæ, quartam partem corporis longitudine vix superantes, articulo 3tio longiore, tribus ultimis parvulis subæquis.

*Long.* 1''' . — *Hab.* in portu "Rio de Janeiro."

Genus II. CLYDONIA. (*Dana.*)

Corpus elongatum, paulo depressum. Abdomen 6-7-articulatum.

*Antennæ* quatuor; duæ elongatæ, styliformes, rectæ et rigidæ, articulo basali brevi, reliquâ parte longissimè subulatâ obsoletè multi-articulatâ. *Pedes* tenues, 6 postici longè filiformes, quintis longissimis.

1. CLYDONIA GRACILIS. — *Antennæ* longæ fere corporis longitudine, subulatæ. *Oculi* parvi, lenticulis 9. *Styli* caudales tenues, 1mi 3tiique 2dis longiores, 3tiis ramum brevem acutum ad medium ferentibus. *Pedes* 5ti corpore non breviores, articulo primo longissimo infra minutè spinoso, apice spinoso-producto; 7mi 5tis plus dimidio breviores. *Abdominis* segmenta 3 antica latere acuta, angulo postico subtruncato.

*Long.* 3''' . — *Hab.* in mari Atlantico, lat. bor. 1°, long. occ. 18°. — *Lect.* die 31 Oct., 1838.

2. CLYDONIA LONGIPES. — *C. gracili* similis. *Antennæ* longæ fere corporis longitudine, subulatæ, parce crassiores. *Pedes* 7mi 5tis non dimidio breviores. *Segmenta* abdominis duo antica angulos posticos acuta et non truncata.

*Long.* 4''' - 5''' . — *Hab.* in mari Pacifico, lat. aust. 18° 10', long. occ. 126°. — *Lect.* die 8 Aug., 1839.

## Familia IV. ICILIDÆ.

*Corpus* valde compressum, latum, vix lineare, abdomine articulos normali, valde inflexo. *Pedes* plerumque latè expansi instar Aranei.

*Antennæ* quatuor flagellis confectæ, non pediformes. *Animalia gressoria.*

Genus ICILIUS.

*Antennæ* elongatæ, secundæ longiores. *Pedes* non prehensiles, toti vergiformes, apicem unguiculati. *Styli caudales* sex, furcati.

ICILIUS OVALIS. — Cephalothorax ellipticus, capite brevi latè triangulato, frontem lateraque obtuso. Oculi remotissimi. Segmentum thoracis primum angustius et brevissimum. Abdomen 7-articulatum, segmentis tribus anticis ad marginem posticum medianum acutis, segmento ultimo parvulo ovato. *Antennæ* subteretes: 2dæ corpore longiores, flagello fere duplo longiore quam basis, tenuissimo: 1mæ fere dimidio breviores, flagello non duplo longiore quam basis. *Pedes* 4 antiqui infra densè hirsuti; 6 postici inter sese similes; 7mi 6tis valde longiores, tenues, fere nudi.

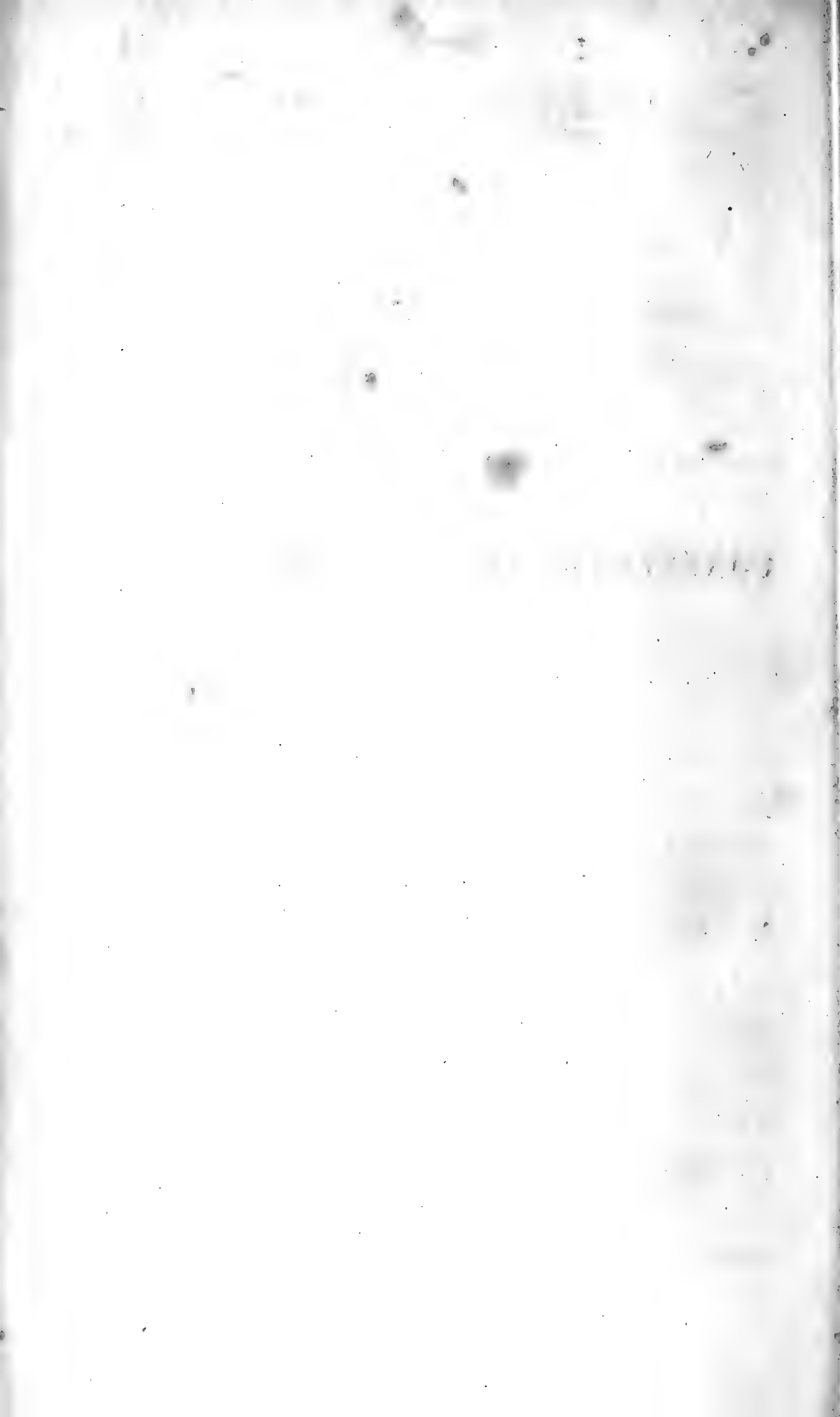
*Long.* 2<sup>'''</sup>. — *Hab.* in freto "Balabac," juxta Borneo.

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**CONSPECTUS CRUSTACEORUM, &c.**

**ISOPODA. No. I.**

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# CONSPECTUS CRUSTACEORUM

QUÆ IN ORBIS TERRARUM CIRCUMNAVIGATIONE,  
CAROLO WILKES E CLASSE REIPUBLICÆ FÆDERATÆ DUCE,

LEXIT ET DESCRIPSIT

JACOBUS D. DANA.

(Continued.)

## CRUSTACEA ISOPODA.

Appendices abdominales, duobus posticis exceptis, plerumque branchii-formes, stylis caudalibus duobus aut nullis. Pedes thoracis 6 antiqui ad eandem seriem pertinent, 8 postici ad seriem alteram,\* exceptionibus raris (in *Isopodis brachiatis*.)

### I. ISOPODA BRACHIATA.

Pedes seriei posticæ sex.†—Species Amphipodis affines (præcipuè Dulichiis); habitum Caprelloideæ; sæpius algas, corallinas, etc. a pedibus sex posticis affixæ cum corpore arrecto.

#### Familia 1. ARCTURIDÆ. (Idotæoideæ.)

Pedes sex postici inter sese unguiculati similes.—Abdomen pauciparticulatum, laminis operculiformibus infra opertum (sicut Idotæis), stylis caudalibus carens.

Genus 1. LEACHIA, † *Johnston*.—Pedes 8 antiqui ciliati, non unguiculati. Antennæ superiores perbreves, 4 articulatae; inferiores longæ, pediformes, ungue 1–3 articulato confectæ. Segmentum thoracis quartum prælongum.

LEACHIA NODOSA.—Corpus tuberosum. Segmentum thoracis quartum valde elongatum anticè latius et utrinque cuspidatum. Abdomen

\* Amphipodis (etiam Isopodis rarissimis) series antiqua octo pedes, et sex postica; quoque, styli caudales sex, et alii appendices abdominales *natatorii*. Hæc discrimina optima et non negligenda.

† Hæc caractere species illæ aliis Isopodis remotæ et Amphipoda osculant.

‡ *Arcturo*; antennis inferioribus flagello non confectis et segmento thoracis quarto prælongo, differt.

2-articulatum, segmento primo transverso, secundo oblongo, prope apicem latiore, posticè rotundato, prope basin utrinque emarginato. Antennæ superiores tenues, articulis duobus inferiorum primis parce longiores; inferiores pediformes, 6-articulatæ, fere corporis longitudine, articulo quinto brevioribus quam quartus, sexto (ultimo) brevi, unguiformi, fere recto, infra parce setuloso.—Long. 6'''.

*Hab.* prope insulas Mangsee in freto Balabac.

#### Familia 2. TANAIIDÆ.

Pedes 2 antici manu validâ instructi, reliqui unguiculati, mediocres, sex posticis inter sese similibus. Abdomen 5-6-articulatum, appendicibus decem subnatoriis, stylis caudalibus articulatis.

Genus 1. TANAIIS, *Edwards*.—Corpus lineare. Caput perbreve. Segmentum thoracis primum oblongum. Antennæ quatuor, breviusculæ, superiores flagello non confectæ. Abdomen 5-6-articulatum. Pedes antici breves, crassè cheliformes.

1. TANAIIS BRASILIENSIS.—Pedes antici crassi, manu ad basin paulo angustiore, pollice non crassiore quam digitus. Antennæ primæ paulo majores, corpore quadruplo breviores, 5-articulatæ; secundæ 6-articulatæ, articulis duobus basalibus paulo crassioribus. Abdomen 6-articulatum, posticè rotundatum et medio apiculatum, segmentis subæquis, ultimo non majore, ad apicem apiculato. Styli caudales 6-articulati. Segmentum thoracis septimum sexto brevius.

*Hab.* in portu Rio de Janeiro.

2. TANAIIS ELONGATUS.—Gracilior. Pedes antici crassi, manu ad basin non angustiore, pollice crassiore quam digitus intus angulato et setam gerente. Antennæ primæ 4-articulatæ; secundæ 4-articulatæ, paulo breviores. Abdomen pubescens, 6-articulatum, posticè rotundatum, segmento ultimo majore, semicirculari. Styli caudales biramei ramo longiore 2-articulato, altero 1-articulato. Segmenta thoracis quatuor postica subæqua, fere quadrata.

*Hab.* in mari Sulu.

Genus 2. LEPTOCHELIA, *Dana*.—*Tanai* similis. Pedes antici longissimi, tenuissimi, manu valde elongatâ. Antennæ superiores longæ, flagello confectæ. Abdomen 6-articulatum, stylis caudalibus articulatis.

LEPTOCHELIA MINUTA.—Corpus lineare. Pedes antici corpore valde longiores, manu fere corporis longitudine, digito polliceque tenuissimis, incurvatis, nudis, pollice prope apicem intus dentigero. Antennæ superiores corpore paulo longiores, basi elongato, 4-articulato, articulo secundo longiore, flagello 6-7-articulato, vix longiore quam articulus basalis secundus.

*Hab.* prope insulas "Viti" in mari Pacifico.

#### II. ISOPODA AMBULATORIA.\*

Pedes seriei posticæ octo in his et totis Isopodis normalibus. Membra buccalia nullo modo suctoria. Abdominis appendices sexti sive operculiformes sive styliformes, nunquam ad natandum apti.

\* "Isopodes Marcheurs" Edwardsii, *Arcturo*, *Leachiâ*, *Tanai* et affinis exclusis.

## Familia 1. IDOTÆIDÆ.

Abdomen pauci-articulatum, articulo ultimo maximo, laminis duobus operculiformibus infra opertum, stylis caudalibus carens. Mandibulæ non palpigeræ.

## Subfamilia 1. IDOTÆINÆ.

Pedes toti inter sese subsimiles, plerumque ambulatorii.

Genus IDOTÆA, *Fabricius*.—Segmenta thoracis subæqua. Antennæ externæ (vel inferiores) valde longiores, non geniculatæ, flagello multiarticulato confectæ. Abdominis opercula simplicissima, prope apicem articulati. Pedes quarti tertiique non valde inæqui.

1. IDOTÆA ARGENTEA.—Angusto-subelliptica anticè truncata vel obsoletè excavata, superficie æqua et lævis. Epimeræ latiusculæ. Abdomen 3-articulatum, segmentis duobus transversis, tertio oblongo, ad apicem paulo angustiore et truncato-rotundato, prope basin utrinque suturâ notato. Antennæ internæ dimidio basis externarum vix longiores. Antennæ externæ fere dimidii corporis longitudine, flagello 7-articulato, brevioribus quam basis, articulis 2 ultimis minutis.—Long. 5<sup>'''</sup>. Argentea et ad latera cærulescens.

*Hab.* in mare Pacifico, lat. aust. 77°, long. occid. 109°, super Porpitam.

2. IDOTÆA ANNULATA.—Angusto-subelliptica, fronte truncata, obsoletè arcuata, superficie annulatâ segmentis prominulis. Epimeræ latiusculæ. Abdomen 3-articulatum, segmentis duobus transversis, tertio oblongo, lateribus fere parallelis, ad apicem truncato cum angulis rotundatis, prope basin suturâ utrinque notato. Antennæ internæ dimidio basis externarum non longiores. Antennæ externæ fere dimidii corporis longitudine, flagello brevioribus quam basis, 7-articulato, articulis 2 ultimis non brevioribus.—Long. 9<sup>'''</sup>. Brunnescens.

*Hab.* in mare Antarctica.

3. IDOTÆA BREVICAUDA.—Angustè ovato-elliptica, anticè posticèque truncata et medio minutè apiculata. Caput transversum, posticè segmento proximo amplexum. Abdomen 3-articulatum, segmentis duobus breviter transversis, tertio oblongo, posticè paulo angustiore, angulis rotundatis, prope basin suturâ notato. Antennæ internæ dimidio basis externarum non longiores. Antennæ externæ dimidium corporis longitudine vix superantes, articulo secundo brevi et ad apicem externum producto, flagello 9-10-articulato, paulo longiore quam basis.—Long. 6<sup>'''</sup>—9<sup>'''</sup>. Brunnescens.

*Hab.* in portu "Rio de Janeiro."

Genus EPELYS, *Dana*.—Antennæ breves subæquæ, externæ non geniculatæ, flagello non confectæ. Pedes subæqui, quarti tertiique non valde inæqui. Oculi minuti, remoti.

EPELYS ANNULATUS.—Angusto-subelliptica. Caput transversum, mediâ fronte apiculatâ, angulis rotundatis. Segmenta thoracis transversa, subæqua, prominentia. Abdomen 2-articulatum; segmento primo brevissimo, fere obsoleto, valde angustiore quam secundum; secundo scutellato, posticè triangulato, obtuso, lateribus mediis fere parallelis.

Antennæ breves, latitudine capitis non longiores; internæ parce breviores, 4-articulatæ; externæ 5-articulatæ.—Long.  $2\frac{1}{2}'''$ .

*Hab.* ad oras prope Valparaiso, super corpus speciei Asterias.

Genus CLEANTIS, *Dana*.—Antennæ externæ valde longiores, non geniculatæ, 5-6-articulatæ, flagello non confectæ. Pedes quarti paris tertiis valde breviores, et parium quatuor ultimorum sensim longitudine increscentes. Abdominis opercula prope apicem articulata et ad articulationem laminam parvulam internam gerentia.

CLEANTIS LINEARIS.—Angusto-linearis, fronte truncata et parce excavata. Caput paulo transversum, posticè profundè arcuatum, segmento proximo amplexum. Oculi mediocres, reniformes, remoti. Segmenta thoracis paulo transversa. Abdomen 3-articulatum, segmentis duobus transversis, tertio lineari, angulis posticis truncatis, apice truncato aut obsoletè excavato, prope basin suturà notato. Antennæ internæ parvulæ, dimidio externarum valde breviores; externæ crassiusculæ, articulo ultimo ovato, pubescente. Pedes tertii primis duplo longiores.

*Hab.* ad oras prope Rio Negro Patagoniæ.

Genus ERICHSONIA, *Dana*.—Antennæ externæ valde longiores, geniculatæ, 6-articulatæ, flagello nullo. Pedes subæqui, similes.

ERICHSONIA ANGULATA.—Elongato-elliptica. Caput et segmenta thoracis ad margines angulata, transversa. Frons excavata, duobis tuberculis supra armata. Segmenta thoracis quatuor antica tuberculum medianum gerentia. Oculi laterales. Abdomen uni-articulatum, oblongum, subscutellatum, margines sinuosum, posticè paulo latius, deinde triangulatum, obtusum. Antennæ internæ fere quadruplo breviores, 4-articulatæ; externæ clavatæ, dimidio corporis longiores, 5-6-articulatæ, articulis tribus ultimis subæquis, penultimo brevior, ultimo obtuso clavato breviter hirsuto. Pedis articulus basalis crassus et tuberculatus.

*Hab.* in portu Rio de Janeiro.

#### Subfamilia 2. CHÆTILINÆ.

Pedes sexti longissimi, setiformes et multiarticulati, non unguiculati; septimi fere similes.

Genus CHÆTILIA, *Dana*.—Antennæ primæ super secundas insitæ; superiores longiores; inferiores flagello multiarticulato confectæ. Pedes septimi sextis valde breviores, non unguiculati, parce multiarticulati. Abdominis opercula prope apicem articulata et ad articulationem lamellam parvulam internam gerentia.

CHÆTILIA OVATA.—Ovata, posticè acuminata. Thorax 7-articulatus, segmento septimo parvulo et partim celato, sexto utrinque acuto. Abdomen 4-articulatum, tribus segmentis transversis, quarto angusto-triangulato, ad apicem subacuto et ciliato. Antennæ lateraliter reflexæ; superiores fere dimidii corporis longitudine, 5-articulatæ, articulis duobus perbrevibus et crassis, tribus reliquis tenuibus, longis, ultimo extus subtiliter setuloso. Antennæ inferiores valde breviores, flagello fermè 10-articulato, articulis basis duobus ultimis anticè setulosis, posticè pubescentibus. Pedes sexti corpore fere duplo longiores, minutè multiarticulati. Pedes septimi perbreves.—Long.  $9'''$ .

*Hab.* in mari prope Rio Negro Patagoniæ.

New Haven, October, 1849.

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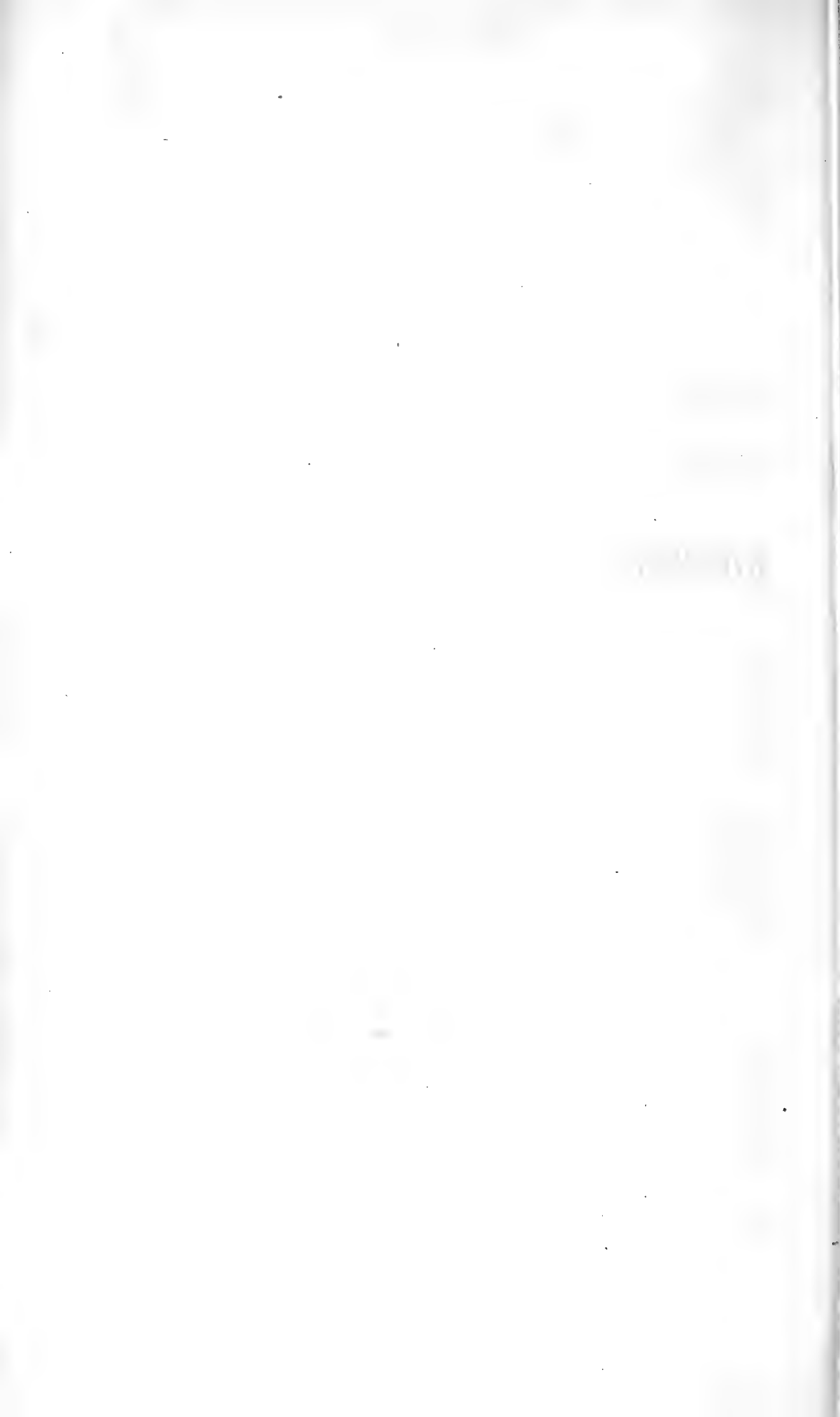
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**CONSPECTUS CRUSTACEORUM, &c.**

**SCHIZOPODA. No. I.**

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Synopsis in generum Crustaceorum Ordo  
Schizopoda

## CONSPECTUS CRUSTACEORUM

QUÆ IN ORBIS TERRARUM CIRCUMNAVIGATIONE,

CAROLO WILKES E CLASSE REIPUBLICÆ FÆDERATÆ DUCE

LEXIT ET DESCRIPSIT

JACOBUS D. DANA.

### ORDO II. CRUSTACEA SCHIZOPODA.

Crustacea Macrourorum pullos affiliantia, branchiis sive externis pedes thoracis abdominisve pertinentibus, sive obsoletis; pedibus pluribus birameis palpo valde elongato; maxillipedibus pedes sequentes sæpe assimilantibus.

#### Tribus I. DIPLOÖPODA.

Pedes thoracis biramei, palpo natatorio, nulli prehensiles. Carapax cephalothoracem plerumque tegens, segmento cephalico non bene discreto.

#### Subtribus I. MYSIDACEA.

Corpus elongatum, subcylindricum. Basis pedum thoracicorum brevis.

#### 1. *Pedes thoracis branchigeri.*

Fam. I. EUPHAUSIDÆ.—Antennæ primæ birameæ. [In speciebus scrutatis segmentum abdominis posticum barbâ nudâ ad extremitatem utrinque armatum.]

Genus 1. THYSANOPODA, (*M. Edwards*).—Oculi symmetrici, breves. Pedes thoracis quatuordecim, duobus posticis obsoletis branchiis exceptis. Flagella duo antennarum primarum elongata.

Genus 2. EUPHAUSIA, (*Dana*).—Oculi symmetrici, breves. Pedes thoracis non unguiculati, numero duodecim, quatuor posticis obsoletis branchiis exceptis. Flagella duo antennarum primarum elongata. Segmentum abdominis posticum acuminatum.

Genus 3. CYRTOPIA, (*Dana*).—Oculi paulo oblongi, apicem externum obliquè gibbosi, lenticulis totis in gibbositate versis. Articulus antennarum primarum primus apicem inferiorem productus. Segmentum abdominis posticum obtusum aut truncatum.

2. *Pedes thoracis abdominisve non branchigeri.*

Fam. II. MYSIDÆ.—Antennæ primæ birameæ, secundæ laminâ basali instructæ. [Pedes thoracis postici nunquam obsoleti?]

1. *Pedum rami ambo thoracicorum extremitatem multiarticulati.*

Genus 1. MYSIS, (*Latreille*).—Pedes thoracis duodecim, maxillipedes numero sex. Antennæ primæ flagellis duobus confectæ. Pedes abdominis parvuli, debiles.

2. *Pedum ramus internus thoracicorum non multiarticulatus, bene unguiculatus. Oculi symmetrici.*

Genus 2. PROMYSIS, (*Dana*).—Pedes thoracis duodecim, maxillipedes sex. Antennæ primæ flagellis duobus laminâque oblongâ confectæ. Pedes abdominis oblongi, natatorii, longitudinem fere æqui. [Segmentum abdominis posticum emarginatum vel bilobatum.]

Genus 3. MYSIDIA, (*Dana*).—Pedes thoracis sexdecim, inter sese similes, toti bene palpigeri. Antennæ primæ flagellis duobus laminâque oblongâ confectæ. Pedes abdominis quarti valde elongati, (an discrimen sexualis tantum). [Segmentum abdominis posticum emarginatum vel bilobatum.]

SYN. Themisto, *Goodsir*. Hoc quoque vocabulum generis Amphipodum auctoritatem prius.

Genus 4. SIRIELLA, (*Dana*).—Pedes thoracis sexdecim, toti bene palpigeri, posteriorum duodecim ramo pediformi apicem setis brevibus mobilibus (instar digitorum) juxta unguem instructo. Antennæ primæ flagellis duobus confectæ, laminâ carentes. Pedes abdominis toti rudimentarii. [Rostrum brevissimum. Segmentum abdominis posticum apicem rotundatum et spinulis ornatum.]

Genus 5. MYTO, (*Krøyer*, Tids. N. R. i. 470).—Pedes thoracis quatuordecim, primi secundi tertii quartique palpigeri, quinti sexti septimi simplices. Appendices caudales segmento que caudali connati, ideoque cauda latè triangulata, margine postico longo. Flagella antennarum primarum non articulata.

3. *Oculi e latere pedicelli externo obliquè spectantes, lenticulis totis parce obliquè versis.*

Genus 6. LOXOPIS, (*Dana*).—Oculi elongati. Antennæ primæ flagellis duobus confectæ, laminâ carentes. Appendices abdominis rudimentarii. [Segmentum abdominis posticum truncatum, vel obtusum, extremitate spinuloso.]\*

Fam. III. Sceletinidæ.—Antennæ primæ simplices, elongatæ; secundæ birameæ.

Genus 1. RACHITIA, (*Dana*).—Carapax anticè acuto-tricuspidatus, post frontem non constrictus—Oculi longi obconici. Segmentum abdominis sextum valde elongatum, [segmentis in specie scrutatâ anticis simul sumtis non longioribus, utroque spinam longam dorsalem gerente.] Antennæ primæ flagello longo tenuissimo confectæ.

Genus 2. Sceletina, (*Dana*).—Carapax anticè acuto-tricuspidatus, paulo post frontem instar colli constrictus, deinde ovatus posticè augustans. Oculi prælongi, obconici. Pedes thoracis elongati duodecim, biramei, ramo pediformi 4-5 articulo, altero

\* Podopsis, *Thompson*, (*Zoological Researches*, i, 59, tab. 59, fig. 1.) pullus (forsan mutilatus) incertæ sedis videtur. Oculi longissimi. Antennæ primæ fere obsoletæ; secundæ laminâ instructæ. Pedes duo longissimi, articulo tenui annulato confecti; reliqui breves. Pedes abdominis natatorii.

Sequentes *Furciliæ* et *Calyptopes* forsan pulli Decapodum aut quorundam Schizopodum; generibus jam enumeratis hoc discrepant: *Ape inferior articuli antennarum primarum primi longè acutèque productus*. Animalia scrutata tota immatura, pedibus plus minus rudimentariis.

Gen. *FURCILIA*, (*Dana*).—Carapax plus minus rostratus. Oculi aperti. Pedes abdominis bene natatorii. Antennæ primæ furcatæ ramis (immaturis?) subæquis 1-2 articulata; segmentum abdominis posticum truncatum, extremitatem sæpius spinulosum. Animalia in mari alto lecta.

Gen. *CALYPTOPIS*, (*Dana*).—Carapax non rostratus, oculos omnino tegens. Antennæ primæ birameæ, ramis (immaturis?) subæquis 1-2 articulata. [Segmentum abdominis posticum truncatum, extremitate sæpius spinuloso.]



(palpo) parce setoso; alii pedes breves quatuor, anteriores. Pedes abdominis rudimentarii. [Segmentum abdominis posticum lineare, truncatum vel emarginatum.]

Hæc animalia Luciferibus paulo affines.

### 3. *Pedes abdominis appendicibus branchiiformibus instructi.*

Fam. IV. CYNTHIDÆ.—Antennæ primæ biramæ, secundæ laminâ basali instructæ.

Genus CYNTHIA, (*Thompson*).—Pedes thoracis quatuordecim, biramei; maxillipedes quatuor. Oculi breves symmetrici.

## Subtribus II. AMPHIONACEA.\*

Corpus depressum, carapace foliaceo. Basis pedum thoracorum elongatus, palpo a corpore remoto.

Fam. I. AMPHIONIDÆ.—Corpus elongatum, abdomine longitudinem mediocri, thorace per carapacem tecto.

Genus AMPHION, (*M. Edwards*).

Fam. II. PHYLLOSOMIDÆ. Corpus latus et breve, abdomine perbrevis aut rudimentario, thorace per carapacem plerumque non tecto.

Genus PHYLLOSOMA, (*Leach*).

## Tribus II. APLOÖPODA.

Pedes thoracis nec biramei nec prehensiles. Corpus gracile, longum.

Fam. I. LUCIFERIDÆ.—Cephalothorax valde elongatus, segmento cephalico (oculos antennisque pertinente) longè attenuato. Oculi tenuiter valdeque elongati.

Genus LUCIFER.—Antennæ primæ simplices, secundæ laminâ basali instructæ. Pedes thoracis quatuor postici (ct. xiii, xiv,) obsoleti; octo precedentes (ct. ix, x, xi, xii,) elongati, setigeri; deinde duo antici (ct. viii,) instar maxillipedum flexi. Maxillipedes duo (ct. vii); maxillæ quatuor (ct. v, vi); mandibulæ (ct. iv,) duæ non palpigeræ.

## Tribus III. STOMATOPODA.

Os mandibulis duobus maxillisque duobus instructum, membris sequentibus pediformibus. Pedes antici (ct. vi) vergiformes, elongati; 8 sequentes chelati; 6 postici aliis remoti, sæpius bifidi.

Fam. 1. SQUILLIDÆ.—Rostrum carapace per articulationem discretum.

Genus 1. SQUILLA.—Digitus manus maximæ intus spinoso-dentatus. Ramus pedum thoracis sex posticorum minor angustus.

Genus 2. GONODACTYLUS.—Digitus manus maximæ integer. Ramus pedum thoracis sex posticorum minor angustus.

Genus 3. CORONIS.—Ramus pedum thoracis sex posticorum minor lamellatus.

Fam. II. ERICHTHIDÆ.—Rostrum carapace non discretum. Branchiæ sæpius rudimentariæ, aut obsoletæ.

Genus 1. SQUILLERICHTHUS.—Erichtho affinis. Digitus manus maximæ intus dentatus.

Genus 2. ERICHTHUS.—Corpus latus. Pars cephalothoracis antica os precedens brevior. Carapax thoracem sæpius omnino tegens. Digitus manus maximæ intus non dentatus.

\* Genus *Cuma* cum affinibus Schizopoda et Macroura affiliat. Forsan Ordo "Cymacea" hic cadit. his dignotus:—Oculi minuti sub carapacem celati: Pedes partim biramei: Appendices caudales prælongi, styliiformes et posticè furcati.—*M. Edwards*, Ann. des Sci. Nat., xiii, 292; *Krøyer*, Tidsk. iii, 503 and ib. N. R., ii, 123; *Goodsir*, Jameson's J., xxxiv, 119, 1843.

Genus 3. ALIMA.—Corpus angustus. Pars cephalothoracis antica os precedens longior. Carapax thoracem sæpius non omnino tegens. Digitus manus maximæ intus non dentatus.\*

### Tribus I. DIPLOPODA.

#### Subtribus I. MYSIDACEA.

#### Familia I. EUPHAUSIDÆ.

#### Genus EUPHAUSIA.

1. EUPHAUSIA PELLUCIDA.—Gracilis. Carapax brevissimè rostratus. Segmenta abdominis margines laterales integra, arcuata. Articulus antennarum primarum primus apicem non productus. Lamina antennarum 2ndarum basalis basi paululo longior. Pedes tenuissimi, articulo ultimo brevissimo, palpo fere triplo breviorè quam pes. Segmentum caudale lamellis caudalibus paulo longius, barbibus subapicalibus salientibus. Branchiæ posticæ subdigitatæ.—Long. 6<sup>'''</sup>. Incolorata.

Hab. in mari Pacifico, prope insulas "Kingsmills;" Lecta Ap. 1841.

2. EUPHAUSIA SPLENDENS.—Carapax brevissimè rostratus; segmenta abdominis quatuor margines laterales integra, subæquè obtusa. Articulus antennarum 1marum primus apicem productus. Lamina antennarum 2ndarum basalis basin non superans. Pedes tenuissimi, articulis tribus ultimis longitudine subæquis, setis longis breviter plumosis palpo plus duplo breviorè quam ramus alter. Segmentum caudale lamellis caudalibus longius, barbibus subapicalibus salientibus. Branchiæ posticæ ramosæ.—Long. 6<sup>'''</sup>.—Paulo rubescens.

Hab. in mari Atlantico, lat. bor. 1°–2°, long. occ. 17°–18°. Lecta diebus 29, 30, Oct. 1838.

EUPHAUSIA GRACILIS.—Carapax brevissimè rostratus. Segmenta abdominis margines laterales subæquè rotundata. Articulus antennarum 1marum primus apicem parè productus et acutus. Lamina antennarum 2ndarum basalis basin multo superans. Pedes tenuissimi, articulis tribus ultimis longitudine subæquis, setis longiusculis, palpo parvulo, quadruplo breviorè quam ramus alter. Segmentum caudale lamellis caudalibus non longius. Branchiæ posticæ ramosæ.—Long. 6<sup>'''</sup>. Parè rubescens.

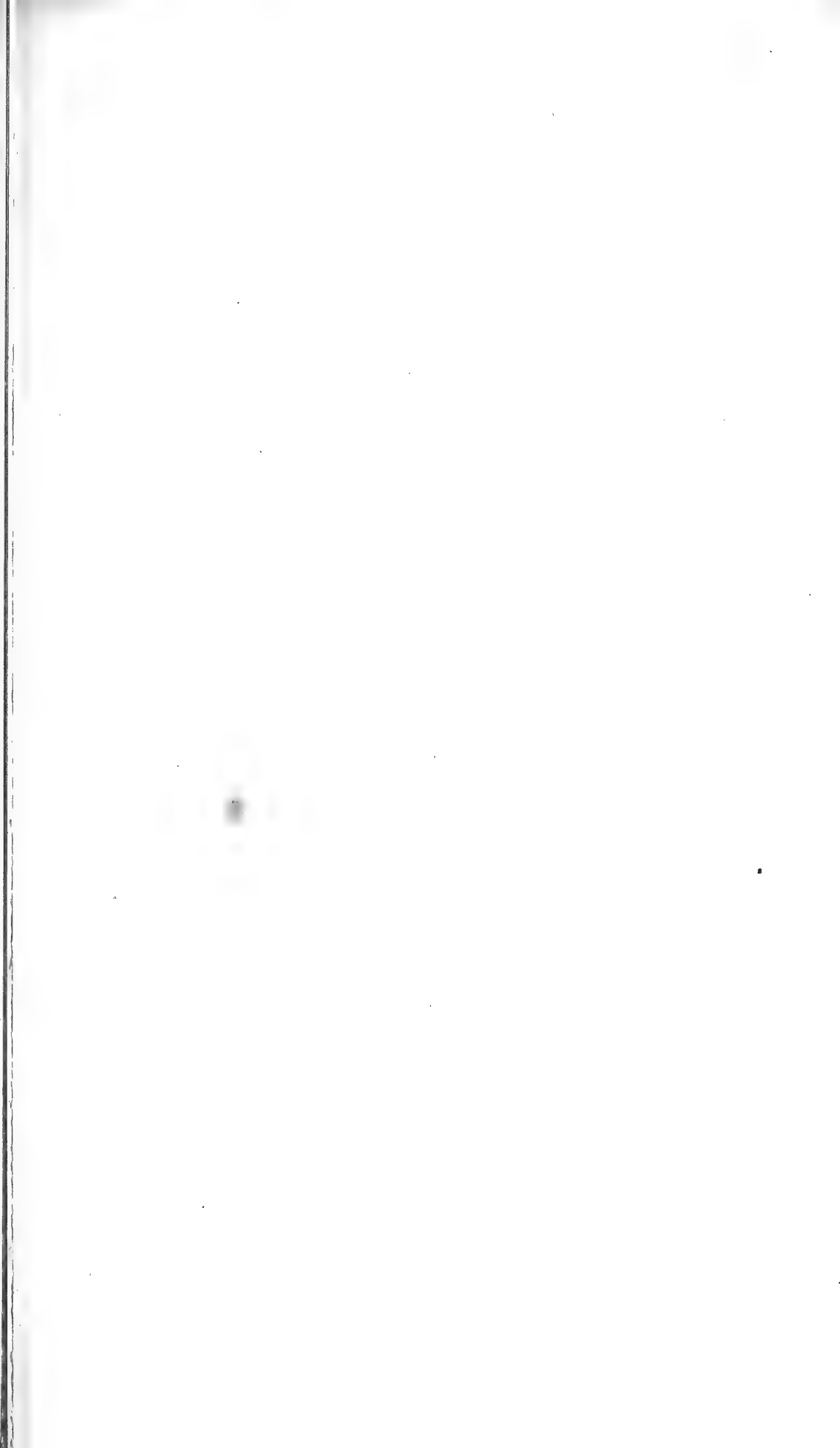
Hab. in mari Pacifico, lat. aust. 15½°, long. occ. 148°; lecta die Sept. 1839.

EUPHAUSIA SUPERBA.—Carapax brevissimè acutè rostratus. Segmenta abdominis margines laterales arcuata, integra, sexto non longiorè. Articulus antennarum 1marum primus apicem productus et obtusus. Lamina antennarum 2ndarum basalis basi vix brevior. Articulus pedum ultimus pertenuis, penultimo multo brevior. Branchiæ posticæ instar rotæ paulo involutæ, ramis subradiatis, arcuiformibus, ramulis seriatis setiformibus. Segmentum caudale laminâ caudali proximâ paululo brevius.—Long. 2<sup>''</sup>. Rubra.

Hab. in mari Antartico, prope long. orient. 150° et lat. aust. 60°.

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\* Longitudo carapacis discrimen Erichthi et Alimæ non semper valet; longitudo partis cephalothoracis os precedentis melius.





## CONSPECTUS CRUSTACEORUM

QUÆ IN ORBIS TERRARUM CIRCUMNAVIGATIONE,  
CAROLO WILKES E CLASSE REIPUBLICÆ FŒDERATÆ DUCE,  
LEXIT ET DESCRIPSIT J. D. DANA.—Pars VI.\*

[Am. Jour. Sci., 2nd Ser., xi, 268.]

**HYAS LYRATUS.**—Carapax† lyratus parce minutè tuberculatus, pone oculos alate expansus, marginibus alæ antico posticoque subæquis, parallelis, margine externo excavato, rostro lævi, cornubus acutis, rectis. Pedes antici subtiliter pubescentes, brachio carpoque margines pustulatis, manu gracili. Pedes 8 postici longi, graciles, subtilissimè pubescentes.

*Hab.* ad oras Oregonenses.

**LIBIDOCLEA COCCINEA.**—Coccinea. Carapax orbiculari-triangularis, sparsim tuberculato-spinosus et paulo subtiliter granulosus, rostro sat brevi. Pedes subtilissimè granulosi, tenues, digito paris 1mi subulato et basin non tumido, articulo paris 2di 3tio valde breviorum quam carapax, tarsoque parce breviorum quam articulus quintus, articulo 4to pedum 8 posticorum supra complanato et lævi. Articulus maxillipedis externi 3tius anticè integer.—Long. 2" 4½'''.

*Hab.* in mari profundo juxta Patagoniam orientalem.

Genus **PUGETTIA**, Dana.—Rostrum, oculos, antennisque externas *Halimo* affinis. Articulus pedum 8 posticorum 5tus cylindricus.

**PUGETTIA GRACILIS.**—Mediocris. Carapax lyratus, paulo convexus, latus, pone oculos utrinque largè triangulato-expansus cum angulo acuto, margine postero-laterali spinâ crassâ armato, latitudine ante-medianâ vix minore quam latitudo post-medianâ, regione medianâ tumidâ, minutè bituberculatâ. Pedes antici crassi, longi, brachio supra carinato, dentato, carpo bicarinato, digitis fere omnino contiguus. Pedes octo postici nudiusculi, articulis 3tio 5toque subcarinatis, 4to dorsum depresso, 5to infra versus apicem penecillum setarum brevissimum ferente.—Long. 16'''.

*Hab.* in maris Oregonensis freto "Puget."

**PUGETTIA RICHII.**—Sat grandis. Carapax subtriangulato-ovatus, pone oculos alatus, alâ bilobatâ, lobis acutis, posteriore elongato et fere transverso; spinâ laterali subposticâ grandi; regione medianâ 4 tuberculis spiniformibus armatâ, cardiacâ uno, postremâ uno, postero-laterali utrinque duobus. Pedes antici longi, crassi, brachio paulo tuberculato, margine antico subtilissimè scalpto, carpo valde cristato, digitis (*maris*) latè hiantibus, apicem denticulatis, digito mobili versus basin infra uniberculato.—Long. 2''.

*Hab.* in mari juxta Californiam.—*W. Rich.*

**MICIPPA HIRTIPES.**—Carapax minutè pustulatus, marginibus lateralibus irregulariter paulo inciso-dentatis, rostro fere verticali, sub-polygonato, juxta antennam externam profundè constricto, apicem triangulatè emarginato, superficiem seriatim pustulato, pustulis setigeris. Oculi longè exserti. Pedes hirsuti.—Long. 7''' ; lat. 6''' . † Long. rostri 3'''.

*Hab.* in mari ad insulam Tongatabu.

\* Vide Partem I, in Nuntiis Acad. Art. Sci. Amer., i, 149; Partem II, ibid. ii, 9; Partem III, ibid. ii, 201; Partem IV, hoc op. [2], viii, 424; Partem V, ibid. ix, 129.

† Vocabulum "Carapax" auctoritate antiquâ non munitum, scientia rogat; masculinum, voce *thorace* exemplo.

‡ Carapaci non corpori dimensiones referendæ.

Genus CHORILIA, Dana.—*Pisæ Chorinoque* affinis. Carapax angustus, triangulatè ovatus, gibbosus, paulo armatus, rostro longo, furcato, cornubus gracilibus. Oculi in orbitis retractiles. Antennæ externæ sub rostrum celantes, articulo primo angusto, apicem externum acuto. Orbita infra interrupta, supra angustè unifissa, spinâ præorbitali acutâ. Pedes 1mi 2dis breviores, 8 postici similes, 2di 3tiis non multo longiores. *Pisâ* quoad antennas externas celatas differt; *Chorino* pedes 2dos 3tiis non multo longiores, 1mos 2dis breviores.

CHORILIA LONGIPES.—Carapax nec villosus nec pubescens, latitudine trans-orbitali perangustâ, triplo minore quam latitudo carapacis maxima, spinâ præorbitali tenui, acutâ, margine orbitali superiore angustè unifisso; rostro longo, pubescente, cornubus fere rectis, parce divaricatis; regione medianâ 4 spinis brevibus armatâ aliisque paucis brevissimis; regione cardiacâ parvâ, inermi, 2-4 tuberculis parvulis ornatâ; regione postero-laterali spinâ crassâ mediocri armatâ aliisque tuberculis parvulis ornatâ. Pedes antici longi, brachio trigono, margines spinuloso; carpo polygonato, margines spinuloso; manu subcarinatâ, subtilissimè tomentosâ.—Long. 1" 7<sup>'''</sup>; lat. 10<sup>'''</sup>.

*Hab.* ad oras Oregonenses.

Genus LAHAINA, Dana.—*Chorilia* quoad pedes antennasque externas celatas affinis. Carapax elongatè ovatus, tumidus, parce armatus; rostri cornubus elongatis, gracillimis, divaricatis. Articulus antennarum externarum 1mus latus, parce longior quam latior, apicem processu spiniformi armatus. Orbita infra supraque sinu rotundato interrupta, dente præorbitali acuto. Pedes toti graciles.

LAHAINA OVATA.—Carapax vix spinosus, subvillosus, papillis postero-dorsalibus rectè flexis, spinâ postero-laterali parvulâ, aliâque posticâ; rostri cornubus corpore paulo brevioribus, tenuibus, valde divaricatis, margine orbitali superiore latè fisso, spinâ anticâ brevè acutâ et lateraliter unidentatâ, posticâ prominenter rectangulatâ non acutâ. Articulus antennarum externarum 1mus apicem spinigerus. Pedes tenues, longi, manu præangustâ, nudâ.

*Hab.* juxta insulam "Maui."

Genus SCYRA, Dana.—*Naxiæ* antennas orbitamque affinis. Rostrum laminatum, acutè furcatum. Articulus antennarum externarum primus undique angustus, apice externo ultra rostrum parce saliente; secundus depressus, tertio valde longior.

SCYRA ACUTIFRONS.—Ovata, fere inermis, rostro brevi, cornubus ovato-lanceolatis, acutis, integris; spinâ præorbitali acutâ; regionibus carapacis valde prominentibus, regione medianâ aliisque profundè sejunctis, cardiacâ simpliciter rotundato-tuberculiformi. Pedes antici elongati, manu carinatâ, brachio angulos pustuloso, carpo 3-4-carinato.

*Hab.* in mari Oregonensi.

Genus CYCLAX, D.—*Mithraci* digitos affinis. Carapax suborbicularis, rostro parvulo, furcato. Oculi prælongi, retractiles, orbitis obliquè transversis. Antennæ externæ rostro remotæ, longæ, articulo primo apicem bi-spinoso, spinâ externâ longâ. Pedes longi; secundi carapace sesqui longiores; toti tenues, fere cylindrici.

**CYCLAX PERRYI.**—Carapax paulo oblongus, convexus, parce pustulatus, rostri cornubus subconicis, acutis, margine orbitæ superiore trispinoso, spinâ anteriore longiore et reflexâ, spinâ præorbitali parvulâ, post-orbitali crassiusculâ; marginibus carapacis antero-lateralibus 5-spinulosis, spinulis remotis, anteriore duplice; margine postico 2-spinuloso. Antennæ externæ dimidio carapacis longiores, pilosæ. Pedes carapace valde longiores, 8 posticis sparsim pilosis, tarso infra paulo piloso.—Long.  $2\frac{1}{2}$ ".

*Hab.* in mari Vitiensi.

**EURYPODIUS SEPTENTRIONALIS.**—Carapax obsoletè villosus, spinis paucis, in regione cardiacâ posterius duabus antierius unâ; spinâ post-orbitali acutâ et anteriore minori vel acutâ vel obtusâ; rostro supra complanato. Articulus antennarum externarum Imus dente subacuto extus ad basin armatus et juxta dentem processu subacuto. Pedes toti fere nudi; antici crassiusculi, brachio carpoque parce tuberculato-spinosis, manu scabro-granatâ, paulo tumidâ, digito cum dente parvulo tuberculiformi intus armato polliceque juxta basin cum dente simili. Pedes 8 postici longi, articulo pedis tertii tertio tuberculis setiferis parvulis biserialis infra ornato, 5to longiore quam quartus, subtilissimè hirsuto, ejus margine inferiore versus apicem brevissimè hirsuto.—Long.  $2'' 7\frac{1}{2}'''$ ; rostri  $7\frac{1}{2}'''$ ; pedis secundi carapace plus duplo major.

*Hab.* in portu "Nassau" Fuegiæ.

**EURYPODIUS BREVIPES.**—*Femina*:—Carapax valde tumidus, spinis paucis, brevibus, in regione cardiacâ posterius duabus antierius unâ; rostro supra complanato, brevior. Articulus antennarum ext. Imus extus ad basin dente armatus et juxta dentem processu subacuto. Pedes breves, hirsuti, primi subtenuis, brachio carpoque cum 3-4ve tuberculos minutos supra armatis, manu lineari, tenui, lævi, margine digiti interno denticulato. Pedes octo postici crassiusculi, valde breviores, articulo 3tio pedis secundi valde brevior quam carapax, articulo 5to lato et crasso, longiore quam quartus, non duplo longiore quam tarsus.—Long.  $1'' 7\frac{1}{2}'''$ ; rostri  $3\frac{1}{2}'''$ ; coxæ pedis secundi  $1''$ , articuli 5ti  $8'''$  ejusque lat.  $2\frac{1}{2}'''$ ; tarsi  $5\frac{1}{3}'''$ .

*Hab.* in portu "Nassau" Fuegiæ.

Genus **OREGONIA**, Dana.—Rostrum, antennas, oculos, spinam postorbitalem pedesque elongatos *Eurypodio* affinis. Pedes tenues, octo postici articulum quintum aliosque subcylindrici, nunquam compressi.

**OREGONIA GRACILIS.**—Carapax breviter sparsimque pubescens, rostro valde longiore quam latitudo inter-orbitalis. Pedes breviter sparsimque pubescentes, tenues; primi secundis paulo breviores, brachio tuberculis minutis supra infraque ornato, manu fere lineari, digito intus prope basin unidentato alioque denticulato. Abdomen *maris* sublineare, margine laterali versus apicem excavato, apice truncato.—Long.  $1'' 7'''$ .

*Hab.* in maris Oregonensis freto "Puget."

**OREGONIA HIRTA.**—Carapax pedesque sparsim hirti, rostro tenui, brevior quam latitudo inter-orbitalis. Pedes paulo breviores; digito pedis antici intus æque denticulato.—Long.  $1'' 5'''$ .

*Hab.* in maris Oregonensis freto "Puget."

**PERICERA TRIGONA.**—Carapax bene triangulatus, triangulo equilaterali, spinâ postero-laterali longâ, crassâ, complanatâ; spinis dorsalibus duobus, unâ medianâ, alterâ cardiacâ; rostro mediocri, cornubus divergentibus; spinâ præorbitali perbrevis, subacutâ. Regio pterygostomiana uni-spinosa. Articulus pedum 3tius minutè tuberculatus et apicem plerumque spinoso-productus; manu tenui, digitis omnino contiguus.—Long.  $1\frac{1}{4}$ ".

*Hab.* in mari Vitiensi. 108-

Genus **TIARINIA**, Dana.—*Pericera* orbitam antennasque affinis. Rostrum bifidum, cornubus plerumque contiguus. Carapax subpyriformis, tuberculatus aut pustulatus, tuberculo cardiaco tuberculis tribus aut pluribus facto. Articulus antennarum ext. Imus latissimus, spinâ apicali non armatus, angulo externo-apicali interdum paulo saliente et subacuto. Orbita bene tubulata. Spina præorbitalis prominens. Pedes 1mi 2dis non longiores.—*Pericera*, cornubus rostri fere contiguus, formâ carapacis, et superficie aggregato-tuberculosâ, differt. *Pericera tiarata* hîc pertinet.

**TIARINIA GRACILIS.**—Carapax pone oculos paulo constrictus, latitudine carapacis maximâ longitudinem post-orbitalem fere æquante, latitudine trans-orbitali sat majore quam dimidium latitudinis maximæ; rostro antennis externis brevior, cornubus apicem parce divergentibus, lateribus non dentigeris. Antennæ externæ ciliatæ, articulo primo angulum externum productum, subacuto, articulis secundo tertioque angustis, ad apicem parce latioribus. Manus tenuis, digitis omnino contiguus. Pedes 8 postici sparsim pubescentes, articulo tertio plus minusve tuberculato.—Long. 6''; lat. 3''.

*Hab.* in mari Suluensi. 111

**TIARINIA ANGUSTA.**—Carapax angustior, pone oculos vix constrictus, latitudine maximâ multo brevior quam longitudo post-orbitalis, latitudine trans-orbitali parce minore quam latitudo maxima; rostro longo, cornubus apicem conspicuè divergentibus, lateribus cum 3-4 dentes minutos remotos armatis. Antennæ externæ rostro dimidio breviores, articulis 2do 3tioque tenuibus. Manus tenuis, digitis omnino contiguus. Pedes 8 postici pubescentes, secundi 3tiis duplo longiores. Articulus 3tius paris antici plus minusve tuberculatus.—Long. 6''; rostri 2''; lat.  $2\frac{1}{2}$ ''.

*Hab.* in mari Suluensi. 113

Genus **PERINIA**, Dana.—*Pericera* affinis. Orbita anticè paulo aperta eoque non bene tubulata, margine superiore non unifisso. Articulus antennarum ext. Imus oblongus, anticè non latior, apicem externum paulo productus. Rostrum breviusculum, cornubus divaricatis. Carapax tumidus, paucis tuberculis tumidis ornatus.

**PERINIA TUMIDA.**—Carapax valde tumidus, brevis (lat. maximâ long. post-rostralem æquante) lateribus rotundatis, regione medianâ convexâ minutè bi-tuberculatâ, regione cardiacâ largè tuberculiformi, laterali tumidè tri-tuberculatâ. Rostrum breve, latitudine trans-orbitali fere duplo brevius. Spina præ-orbitalis brevis, subacuta. Pedes breves, articulis 3tio 4toque spinosè tuberculatis, manu crassâ, digitis latissimè hiantibus, digito mobili prope basin unidentato.—Long.  $3\frac{3}{4}$ ''; lat. plus 3''.

*Hab.* in mari juxta insulam Hawaiiensem "Maui." 117



**MENÆTHIUS ANGUSTUS.**—Carapax sat tuberculatus, perangustus (latitudine multo minore quam longitudo post-rostralis), dentibus lateralibus tribus, duobus anticis bilobatis; rostro longo, emarginato; regione medianâ tumidâ, posticè bituberculatâ et antè triangulatâ notatâ; regione post-medianâ brevi, uni-tuberculatâ; regione intestinali grandi unituberculatâ, margine postico rotundato, integro.—Long.  $5\frac{1}{2}$ ''; lat. 3''.

**MENÆTHIUS AREOLATUS.**—*M. subserrato* affinis. Carapax paulo tuberculatus, tuberculo cardiaco simplice, quoque post-mediano intestinalique simplicibus; rostro integro, mediocri, margine laterali dentibus tribus, primo simplice, secundo paulo duplice. Oculi apicem rotundati et spinâ anticâ alterâque posticâ instructi. Manus oblonga, superficie subtilissimè areolata, digitis plerumque contiguis, denticulis sex. Pedes 2di 1mis longiores.—Long. 2''.

*Hab.* in mari Suluensi.

**MENÆTHIUS INORNATUS.**—Carapax latus, latitudine trans-orbitali dimidio minore quam sive latitudo maxima sive longitudo post-rostralis, pone oculos non constrictus; marginibus lateralibus 3-dentatis, dentibus triangulatis subacutis; rostro brevi, integro; spinâ præorbitali latè triangulatâ; superficie dorsali paululum gibbosâ, regione cardiacâ simplicissimè tuberculatâ, medianâ tumidâ, vix subdivisâ, regione laterali fere planâ. Oculi parce salientes, apicem bene truncati.—Long. 5''; rostri 1''; lat. 4''.

*Hab.* in mari juxta insulam Hawaiensem "Maui."

**ACANTHONYX SIMPLEX.**—*Feminae*: *A. Petiverio* affinis. Carapax parce convexus, tuberculis omnino carens, marginibus lateralibus parallelis, posterius cum dentibus duobus obsoletis ornatis, dente post-orbitali nullo. Pedes antici reliquis parce crassiores, digitis plerumque contiguis, 7-8-denticulatis, denticulis triangulatis, carpo supra cristato, subacuto; paris postici articulus penultimus angustior, angulo inferiore basi nec apici propiore, (in *Petiverio* apici nec basi propiore). Tarsus 8-10 spinulis armatus.—Long. 9''; lat.  $5\frac{2}{3}$ ''.

*Hab.* ad insulas Hawaienses.

**ACANTHONYX DEBILIS.**—*Petiverio* affinis. Carapax paulo convexus, marginibus lateralibus parallelis, regione medianâ obsoletè bi-tuberculatâ, tuberculis setigeris. Pedes antici *maris* reliquis vix crassiores. Digitis parce hiantibus, carpo non cristato. Tarsus pedis postici 12-14 spinulis seriatim armatus; articulus penultimus latè triangulatus, infra obliquè truncatus.—Long. 9''; lat.  $5\frac{2}{3}$ ''.

*Hab.* ad oras Chilenses.

Genus **PELTINIA**, Dana.—*Epialto Acanthonyce* affinis. Carapax latus, sublævis, depressus, rostro brevi complanato, profundè bifido, latitudine transorbitali grandi, quam dimidium carapacis vix angustiore, dente præorbitali prominente, antero-laterali valde producto, postero-laterali parce prominente. Antennæ externæ rostro non celatæ, articulo primo angusto, apicem non dentigero. Oculi non retractiles, breves. Pedes 1mi 2dis breviores. Articulus 8 pedum posteriorum penultimus fere cylindricus infraque non gibbosus.—Antennis apertis *Epialto* differt, *Acanthonyce* congruit; articulo pedum 8 posteriorum penultimo subcylindrico *Acanthonyce* differt. Latitudo transorbitalis *Antilibiniæ* latitudine duplo major; quoque dorsum depressum, rostrum profundius furcatum.

**PELTINIA SCUTIFORMIS.**—Carapax subscutiformis, paulo oblongus, lævis, rostro vix longiore quam latiore, bilobato, angulis antico-lateralibus valde productis setigeris, diametroque gastrico maximo. Margine postero-lateralī dentibus duobus obsolescentibus setigeris notato, regione medianā bi-tuberculatā. Antennæ externæ rostro valde longiores. Pedes tenuēs, antichi inermes, digitis contiguīs.—Long. 2'''.

*Hab.* in portu "Rio Janeiro."

**PELTINIA NODULOSA.**—Carapax suboctagonus, parce oblongus, lævis, angulis duobus lateralibus utrinque productis, obtusis, rostri cornubus triangulatè sejunctis, triangulatis, subacutis; dente præorbitali subacuto, post-orbitali obsoleto, margine postico inermi. Pedes nudī, mediocres, articulis totis manu tarsoque exceptis, plus minusve nodulosus, tarsis infra minutè spinulosus. Antennæ externæ apicem rostri parce superantes.—Long. 3'''.

*Hab.* in mari Vitiensi.

**HALIMUS TUMIDUS.**—Rostrī cornua subconica, latè divaricata: Carapax valde tumidus, latere 4-6 spinulis minutis armato; regione medianā tribus tuberculis parvulis triangulatè ornatā, alio tuberculo obsolescente posteriore; regione cardiacā tuberculis obsolescentibus notatā. Pedes pubescentes, sat breves; manu tenui, basin latiore, digitis fere contiguīs, tenuibus; articulo 5to pedis postici duplo longiore quam latiore. Articulus antennarum ext. Imus apicem externum valde productus extusque 2-3-spinulosus.—Long. 7'''.

*Hab.* ad oras Australiæ orientalis.

**HUENIA SIMPLEX.**—*Maris*:—Carapax lævis, valde elongatus, angustè subtriangularis, lateribus antero-lateralibus longis, anticè convergentibus fere rectis et integris, in latera rostri rectè productis, dente præorbitali nullo, rostro oblongo, valde obtuso, angulo postero-laterali subacuto; margine postico integro; superficie 4-tuberculatā, (regione medianā 3-tuberculatā, cardiacā 1-tuberculatā.) Pedes antichi validi, manu crassā, digitis latissimè hiantibus; articulus pedum 8 posticorum penultimus subcylindricus.—Long. 9½'''.

*Hab.* ad Insulas Hawaienses.

**HUENIA BREVIROSTRATA.**—*Feminae*:—Carapax latus, paulo oblongus, breviter rostratus, utrinque 2-angulatus, angulis salientibus, lateribus inter angulos laterales valde excavatis; superficie carapacis breviter 4-tuberculatā, rostro ad basin valde angustiore quam frons, acuto, non longiore quam latitudo transorbitalis, dente præorbitali vix saliente, obtuso. Manus tenuis, digitis versus basin paulo hiantibus, carpo inermi; articulus pedum 8 posticorum penultimus subcylindricus.—Long. 7½'''.

*Hab.* ad Insulas Hawaienses.

**LEUCIPPA LÆVIS.**—Carapax subtriangulatus, lævis, regione medianā parce tumidā, rostro elongato, furcato, cornubus triangulatis, et triangulatè sejunctis, acutis; marginibus carapacis lateralibus pertenuibus, paulo expansis et subreflexis, 4-dentatis (aut angulatè undulatis), dentibus inæquis, dente posteriore posticè arcuato, hoc margine in superficiem regionis postero-lateralis producto. Regio pterygostomiana 3-dentata (aut instructa uno dente in sinu grandi insito). Pedes nudī, articulo 3tio cristato.

**LAMBRUS RHOMBICUS.**—Carapax paulo transversus, medium latior, subrhombicus, lateraliter posticèque arcuatus, pone oculos non constrictus; superficie inæquali tuberculis parvulis parce ornatâ, regione laterali super basin pedis secundi tuberculo conico armatâ, posterius altero minore; rostro apicem pubescente. Pedes antici margines hirsuti, manu trigonâ, marginibus salientibus inæque dentatis, brachio marginem anticum minutè eroso et superficiem minutè spinuloso. Pedes 8 postici gracillimi, breviter pubescentes.—Long. 10”.

*Hab.* in Archipelago Vitiensi, mari Pacifico.

**CERATOCARCINUS? SPECIOSUS.**—Carapax hexagonus, fere equilateralis, depressus, regionibus partim conspicuis, fronte lato, rectè transverso, subtiliter crenulato, medium emarginato, utrinque juxta oculum valde saliente. Manus digitusque mobilis spinulosi; carpus parce spinulosus; digiti contigui. Pedes 8 postici breviter pubescentes, inermes.—Long. 1½”.

*Hab.* in Archipelago Vitiensi, mari Pacifico.

6a. p. 222

ON THE GENERA *TRAPEZIA* AND *TETRALIA*. BY J. D. DANA.

[Am. Jour. Sci., 2nd Ser., xi, p. 223.]

THE genus *Trapezia*, as instituted by Latreille and accepted by authors, embraces two distinct genera, which are similar in the general form and appearance of the species, but are readily distinguished by several characters. The *Trapezia cymodoce* is the type of the true *Trapeziæ*, the *T. digitalis* or *glaberrima* of the other genus. The following are their characteristics, omitting the points in which they agree.

GENUS *TRAPEZIA*.

*Frons* sinuosus vel 6–8-dentatus.

*Maxillipedes externi* marginem posticum fere transversum; apicesque articularum secundorum inter sese valde remoti.

*Superficies prælabialis* viaque efferens lineâ elevatâ divisæ margoque buccalis anticus utrinque emarginatus, emarginatione viæ efferentis ostio.

*Pedes antici* elongati, brachio extra carapacem valde exserto, margine brachii antico denticulato et apicem anticum acuto, manu fere rectâ, pollice parce deflexo.

*Pedes 8 postici* non unguiculati, tarso apicem pusillè producto et truncato.

*Abdomen* maris sæpius 5-articulatum.

## GENUS TETRALIA.

*Frons* rectus aut rectiusculus, subtilissimè denticulatus.

*Maxillipedes externi* marginem posticum valde obliqui, apices articularum secundorum inter sese paulo remoti.

*Superficies prælabialis* viaque efferens lineâ paulo elevatâ divisæ sed margo buccalis anticus vix emarginatus.

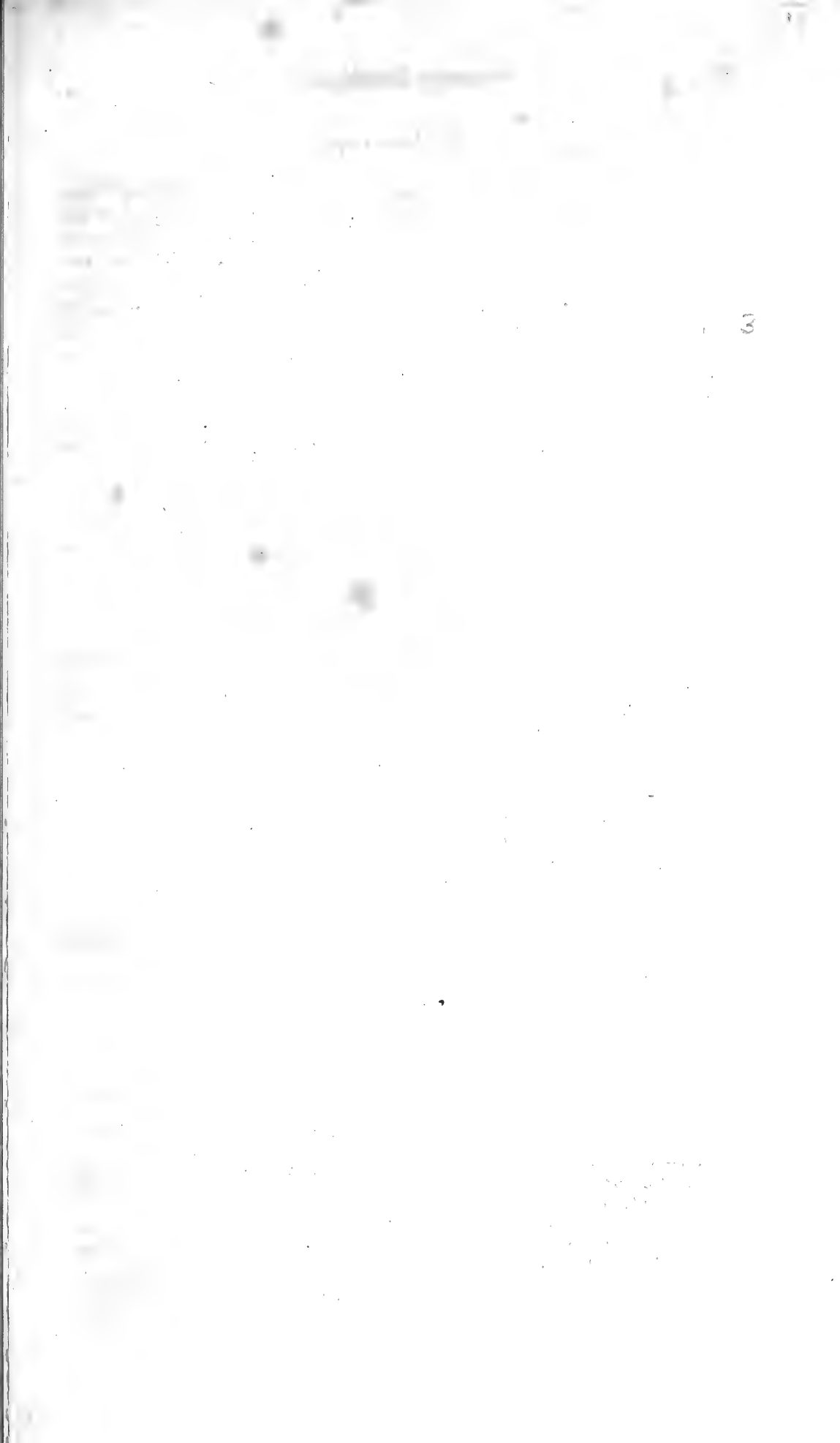
*Pedes antici* breviores, brachio apicem paulo exserto, margine brachii antico apicem rotundato subtiliterque denticulato, pollice valde deflexo.

*Pedes 8 postici*, breviter unguiculati.

*Abdomen* maris 7-articulatum.

The name *Tetralia*, from the Greek τετρα *four*, alludes to the subquadrate form of the species. The *Grapsilla* of M'Leay, as shown by Krauss and others is identical with Trapezia. The want of a proper claw to the tarsus in the Trapezia is a striking character, and is an anomaly among the Cancrinea. The extremity appears truncate in a side view as well as in an upper, and has nothing of the texture of a claw except in its minute points or setæ; while in Tetralia the tarsus is pointed in a side view though somewhat truncate as seen vertically; and the texture of the extremity is horny like a regular claw, which same texture extends back on either side.

In the closed orbits, the antennæ being wholly excluded, and in the ridge separating the efferent canal from the prælabial space as well as the narrow form, these genera are related to Eriphia. Fuller descriptions with many illustrations will be given in the Author's Report on the Crustacea of the Expedition, now ready for the press.



## III. ZOOLOGY.

(pt. 7)

1. *Conspectus Crustaceorum quæ in Orbis Terrarum Circumnavigatione, Carolo Wilkes e Classe Reipublicæ Fœderatæ Duce, lexit et descripsit* JACOBUS D. DANA—(Proceedings of the American Academy of Arts and Sciences, Boston, May 4, 1847, vol. i, p. 150–154, and Nov. 8, 1849, vol. ii, pp. 9–61.)—This *Conspectus* includes descriptions of 183 new species of Entomostraca, collected by Mr. James D. Dana during the cruise of the Exploring Expedition. We here cite the descriptions of the genera and families introduced, as they contain some modifications of those received, and mention only the names of the new species included in the *Conspectus* under each genus. As elsewhere stated, the full Report on the Crustacea of the Expedition is in course of preparation and will be illustrated by drawings of these and the other new species collected.

## ORDO 2. ENTOMOSTRACA.

## SUBORDO 1. GNATHOSTOMATA.\*

Tribus I.—CRUSTACEA CYCLOPACEA (vel Copepoda).†

Familia I. CYCLOPIDÆ.

*Oculi* duo simplices tantum. *Palpi* mandibularum maxillarumque breves aut obsoleti. *Sacculi ovigeri* duo.

Genus I. CYCLOPS.—*Antennæ maris anticæ* subcheliformes aut articulo geniculante instructæ.

Sp. C. brasiliensis, curticaudus, pubescens, MacLeayi, vitiensis.

\* See this Journal, 2nd Ser., i, 225.

† Cyclopæorum membra sunt:—

*Cephalothorax* 4–7-articulatus. *Abdomen* 1–6-articulatum, carapace non tectum. *Frons* sæpissimè rostrata, rostro aut simplice, aut furcato, aut transversim emarginato, aut appendicibus instructo.

*Oculi* duo simplices, pigmento aut connati aut disjuncti; quoque in quibusdam oculi duo coaliti sub capite insistentes; aliis, oculi maximo lenticulo prolato et corneâ latè oblatâ constructi.

*Antennæ anticæ* 4–28-articulatæ, aut simplices, aut appendiculatæ; *posticæ* 2–5-articulatæ et sæpe ramum ferentes, aliis ad apicem setigeræ, aliis subcheliformes.

*Mandibulæ* ad apicem dentatæ, sæpius palpigeræ:—membra cephalothoracis ad normam quarta; itaque breviter denominata ct. iv.

*Maxillæ* duæ (ct. v.) setosæ; sæpe palpigeræ, palpo sive parvulo et vix discernendo, sive setas diffusas ferente.

*Maxillipedes* (vel *Maxillæ*, ct. vi.) duo, aliis parvi et parcius setigeri, aliis crassiores et valde setigeri.

*Pedes anticæ* (ct. vii) duo simplices, aut obsolescentes aut elongati, aliis setigeri, aliis subcheliformes.

*Pedes biremes* decem (ct. viii, ix, x, xi, xii); octo anteriores sæpius natatorii, sed duo anticæ interdum subprehensiles; duo posteriores plurimum obsoleti aut parvuli; in quibusdam masculinis pergrandes et uno ambove prehensiles.

*Abdominis* ad basin pertinentes sæpissimè *pedes spurii*, sive obsolescentes sive oblongi et setis armati; ad extremum, styli caudales duo, unusquisque 4–6 setis plumosis instructus.

*Cephalothorace septem-articulato*, ad segmentum primum antennæ quatuor pertinent; ad secundum, mandibula, maxillæ, et maxillipedes (ct. iv, v, vi); ad tertium,

## Familia II. HARPACTIDÆ.

*Oculi* duo simplices tantum. *Palpi* mandibulorum maxillarumque parvuli, aut obsoleti, setis diffusis non instructi. *Sacculus oviger* unicus. *Antennæ posticæ* setis habitu digitorum ad apicem instructæ.

Genus I.—HARPACTICUS. (*Milne Edwards.*)—*Frons* subrostrata, appendicibus nullis. *Antennæ anticæ maris* subcheliformes, aut articulo geniculante instructæ; *feminæ* basi 2-5 articulata et quasi flagello curto sæpius minutè 5-articulato compositæ, ad apicem basis appendicem brevem ferentes. *Cephalothorax* 4-articulatus. *Pedes antici* subcheliformes mediocres.

SYN.—Arpacticus, et Cyclopsina partim (C. castor excluso), *M. Edwards.*—Nauplius, *Philippi.*—Canthocarpus, *Westwood.*—Doris, *Koch.*—Canthocarpus et Arpacticus, non Cyclopsina, *Baird.*

Sp. H. virescens, concinnus, sacer, linearis, roseus, acutifrons.

Genus II. CLYTEMNESTRA. (*Dana.*)—*Frons* subrostrata, appendicibus nullis. *Antennæ anticæ* flexiles; *maris*, non subcheliformes. *Pedes antici* (ct. vii,) permagni, subcheliformes.

OBS. Non *Arpacticus* Bairdii, *Cyclops chelifer* Arpacticis pertinet. Magnitudo pedum anticorum character genericum non bene validum, nisi pedes pergrandes, quoque pro antennis geniculatis in coitu usitati sunt; ideoque est antennæ *maris* Clytemnestræ non subcheliformes.

Sp. C. scutellata.

Genus III. SETELLA. (*Dana.*)—*Corpus* angustissimum fere lineare, anticè attenuatum et subacutum, et fronte appendices duas parvulas falciformes subtus gerens. *Antennæ anticæ* flexiles, appendice brevi instructæ, setis brevibus; *maris* non subcheliformes. *Pedes antici* (ct. vii) mediocres aut parvi. *Pedes proximè sequentes* lateraliter porrecti, ad apicem breviter setigeri. *Pedes abdominis* elongati et longè setigeri. *Setæ caudales* duæ longissimæ, (in speciebus scrutatis corpore valde longiores, spinulosæ, et strictè appressæ,) reliquæ brevissimæ. (Tubum cibarium sæpius lætè rubrum.)

Sp. S. tenuicornis, longicauda, gracilis, crassicornis, aciculus.

## Familia III. CALANIDÆ.

*Oculi* simplices; etiam sæpe alii duo inferiores deorsum spectantes. *Pedes mandibulares maxillaresque* articulati et longè setigeri. *Sacculus oviger* unicus. *Antennæ anticæ* elongatæ, non appendiculatæ. *Antennæ posticæ* ad apicem setigeræ.

Genera notis sequentibus distinguenda:—

pedes quatuor antici (ct. vii, viii); (cephalo-thorace quadri-articulato, hæc tota adhuc enumerata ad segmentum anticum pertinent;) ad segmenta sequentia, singulatim, duo pedes biremes, (ct. ix, x, xi, xii).

Mandibula est articulus pedis mandibularis primus, et "palpus" articuli sequentes pedis reliqui.

Setæ antennarum plerumque valent ad species distinguendum, et præcipuè illæ articulorum ultimorum. Articulos 2, 3, aut 4, ultimum præcedentes, *subultimos* sæpe vocamus; et eorum setæ, *anteriores* et *posteriores*, scrutandæ et comparandæ.

- |                                                                                                                     |                                                                                                                                            |                                                                                                                    |                                                                                                                  |                                                                                                                                             |               |
|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Oculis inferioribus nullis.                                                                                         | { Antennis anticis nec angulo flexis nec articulatione geniculatis.                                                                        | { Pedibus posticis (ct. xii.) non prehensilibus, sæpe obsoletis.                                                   | { Pedibus anticis (ct. vii.) majoribus quam maxillipedes (ct. vi.), lateraliter porrectis, non geniculatis. .... | 1. CALANUS.                                                                                                                                 |               |
|                                                                                                                     |                                                                                                                                            |                                                                                                                    |                                                                                                                  | { Pedibus posticis elongatis, subulatis, uno subprehensili; pedibus anticis duplo geniculatis, sub corpore gestis, ad apicem deflexis. .... | 2. SCRIBELLA. |
|                                                                                                                     |                                                                                                                                            |                                                                                                                    |                                                                                                                  |                                                                                                                                             | 3. EUCLÆTA.   |
|                                                                                                                     | Antennis anticis angulo levissimè flexis, nunquam articulatione geniculatis; pedibus posticis <i>maris</i> prehensilibus. ....             |                                                                                                                    |                                                                                                                  | 4. UNDINA.                                                                                                                                  |               |
| Oculis inferioribus et superioribus nullis, inferioribus grandibus; antennâ <i>maris</i> anticâ dextrâ geniculante; | { Antennâ <i>maris</i> anticâ dextrâ geniculante.                                                                                          | { Maxillipedibus duplo geniculatis, inflexis, setis longis, nudis. ....                                            | { Max. rectis, setis longis, setulosis. ....                                                                     | 5. CANDACE.                                                                                                                                 |               |
|                                                                                                                     |                                                                                                                                            |                                                                                                                    |                                                                                                                  | 6. CYCLOPSINA.                                                                                                                              |               |
|                                                                                                                     |                                                                                                                                            |                                                                                                                    |                                                                                                                  | 7. CATOPIA.                                                                                                                                 |               |
| Oculis inferioribus et superioribus.                                                                                | { Antennâ <i>maris</i> anticâ dextrâ non geniculante, ambabus flexilibus, setis diffusis; pedibus posticis parvulis, uniaarticulatis. .... | { Antennâ <i>maris</i> anticâ dextrâ geniculante; setis non diffusis; pede postico dextro crasso, prehensili. .... | {                                                                                                                | 8. ACARTIA.                                                                                                                                 |               |
|                                                                                                                     |                                                                                                                                            |                                                                                                                    |                                                                                                                  | 9. PONTELLA.                                                                                                                                |               |

Genus I. CALANUS. (*Leach.*)—*Rostrum* furcatum. *Antennæ anticae* sive leviter curvatæ sive rectæ, *maris* non geniculantes. *Pedes postici* (ct. xii.) obsolescentes, *maris* non prehensiles. *Pedes antici* (ct. vii.) elongati, latè porrecti, maxillipedibus (ct. vi.) majores, non geniculati. *Oculi inferiores* nulli. Cephalothorax 4-5-articulatus. *Rami antennarum posticarum* subæqui, ramo brevior ad apicem 3 setis instructo, in dorso setigero.\*—Hab. in maribus Atlantico et Pacifico.

SYN.—Cyclops, *Müller.*—Calanus, *Leach.*—Cetochilus? *Roussel de Vauzème.*

Sp. C. rotundatus, comptus, nudus, magellanicus, crassus, furcicaudus, arcuicornis, turbinatus, stylifer, curtus, scutellatus, pavo, levis, medius, placidus, recticornis, setuligerus, pellucidus, affinis, flavipes, tenuicornis, sanguineus, mundus, inauritus, simplicicaudus, appressus, communis, amænus, bellus, gracilis, elongatus, attenuatus, rostrifrons, cornutus.

\* Species optimè distinguendæ sunt:—

1. Per gustum antennarum anticarum; etiam per discrimina setarum, præcipuè apicalium et subapicalium; per longitudinem et numerum articularum:

2. Per structuram maxillipedium, et pedium anticorum;

3. Per pedes posticos thoracicos:

4. Per numerum segmentorum cephalothoracis, et characteres segmentorum antici posticique:

5. Per stylos caudales et eorum setas:

Articulatio cephalothoracis non character *generica*. Numerus segmentorum abdominis per ætatem variat, et vix valet *species* distinguere.



Genus II. SCRIBELLA. (*Dana*).—*Antennæ antica* elongatæ, pauciparticulatæ, longè setigeræ, setis diffusis, *maris* non geniculantes. *Antennæ postica* simplices (?). *Maxillipedes* (ct. vi.) maximi, pedibus proximis majores, 4-articulati, geniculati et prorsum flexi. *Oculi inferiores* nulli. *Cephalothorax* 4–5-articulatus, capite non discreto. *Abdomen* valde elongatum, cephalothorace non brevius. *Styli caudales* oblongi, divaricati. [Sæpius, e basi pedis biremis, seta grandis lateraliter porrecta.]—Hab. in maribus Atlantico et Pacifico.

SYN.—Scribella, *D.*, Amer. Jour. Sci., Ser. 2da, i, 227.

Sp. S. scriba, setiger, abbreviata.

Genus III. EUCHÆTA. (*Philippi*).—*Frons* acuta. *Rostrum* transversim emarginatum. *Antennæ antica* duplo leviter curvatæ, nunquam minimè angulo flexæ, *maris* non geniculantes. *Pedes maris postici* (ct. xii.) ambo valde elongati, subulati. *Pedes antici* (ct. vii.) maxillipedibus (ct. vi.) majores, duplo geniculati et sub corpore gesti, penecillum setarum nudarum reflexum ferentes. *Oculi inferiores* nulli. *Cephalothorax* 4–5-articulatus, capite non discreto.—Hab. in maribus Atlantico et Pacifico.

SYN.—Euchæta, *Philippi*, Archiv für Naturgeschichte, vol. ix, p. 55.—Euchirus, *Dana*, Amer. Jour. Sci., Ser. 2da, i, 228.

Sp. E. communis, concinna, pubescens, diadema.

Genus IV. UNDINA. (*Dana*).—*Antennæ antica* ante medium angulo leviter flexæ, ad apicem fronte posteriores, *maris* non geniculantes. *Pedes postici* (ct. xii.) *maris* grandes, dextro subcheliformi. *Pedes antici* (ct. vii.) elongati, maxillipedibus sæpe majores et valde porrecti, non geniculati. *Oculi inferiores* nulli. *Cephalothorax* 4–5-articulatus, capite non discreto.—Hab. in maribus Atlantico et Pacifico.

Sp. U. vulgaris, simplex, inornata.

Genus V. CANDACE. (*Dana*).—*Frons* quadrata. *Oculi inferiores* obsoleti. *Antennæ antica* regulariter et breviter setigeræ, transversæ; dextrâ *maris* articulatione geniculante. *Maxillipedes* (ct. vi.) pedibus proximis majores, duplo geniculantes et inflexi, 4-articulati, setis nudis, longis. *Pedes maris postici* dispares, dextro prehensili. *Abdomen* mediocre. *Styli caudales* breves, setis strictè appressis. [Animal sæpius partim nigrescens.]—Hab. in maribus Atlantico et Pacifico.

SYN.—Candace, *D.*, Amer. Jour. Sci., Ser. 2da, i, 228. 1846.

Sp. C. ornata, pachydactyla, ethiopica, curta, acuta, truncata.

Genus VI. CYCLOPSINA. (*Milne Edwards*).—*Rostrum* furcatum. *Antennæ antica* sive rectæ sive leviter curvatæ, *maris* dextrâ articulatione geniculante. *Maxillipedes* (ct. vi.) pedibus proximis majores, non geniculati, setis longis spinulosis instructi. *Oculi inferiores* nulli. *Cephalothorax* 4–7-articulatus, capite sæpe discreto. *Antennæ postica* iisdem *Calani* similes. *Pes maris posticus dexter* grandis et prehensilis. [Maxillipedes, et antennam *maris* anticam pedemque posticum dextrum, *Pontellæ* affinis; antennam posticam, oculos, et habitum, *Calano* similis. *Si oculi inferiores* adsunt, species *Pontellæ* pertinent.]—Hab. in maribus Atlantico et Pacifico.

SYN.—Cyclopsina (*C. castor*), *Milne Edwards*.—Cetochilus? *Roussel de Vauzème*.—Monoculus (*M. castor*), *Jurine*.—Cyclops (*C. castor*), *Desmarest*.—Dioptomus (*D. castor*), *Westwood*.—Non Cyclopsina *Bairdii*.

Sp. C. longicornis, calanina, tenuicornis, gracilis.

Genus VII. CATOPIA. (*Dana*).—Antennas posticas et antennarum habitum anticarum *Calano* affinis. Antennam *maris* anticam dextram *Pontellæ* affinis. *Oculi* superiores nulli; oculus inferior unicus (?)—Hab. in mari Sinensi.

Sp. C. furcata.

Genus VIII. ACARTIA. (*Dana*).—*Antennæ anticæ* rectiusculæ, flexiles, setis irregulariter diffusis, dextrâ *maris* non geniculante. *Maxillipedes* (ct. vi.) pedibus proximis majores, recti, setis setulosis longis instructi. *Pedes postici* (ct. xii.) parvuli, uni-articulati, 2 setas divaricatas gerentes. *Oculi* duo inferiores et duo superiores. *Setæ caudales* mediocres.—Hab. in maribus Atlantico et Pacifico.

Sp. A. limpida, negligens, tonsa, laxa.

Genus IX. PONTELLA.—*Rostrum* furcatum. *Oculi* duo superiores, pigmentis sive coalitis sive remotis; duo inferiores coaliti. *Antennæ anticæ* multiarticulatæ, setis non diffusis, antennâ dextrâ *maris* geniculante. *Cephalothorax* 4-7-articulatus, segmento cephalico sæpe discreto. *Maxillipedes* (ct. vi.) grandes, recti, setis longis, setulosis. *Pedes antichi* (ct. vii.) minores. *Pes maris posticus* (ct. xii.) *dexter* crassus, prehensilis.—Hab. in maribus Atlantico et Pacifico.

SYN.—*Pontia*, *Milne Edwards*.—*Irenæus*, *Goodsir*.—*Broteas*, *Lovén*.

Sp. P. elliptica, brachiata, plumata, turgida, curta, contracta, media, crispata, detruncata, simplex, exigua, agilis, acutifrons, acuta, rubescens, emerita, regalis, perspicax, strenua, protensa, hebes, frivola, detonsa, argentea, speciosa, princeps, fera.

#### Familia IV. CORYCÆIDÆ.

*Oculi* duo grandes plus minusve remoti, lenticulis duobus prolatis maximis, et corneis oblatis instar conspicillorum, constructi; quoque duo oculi connati minutissimi. *Antennæ anticæ* pauci-articulatæ, simplicissimæ. *Antennæ posticæ* simplicissimæ. *Pedes mandibulares maxillaresque* brevissimi. *Sacculi ovigeri* duo.

Genus I. CORYCÆUS. (*Dana*).—*Corpus* crassum, anticè rotundatum. *Conspicilla* fronte affixa. *Antennæ posticæ* pedibus anticis majores. *Pedes antichi* sexu vix dissimiles digito subuncinato tenuique confecti. *Abdomen* pauci-articulatum, appendicibus basis nullis, stylis caudæ styliformibus.—Hab. in maribus Atlantico et Pacifico.

SYN.—*Corycæus*, *D.*, Proc. Acad. Nat. Sci. Philad., 1847; Am. Jour. Science, Ser. 2da, i, 228.

Sp. C. gracilis, decurtatus, deplumatus, varius, longistylis, obtusus, crassiusculus, laticeps, vitreus, agilis, orientalis, lautus, speciosus, remiger, latus, venustus, pellucidus, concinnus, productus, longicaudatus.

Genus II. ANTARIA. (*Dana*).—*Corpus* crassum, antice rotundatum. *Conspicilla* fronte affixa. *Antennæ posticæ* parvæ, ad apicem breviter setigeræ, pedibus anticis (ct. vii.) non majores, carpo posticè angulato. *Pedes antichi* sexu vix dissimiles (?), digito tenui subuncinato. *Abdomen* pauci-articulatum. [Cephalothorax postice obtusus.]—Hab. in maribus Atlantico et Sinensi.

Sp. A. crassimana, gracilis, obtusa.

\* *Pontia* Papilionum generis vocabulum, itaque *Pontella* nobis scripsa.

Genus III. COPILIA. (*Dana*.)—*Corpus* depressum, fronte latè quadratum, et conspicilla ad angulos anticos gerens. *Antennæ posticæ* digitiformes, digito elongato, subulato. *Abdomen* pauci-articulatum, appendicibus ad basin nullis.—Hab. in mari Pacifico.

Sp. C. mirabilis, quadrata.

Genus IV. SAPPHIRINA. (*Thomson*.)—*Corpus* depressum. *Sexus* antennas posticas stylosque caudales similes, et abdomen pedesque anticos (ct. vii., vere maxillipedes,) dissimiles. *Antennæ posticæ* pediformes, digito tenui, 2-articulato, ad apicem unguiculato. *Abdomen feminae* 5-6-articulatum, thorace subito angustius, appendices breves ad basin latere gerens; *maris* 4-5-articulatum, thorace subito non angustius, appendicibus nullis. *Pedes maris antici* digitum elongati, *feminae* breves. *Styli* caudales laminati.—*Mares* sæpe lætè opalini aut fulgidè metallini, interdum cærulei. *Feminae* sæpius incoloratæ, plus minusve pellucidæ; interdum opacæ et azuleæ.—Hab. in maribus Atlantico et Pacifico.

Sp. S. iris, angusta, elongata, metallina, coruscans, inæqualis, ovata, splendens, ovalis, detonsa, indigotica, orientalis, ovato-lanceolata, gemma, bella, opalina, versicolor, tenella, obesa, obtusa.

#### Familia V. MIRACIDÆ.

*Oculi* duo conspicillis maximis constructi. *Antennæ posticæ* ad apicem setigeræ. *Pedes mandibulares maxillaresque* brevissimi. *Abdomen feminae* (an *maris*?) 6-articulatum. *Sacculus ovigerus* unicus.

Genus MIRACIA. (*Dana*.)—*Corpus* elongatum, non depressum, ad frontem duas appendices falciformes subtus gerens. *Antennæ anticæ* appendiculatæ, flexiles et non geniculantes. *Pedes antici* (ct. vii.) mediocres, uni-unguiculati; *pedes* duo sequentes biremes, lateraliter porrecti. *Pedes abdominis* longè setigeri. *Setæ caudales* elongatæ.—*Setellæ* affinis, sed conspicilla oculorum diversæ.—Hab. in maribus Atlantico et Pacifico.

Sp. M. efferata, gracilis.

#### Tribus II. DAPHNIACEA (vel Cladocera).

*Corpus* testâ plerumque tectum, capite antennisque posticis sæpius exclusis. *Pedes* plures natatorii. *Antennæ anticæ* sæpe obsoletæ, raro elongatæ. *Oculus* compositus. [Membra tota cephalothoracis mandibularia, maxillaria, pediformiaque, numero 12-16.]

Familia sunt:—

1. PENILIDÆ.—*Pedes* duodecim. *Antennæ anticæ* obsolescentes.
2. DAPHNIDÆ.—*Pedes* decem. *Antennæ anticæ* sive obsoletæ sive uni-articulatæ.
3. BOSMINIDÆ.—*Pedes* decem. *Antennæ anticæ* elongatæ, multi-articulatæ.
4. POLYPHEMIDÆ.—*Pedes* octo. *Antennæ anticæ* obsolescentes.

#### Familia I. PENILIDÆ.

Genus PENILIA. (*D.*)—*Caput* discretum, longè rostratum. *Antennæ posticæ* grandes, ramis duobus 2-articulatis. *Abdomen* non inflexum, stylis duobus corneis confectum.—Hab. in maribus prope oras.

Sp. P. avirostris, orientalis.

## Familia II. DAPHNIDÆ.

Genus I. DAPHNIA.—*Abdomen* inflexum. *Antennæ anticæ* obsolescentes. *Antennæ posticæ* birameæ, ramis 3-4-articulatis. *Intestina* non convoluta.—Hab. in stagnis.

Sp. *D. textilis*, *australiensis*, *macrura*.

Genus II. SIDA.—*Abdomen* rectum. *Antennæ anticæ* fere obsoletæ. *Antennæ posticæ* birameæ, uno ramorum 2-articulato. *Intestina* non convoluta.—Hab. in stagnis.

Sp. *S. angusta*.

Genus III. LYNCEUS.—*Abdomen* inflexum. *Intestina* convoluta. *Antennæ anticæ* fere obsoletæ. *Antennæ posticæ* parvæ.

Sp. *L. latifrons*.

## Familia IV. POLYPHEMIDÆ.

*Pedes* octo. *Oculus* maximus.

Genus POLYPHEMUS.—*Caput* discretum magnum. *Antennæ* birameæ, validæ.—Hab. in mari.

Sp. *P. brevicaudis*.

## Tribus III. CYPRIDACEA (vel Ostracoda).

*Corpus* testâ bivalvi omnino tectum, posticè incurvatum, capite antennisque nunquam exclusis. *Pedes* nulli biremes nec natatorii. *Oculi* vel simplices vel compositi. *Antennæ* quatuor. [Membra cephalothoracis mandibularia, maxillaria, pediformiaque numero decem.]

Genus I. CYPRIS. (*Müller.*)—*Testa* integra ad frontem nec perforata nec incisa. *Oculus* unicus. *Antennæ anticæ* setigeræ, subnatatoriæ. *Antennæ posticæ* subpediformes, setigeræ. *Pedes mandibulares* 3-5-articulati. *Maxillæ* quatuor, breves. *Pedes* quatuor, duo uncinis longè confecti, duo sequentes graciles, 4-5-articulati, ad ova pertinentes.—Hab. in stagnis.

Sp. *C. speciosa*, *albida*, *chilensis*, *pubescens*, *vitiensis*.

Genus II. CYPRIDINA. (*Milne Edwards.*)—*Testa* breviter rostrata corpus omnino tegens, et clausa. *Oculi* duo compositi, remoti. *Antennæ anticæ* setis paucis inæquis ad apicem instructæ, setis rectis, sæpe divaricantibus, vix natatoriis. *Antennæ posticæ* 5-7 articulis brevissimis longè et plumosè setigeris confectæ. *Pedes mandibulares* 5-articulati, digitiformes, apicem unguiculati. *Maxillæ* sex, breves, breviter setigeræ, paris secundi laminam ciliatam ad basin gerentes, setis longis, plumosis. *Pedes* duo, longissimè vermiformes, omnino flexiles, ad ova pertinentes, ad apicem setis spinulosis partim reversis armati. *Abdomen* spinulis biseriatis confectum.—Hab. in maribus Pacifico et Atlantico.

Sp. *C. luteola*, *punctata*, *olivacea*, *gibbosa*, *formosa*.

SYN. *Asterope*, *Philippi*.

Genus III. CONCHÆCIA. (*Dana.*)—*Testa* interdum breviter rostrata, corpus omnino tegens, fronte apertâ. *Oculi* simplices. *Antennæ anticæ* 3-4-articulatæ, apicem longè setigeræ. *Spiculum* inter antennas sarcosum, simplex, exsertile. *Antennæ posticæ* 5-7-articulatæ, articulis brevissimis longè setigeris confectæ, ramo altero brevi. *Pedes man-*

*dibulares* fermè 5-articulati, non unguiculati, apice articuli primi interno et sæpius basi secundi interno simul corneis (instar mandibulæ) et denticulatis. *Maxillæ* quatuor. *Pedes* quatuor, tenues. *Abdomen* spinulis biseriatis confectum.—Hab. in maribus Pacifico et Atlantico.

Sp. C. *agilis*, rostrata, brevirostris, inflata.

## SUBORDO 2. CORMOSTOMATA.

*Os* rostriformis.—Tribus quatuor sequentes :—

I. MONSTRILLACEA.—Corpus elongatum (Cyclopiforme). *Maxillæ* pedesque antici obsoleti. *Pedes* postici octo natatorii.

II. CALIGACEA.—Corpus sæpius depressum. *Maxillæ* pedesque toti numero 12–14, octo pedes ultimi plerumque natatorii, plurimi testâ tecti.

III. LERNÆACEA.—Corpus depressum aut vermiforme. *Antennæ* pedesque partim obsoleti.

IV. NYMPHACEA.—Corpus breve, araneiforme, abdomine obsolescente.

### Tribus I. MONSTRILLACEA.

Genus MONSTRILLA. (*Dana*).—*Cephalothorax* fere cylindricus, 4-articulatus. *Abdomen* 5–6-articulatum. *Antennæ* duæ. *Oculi* duo simplices; quoque oculus inferior sicut *Pontellis*. *Truncus buccalis* parvulus subconicus, maxillis pedibusve non munitus. *Pedes* octo, natatorii.—Hab. in mari “Sulu.”

Sp. M. *viridis*.

### Tribus II. CALIGACEA.

Familie quinque sequentes :—

1. ARGULIDÆ.—Corpus anticè latè peltatum. *Ovarium* externum nullum. *Pedes* antici largè tubulati, suptatorii.

2. CALIGIDÆ.—Corpus anticè latè peltatum. *Ovarium* externum tubiforme, rectum, ovis uniseriatis. *Pedes* quatuor antici subprehensiles. *Antennæ* posticæ carapacè tectæ.

3. DICHELESTIDÆ.—Corpus depressum, valde angustum. *Antennæ* posticæ carapacè non tectæ. *Ovarium* externum tubiforme, ovis uniseriatis.

4. ERGASILIDÆ.—*Corycæis* affines. Corpus vix depressum, plus minusve Cyclopiforme. *Antennæ* posticæ carapacè non tectæ. *Ovarium* externum elongatum aut sacculiforme, ovis non uniseriatis.

5. NICOTHOIDÆ.—Corpus plerumque Cyclopiforme, sed e lateribus longissimè alatum. *Ovarium* externum sacculiforme, ovis non uniseriatis.

### Familia II. CALIGIDÆ.

Subfamilie Caligidarum nobis sunt :—

1. CALIGINÆ.—*Truncus buccalis* subovatus, obtusus. *Maxillæ* truncato buccali remotiusculæ, posticè aculeo-elongatæ. *Tubum ovigerum* externum rectum. Corpus anticè latius. (Genera sunt *Caligus*, *Lepeophtheirus*, *Chalimus*, *Caligeria*, *Calistes*.)

2. PANDARINÆ.—*Truncus buccalis* tenuis acuminatus. *Maxillæ* ad truncum buccalem appressæ, parvulæ, lamellatæ. *Tubum ovigerum* externum rectum. Corpus posticè interdum latius. (Genera sunt *Pandarus*, *Trebius*, *Nogagus*, *Specilligus*, *Dinematura*, *Phyllophora*, *Euryphora*, *Lepidopus*.)

3. CECROPINÆ.—Truncus buccalis tenuis, acuminatus. Maxillæ ad truncum buccalem appressæ. Tubum ovigerum externum sub testam convolutum. Corpus posticè latius. (Genera sunt *Cecrops*, *Læmargus*.)

Caligaceorum segmenta corporis auctoribus sæpe malè data. Segmentum *abdominis* anticum, ovarium externum gestans, *thoracis* posticum sæpe vocatum.\* In Cyclopaeis Caligaceisque ovarium externum ad segmentum secundum abdominis *normalem* semper pertinet. His animalibus et Cyclopaeis Crustaceisque aliis comparatis, affinitates verè educuntur. Tabula sequens, membris ordine enumeratis, hæc comparisonem exhibet.

SEGMENTA.	ASTACUS.	LUCIFER.	CYCLOPS.	PONTELLA	CALIGUS.	PENILIA.	DAPHNIA.	CYPRIS.
1. <i>Cephalo-thoracis.</i>								
I.	Oculi	Oculi	00	00	00	00	00	00
II.	Ant. I.	Ant. I.	Ant. I.	Ant. I.	Ant. I.	Ant. I.	00	Ant. I.
III.	Ant. II.	Ant. II.	Ant. II.	Ant. II.	Ant. II.	Ant. II.	Ant. II.	Ant. II.
IV.	Mand.	Mand.	Mand.	Mand.	Mand.	Mand.	Mand.	Mand.
V.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.
VI.	Max.	Max.	Maxd.	Maxd.	P. verg.	P. nat.	P. nat.	Maxd.
VII.	Maxd.	Maxd.	P. preh.	P. preh.	P. preh.	P. nat.	P. nat.	P. verg.
VIII.	Maxd.	Maxd.	P. nat.	P. nat.	P. nat.	P. nat.	P. nat.	P. ovar.
IX.	Maxd.	P. subnat.	P. nat.	P. nat.	P. nat.	P. nat.	P. nat.	00
X.	P. chel.	P. subnat.	P. nat.	P. nat.	P. nat.	P. nat.	P. nat.	00
XI.	P. verg.	P. subnat.	P. nat.	P. nat.	P. nat.	P. nat.	00	00
XII.	P. verg.	P. subnat.	0 vel 00	P. genit.	00	00	00	00
XIII.	P. verg.	0	00	00	00	00	00	00
XIV.	P. verg.	0	00	00	00	00	00	00
2. <i>Abdominis.</i>								
I.	P. rud.	P. rud.	0 vel P. rud.	0 vel 00	0 vel 00	P. rud.	0 vel P. rud.	0 vel 00
II.	P. rud.	P. rud.	0	0	0	0	0	0
III.	P. rud.	P. rud.	0	0	0	0	0	0
IV.	P. rud.	P. rud.	0	0	0	0	0	0
V.	P. rud.	P. rud.	0	0	0	0	0	0
VI.	Ap. caud.	Ap. caud.	Ap. caud.	Ap. caud.	Ap. caud.	Ap. caud.	Ap. caud.	Ap. caud.
VII.	0	0	00	00	00	00	00	00

In hæc tabulâ abbreviationes sequentes:—

<i>Ant.</i>	Antennæ.	<i>P.</i>	Pedes.	<i>Preh.</i>	Prehensiles.
<i>Ap.</i>	Appendices.	<i>Chel.</i>	Cheliformes.	<i>Ovar.</i>	Ovariani vel ovarium.
<i>Mand.</i>	Mandibulæ.	<i>Verg.</i>	Vergiformes.	<i>Rud.</i>	Rudimentarii.
<i>Max.</i>	Maxillæ.	<i>Nat.</i>	Natatorii.	<i>Caud.</i>	Caudales.
<i>Maxd.</i>	Maxillipedes.	<i>Subnat.</i>	Subnatatorii.		

0. Membra segmenti obsoleta.

00.. Segmentum ejusque membra simul obsoleta.

#### Subfamilia I. CALIGINÆ.

Genus I. CALIGUS.—*Cephalothorax* 2-articulatus; segmento antico latè peltato, fronte discis duobus suclatoriiis plerumque instructâ; postico parvulo, non alato. *Oculi* simplices pigmento unico conjuncti. *Antennæ posticæ* prehensiles, et extus basin spinâ crassâ sæpius munitæ. *Pedes* duo antici vergiformes, bifidi; † duo proximi sequentes subprehensiles digito acuto confecti; sex sequentes natatorii; duo reliqui simplices, vergiformes. Venter furculâ parvulâ armatus. *Abdomen* 2-3-articulatum, appendicibus caudalibus sublamellatis, marginem setigeris. [Sexus antennas posticas, pedes paris secundi et formam abdominis, valde dissimiles.]

Sp. C. thymni, productus, gracilis, (Lepeophtheirus) bagri.

\* Vide "*Hist. Nat. des Crustaces*, par M. Milne Edwards," iii, 445 et seq.

† Extremitas bifida articulo tertio et apice secundi elongato composita.

Genus II. CALISTES. (*Dana.*)—*Caligo* similis. *Cephalothorax* 2-articulatus, segmento postico non alato. *Pedes duo postici* biramei, subnatatorii.

*Trebio* affinis, sed cephalothorax non 3-articulatus et maxillæ nec lamellares, nec ad truncum buccalem appressæ.

Sp. C. trigonis.

Genus III. CALIGERIA. (*Dana.*)—*Caligo* similis. *Cephalothorax* 2-articulatus, segmento postico bialato. *Pedes duo postici* biramei, setis brevibus, non natatoriis.

Sp. C. bella.

#### Subfamilia 2. PANDARINÆ.

Genus I. NOGAGUS. (*Leach.*)—*Cephalothorax* 4-articulatus, fronte arcuatâ, segmento secundo ad latera posticè producto, duobus sequentibus non alatis. *Abdomen* stylis brevibus sublamellatis setigerisque confectum. *Oculi* simplices, remotiusculi: (an quoque oculus subtilissimus intermedius?). *Pedes* paris secundi crassè cheliformes; pedes natatorii octo, grandes.

Sp. N. validus.

Genus II. SPECILLIGUS. (*Dana.*)—*Nogago* segmenta cephalothoracis pedesque affinis. *Oculi* duo remotiusculi, et *conspicillis grandibus* instructi, eisque Sapphirinæ similes.

Sp. S. curticaudus.

Genus III. PANDARUS. (*Leach.*)—*Cephalothorax* 4-articulatus, carapace grandi, segmentis sequentibus transversis, secundo ad latera alatè producto, tertio quartoque posticè alatis, et bilobatis. *Abdomen* 2-3-articulatum, segmento ultimo tecto, secundo posticè rotundato et utrinque stylis caudalibus sæpius munito. *Pedes* paris secundi crassè cheliformes; natatorii octo, setis brevissimis. *Oculi* duo, remotiusculi. *Styli caudales* styliformes, acuti, subnudi.

Sp. P. concinnus, satyrus, brevicaudus.

Genus IV. DINEMATURA. (*Latreille.*)—*Cephalothorax* 3-articulatus, segmento secundo parvo, testâ tertii dorsali posticè valde expansâ et profundè bilobatâ, eoque elythroideâ. *Abdomen* 2-articulatum, carapace paulo angustius, oblongum, segmento antico maximo, posticè bilobato, postico parvulo, celato. *Styli caudales* lamellati, terminales.

Sp. D. braccata.

Genus V. LEPIDOPUS. (*Dana.*)—*Corpus* anticè non latius. *Cephalothorax* 3-articulatus, carapace minore quam abdomen, segmentis duobus sequentibus posticè largè bialatis. *Abdomen* 2-articulatum, segmento postico parvulo, celato, antico maximo et posticè bilobato. *Antennæ posticæ* articulo tenui falciformi confectæ. *Pedes paris secundi superficie terminali latâ prehensili squamatâ instructi*. *Pedes natatorii* quatuor ultimi similes, latè lamellati.

Sp. L. armatus.

#### Tribus IV. NYMPHACEA.

Genus ASTRIDIUM. (*Dana.*)—*Pycnogono* affinis. *Caput* duobus maxillipedibus subtus instructum parvulis, debilibus, ad apicem obtusis, non prehensilibus. *Pedes* octo unguiculo confecti. *Abdomen* perbreve.

Sp. A. orientale.

*[The text in this image is extremely faint and illegible due to heavy noise and low contrast. It appears to be a multi-column document, possibly a ledger or a list, with several columns of text. A prominent diagonal crease or tear is visible across the middle of the page.]*



Conspectus Crustaceorum quæ in Orbis Terrarum circumnavigatione, Carolo Wilkes e Classe Republicæ Fœderatæ Duce.

Lexit et descripsit J. D. DANA.

[Ex Academiæ Scientiarum Naturalium Philadelphiensis, Nuntiis, anno 1851, p. 247.]

Descriptio Familiarum Subfamiliarum Generorumque Crustaceorum Grapsoideorum in Ephemeride Scientiarum Americana Sillimani, vol. xii, p. 283, anno 1851, auctore edita. Synopsis brevis Familiarum et Subfamiliarum sequens —

CRUSTACEA GRAPSOIDEA, (CYCLOMETOPA, Edwardsii.)

1. ARTICULUS MAXILLIPEDIS EXTERNI 4TUS ANGULO 3TII INTERNO ARTICULATUS.

Fam. I. GONOPLACIDÆ, vel GRAPSOIDEA CANCRIDICA. Gen. *Eucrate* De Haan, *Curtonotus* De H. (*Pseudorhombila*, Edw.), *Gonoplax* Leach.

2. ARTICULUS MAXILLIPEDIS EXTERNI 4TUS ANGULO 3TII INTERNO NON ARTICULATUS.

Fam. II. MACROPHTHALMIDÆ.

Sub-fam. 1. Macrophthalminæ.—Gen. *Cleistostoma*, De H., *Macrophthalmus*, Latr.

Subfam. 2. Ocypodinæ.—Gen. *Gelasimus*, Latr., *Helæcius*, Dana (*Gelasimum cordiformem* amplectens), *Ocypoda*, Fabr., *Scopinera*, De H.

Subfam. 3. Dotinæ.—Gen. *Dotu*, De H.

Fam. III. GRAPSIDÆ.

Subfam. 1. Grapsinæ.—Gen. *Pseudograpsus*, Edw., *Eriocheir*, De H. (*Utica*, White), *Platynotus*, De H., *Brachynotus*, De H., *Trichopus*, De H. (*Varuna*, Edw.), quorum maxillipedibus externis vix hiantibus; *Grapsus*, Lamk., *Gonio-grapsus*, Dana (*Graps. cruentatum*, *messor*, etc., amplectens), *Planes* Leach (*Nautilograpsus*, Edw.), *Hemigrapsus*, Dana (*Cyclograpsus* partim, Edw.), *Cyrtograpsus*, Dana,—maxillipedibus externis rhomboidicè hiantibus.

Subfam. 2. Sesarminæ.—Gen., *Sesarma*, Say (*Pachysoma*, De H.), *Sarmatium*, Dana,—quorum, articulo maxillipedis externi 3tio apicem rotundato; *Cyclograpsus*, Edw. (*Gnathochasmus*, M'Leay), *Chasmagnathus*, De H., *Helice*, De H.,—quorum articulo maxillipedis externi 3tio apicem truncato et sæpe excavato.

Subfam. 3. Plagusinæ.—Gen. *Acanthopus*, De H. (*Plagusiam clavimanam* amplect), *Plagusia*, Latr.

Fam. IV. GECARCINIDÆ.

Subfam. 1. Ucainæ.—Gen. *Uca*, Leach, *Gecarcinucus*, Edw., *Cardisoma*, Latr. *Gecarcoidea*, Edw.

Subfam. 2. Gecarcininæ.—Gen. *Gecarcinus*.

Fam. V. PINNOTHERIDÆ.

Subfam. 1. Pinnotherinæ.—Gen. *Pinnothera*, Latr., *Fabia*, Dana, *Xenophthalmus*, White, *Xanthasia*, White, *Pinnixa*, White, *Pinnotherelia*, Lucas.

Subfam. 2. Hymenicinæ.—Gen. *Hymenosoma*, Leach, *Halicarcinus*, White, *Hymenicus*, Dana, *Elamena*, Edw.

Fam. VI. MYCTIRIDÆ.—Genus *Myctiris*.

*Specierum Grapsoidearum adhuc ineditarum Descriptiones.*

## FAM. I. GONOPLACIDÆ, vel GRAPSOIDEA CANCRIDICA.

GENUS EUCRATE, *De Haan.*

EUCRATE CRASSIMANUS.—Carapax nudus, bene areolatus, margine anterolaterali 4-dentato, dentibus tribus posticis prominenter triangulatis; fronte fere recto, medium emarginato. Pedes antici crassi, subæqui, nudi, læves, inermes, manu infra compressâ, carpo intus breviter acuminato, brachio in margine postico prope apicem unidentato. Pedes 8 postici sat graciles, marginibus ciliati, tarso recto, infra hirsuto.

*Long.* carapacis 10''' ; *lat.* 13''' . *Hab.* in portu "Rio Janeiro?"

## FAM. II. MACROPHTHALMIDÆ.

## SUBFAM. I. MACROPHTHALMINÆ.

## GENUS MACROPHTHALMUS.

MACROPHTHALMUS PACIFICUS.—Carapax valde transversus, nudus et lævis, margine laterali arcuato, anterieus 2-emarginato, emarginatione anteriore profundâ, posteriore obsolescente, fronte latiusculo et lateribus non excavato. Oculi graciles, sat breves, tertiam latitudinis carapacis partem longitudine æquantes. Pedes maris antici parvuli, læves, manu extus nudâ, subtiliter punctatâ et non costatâ, digito inferiore non deflexo. Pedes postici marginibus pubescentes, articulo pedis 4ti 3tio duplo latiore quam 5tus, apice cum dente acuto armato.

*Long.* carapacis 4''' , *lat.* 5½''' . *Hab.* insulâ "Upolu."

## SUBFAM. II. OCYPODINÆ.

GENUS GELASIMUS, *Latreille.*

GELASIMUS NITIDUS.—*G. Duperreyi* similis. Carapax nitidus, antice paulo arcuatus, fronte angustissimo, paulo constricto. Pedes *maris* antici valde inæqui, manu majore multo compressâ et latâ, extus valde granulâtâ, intus cristis duobus obliquis ornatâ, digito superiore laminato, fere duplo latiore quam inferior, inferiore juxta basin uni-dentigero. Pedes 8 postici fere nudi, articulo 3tio pedis 5ti perangusto.

*Long.* carapacis 6¼''' . *Hab.* archipelagine "Viti."

GENUS HELÆCIUS, *Dana.*

HELÆCIUS INORNATUS.—Carapax convexus, nudus, angulis anticis fronte posterioribus. Pedes antici sat breves; carpo non duplo longiore quam latiore, margine interno angulato; manu latâ, parte palmari paulo oblongâ. Segmentum abdominis ultimum breviter transversum, penultimo subito angustius. Articulus pedum 3tius supra tomentosus.

*Long.* carapacis 6''' ; *lat.* 8¼''' . *Hab.* ad oras australes Novi-Hollandiæ. *Helæcii cordiformis* (*Gelasimi cordiformis* auctorum) manus carpusque multo longiores quam in *inornato*; segmenta abdominis breviora, ultimo non subito angustiore quam penultimum.

## FAM. III. GRAPSIDÆ.

## SUBFAM. I. GRAPSINÆ.

GENUS PSEUDOGRAPSUS, *Edwards.*

PSEUDOGRAPSUS OREGONENSIS.—Carapax parce areolatus, regione medianâ leviter circumscriptâ, cum lineâ transversâ antice levissimè notatâ et margine hujus

regionis antice abrupto; fronte sinuoso; margine antero-laterali bi-emarginato, dentibus acutis. Pedes antici læves, manu extus nudâ, infra obsolete uni-costatâ, intus partim lanosâ, carpo lævi, digitis *maris* hiantibus. Pedes postici margines paulo hirsuti, præcipue articulorum 4ti et 5ti.

*Long.* carapacis 10''; *lat.* 11½''. *Hab.* in Oregoniæ freto "Puget."

**PSEUDOGRAPSUS NUDUS.**—Carapax obsolete areolatus, regione medianâ vix circumscriptâ, cum lineâ elevatâ non intersectâ, areolâ intramedianâ (3 M) non circumscriptâ; fronte paulo arcuato; margine antero-laterali leviter bi-emarginato. Pedes toti nudi; antici æqui, manu extus nudâ, lævi, infra levissimè costatâ, intus partim lanosâ, carpo lævi; 8 postici paulo lati, tarso sulcato.

*Long.* carapacis 10½''; *lat.* 12½''. *Hab.* in Oregoniæ freto "Puget."

#### GENUS GRAPSUS.

1. **GRAPSUS PLANIFRONS.**—*G. variegato* similis, fronte fere horizontali, sat lato. Articulus maxillipedis externi 3tius vix oblongus. Margo carapacis lateralis bene arcuatus, antero-lateralis bi-emarginatus. Epistoma brevissimum. Pedes antici sat crassi, manu supra pustulatâ, extus infraque lævi; brachio apicem anticum 5—6-denticulato. Pedes 8 postici valde compressi, articulo 3tio pedis postici ad apicem inferiorem integro, penultimo supra scabro.

*Long.* carapacis 17½''; *lat.* 19''. *Hab.* ad oras juxta urbem "Valparaiso."

2. **GRAPSUS LONGITARSIS.**—Carapax nudus, regione medianâ granulatus; fronte abrupto, perangusto; lateribus parce arcuatis, margine antero-laterali 1-emarginato. Articulus maxillipedis externi 3tius vix oblongus. Epistoma breve, utrinque acutè cristatum. Pedes antici sat parvi, manu carpoque supra parce granulatis, manu extus fere lævi, infra leviter costatâ. Pedes postici nudi, tarso elongato, spinulis dorsi multo brevioribus.

*Long.* carapacis 9½''; *lat.* 10½''. *Hab.* in archipelagine "Paumotu."

**GRAPSUS CRINIPES.**—*G. livido* affinis. Carapax nudus, sublævis, fere quadratus, fronte sat abrupto, margine antero-laterali 1-emarginato. Pedes antici fere æqui, carpo manu digitoque mobili superne granulatis, manu extus fere lævi, nec costatâ; brachio ad apicem anticum 5—7-denticulato. Pedes postici sparsim criniti, articulo tertio lato, tarso perangusto, lineari, paulo curvato. Margo epistomatis posticus valde arcuatus.

*Long.* carapacis 9¾''; *lat.* 11½''. *Hab.* ad insulas "Sandwich."

#### GENUS GONIOGRAPSUS, *Dana.*

**GONIOGRAPSUS SIMPLEX.**—*G. vario* similis. Carapax fere quadratus, lateribus postice vix convergentibus, fronte paulo declivi, parce sinuoso, margine antero-laterali 1-emarginato. Carpus supra minutè rugatus; manus extus lævis, supra paulo rugata. Articuli pedum 8 posticorum 4tus 5tusque sparsim hirsuti; 3tius pedis postici apice inferiore truncatus, integer, pedis 4ti 3tiive 2—3-dentatus.

*Long.* carapacis 4''; *lat.* 4¾''. *Hab.* in portu "Rio Janeiro."?

**GONIOGRAPSUS INNOTATUS.**—Carapax fere quadratus, lateribus postice convergentibus, fronte sat declivi, margine antero-laterali 1-emarginato, lineis transversis carapacis subtilissime crenulatis. Carpus supra lævis; manus supra extusque lævis; brachium apice 2—3-dentatum. Articulus pedis postici 3tius apice inferiore 3-dentatus.

*Long.* carapacis 7''; *lat.* 9''; *long. frontis* 5¼''. *Hab.* ad oras Americæ Australis?

GENUS PLANES, *Leach*.

PLANES CYANEUS.—Pedes octo postici valde compressi, articulis tribus ultimis extus dense villosociliatis. Abdomen maris angusto-triangulatum, duplo longius quam latius, 7-articulatum, articulo 3tio latiore, brevior quam 4tus, ultimo triangulato.

*Long.* 6'''—8'''. *Hab.* in mari Pacifico, lat. bor. 28°, long. orient. 174°.

GENUS HEMIGRAPUS, *Dana*.

HEMIGRAPUS CRASSIMANUS.—Carapax subtiliter granulatus, margine anterolaterali leviter 2-emarginato, dentibus brevissimis, rotundatis, etiam emarginatione 3tiâ obsoletâ. Pedes *maris* antichi crassi, nudi, carpo supra indentato. Pedes sequentes tenues, articulo 3tio supra fere nudo, infra lanoso, reliquis margines plerumque pubescentibus, 5to supra sulcato, tarso gracili. Abdomen maris perangustum, articulo ultimo anguste elongato.

*Long.* carapacis 6¼'''; lat. 6¼'''; long. frontis 2¼'''. *Hab.* ad insulas "Sandwich."

HEMIGRAPUS AFFINIS.—*H. crassimano* fermè affinis. Manus *maris* crassa, minus tumida, antice paulo compressa, digitis hiantibus. Articulus pedis 2di, 3tii, 4tive 3tius infra villosus, supra partim pubescens. Pes 5tus articulis 4to 5to 6toque infra supraque pubescens. Margo carapacis antero-lateralis 3-emarginatus, emarginationibus duabus posticis parvulis.

*Long.* carapacis 7'''. *Hab.* portu "Rio Negro" Patagoniæ.

GENUS CYRTOGRAPUS, *Dana*.

CYRTOGRAPUS ANGULATUS.—Carapax angulato-gibbosus, granulatus, nudus, margine antero-laterali fere recto, 4-dentato, margine postero-laterali leviter uni-dentato. Pedes *maris* antichi crassi, granulati, manu supra paulo truncatâ, carpo intus truncato. Pedes 8 postici fere nudi, articulo 5to supra sulcato, tarso sulcato.

*Long.* carapacis 17¼'''; lat. 21'''; long. frontis 6'''. *Hab.* portu "Rio Negro," Patagoniæ.

## SUBFAM. II SESARMINÆ.

GENUS SESARMA, *Say*.

SESARMA OBTUSIFRONS.—Carapax quadratus, sat transversus, postice paulo angustior, omnino bene granulatus, granulis sparsis, lateraliter nec lineolatus, margine antero-laterali integro, fronte perpendiculari, supra rotundato, margine frontali arcuato. Epistoma granulatum. Pedes antichi mediocres, carpo manaque supra granulatis, manu extus lævi, digitis nudis. Pedes postici granulati, articulo 5to brevissime sparsim hirsuto, 4to fere nudo.

*Long.* carapacis 4'''; lat. ant. 5¼''', post. 4¼'''. *Hab.* ad insulas "Sandwich."

SESARMA OBESUM.—Carapax crassus, quadratus, parce areolatus, postice vix angustior, punctatus, non nitidus, lateribus fere arcuatis, nulla parte acutis, margine antero-laterali integro; fronte perpendiculari, supra fere recto, infra bene arcuato. Epistoma granulatum. Pedes antichi breves, manu brevi, non granulata, superne integrâ et brevi. Pedes 8 postici angusti, articulo 4to non hirsuto, 5to sparsim breviter hirsuto, tarso breviter hirsuto.

*Long.* carapacis 6'''; lat. 6¼'''. *Hab.* freto "Balabac."

GENUS SARMATIUM, *Dana*.

**SARMATIUM CRASSUM.**—Carapax crassus, supra lævis, lateribus valde arcuatus, fronte fere recto, margine antero-laterali leviter 2-emarginato, dentibus rotundatis. Pedes antici *maris* breves, manu supra transversim 4—5-plicatâ, extus fere lævi, digito supra breviter 4-subspinoso, carpo plerumque lævi, supra paulo seriatim granulato.

*Long.* carapacis  $6\frac{1}{2}$ ''; *lat.* 7''; *alt.* thoracis  $4\frac{1}{2}$ ''; *long.* frontis 3''. *Hab.* ad insulam Samoensem "Upolu."

GENUS CYCLOGRAPSUS, *Edwards*.

**1. CYCLOGRAPSUS CINEREUS.**—Carapax parce transversus, non areolatus, paulo nitidus, non granulatus. Orbita infra plerumque circumscripta. Articululus maxillipedis externi 3tius valde oblongus, 2do non brevior, pubescens, cristâ fere ad angulum 2di externo-posteriorem productâ. Digniti intus denticulati. Articululus pedis 2di 5tus apice non tomentosus, tarso non spinuloso, lineis angustis tomentososis supra ornato. Abdomen *maris* fere rectangulatum, postice parce angustius lateribus subparallelis, rectis, segmento postico elongate triangulato, triplo angustiore quam penultimum. Sternum pone aream buccalem pubescens.

*Long.* carapacis 6'', *lat.*  $7\frac{1}{2}$ ''; *long.* frontis 3''. *Hab.* ad oras Chilenses; quoque ad insulas "Sandwich."

**2. CYCLOGRAPSUS GRANULATUS.**—Carapax non areolatus, antice paulo granulatus. Orbita infra incompleta. Articululus maxillipedis externi 3tius vix oblongus, 2do multo brevior, nudus, cristâ tenui, pilosâ, angulum 2di externo-anteriorem intersecante tantum, 2dus nudus. Articululus pedis 2di 5tus apice non tomentosus, tarso lineis tomentososis paulo laxis ornato, non spinuloso. Manus glabra, nitida, digitis *maris* intus non denticulatis. Abdomen *maris* eo *C. cinerei* fere simile, lateribus vix excavatis, segmento postico parce oblongo, apice late rotundato. Sternum pone aream buccalem nudum.

*Long.* carapacis 3.7''; *lat.* 4.6''. *Hab.* ad oras insulæ "Maui" Hawaiensis.

GENUS CHASMAGNATHUS, *De Haan*.

**1. CHASMAGNATHUS SUBQUADRATUS.**—Carapax convexus, lævis, postice paulo punctatus, paulo areolatus, fronte margineque antero-laterali uti in *C. granulato*, lateribus parce arcuatis, areolâ præmedianâ antice vix notatâ. Maxillipedes externi sternique pars proxima brevissime hirsuti. Pedes antici posticique plerumque uti in *C. lævi*, manu non granulata, minute punctatâ. Regio pterygostomiana breviter reticulata. Articululus pedis 2di 5tus infra non tomentosus, supra anticeque tomentosus. Abdomen lateribus excavatum, basi latius, longius ciliatum.

*Long.* carapacis 8''; *lat.*  $9\frac{1}{2}$ ''; *long.* frontis inter oculos 4''. *Hab.* ad oras Novi-Zelandiæ? Novi-Hollandiæ orientalis?

**2. CHASMAGNATHUS GRANULATUS.**—Carapax valde convexus, sat areolatus; fronte sinuato, medio depresso et juxta marginem medianum minute apiculato; margine antero-laterali tenui, 2-inciso, dentibus triangulatis, acutis. Margo epistomatidis inferior fronte prominentior. Pedes antici *maris* crassi, subæqui, granulati, carpo intus acuto, manu supra tenui et paulo obtusâ. Pedes postici valde compressi, articulis 4to 5to dorso paulo tomentososis, 5to pedis 2di infra non

tomentoso, tarso tenui, tenuiter sulcato et sulcis hirsuto. Abdomen *maris* lateribus fere rectum.

*Long.* carapacis 15''; lat. 17½''; long. frontis inter oculos 7''. *Hab.* palude juxta lacum "Peteninga" urbi "Rio Janeiro" vicinum.

3. CHASMAGNATHUS LÆVIS.—Carapax convexus, lævis, vix granulatus, paulo areolatus, fronte margineque antero-laterali plerumque uti in *C. granulato*, fronte juxta marginem medianum non apiculato, areolâ præmedianâ antice præruptâ. Epistoma fronte non prominentius. Pedes antici *maris* æqui, manu leviter granulata, supra non tenui. Pedes postici angustiores, articulus pedis 2di 5tus infra antice supraque tomentosus. Abdomen lateribus fere rectum vel obsolete excavatum.

*Long.* carapacis 11½''; lat. 14''; long. frontis inter oculos 6''. *Hab.* in portu "Sydney" Novi-Hollandiæ Orientalis.

#### GENUS HELICE, *De Haan.*

HELICE CRASSA.—Carapax subquadratus, margine laterali antice bi-emarginato, fronte dimidii latitudinis carapacis longitudine. Manus brevis et lata, superne subcarinata, extus fere lævis, minute granulata. Articulus pedum sequentium 3tius supra subacutus. Regio pterygostomiana granulata, leviter pubescens.

*Long.* carapacis 5½''; lat. 6¼''. *Hab.* ad oras "Illawarræ" Novi-Hollandiæ Orientalis.

#### SUBFAM. III. PLAGUSINÆ.

##### GENUS ACANTHOPUS, *De Haan.*

ACANTHOPUS ABBREVIATUS.—Carapax subquadratus, non oblongus, supra omnino tomentosus lineis nudis nullis; fronte uti in *planissimo* sed latiore; margine antero-laterali 4-dentato, dente 2do inconspicuo. Pedes *maris* antici æqui, manu vix inflatâ, supra sulcatâ. Abdomen *maris* angustius, lateribus excavatum.

*Long.* carapacis *maris* 6''. *Hab.* ad oras insulæ "Tahiti."

##### GENUS PLAGUSIA.

1. PLAGUSIA SPECIOSA.—*P. squamosæ* affinis. Margo antero-lateralis 3-dentatus.

*Long.* carapacis 14''; lat. 15''. *Hab.* archipelaginis "Paumotu" insulæ "Waterland."

2. PLAGUSIA GLABRA.—Carapax lævis, glaber, margine antero-laterali 4-dentato, fronte superne oblique subcristato, non spinigero. Pedes *maris* antici perbreves, parte manus palmari brevior quam altiore, supra granulata, extus lævi et non costatâ, carpo fere lævi. Articulus pedum 8 posticorum 3tius lævis, non multispinosus. Articulus maxillipedis externi 3tius quadratus, parce oblongus.

*Long.* carapacis *maris* 9''; lat., dentibus exclusis, 9'', dentibus inclusis 9¾''. *Hab.* ad oras Novi-Hollandiæ Orientalis.

#### FAM. IV. GECARCININÆ.

##### SUBFAM. I. UCAINÆ.

##### GENUS CARDISOMA.

CARDISOMA OBESUM.—Carapax obesus, undique convexus, lateribus antero-lateralibus valde tumidis, linea angulove marginis omnino carentibus. Articulus

antennæ externæ 1mus transversus, apice utrinque productus et subacutus, superficie granulatus, processu orbitam antennamque sejungente subtriangulato, trihedrico, non truncato.

*Long.* carapacis 3''; *lat.* 3 $\frac{3}{4}$ ''; *long.* frontis inter oculos 12''; *lat.* areæ buccalis antice 9''. *Hab.* archipelagine "Paumotu."

**CARDISOMA HIRTIPES.**—Carapax longitudinaliter convexus, margine laterali antice notatus, prope dentem post-orbitalem minute apiculato, areolâ præmedianâ antice juxta frontem paulo abruptâ, regione pterygostomianâ pilosâ. Processus præorbitalis orbitam antennamque externam sejungens triangulatus, trihedricus. Articulus antennæ externæ 1mus rectangulatus apice recte truncatus. Pedes *maris* antici crassi, subæqui, sat breves, manu punctatâ, digitis late hiantibus. Pedes postici hirti.

*Long.* carapacis *maris* 22 $\frac{1}{2}$ ''; *lat.* 28''; *long.* frontis 7 $\frac{1}{2}$ ''; *lat.* areæ buccalis antice 5 $\frac{3}{8}$ ''; postice 8 $\frac{1}{4}$ '' . *Hab.* insulis "Viti."

#### FAM. V. PINNOTHERIDÆ.

##### SUBFAM. I. PINNOTHERINÆ.

##### GENUS PINNOTHERA, *Latreille.*

**PINNOTHERA FABIA.**—Carapax late transversus, nudus, paulo nitidus. Maxillipedes externi nudi, vix obliqui. Oculi parvuli. Pedes antici *feminæ* breves, manu supra rotundata, digitis subtiliter pubescentibus. Pedes postici perbreves, crassiusculi, articulo 3tio pedis 4ti triplo brevior quam carapacis latitudo, tarso brevi, basi crasso, subconico, apice uncinato.

*Long.* carapacis *feminæ* 5 $\frac{1}{2}$ ''; *lat.* 8'' . *Hab.* in freto "Puget" Oregoniæ.

##### GENUS FABIA, *Dana.*

**FABIA SUBQUADRATA.**—Carapax (*feminæ*) subquadratus, antice rotundatus, parce latior quam longior, nudus, nitidus. Maxillipedes externi nudi, valde obliqui. Oculi minimi. Suturæ post-frontales fere parallelæ. Pedes antici (*feminæ*) sat tenues, manu elongatâ, infra 2 lineis pubescentibus (lineâ unâ usque ad digiti extremitatem productâ) ornatâ. Pedes 8 postici sat graciles, articulo 3tio supra partim pubescente, 5to infra pubescente, tarso brevi, dimidii articuli 5ti longitudine, uncinato.

*Long.* carapacis 5 $\frac{1}{2}$ ''; *lat.* 6 $\frac{3}{4}$ ''; *lat.* inter suturas post-frontales 2 $\frac{1}{4}$ '' . *Hab.* in freto "Puget" Oregoniæ.

##### SUBFAM. II. HYMENICINÆ.

##### GENUS HALICARCINUS, *White.*

**HALICARCINUS PUBESCENS.**—Carapax ovato-orbicularis pone medium latior. Pedes longitudine mediocres, 8 postici laxè pubescentes. Abdomen *maris* angustum, fere lineare, apice triangulatum.

*Long.* 1 $\frac{1}{4}$ '' . *Hab.* in mari, juxta Patagoniam orientalem, altitudine 50 brachiorum.

##### GENUS HYMENICUS, *Dana.*

1. **HYMENICUS VARIUS.**—Carapax lævis, nudus, planus, ovato-orbiculatus, vix transversus, fronte expansus et trilobatus, lobis rotundatis, margine antero-laterali dentibus duobus obsolete remote armato. Abdomen *maris* angustum, subtriangulatum, segmento basali latiore et utrinque triangulato, penultimo angustiore

quam precedens, ultimo paulo oblongo, apice rotundato. Pedes antici mediocres; 8 sequentes tenuissimi, nudi aut nudiusculi.

*Long.* 2'''—3'''. *Hab.* ad oras portus "Bay of Islands" Novi-Zealandiæ.

2. HYMENICUS NOVI-ZEALANDIÆ.—Carapacem, frontem, pedesque *H. vario* similis. Abdomen *maris* lineare, segmentis penultimo precedentibusque duobus latitudine æquis, ultimo triangulato, non oblongo, obtuso. An varietas *varii*?

*Hab.* ad oras portus "Bay of Islands."

3. HYMENICUS PUBESCENS.—Carapax pubescens, ferme orbiculatus aut vix ovato-orbiculatus, postice arcuatus, rostro parvulo simplicissimo, rotundato et marginem pubescente, margine carapacis omnino integro, inermi. Abdomen *maris* angustum, lineari-subtriangulatum, segmentis penultimo precedentibusque duobus fere æquis, postice parce angustantibus, ultimo subtriangulato, paulo oblongo, obtuso. Pedes breviter pubescentes; antici mediocres; sequentes tenues.

*Long.* 1½'''—2'''. *Hab.* in portu "Bay of Islands."



From the author

(p. 267-72)

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**CRUSTACEA PAGURIDEA.**

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Handwritten text at the top of the page, possibly a title or header, which is mostly illegible due to blurring and fading. Some characters are difficult to discern but appear to be in a cursive or handwritten style.

*Conspectus Crustaceorum quæ in Orbis Terrarum circumnavigatione, Carolo Wilkes e classe Reipublicæ Fæderatæ Duce, lexit et descripsit J. D. DANA.*

(pl. 9)

[Ex Academiæ Scientiarum Naturalium Philadelphienſis Nuntiis, Anno 1851, Vol. v. p. 267.]

## PAGURIDEA.

The Paguridea include two groups, distinguished by peculiarities in the form of the inner antenna, outer maxillipeds, and some other characteristics;—the one *aquatic* in habit, and the other *subterrestrial*. They are as follows:

Fam. I. PAGURIDÆ.—Inner antennæ short, first joint very short. Palpus of maxillipeds with a multiarticulate flagellum. Aquatic or littoral.

Fam. II. CENOBITIDÆ.—Inner antennæ very long, the first joint of the base as long as the eyes or longer, and bent obliquely downward. Palpus of outer maxillipeds without a flagellum. Subterrestrial.

The Paguridæ have hitherto been divided into but two genera; *Pagurus*, with unsymmetrical abdomen, and *Cancellus*, (Edw.) with symmetrical. There are, however, important characteristics, which point to a division into other groups. These have been partly indicated by Milne Edwards, in the subdivisions of the genus *Pagurus*, laid down in his work on Crustacea,\* and more distinctly in the *Annales des Sciences Naturelles*, for July, 1848.† In the latter article there are discrepancies in certain instances, between the character of the species and those mentioned for the subdivisions, which we find it difficult to reconcile; such as the placing of *P. tibicen*, and some related species, with his “*Æquimanes*,” when, in fact, the left hand is very much larger than the right, and the *guttatus* and *granulatus* with the “*Senestres*,” although, in the former, the hands are nearly equal, as in many of the “*Æquimanes*,” and in the latter the right hand (as is observed in his “*Crustacés*”) is actually the larger. Yet his sections are, in the main, natural groups, and some of them have more important points of distinction than he has mentioned.

The *Pagurus Bernhardus* is the type of one of these groups. Besides being “*dextres*,” they are peculiar in having *acuminate fingers*, with the tips of those of the larger hand *calcareous*; and although the feet of the 4th pair are subcheliform, like most other Paguridæ, the scabrous area or rasp of the hand is confined nearly to the posterior edge. Moreover, the species belong mainly to colder waters, while the ordinary Paguri abound especially in the tropics. All the Paguri of England (or with but one uncertain exception, recently pointed out,) are of the *Bernhardus* type; those of the Northwest coast of America are the same. We naturally, therefore, distinguish this group as a genus under the name of BERNHARDUS. [The species *P. Bernhardus* may be hereafter named the *Bernhardus typicum*.]

Among the remaining Paguri, the larger part have the feet of the 4th pair subcheliform, the penult joint being broad, and the last (or tarsus) forming a finger placed on its anterior margin. Yet, a few have these feet vergiform, the tarsus being terminal; and these species are also peculiar, in having two pairs of slender appendages at the base of the abdomen, on account of which they are called the “*Pagures appendicules*” by Edwards. Besides, they have the flagellum of the outer antennæ more or less hairy, and often long ciliate along the under side, and, also, the inner antennæ have a longer base than usual, the 2d basal joint

\* Crustacés, ii, 213, and *Annales des Sci. Nat.* [2], vi, 257.

† *Ann. des Sci. Nat.* [3], x, 59.

chelon

reaching nearly, or quite, to the extremity of the eyes. These species make a well characterized group, which we name *Paguristes*.

Another small group is singular in having a rostriform appendage to the ophthalmic joint; they are the "Pagures armés" of Edwards, including *P. miles* and *P. custos*, the former the *Cancer Diogenes* of Herbst. Besides this distinction, the fingers of the hands are acuminate, as in the Bernhardi, and have calcareous tips, although the species are not right-handed; also, the 2d joint of the outer antennæ is complete on the upper side, and there is no moveable appendage or acicle (a name we give to the so-called palpus, in allusion to its form). With these distinctions, the group is entitled to the rank of a genus, which may be named *Diogenes*.

The remaining species of Paguri are similar, in having the fingers of the hands more or less spoon-shaped;—with no rostriform appendage to the ophthalmic segment between the eyes;—the outer antennæ bearing a moveable acicle;—the flagellum of the outer antennæ naked; the 2d joint of the base of the inner antennæ not reaching to extremity of eyes;—the feet of the 4th pair subcheliform with the scabrous area on the hand, lateral and broad.

The great majority of these have the tips of all the fingers corneous. But a few have these tips in the larger hand calcareous, besides being peculiarly smooth and neat in the appearance of the limbs, and naked, or nearly so, with the shell more calcareous than usual. They have the left hand much the larger; yet unlike those species with *corneous* tips to the fingers that are strongly left-handed, the front margin has a small salient point at middle. Of the species with calcareous tips to the fingers, I make the genus *Calcinus*. This genus includes the old species *P. tibicen*, *Gaimardii*, *elegans*, &c.

The remaining species, still the larger part of the whole family, constitute the genus *Pagurus*. The following is a synopsis of the subdivisions proposed.

#### FAM. I. PAGURIDÆ.

Antennæ internæ mediocres, articulo primo brevissimo. Maxillipedis palpus externi flagello multiarticulato instructus. Species aquaticæ vel littorales.

Subfam. I. PAGURINÆ.—Abdomen asymmetricum.

I. Pedes 4ti subcheliformes. Abdomen ad basin duobus paribus appendicium infra non instructum. Antennarum externarum flagellum nudum vel nudiusculum.

1. *Annulum ophthalmicum non rostriferum. Antennæ internæ aciculo mobili instructæ.*

Gen. 1. BERNHARDUS, D.—Pedes antici depressi; digiti acuminati; manus dextra major, apicibus digitorum calcarea. Macula scabra manus 4tæ submarginalis, linearis.

Gen. 2. PAGURUS, Fabr.—Manus anticæ sive depressæ sive compressæ; digiti plus minusve instar cochlearis excavati, apicibus cornei; manus sinistra sæpius major. Macula scabra manus 4tæ lateralis, lata. Frons medio sive truncatus sive acutus.

Gen. 2. CALCINUS, D.—Manus compressæ, sinistra major, apicibus digitorum calcarea et instar cochlearis optime excavata. Frons medio acutus. Pedes læves, nudi vel nudiusculi.

2. *Annulum ophthalmicum rostriferum*. Antennæ externæ aciculo mobili non instructæ.

Gen. 4. *DIOGENES*, D.—Manus sinistra major. Digiti acuminati, apicibus calcarei.

II. Pedes 4ti vergiformes, tarso terminali. Abdomen ad basin 4 appendicibus infra instructum. Antennarum flagellum externarum plus minusve pilosum sæpe elongatè ciliatum.

Gen. 5. *PAGURISTES*, D.—Antennæ internæ elongatæ, apice articuli 2di extremitatem oculorum fere attingente.

Subfam. II. *CANCELLINÆ*.—Abdomen symmetricum. Gen. *CANCELLUS*, *Edw.*

#### FAM. II. *CENOBITIDÆ*.

Antennæ internæ basi longissimæ, articulo primo oculis sæpe longiore et valde deflexo. Maxillipedis palpus externi flagello non instructus. Species subterrestriales.

Gen. 1. *CENOBITA*, *Edw.*—Corpus angustum, carapace parce elongato, fronte non rostrato. Abdomen in cochleam retortum, superficie plerumque carnosum.

Gen. 2. *BIRGUS*, *Leach.*—Corpus latum, carapace parce oblongo, postice latissimo, fronte triangulato. Abdomen directum, inflexum, laminis crustaceis quoad dorsum plerumque tectum.

Specierum Paguridearum adhuc ineditarum Descriptiones.

#### GENUS *BERNHARDUS*.

*BERNHARDUS NOVI-ZEALANDIÆ*.—Oculorum pedunculi margine carapacis antico vix breviores, basi antennarum externarum longiores, aciculo hirsuto multo longiores; cornea non obliqua, perbrevis; squama basalis paulo angusta, apice inciso-denticulata. Pedes antici valde inæqui, fere nudi; carpo versus apicem paulo pubescens, granulato-spinuloso; manu grandi, oblongâ, parce longiore non latiore quam carpus, superficie externâ sex-seriatim tuberculatâ (marginibus inclusis) inter has series fere lævi, digito mobili carinato, crenulato, et superficie uniseriatim tuberculato, etiam tuberculis minoribus instructo. Pedes 4 sequentes marginibus dense hirsuti, vix spinulosi.

*Long.* 1½—2". *Hab.* in portu "Bay of Islands" Novi-Zelandiæ.

*BERNHARDUS TENUIMANUS*.—Frons medio subacutus. Carapax nudus. Oculorum pedunculi breves, basi antennarum externarum paulo breviores, aciculo subulato subnudo vix breviores; cornea non obliqua, brevis; squama basalis angusta, acuta. Pedes toti nudi, antici valde inæqui, granulati, granulis vix seriatis, carpi margine superiore denticulato, manu grandi tenuissimè compressâ, parce oblonga, multo latiore quam carpus, margine superiore tenuiter cristato et denticulato, inferiore tenui; manu minore carpoque angustissimè oblongis. Pedes 4 sequentes lateraliter læves, margine superno subspinulosi.

*Long.* 1—1½". *Hab.* in freto "Puget" Oregonensi.

**BERNHARDUS ARMATUS.**—Carapax subnudus. Oculorum pedunculi margine carapacis antico breviores, sive basi sive aciculo subulato subnudo antennarum externarum multo breviores; cornea obliqua, dimidii pedunculi longitudine; squama basalis subovata, apiculata. Frons marginatus, medio paulo saliens, obtusus. Pedes toti fere nudi (junioribus exceptis pubescentioribus); antici valde inæqui, usque ad digitorum extremitatem tenuiter dense spinosi, spinis partim subseriatis, manu grandi latâ, oblongâ, multo longiore et parce latiore quam carpus; 4 sequentes supra spinulosi, tarsis infra paulo lateraliter uniseriatim spinulosi.

*Long.* 1 $\frac{3}{4}$ ". *Hab.* in freto "Puget" Oregonensi.

**BERNHARDUS HIRSUTIUSCULUS.**—Frons medio subacutus. Carapax brevis, sparsim pubescens, regione antico transverso. Oculorum pedunculi perbreves, basi antennarum externarum multo breviores, aciculo subnudo parce breviores; cornea vix obliqua; squama basalis ovata, non acuta. Pedes antici valde inæqui, angusti, carpo manuque pubescentes et granulato-scabri, margine superiore crassi, non spinulosi nec denticulati; manu oblongâ (duplo longiore quam latitudo) paulo breviora parce latiore quam carpus. Pedes 4 sequentes hirsutiusculi, non spinulosi, tarsis paulo compressis, infra subtiliter spinulosi.

*Long.* 1 $\frac{1}{4}$ ". *Hab.* in freto "Puget" Oregonensi.

**BERNHARDUS PUBESCENS.**—*B. hirsutiusculo* affinis. Frons medio subacutus. Carapax longior, fere nudus, regione antico non transverso. Oculorum pedunculi longi, margine carapacis antico non breviores, basi antennarum externarum parce longiores, aciculo multo longiores; cornea non obliqua; squama basalis subovata, apice rotundata. Pedes antici valde inæqui, angusti, carpo manuque pubescentes, scabriculi, non sparsim granulati, carpo ad marginem superiorem minute spinuloso manu oblongâ (duplo longiore quam latitudo) paulo breviora parce latiore quam carpus. Pedes 4 sequentes pubescentes, non spinulosi.

*Long.* 1". *Hab.* ? Conchæ quas habitant oris Americæ septentrionalis inveniuntur.

## GENUS PAGURUS.

### 1. *Frons medio truncatus.* *Squama oculorum basalis lata.*

**PAGURUS FABIMANUS.**—Frons medio fere rectus. Carapax plerumque nudus regione antico parce transverso. Oculi longiusculi, basi antennarum longiores; squama basalis lata, inverso-triangulata. Pedes antici valde inæqui, manu majore oblongâ, marginibus fere parallelis et subacutis, superiore spinuloso, inferiore crenulato aut subintegro, superficie externâ bene convexâ, tomentosâ, scabriculâ, digito mobili superne fere ad apicem minute spinuloso. Pedes 4 sequentes leviter hirsuti, tarsis prælongis, tarso pedis sinistri tertii subtriquetro, superficie hujus articuli præcedentisque externâ aut planâ aut subconconvâ, tomentosâ, margine superiore non spinuloso.

*Long.* 1 $\frac{1}{2}$ ". *Hab.* ad oras insulæ "Mindanao" Indiæ orientalis.

**PAGURUS SCABRIMANUS.**—*P. fabimano* fermè affinis, formâ carapacis, manus squamæque oculorum basalis similis. Oculi parce breviores, basi antennarum externarum longiores, internarum non longiores. Manus major extus non tomentosa, nudiuscula, scabricula, supra spinulosa, infra denticulata aut crenulata, digito mobili supra vix spinuloso, carpo supra extusque prope apicem spinuloso. Pedes

4 sequentes leviter hirsuti, tarsis prælongis, tarso pedis sinistri 3tii non subtriquetro, superficie externâ nec planâ, nec tomentosâ, margine superiore minute spinuloso.

Long. 1—1½". Hab. ad oras insulæ "Mindanao."

2. *Frons medio subacutus. Squama oculorum basalis sæpius angusta.*

PAGURUS ÆQUABILIS.—*P. lineato* ferme affinis, manibus æquis, hirsutis, breviter spinulosis, formâ frontis oculique simili. Pedes 2di 3tiique parce hirsutiusculi, superficie externâ nudâ, articulis latioribus, fere lævibus, punctulatis, tarsis brevibus; pedibus paris 3tii inæquis, articulo sinistro penultimo extus planiusculo et superne subacuto. Pedes colore non lineati.

Long. ¾". Hab. ad insulas "Madeira," et "St. Jago" archipelagi "Cape Verde."

PAGURUS ZEBRA.—*P. æquabili* fronte manibus hirsutis subæquis depressis oculisque similis. Oculi margine carapacis antico non breviores, basin antennarum externarum longitudine æquantes, aciculo duplo longiores. Pedes antichi parvi, dextro paulo majore, manu duplo longiore quam latitudo, crasse granulata aut minute tuberculata, hirsuta, carpo non depresso, dextro parce tuberculato. Pedes 2di 3tii leviter hirsuti, colore pauci-lineati, subtiliter sparsim granulati, tarsis brevibus, articulo penultimo pedis sinistri paris 3tii supra non spinuloso.

Long. ¾". Hab. ad insulas "Sandwich."

PAGURUS GLOBOSO-MANUS.—*P. æquabili* manibus subæquis, digitis, formâ frontis affinis. Frons medio latius acutus. Oculi margine antico carapacis parce longiores, basi antennarum externarum vix longiores. Pedes antichi breves, manu globulosâ, non duplo longiore quam latitudo, supra infraque minute tuberculato-spinosâ, breviter hirsuta. Pedes sequentes fere nudi, articulo 3tio subtiliter verrucoso, penultimo pedis sinistri paris 3tii extus plano et hirsuto, paris 2di nudo, paucis spinulis minutis armato. Pedes colore non lineati.

Long. 1½". Hab. ad insulas "Viti."

PAGURUS HUMILIS.—*P. æquabili* fronte manibus parvis subæquis affinis. Oculi breviores, crassiusculi, fronte non longiores; squamâ basali triangulata. Pedes primi parvi, manu dextrâ parce majore, pubescente, oblongâ, paulo compressâ, margine superno rotundato. Pedes 4 sequentes crassiusculi, subteretes, sparsim pubescentes, tarso tenui, terete, brevior quam articulus penultimus. Pedes colore non lineati.

Long. 1". Hab. ad insulas "Viti" et "Tongatabu."

#### GENUS PAGURISTES.

PAGURISTES LONGIROSTRIS.—Rostrum anguste elongatum, acutum, integrum, carapacis regio antica subcordata, fere nuda. Oculi graciles, margine carapacis antico longiores, vel basi vel aciculo antennarum externarum vel basi internarum multo longiores; squamâ basali medio acutâ. Flagellum antennarum externarum nudiusculum. Pedes antichi æqui, manu carpoque depressis, latis, bene areolatis, non scabriculis, manu infra partim villosâ. Pedes 4 sequentes intus areolati supra hirsuti, extus fere læves et nudi.

Long. 1½". Hab. in mari Indiæ orientalis.

**PAGURISTES HIRTUS.**—Rostrum brevissimum. Carapax plerumque hirtus. Oculi graciles margine carapacis antico non breviores, basi vel aciculo antennarum externarum multo longiores, basi internarum breviores, squamâ basali valde elongatâ, angustâ, margine externo arcuato et tenuiter bene denticulato. Flagellum antennarum externarum infra elongate ciliatum. Pedes 2di 3tii hirti crassiusculi.

*Long.* 2". *Hab.* in mari Sinensi.

#### GENUS CENOBITA.

**CENOBITA CARNESENS.**—Regio carapacis antica plana, scabricula, lateribus quoque plana. Oculi fronte longiores, plus duplo longiores quam altitudo, valde compressi, squamâ basali triangulatâ, acutâ. Pedes antichi inæqui, sinistro majore, superficiem granuloso, carpo paulo brevior quam manus, brachio apicem oblique plano-truncato. Pedes quatuor sequentes fere nudi, parce pubescentes, articulo ultimo scabriculo.

*Long.*  $1\frac{1}{4}$ — $1\frac{1}{2}$ ". *Hab.* in archipelago "Paumotu."

**CENOBITA BRUNNEA.**—Regio carapacis convexa, nuda. Oculi fronte paulo breviores. Pedes antichi validi, paulo inæqui, manu carpoque hirsutis, manu spinulis minutis sparsis scabriculâ, brachio apicem rotundato. Pedes 4 sequentes hirsuti, articulo ultimo subterete, longiore quam penultimus.

*Long.* 3". *Hab.* ad insulam "Upolu" Samoensem. Abdomen nuce myristico sæpe tectum.



From the author

From the American Journal of Science and Arts, 2nd Series, Vol. XIII.—Jan., 1852.

ON THE See p. 121  
CLASSIFICATION  
OF THE cut 9  
CORYSTOIDEA, PAGURIDEA, ETC.

By JAMES D. DANA.

1. THE CORYSTOIDEA have their closest relations with the Cancroidea, and form a passage between this division of the Brachyura and the Hippidea. They are remote from the Oxystomata in the mouth and efferent branchial channels, the latter having these channels *medial* over the palate, and the former *lateral* like the Cancroids. In the projection of the outer maxillipeds over the epistome, the elongated and more or less pilose outer antennæ, and the partially free or less closely inflexed abdomen, the species exhibit their degradation below the Cancrer type. The Platyonychidæ are the Cancroids which approximate most to the Corystoids, and they are placed with this group by De Haan. But they differ from the Corystoidea in the shorter and more naked outer antennæ; and we therefore incline rather to retain them with the Cancroidea, where they are arranged by Milne Edwards.

The degradation of the Cancroidea is also seen in another line leading through *Acanthocyclus* to *Corystoides*, Lucas, and *Bellia*, Edw.\* The last two genera are somewhat Corystoid in habit: yet they pertain to a distinct group, inasmuch as they have the outer antennæ obsolete or nearly so, and the inner antennæ *without fossettes*. This last character belongs only to the lower Anomoura and the Macroura, and places these genera quite low in rank in a group we name BELLIDEA which belongs near if not among the Anomoura.

In attempting to arrange the Corystoidea into groups, we consider, as in other cases, the relations of the species to the higher Crustacea, and by the transitions observed, we are led to our subdivisions. *Trichocera* is Cancroid in habit, in the absence of a beak, in the nearly naked outer antennæ, and in having the outer maxillipeds fitted neatly to the epistome. *Thia* and *Kraussia* are also without a beak, like the Cancroids, but have the outer maxillipeds overlapping the epistome. The remaining genera have the front somewhat rostrate, the inner antennæ longitudinal, the maxillipeds produced over the epistome and the outer antennæ elongate and pilose and flexed at base towards the medial line. The form of the third joint of the outer maxillipeds varies from narrow oblong to transverse in closely related genera, and affords no basis for a family distinction.

\* In the synopsis of the Cancroidea in this Jour., vol. xii, p. 131, *Corystoides* was placed near *Acanthocyclus*, to which it has close relations; but from this and the other Cancroids, it is removed by the absence of all power of retraction in the inner antennæ.

The name *Bellia* has been recently duplicated in the science, in an article by Mr. C. Spence Bate, on a new genus of Amphipods near *Lepidactylis*, published in the Annals and Mag. Nat. Hist., [2], vii, 318, pl. 11, f. 8, 1851. The description of Milne Edwards's genus of this name is published in the Ann. des Sci. Nat. [3], ix, 1848, p. 192.

The following are the families thus deduced, with the genera of Corystoidea and their characteristics.

### FAM. I. TRICHOCERIDÆ.

Carapax formâ Cancroideus, fronte non rostratus. Antennæ internæ longitudinales. Antennæ externæ breves, flagello parce piloso. Maxillipedes externi super epistoma non producti, sed margini areæ buccalis bene adaptati.

Gen. TRICHOCERA, *DeHaan*.\*—Frons dentatus. Articulus maxillipedis externi 3tius apice truncatus. Articulus antennarum externarum 1mus elongatus, hiatum orbitæ bene occupans.

### FAM. II. THIIDÆ.

Carapax suborbicularis, non oblongus, fronte non rostratus. Antennæ internæ transversæ vel obliquæ. Antennæ externæ breves, flagello parce piloso. Maxillipedes externi super epistoma producti.

Gen. 1. THIA, *Leach*.—Frons integer, arcuatus. Antennæ internæ transversæ. Pedes nulli natatorii. Articulus maxillipedis externi 3tius vix oblongus.

Gen. 2. KRAUSSIA, *Dana*.† Carapax paulo transversus, margine postero-laterali brevi, fronte denticulato, medio emarginato. Antennæ internæ obliquæ. Pedes 8 postici natatorii, tarso falci-formi. Articulus maxillipedis externi 3tius vix oblongus.

### FAM. III. CORYSTIDÆ.

Carapax sive suborbicularis sive multum angustus, fronte plus minusve rostrato. Maxillipedes externi super epistoma producti.

#### 1. *Pedes nulli natatorii.*

G. 1. TELMESSUS, *White*.‡—Carapax parce transversus, pone medium latior, fronte paulo producto et medio emarginato. Articulus antennarum externarum 1mus elongatus, processu elongato hiatum orbitæ bene occupans. Articulus maxillipedis externi 3tius parce oblongus apice triangulatus, articulum 4tum prope apicem gerens.

G. 2. ATELECYCLUS, *Leach*.§—Carapax fere orbicularis, lateraliter arcuatus, fronte paulo producto. Articulus antennarum exter-

\* Faun. Japon. (1833), p. 16.

† Ad species completendum *Xantho integrum* Haanii, (Faun. Japon. 66, tab. 18, f. 6) et *Platyonychum rugulosum* Kraussii ("Südaf. Crust." 26, tab. 1, f. 5), Thiaæ affines et *Xantho* remotas, genus "Kraussia" institutum est. *Platyonycho* discrepat margine postero-laterali brevior quam antero-lateralis, carapace paulo transverso, fronte bilobato et denticulato, flagello antennarum internarum subpiloso. An *Trichocera porcellana* (A. White, "Voy. Samarang," p. 59) a Kraussii specie differt?

‡ A. White, "Ann. Mag. Nat. Hist.," xvii, 497, 1846; Voy. Samarang, 14, tab. 3. *Atelecyclo*, habitu, antennis aliisque, Kraussia affinis: ejus affinitas Maioides, ab Adamsio White edita, justa non videtur. •

§ *Chlorodius* Haanii, Faun. Japon., 13.

narum Imus elongatus hiatum bene occupans. Articululus maxillipedis externi 3tius oblongus, apice oblique truncatus, in marginis interni emarginatione articulum 4tum gerens.

G. 3. PELTARION, *Hombron et Jacquinot*.<sup>\*</sup>—Carapax suborbicularis, ante medium latior, fronte triangulatè rostrato. Articululus antennæ externæ Imus perbrevis, 2do parce crassior. Articululus maxillipedis externi 3tius non oblongus, apice truncatus. Articululus pedum 8 posticorum 5tus 4to vix brevior.

G. 4. PSEUDOCORYSTES, *Edwards*.—Carapax suborbicularis, parce oblongus, triangulatè rostratus. Articululus maxillipedis externi 3tius vix oblongus. Articululus pedum 8 posticorum 5tus 4to duplo brevior.

G. 5. GOMEZA, *Gray*.<sup>†</sup>—Carapax oblongus, fere ellipticus, triangulatè rostratus. Oculi parvi vel mediocres. Articululus maxillipedis externi 3tius vix oblongus vel transversus, apice truncatus. Articuli pedum 8 posticorum 5tus et 4tus fere æqui.

G. 6. OEIDIA, *DeHaan* (partim).<sup>‡</sup>—Carapax oblongus, antice non angustans, fronte breviter rostrato. Oculi permagni. Articululus maxillipedis externi 3tius latus, oblongus, 2do paulo brevior. Articuli pedum 8 posticorum 5tus et 4tus fere æqui.

G. 7. CORYSTES, *Latreille*.—Carapax oblongus, rostratus. Oculi mediocres. Articululus maxillipedis externi 3tius angustè oblongus 2do vix brevior.

2. *Pedes postici natatorii.*

G. 8. DICERA, *DeHaan*.<sup>§</sup>—Carapax oblongus, rostro late triangulato. Pedes postici natatorii, tarso falciformi. Articululus maxillipedis externi 3tius angustè oblongus, 2do parce brevior.

2. *Conspectus Crustaceorum, &c.*—*Conspectus of the Crustacea of the Exploring Expedition under Capt. Wilkes, U.S.N.*; by JAMES D. DANA. —PAGURIDEA, (Proc. Acad. Nat. Sci., Philad., 1851. p. 267.)—This paper contains a distribution of the Paguridea into genera, and also a description of new species. The natural groups have been partly indicated by Milne Edwards in his work on Crustacea, and more lately in the *Annales des Sciences Naturelles* for 1848, p. 59. There are, however, in his arrangement, discrepancies between the characters of the species and those laid down for his subdivisions which we find it difficult to explain. Such are, the placing of *Pagurus tibicen* and some related species with his “*Æquimanus*,” when the left hand is very much the larger, and the *guttatus* and *granulatus* with the “*Senestres*,” although the hands are nearly equal in the former, and the right is the larger in the latter. Still his sections are in the main natural groups, and some of them have more important points of distinction than this distinguished author has mentioned.

\* *Hombron et Jacquinot*, “Voy. au pole Sud,” tab. 8, f. 1.

† *Oeidia Haanii* (partim), Faun. Japon. 15. Species *Oeidiæ* typica (*O. 20-spinosa* denominata) *Gomezæ* vera est.

‡ Faun. Japon. 15. Species *Oeidia distincta* Haanii, typus est generis *Oeidiæ* accepti. Genus idem est *Jonas*, (*Hombron et Jacquinot*, “Voy. au pole Sud,” tab. 8, f. 4–8.) Species *J. macrophthalmus*, oculis grandibus formâ characteribusque aliis, *Oeidiæ distinctæ* ferme similis.

§ Faun. Japon. 14, (1833). *Nautilocorystes*, *Edwardsii*, Crust. ii, 149 (1837).

The *Pagurus Bernhardus* is the type of one group, the species of which live mostly in the colder oceans. This genus is called BERNHARDUS, and the common species naturally bears Leach's specific name, *Bernhardus streblonyx*. The 2d genus is called DIOGENES; *Pagurus miles* is the type. The 3d, PAGURISTES, having for its type, *Pagurus gonagrus* or *P. pilosus*. The preceding have the fingers acuminate, while in the following genera they are spoon-excavate at tip. The 4th genus is PAGURUS, a large group including *P. punctulatus*, having corneous tips to the fingers, and no beak; the 5th, CALCINUS, with *P. tibicen* as the type, with calcareous tips and a short beak; [6th, ANICULUS, equal handed and beaked, and with corneous tips to the fingers like the following, but having a vertical movement in the fingers, as in *Pag. aniculus*; 7th, CLIBANARIUS, equal-handed and having a lateral or horizontal movement in the fingers, as in *Pagurus clibanarius*.\* The last two genera are here for the first time published, not being included in the paper in the Academy's Proceedings.—D.]

The following is a synopsis of the genera :

#### FAM. I. PAGURIDÆ.

Antennæ internæ mediocres, articulo 1mo brevissimo. Maxillipedis externi palpus flagello multiarticulato instructus.—Species aquaticæ vel littorinæ.

##### 1. PAGURINÆ.—Abdomen asymmetricum.

1. *Digiti acuminati. Flagellum antennarum internarum sæpe plus minusve pilosum.*

Gen. 1. PAGURISTES, (*D.*)—Pedes 4ti non subcheliformes, tarso terminali. 2-4 appendicibus pone pedum posticorum bases instructus. Basis antennarum internarum paulo longior, apice articuli 2di extremitatem oculorum fere attingente.

Gen. 2. DIOGENES, (*D.*)—Pedes 4ti subcheliformes. Pedes 1mi inæqui, sinister major. Annulum ophthalmicum rostriferum. Appendicibus pone pedum posticorum bases carens.

Gen. 3. BERNHARDUS, (*D.*)—Pedes 4ti subcheliformes. Pedes 1mi interdum subæquales, sæpius dexter major. Annulum ophthalmicum non rostriferum. Appendicibus articulatis pone pedum posticorum bases carens.

2. *Digiti instar cochlearis excavati. Flagellum antennarum internarum nudum vel nudiusculum.*

Gen. 4. PAGURUS.—Manus anticæ sæpius compressæ, interdum subæquæ, sæpius sinistrâ majore; digitis apice corneis, in plano verticali claudentibus. Frons medio non rostratus sed truncatus.

Gen. 5. CALCINUS, *D.*—Manus anticæ compressæ, inæquæ, sinistrâ majore, digitis apice calcareis, in plano verticali claudentibus. Frons medio breviter rostratus.

Gen. 6. ANICULUS, *D.*—Manus anticæ subæquæ, digitis apice corneis, in plano verticali claudentibus. Frons medio breviter rostratus.

\* The *Pagurus aniculus* may hereafter be named *Aniculus typicus* and the *P. clibanarius*, *Clibanarius vulgaris*.—D.

Gen. 7. CLIBANARIUS, *D.*—Manus anticæ plus minusve depressæ, subæquæ, digitis apice corneis, in plano horizontali claudentibus. Frons medio breviter rostratus.

## II. CANCELLINÆ.—Abdomen symmetricum.

Gen. CANCELLUS, *Edwards.*

### FAM. II. CENOBITIDÆ.

Antennæ internæ multo elongatæ, articulo Imo oculis sæpius longiore, valde deflexo. Maxillipedis externi palpus flagello non instructus.—Species subterrestriales.

Gen. 1. CENOBITA, *Edw.*—Corpus angustum, carapace elongato, fronte non rostrato. Abdomen in cochleam retortum, superficie plerumque carnosum.

Gen. 2. BIRGUS, *Leach.*—Corpus latum, carapace parce oblongo postice latissimo, fronte triangulato. Abdomen directum, lamini crustaceis dorso plerumque tectum.

The following are the names of the species described in this paper: Bernhardus Novi-Zelandiæ, *B. armatus*, *B. hirsutiusculus*, *B. pubescens*, *B. tenuimanus*; Paguristes longirostris, *P. hirtus*; Pagurus fabimanus, *P. scabrimanus*; together with the following referred to Pagurus, but which pertain to the new division Clibanarius, *C. æquabilis*, *C. zebra*, *C. humilis*, *C. globoso-manus*. The last may be the *P. corallinus* of Edwards. Also Cenobita carnescens and *C. brunnea*. D.

3. *On the Genus Orthostoma*; by JAMES D. DANA.—The genus *Orthostoma* was referred by its describer, Dr. Randall, (*J. Acad. Nat. Sci., Philad., viii, 121, pl. 5, 1840,*) to the family Gecarcinidæ. In its convex or obese form, it approaches that group. Yet the dentate anterolateral margin, and thin dentate front led to his remarking that “the species has at first sight much resemblance to the Cancers.” Upon examining the specimens, recently, in the collections of the Academy at Philadelphia, I find that in their essential characters as well as the texture of the carapax, the species is related to the *Telphusidæ*. The male verges are situated as in *Telphusa*, and not as in the *Grapsoidæ*; and in general habit, the described species is near *Potamia* and *Trichodactylus*. It has the 2d joint of the outer maxillipeds oblong (but little shorter than the second), with the summit oblique, and the 4th joint articulated with it near the outer apex. The male abdomen is very broad triangular, and 5-jointed.

The known genera of *Telphusidæ*, are, then, as follows:—

G. 1. TELPHUSA, *Latr.*—Articulus maxillipedis externi 3tius subquadratus, 2dus multo brevior, 4tum angulo apicali interno gerens.

G. 2. VALDIVIA, *White.*—Articulus maxillipedis externi 3tius oblongus, 2dus transversus. [Carapax margine antero-laterali 4-dentatus.] Pedes longi.

G. 3. POTAMIA, *Latr.*—Articulus maxillipedis externi 3tius subquadratus, apice subtriangulatus anguloque apicali 4tum gerens.

G. 4. TRICHODACTYLUS, *Latr.*—Carapax marginibus subinteger. Articulus maxillipedis externi 2dus oblongus, 3tius vix oblongus, subtriangulatus, margine terminali valde obliquo anguloque externo 4tum gerens, 2ndo multo brevior.

G. 5. ORTHOSTOMA, *Randall.*—Carapax margine antero-laterali dentatus. Articulus maxillipedis externi 2dus oblongus, 3tius oblongus, 2do paulo brevior, apice obliquus, prope angulum exteriorum articulum 4tum gerens.

4. Genus *Heterograpsus* of *Lucas*.—The genus *Heterograpsus*, described in the recent work on the Exploration of Algiers, and figured on plate 2 of Crustacea, f. 4, has the outer maxillipeds and most other characters of *Pseudograpsus*, *Edw.*,\* but differs from that genus in having the sides nearly straight and convergent backward as in most *Sesarmæ*, instead of arcuate. In the species described, the *H. sexdentatus*, the antero-lateral margin is bi-emarginate. J. D. D.

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\* See this Journal, xi, 278.

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PAGURIDEA, MEGALOPIDEA, MACROURA.

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PL. 1852-53, pp. 6-28, 10

# CONSPECTUS CRUSTACEORUM, &c.

## Conspectus of the Crustacea of the Exploring Expedition under Capt. Wilkes, U. S. N. (Pl. 10)

BY  
JAMES D. DANA.

Including the PAGURIDEA continued, the MEGALOPIDEA, and the MACROURA.

[From the Proceedings of the Academy of Natural Sciences of Philada., Jan., 1852.]

### PAGURIDEA, continued, and Subtribe MEGALOPIDEA.

#### I. PAGURIDEA, continued.

Among the species of the genus *Pagurus*, as restricted in my former paper on the Paguridea, there are still three groups of distinct character; one, having no trace of a beak, the front being truncate, and also having the fingers opening in a vertical plane, the hands being usually compressed, with commonly the left the larger; a second, having a short beak or triangular point in front, and the fingers opening like the preceding, with the hands subequal; a third, having a beak like the last, but the fingers opening in a *horizontal* plane, the hands being subequal and more or less depressed, and never compressed. The first group has *Pagurus punctulatus* for its type; the second, *P. aniculus*; the third, *P. clibanarius*. They form three genera with the following characters:—

1. **PAGURUS.**—Frons non rostratus, truncatus. Manus anticæ sæpius compressæ, interdum subæquæ, sæpius sinistrâ majore, digitis apice corneis, in plano verticali claudentibus.

2. **ANICULUS, D.**—Frons triangulatè rostratus. Manus anticæ subæquæ, digitis apice corneis, in plano verticali claudentibus.

3. **CLIBANARIUS, D.**—Frons triangulatè rostratus. Manus anticæ subæquæ, plus minusve depressæ, digitis apice corneis, in plano horizontali claudentibus. Species *P. æqualis*, *zebra*, *humilis*, *globosi-manus*, *Clibanario* pertinent.

The species *Pagurus aniculus* may hereafter be named *Aniculus typicus*; the *P. clibanarius*, *Clibanarius vulgaris*; and the *P. Bernhardus*, *Bernhardus streblonyx*. The name *Bernhardus pubescens*, (see preceding volume, p. 270,) we propose to change to *B. scabriculus*, as Kröyer\* has described a *Pagurus pubescens*, which is probably a *Bernhardus*.

#### *Descriptiones Pagurideorum adhuc ineditæ.*

**BERNHARDUS OBESI-CARPUS.**—Frons medio prominulus, obtusus. Regio carapacis antica paulo transversa, nudiuscula. Oculi crassi et perbreves, aciculo longiores, squamâ basali ovatâ, subacutâ, integrâ. Antennæ externæ nudæ, basi multo longiore quam oculus, aciculo crasso, brevi, apicem articuli 3tii attingente. Pedes toti fere nudi et granulosi, non armati; antici inæqui; manu majore oblongâ, convexâ, symmetricâ, granulis nitidis partim seriatis, carpo multo crassiore, parce latiore. Pares 2di et 3tii crassiusculi, articulo 3tio supra

\* Tidsk. ii, 251, 252.



scabri-rugato et breviter hirsuto, tarso curvato, canaliculato. *Hab.* Valparaiso? *Long.* 2".

**BERNHARDUS ÆQUIMANUS.**—Carapax sparsim pilosus, regione anticâ non oblongâ, fronte ad medium angulato, vix rostrato. Oculi cylindrici, aciculum antennalem longitudine æquantes, squamâ basali apice productâ et 3—4-denticulatâ. Antennarum externarum flagellum infra elongatè ciliatum. Pedes superficie granulati partim sparsim hirsuti, marginibus hirti; antici æqui, mediocres, manu breviter ellipticâ, parce latiore et longiore quam carpus, non costatâ, marginibus subspinulosis, carpo supra subspinuloso et hirto. Pedum 4 sequentium tarsus bene canaliculati, infra ciliati. *Hab.* Valparaiso. *Long.* 1½".

**BERNHARDUS CRINITICORNIS.**—Frons medio parce angulatus. Regio carapacis antica non transversa. Oculi mediocres, aciculo antennali paulo longiores, squamâ basali apicem rotundatâ. Flagellum antennarum externarum infra crinitum non ciliatum. Pedes antici valde inæqui, nudiusculi, manu majore oblongâ, paulo longiore et latiore quam carpus, scabriculâ, spinulis subtilissimis 4—5-seriatis, margine inferiore fere recto, carpo minutè spinuloso. Pedes 2di 3tii laxè pubescentes, non spinulosi, tarso non canaliculato. *Hab.* portu "Rio Janeiro." *Long.* 9—10".

**PAGURUS EUOPSIS.**—*P. punctulato* affinis. Oculi fronte carapacis valde longiores, crassiusculi. Flagellum antennarum externarum nudum, articulis versus antennæ extremitatem latere interno gibbosis; aciculum parvulum. Pedes antici sat inæqui, manu majore carpoque oblongis, extus spinulosis et hirsutis. Pedes 2di 3tii marginibus multo hirsuti, articulo 5to spinulis supra paulo armati, tarsis totis subteretibus, undique divaricatè hirsutis. *Hab.* ad insulam "Upolu" et in freto "Balabac." *Long.* 2¼".

**CLIBANARIUS STRIOLATUS.**—Regio carapacis antica fere quadrata. Oculi graciles, margine carapacis antico vix breviores, squamâ basali angustâ, acuminatâ, bidentatâ. Pedes antici subæqui, manibus brevibus carpisque supra spini-tuberculatis et pilosis, manu sinistrâ maris paulo majore. Pedes 2di 3tii supra infraque paulo hirsuti, multis lineis brunneis longitudinalibus ornati, tarso subterete, non breviora quam articulus penultimus, sinistro 3tii paris articulo 5to extus parce convexo, acie rectangulatâ superne instructo. *Hab.* insulâ "Tongatabu," et archipelago "Viti." *Long.* 2". *Paguro lineato*, Edw. propinquus.

**CLIBANARIUS BRASILIENSIS.**—Regio carapacis antica paulo oblonga. Rostrum bene triangulatum. Oculi gracillimi, margine carapacis antico non breviores, squamâ basali valde truncatâ et brevissimâ, pilis longis, margine apicali transverso instructâ. Pedes antici æqui, manu dextrâ parce majore. Pedes 2di 3tiique persparsim hirsuti, subnudi, tarso perbrevis, articulo 5to paris 3tii extus subcomplanato, parce convexo, supra subcarinato. Pedes colore pauci-lineati. *Hab.* portu "Rio Janeiro." *Long.* 1¼".

*Clibanarius globosi-manus* (Pag. globosi-manus, D.) *P. corallino*, Edw. adhuc partim descripto an differt? In specimine globosi-mani non attritâ, pedes 2di 3tii marginibus hirsuti non nudiusculi. *Clibanariis* aliis totis nobis lectis differt, superficie externâ articuli 5ti sinistri paris 3tii omnino hirsutâ.

## II. MEGALOPIDEA.

The question of the maturity or immaturity of the Megalopæ and that of their true place in the natural system, still remain in doubt. Without touching on these points, at this time, I propose to describe some new genera and species pertaining to the group.

The species, however diverse, agree in the structure of the abdomen and its caudal appendages; in the position of the four antennæ *between* the eyes; in the articulations of the outer antennæ; in the inner antennæ folded longitudinally or obliquely either side of the beak; in the general form of the outer maxillipeds; in the large size and lateral position of the eyes without orbits; in the general structure of the legs; and in their habits. The beak is either horizontal or

flexed downward, and has usually a sharp prominent tooth either side of it, exterior to the inner antennæ.

The genus *Megalopa*, *Leach*, as now accepted, embraces two distinct sets of species—the *M. Montagu* and *armata* for which it was instituted by *Leach*, and the *M. mutica* of *Desmarest*. The former (the true *Megalopæ*) have the beak nearly horizontal, with rarely a tooth either side, and there is a reflexed spine on the ventral surface of the first joint of the 8 posterior legs. The latter has the beak bent downward vertically, and either side of it there is a prominent spine or tooth; the ventral surface of the base of the legs is unarmed. The *M. mutica* is very closely related to *Monolepis spinitarsus* of *Say*, the only difference being that the extremity of the posterior legs in this species of *Monolepis* bear 3 or 4 setæ rather longer than the tarsus, while the descriptions of the *mutica* make mention of no such setæ. The posterior legs in *Monolepis* fold up and overlie the carapax: but these legs are otherwise like the preceding, though somewhat smaller, and it is probable that this habit in the *M. mutica* has been overlooked, as these animals almost always swim with the posterior legs extended like the others, when taken and kept in a jar for examination, and they also have them extended when walking. These legs do not resemble at all the posterior pair in *Porcellana* or *Galathæa*. I had examined several species before I discovered this habit with regard to the posterior legs. The animal also throws the fourth pair of legs forward along or over the borders of the carapax, so that the extremity overlies the bases of the eyes and the tarsi hang down in front; and at the same time the two preceding pair are folded up and lie against the sides of the carapax outside of the 4th pair, or the 3d pair may be thrown forward like the 4th. A *Sooloo* species, and another common off *Cape of Good Hope*, were observed swimming with the legs thus disposed.

*Say's* genus *Monolepis*\* also embraces two groups, alike in the deflexed front and the longish setæ at the extremity of the posterior tarsi. In one division, including the *M. inermis*, the tarsi are flattened styliform, and unarmed, with either lateral edge sparsely furnished with minute hairs; the fossa of the sternum, along which the abdomen lies when inflexed, has a prominent trenchant border; the depression on the carapax for the posterior legs is rather abrupt and somewhat neatly defined; the body is very convex and obese, with the sides high and vertical, and much wider behind than before, being gradually narrowed forward.

The other division has the tarsi unguiform, compressed, and spinous below, the antepenult spine always longest; the fossa of the sternum with flaring borders; the depression of the carapax for the posterior legs shallow concave; the body more flattened above, with the sides more oblique. This division corresponds to *Monolepis spinitarsus*.

Besides the preceding, there is another group of *Megalopidea*, examined by the author, resembling *Megalopa* of *Leach*, except that the tarsus of the posterior legs is narrow lamellar instead of unguiculate, and edged with longish setæ somewhat shorter than the tarsus.

There is still another group in which the front is horizontal and tricuspidate, the inner antennæ when retracted being exposed in the interval between the beak or inner cusp and either outer, lying in view as in *Plagusia*.

With these explanations we give the characters of the genera.

1. *MONOLEPIS*, *Say*.—Carapax fronte tricuspidatus sed valde deflexus ideoque frons superne visus medio non acutus sed truncatus. Pedes 5ti minores, super carapacem sæpe restantes, depressione ad eos recipiendos abruptâ, tarsis inermibus, depressis styliformibus, paris postici non depressis, apice 3—4 setis longiusculis (tarso paulo longioribus) instructo. Sterni fossa abdominalis marginibus bene prominens et subacuta.—*Monolepis inermis*, *Say*, typus est.

2. *MARESTIA*, *Dana*.—Carapax fronte uti in *Monolepi*. Pedes 8 postici ad basin infra non armati; 5ti minores, super carapacem sæpe restantes, depressione ad eos recipiendos parce concavâ; tarsis styliformibus, unguiculatis, spinis infra

\**Journ. Acad. Nat. Sci., Philad., i. 155.*

armatis, paris postici apice setis longiusculis instructis.—Typus est *Monolepis spinitarsus*, Say. Hic pertineret quoque *Meg. mutica*, Desm. si ejus pedes postici setis longiusculis confecti; aliter genus alterum instituendum. Verbum "Marestia" clarissimum Desmarest commemorat.

3. MEGALOPA, *Leach*.—Carapax fronte simpliciter rostratus, rostro vix deflexo, acuto. Pedes 8 postici ad basin infra uni-spinigeri: 5ti minores, tarso styliformi.—Typus *Meg. Montagui*, Leach.\*

4. CYLLENE, *Dana*.—Carapacis frons uti in *Megalopa*. Pedes 8 postici ad basin infra uni-spinigeri; 5ti minores, tarso anguste lamellato, setis longiusculis partim ciliato.

5. TRIBOLA, *Dana*.—Carapax fronte horizontalis tricuspidatus, rostro (vel cuspidè medianâ) tenui, cuspidibus (vel dentibus) externis vix longiore. Antennæ internæ inter rostrum et cuspidè externas apertè inflexæ. Pedes postici minores, tarso unguiculato setisque longis non instructo.

*Descriptiones Megalopideorum adhuc ineditæ.*

MARESTIA ELEGANS.—Carapax antice angustus et superne visus bilobatus, lateribus fere parallelis, pone oculos vix salientibus. Pedes antici parvi, manu oblongâ, margine inferiore et partim superficie internâ remotè hirsutis. Pedes 2di marginibus sparsim ciliati, tarso infra 7-spinoso, ad basin tuberculum infra non gerente. Tarsi postici infra 6-spinosi, apice unguiculati et 4 setis longis instructi. *Hab.* Promontorio Bonæ Spei. *Long.* Carapacis 4—5". An *Megalopa mutica Kraussii* (Südaf. Crust. p. 54) et *De Haanii* (Faun. Japon. p. 167)? Sed pedes postici extremitate setis tarso paulo longioribus instructi.

MARESTIA ATLANTICA.—Carapax antice angustus et superne visus bilobatus, lateribus postice paulo divergentibus, pone oculos vix salientibus. Pedes antici parvi, manu oblongâ, nudâ aut nudiusculâ. Pedes 6 sequentes nudiusculi, tarso infra quinque spinas tuberculumque ad basin instar calcis gerente. Tarsi postici parvuli, sed setularum duabus paribus infra instructi, non spinosi, apice unguiculati et tribus setis longis armati.—*Hab.* lat. aust. 6°, long. occ. 24°.

MARESTIA PERVALIDA.—Carapax antice latus et superne visus obsolete quadri-lobatus, lobis subæquis, lateribus postice non divergentibus, prope medium unidentatis. Pedes antici pervalidi, manu valde crassâ, tumidâ. Tarsi postici infra spinosi, apice tribus setis longiusculis armati.—*Hab.* lat. bor. 6°, long. orient. 173°.

MONOLEPIS ORIENTALIS.—Sterni segmenta fossam sterni includentia antica margine interiore fere truncata, vix triangulata; segmenta proxima convexa, non tuberculigera. Tuberculum medianum inter aream buccalem et fossam sterni simpliciter subtriangulatum, antice acutum, postice hemisphericum, utrinque depressione deinde septo brevi antice et oblique producto cinctum. Tarsus pedis postici brevis, non unguiculatus, apice tribus setis longiusculis armatus, infra setulis paucis perbrevis necque spinis instructus. *Hab.* in mari Suluensi. *Long.* carapacis 4".—*M. inermis* differt, sterni segmentis anticis intus non subtruncatis sed prominenter triangulatis, proximis unituberculatis, tuberculo mediano inter aream buccalem et fossam sterni tuberculis tribus composito.†

CYLLENE HYALINA.—Rostrum parce prominens. Carapax subovatus, lateribus pone oculos paulo saliens, postice inermis. Thorax infra ad extremitatem pos-

\* *Malac. Pod. Brit. pl. 16.* Leach describes three other species, (not noticed by Edwards,) in Tuckey's Exped. to the Zaire, (London, 1818.) p. 404. The *M. Cranchii* may be a true *Megalopa*; the others have a deflexed beak.

† The author is indebted to Prof. L. R. Gibbes, of Charleston, S. C., for the privilege of examining specimens of the *M. inermis*. They were obtained by him from the stomach of a fish off the Atlantic coast between New York and Charleston, in 1846. See Rep. Crust. in U. S. Collections, by Prof. Gibbes, in Proc. Amer. Assoc. Charleston, 1850, vol. iii. p. 192.

teriores inermis. Pedes antici mediocres, carpo inermi, manu paulo tumidâ, supra subgibbosâ, digitis hiantibus, apice inflexis et acutis. Pedes 2di 3tii 4tique subæqui, tarsis fere rectis, longis, articulo penultimo longioribus. *Hab.* in mari Atlantico juxta "Rio Negro" Patagoniæ, et in mari Pacifico prope "Valparaiso." *Long.* carapacis 3—4'''.

CYLLENE FURCIGER.—Rostrum elongatum, spiniforme, frontis latitudine non brevior. Thorax infra ad extremitatem posteriorem duabus spinis longis divergentibus postice productis armatus. Pedes antici angusti, carpo articuloque secundo spinâ brevi curvatâ armatis, brachio inermi. Tarsi 2di 3tii 4tique parce armati, styliformes.—*Hab.* in mari Suluensi.

TRIBOLA LATA.—Carapax late ovatus non pubescens, paulo longior quam latus, lateribus pone oculos parce undulatis, rostro lineari, dentibus frontis lateralibus rostro remotis, apice acutis et paulo divaricatis. Pedes antici parvuli, tenues, manu pedibus sequentibus vix crassiore. *Hab.* in mari Atlantico, prope insulas "Canary;" e stomacho piscis "Bonito" lecta. *Long.* corporis fere 1''.

TRIBOLA PUBESCENS.—Carapax oblongus, subovatus, pubescens, lateribus pone oculos undulatis, rostro lineari, dentibus frontis lateralibus rostro minus remotis. Pedes toti densè brevissimèque pubescentes; antici rostrum paulo superantes, angusti, inæqui, manu dextrâ non latiore quam carpus. Pedes 8 sequentes fere duplo longiores, 2dis brevioribus quam 3tii. *Hab.* in Archipelago "Paumotu" mari Pacifico.

## H. MACROURA.

We follow De Haan in placing the genus *Galathæa* with the *Anomoura*; and near it we arrange *Æglea*, which widely differs from most other related species in having penicillate instead of foliose branchiæ.

The *Macroura*, excluding these groups, includes three distinct sections or subtribes.

One, the "Fossores" of authors, or the *THALASSINIDEA*, has close relations on one side with the *Paguri*, and on the other with the *Squillidæ*. They constitute a line of gradation between these extremes, independent mostly of the other *Macroura*, and osculating only with the *Astaci*, although removed from them in general habit and structure. There is a diversity among the legs as to form and position, which is not found in any other *Macroura*, and calls to mind the *Paguri*. Moreover, there is in general a looseness of structure, a length of abdomen, and sluggish habit of body, unlike the trim compact forms of the typical *Macroura*. The anterior feet are thrown directly forward and are thus fitted for the burrowing habits of the species.

The *second* subtribe—the *ASTACIDEA*—is composed of the highest grade of *Macroura*, approaching in some points of structure the *Brachyura*. This is seen in the fact that the sides of the carapax fold under and unite to the epistome, as is well shown in *Scyllarus* and less perfectly in *Astacus*; also in the absence or small size of the basal scale of the outer antennæ. The *Astaci* are the transition species between the other *Astacidea* and the *Caridea*, and in the genus *Paraneuphrops*, White, the antennary scale is not smaller than is common in the latter group. Yet they properly form part of the same section with the *Scyllari* and *Palinuri*, rather than a separate division as made by Milne Edwards; they differ from all the *Caridea* in the transverse suture across the carapax near its middle.

The *third* section—the *CARIDEA*—includes the typical *Macroura*, which have the sides of the carapax not soldered to the epistome, and a large basal scale to the outer antennæ.\*

\* The *Cumæ* would constitute another section—*Cumidea*—if mature animals. But according to recent researches of Prof. Agassiz, as he has informed the author, they are in some cases, and probably in all, immature forms of *Palæmon*, *Crangon*, and other known *Macroural* genera.

These subtribes may be divided into families.

*Subtribe 1. Thalassinidea.* This section, as Milne Edwards observes, includes two strongly marked divisions; *one*, with only the ordinary thoracic branchiæ, and a *second* with the addition of *abdominal* branchial appendages, as in the Squillidæ. The former we name the *Thalassinidea Eubranchiata*, the latter, the *Thalassinidea Anomobranchiata*. The first group embraces three families, differing strikingly in outer maxillipeds and abdomen, as explained beyond. The second contains only two genera, *Callianidea*, Edw., and *Isæa*, Guerin—the last name was changed by Edwards to *Callianisea*; but as this word is so near *Callianassa* and *Callianidea*, a contraction to *Callisea* would be preferable.

*Subtribe 2. Astacidea.*—In this subtribe, we adopt De Haan's sections, except that we exclude the Megalopidea, and we do not associate the *Thalassinidea* with the *Astacidea*. The sections or families are *Scyllaridæ*, *Palinuridæ*, *Eryonidæ* and *Astacidæ*.

Leach in 1819 divided the old genus *Astacus*, naming the marine species (*Homarus Edw.*) *Astacus*, and the fresh water (*Astacus Edw.*) *Potamobius*. Edwards' division, of like character, now generally accepted, was not published till 1837. Leach hence has the priority. But according to Leach, the name *Astacus* is appropriated, not to the typical part of the group, that including the *Astacus fluviatilis* of old authors, or *Cancer Astacus* of Linnæus, and which embraces at the present time numerous species, but to that including the *Cancer Gammarus* of Linnæus, still but a small group. There is hence much objection to the names of Leach, and moreover much confusion would now ensue from their adoption. There seems therefore to be sufficient reason for rejecting them, if it be of no weight that they have remained for 30 years unrecognised by British authors. They are adopted in the Catalogue of British Crustacea of the British Museum, published in 1850, but not in the general catalogue of 1847.

*Subtribe 3. Caridea.*—In arranging the Caridea into groups, much stress is usually laid upon external form and length of beak. The unimportance of these characters is inferrible from the fact that they involve no essential variations of structure. Moreover, in a single natural group we may find both the long and short beak. In the Crangon group, for instance, in which the beak is usually very short and the body depressed, we have a species with the beak and habit of a Hippolyte.

There are other characters of more fundamental value; and these have been brought forward by De Haan. The mandibles afford the distinctions alluded to. In one section they are very slender and are bent nearly at a right angle, without enlargement at the crown. In another they are very stout, and somewhat bent above with a broad dilated crown. In a third, they are stout, but not bent, and have a dentate summit. In a fourth they have, in addition to a projecting lateral crown, a large summit process, which is often oblong and very prominent. These forms are characteristic of different sections of the Caridea.

The fact that the mandibles bear a palpus or not is of much less importance; for the portion of the mandible which is most essential to its functions is the crown. Among the Palæmoninæ, there are genera having a mandibular palpus, and others without one; while the two kinds in other respects are remarkably close in their relations. We have found moreover that in this group, the length of the palpus varies with the disjunction of the 2d and 3d flagella of the inner antennæ. If these flagella are separate to their bases nearly, (as in Palæmon,) the palpus is long and 3-jointed; if united for some distance up, the palpus becomes short and finally only 2-jointed (Palæmonella;) if united nearly or quite to their summits, there is no palpus.\*

In the arrangement of the genera into families, the fact *whether the 1st or 2d*

\* In our genus *Palæmonella*, the palpus of the mandible is 2-jointed, and in *Anchistia*, which is closely like Palæmon in habit in some of its species, there is no palpus, as in the Pontoniæ; and thus the transition to the Pontoniæ from Palæmon is exceedingly gradual. Harpilius and Œdipus (Pontoniæ of authors) fill up the interval between Anchistia and the true Pontoniæ. They are all similar in having the 2d pair of legs largest, and in other prominent characteristics.

*dair of legs is the stouter*, is of great weight, much greater than previous authors have recognised. In the Brachyura, the anterior pair is uniformly the strong pair; and this uniformity through so extensive a group shows that the variations from it must be of importance in classification. This peculiarity of the Brachyura is a consequence of the concentration of force in the cephalic or anterior portion of the cephalothorax; and the diffusion of this force posteriorly, which in different degrees marks the Macrourea, is especially exhibited in the legs. It is therefore of no little interest to observe whether the first or the second pair is the larger, or whether the degradation is still greater and the 3d pair is chelate like the 2d and even stouter, as in the Penæi. By regarding this character we are led to place Hippolyte and Rhyncocinetes with Alpheus, instead of with Palæmon; also Hymenocera and Pontonia with Palæmon, instead of with Alpheus; Pasi-phæa in a distinct group from the Penæi, &c. Moreover, the Penæinea, viewed in this light and stripped of some unrelated genera, make a natural group, for they are characterized by having the third pair of legs *like the second*, instead of like the fourth. In the lowest forms among the Penæinea, there are *no* chelate or didactyle legs, and the species approach the Schizopods.

In the preceding paragraphs we have but hinted at some of the more prominent principles involved in the classification of the Macrourea here presented, a fuller exposition of which will be given in another place. Below is a synopsis of the arrangement thus arrived at, and following this synopsis, are our descriptions of new species.

*Synopsis Familiarum Crustaceorum Macroureorum.*

## I. THALASSINIDEA, vel MACROURA PAGURO-SQUILLIDICA.

Carapax suturâ transversâ notatus, posticeque sæpe suturis duabus longitudinalibus. Abdomen sæpius multo elongatum. Antennæ externæ squamâ basali sive nullâ sive parvulâ instructæ. Pedes 2 antici prorsum projecti; 6 postici habitu raro consimiles. *Species fossores.*

### Legio I. THALASSINIDEA EUBRANCHIATA.

Branchiis thoracis instructa tantum.

Fam. 1. GEBIDÆ.—Maxillipedes externi pediformes. Appendices caudales et aliæ abdominales latæ.

Fam. 2. CALLIANASSIDÆ.—Maxillipedes externi operculiformes. Appendices caudales latæ.

Fam. 3. THALASSINIDÆ.—Maxillipedes externi pediformes. Appendices caudales lineares.

### Legio II. THALASSINIDEA ANOMBRANCHIATA.

## II. ASTACIDEA vel MACROURA SUPERIORA.

Carapax suturâ transversâ sæpius notatus, lateribus anterioribus epistomate connatis. Antennæ externæ squamâ basali sive nullâ sive parvâ instructæ. Abdomen sat breve vel mediocre. Branchiæ penicillatæ. Pedes 2 antici oblique projecti; 6 postici directione consimiles.

1. *Antennæ externæ squamâ basali non instructæ. Pedes antici monodactyli.*

Fam. 1. SCYLLARIDÆ.—Carapax valde depressus, marginibus lateralibus sat tenuibus, carapace lateraliter subito inflexo. Antennæ externæ laminatæ, breves. Sternum trigonum.

Fam. 2. PALINURIDÆ.—Carapax subcylindricus, lateraliter late rotundatus. Antennæ externæ basi subcylindricæ, longæ. Sternum trigonum.

2. *Antennæ externæ squamâ basali instructæ. Pedes antici didactyli.*

Fam. 3. ERYONIDÆ.—Carapax non oblongus, depressus, lateribus subito inflexis, abdomine multo angustiore.

Fam. 4. ASTACIDÆ.—Carapax oblongus, subcylindricus, abdomine parce angustiore. Sternum angustum.

## III. CARIDEA.

Carapax suturâ transversâ non notatus, cephalothoracem plerumque tegens, lateribus anterioribus liberis, epistomate non connatis. Antennæ externæ squamâ basali grandi instructæ. Corpus sive subcylindricum sive paulo compressum. Branchiæ sæpius foliosæ.

## Legio I. PALÆMONINEA.

Pares 1mi 2dique pedum, unus vel ambo, chelati; 3tii 4tis similes. Maxillipedes 2di breves, lamellatæ.

Fam. 1. CRANGONIDÆ.—Mandibulæ graciles, valde incurvatæ, non palpigeræ, coronâ angustâ et non dilatatâ. Pedum pares 1mi 2di inter se valde inæqui.

Fam. 2. ATYIDÆ.—Mandibulæ crassæ, non palpigeræ, coronâ latâ, parce bipartitâ, processu terminali brevi et dilatato. Pedum pares 1mi 2dique inter se æqui, carpo nunquam annulato.

Fam. 3. PALÆMONIDÆ.—Mandibulæ crassæ, sive palpigeræ sive non palpigeræ, supra profunde bipartitæ, processu apicali oblongo, angusto.

## Legio II. PASIPHÆINEA.

Pedes 1mi 2dique chelati, 3tii 4tis similes. Maxillipedes 2di tenuiter pediformes.

Fam. 1. PASIPHÆIDÆ.—Mandibulæ uti in *Atyidis*.

## Legio III. PENÆINEA.

Pedes 3tii 2dis similes, sæpius chelati, 3tiis majoribus; nisi chelati, toti vergiformes et debiles.

Fam. 1. PENÆIDÆ.—Pedes 3tii bene didactyli, validiores, 2dis similes. Palpus mandibularis latus.

Fam. 2. SERGESTIDÆ.—Pedes 3tii 2dique sive vergiformes sive obsolete chelati, 1mis vergiformibus. Palpus mandibularis gracilis.

Fam. 3. EUCOPIDÆ.—Pedes 3tii 2dique vergiformes; 1mi maxillipedesque externi æque monodactyli et subprehensiles, digito in articulum penultimum claudente. Palpus mandibularis gracilis.

*Synopsis Subfamiliarum Generumque Crustaceorum Macrourorum Viventium.*

## Subtribus I. THALASSINIDEA.

## Legio I. THALASSINIDEA EUBRANCHIATA.

## Fam. I. GEBIDÆ.

G. 1. GEBIA, *Leach*.—Digitus manus inferior obsolescens. Pedes 2di 3tii 4ti 5tique monodactyli. Rostrum tridentatum. Antennæ externæ squamâ basali carentes.

G. 2. AXIUS, *Leach*.—Manus lata, digito inferiore elongato. Pedes 2di minores, sublamellati, didactyli; 3tii 4ti 5tique monodactyli. Rostrum simplex, triangulatum. Oculi pigmento perfecti. Antennæ externæ squamâ basali parvâ instructæ.

G. 3. CALOCARIS, *Bell*.\*—Manus gracilis, digito inferiore elongato. Pedes 2di minores, cheliformes, 3tii 4ti 5tique monodactyli. Rostrum ac in *Axio*. Oculi pigmento corneâque carentes. Antennæ externæ squamâ basali parvâ instructæ. Segmentum caudale oblongum.

G. 4. LAOMEDIA, *De Haan*.†—Manus ac in *Axio*. Pedes 2di monodactyli, quæ 3tii et 4ti; 5ti obsoleti.

\* "British Crustacea," p. 231.

† Faun. Japon. Crust., p. 162.

- G. 5. GLAUCOTHOE, *Edw.*—Manus ac in *Azio*. Pedes 2di 3tiii que pediformes ac in *Paguro*; 4ti 5tique subcheliformes. Antennarum internarum flagella articulo precedente breviora.

Fam. 2. CALLIANASSIDÆ.

- G. 1. CALLIANASSA, *Leach.*—Oculi sublamellati, corneâ medianâ et non marginali. Flagella antennarum internarum articulo precedente longiora. Pedes 1mi grandes, bene didactyli; 2di didactyli minores, 3tii articulo penultimo late lamellati.
- G. 2. ΤΡΥΡÆΑ, *Dana.*—Pedibus *Callianassæ* affinis. Flagella antennarum internarum articulo precedente breviora, antennis subpediformibus.

Fam. 3. THALASSINIDÆ.

- G. 1. THALASSINA, *Latreille.*—Manus validæ, multo inæquæ, digito immobili majoris brevi. Pedes 2di articulo penultimo lamellati, 3tii 4ti 5tique angusti, monodactyli.

Legio 2. THALASSINIDEA ANOMOBANCHIATA.

- G. 1. CALLIANIDEA, *Edw.*—Pedibus *Callianassæ* affinis, anticis bene didactylis, 2dis et 3tiis minoribus, didactylis, compressis, 4tis 5tis que subcylindricis. Oculi ac in *Callianassa*.
- G. 2. CALLISEA.—(*Isæa*, *Guerin*. *Callianisea*, *Edw.*) Forsan a CALLIANIDEA nihil differt, teste Edwardsio (*Crust.* ii. 321.)

Subtribus II. ASTACIDEA.

Fam. 1. SCYLLARIDÆ.

1. *Carapax oblongus vel subquadratus, non transversus. Oculi versus cephalothoracis angulos externos insiti.*
- G. 1. SCYLLARUS, *Fabr.*—Rostrum valde saliens. Latera carapacis non incisa. Antennæ externæ inter se fere contiguæ. Palpus maxillipedis externi flagello confectus. Branchiæ numero 21. Species, *Sc. sculptus, latus, squamosus, equinoxialis, Haanii, Sieboldi.*
- G. 2. ARCTUS, *Dana*, (Scyllari subgenus 5tum, *De Haan.*)—Rostrum perbreve, truncatum. Antennæ externæ inter se remotæ. Palpus maxillipedis flagello carens. Branchiæ 19. Sp. *A. ursus*, *D.* (Scyllarus arctus, *Auct.*)
2. *Carapax plus minusve transversus, lateribus non incisus. Oculi in angulis externis.*
- G. 3. THENUS, *Leach.*—Oculi oblongi. Rostrum bilobatum. Branchiæ 21. Species. *T. orientalis.*
3. *Carapax plus minusve transversus, lateribus incisus. Oculi angulis externis valde remoti.*
- G. 4. PARRIBACUS, *Dana*, (Scyllari subgenus 2dum, *De Haan.*)—Rostrum subtriangulatum. Antennæ externæ inter se fere contiguæ. Oculi fere in medio inter antennas internas et angulos cephalothoracis externos. Branchiæ 21. Species. *P. antarcticus et P. Parra* (Ibacus antarcticus et *I. Parra*, *Auct.*)
- G. 5. IBACUS, *Leach.*—Rostrum bilobatum. Antennæ externæ inter se paulo remotæ. Oculi versus rostrum insiti. Branchiæ 21. Species. *I. Peronii, I. ciliatus, De Haan, et I. novemdentatus, Gibbes.\**

\* Species Scyllaridarum enumeratæ in "Hist. Nat. des Crustacés," Edwardsii editæ, sequentibus exceptis: *Sc. Haanii*, Siebold (*Faun. Japon.* 152, pl. 38, f. 1.) *Sc. Sieboldi*, *De Haan* (*Faun. Jap.* 152, pl. 36, f. 1.) *Ibacus ciliatus*, Siebold, (*Faun. Jap.* 153, pl. 36, f. 2.) *Ibacus novemdentatus*, Gibbes, (*Nuntiis Assoc. Sci. Amer.* 1850, *Charleston*, iii, 193.)



## Fam. 2. PALINURIDÆ.

- G. 1. PALINURUS, *Fabr.* (Palinuri communes, *Edw.*)—Carapax vix rostratus. Annulus antennalis supra angustissimus, curvatus. Antennæ externæ basi fere contiguæ. Antennæ internæ flagellis breves.—*Linuparus*, Gray, hic inclusus.
- G. 2. PANULIRUS, *Gray*, (Palinuri longicornes, *Edw.*)—Carapax rostratus. Annulus antennalis supra latus, subquadratus et horizontalis. Antennæ externæ basi non contiguæ; antennæ internæ flagellis longæ.

## Fam. 3. ERYONIDÆ.

Genus ERYON, *Desmarest*.

## Fam. 4. ASTACIDÆ.

1. *Manus crassæ et latæ, marginibus arcuatæ, superficie convexæ* (ASTACINÆ.)  
A. Branchiæ 19. Segmentum thoracis ultimum non mobile—Species marinæ.
- G. 1. HOMARUS, *Edw.*—Rostrum tenue, utrinque paucidentatum. Squama basalis antennarum externarum perbrevis.
- B. Branchiæ 17—18. Segmentum thoracis ultimum mobile. Rostrum integrum vel utrinque unidentatum.—Species fluviales.
- G. 2. ASTACOIDES, *Guerin*.—Segmentum abdominis maris 1mum appendicibus carens.—Hic referemus subgenera Erichsoni *Astacoides*, *Engæus* et *Cheraps*.\*
- G. 3. ASTACUS.—Segmentum abdominis maris 1mum appendicibus instructum. Hic referemus subgenera Erichsoni *Astacus* et *Cambarus*, illo branchiis 18, hoc branchiis 17, instructo.
2. *Manus prismaticæ lateribus fere rectæ.* (NEPHROPINÆ.)
- G. 4. NEPHROPS, *Leach*.—Rostrum utrinque dentatum vel spinosum. Squama basalis antennarum externarum basi vix longiores.—Species marinæ.
- G. 5. PARANEPHROPS, *White*.†—Rostrum uti in *Nephrope*. Squama basalis antennarum externarum basi dimidio longiores.—Species fluviales?

## Subtribus III. CARIDEA.

## Legio I. PALÆMONINEA.

## Fam. I. CRANGONIDÆ.

- Subfam. 1. CRANGONINÆ.—Pedes 1mi 2dis crassiores. Maxillipedes externi pediformes. Digitus mobilis in palmam claudens, immobilis spiniformis. Pedes 2di non annulati.
- G. 1. CRANGON, *Fabr.*—Rostrum brevissimum. Oculi liberi. Pedes 2di chelis armati, 4ti 5tique acuminati, gressorii.

\* Archiv. f. Nat. 1846, p. 86 et 375. Astaci Subgenera Erichsono instituta sequentia sunt.

1. ASTACOIDES. Pedes abdominales ramis membranacei, 1mis maris obsoletis. Antennæ externæ internis exteriores.

2. ASTACUS. Pedes abdominales (lamellis caudalibus inclusis) calcarei, 1mis maris elongatis. Antennæ externæ internis exteriores. Pedes 5ti branchias gerentes, branchiis numero 18.

3. CAMBARUS. Pedes abdominales (lamellis caudalibus inclusis) calcarei, 1mis maris elongatis. Antennæ externæ internis exteriores. Pedes 5ti branchias non gerentes, branchiis numero 17.

4. CHERAPS. Pedes abdominales calcarei, 1mis maris obsoletis; lamellæ caudales partim membranacei. Antennæ externæ internis exteriores. Pedes 5ti branchias non gerentes, branchiis numero 17.

5. ENGÆUS. Antennæ externæ sub internis. Pedes 5ti branchias gerentes, branchiis numero 18.

Textura appendicium abdominalium discrimen genericum justum non videtur, necque situs antennarum externarum. An auctoritatis gravis numerus branchiarum? non credimus

† A. White, in Misc. Zool. Gray 79. 1842 et "Voy. Erebus and Terror," pl. 3, f. 1.

- G. 2. *SABINEA*, *Owen*.\*—Rostrum brevissimum. Oculi liberi. Pedes 2di chelis carentes; 4ti 5tique acuminati, gressorii.
- G. 3. *ARGIS*, *Kröyer*.†—Rostrum nullum. Oculi sub carapace fere occulti. Pedes 2di chelis armati.
- G. 4. *PARACRANGON*, *Dana*.—Rostrum elongatum. Oculi liberi. Pedes 2di obsoleti, 4ti 5tique acuminati, gressorii.
- Subfam. 2. *LYSMATINÆ*.—Pedes 1mi 2dis crassiores. Maxillipedes externi pediformes. Digi alter ad alterum claudentes. Pedes 2di annulati.
- G. 1. *NIKA*, *Risso*.—Rostrum breve. Antennæ internæ duobus flagellis confectæ. Pedes antici impares, uno chelato, altero monodactylo. Carpus paris 2di elongatus annulatus.
- G. 2. *LYSMATA*, *Risso*.—Rostrum elongatum, subensiforme. Antennæ internæ tribus flagellis confectæ. Pedes antici ambo chelati. Carpus paris 2di elongatè filiformis.
- G. 3. *CYCLORHYNCHUS*, *De Haan*.‡—Rostrum sat breve, compressum et suborbiculare. Carpus 2dus brevis, pauci-annulatus.
- Subfam. 3. *GNATHOPHYLLINÆ*.—Pedes 2di 1mis crassiores. Maxillipedes externi lati, operculiformes.
- G. 1. *GNATHOPHYLLUM*, *Latreille*.

## Fam. 2. *ATYIDÆ*.

- Subfam. 1. *ATYINÆ*.—Pedes thoracici palpo non instructi.
- G. 1. *ATYA*, *Leach*.—Rostrum breve, depressum. Antennæ internæ flagellis duobus confectæ. Pedes 4 antici sat breves, carpis sublunatis, cuspidate inferiore manum ferente, digitis penecillo setarum longo ad apicem armatis; 3tii 5tis multo longiores et crassiores.
- G. 2. *ATYOIDA*, *Randall*.§—Rostro, antennis pedibusque anticis *Atyæ* affinis. Pedes 3tii tenues, 5tis breviores. [An distinctio valida?]
- G. 3. *CARIDINA*, *Edwards*.—Rostrum sat breve sat longum. Antennæ internæ flagellis duobus confectæ. Pedes 2di 1mis longiores, digitis parium amborum apice penecillatus, carpis 1mis perbrevis et antice excavatis, 2dis subcylindricis, oblongis.
- Subfam. 2. *EPHYRINÆ*.—Pedes thoracici palpo instructi.
- G. 1. *EPHYRA*, *Roux*, *De Haan*.||—Rostrum dentatum. Antennæ internæ flagellis duobus confectæ. Pedes 4 antici parvi, nudi vel nudiusculi. Pedes 6 postici graciles.

## Fam. 3. *PALÆMONIDÆ*.

- Subfam. 1. *ALPHEINÆ*.—Pedes 1mi crassiores, chelati, 2di filiformes, carpo sæpius annulati et chelati. Mandibuli palpigeri.
- G. 1. *ALPHEUS*, *Fabr*.—Rostrum brevissimum. Antennæ internæ flagellis duobus confectæ. Oculi sub carapace occulti. Manus paris 2di major non inversa, digito mobili superiore. Pedes 2di carpo filiformes, annulati. Maxillipedes externi subtenuis, mediocres. Species maris calidioris.
- G. 2. *BETÆUS*, *Dana*.—Rostrum nullum. Oculis et ceteris *Alpheo* plerumque affinis. Manus paris 2di major fere inversa, digito mobili inferiore vel exteriore.—Species maris frigidioris.

\* *Owen*, Append. "Voy. Capt. Ross," p. 82.—*Crangon septemcarinatum*, *Sabine*.

† *Tidskrift*, iv. 1843, p. 217.

‡ *Faun. Japon. Crust.*, p. 174.

§ *Journ. Acad. Nat. Sci. Philad.* viii, p. 140.

|| *De Haan*, *Faun. Japon.* p. 185, pl. 46, f. 7.

- G. 3. *ALOPE*, *White*.—Rostrum breve, inter spinas duas longas insitum hisque sæpe partim celatum. Antennæ internæ flagellis duobus confectæ. Maxillipedes externi longissimi. Oculi paulo salientes.
- G. 4. *ATHANAS*, *Leach*.—Rostrum breve. Antennæ internæ flagellis tribus confectæ. Oculi paulo salientes. Pedes 2di carpo annulati.
- G. 5. *HIPPOLYTE*, *Leach*.†—Rostrum sat longum, plus minusve ensiforme, non mobile. Abdomen medio deflexum. Antennæ internæ flagellis duobus confectæ. Oculi salientes. Pedes 2di carpo annulati.
- G. 6. *RHYNOCINETES*, *Edw*.—Rostrum ensiforme, mobile, fronte articulo conjunctum. Oculi antennæque uti in Hippolyte. Pedes 2di carpo non annulati.

[Ubi pertinet genus sequens ?

- G. *AUTONOMEA*, *Risso*.—Pedes antichi crassi, chelati. Pedes 2di non chelati et carpo non annulati, 3tiis similes. Maxillipedes externi tenues. Rostrum breve. Oculi salientes. Antennæ internæ flagellis duobus confectæ; externæ squamâ basali non instructæ.]

Subfam. 2. *PANDALINÆ*.—Pedes antichi gracillimi, non chelati, 2di filiformes, carpo annulati.

- G. *PANDALUS*, *Leach*.—

Subfam. 3. *PALÆMONINÆ*.—Pedes 4 antichi chelati, 2di 1mis crassiores. Carpis nullis annulatis. Pedes nulli palpigeri.]

1. *Antennæ internæ duobus flagellis confectæ. Mandibulæ non palpigeræ.*

- G. 1. *PONTONIA*, *Latr*.—Corpus depressum. Rostrum breve. Oculi parvuli. Maxillipedes suboperculiformes, articulo 2do lato, 3tio 4toque simul sumtis longiore, his subcylindricis.

- G. 2. *ÆDIPUS*, *Dana*.—(Pontonia, *Auct.*) Corpus plus minusve depressum. Rostrum longitudine mediocre. Oculi permagni. Maxillipedes externi latiusculi, articulis totis latitudine fere æquis. Tarsi infra elongatè gibbosi.

- G. 3. *HARPILIUS*, *Dana*. (Pontonia, *Auct.*†)—Corpus non depressum. Rostrum longitudine mediocre. Oculi magni. Maxillipedes suboperculiformes, articulo 2do lato, 3tio 4toque simul sumtis breviorè, his subcylindricis. Tarsi uncinati, infra non gibbosi.

- G. 4. *ANCHISTIA*, *Dana*.—Rostrum tenue, sæpius ensiforme et elongatum. Corpus vix depressum, sæpe compressum. Oculi mediocres; antennæ duobus flagellis instructæ, unâ parce bifidâ. Maxillipedes externi omnino tenues, pediformes.

2. *Mandibulæ palpigeræ.*

a. Oculi aperti.

- G. 5. *PALÆMONELLA*, *Dana*.—Corpus non depressum. Rostrum sat longum, dentatum. Oculi mediocres. Mandibularum palpus bi-articulatus, perbrevis. Antennæ internæ flagellis duobus confectæ, uno apicem bifido. Maxillipedes externi tenues.

- G. 6. *PALÆMON*, *Fabr.*||—Corpus non depressum. Rostrum longum, dentatum. Oculi mediocres. Palpus mandibularum 3-articulatus. Antennæ internæ flagellis tribus confectæ. Maxillipedes externi tenues. Pedes 2di nunquam lamellati.

\* Ann. and Mag. Nat. Hist. [2], i. 225.

† Periclimenes, *Costa*, (Ann. dell' Acad. degli Aspir. Nat. di Napoli, ii, 1844,) Hippolyto affinis et vix differt, teste *Erichsono*. Arch. f. Nat. 1846, p. 310.

‡ Pontoniæ verè *Ædipis* et *Harpiliis* habitu multo differt; Pontoniarum oculis parvulis, abdomine valde inflexo, et modo vitæ sæpius uti in Pinnotheris: aliorum oculis pergrandibus, abdomine minus inflexo, animalibus modo vitæ liberis, inter ramos coraliorum sæpe natantibus. Pontonia macrophthalma, *Edw.*, *Ædipo* pertinet.

|| *Leander*, *Desmarest*, (Ann. Ent. Soc. France, 1849, p. 87,) a *Palemone* vix differt, abdomine ad articulationem 3-tiam inflexo non discrimine valido.

G. 7. *HYMENOCERA*, *Latr.*—Corpus non depressum. Rostrum sat longum. Oculi mediocres. Pedes 2di tenuiter laminati, latissimi; 1mi tenuissimi, manu minutâ. Maxillipedes externi subfoliacei.

b. Oculi sub carapace celati.

G. 8. *CRYPHIOPS*, *Dana.*—Rostrum longitudine mediocre. Oculi parvuli, omnino occulti. Antennæ internæ flagellis tribus confectæ. Maxillipedes externi subtenuis.

[Ubi pertinet Genus *TYPTON*, *Costa*, (Annal. dell' Acad. degli Aspir. Nat. di Napoli, ii, 1844); squamâ basali antennarum externarum carens; Pontoniæ affinis.]

Subfam. 4. *OPLOPHORINÆ*.—Pedes 1mi sive didactyli sive vergiformes; 2di chelati, crassiores. Squama antennarum externarum acuminata, extus spinis armata.

G. 1. *OPLOPHORUS*, *Edw.*—Corpus non compressum. Rostrum longum, dentatum. Antennæ internæ flagellis duobus confectæ. Pedes toti palpigeri, 4 antichi chelati. [Abdominis dorsum processibus spiniformibus uno vel pluribus armatum.]

G. 2. *REGULUS*, *Dana.*—Rostrum longum, dentatum. Antennæ internæ flagellis duobus confectæ. Pedes nulli palpigeri, 2 antichi non chelati, 2di crassè chelati. Mandibularum palpus 3-articulatus. [Abdominis segmentum 3tium dorso postico instar spinæ longæ productum.]

## Legio II. PASIPHÆINEA.

### Fam. I. PASIPHÆIDÆ.

G. 1. *PASIPHÆA*, *Savigny.*—Rostrum obsolescens. Antennæ internæ flagellis duobus confectæ. Pedes palpigeri, palpibus elongatis. Pedes 4 antichi subæqui, manubus gracilibus.

## Legio III. PENÆINEA.

### Fam. 1. PENÆIDÆ.

G. 1. *SICYONIA*, *Edw.*—Pedes 6 antichi lineares, 4 postici non annulati. Carapax breviter rostratus, semicalcareus, dorso carinato. Pedes abdominales laminâ unâ instructi. Maxillipedes 2di 3tiique non palpigeri. Antennæ internæ perbreves.

G. 2. *PENÆUS*, *Latr.*—Pedes 6 antichi lineares, 4 postici non annulati. Carapax elongato-rostratus, rostro ensiformi. Pedes abdominales laminis duabus instructi. Maxillipedes externi bene palpigeri.—Hic referemus genus "*Aristæus*" [Duvernoy, Ann. des Sci. Nat. xv, 1841, pl. 4.]

G. 3. *STENOPUS*, *Latr.*—Pedes 6 antichi lineares, 3 postici longi, annulati. Rostrum longitudine mediocre. Maxillipedes externi brevissimè palpigeri.

G. 4. *SPONGICOLA*, *DeHaan*.\*—Pedes 4 antichi filiformes, 2 sequentes unus vel ambo crassissimi; 4 postici non annulati. Carapax bene rostratus, rostro subensiformi. Maxillipedes externi non palpigeri.

### Fam. 2. SERGESTIDÆ.

G. 1. *SERGESTES*, *Edw.*—Carapax brevissime rostratus. Pedes thoracis non palpigeri, 2di 3tiique obsoletè didactyli, 5ti parvuli.

G. 2. *ACETES*, *Edw.*—Carapax minute rostratus. Pedes thoracis non palpigeri, 2di 3tiique obsoletè didactyli, 5ti obsoleti.

G. 3. *EUPHEMA*, *Edw.*—Carapax bene rostratus. Pedes thoracis elongato-palpigeri, 6 antichi didactyli, manubus parvulis, 4 postici filiformes, ciliati, non annulati. Branchiæ foliosæ. Abdomen dorso uni-spinosum—An hujus sedis est?

\* Faun. Japon. Crust. p. 189, tab. 46, f. 9.

## Fam. 3. EUCOPIDÆ.

G. 1. EUCOPIA, Dana.—Carapax non rostratus, fronte integro. Pedes thoracis elongato-palpigeri, palpis natatoriis. Maxillipedes 2di 3tii et pedes 1mi monodactyli et prehensiles, unguiculo ad articulum precedens claudente.

*Descriptiones Crustaceorum Macrourorum adhuc ineditæ.*

## Subtribus I. THALASSINIDEA.

## Legio I. THALASSINIDEA EUBRANCHIATA.

## Fam. GEBIDÆ.

GEBIA PUGETTENSIS.—Frons tridentatus, dente mediano triangulatus, superficie supernâ usque ad suturam dorsi transversam scabrâ et hirsutâ. Manus marginibus pilosa, non spinulosa nec dentata, superficie externâ lævis non costata, lineâque densè hirsutâ longitudinaliter notata, digito inferiore dentiformi, crasso, acuto, non incurvato, digito mobili elongato, inermi, margine piloso. Pedes 2di infra longissimè ciliati. Antennæ externæ quoad basin partim pilosæ, flagellis paulo hirsutis. Segmentum caudale transversum, rectangulatum, integrum. *Hab.* in freto Pugettensi, Oregoniæ. *Long.* 2".

## Fam. CALLIANASSIDÆ.

CALLIANASSA GIGAS.—Frons paulo triangulatus. Oculi complanati. Manus major valde compressa, lævis, carpo non duplo longior, digitis brevibus, dimidio manus brevioribus, sparsim hirsutis, consimilibus, non hiantibus, superiore arcuato, acuto, brachio angusto, ad basin infra dentigero sed vix latiore, paululo longiore quam corpus, intus vix dentato. Segmentum caudale appendicibus caudalibus vix brevius. *Hab.* in freto Pugettensi, Oregoniæ. *Long.* 4½".

TRYPÆA AUSTRALIENSIS.—Frons non triangulatus. Pedes antici valde compressi, brachio carpo manuque pedis majoris supra acutis. Manus major lata, lævis, carpo paululo longior; digitis fere dimidii manus longitudine, non hiantibus, intus subtiliter denticulatis, superiore paulo longiore, arcuato, carpo paulo minore quam manus, brachio cum processu cultriformi juxta basin infra armato. Segmentum caudale non longius quam latum, postice arcuatum. *Hab.* in oris Illawarræ Australiæ orientalis. *Long.* 2½".

## Fam. THALASSINIDÆ.

THALASSINA GRACILIS.—Carapax lævis, rostro perbrevis, acuto, margine extra-orbitali acuto. Abdomen sparsim pubescens, marginibus integris, segmento caudali paulo oblongo, postice bene rotundato, non longiore quam appendices caudales. Pedes 1mi subæqui, valde compressi, manu angusto-elongatâ, margine superiore subacuto, breviter spinoso, inferiore integro et inermi, digito mobili paulo brevior quam pars manus anterior, angusto, fere recto, seriatim pubescente, digito immobili plus dimidio brevior, acuto. Pedes 6 postici tenues; 5ti paulo breviores. *Hab.* in oris insulæ "Telegraph," juxta "Singapore." *Long.* 2½".

## Subtribus II. ASTACOIDEA.

## Fam. SCYLLARIDÆ.

ARCTUS VITIENSIS.—Carapax subtilissimis plumulis pubescens, spinâ pone medium frontis et alterâ gastricâ armatus, versus orbitam utrinque subcarinatus et 1—2-dentatus. Antennæ internæ nudiunculæ, articulo basis penultimo fere duplo longiore quam ultimus. Antennæ externæ extremitate truncatæ, articulo ultimo apice 5-lobato, lobis oblongis, interno brevior, articulo 2do ultimum

fere superante, extus unidentato, intus 3-dentato, superficie carinatâ, carinâ integrâ. Pedes nudi, subteretes, inermes, 2dis pergracilibus, tarso 2do duplo longiore quam 3tius. *Hab.* in archipelago Vitiensi ("Fejee"). *Long.* 1".

### Fam. ASTACIDÆ.

**ASTACUS LENIUSCULUS.**—Rostrum tridentatum, dentibus acutis, medio tenuiter elongato. Carapax lævis, punctulatus, lateraliter pone rostrum utrinque 2-spinosus; areolâ inter suturas longitudinales post-dorsales latâ. Pedes antichi compressi, inermes, non tuberculati, manu lævi, punctulatâ, carpo paulo oblongo, intus recto, inermi, apice interno acuto excepto, brachio antice denticulato, apice interno elongate acuto, dorso unispinoso. Pedes sequentes nudiusculi. Segmentum caudale parce oblongum, lateribus fere parallelis. Pedes 5ti branchias parvas gerentes. *Hab.* flumine "Columbia," Oregoniæ. *Long.* 4".

**ASTACOIDES NOBILIS.**—Rostrum sat longum fere integrum, apice obtusum, utrinque obsolete unidentatum, basi antennarum externarum paulo brevius. Carapax lateraliter infra basin rostri obsolete utrinque armatus. Abdominis segmenta utrinque paulo uni-tuberculata, *junioris* tuberculis obsolescentibus; segmentum 2dum prope marginem lateralem spinis brevibus armatum; segmentum caudale paulo oblongum. Pedes antichi æqui, crassi, carpo intus valde trispinoso, manu infra supraque marginatâ et breviter dentatâ, superficie fere lævi, nudâ. Epistomatis processus medianus anticus triangulatus et valde elongatus, et perangustus. *Hab.* Australiâ orientali? *Long.* 5".

**PARANEPHROPS TENUICORNIS.**—Rostrum elongatum, acuminatum, tenue, bases antennarum longitudine superans, utrinque 4-spinosum et posterius super carapacem utrinque aliis spinis duabus. Pedes 8 postici gracillimi. Pedes antichi longi, manu vix crassiore quam carpus, margine superno biseriatis spinoso, superficiebus internâ externâque uniseriatim spinosis, margine inferiore et superficie proximâ spinuli-scabris et non seriatim spinosis. *Hab.* in fluminibus prope portum "Bay of Islands," Novi-Zelandiæ.

## Subtribus III. CARIDEA.

### Legio I. PALÆMONINEA.

#### Fam. CRANGONIDÆ.

##### Subfam. CRANGONINÆ.

**CRANGON MUNITUS.**—Rostrum brevissimum, rotundatum. Carapax partim 7-carinatus, carinâ mediâ vel primâ bispinosâ, 2dâ utrinque unispinosâ, brevi, 3tiâ nudâ, 4tâ unispinosâ, brevi. Abdomen læve, inerme. Manus nuda. Pedes 2di 3tius vix breviores, 4ti 5tique paulo hirsuti, 5tis minoribus. Maxillipedes externi utrinque valde ciliati. Segmentum caudale apice subacutum et quatuor setis instructum. *Hab.* in freto Pugettensi. *Long.* 1" 10".

**PARACRANGON ECHINATUS.**—Rostrum elongatum, porrectum, apice bidentatum, dorso unidentatum, juxta basin infra unispinosum, spinâ longâ porrectâ. Carapax multispinosus, medio dorso inæque 4-dentatus, utrinque 5—7-spinosus. Abdomen superne partim carinatum superficie paulo scalptum, lateribus acutis. Manus elongata, digito immobili longo et gracillimo. Pedes 4ti 5tique fere nudi, subæqui. *Hab.* in freto Pugettensi. *Long.* 1½".

##### Subfam. LYSMATINÆ.

**NIKA HAWAIENSIS.**—Rostrum brevissimè triangulatum, oculis multo brevius, latius quam longum. Squama antennarum externarum basi internarum parce brevior. Pedes antichi subæqui, dexter chelatus nudiusculus. Articulus pedis 2di 4tus 3tio vix longior, non annulatus; carpus 11-articulatus, articulis quatuor 1mis vix disjunctis. Pedes 6 postici subæqui, nudiusculi, gracillimi. *Hab.* prope insulam "Maui" Hawaiensem. *Long.* 8".

## Fam. PALÆMONIDÆ.

## Subfam. ALPHEINÆ.

## Genus ALPHEUS.

I. *Rostrum margine frontis ortum, superficie inter oculos sæpius leviter carinatâ.*

A. Antennarum articulus 1mus externarum spinâ externâ sive nullâ sive obsolescente armatus.

1. *Manus marginibus inferiore superioreque versus digitos excavata. Dens antennarum internarum basalis articulo 1mo non longior. Articulus pedum 3tiorum 4torum 3tius omnino inermis.*

a. Orbitæ margo inermis.

ALPHEUS STRENUUS.—Rostrum elongatum, acutum, superficie inter oculos leviter carinatâ. Squama antennarum externarum basalis basi non longior. Articulus antennarum internarum 2dus 1mo fere duplo longior. Pedes antici multo inæqui, manus majoris sinu infero-marginali concavo et non triangulato, brachio ad apicem internum acute uni-dentato; manu minore angusto-oblongâ, paulo pubescente, digitis intus dense hirsutis, pilis apicem digiti mobilis omnino celantibus. Pedes 2di 3tiis multo longiores, carpi articulis 1mo 2doque fere æquis, 2do longiore quam 5tus. *Hab.* insulâ Tongatabu. *Long.* 1½".

ALPHEUS PACIFICUS.—Rostrum breve, acutum, superficie inter oculos breviter carinatâ. Squama antennarum externarum basalis basi planè brevior; articulus antennarum internarum 2dus 1mo duplo longior. Pedes antici multo inæqui; manus majoris sinu infero-marginali profundè triangulato, brachio apicem internum inermis; manu minore angusto-oblongâ, paulo pubescente, digitis intus dense hirsutis, apicibus apertis. Pedes 2di 3tiis parce longiores, carpi articulo 2do multo brevior quam 1mus, vix longiore quam 5tus. *Hab.* insulis Hawaiensibus. *Long.* 1½".

b. Orbitæ margo spinulâ armatus.

ALPHEUS EUCHIRUS.—Rostrum paulo elongatum, superficie inter oculos carinatâ. Squama antennarum externarum basalis basi non longior. Articulus antennarum internarum 2dus 1mo paulo longior. Pedes antici multo inæqui; manus majoris sinu infero-marginali concavo; brachio apicem non spinigero; manu minore oblongâ, crassiusculâ, lævi, digitis extus et intus leviter laxèque pubescentibus. Pedes 2di 3tiis paulo longiores, carpi articulo 1mo duplo longiore quam 2dus, manu vix brevior quam tres articuli precedentes simul sumti. Pedes 3tii 4tive parce criniti, articulo 3tio apicem internum brevissimè acuto, 5to intus 7—8-setuloso, setulis paulo confertis. *Hab.* in freto "Balabac." *Long.* 9".

2. *Manus margine inferiore integer. Dens antennarum internarum basalis articulo primo vix longior.*

a. Orbitæ margo inermis.

ALPHEUS OBESO-MANUS.—Rostrum brevissimum, in carinam paulo postice productum. Squama antennarum externarum basalis basi non brevior, basi internarum multo brevior; dens internarum basalis perbrevis; articulus 2dus 1mo plus duplo longior. Pedes antici valde inæqui, manu *majore* lævi, elongatâ, obesâ, non compressâ, versus apicem angustiore, digito mobili perbrevi, malleiformi, *minore* lineari, digitis brevissimis. Pedes 2di portentosè elongati, 3tiis plus duplo longiores, carpi articulo 1mo quadruplo brevior quam 2dus, 3tio 4to 5toque brevibus, subæquis. Articulus pedis 3tii 3tius apice inferiore acutus. *Hab.* in archipelago "Viti." *Long.* 9".

ALPHEUS CRINITUS.—Rostrum acutum, superficie inter oculos carinatâ. Squama antennarum externarum basalis basi harum parce brevior, basi internarum paulo brevior; dens internarum basalis perbrevis. Articulus antennarum internarum 2dus 1mo duplo longior. Pedes antici multo inæqui; manu *majore* obesâ, parce compressâ, infra rotundatâ, omnino lævi, partim leviter pubescente,

digitis perbrevibus, (manu quadruplo brevioribus), digito mobili arcuato; *minore* oblongâ, leviter crinitâ, digitis parte manus ante digitos paulo brevioribus. Pedes 2di valde elongati, 3tiis sesquialongiores, articulo carpi 2do parce longiore quam 1mus, 3tio 4to 5tove oblongo, uno alterum fere æquante. Pedes 3tii 4tive leviter criniti, articulo 3tio apicem inferiorem dentigero. *Hab.* in freto "Balabac." *Long.* 10".

**ALPHEUS MITIS.**—Rostrum acutum, superficie inter oculos carinatâ. Squama antenarum externarum basalis basi harum internarumve parce longior. Articulus antenarum internarum 2dus 1mo paulo longior, densque basalis articulo 1mo fere longior. Pedes antichi inæqui; manu majore lævi, paulo compressâ, marginibus rotundatâ, digitis regularibus, manu fere triplo brevioribus; minore simili, angustiore. Pedes 2di 3tiis multo longiores, articulo carpi 2do 1mum longitudine æquante, 3tio 4tove oblongo, parce brevior quam 5tus, manu perbrevis. Pedes 3tii 4tique fere nudi, articulo 3tio apicem internum non acuto. *Hab.* in freto "Balabac." *Long.* 9". An femina A. Lottinii?

*b.* Orbitæ margo spinulâ denteve armatus.

**ALPHEUS ACUTO-FEMORATUS.**—Rostrum acutum postice inter oculos productum. Squama antenarum externarum basalis basis antenarum non longior. Dens basalis antenarum internarum brevis, articulus 2dus 1mo parce longior. Orbitæ margo acutus sed spinâ non productus. Pedes 2di 3tiis sat longiores, carpi articulo 1mo brevi, 2do plus duplo longiore quam 1mus. Pedes 3tii, 4tique crassiusculi, articulo 2do 3tioque apicem inferiorem instar spinæ elongate acuto. [Pedibus anticis specimen nobis mutilatum.] *Hab.* in freto "Balabac." *Long.* 9".

**B.** Articulus antenarum externarum 1mus spinâ externâ armatus.

*a.* Orbitæ margo inermis.

**ALPHEUS PARVI-ROSTRIS.**—Corpus nudum. Rostrum acutum, breve, superficie inter oculos carinatâ. Squama antenarum externarum basalis basi utroque paulo longior; spina basalis mediocris; dens internarum basalis brevis; articulus 2dus 1mo vix longior. Pedes antichi valde inæqui, manu majore crassissimâ, marginibus ambobus indentatâ, superficie externâ partim sulcatâ, digitis perbrevibus, digito mobili extus arcuato; manu minore regulari, pubescente. Pedes 2di 3tiis paulo longiores, articulo carpi 1mo fere duplo longiore quam 2dus, manu brevi. Pedes 3tii 4tique crassiusculi, articulo 3tio apicem inferiorem unidentato. *Hab.* in freto "Balabac." *Long.* 8".

*b.* Orbitæ margo spinulâ denteve armatus vix brevior quam rostrum.

**ALPHEUS TRIDENTULATUS.**—Rostrum perbreve, dentiforme. Squama antenarum externarum basalis basi brevior, basi internarum vix brevior, spina externarum basalis mediocris, spina internarum longissima, articulo 1mo multo longior; articulus 2dus 1mo non longior. Pedes antichi valde inæqui, manu majore lævi, paulo compressâ, marginibus latè rotundata, digitis perbrevibus, manu triplo brevioribus. Pedes 2di 3tiis paulo longiores, articulo carpi 1mo quadruplo longiore quam 2dus, 2do perbrevis, vix longiore quam 3tius. Articulus pedum 3tiorum 4torumve 3tius apice interno inermis. *Hab.* in portu "Rio Janeiro"? *Long.* 10".

**ALPHEUS NEPTUNUS.**—Frons elongate trispinosus, rostro spinisque orbitalibus prælongis, æquis. Squama antenarum externarum basalis basi brevior et spina externa elongata; spina internarum basalis longa, articulo 2do brevior quam 1mus. Pedes antichi multo inæqui, manu majore lævi, paulo compressâ, marginibus rotundatâ, digitis brevibus, manu triplo brevioribus, digito mobili supra arcuato; manu minore angustâ. Pedes 2di 3tiis longiores, articulo carpi 1mo quadruplo longiore quam 2dus, 2do 3tio 4toque inter se fere æquis, non oblongis. Articulus pedum sequentium 3tius apice inferiore inermis. *Hab.* in mari Suluensi. *Long.* 8—9".



II. *Rostrum inter oculorum bases ortum, sulco profundo in carapace utrinque juxta rostrum excavato.*

a. *Orbitæ margo inermis.*

ALPHEUS PUGNAX.—Rostrum acutum, anguste triangulatum, planum, inter oculorum bases ortum. Spina antennarum externarum basalis parva; squama basi paulo longior. Spina antennarum externarum basalis articulo 1mo non brevior, articulus 2dus brevis, 3tius squamam externarum non superans. Pedes antici inæqui; majore elongatâ, lævi, marginibus rotundatâ, supra angustè emarginatâ, digitis brevibus (manu triplo brevioribus), brachio apicibus instar spinæ acuto. Pedes 2di longi, articulo carpi 1mo dimidio brevior quam 2dus. Pedes 3tii 4tisque graciles, articulo 3tio apicem inferiorem uni-dentato. *Hab.* ad insulam "Maui" Hawaiensem. *Long.* 12'''.

ALPHEUS DIADEMA.—Rostrum latum, apice triangulatum et acutum, inter oculorum bases ortum, lateribus concavis. Spina basalis antennarum omnium brevis; squama externarum basi utroque longior. Pedes 2di 3tiis parce longiores, articulo carpi 1mo paulo longiore quam 2dus vel 5tus, 3tio 4tove parce oblongo. Pedes 3tii 4tive 5tis valde crassiores, articulo 3tio apicem inferiorem unidentato. *Hab.* ad insulam "Maui" Hawaiensem. *Long.* 10'''.

b. *Orbitæ margo spinulâ denteve armatus.*

ALPHEUS LÆVIS.—(Randall, Jour Acad. Nat. Sci. Philad. viii.)

ALPHEUS MALLEATOR.—Rostrum perbreve, triangulatum, inter oculorum bases ortum. Spina orbitalis brevis. Squama antennarum externarum basalis basi brevior; spina basalis externarum mediocris, internarum brevissima; articulus 2dus internarum 1mo sesqui longior. Pedes antici inæqui; manus majoris superficie supernâ et internâ partim minutè tuberculatâ, margine superiore sulcato, juxta articulationem digiti 2—3-inciso, digitis perbrevibus, mobili malleiformi, obtuso. Pedes 2di 3tiis parce longiores, articulo carpi 1mo duplo longiore quam 2dus. Pedes 3tii crassiusculi, articulo 3tio apicem inferiorem obtuso. *Hab.* in portu Rio Janeiro? *Long.* 2½''.

Genus BETÆUS.

BETÆUS TRUNCATUS.—Frons truncatus, medio non emarginatus. Squama antennarum externarum basi non longior; spina externa brevis; spina internarum basalis prælonga, articuli basales elongati, subæqui. Pedes antici multo inæqui, manu majore longâ, sublineari, valde compressâ, fere lævi, scabriculâ, digitis longis, fere dimidii manus longitudine, mobili terete. Pedes 2di 3tiis sat longiores, carpo sat brevi, articulo carpi 1mo plus duplo longiore quam 2dus, 2do 3tio 4toque brevibus. Articulus pedum sequentium 3tius omnino inermis. *Hab.* Fuegiâ in mari prope insulam "Hermite," pedibus sexaginta altitudine. *Long.* 15'''.

BETÆUS ÆQUIMANUS.—Frons medio profundè incisus. Squama antennarum externarum basalis basi paulo brevior; spina externa perbrevis; spina internarum basalis prælonga, articulo 2do multo brevior quam primus. Pedes antici æqui, manu lævi, compressâ, digitis perbrevibus. Pedes 2di 3tiis sat longiores, articulo carpi 1mo plus duplo longiore quam 2dus, 2do 3tio 4toque perbrevibus. Articulus pedum sequentium 3tius omnino inermis. *Hab.* in portu "Bay of Islands," ad insulas "Black Rocks," Novi-Zelandiæ.

BETÆUS SCABRO-DIGITUS.—Frons leviter arcuatus, medio obsolete excavatus. Squama antennarum externarum basalis mediocris, basi parce brevior, basin internarum fere æquans; flagellum latè compressum; spina externa brevis; spina internarum basalis longa. Pedes antici *feminae* valde inæqui, manu majore mediocri, leviusculâ, compressâ, margine inferiore rotundatâ, digitis scabriculis, dimidio manus paulo brevioribus, vix dentigeris; *maris* æqui, crassiores, digitis brevibus, valde incurvatis, immobili crassè unidentato. Pedes 2di 3tiis paulo longiores, articulo carpi 1mo plus duplo longiore quam 2dus, 2do 3tio 4toque brevibus. Articulus pedum sequentium 3tius extus prope basin spinâ armatus. *Hab.* juxta urbem "Valparaiso" Chilensem. *Long.* 1½''.

## Genus HIPPOLYTE.

I. *Rostrum in dorsum non productum.*

**HIPPOLYTE ACUMINATUS.**—Rostrum elongatè acuminatum, subensiforme, apice parce recurvatum, squamâ antennali non brevis, medio margine supra infraque unidentatum. Carapax supra oculum unispinosus. Antennarum flagellum brevius internarum 5—6-articulatum, apicem rostri non superans. Pedes antici perbreves, manu ovatâ. Pedes 2di 3tiis breviores, carpo 3-articulato. Maxillipedes externi basin antennarum externarum superantes, pubescentes. Tarsi pedum 6 posticorum infra spinulosi. *Hab.* in mari Atlantico cum *Sargasso* lat. bor. 36° 07'—4° 07', long. occid. 20° 43'—71° 36'. A *tenuirostrato Edw.* differt, dorso in regione gastrico spinâ non armato, margine rostri inferiore unidentato tantum.

**HIPPOLYTE EXILIROSTRATUS.**—Rostrum longum, omnino angustissimum, versus apicem non latior, rectum, apice acutum, supra 4-spinosum, infra rectum, integrum. Antennarum flagellum brevius internarum apicem rostri multum superans, multiarculatum. Maxillipedes externi elongati, apicem basis antennarum externarum multum superantes. Pedes antici perbreves, manu subovatâ, fere per ejus latus carpo articulata. Pedes 2di 3tiis breviores, carpo 3-articulato; 6 sequentes nudiusculi, tarsi infra spinulosi, spinulis apicis longis reliquis brevissimis. *Hab.* in portu "Rio Janeiro." *Long.* 6—8".

**HIPPOLYTE OBLIQUIMANUS.**—Rostrum longum, tenuiter laminatum, rectum, versus apicem verticaliter latior, infra non rectum 2-dentatum, supra 4-dentatum, apice bifidum. Flagellum antennarum internarum minus apicem rostri superans, majus paulo longius. Pedes antici perbreves, manu subovatâ carpo manu multo brevior, vix oblongo. Pedes 2di 3tiis breviores, carpo 3-articulato. Tarsi pedum 6 sequentium infra spinulosi, spinulis apicis longis, deinde sensim brevioribus. *Hab.* in portu Rio Janeiro. *Long.* 8".

2. *Rostrum in dorsum productum.*

**HIPPOLYTE BREVIROSTRIS.**—Rostrum breve (basi antennarum internarum multo brevius) acutum, spiniforme, dorso breviter productum, supra 4-spinosum, spinis inter se æque remotis. Maxillipedes externi longi, squamam antennalem longè superantes. Pedes antici crassiusculi, manu oblongâ. Pedes 2di 3tiis longiore, carpo elongato, 7-articulato. *Hab.* in freto "de Fuca," juxta portum "Dungeness." *Long.* 1½".

**HIPPOLYTE LAMELLICORNIS.**—Rostrum longum verticaliter latissimum, fere ad thoracis basin productum, apice bifidum, supra sinuosum, super cephalothoracem 4-spinosum, anterius 6-spini-dentatum, spinulis inæquis, totis inter se subæque remotis, infra triangulatum, 2-dentatum. Antennæ internæ rostro parce longiores. Pedes antici gracillimi, 2dis paulo crassiores. Pedes 2di 3tiis vix breviores, carpo elongato, 7-articulato, articulo carpi 3tio longo. Tarsi pedum sequentium fere inermes, spinulis versus basin subtilissimis. Maxillipedes externi apice spinulosi, articulo ultimo supra pubescente. *Hab.* in freto "de Fuca" Oregoniæ, juxta portum "Dungeness." *Long.* 1½—2".

## Subfam. PANDALINÆ.

**PANDALUS PUBESCENTULUS.**—Carapax dense brevissimeque pubescens, margine infra oculum bispinoso. Rostrum squamâ antennali longius, ensiforme, paulo recurvatum sed apice non altius quam dorsum, supra 16—18-dentatum, dentibus parvulis et fere ad dorsi medium continuatis, versus apicem edentulum, infra 7-dentatum, apice bifidum. Pedes toti nudiusculi, 3tii 4ti 5ti longitudine sensim decrescentes, 3tii longi, 1mi articulis 2dorum tribus primis longiores. *Hab.* in freto "de Fuca" Oregoniæ, juxta portum "Dungeness." *Long.* 5".

## Subfam. PALÆMONINÆ.

**PONTONIA TRIDACNÆ.**—Corpus depressum. Carapax nudus, lævis, paulo oblongus, rostro triangulato, obtuso. Antennæ internæ perbreves, flagellis subæquis, articulis duobus precedentibus non oblongis. Squama antennarum exter-

narum basalis apicem rostri non superans; flagellum rostro paulo longius. Pedes antici longiores, tenues, digito dimidio brevioribus; 2di crassiusculi, breves, subæqui, manu oblongâ, digitis manu plus dimidio brevioribus, brachio ultra carapacem parce saliente. Pedes 6 postici breves, æqui, nudi. *Hab.* in conchâ Tridacnæ maris juxta insulam "Tutuila" Samoensen (vel "Navigator's.") *Long.* fere 8''; vel abdomine inflexo, 4''.

**ÆDIPUS SUPERBUS.**—Corpus paulo depressum. Rostrum horizontaliter latum, oblongo-triangulatum, rectum, supernè medio costatum et 5-serratum, infra prope apicem 2-serratum, squamâ basali antennarum externarum plus duplo brevius, basi internarum paulo brevius. Pedes antici tenues, manu breviter villosâ, proximi æqui, crassissimi, manu magnitudine portentosâ, plus dimidio longiore quam carapax, tumidâ, versus basin crassiore, digito mobili plus quadruplo brevioribus quam manus, angusto, tenuiore quam immobilis et margine externo angulate sinuoso. Oculi magni. *Hab.* insulâ "Tongatabu." *Long.* 10''.

**ÆDIPUS GRAMINEUS.**—Corpus paulo depressum. Rostrum angustum, rectum, squamâ basali antennarum externarum fere dimidio brevius, basin internarum longitudine æquans, supra 4-dentatum, infra prope apicem 1-dentatum. Oculi magni. Pedes antici elongati, antennis internis non breviores. Pedes 2di æqui, crassissimi, manu magnitudine portentosâ, plus dimidio longiore quam carapax, inflatâ, versus basin crassiore, digito plus quadruplo brevioribus quam manus, sublunato, extus integro, arcuato. *Hab.* archipelago "Viti." *Long.* 8''.

**HARPILIUS LUTESCENS.**—Corpus paulo depressum. Rostrum angustum, parce recurvatum, squamâ antennali paulo brevius, basi internarum multo longius, supra 7—8-dentatum, infra prope medium 1-dentatum. Pedes antici manu sparsim pubescentes; 2di angusti, manu gracili, fere lineari, digitis linearibus vix dimidii manus longitudine. *Hab.* insulâ "Tongatabu." *Long.* 7''.

**ANCHISTIA GRACILIS.**—Rostrum tenue, rectum, acutum, longum, squamâ antennali fere brevius, basi antennarum internarum longius, supra 6-dentatum, dente postico inter oculos, infra unidentatum. Antennarum internarum articuli 2dus 3tiusque perbreves. Pedes 2di longi, carpo perbrevis, apice acuto, brachio apice externo acuto, manu subcylindricâ, digitis manu fere triplo brevioribus. *Hab.* in mari Suluensi. *Long.* 9''.

**ANCHISTIA LONGIMANA.**—Rostrum elongatum, acutum, basi angustum, tenue, supra 6-dentatum, dente postico oculis posteriore. Antennæ internæ elongatæ, articulis basalibus 2do 3tioque longissimis, apice 2di extremitatem rostri fere attingente, 3tio dimidii rostri longitudine. Pedes 2di prælongi, æqui, brachio apicem rostri multo superante, carpo elongatè obconico, apice interno spinigero, manu longâ angustâ, digitis dimidio manus multo brevioribus. *Long.* 6—8''.

**ANCHISTIA ENSIFRONS.**—Rostrum ensiforme, valde recurvatum, squamâ antennali non longius, apice bifidum, supra 6—7-dentatum, infra paulo dilatatum et 3-dentatum. Carapax super orbitam spinâ armatus, infra orbitam spinis duabus in eadem lineâ horizontali. Antennæ internæ rostrum parce superantes. Pedes antici graciles, apicem carpi 2di non attingentes; 2di crassiusculi, subcylindrici, per carpum manumque rostrum superantes, carpo longo, apice inermi, obtuso, manu prælongâ, lineari, digitis dimidio manus paulo brevioribus. Pedes 6-sequentes gracillimi, longi, fere nudi. *Hab.* in freto "Balabac." *Long.* 8—9''.

**ANCHISTIA AURANTIACA.**—Corpus vix depressum. Rostrum angustum, integrum, basis antennarum internarum longitudine, squamâ externarum paulo brevius. Pedes antici superficie manus internâ prope basin densè laxèque pubescentes. Pedes 2di graciles, manu parce crassiore quam carpus, fere lineari, digitis dimidio manus multo brevioribus, parce pubescentibus, angustis. *Hab.* archipelago "Viti." *Long.* 6''.

**PALEMNELA TENUIPES.**—Rostrum rectum, non reflexum, squamâ antennali non longius, supra 6—7-dentatum, dentibus inter se fere æquè remotis, infra 2-dentatum et non dilatatum, apice acutum. Pedes 2di valde elongati, apice brachii apicem rostri vix superante et infra supraque acuto, carpo dimidii manus longitudine, apice spinâ armato, digitis dimidio manus brevioribus. Pedes 6 postici gracillimi fere nudi. *Hab.* in mari Suluensi. *Long.* 8''.

**PALÆMONELLA ORIENTALIS.**—Rostrum rectum, non recurvatum, squamâ antennali non longius, apice acutum, supra 6-dentatum, dentibus inter se fere æque distantibus, infra 1-dentatum. Pedes 2di crassiusculi, subcylindrici, apice brachii apicem rostri non attingente et non acuto, carpo brevioribus. Pedes 6 postici fere nudi, graciles. *Hab.* in mari Suluensi. *Long.* 8", (feminæ ovigeræ.)

Genus PALÆMON.

1. *Carapax margine antico infra oculum spinis duabus armatus.*

**PALÆMON DEBILIS.**—Rostrum prælongum, gracile, paulo recurvatum, squamâ antennali multo longius, apice bifidum, dimidio apicali supra integro, basali 4—6-dentato, margine inferiore 6—9-dentato. Antennarum internarum flagella duo longè conjuncta. Pedes nudi, inermes; 1mi 2dique inter se subæquales, parvuli, gracillimi, manu dimidio carpi paulo longiore, non incrassatâ. Flagellum antennarum internarum minus perbreve. *Var. α*, Rostrum supra 4-dentatum, infra 6-dentatum; *var. β, attenuatus*—Rostrum longissimum, supra 6-dentatum et infra 9-dentatum. *Hab.* insulis Hawaiensibus. *Long.* 12—15".

**PALÆMON EXILIMANUS.**—Rostrum lanceolatum, apice brevi deflexum, supra paulo arcuatum et 6-serratum, infra 3-serratum, squamam antennalem non superans. Flagella duo antennarum internarum parce conjuncta. Pedes antici gracillimi, manu plus duplo brevioribus quam carpus; 2di non crassiores, nudi, manu duplo longiore, carpo dimidio longiore quam manus, digitis dimidio manus paulo brevioribus. Pedes duo postici tenuissimi, prorsum porrecti apicem rostri superantes. *Hab.* archipelago "Viti." *Long.* 1½".

**PALÆMON CONCINNUS.**—Rostrum gracillimum, squamâ antennali vix longius, basi antennarum internarum multo longius, ensiforme, fere rectum, apice bifidum vel trifidum dorsoque non altius, infra remotè minutèque 5-serratum, supra 5—6-serratum, dente 1mo vel externo a extremitate rostri remoto, penultimo inter oculos. Maxillipedes externi apicem basis anternarum externarum paulo superantes, hirsuti. Pedes 1mi apicem squamæ antennalis fere attingentes. Pedes duo postici prælongi, tenuissimi, articulo 4to apicem maxillipedis externi fere attingente. *Hab.* archipelago "Viti." *Long.* 1¾".

2. *Carapax margine antico infra oculum spinâ unâ armatus, poneque hanc alterâ minore.*

**PALÆMON GRANDIMANUS.**—*Randall, Jour Acad. Nat. Sci. viii. 142.*

**PALÆMON LANCEIFRONS.**—Rostrum late elevatum, lanceolatum, supra arcuatum et 12-serratum, apice vix recurvatum, infra 3-serratum, squamam antennalem longitudine non superans. Pedes antici gracillimi, carpo plus duplo longiore quam manus. Pedes 2di longissimi (corpore longiores), fere cylindrici, manu graciliore et non brevioribus quam carpus, scaberculâ, digitis brevibus, superiore hirsuto. Pedes postici si prorsum porrecti apicem rostri superantes. *Hab.* insulâ "Luzon," archipelagi Phillipensis, prope portum "Manila." *Long.* 2".

**PALÆMON ACUTIROSTRIS.**—Rostrum lanceolatum, apice non recurvatum, squamâ antennali non longius, supra 14—16-dentatum, dentibus confertis, et usque ad apicem continuatis, infra 4—5-dentatum. Maxillipedes externi mediores. Pedes antici gracillimi, manu dimidii carpi longitudine. Pedes 2di longi, tenues, omnino bene scabri, manu parce crassiore et duplo longiore quam carpus, digitis dimidio manus brevioribus, apice carpi rostrum paulo superante. Pedes sequentes inermes. *Hab.* insulis Hawaiensibus. *Long.* 2½—3".

**PALÆMON EQUIDENS.**—Rostrum rectè ensiforme, verticaliter sat latum, apice parce reflexum, squamâ antennali non brevius, supra rectiusculum et 10—11-dentatum, dentibus inter se fere æque remotis, et supra tertiam partem dorsi carapacis continuatis, duobus terminalibus minoribus et fere apicalibus; infra arcuatum et 6-dentatum. Pedes 1mi rostrum multo superantes. Pedes 2di longi, subcylindrici, subtilissimè spinulosi, brachii apice apicem rostri attingente. *Hab.* in mari prope portum "Singapore." *Long.* 4¾".

**CRYPHIOPS SPINULOSO-MANUS.**—Rostrum triangulatum, squamâ antennali bre-

vius, basin antennarum internarum superans; supra æque 7-dentatum, infra prope apicem unidentatum. Pedes 2di 1mos vix superantes, minute spinulosi, manu plus duplo longiore quam carpus, digitis dimidio manus longioribus, apice minutè cochleari-excavatis. Pedes antici nudiusculi, manu infra hirsutâ. Pedes 6 postici quoque nudiusculi, articulo 5to infra parce armato, tarsis unguiculatis. *Hab.* in fluminibus Chilensibus mari remotis. *Long.* 3½".

#### Subfam. OPLOPHORINÆ.

**REGULUS LUCIDUS.**—Rostrum prælongum recurvatum, longè acuminatum, versus basin horizontaliter sensim latius deinde lateribus subparallelum, supra 8—9-dentatum infra 3-dentatum. Squama antennalis perangusta, rostro paulo brevior, dentibus tribus externis parvulis. Pedes 2di crassi, manu oblongâ, digitis dimidio manus brevior, parce hiantibus. Pedes 6 postici sparsim laxèque pubescentes. *Hab.* in mari Pacifico, prope insulas "Ladrone." *Long.* 9".

**REGULUS CRINITUS.**—Rostrum longiusculum, non recurvatum, supra 9—10-dentatum, infra prope apicem 2-dentatum, versus basin super oculos subito valde latior deinde posterius parce angustans. Squama antennalis rostro non brevior, paulo lata, dentibus tribus externis prominentibus. Pedes 2di crassè chelati, manu oblongâ, digitis brevibus, hiantibus. Pedes 6 postici laxè criniti, articulo 3tio parium 3tii 4tique infra 3—4-serrato. *Hab.* in mari Suluensi. *Long.* 10".

### Legio III. PENÆINEA.

#### Fam. PENÆIDÆ.

**PENÆUS CARINATUS.**—Rostrum squamâ antennali parce longius, paulo sinuosum, extremitate styliforme, parce recurvatum, apice vix altius quam dorsum, supra 7—8-dentatum, infra 3-dentatum. Flagella antennarum internarum articulis duobus precedentibus non longiora. Pedes 5ti 4tis non graciliores.—*Hab.* in mari prope portum "Singapore."—*Long.* 7". *P. setifero* affinis, sed rostrum infra 3-dentatum.

**PENÆUS AVIROSTRIS.**—Rostrum rectum, extremitate anguste styliforme, et edentatum, non recurvatum, basi supra prominenter dilatatum et 6-dentatum, infra rectissimum, integrum, longitudine squamam antennalem non superans. Carapax dorso postico non carinatus nec sulcatus. Flagella antennarum internarum articulis duobus precedentibus non longiora. Oculi breves. Pedes 5ti 4tis multo graciliores. *Hab.* in mari prope urbem "Singapore." *Long.* 5".

**PENÆUS VELUTINUS.**—Carapax abdomenque omnino breviter velutini. Rostrum rectum, bene lanceolatum, e basi ascendens, usque ad apicem supra denticulatum, dentibus septem æque dispositis, altero paulo posteriore, infra integrum, ciliatum, rectum. Dorsum carapacis posticum non carinatum nec sulcatum. Pedes 2di 3tique subæqui. Maxillipedes externi longi, pubescentes. Segmentum caudale utrinque minutè armatum. Flagella antennarum internarum brevissima, articulo ultimo parce superantia. *Hab.* insulâ "Maui Hawaiensi."—*Long.* 1½".

**PENÆUS TENUIS.**—Rostrum supra multidentatum (dentibus novem vel pluribus), parce sinuosum. Carapax dorso postice non carinatus nec sulcatus. Oculi sat longi. Flagella antennarum internarum subæqua, carapace vix breviora. *Hab.* in mari Atlantico prope portum "Rio Negro" Patagoniæ.—*Long.* 1½".

**PENÆUS GRACILIS.**—Gracillimus. Rostrum rectum, sat breve, oculis vix longius, supra 5-dentatus. Antennarum internarum basis tenuis, longissimus, carapacem longitudine æquans. Manus pedum sex anticorum carpo vix longior, apice parce pubescens; digiti dimidii manus longitudine. Segmentum caudale margine tri-spinulosum; lamella externa non articulata.—*Hab.* in mari Suluensi. *Long.* 8—9".

**STENOPUS ENSIFERUS.**—Carapax plerumque lævis, 2—3 sulcis obliquis intersectus, uno validiore e dorsi medio fere ad angulum antero-lateralem producto et margine spinuloso, superficie carapacis antero-laterali spinulis armatâ; rostro ensiformi, paulo longiore quam basis antennarum internarum, fere recto, apicem

vix recurvato, supra 10-dentato, infra 3-dentato. Abdomen inerme.—*Hab.* archipelago "Viti."—*Long.* 6'''.

#### FAMILY EUCOPIDÆ.

*EUCOPIA AUSTRALIS*.—Carapax fronte truncato-rotundatus, margine postico profunde excavatus. Segmentum abdominis penultimum ultimo longius, ultimum subulatum, lamellis caudalibus vix longius. Antennæ internæ externis paulo breviores, dimidii corporis longitudine, flagello uno brevi; externarum squama basalis basi internarum multo longior. Maxillipedes 2di et 3tii et pedes 1mi formâ consimiles, sensim incrementales, articulo penultimo angustè oblongo, digito plus dimidio brevior quam articulus precedens. Pedes reliqui gracillimi, criniti, palpo longo, natatorio.—*Hab.* in mari antarctico, lat. aust. 66° 12' long. occ. 149° 24'; e stomacho Penguini lecta.—*Long.* 1''.

## CONSPECTUS OF THE CRUSTACEA

OF THE

EXPLORING EXPEDITION UNDER CAPT. C. WILKES, U. S. N.

BY JAMES D. DANA.

(pt. 10 continued)

### PAGURIDEA, continued, MEGALOPIDEA and MACROURA.

THE genera of Paguridea described in this paper have already been mentioned in this Journal.\* The following are the observations on the Megalopidea, together with the descriptions of the new genera, omitting those of the species.

#### MEGALOPIDEA.

The question of the maturity or immaturity of the Megalopæ and that of their true place in the natural system, still remain in doubt. Without touching on these points, at this time, I propose to describe some new genera and species pertaining to the group.

The species, however diverse, agree in the structure of the abdomen and its caudal appendages; in the position of the four antennæ *between* the eyes; in the articulations of the outer antennæ; in the inner antennæ folded longitudinally or obliquely either side of the beak; in the general form of the outer maxillipeds; in the large size and lateral position of the eyes without orbits; in the general structure of the legs; and in their habits. The beak is either horizontal or flexed downward, and has usually a sharp prominent tooth, either side of it, exterior to the inner antennæ.

The genus *Megalopa*, *Leach*, as now accepted, embraces two distinct sets of species—the *M. Montagu* and *armata* for which it was instituted by Leach, and the *M. mutica* of Desmarest. The former (the true Megalopæ) have the beak nearly horizontal, with rarely a tooth either side, and there is a reflexed spine on the ventral surface of the first joint of the 8 posterior legs. The latter has the beak bent downward vertically, and either side of it there is a prominent spine or tooth; the ventral surface of the base of the legs is unarmed. The *M. mutica* is very closely related to *Monolepis spinatarsus* of Say, the only difference being that the extremity of the posterior legs in this species of *Monolepis* bear 3 or 4 setæ rather longer than the tarsus, while the descriptions of the *mutica* make mention of no such setæ. The posterior legs in *Monolepis* fold up and overlie the carapax: but

\* Vol. xiii, p. 121.

these legs are otherwise like the preceding, though somewhat smaller, and it is probable that this habit in the *M. mutica* has been overlooked, as these animals almost always swim with the posterior legs extended like the others, when taken and kept in a jar for examination, and they also have them extended when walking. These legs do not resemble at all the posterior pair in Porcellana or Galathea. I had examined several species before I discovered this habit with regard to the posterior legs. The animal also throws the fourth pair of legs forward along or over the borders of the carapax, so that the extremity overlies the bases of the eyes and the tarsi hang down in front; and at the same time the two preceding pair are folded up and lie against the sides of the carapax outside of the 4th pair, or the third pair may be thrown forward like the 4th. A Sooloo species, and another common off Cape of Good Hope, were observed swimming with the legs thus disposed.

Say's genus *Monolepis*\* also embraces two groups, alike in the deflexed front, and the longish setæ at the extremity of the posterior tarsi. In one division, including the *M. inermis*, the tarsi are flattened styliiform, and unarmed, with either lateral edge sparsely furnished with minute hairs; the fossa of the sternum along which the abdomen lies when inflexed, has a prominent trenchant border; the depression on the carapax for the posterior legs is rather abrupt and somewhat neatly defined; the body is very convex and obese, with the sides high and vertical, and much wider behind than before, being gradually narrowed forward.

The other division has the tarsi unguiform, compressed, and spinous below, the antepenult spine always longest; the fossa of the sternum with flaring borders; the depression of the carapax for the posterior legs shallow concave; the body more flattened above, with the sides more oblique. This division corresponds to *Monolepis spinitarsus*.

Besides the preceding, there is another group of Megalopidea, examined by the author, resembling *Megalopa* of Leach, except that the tarsus of the posterior legs is narrow lamellar instead of unguiculate, and edged with longish setæ somewhat shorter than the tarsus.

There is still another group in which the front is horizontal and tricuspidate, the inner antennæ when retracted being exposed in the interval between the beak or inner cusp and either outer, lying in view as in *Plagusia*.

With these explanations we give the characters of the genera.

1. *MONOLEPIS*, Say.—Carapax fronte tricuspidatus sed valde deflexus ideoque frons superne visus medio non acutus sed truncatus. Pedes 5ti minores, supe carapacem sæpe restantes, depressione ad eos recipiendos abruptâ; tarsis inermibus, depressis, styliiformibus, paris postici non depressis, apice 3—4 setis longiusculis (tarso paulo longioribus) instructo. Sterni fossa abdominalis marginibus bene prominens et sub-acuta.—*Monolepis inermis*, Say, typus est.

2. *MARESTIA*, Dana.—Carapax fronte uti in *Monolepi*. Pedes 8 postici ad basin infra non armati; 5ti minores, super carapacem sæpe

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\* Journ. Acad. Nat. Sci., Philad., i, 155. The author is indebted for the privilege of examining a specimen of Say's *M. inermis*, to Prof. Lewis R. Gibbes of Charleston, S. C. Another related species was obtained by the author in the East Indies.



restantes, depressione ad eos recipiendos parce concavâ : tarsis styli-formibus, unguiculatis, spinis infra armatis, paris postici apice setis longiusculis instructis.—Typus est *Monolepis spinitarsus*, Say. Hic pertinere quoque *Meg. mutica*, Desm., si ejus pedes postici setis longiusculis confecti; aliter genus novum instituendum. Verbum “Marestia” Desmarest commemorat clarissimum.

3. MEGALOPA, *Leach*.—Carapax fronte simpliciter rostratus, rostro vix deflexo, acuto. Pedes 8 postici ad basin infra uni-spinigeri; 5ti minores tarso styliiformi.—Typus *Meg. Montagui*, *Leach*.\*

4. CYLLENE, *Dana*.—Carapacis frons uti in *Megalopa*. Pedes 8 postici ad basin infra uni-spinigeri; 5ti minores, tarso anguste lamellato, setis longiusculis partim ciliato.

5. TRIBOLA, *Dana*.—Carapax fronte horizontalis, tricuspидatus, rostro (vel cuspidate medianâ) tenui, cuspidibus externis vix longiore. Antennæ internæ inter rostrum et cuspides externas apertè inflexæ. Pedes postici minores, tarso unguiculato setisque longis non instructo.

*List of new species of Megalopidea described in this paper:—*Marestia elegans, M. atlantica, M. pervalida; Monolepis orientalis; Cyllene hyalina, C. furciger; Tribola lata, T. pubescens.

#### MACROURA.

In the account of the Macroura, this tribe is arranged anew, several new genera are added, and 59 new species described. In citing the general remarks, the writer and author here makes a single modification, which consists in removing the Penæus group from the Caridea, and making it a distinct subtribe.

We follow De Haan in placing the genus Galathea with the Anomura; and near it we arrange Æglea, which widely differs from most other related species in having penicillate instead of foliose branchiæ.

The Macroura, excluding these groups, includes three distinct sections or subtribes, pertaining to two series.

The *first series* includes the “Fossores” of authors, or the THALASSINIDEA, which have close relations on one side with the Paguri, and on the other with the Squillidæ. They constitute a line of gradation between these extremes, independent mostly of the other Macroura, and osculating only with the Astaci, although removed from them in general habit and structure. There is a diversity among the legs as to form and position, which is not found in any other Macroura, and calls to mind the Paguri. Moreover, there is in general a looseness of structure, a length of abdomen, and sluggish habit of body, unlike the trim compact forms of the typical Macroura. The anterior feet are thrown directly forward, and are thus fitted for the burrowing habits of the species.

The *second series* embraces the remaining Macroura. There are three grand divisions or subtribes included in the series—a superior, a typical, and an inferior.

The first is somewhat Brachyural in its characteristics, and is made up of the ASTACIDEA. Their relation to the Brachyura and their cephalic

\* Malac Pod. Brit., pl. 16. Leach describes three other species (not noticed by Edwards,) in Tuckey's Exped. to the Zaire, (London, 1818,) p. 404. The *M. Cran-chii* may be a true Megalopa; the others have a deflexed beak.

superiority, is seen in the fact that the sides of the carapax fold under and unite to the epistome, a peculiarity well shown in *Scyllarus* and also, though less perfectly, in *Astacus*. Another mark of this superiority is observed in the absence or small size of the basal scale of the outer antennæ—this scale existing in no *Brachyura*, and having a large size in the typical *Macroura*. The *Astaci* are the transition species between the *Astacidea* and the next division of *Macroura*, and in the genus *Paranephrops* of White, the antennary scale is quite large; the *Astaci* differ from all the *Macroura* of the following divisions in the transverse suture which crosses the carapax near its middle.

The remaining *Macroura* differ from the *Astacidea* in both of the characters above-mentioned; the carapax is free from the epistome, and the antennary scale is large. They are naturally separated into two sections marked off by the extent of their divergence from the higher Crustacea, and their different degrees of cephalic inferiority. The distribution alluded to is indicated by the position of the strong prehensile legs. In the *Brachyura* the anterior pair is uniformly the strong pair; and this uniformity through so extensive a group shows that the variations from it must be of importance in classification. This peculiarity of the *Brachyura* is a consequence of the concentration of force in the anterior portion of the cephalothorax or the anterior nervous ganglia; and the diffusion of this force posteriorly, which in different degrees marks the *Macroura*, is especially exhibited in the legs.

We observe then that through a large part of the *Macroura* the strong prehensile legs are either the first or second pairs. These species are all of a common grade; for the species having the first pair the larger are connected by so many transitions with those that have the second pair the larger, that no line of demarcation can be drawn which should make a grand division among them. These are the *CARIDEA*.

Another group remains, in which the stoutest prehensile legs are those of the *third* pair, and the line between these species and the preceding in this respect is strongly drawn. This peculiarity indicates a transfer of force, which pertained to the first pair in the *Brachyura*, and to the first or second in the typical *Macroura*, to a pair more posterior: giving the anterior part of the body a still lower character. These, the *PENÆIDEA* constitute our third division or subtribe. With the *Penæidea* should be included certain still lower species, approaching the *Mysis* group, in which none of the legs are stout chelate, (*Sergestes*, &c.) whose whole structure indicates their inferior character, and the low state of the forces within.

The three grand divisions, *ASTACIDEA*, *CARIDEA* and *PENÆIDEA*, constituting the second series, thus mark three grades of rank among the *Macroura*. The *Thalassinidea* are the *aberrant* species.

These subtribes may be divided into families.

*Subtribe 1. Thalassinidea*.—This section, as Milne Edwards observes, includes two strongly marked divisions; *one*, with only the ordinary thoracic branchiæ, and a *second* with the addition of *abdominal* branchial appendages, as in the *Squillidæ*. The former we name the *Thalassinidea Eubranchiata*, the latter, the *Thalassinidea Anomobranchiata*. The first group embraces three families, differing strikingly in outer maxillipeds and abdomen, as explained beyond. The second con-

tains only two genera, *Callianidea*, Edw., and *Isæa*, Guerin: the last name was changed by Edwards to *Callianisea*; but as this word is so near *Callianassa* and *Callianidea*, a contraction to *Callisea* would be preferable.

*Subtribe 2. Astacidea.*—In this subtribe we adopt De Haan's sections, except that we exclude the *Megalopidea*, and we do not associate the *Thalassinidea* with the *Astacidea*. The sections or families are *Scyllaridæ*, *Palinuridæ*, *Eryonidæ*, and *Astacidæ*.

Leach in 1819 subdivided the old genus *Astacus*, naming the marine species (*Homarus*, Edw.) *Astacus*, and the fresh water (*Astacus*, Edw.) *Potamobius*. Edwards's division, of like character, now generally accepted, was not published till 1837. Leach hence has the priority. But according to Leach, the name *Astacus* is appropriated, not to the typical part of the group, that including the *Astacus fluviatilis* of old authors, or *Cancer Astacus* of Linnæus, and which embraces at the present time numerous species, but to that including the *Cancer Gammarus* of Linnæus, still but a small group. There is hence much objection to the names of Leach, and moreover much confusion would now ensue from their adoption. There seems, therefore, to be sufficient reason for rejecting them, if it be of no weight that they have remained for 30 years unrecognized by British authors. They are adopted in the Catalogue of British Crustacea of the British Museum, published in 1850, but not in the general Catalogue of 1847.

*Subtribe 3. Caridea.*—In arranging the *Caridea* into groups, much stress is usually laid upon external form and length of beak. The unimportance of these characters is inferrible from the fact that they involve no essential variations of structure. Moreover, in a single natural group, we may find both the long and short beak. In the *Crangon* group, for instance, in which the beak is usually very short and the body depressed, we have a species with the beak and habit of an *Hyppolyte*.

There are other characters of more fundamental value; and these have been brought forward by De Haan. The mandibles afford the distinctions alluded to. In one section they are very slender and are bent nearly at a right angle, without enlargement at the crown. In another they are very stout, and somewhat bent above with a broad dilated crown. In a third, they are stout, but not bent, and have a dentate summit. In a fourth they have, in addition to a projecting lateral crown, a large summit process, which is often oblong and very prominent. These forms are characteristic of different sections of the *Caridea*.

The fact that the mandibles bear a palpus or not is of much less importance; for the portion of the mandible which is most essential to its functions is the crown.\* Among the *Palæmoninæ*, there are genera having a mandipular palpus, and others without one; while the two kinds in other respects are remarkably close in their relations. We have found moreover, that in this group, the length of the palpus varies with the disjunction of the 2d and 3d flagella of the inner antennæ. If these flagella are separate to their bases nearly, (as in *Palæmon*),

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\* The highest Crustacea have no manibular palpi.

the palpus is long and 3-jointed; if united for some distance up, the palpus becomes short and finally only 2-jointed (*Palæmonella*;) if united nearly or quite to their summits, there is no palpus.\*

In the arrangement of the genera into families, the fact *whether the 1st or 2d pair of legs is the stouter*, is here of great weight, much greater than has been recognized. By regarding this character, we are led to place *Hippolyte* and *Rhyncocinetes* with *Alpheus*, instead of with *Palæmon*; also *Hymenocera* and *Pontonia* with *Palæmon*, instead of with *Alpheus*.

In the preceding paragraphs we have but hinted at some of the more prominent principles involved in the classification of the *Macroura* here presented, a fuller exposition of which will be given in another place. Below is a synopsis of the families and sub-families thus arrived at, with a description of the new genera.

*Synopsis Familiarum Crustaceorum Macrourorum.*

Subtribus I. THALASSINIDEA, vel MACROURA PAGURO-SQUILLIDICA.

Carapax suturâ transversâ notatus, posticeque sæpe suturis duabus longitudinalibus. Abdomen sæpius multo elongatum. Antennæ externæ squamâ basali sive nullâ sive parvulâ instructæ. Pedes 2 antici prorsum projecti; 6 postici habitu raro consimiles. *Species fossores.*

Legio I. THALASSINIDEA EUBRANCHIATA.

Branchiis instructa thoracis tantum.

Fam. 1. GEBIDÆ.—Maxillipedes externi pediformes. Appendices caudales et aliæ abdominales latæ.—GENERA: *Gebia*, *Leach*, *Axius*, *Leach*, *Calocaris*, *Bell*, *Laomedia*, *De Haan*, *Glaucothoe*, *Edw.*†

Fam. 2. CALLIANASSIDÆ.—Maxillipedes externi operculiformes. Appendices caudales latæ.—GENERA: *Callianassa*, *Leach*, *Trypæa*. *D.*

Fam. 3. THALASSINIDÆ.—Maxillipedes externi pediformes. Appendices caudales lineares.—GENUS: *Thalassina*, *Latr.*

Legio II. THALASSINIDEA ANOMOBANCHIATA.

GENERA:—*Callianidea*, *Edw.*, *Callisea*, (*Guerin*), *D.*

Subtribus II. ASTACIDEA vel MACROURA SUPERIORA.

Carapax suturâ transversâ sæpius notatus, lateribus anterioribus episotomate connatis. Antennæ externæ squamâ basali sive nullâ sive

\* In our genus *Palæmonella*, the palpus of the mandible is 2-jointed, and in *Anchistia*, which is closely like *Palæmon* in habit in some of its species, there is no palpus, as in the *Pontoniæ*; and thus the transition to the *Pontoniæ* from *Palæmon* is exceedingly gradual. *Harpilius* and *Œdipus* (*Pontonia* of authors) fill up the interval between *Anchistia* and the true *Pontoniæ*. They are all similar in having the 2d pair of legs largest, and in other prominent characteristics.

† The genera of living species only are mentioned.

parvâ instructæ. Abdomen sat breve vel mediocre. Branchiæ sæpius penicillatæ. Pedes 2 antici oblique projecti; 6 postici directione consimiles.

1. *Antennæ externæ squamâ basali non instructæ. Pedes antici non chelati.*

Fam. 1. SCYLLARIDÆ.—Carapax valde depressus, marginibus lateralibus sat tenuibus, carapace lateraliter subito inflexo. Antennæ externæ laminatæ, breves. Sternum trigonum.—GENERA: Scyllarus, *Fabr.*, Arctus, *D.*, Thenus, *Leach*, Parribacus, *D.* Ibacus, *Leach*.

Fam. 2. PALINURIDÆ.—Carapax subcylindricus, lateraliter late rotundatus. Antennæ externæ basi subcylindricæ, longæ. Sternum trigonum.—GENERA: Palinurus, *Fabr.*, Panulirus, *Gray*.

2. *Antennæ externæ squamâ basali instructæ. Pedes antici didactyli.*

Fam. 3. ERYONIDÆ.—Carapax non oblongus, depressus, lateribus subito inflexis, abdomine multo angustiore.—GENUS: Eryon, *Desm.*

Fam. 4. ASTACIDÆ.—Carapax oblongus, subcylindricus, abdomine parce angustiore. Sternum angustum.—GENERA: Homarus, *Edw.*, Astacoides, *Guerin*, (subgen. incl. Astacoides et Cheraps, *Erich.*) Astacus (subgen. incl. Astacus et Cambarus, *Erich.*) Nephrops, *Leach*, Paranephrops, *White*.

### Subtribus III. CARIDEA vel MACROURA TYPICA.

Carapax suturâ transversâ non notatus, cephalothoracem plerumque tegens, lateribus anterioribus liberis, epistomate non connatis. Antennæ externæ squamâ basali grandi instructæ. Corpus sive subcylindricum sive paulo compressum. Branchiæ sæpius foliosæ.

Fam. 1. CRANGONIDÆ.—Mandibulæ graciles, valde incurvatæ, non palpigeræ, coronâ angustâ. Pedum pares 1mi 2di inter se valde inæqui.

Subfam. 1. CRANGONINÆ.—Pedes 1mi 2dis crassiores. Maxillipedes externi pediformes. Digitus mobilis in palmam claudens, immobilis spiniformis. Pedes 2di non annulati.—GENERA: Crangon, *Fabr.*, Sabinea, *Owen*, Argis, *Kröyer*, Paracrangon, *D.*

Subfam. 2. LYSMATINÆ.—Pedes 1mi 2dis crassiores. Maxillipedes externi pediformes. Manus bene didactylæ. Pedes 2di annulati. GENERA: Nika, *Risso*, Lysmata, *Risso*, Cyclorhynchus, *DeH.*

Subfam. 3. GNATHOPHYLLINÆ.—Pedes 2di 1mis crassiores. Maxillipedes externi late operculiformes.—GENUS: Gnathophyllum.

Fam. 2. ATYIDÆ.—Mandibulæ crassæ, non palpigeræ, coronâ latâ, parce bipartitâ, processu terminali brevi et dilatato. Pedum pares 1mi 2dique inter se æqui, carpo nunquam annulato.

Subfam. 1. ATYINÆ.—Pedes thoracici palpo non instructi.—GENERA: Atya, *Leach*, Atyoida, *Randall*, Caridina, *Edw.*

Subfam. 2. EPHYRINÆ.—Pedes thoracici palpo instructi.—GENUS: Ephyra, *Roux*, *DeH.*

Fam. 3. PALÆMONIDÆ.—Mandibulæ crassæ, sive palpigeræ sive non palpigeræ, profunde bipartitæ, processu apicali oblongo, angusto.

Subfam. 1. ALPHEINÆ.—Pedes 1mi crassiores, chelati; 2di filiformes, carpo sæpius annulati et chelati. Mandibulæ palpigeræ.—GENERA: Alpheus, *Fabr.*, Betæus, *D.*, Alope, *White*, Athanas, *Leach*, Hippolyte,\* *Leach*, Rhyncocinetes, *Edw.*,—[Cujus sedis genus Antonomea, *Risso*?].

Subfam. 2. PANDALINÆ.—Pedes 1mi gracillimi; non chelati; 2di filiformes, carpo annulato.—GENUS: Pandalus, *Leach*.

Subfam. 3. PALÆMONINÆ.—Pedes 2di 1mis crassiores, 4 antichi chelati, carpis nullis annulatis. Pedes nulli palpigeri. Squama antennarum externarum non acuminata et extus non spinigera.—GENERA *mandibulis non palpigeris*: Pontonia, *Latr.*, Œdipus, *D.*, Harpilius, *D.*, Anchistia, *D.*; *mandibulis palpigeris*, Palæmonella, *D.*, Palæmon,† *Fabr.*, Hymenocera, *Latr.*, Cryphiops, *D.* [Cujus sedis genus Typton, *Costa*,?]

Subfam. 4. OPLOPHORINÆ.—Pedes 2di crassiores, chelati, 1mi sive didactyli sive vergiformes. Squama antennarum externarum acuminata, extus spinis armata.—GENERA: Oplophorus, *Edw.*, Regulus, *D.*

2. *Maxillipedes 2di tenuiter pediformes.*

Fam. 4. PASIPHÆIDÆ.—Pedes 1mi 2dique chelati. Mandibulæ uti in Atyidis.—GENUS: Pasiphæa.

Subtribus IV. PENÆIDEA, vel MACROURA INFERIORA.

Pedes 3tii majores, 2dis similes; interdum toti debiles et vergiformes. Carapax uti in Carideis.

Fam. 1. PENÆIDÆ.—Pedes 3tii bene didactyli, validiores. Palpus mandibularis latus.—GENERA: Sicyonia, *Edw.*, Penæus, *Latr.* (*Aristæo*, Duvernoy, incluso,) Stenopus, *Latr.*, Spongicola, *DeH.*

Fam. 2. SERGESTIDÆ.—Pedes 3tii 2dique 1mique debiles, obsolete chelati vel non chelati. Palpus mandibularis gracilis.—GENERA: Sergestes, *Edw.*, Acetes, *Edw.*, et forsàn Euphema, *Edw.*

Fam. 3. EUCOPIDÆ.—Pedes 3tii 2dique vergiformes, non chelati; 1mi maxillipedesque externi æque monodactyli et subprehensiles, digito in articulo penultimum claudente. Palpus mandibularis gracilis.—GENUS: Eucopia, *Dana*.

*New Genera described.*

TRYPÆA.—Pedibus *Callianassæ* affinis. Flagella antennarum internarum articulo precedente breviora, antennis supediformibus.

\* Periclimenes, *Costa*, (Ann. dell'Acad. degli Aspir. Nat. di Napoli, ii, 1844) hardly differs from Hippolyte, according to Erichson, Arch. f. Nat. 1846, p. 310.

† *Leander*, Desmarest, (Ann. Ent. Soc., France, 1849, p. 87,) appears to be identical with Palæmon.

**ARCTUS**, (Scyllari subgenus 5tum, *De Haan.*)—Rostrum perbreve, truncatum. Antennæ externæ inter se remotæ. Palpus maxillipedis flagello carens. Branchiæ 19. Sp. A. *ursus*, D. (Scyllarus arctus, *Auct.*)

**PARRIBACUS**.—(Scyllari subgenus 2dum, *De Haan.*)—Rostrum subtriangulatum. Antennæ externæ inter se fere contiguous. Oculi fere in medio inter antennas internas et angulos cephalothoracis externos. Branchiæ 21. Species, *P. antarcticus* et *P. Parræ* (Ibacus antarcticus et *I. Parræ*, *Auct.*)

**PARACRANGON**.—Rostrum elongatum. Oculi liberi. Pedes 2di obsoleti, 4ti 5tiq̄ue acuminati, gressorii.

**BETÆUS**.—Rostrum nullum. Oculis et ceteris *Alpheo* plerumque affinis. Manus paris 2di major fere inversa, digito mobili inferiore vel exteriori.—Species maris frigidioris. (*Alpei* manus non inversa et species maris calidioris.)

**PONTONIA**, *Latr. D.*—Corpus depressum. Rostrum breve. Oculi parvuli. Maxillipedes suboperculiformes, articulo 2do lato, 3tio 4toque simul sumtis longiore, his subcylindricis.

**ŒDIPUS**.—(Pontonia, *Auct.*)—Corpus plus minusve depressum. Rostrum longitudine mediocre. Oculi permagni. Maxillipedes externi latiusculi, articulis totis latitudine fere æquis. Tarsi infra elongatè gibbosi.

**HARPILIUS**, (Pontonia, *Auct.\**)—Corpus non depressum. Rostrum longitudine mediocre. Oculi magni. Maxillipedes suboperculiformes, articulo 2do lato, 3tio 4toque simul sumtis brevior, his subcylindricis. Tarsi uncinati, infra non gibbosi.

**ANCHISTIA**.—Rostrum tenue, sæpius ensiforme et elongatum. Corpus vix depressum, sæpe compressum. Oculi mediocres; antennæ duobus flagellis instructæ, unâ parce bifidâ. Maxillipedes externi omnino tenues, pediformes.

**PALÆMONELLA**.—Corpus non depressum. Rostrum sat longum, dentatum. Oculi mediocres. Mandibularum palpus bi-articulatus perbrevis. Antennæ internæ flagellis duobus confectæ, uno apicem bifido. Maxillipedes externi tenues. (Palpus mandibularis specierum *Palæmonis* tri-articulatus.)

**REGULUS**, *Dana.*—Rostrum longum, dentatum. Antennæ internæ flagellis duobus confectæ. Pedes toti palpigeri, 2 antici non chelati, 2di crassè chelati. Mandibularum palpus 3-articulatus. [Abdominis segmentum 3tium dorso postico instar spinæ productum longæ.]

**EUCOPIA**, *Dana.*—Carapax non rostratus, fronte integro. Pedis thoracis elongato-palpigeri, palpis natatoriis. Maxillipedes 2di 3tii et pedes 1mi monodactyli et prehensiles, ungue ad articulum precedens claudente.

The following are the names of the new species :

I. **THALASSINIDEA**.—*Gebia pugettensis*; *Callianassa gigas*; *Trypæa australiensis*; *Thalassina gracilis*.

\* Pontoniæ veræ Œdipis et Harpiliis habitu multo discrepant; Pontoniarum oculis parvulis, abdomine valde inflexo, et modo vitæ sæpius Pinnotheroideis: horum oculis pergrandibus, abdomine minus inflexo, animalibus modo vitæ liberis, inter ramos corallorum sæpe natantibus. Pontonia macrophthalma, *Edw.*, Œdipo pertinet.

II. **ASTACIDEA.**—*Arctus vitiensis*; *Astacus leniusculus*, *Astacoides nobilis*, *Paranephrops tenuicornis*.

III. **CARIDEA.**—*Crangon munitus*; *Paracrangon echinatus*; *Nika hawaiiensis*; *Alpheus strenuus*, *A. pacificus*, *A. euchirus*, *A. obesomanus*, *A. crinitus*, *A. mitis*, *A. acuto-femoratus*, *A. parvi-rostris*, *A. tridentulatus*, *A. neptunus*, *A. pugnax*, *A. diadema*, *A. malleator*; *Betæus truncatus*; *B. æquimanus*, *B. scabri-digitus*; *Hippolyte acuminatus*, *H. exilirostratus*, *H. obliquimanus*, *H. brevirostris*, *H. lamellicornis*; *Pandalus pubescentulus*; *Pontonia tridacnæ*; *Ædipus superbus*, *Æ. gramineus*; *Harpilius lutescens*; *Anchistia gracilis*, *A. longimana*, *A. ensifrons*, *A. aurantiaca*; *Palæmonella tenuipes*, *P. orientalis*; *Palæmon debilis*, *P. exilimanus*, *P. concinnus*, *P. lanceifrons*, *P. acutirostris*, *P. equidens*; *Cryphiops spinuloso-manus*; *Regulus lucidus*, *R. crinitus*.

IV. **PENÆIDEA.**—*Penæus carinatus*, *P. avirostris*, *P. velutinus*, *P. tenuis*, *P. gracilis*; *Stenopus ensiferus*; *Eucopia australis*.

J. D. D.



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CRUSTACEA CANCROIDEA & CORYSTOIDEA.

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*Conspectus Crustaceorum, &c. Conspectus of the Crustacea of the Exploring Expedition under Capt. Wilkes, U. S. N., including the CRUSTACEA CANCROIDEA and CORYSTOIDEA.* By JAMES D. DANA. (Pl. 11)

[From the Proceedings of the Academy of Natural Sciences of Philada., May, 1852.]

## I. CRUSTACEA CANCROIDEA.

A synopsis of the genera of Cancroidea—the Cyclometopa of Edwards—including their arrangement into families and other groups, has been published by the writer in the American Journal of Science, 2d ser., vol. xii, p. 121. The following pages contain descriptions of the new species in the Expedition collections, arranged in accordance with the classification explained in that paper. The distinctive characters of the genera will there be found, both of those of other authors, as far as accepted, and those here instituted.

### Fam. I. CANCRIDÆ.

#### Subfam. CANCRINÆ.

#### Genus CANCER, Leach, (*Platycarcinus*, *Edw.*)

**CANCER MAGISTER.**—Carapax nudus, granulatus, paulo convexus, superficie paulo undulatus, lateraliter triangulatus et acutus, margine postero-laterali fere recto, antero-laterali 10-dentato, dentibus paululo prominentibus, margine dentis postero longissimo et fere recto, subtiliter crenulato, dente ultimo triangulato; fronte inter-antennali 3-dentato; articulo antennarum externarum 1mo apicem crassè producto. Pedes antici subæqui, manu supra cristatâ, multi-dentatâ, extus costatâ, digito mobili supra denticulato. Pedes 8 postici valde compressi, tarso paulo lato, articulis supra granulatis, 4to supra canaliculato, tarso articuloque 5to pedis 5ti infra bene ciliatis. Articulus maxillipedis externi 3tius oblongus, apice externo obliquè truncatus. *Hab.* portu “San Francisco.” *Long.* carapacis  $4\frac{3}{4}$ ”, *lat.* 7”.

**CANCER GRACILIS.**—Carapax nudus, partim minutè granulatus, valde convexus, non distinctè areolatus, superficie non undulatus, lateraliter triangulatus et acutus, margine postero-laterali fere recto, antero-laterali 9-dentato, dentibus regularibus, acutis, paulo prominentibus, dente 1mo vix longiore quam 2dus, totis margine postero fere rectis et longis et subtiliter denticulatis, fronte inter-antennali 3-dentato. Maxillipedes externi pubescentes, articulo 3tio apicem externum valde arcuato aut rotundato, margines apicalem et externum longè ciliato. Pedes antici subæqui, manu subcristatâ, cristâ 1—2-dentatâ, superficie externâ costatâ. Pedes 8 postici nudi, tarso longo, tenuissimo, nudo. *Hab.* portu “San Francisco.” *Long.* carapacis 13”, *lat.* 19”.

#### Subfam. XANTHINÆ.

#### Genus LIOMERA, *Dana.*

*Carpilio*, aspectu, pedibus nudis quoad margines obtusis antennisque similis. Carapax valde transversus, subellipticus, lateribus rotundatis, margine antero-laterali non brevior quam postero-lateralis, fronte brevissimè bilobato. Ramus maxillipedis primi internus non lobatus, apice fere rectus. Pedes usque ad tarsos nudi. An *Carpilius cinctimanus*, White, hic pertinet?

**LIOMERA LATA.**—Carapax nitidus, valde transversus, transversim bene ellipticus, antice versus marginem anticum subareolatus, in medio areolis inconspicuis; fronte brevi, perpendiculariter deflexo, supernè viso fere recto et super orbitas vix saliente, leviter emarginato; margine antero-laterali crasso et crassè rotundato, 4-lobato, lobis 2do 3tio 4toque validis, rotundatis, 3tio majore. Pedes antici æqui, mediocres, manu lævi, digitis brevibus. *Hab.* ad insulas “Feejee.” *Long.* carapacis 7”, *lat.*  $13\frac{1}{2}$ ”.

#### Genus ACTÆA, (*DeHaan*) *Dana.*

**ACTÆA AREOLATA.**—*A. hirtissimo* vel *specioso* affinis. Carapax latior, valde transversus, infra omnino brevissimè hirsutus, supra omnino areolatus, sub-

tilissimè hirsutus, pilis vix longioribus quam granuli, areolâ 2M\* subdivisâ, ejus parte externâ etiam partim subdivisâ, 3M tripartitâ, 1P tripartitâ; margine antero-laterali longo, leviter 5-lobato, postero laterali brevi, valde concavi. Pedes brevissimè hirsuti; antici subæqui, granulosi, manu carpoque paulo nodosis, digitis striatis, scabris, brevissimè hirsutis, bene triangulato-dentatis. Pedes postici granulosi, densè brevissimèque hirsuti. *Hab.* freto "Balabac." *Long.* carapacis 5.9''', *lat.* 9.33'''.

ACTÆA CELLULOSA.—Carapax antice posticeque malè areolatus, omnino cellulosus, nudus, margine antero-laterali imperfectè 3—4-lobato et cellulis excavato, margine postero-laterali perbrevis et concavo. Pedes antici subæqui, manu carpoque superficie cellulosis, manu extus infraque subtiliter villosâ, digitis scabris, etiam villosis. Pedes 8 postici cellulis excavati, breves. *Hab.* ad insulam "Tutuila" Samoensem. *Long.* carapacis 3''', *lat.* 4.3'''.

## Genus XANTHO.

### Subgenus XANTHO.

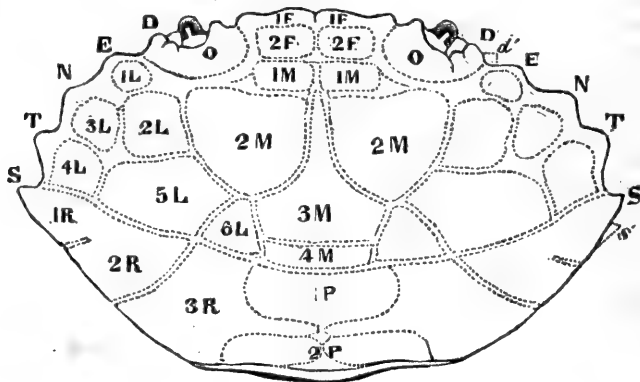
Articulus antennarum externarum 1mus orbitæ fissuram internam fere implens, articulum sequentem medio gerens. Corpus bene transversum, margo antero-lateralis ab angulo orbitæ incipiens.

#### 1. *Pedes 8 postici cristati.*

XANTHO NITIDUS.—Carapax lævis, paulo nitidus, antice partim leviter areolatus, areolis 2M 5L 6L postice vix circumscriptis; fronte fere recto, non emarginato, margine antero-laterali leviter 3—4-lobato, lobis subtriangulatis, angulo orbitali externo non saliente. Pedes antici subæqui, inermes, fere læves (subtilissime corrugatæ,) manu bene cristatâ, digito mobili subcristato et dente basali magno carente. Pedes 8 postici bene cristati, fere nudi, marginibus integris, apice margineque inferiore articuli 5ti brevissimè hirsuti-villosis, tarso supra infraque etiam villosi. *Hab.* juxta insulas "Viti" vel "Tonga." *Long.* carapacis 3.2''', *lat.* 5'''.

XANTHO SUPERBUS.—Carapax paulo convexus, antice sed non medio areolatus,

\* Areolæ carapacis normales dentesque sic nobis deominati.



F. *Regio Frontalis.*—1F, areola præfrontalis; 2F, post-frontalis.

M. *Regio Mediana.*—1M, areola præmediana; 2M, extra-mediana; 3M, intra-mediana vel gastrica; 4M, post-mediana.

P. *Regio Posterior.*—1P, areola cardiaca; 2P, intestinalis.

L. *Regio Antero-lateralis.*—Areolæ sunt normales, 1L, 2L, 3L, 4L, 5L, 6L.

R. *Regio Postero-lateralis.*—Areolæ sunt normales, 1R, 2R, 3R.

O. *Regio orbitalis.*

*Dentes* normales antero-laterales numero quinque sunt et designati D, E, N, T, S. Alter dens supplementalis pone S, s denominatus et alter inter dentes D et E, d. Vide "Amer. Journ. Sci." [2], vol. xi, p. 95.

areolis 3M 4M 5L 6L fere coalitis et postice vix circumscriptis, sulcis anterioribus villosis; fronte paulo sinuoso, emarginato; margine antero-laterali crassè 4-dentato, dentibus duobus anticis rotundatis. Pedes cristati, manu extus subseriatim minute tuberculatâ, supra valde cristatâ; pedibus posticis quoad margines dense hirsutis, tarso villosus. *Hab.* ad insulam "Raraka" archipelagi Paumotensis. *Long.* carapacis 13''; *lat.* 21''.

2. *Pedes 8 postici non cristati.*

XANTHO DISPAR.—Carapax fere planus, ellipticus, latere rotundatus, non nitidus, antice non bene areolatus, prope marginem impressus, margine antico areolarum 1M 2M paulo impresso, lineis duabus regionem antero-lateralem intersecantibus; fronte fere recto, non producto, margine antero-laterali crassiusculo, subacuto, fere integro, levissimè trilobato, lobo antico (D E N respondente) plus duplo longiore quam 2dus (T) angulo post-orbitali non saliente. Pedes antici valde inæqui, manu supra latè rotundatâ, corrugatâ et partim granulosa, digito mobili non canaliculato, dente magno basali. Pedes 8 postici breves, subnudi, articulis 4to 5toque supra granulosi, 5to tarsoque minutè villosis. *Hab.* portu "Rio Janeiro." *Long.* carapacis 5½''; *lat.* 8¼''.

XANTHO MINOR.—*X. parvulo*, affinis. Carapax anticè areolatus, areolis leviter elevatis, 2M 3M 5L 6L postice circumscriptis, 2M cum rugâ transversim divisâ; fronte fere recto, leviter emarginato; margine antero-laterali tenui, 4-dentato, dentibus tribus posticis subtriangulatis. Pedes antici mediocres, carpo manūque supra paulo granulosi, manu extus leviter granulato-costatâ et supra sulcatâ, digito mobili cum dente magno basali non armato. Pedes 8 postici sparsim pubescentes. *Hab.* insulam Madeira vel "Cape Verds." *Long.* carapacis 2.1'', *lat.* 3.1''

Subgenus PARAXANTHUS, *Lucas*, (D'Orb. S. A. p. 18.)

Hic referemus *Xantho sexdecimdentatum*, Edw. et Lucas, (D'Orb. S. America, tab. 7, p. 2.) fronte, ac in *Paraxantho*, horizontaliter producto, lateribus rotundatis et expansis, abdomine angusto, articulo antennarum externarum 1mo brevi.

Subgenus EUXANTHUS, *Dana*.

Articulus antennarum externarum 1mus orbitæ fissuram internam ad summum implens, cavitate in ejus apicis latere antico articulum proximum gerente. Margo antero-lateralis sub orbitâ antice productus.

EUXANTHUS SCULPTILIS.—Carapax antice posticeque profundè areolatus, areolâ 2M bipartitâ, ejus partibus transversim subdivisis, totisque areolis plus minusve rugatis aut incis; fronte inter-antennali bilobato, paulo prominente, margine orbitæ sub antennâ saliente; margine antero-laterali 6—7-dentato, dentibus sat crassis, pyramidicis, obtusis. Pedes antici æqui, carpo crassè nodoso, manu supra tuberculatâ, extus costatâ, digito mobili supra denticulato. Pedes postici mediocres, articulo 3tio granuloso, 4to 5toque supra rugatis aut tuberculosi, tarso villosus. Abdomen valde areolatum. *Hab.* archipelago Vitiensi (Feejee) vel Tongensi. *Long.* carapacis 11½'', *lat.* 17½''.

EUXANTHUS NITIDUS.—*E. sculptili* quoad pedes anticos et posticos marginem carapacis antero-lateralem frontemque similis. Carapax omnino valde areolatus, areolis plerisque levibus, interdum leviter rugatis, angulo orbitæ externo tenui et non tuberculiformi nec angulato. *Hab.* ibid. *Long.* carapacis 9''; *lat.* 14''.

Subgenus XANTHODES, *Dano*.

Articulus antennarum externarum 1mus brevis, processum frontis oblongum attingens tantum. Carapax sæpe angustior, sæpe *Pilumno* paulo similis, lateraliter angulum ad dentem S habens, et non rotundatus ac in *Paraxantho*.

XANTHODES GRANOSO-MANUS.—Carapax lævis, prope margines anticum et antero-lateralem granulosus, antice parce areolatus, areolis 2M 3M postice sæpius vix circumscriptis, 4L 5L 6L coalitis et posticè non circumscriptis; fronte fere recto, emarginato, margine antero-laterali non tenui, 5-dentato,

dentibus sat isolatis, vix acutis, D vix prominente, E parvulo et granuliformi. Pedes antici fere æqui, manu supra rotundatâ, supra infraque granulosa, extus latè costatâ, costis granulosis, carpo granuloso, digitis canaliculatis. Pedes postici fere nudi, articulis 4to 5toque supra granulosis, tarso brevissimè villosa. *Hab.* ad insulas Samoenses ("Navigators") quoque credimus Tahitienses ("Society") et Paumotenses. *Long.* carapacis  $4\frac{1}{4}'''$ ; *lat.*  $6\frac{1}{4}'''$ .

*XANTHODES NITIDULUS.*—Carapax lævis, nitidus, anticè partim areolatus, areolis 1M 2M 3M vix discretis, 2L 3L extus abruptis, 2L cum 4L 5L 6L sæpius coalitis hisque postice non bene circumscriptis, 3L circumscriptâ; fronte leviter arcuato, emarginato; margine antero-laterali 4-dentato, dente D obsoleto, dentibus E N T S subconicis, subacutis, nitidis. Pedes antici paulo inæqui, inermes, læves, manu supra obtusâ, prope marginem supernum uni-caniculatâ; carpo prope articulationem apicalem paulo excavato. Pedes 8 postici margine superno articularum 3tii 4ti 5tique valde hirsuti, tarso hirsuto, articulo 3tio supra non denticulato. *Hab.* archipelago Paumotensi. *Long.* carapacis  $5'''$ ; *lat.*  $7\frac{3}{4}'''$ .

*XANTHODES NOTATUS.*—Carapax anticè bene areolatus, areolis planis, fere lævibus et subtilissime erosis, sulcis abruptis, fronte fere recto, emarginato; margine antero-laterali 5-dentato, dente D fere obsoleto, E N tuberculiformibus, T S acutis et spiniformibus. Pedes antici valde inæqui, manu carpoque pedis majoris minute tuberculatis, manu infra lævi, nitidâ, manu carpoque pedis minoris spinulis dense armatis. Pedes 8 postici hirsuti, articulo 3tio supra denticulato. *Hab.* ad insulas Paumotenses vel Tahitienses; quoque insulas Hawaienses. *Long.* carapacis feminae ovigeræ  $3\frac{3}{4}'''$ ; *lat.*  $5\frac{1}{2}'''$ .

#### Genus PANOPÆUS, *Edwards.*

*PANOPÆUS LÆVIS.*—Carapax lævis, vix nitidus, non bene areolatus, fronte fere recto, non producto, minute emarginato, margine antero-laterali tenui, 4-lobato, lobis 2do 3tioque bene dentiformibus et acutis, margine eorum postico arcuato, 4to angustiore. Pedes antici valde inæqui, inermes, supra rotundati, manu lævi, extus paulo nitidâ, digito mobili lævi, dente magno basali carente. Pedes 8 postici tenues, marginibus pubescentibus, articulo 3tio fere nudo. *Hab.* ———? *Long.* carapacis  $5\frac{1}{2}'''$ ; *lat.*  $7\frac{1}{2}''$ .

#### Genus MEDÆUS, *Dana.*

Carapax angustus, paulo transversus. Orbitæ margo inferior externusque dentibus tribus instructus. Frons sat brevis. Margo carapacis antero-lateralis sub orbitâ productus. Articulus antennæ externæ imus orbitæ fissuram fere implens ac in subgenere *Xantho*. Abdomen maris 5-articulatum, segmento ultimo brevi. Pedes antici crassi.

*MEDÆUS ORNATUS.*—Carapax paulo transversus, profundè areolatus, areolis asperatis præcipue in parte anteriore, nec 2M nec 3M subdivisâ, margine antero-laterali 5—6-dentato, dentibus D d E N T S designatis, scabris, orbitâ 4 dentibus circumdatâ; fronte producto, latiore, bene emarginato, lobis margine concavis. Pedes antici asperè tuberculato, manu tuberculis asperatis fere oblongis et non acuminatis armatâ, digitis asperatis. Pedes postici pubescentes, articulo 3tio supra spinuloso. *Hab.* prope insulam "Lahaina" Hawaiensem. *Long.* carapacis  $5.1'''$ ; *lat.*  $7'''$ .

#### Subfam CHLORODINÆ.

#### Genus ETISUS, *Leach.*

*ETISUS DEFLEXUS.*—Carapax leviter bene areolatus, lævis, fronte inter-antennali 4-lobato, tenui, valde deflexo, setigero, margine antero-laterali 5-dentato, dentibus subacutis, 2do minore. Pedes antici sat longi, manu carpoque extus supraque bene granulosis, digitis lævibus; reliqui angusti, valde pilosi. Abdomen maris 5-articulatum eoque *levimani* simile. *Hab.* archipelago Vitiensi. *Long.* carapacis  $6'''$ ; *lat.*  $9\frac{1}{2}'''$ .

*ETISUS LEVIMANUS, Randall,* (Jour. Acad. Nat. Sci. Philad. viii. 115,) ad insulas Vitienses et Hawaienses lectus. *Long.* carapacis  $19'''$ , *lat.*  $31'''$ .

## Subgenus ETISODES, Dana.

Etiso differt brachio parce exserto, carapace angustiore et non lateraliter producto, formâ Xantho simili et non Cancro uti in Etiso.

ETISODES FRONTALIS.—Carapax vix nitidus, minus transversus; antice areolatus, postice planus, areolis fere planis, areolâ 2M simplice; fronte producto, horizontali; margine antero-laterali 5-dentato, dentibus subtriangulatis, dente posteriore (S) minore. Pedes antici inermes, manu supra non lævi, digito mobili supra fere 3-carinato, carpo granuloso, prope articulationem manus prominente. Pedes 8 postici paulo pubescentes, articulo 3tio inermi. *Hab.* mari Suluensi. *Long.* carapacis 3''; *lat.* 3½''.

ETISODES CÆLATUS.—Carapax valde convexus et areolatus, areolis tuberculi-formibus, parce granulosis, areolâ 2M longitudinaliter subdivisâ, 3M tripartitâ, 4M tripartitâ, 1P et 2P valde disjunctis et bene circumscriptis, transversis; fronte inter-antennali 4-lobato, lobis externis parvulis, non salientibus; margine antero-laterali 5-dentato, dentibus obtusis. Pedes antici sat crassi, carpo tuberculoso, manu extus seriatim spinulosâ aut spini-tuberculosâ, digito supra spinuloso. Pedes reliqui compressi obsoletè pubescentes, marginibusque valde hirsuti. Abdomen feminae 7-articulatum. *Hab.* ad insulam "Wakes," maris Pacifici. *Long.* carapacis 10''; *lat.* 14''.

## Genus ZOZYMUS, Leach. (ÆGLE, De Haan.)

*Atergati Acteaeque* differt pedibus 8 posticis cristatis.

ZOZYMUS GEMMULA.—Carapax nudus, non granulatus, nitidus, antice bene areolatus, areolis paulo monticulosis, 1M 2M discretis, 2M subdivisâ, fronte fere recto, emarginato, margine antero-laterali tenui, leviter 4-lobato, lobis tribus posticis fere æquis. Pedes antici æqui, non carinati, manu carpoque tuberculatis, tuberculis cum granulis acervatis instructis; manu extus partim seriatim granulata. Pedes 8 postici bene carinati, carinâ articulorum 3tii 4tique prope apicem profundè incisâ, tarso sparsim hirsuto. *Hab.* mari Suluensi. *Long.* carapacis 2·6''; *lat.* 3·9''.

ZOZYMUS LÆVIS.—Carapax latus, lævis, paulo nitidus, areolis plerisque obsoletis, 2L et 1M prominulis, margine antero-laterali dilatato et tenui, obsoletè 2—3-lobato, dente nullo. Pedes antici æqui, inermes, manu latâ, supra rotundatâ, digito mobili valde uncinato. Pedes postici subcristati, fere nudi. *Hab.* freto "Balabac." *Long.* carapacis 5·1''; *lat.* 9''.

## Genus CARPILODES, Dana.

Carapax latus, undique convexus, nudus, marginibus crassè rotundatis. Pedes nudi, fere læves et subcylindrici. Aliis *Zozymo* similis. *Carpilio Liomeræque* habitu affinis sed digitis cochleariformibus differt.

CARPILODES TRISTIS.—Carapax latior, latè subrhombicus, lævis, non nitidus, antice sat areolatus, areolis 1M 2M conjunctis, 2L 3L conjunctis, 4L 5L 6L conjunctis; fronte brevi, fere recto, levissimè emarginato; margine antero-laterali 4-lobato, lobis rotundatis; latere postero-laterali recto, convexo. Pedes antici æqui, breves et parvi, nudi et inermes, læves. Pedes postici vix compressi, nudi. *Hab.* archipelago Paumotensi? *Long.* carapacis 6·15''; *lat.* 10·5''.

## Genus ACTÆODES, Dana.

Carapax postice fere planus, versus margines anticum antero-lateralemque curvatim declivis. Digiti instar cochlearis excavati. Pedes 8 postici articulo 3tio non cristati. Typus *Zozymus tomentosus*. Actæa differt, digitis plus minusve cochleariformibus.

1. *Carapax sive lævis sive vix granulatus, nec tomentosus.*

ACTÆODES AREOLATUS.—Carapax bene areolatus, lævis, areolâ 2M simplice, 1R 3R discretis, 1P vix circumscriptâ; margine frontali fere recto, emarginato; margine antero-laterali 5-dentato, dente 5to parce minore. Pedes antici æqui, manu extus parce rugatâ, digitis canaliculatis, 2—3-dentatis, digito mobili

valde uncinato. Pedes postici paulo nudi, articulis compressis, 3tio supra fere acuto. *Hab.* insulam "Raraka" Paumotensem. *Long.* carapacis  $2\frac{1}{2}'''$ ; *lat.*  $3'''$ .

ACTÆODES FABÆ.—Carapax transversim ellipticus, valde convexus, non granulosis, antice bene areolatus, regione posticâ simplicissimâ, cum regione postero-laterali coalitâ, areolâ 2M fere bisectâ, areolis 2L 3L coalitis, superficie areolarum planâ; fronte inter-antennali fere recto, medio parce emarginato, margine antero-laterali parce expanso, 5-angulato aut obsolete 5-dentato. Pedes antici mediocres, carpo manûque subtiliter erosis et interdum areolatis, digitis inermibus. Pedes 8 sequentes fere nudi, compressi, articulo 3tio supra paulo carinato, articulis 4to 5toque paulo granulosis. Abdomen *maris* 5-articulatum, *femine* 7-articulatum, nudum præter marginem ciliatum. *Hab.* ad insulas "Cape Verdes." *Long.* carapacis  $3\frac{1}{4}'''$ ; *lat.*  $5'''$ .

ACTÆODES BELLUS.—Carapax latior, antice bene arcuatus, non nitidus, lævis, antice et lateraliter subtilissime granulosis, antice areolatus, sulcis angustis, areolis 1M 2M conjunctis, 4L 5L 6L regioneque postero-laterali totis conjunctis; fronte fere recto, emarginato; margine antero-laterali crasso, 4-lobato, lobis 3 posticis dentiformibus, obtusis. Pedes antici æqui, manu supra rotundatâ, extus subtiliter granulosa, granulis partim seriatis, digitis canaliculatis, carpo intus obtuso. Pedes 8 postici sat compressi, fere nudi. *Hab.* ad insulas Samoenses, quoque insulam "Wakes." *Long.* carapacis  $3\frac{1}{2}'''$ ; *lat.*  $5\frac{1}{2}'''$ .

## 2. *Carapax granulatus aut tomentosus.*

ACTÆODES AFFINIS.—A. *tomentoso* areolis affinis, areolâ cardiacâ fere bisectâ. Carapax paulo angustior, minutius granulosis, parce tomentosus. Margo antero-lateralis 4-dentatus. Digi manus spinulosi, spinulis majoribus quam in *tomentoso* et paucioribus. Maxillipedes externi nudi, læves. Abdomen sparsim pubescens. *Hab.* ad insulas Tahitienses. *Long.* carapacis  $5\frac{1}{2}'''$ ; *lat.*  $7\frac{1}{2}'''$ . Granulæ in dimidio utroque areolæ cardiacæ numero 40; sed *tomentosi* ferme 12.

ACTÆODES SPECIOSUS.—Carapax paulo angustior, undique granulosis, fere nudus, pilis interstitialibus brevioribus quam granuli, antice bene areolatus, sulcis perangustis, subtiliter tomentosus, areolis planis, areolâ 2M partim subdivisâ, 3M tripartitâ, margine antero-laterali bene 4-lobato, postero-laterali concavo, brevi. Pedes toti omnino granulosis et fere nudi, marginibus non ciliati, manu carpoque superficie irregulariter areolatis; manu granulis seriatis extus ornatâ, digitis perbrevibus, instar cochlearis malè excavatis, digito mobili clauso fere verticali, articulo 4to pedum 2di 3tii 4tique superficie tripartito. *Hab.* ad insulas Samoenses. *Long.* carapacis  $3\frac{3}{4}'''$ ; *lat.*  $5'''$ .

ACTÆODES CAVIPES.—Carapax latior, infra omnino villosus, supra fere nudus, granulosis, omnino areolatus, sulcis nudis aut vix tomentosus, areolis minute granulosis, valde convexus et paulo irregularibus, 2M subdivisâ, 3M tripartitâ, margine antero-laterali irregulariter 5-dentato. Pedes granulosis, antici subæqui, manu carpoque partim granulosis et superficie cavernosis, manu extus seriato-grulosâ, subtiliter tomentosâ, digitis malè excavatis, scabris, striatis, partim subtiliter tomentosus; postici paulo hirsuti, articulis 4to 5toque supra valde cristato, cristâ integrâ, lunulatâ, sublaterali, hæc cristâ et margine pedis superno cavitatem grandem includentibus. *Hab.* ad insulas Vitienses et Samoenses. *Long.* carapacis  $5'''$ ; *lat.*  $7\frac{1}{2}'''$ .

ACTÆODES SPONGIOSUS.—Carapax postice vix areolatus, areolâ 2M subdivisâ, superficie, sulcis exceptis, breviter et rigidè velutinâ, aspectu spongiosâ; margine antero-laterali simplicissimè 5-dentato, dentibus gracilibus, acutis. Pedes breviter rigideque pubescentes, antici paulo armati. *Hab.* mari Suluensi. *Long.*  $2\frac{1}{2}'''$ ; *lat.*  $3\frac{1}{2}'''$ .

## Genus CHLORODIUS, *Leach.*

### Subgenus CHLORODIUS.

Carapax transversus. Articulus antennarum externarum 1mus fissuram orbitæ fere implens.



1. *Carapax antice posticeque areolatus, areolâ 2M bipartitâ. Articulus pedum posticorum 3tius supernè spinulosus.*

CHLORODIUS MONTICULOSUS.—*C. ungulato* affinis, areolis valde distinctis, margine antero-laterali 5-dentato, fronte inter-antennali 4-lobato, pedibus 8 posticis paulo pubescentibus et supra spinulosis. Areola 2M decomposita, 4L plus minusve divisa. Pedes antici tuberculis parvulis subacutis armati, digito mobili inermi. Segmentum abdominis maris penultimum parce oblongum. *Hab.* ad insulas Vitienses, Tahitienses, Samoenses, et in freto "Balabac." *Long.* carapacis 8''; *lat.* 11½'''. *T. ungulati* tuberculi manus obtusi, areolæque carapacis vix decompositæ.

2. *Carapax antice areolatus, postice planus aut imperfecte divisus, areolâ 2M non subdivisâ. Pedes antici inermes; articulus pedum 8 posticorum 3tius supra non spinulosus.*

CHLORODIUS NUDIPES.—Carapax non nitidus, antice bene areolatus, postice fere planus, areolâ 2M non omnino divisâ, 3L 4L sejunctis, 1P 2P coalitis aut vix sejunctis, fronte emarginato, juxta antennas saliente, margine antero-laterali 10—11-denticulato, uno dente pone S. Pedes toti nudi; antici crassi, manu carpoque supra subtiliter exesis, carpo spinâ brevi intus armato. Pedes 8 postici sat breves, articulo 3tio dorsum non acuto. *Hab.* ad insulam "Mangsi," freti "Balabac." *Long.* carapacis 4½'''; *lat.* 7¼'''.

CHLORODIUS SANGUINEUS, *Edwards.*—*Hab.* ad insulas Vitienses, Paumotenses, Hawaienses. Margo antero-lateralis 7-dentatus, dente uno pone S.

CHLORODIUS EXARATUS, *Edw.*—*Hab.* mare Pacifico. Margo antero-lateralis 5—6-dentatus, dente pone S. carens. Hic pertinet *Chlorodius Floridanus*, Gibbes, (Proc. Amer. Assoc. iii. 175,) insulâ "Key West" lectus.

CHLORODIUS GRACILIS.—*C. sanguineo* affinis. Carapax non nitidus, antice areolatus, postice non areolatus, sulcis non profundis, areolis 2R 3R non discretis, margine antero-laterali 5-dentato, dentibus bene regularibus. Manus carpusque crassi, læves, nec rugati nec exesi. Pedes 8 postici compressi, inermes, pubescentes. *Hab.* ad insulam "Wakes." *Long.* carapacis 5''; *lat.* 7¼'''.

CHLORODIUS NODOSUS, *D.*—*Etisus nodosus*, *J. W. Randall*, (Jour. Acad. Nat. Sci. Philad. viii. 111.)—*Sanguineo* fermè affinis; sed pedes 8 postici fere nudi, margine articuli 3tii antico omnino nudi; tarsus supernè nudus; carapax superficie punctatus; et areola 2M depressione V-formi antice notata.

CHLORODIUS CAVIPES.—Carapax non nitidus, latere rotundatus, superficie antice areolatus, areolis partim granulosis et imbricato-granulosis; fronte fere recto, emarginato, margine antero-laterali crassiusculo, 8—9-dentato, dentibus D, d, E, E', N (vel N, N'), T, S, s, totis parvulis, D vix saliente. Pedes antici inæqui, valde granulosis et corrugati, manu infra breviter villosâ et granulosa, digito mobili canaliculato, supra denticulato: Pedes 8 postici paulo asperati, articulo 3tio breviter pubescente, 4to bene bicristato, cristis tenuibus cavitatem elongatam includentibus, 5to tarsoque omnino breviter hirsuto, tarso brevi. *Hab.* ? *Long.* carapacis 7''; *lat.* 10¼'''.

3. *Carapax postice non areolatus antice vix areolatus, fere planus aut paulo convexus, 5L 6L nunquam circumscriptis.*

CHLORODIUS CYTHEREA.—*C. nigro* affinis. Carapax fere lævis, areolis medianis indistinctis, antero-lateralibus melioribus, angulatis, margine antero-laterali 5-dentato, dentibus N T subacutis, E S minoribus, T valde prominentiore quam S ideoque carapacis latitudine T majore quam latitudo S. Pedes antici ac in *C. nigro*, digitis nigris, fere contiguis. Pedes 8 postici inermes, margine pubescentes. *Hab.* ad insulas Paumotenses, Tahitienses et Hawaienses. *Long.* carapacis 3½'''; *lat.* 5½'''. *C. nigro* differt, dente S multo minus prominentiore quam dens T; dente E distincto, dentibus quinque conspicuis; areolis 1L 3L 4L plus angulatis et non lævibus, nec cum dentibus bene continuatis ac in *nigro*.

An. *C. hirtipes*, Adams et White, (Crust. Samarang p. 40, tab. 11, f.4,) *C. nigro* differt.

**CHLORODIUS NEBULOSUS.**—*C. nigro* affinis. Carapax lævis, antice obsolete areolatus, fronte parce emarginato, regione antero-laterali 4-dentato (D, N, T, S,) dentibus tribus posticis acutè spiniformibus. Pedes antichi subæqui, sat breves, brachio paululum saliente, carpo subtiliter granulato, intus acuto aut subacuto, manu compressâ, lævi, digitis paulo canaliculatis. Pedes postici mediocres, paulo pubescentes. *Hab.* mari Suluensi. *Long.* carapacis 2·2''; *lat.* 3''.

**CHLORODIUS LÆVISSIMUS.**—*C. nigro* affinis. Carapax perlævis, nec ad medium nec versus latera areolatus, margine antero-laterali 4—5-dentato, dentibus N et D paulo remotis, E sæpe obsolete, S minore, T et S obtusis, carapacis latitudine T majore quam latitudo S. Pedes antichi longi, pervalidi, læves, digitis multo hiantibus. Pedes 8 postici paulo pubescentes. *Hab.* ad insulas Hawaienses.

#### Subgenus PILODIUS, Dana.

*Pilumno* aspectu fere similis; pedibus antennisque *Chlorodio* affinis. Articululus antennarum externarum 1mus brevior, processum frontis oblongum attingens ac in *Xanthode*. Articululus maxillipedis externi 3tius paulo transversus, subrectangulatus. *Chlorodius pilumnoides*, White, hic pertinet.

**PILODIUS PUBESCENS.**—*P. pilumnoidi* similis. Carapax breviter pubescens, antice leviter areolatus, margine antero-laterali simplicissimè 5-dentato, dentibus tenuibus, acutis. Pedes antichi validi, minutè tuberculati et pubescentes, digitis subspinulosis, brachio antice dentigero. Pedes 8 postici pilosi, articulo 3tio supra spinuloso. *Hab.* freto Balabac. *Long.* carapacis 3½''; *lat.* 5½''.

**PILODIUS NITIDUS.**—Carapax bene nitidus, antice optimè areolatus, areolis plerisque superficie planis, 1R 2R sulco discretis, areolâ 1R 2 3ve tuberculis antice ornata; margine antero-laterali bene 5-dentato, dentibus duobus posticis acutis. Pedes antichi spinis valde armati, digito mobili prope basin interdum spinuloso, carpo duabus spinis tenuibus acutis intus armato. Pedes 8 postici pubescentes, articulo 3tio supra armato. *Hab.* ad insulam "Tutuila" Samoensem. *Long.* carapacis 3½''; *lat.* 5''.

**PILODIUS PUGIL.**—*P. nitido* affinis. Carapax paulo nitidus, antice areolatus, postice fere planus, areolis 5L 6L discretis, 1L 2L 3L subconicis, 1R 2R paulo discretis; margine antero-laterali 4-dentato, dente E fere obsolete, dentibus tribus posticis valde acutis. Pedes antichi validi, manu carpoque bene tuberculatis, tuberculis plerumque conicis, manus minoris spiniformibus, angulo carpi interno duabus spinis tenuibus acutis armato, brachio apicem anticum spinoso. Pedes postici pilosi, articulo 3tio supra armato. *Hab.* ad insulas Samoenses; quoque in freto "Balabac." *Long.* carapacis 2½''; *lat.* 4''. An var. *nitidi*.

**PILODIUS SCABRICULUS.**—Carapax fronte latus, antice leviter areolatus, paulo scabriculus, areolis 1L 3L 4L subacutis et scabriculis, margine antero-laterali fere longitudinali, 4-dentato (dente E fere obsolete), dentibus tribus (N T S) acutis, spiniformibus. Pedes antichi fere æqui, manu carpoque subtilissimè tuberculatis, tuberculis partim seriatis, digitis canaliculatis, paulo scabriculis, articulo 3tio anticè denticulato. Pedes postici sparsim pubescentes, articulo 3tio supra minutè spinuloso, tarso longo. *Hab.* in freto "Balabac;" quoque insulâ "Raraka" Paumotensi. *Long.* carapacis 1·7'', et *lat.* 2·6''; alterius *long.* 2½'', et *lat.* 4''.

#### Subgenus CYCLODIUS, Dana.

*Chlorodio* affinis, carapace angustiore, suborbiculato, articulo maxillipedis externi 3tio subtriangulato, paulo transverso, latere interno brevissimo. Articululus antennarum externarum 1mus *orbite* fissuram fere implens, ac in *Chlorodio*, *Pilodio* dissimilis.

**CYCLODIUS ORNATUS.**—Carapax nudus, parce nitidus, antice posticeque valde areolatus, areolis sæpe compositis, 2M subdivisâ 3M tripartitâ; margine antero-laterali 5-dentato, dentibus tumidis, apiculatis, dente E minore, rotundato, D obtuso. Pedes spinulis armati, 8 posticis parce pubescentibus, manu seriatim spinulosâ, digitis spinulosis. *Hab.* mari Suluensi. *Long.* carapacis 3½''; *lat.* 4½''.

**CYCLODIUS GRACILIS.**—*C. ornato* aspectu areolisque similis. Parce latior, dentibus antero-lateralibus tribus posticis tenuioribus et bene acutis, areolis vix

compositis, 2M subdivisâ, 3M vix tripartitâ. Pedes armati, 8 posticis paulo pubescentibus, manu seriatim spinulosâ, digitis spinulosis. *Hab.* ad insulas Samoenses. *Long.* carapacis 3''; *lat.* 4''.

Subfam. POLYDECTINÆ.

Genus POLYDECTUS, *Edwards.*

POLYDECTUS VILLOSUS.—Carapax pedesque densissimè villosi, pilis plumiformibus, fronte margineque antero-laterali integris. Digitus mobilis paris antici duabus spinis elongatis remotis armatus, et alter spinis tribus. Antennæ externæ fronte vix longiores, flagello 10-articulato. *Hab.* ad insulam "Raraka" Paumotensem. *Long.* carapacis 4''.

Fam. ERIPHIDÆ.

Subfam. OZINÆ.

Genus GALENE, *De Haan.*

GALENE HAWAIENSIS.—*G. natalensi* fermè affinis. Pedes 8 postici sat graciles, articulo 3tio supra paulo pubescente, sequentibus pubescentibus. Margo antero-laterali 4-dentato, dentibus 2 anticis obtusis, anteriore marginem paulo excavato. *Hab.* ad insulas Hawaienses. *Long.* carapacis 7½''; *lat.* 10½''. An. varietas *natalensis*, Krauss (Crust. Südaf. p. 31, tab. 1, f. 4.)

Genus PSEUDOZIUS, *Dana.*

Carapax plus minusve transversus, margine antero-laterali brevior quam postero-lateralis. Articulus antennarum externarum 1mus angustus et brevis, frontem non attingens (eoque *Menippi* affinis.) Area prælabialis lineâ elevatâ utrinque bene divisa (eoque *Ozio* affinis.) Digniti acuminati.

PSEUDOZIUS PLANUS.—Carapax latus, lævis, fere planus, non areolatus, antice prope marginem leviter impressus: fronte fere recto, paulo emarginato, margine antero-laterali paulo acuto, fere integro, levissimè 4-lobato, margine postero-laterali paulo recto. Pedes antici paulo inæqui, læves et nudi, carpo non rugato, manu supra rotundatâ, digitis sat longis, non canaliculatis, digito mobili prope basin armato cum dente crasso obliquo. Pedes postici fere nudi, tarso hirsuto. *Hab.* ad insulas Paumotenses; quoque ad insulam "Wakes." *Long.* carapacis 5.5''; *lat.* 9''.

PSEUDOZIUS INORNATUS.—*P. plano* carapace affinis. Carapax paulo latior, prope marginem anticum abruptius impressus, margine antero-laterali distinctius 4-lobato. Pedes antici inæqui, carpo leviter rugato. Pedes postici latiores, articulo penultimo supra sparsim hirsuto, tarso hirsuto. *Hab.* ad insulas Hawaienses. *Long.* carapacis feminæ ovigeræ 6½''; *lat.* 11¼''.

PSEUDOZIUS DISPAR.—Carapax angustus, lævis, paulo nitidus, omnino usque ad frontem nec areolatus nec inæqualis, fronte fere recto, leviter emarginato; margine antero-laterali levissimè 3-dentato, dentibus non salientibus. Pedes antici inæqui, major crassus, lævis, nudus, manu supra rotundatâ, manu minore minutè tuberculatâ, tuberculis partim paulo seriatim. Pedes postici fere nudi, paucis pilis sparsis. *Hab.* in mari Suluensi. *Long.* carapacis feminæ 3.3''; *lat.* 4''.

Genus PILUMNUS, *Leach.*

PILUMNUS GLOBOSUS.—Carapax valde convexus, subglobosus; parce transversus, non areolatus, vix granulosus, breviter pubescens, fronte emarginato, margine antero-laterali fere integro, dentibus minutis tribus vel quatuor granuliformibus, isolatis. Pedes antici crassi, inæqui, omnino hirsuti et minutè tuberculati, tuberculis nullis seriatim. Pedes 8 postici omnino hirsuti. *Hab.* ad insulam "Tahiti;" quoque insulas "Waterland" et "Raraka." *Long.* carapacis 5½''; *lat.* 6½''.

PILUMNUS LEVIMANUS.—Carapax convexusculus, non areolatus, antice vix lævis, fronte emarginato; margine antero-laterali 3-dentato angulo orbitæ ex

terno vix prominente excluso, dentibus minutis, non acutis. Pedes antici valde inæqui, carpo obsolete tuberculato, manu majore crassâ, nudâ, lævi, extus non costatâ, minore hirsutâ et minute tuberculatâ. Pedes 8 postici partim hirsuti. *Hab.* in freto Balabac. *Long.* carapacis maris 3''; *lat.* 3·9''.

*PILUMNUS LÆVIS.*—*P. levimano* affinis, latior. Carapax omnino lævis, nitidus, non areolatus, convexiusculus; fronte emarginato; margine antero-laterali 3-dentato, dentibus minutis spiniformibus, posteriore minimo, angulo orbitæ externo non prominente. Pedes antici valde inæqui, carpo lævi, non obsolete tuberculato, manu majore omnino lævi, minore sparsim hirsutâ, non tuberculatâ. Pedes 8 postici tennes, paulo hirsuti. *Hab.* in freto "Balabac." *Long.* carapacis feminæ 2·1''; *lat.* 2·95''.

*PILUMNUS CALCULOSUS.*—Carapax convexiusculus, antice non areolatus, paulo inæqualibus et pubescens, fronte emarginato, margine antero-laterali perbrevis, 4-dentato, dente postico minimo, ceteris crassiusculis; margine orbitali inferiore 3-dentato. Pedes antici subæqui, carpo tuberculis paucis grandibus elongatis nudis complanatis armato et inter hos tuberculos hirsuto, manu supra quoque armatâ. Pedes 8 postici hirsuti, articulis 4to 5toque supra gibbosis. *Hab.* ad insulam Madeira (?) *Long.* carapacis 3½''; *lat.* 4½''.

*PILUMNUS TENELLUS.*—Carapax pedesque toti subtilissime tomentosi. Carapax convexiusculus non areolatus, fere quadratus, paulo transversus; fronte emarginato; margine antero-laterali perbrevis, 3-dentato, dentibus minutis spiniformibus, posteriore minimo. Pedes antici non tuberculati, 8 postici longi et perennes, filiformes, tarso subtilissime pubescente. *Hab.* mari Suluensi. *Long.* carapacis 2·4''; *lat.* 3''.

*PILUMNUS MUS.*—*P. ursulo* affinis, carapace pedibusque dense crasseque lanatis, capillis longis tubulatis. Carapax parce granulatus. Frons fimbriâ longâ ornatus. Margo antero-lateralis crassè tridentatus, dente altero brevi inter duos anteriores infra insito. Pedes antici inæqui, manu minutè tuberculatâ, tuberculis superficiei externæ seriatis. *Hab.* ad insulas Samoenses vel Tongenses. *Long.* carapacis 11½''; *lat.* 16''.

#### Subfam. ACTUMNINÆ..

#### Genus ACTUMNUS, *Dana*.

Carapax angustus, valde convexus, fronte et lateribus curvatim declivis. Area prælabialis lineâ elevatâ longitudinali utrinque bene subdivisa. Articulus antennarum externarum 1mus processum frontis oblongum attingens tantum. Digiti breves, instar cochlearis excavati.

*ACTUMNUS TOMENTOSUS.*—Carapax angustus, convexus, subglobosus, subtiliter tomentosus, antice leviter partim areolatus, fronte emarginato; margine antero-laterali leviter 4-lobato, margine postero-laterali concavo, lævi. Pedes antici crassi, subæqui, subtilissime tomentosi, minutè tuberculati, digitis brevibus, dentibus eorum contiguos et non hiantibus. Pedes 8 postici æque tomentosi, posteriores paulo dorsales. *Hab.* ad insulam "Upolu" vel "Tahiti." *Long.* carapacis 4·1''; *lat.* 5·1''.

*ACTUMNUS OBEUS.*—Carapax maximè convexus, suborbicularis, anticè leviter areolatus, areolis planis, granulosis, 2M non subdivisâ, granulis nudis, interstitiis et sulcis subtilissime velutinis; fronte paululo producto, emarginato; margine antero-laterali arcuato, fere integro, lævissimè 4-lobato, lobis minutè denticulatis; margine postero-laterali valde concavo. Pedes antici crassi, manu acie supra instructâ, valde granulosâ, granulis vix seriatis, superioribus paulo elongatis et acutis, digito mobili spinuli-granulato, pollice perbrevis. Pedes 8 postici valde compressi, minutè velutini, marginibus hirsutis. *Hab.* prope insulam "Maui" Hawaiensem. *Long.* carapacis 6½''; *lat.* 8½''.

#### Subfam. ERIPHINÆ.

#### Genus ERIPHIA.

*ERIPHIA SCABRICULA.*—Carapax partim scabriculus, areolâ 3M circumscriptâ, 2M 1M 2F coalitis, non transversim rugatis, regione antero-laterali non areolatâ;

fronte integro, subtilissimè denticulato; margine orbitali, nec infra nec supra spinuloso, (angulo orbitali excluso.) Pedes antici omnino scabriculi, manu carpoque pubescentibus, digito mobili cum dente basali paulo grandi armato. Pedes antici subtenuēs, paulo hirsuti. *Hab.* ad insulas Vitienses et Tahitienses, quoque in mari Suluensi. *Long.* carapacis maris  $6\frac{1}{2}''$ ; *lat.*  $10''$ .

*ERIPHIA ARMATA.*—Mediocriter crassa. Carapax antice transversim paulo rugatus, margine areolarum 1M 2M et 5L per rugam granulosam conspicuis, areolâ 2L 3L circumscriptâ, spinosâ; fronte paulo deflexo, emarginato, denticulato, denticulis parvulis conicis, regione orbitali internâ 1—2-spinosâ, ejus margine externo 2—3-spinoso, margine superno subtiliter denticulato; margine antero-laterali carapacis subacuto, 5-spinoso (spinis orbitæ exclusis), spinis acutis. Pedes antici spinulis valde armati et extus hirsuti, manu majore extus seriatim spinulosâ, infra lævi, digito ejus mobili cum dente magno obliquo infra armato. Pedes postici hirsuti. *Hab.* juxta portum "Rio Negro," Patagoniæ Orientalis. *Long.* carapacis  $9\frac{1}{2}''$ ; *lat.*  $13\frac{1}{4}''$ .

### Genus TRAPEZIA, (*Latreille*), *Dana*.

#### 1. *Latera carapacis inermia*.

*TRAPEZIA SPECIOSA.*—Frons fere integer, versus oculos et ad medium obsolete emarginatus. Pedes antici subæqui, carpo supra obtuso, articulo 3tio apicem internum acuto (rectangulato) et marginem internum denticulato, denticulis subquadratis, minutis. Pedes 8 postici toti tenuēs, articulis 3tio et sequentibus perangustis, subcylindricis. *Hab.* ad insulam "Carlshoff" Paumotensem. *Long.*  $2\frac{1}{2}''$ . Carapax carneus, lineis paucis rubris latissimè areolatus.

*TRAPEZIA BELLA.*—Frons subinteger, obsolete sinuosus, crenaturis sex obsolete. Pedes antici subæqui, nudi, carpo obtuso, articulo 3tio apicem internum acuto (rectangulato), marginemque regulariter serrulato, denticulatis triangulatis. Pedes 8 postici graciles, articulis 3tio et sequentibus subcylindricis. *Hab.* ad insulam "Carlshoff." *Long.*  $2\frac{1}{2}''$ . Carapax carneus rubro punctulatus. An varietas *speciosæ*?

#### 2. *Latera carapacis dente armata*.

*TRAPEZIA AREOLATA.*—Frons sinuosus, angulo orbitæ inferiore interno subacuto. Pedes antici mediocres, margine articuli 3tii interno serrato, dente apicali curvato, carpo angulum internum acuto. Pedes 8 postici sat breves, sparsim pubescentes, tarso paulo breviorē quam articulus precedens. Carapax colore brunneo latè areolatus. *Hab.* ad insulam "Tahiti." *Long.* carapacis  $3\frac{1}{2}''$ ; *lat.*  $4''$ . *T. dentata* (M<sup>l</sup>Leay) affinis, an varietas alia. Forsan varietas *T. ferrugineæ*.

### Genus TETRALIA, *Dana*.

*Trapeziæ* affinis. Frons subtilissimè denticulatus. Pedes antici breviores, brachio apicem paulo exserto, pollice valde deflexo; 8 postici extremitate breviter unguiculati. Maxillipedes externi margine postico valde obliqui et non transversi, apicibus internis articularum 2dorum inter se paulo remotis. Abdomen maris 7-articulatum. *Trapezia* differt, brachio longe exserto; pedibus 8 posticis non unguiculatis; maxillipedibus externis margine postico fere transversis; fronte leviter 6—8-lobato, non bene subtilissimè denticulatis. *Trapeziæ glaberrima*, Herbst, et *digitalis* Edw. veræ Tetraliæ sunt.

#### 1. *Latera carapacis inermia*.

*TETRALIA NIGRIFRONS.*—Frons subtiliter denticulatus parce sinuosus, medio obsolete bilobatus. Pedes antici valde inæqui, carpo intus spini-acuto. Pedes 8 postici fere nudi, articulo 3tio paris postici latissimo, sesqui longiore quam lato, fere triplo latiore quam articulus 5tus. *Hab.* ad insulam "Honden" Paumotensem. *Long.* 2— $3''$ . Carapax albus margine antico nigro. Pedes fuscii.

#### 2. *Carapacis latus spinâ armatum*.

*TETRALIA ARMATA.*—Frons subtilissime denticulatus, non sinuosus. Pedes antici inæqui, manu extus prope basin pubescente, carpo spinis duabus intus

armato, articulo 3tio prope apicem internum 4 denticulis tenuibus ornato. Pedes postici mediocres, articulo 3tio paulo angusto. *Hab.* ad insulam "Tongatabu." *Long.* 2'''.

### Genus QUADRELLA, Dana.

Carapax sat convexus, lævis, subquadratus, margine laterali fere longitudinalis fronte lato, horizontali, regulariter spinoso, oculis ad angulos insitis. Articulus antennarum externarum imus perbrevis, secundo non longior, frontem non attingens, margine orbitæ hiatu carenti exclusus. Pedes longi, posteriores graciles, tarsis unguiculatis.

QUADRELLA CORONATA.—Carapax lævis, lateribus paululum arcuatis et medio uni-spinosis, dentibus frontis sex medianis paulo longioribus externis perbrevis, dente infra-orbitali elongato. Pedes antici elongati, manu angustâ, triplo longiore quam corporis dimidium, inermi, lævi, carpo intus 2-spinoso, brachio ad marginem anticum bene 7-spinoso. Pedes postici graciles, fere cylindrici, articulis subtilissimè pubescentibus, articulo 5to marginibus parce pubescenti, tarso infra spinuloso. *Hab.* mari Suluensi. *Long.* carapacis et *lat.* 3½'''. *Long.* manus 5½'''; *digiti mobilis* 2½''', *brachii* 3¼'''.

## Fam. PORTUNIDÆ.

### Subfam. LUPINÆ.

### Genus LUPA, Leach.

LUPA PUBESCENS.—Carapax valde convexus, angustior, subtiliter granulatus, breviter hirsutus; fronte angusto, dentibus quatuor subæquis, parvulis, dente præorbitali prominentioribus, emarginatione medianâ profundiore; margine antero-laterali 9-dentato, dente postico plus duplo longiore. Pedes antico breviores, non crassiores, hirsuti, brachio antice trispinoso, et apice postico non armato, manu supernè trispinosâ, costis valde prominentibus, digito manus majoris mobili cum dente crasso obliquo basali armato. *Hab.* ad insulam "Maui" Hawaiensem. *Long.* carapacis 13'''; *lat.* dentibus lateralibus longis inclusis 20'''.

### Genus AMPHITRITE, (De Haan) Dana.

#### 1. *Dens lateralis non elongatus.*

AMPHITRITE SPECIOSA.—Carapax areolatus, parce transversus, nudus, granulatus, fronte inter-antennali 5-dentato, dente mediano minutissimo, triangulato, proximo non prominente, remotiore prominente, obtuso; margine antero-laterali paulo arcuato, 9-dentato, dentibus alternatim paulo minoribus. Pedes antici sat validi, brachio postice 2-spinoso, antice 4-spinoso, carpo 2-spinoso, manu breviorè quam latitudo carapacis, 2-spinosâ spinâ anteriore brevissimâ et vix conspicuâ. Areola carapacis cardiaca bipartita; intestinalis grandis, tripartita, parte medianâ fere lineari. *Hab.* ad insulas Vitienses. *Long.* carapacis 8'''; *lat.* 11½'''.

#### 2. *Dens lateralis valde elongatus.*

AMPHITRITE LONGI-SPINOSA.—Carapax areolatus, paulo transversus, spinâ laterali diametro carapacis non duplo breviorè, paulo reflexâ, dentibus antero-lateralibus numero quinque (angulo orbitæ excluso), minutis, non contiguis, inter se subæquè remotis, fronte inter-antennali 4-dentato, dentibus medianis minutis, exterioribus prominenter triangulatis. Pedes antici mediocres, manu supernè 3-spinosâ, carpo 2-spinoso, brachio apice externo uni-spinoso, margine antico 3-spinoso. *Hab.* ad insulas Vitienses. *Long.* carapacis 3'''; *lat.* spinis longis lateralibus inclusis 6¾'''; *long.* spinæ longæ 1½'''.

AMPHITRITE VIGILANS.—Carapax areolatus, paulo transversus, granulatus, spinâ laterali fere triplo breviorè quam latitudo carapacis, dentibus parvulis antero-lateralibus numero sex (angulo orbitæ excluso), quatuor posterioribus, duobus anterioribus; fronte 4-dentato, dentibus duobus medianis minutis, exterioribus prominenter triangulatis. Pedes antici mediocres, manu supernè 3-spinosâ, carpo 2-spinoso, brachio apice externo uni-spinoso, margine antico

4-spinoso. *Hab.* ad insulas Vitienses et Hawaienses. *Long.* carapacis 7''; *lat.* spinis longis lateralibus inclusis 14''.

### Genus CARUPA, Dana.

Pedes antici sequentibus vix longiores, 2di 3tii 4tisque longi, gracillimi, tarso valde tenui, 5ti bene natatorii, tarso elliptico. Articulus antennarum externarum 1mus cylindricus, sequenti similis. Carapax transversus.

CARUPA TENUIPES.—Carapax transversus, non areolatus, lævis, granulatus, nudus, fronte integro, medium paululo emarginato, margine antero-laterali 7-dentato, dentibus acutis, subæquis, dente 5to minimo; margine orbitali inferiore 4-lobato. Pedes antici breves, manu non armata, brachio antice 3-spinoso, spinâ medianâ majore. Pedes sex proximi gracillimi, nudi, tarso longissimo. Pedes postici breviores, tarso oblongo, elliptico, apice breviter uni-spinoso. *Hab.* in archipelago Paumotensi. *Long.* carapacis 2½''; *lat.* 3½''.

### Genus THALAMITA, (Latr.), DeHaan.

#### 1. *Frons subinteger.*

THALAMITA INTEGR.—Carapax convexior, glaber, nitidus, regione medianâ lineis elevatis non intersectâ, fronte paulo arcuato, lobo præorbitali longo et marginem recto, et paululo elevato, margine antero-laterali 5-dentato, dentibus acutis, 4to minuto. Articulus antennarum externarum 1mus prælongus, cristâ longâ integrâ. Pedes antici breves, manu nitidâ, omnino lævi, extus non costatâ, superne breviter 3-spinosâ, spinâ unâ in margine superno ad medium insitâ, secundâ in lineâ parallelâ externâ, tertiâ juxta basin. *Hab.* ad insulas Paumotenses et Hawaienses.

#### 2. *Frons multilobatus.*

THALAMITA SPINIMANA.—Carapax valde transversus, regione medianâ lineis elevatis intersectâ, margine antero-laterali æque 5-dentato, dentibus longis, acutis, curvatis, lobis frontalibus prominentibus, 2do latiore quam 3tius, lobo præorbitali elongato et valde prominente. Articulus antennarum externarum 1mus prælongus, cristâ irregulariter spinulosâ. Pedes antici valde armati, carpo 6-spinoso, manu 7—9-spinosâ (margine superno 4—5-spinoso) costis duabus externis cum spinulis obsoletis seriatis instructis. *Hab.* archipelago Vitiensi. *Long.* carapacis 19''; *lat.* 27''.

THALAMITA CRASSIMANA.—Carapax valde transversus, lævis, nitidus, regione medianâ 2 lineis elevatis intersectâ, fronte recto, lobis latis, perbrevis, truncatis, 2do latiore quam 3tius, 3tio rotundato, lobo præorbitali longo, paululo prominente, margine antero-laterali 5-dentato, dentibus acutis, 3tio non brevior, 4to brevissimo. Articulus antennarum externarum 1mus prælongus, cristâ irregulariter divisâ. Pedes antici crassi, manu paulo tumidâ, supernè 5-spinosâ, (margine superno spinis duabus medianis armato et apice nullâ), extus 2-costatâ, superficie minutè tuberculatâ, carpo 4-spinoso et minute tuberculato, brachio margine antico 3-spinoso. *Hab.* ad insulas Vitienses. *Long.* carapacis 19''; *lat.* 27''. Forsan *T. prymna*, DeHaan, (Faun. Jap. tab. 12, f. 1); non *T. prymna*, Herbst et Edw.

### Genus CHARYBDIS, DeHaan.

CHARYBDIS ORIENTALIS.—Carapax lævis, regione medianâ 2—3 lineis elevatis intersectâ, fronte arcuato, dentibus valde obtusis, 3tio triangulato, margine antero-laterali 6-dentato, dentibus acutis, 2do minimo, postremo non longiore. *Hab.* ad insulam "Mindanao" Philippensem. *Long.* carapacis 15½''; *lat.* 22''.

CHARYBDIS AFFINIS.—*C. crucifera* affinis. Margo antero-lateralis 6-dentatus, dente postremo duplo longiore, primo truncato et emarginato. Carapax superficie subtiliter velutinus; frontis dentes subtriangulati, vix acuti. Manus supra 5-spinosa extus 3-costata; brachium 3-spinosum, spinâ inferiore dimidio brevior. *Hab.* prope portum "Singapore." *Long.* carapacis 11½''; *lat.* dentibus lateralibus inclusis 17¾''.

Genus LISSOCARCINUS, *White.*

LISSOCARCINUS ORBICULARIS.—Carapax paululo latior quam longus, levissimus, nitidus, fronte medio parce angulato, integro, margine antero-laterali tenui, paulo reflexo, obsolete 5-lobato. Pedes antici perbreves, manu superne bicarinatâ, carinis integris, digito mobili supra bene carinato. Pedes 8 postici nudi, articulo 3tio superne obtuso, tarso pedis postici angustè subovato, apicem acuto et inflexo. *Hab.* ad insulas Vitienses. *Long.* carapacis 5''; *lat.* 5½''.

## Fam. PLATYONYCHIDÆ.

Genus PLATYONYCHUS, *Latreille.*

PLATYONYCHUS PURPUREUS,—*B. bipustulato* affinis. Carapax paulo transversus (latitudine quartâ parte majore); margine antero-laterali brevior, crassè 5-dentato; fronte 4-dentato, dentibus acutis, inter se non æque remotis, medianis propioribus. Pedes antici fere æqui, carpo granulis minutis reticulato et scabriculo, intus elongatè acuto, manu granulis asperatâ, inferne transversim pliculatâ. Pedes postici marginibus dense ciliati, articulo 3tio supernè non denticulato, tarso fere duplo longiore quam lato. Abdomen maris fere lineare, segmento penultimo basin non latiore. Carapax purpureo punctatus, regionis medianæ parte posteriore valde purpureus et sublunatus. *Hab.* juxta portum "Valparaiso." *Long.* carapacis 2'' 6''; *lat.* 3'' 4''.

## II. CRUSTACEA CORYSTOIDEA.

Synopsis Generum Familiarumque Corystoideorum in Amer. Jour. Sci., Ser. 2dâ, v. xiii. p. 119, auctore edita, q. v.

## Fam. TRICHOCERIDÆ.

TRICHOCERA OREGONENSIS.—Carapax transversus, convexus, gibbosus, granulatus, antice lateraliterque bene arcuatus, angulo laterali vix instructus, margine laterali (postero-laterali incluso) 13-dentato, dentibus regularibus, brevibus; margine postero-laterali recto; fronte inter-antennali brevi, recto, medium non emarginato. Pedes antici crassi, manu perbrevis, altâ, superne minute tuberculatâ, extus lævi et obsolete 5-costatâ. Pedes 8 postici pubescentes. *Hab.* freto Pugettensi Americæ occidentalis. *Long.* carapacis 8½''; *lat.* 11''.

## Fam. THIIDÆ.

Genus KRAUSSIA, *Dana.*

KRAUSSIA RUGULOSA, *Platyonychus rugulosus* Krauss (*Südaf. Crust.* p. 26, tab. 1, f. 5) ad insulas Hawaienses lecta.

## Fam. CORYSTIDÆ.

Genus TELMESSUS, *White.*

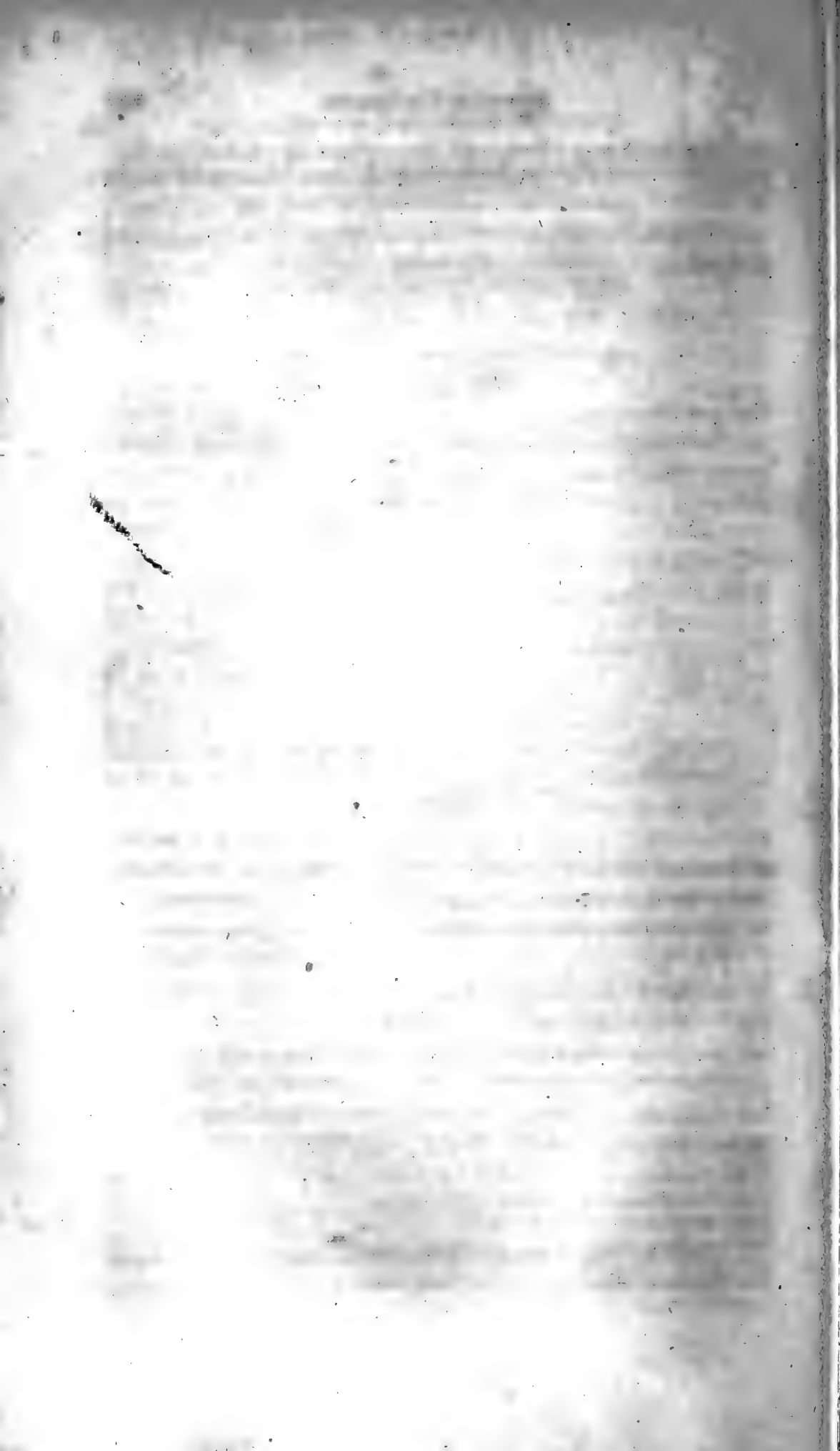
TELMESSUS SERRATUS, *White*, in freto Pugettensi Americæ occidentalis lectus.

Genus GOMEZA, *Gray.*

GOMEZA SERRATA.—Carapax subovatus, scaber, breviter hirsutus, rostro apicem truncato, margine juxta apicem utrinque inciso, lateribus acute 5-serratis, serraturâ 4tâ fere medianâ, quoque subtilissimè denticulatis. Pedes marginibus pubescentes. *Hab.* mari prope Patagoniam orientalem. *Long.* carapacis 1½''.







ART. IX.—*Notice of some Genera of Cyclopæcea*; by J. D. DANA.

As a preface to the descriptions which follow, a classification of Crustacea is here given; it is made out so as to exhibit to some extent the parallel relations of the several orders and subdivisions.

CRUSTACEA.

Subclassis I. <b>PODOPHTHALMIA.</b> Ordo 1. DECAPODA. Tribus 1. Brachyura. 2. Anomoura. 3. Macroura.	Subclassis II. <b>EDRIOPHTHALMIA.</b> Ordo 1. CHORISTOPODA.* Tribus 1. Isopoda. 2. Læmipoda. 3. Amphipoda.	Subclassis III. <b>MANDYATA.¶</b>			
Ordo 2. SCHIZOPODA.  Tribus 1. Stomapoda. 2. Diploöpada.	Ordo 2. ENTOMOSTRACA. <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; vertical-align: top;">                             Subord. 1.                              GNATHOSTOMATA.†                              Tribus                              1. Branchipodæcea.                              2. Limnadiæcea.                              3. Daphniæcea.                              4. Cyclopæcea.                              5. Cypridæcea.                         </td> <td style="width: 33%; vertical-align: top;">                             Subord. 2.                              CORMOSTOMATA.‡                              Tribus                              1. Caligæcea.                              2. Lernææcea.                              3. Nymphonæcea.                         </td> <td style="width: 33%; vertical-align: top;">                             Subord. 3.                              MEROSTOMATA.§                              Tribus                              1. Limulæcea.                         </td> </tr> </table>		Subord. 1. GNATHOSTOMATA.† Tribus 1. Branchipodæcea. 2. Limnadiæcea. 3. Daphniæcea. 4. Cyclopæcea. 5. Cypridæcea.	Subord. 2. CORMOSTOMATA.‡ Tribus 1. Caligæcea. 2. Lernææcea. 3. Nymphonæcea.	Subord. 3. MEROSTOMATA.§ Tribus 1. Limulæcea.
Subord. 1. GNATHOSTOMATA.† Tribus 1. Branchipodæcea. 2. Limnadiæcea. 3. Daphniæcea. 4. Cyclopæcea. 5. Cypridæcea.	Subord. 2. CORMOSTOMATA.‡ Tribus 1. Caligæcea. 2. Lernææcea. 3. Nymphonæcea.	Subord. 3. MEROSTOMATA.§ Tribus 1. Limulæcea.			
	Ordo 3. TRILOBITA.				
		Tribus 1. Cirripeda, or Balanæcea.¶			

Order ENTOMOSTRACA.

Tribe CYCLOPÆCEA.

To avoid explanations in the following descriptions, we here enumerate the prominent external characters of this tribe.

\* From *χωριστος* separate, and *πους* foot, alluding to the fact that the pairs of feet belong each to a distinct segment of the body.

† From *γναθος* jaw, and *στομα* mouth, alluding to the mouth being furnished with proper mandibles and maxillæ.

‡ From *κορμος* trunk, and *στομα* mouth, the mouth having the form of a movable trunk.

§ From *μηρος* thigh, and *στομα* mouth, the basal joints of the legs constituting the jaws.

¶ From *μανδυα* a cloak, alluding to the covering in which the body of the animal is enclosed.

¶ The Cypris-like young of several Anatifæ were collected and figured by the writer, and the metamorphosis traced to the adult state. When first found swimming free in the ocean, they were taken for a new genus allied to Cypris, so similar are their forms. The fact that the body and legs of the Cirripeda shed their skin, is further evidence of the propriety of placing this group with Crustacea.

The pedicel of the Anatifæ corresponds to a pair of antennæ in the young; the animal attaches itself by the sucker-like disk terminating these organs before the metamorphosis commences, and in a group of Anatifæ all the different stages may be observed, from the pair of distinct antennæ to the fixed simple pedicel.

*Body* jointed, the carapax not prolonged beyond the joint to which it belongs; *abdomen* not inflexed.

*Eyes* simple.

*Antennæ* two pairs; the second often pediform or subcheliform.

*Mandibles* 4-5-spino-dentate, sometimes having a subnatatory palpus.

*Maxillæ*, one pair; sometimes with a subnatatory palpus.

*Maxillipeds*, one pair; sometimes simple maxillæ; at others, prehensile, but never at all natatory.

*Feet*, 6 pairs; the *first* often prehensile, and subcheliform, and either straight or geniculated; *next four* pairs, bifid and natatory; the *sixth* or *posterior*, (corresponding to another pair of natatories,) rudimentary or obsolete, but in some genera, large in the male, with the right one subcheliform.

*Abdomen*, 2 to 6-jointed; two caudal appendages furnished with 5 setæ, some of which may be obsolete; occasionally short appendages to one or both of the first and second joints.

*External ovaries*, one or two, proceeding from the *second* joint of the abdomen, or what corresponds thereto.

The genera of this tribe here described may be distributed as follows:

1. *Palpi of the mandibles and maxillæ obsolete or wanting, eyes with simple spherical lenses.*

Family 1. CYCLOPIDÆ. External ovaries two. Eyes two, on a single spot of pigment. Abdomen abruptly narrower than the cephalo-thorax.

Genus 1. CYCLOPS, Müller. The two anterior antennæ subcheliform in the male. (Fresh-water species.)

Family 2. ARPACTIDÆ. External ovary single. Eyes two on a single spot of pigment. A short appendage near middle of anterior antennæ. Abdomen seldom abruptly narrower than the cephalo-thorax. (Marine species.)

Genus 1. ARPACTUS,\* Milne Edwards. Anterior antennæ short, and both, in the male, subcheliform; posterior pair terminating in a number of movable setæ. Prehensile feet subcheliform.

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\* Milne Edwards has instituted the genus *Cyclopsina* for a group near *Arpactus* having the posterior maxillipeds not subcheliform. In the species examined by the writer the subcheliform character is constant, but the movable finger is sometimes reduced to a very short hook.

Genus 2. *SETELLA*, Dana. Anterior antennæ moderately long, slender, and not subcheliform in the male; posterior pair and prehensile feet nearly as in *Arpactus*; short appendages to the first two joints of abdomen; body slender, and two caudal setæ much longer than the body. (Two movable appendages under the beak.)

The name *Setella* alludes to the *seta*-like form of the animal, and is from *seta*, a bristle.

2. *Palpi of the mandibles and of the maxillæ prominent, and subnatatory.*

Family 3. CALANIDÆ. External ovary single. Eyes two, the spherical lenses on the same or separate spots of pigment. Anterior antennæ very long and slender, without an appendage. Abdomen abruptly narrower than the cephalo-thorax. (Marine species.)

a. *Posterior thoracic legs rudimentary or obsolete, without appendages. Anterior antennæ alike in the two sexes, and never with a geniculating joint.*

Genus 1. *CALANUS*, Leach. Cephalo-thorax 4-jointed. Anterior antennæ multiarticulate, with the front margin neatly setiferous, and also the posterior apices of the three terminal joints; first pair of feet much larger than the maxillipeds, having outward lateral motion, but scarcely prehensile; maxillipeds very short and straight, setigerous; abdomen short, 2 to 4-jointed. Beak furcate.

Genus 2. *SCRIBELLA*, Dana. Cephalo-thorax 4-jointed. Anterior antennæ, long 7-jointed; setæ long and pointing in different directions. Maxillipeds much larger than the first pair of legs, flexed forward, the three terminal joints as long as the basal, and setigerous, the setæ setulose. Abdomen very long, (as long as the cephalo-thorax;) two setæ to the short basal joint; (a plume or capillary appendage to base of the 8 natatory legs, extending outward at right angles with the body.)

Genus 3. *ACARTIA*, Dana. Anterior antennæ few-jointed; setæ long and pointed in different directions; maxillipeds much larger than the first pair of legs; not flexed, having the terminal joints very short, and setigerous nearly as in the genus *Pontella*; the first pair of legs small and short, not prehensile; the posterior thoracic legs, a single small joint bearing two divergent setæ, one quite long, and usually standing out from the body.

The name *Acartia* is from *ακατος* *unshorn*, alluding to the long divaricate hairs of the antennæ.

b. *Posterior thoracic legs very long and nearly equal; antennæ of the two sexes alike, without a geniculating joint.*

Genus 4. *EUCHIRUS*, Dana. Anterior antennæ many-jointed, with several long setæ at intervals; first pair of feet much larger than the maxillipeds, very long and doubly geniculate, the apex flexed downward and furnished below with a pencil of naked setæ; motion of these organs forward in the line of the body, and not outward. Posterior thoracic legs in male very long, and the right one subcheliform. Beak pointed, in lateral view emarginate.

*c. Posterior thoracic legs in the male large, the two unequal, and the right subcheliform; the right one of the anterior antennæ in the same sex having a geniculating joint about one third its length from the apex.*

Genus 5. *PONTELLA*.\* Anterior antennæ multiarticulate, the setæ as in *Calanus*. Maxillipeds much larger than the first pair of legs, not flexed, and having the terminal joints short and setigerous, the setæ extending forward to the mouth and setulose, as in *Acartia*; the first pair of legs small and short, not prehensile. The right posterior thoracic leg in the male large cheliform, the left smaller and often simple. Beak furcate. Caudal setæ more or less spread. (There is a large glassy appendage under the head, with a rounded or reniform summit.)

Genus 6. *CANDACIA*, Dana. Anterior antennæ and posterior thoracic legs, nearly as in *Pontella*; the first pair of legs much larger than the maxillipeds, elongate, and flexed forward, with the extremity inflexed and bearing a pencil of long naked setæ, motion in the line of the body. Front truncate; caudal setæ usually not spread. Color often in part black or nearly so.

3. *Palpi of the mandibles and maxillæ obsolete; two simple eyes?; also two oblate lenses in the front, and two prolate lenses posterior to these within, which may constitute another pair of eyes.*

Family 4. *CORYCÆIDÆ*. Tentacles short, few-jointed; external ovaries two.

Genus 1. *CORYCÆUS*,† Dana. Body not depressed. Abdomen abruptly narrower than the body, 2 or 3-jointed; second pair of antennæ

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\* The name *Pontia*, applied to this group by Milne Edwards, was previously applied to a genus of insects, and has therefore been changed as above. The genus *Cetochilus* of Roussel de Vauzème does not differ essentially from *Pontella*.

† See Proceed. of Acad. Nat. Sci. of Philad. for October, 1845, p. 285. The two lenses in these animals are separated by an unobstructed space, and appear beyond doubt to serve for the transmission of light. In contact with the posterior lens behind is an oblong spot of dark pigment. The only other supposition with

subcheliform, larger than the first pair of legs, (nearly as in the genus *Ergasilus*.)

Genus 2. *ANTARIA*, Dana. Similar to *Corycæus*, but having the second pair of antennæ terminating in a few movable setæ, and smaller than the first pair of legs. (I am not satisfied that these specimens are not the female of the *Corycæi*.)

Genus 3. *SAPPHIRINA*, Thompson. Body much depressed; antennæ as in *Corycæus*; abdomen 5 or 6-jointed, the basal joint in the female abruptly narrower than the thorax, and having a pair of short appendages; external ovaries two.

Family 5. *MIRACIDÆ*. Antennæ as in *Setella*; external ovary single.

Genus 1. *MIRACIA*, Dana. Body not depressed, nearly as in the *Arpactidæ*, the abdomen 5 or 6-jointed and not abruptly narrower than the thorax; anterior antennæ nearly as in *Setella*, with a short appendage near the middle; second pair of antennæ terminating in a few movable setæ; beak with two cultriform appendages; first pair of legs subcheliform.

The distinctions in the above genera rest to a considerable extent upon the use of different organs for grasping in the union of the sexes. In *Cyclops* and *Arpactus*, both anterior antennæ of the male are subcheliform for this purpose; in *Pontella* and *Candacia*, the right antenna and right posterior thoracic leg is thus modified in the male; in *Euchirus*, both posterior thoracic legs are very much elongated; in *Calanus*, the first pair of legs are long and have an outward lateral motion for the purpose; in *Corycæus* the second pair of antennæ subserves this end, and in *Antaria* the first pair of legs are large and subcheliform; in *Setella* the same end appears to be secured by the first pair of natatories.

The genera of *Calanidæ* differ also in the relative development of the maxillipeds and first pair of legs. In *Pontella*, *Acartia*, and *Scribella*, the maxillipeds are largest. In *Pontella* and *Acartia* they are straight, with long setulose setæ directed forward so as to form a kind of scoop-net. In *Scribella* they are flexed like the letter L. In *Calanus*, *Euchirus* and *Candacia*, the first pair of legs are larger than the maxillipeds; in *Calanus* they are long

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regard to their nature which I can suggest, is their possible connection with phosphorescence. But such an arrangement for this end is not probable; and moreover I was never satisfied that the species were phosphorescent.

and spread outward laterally; in *Euchirus* they are thrown forward in the line of the body, and are flexed like the letter  $\sphericalangle$ ; and in *Candacia* they have nearly a similar position, but have the extremity flexed *towards* the head instead of *away* from it.

The maxillipeds may always be distinguished from the first pair of legs by the setæ, which are *setulose* in the former, and *naked* in the latter.

ART. X.—*On the Law of Electric Conduction in Metals*; by  
JONATHAN H. LANE.

MY attention was first directed to the subject of the law of conduction by reading a paper by Prof. Morse, published in this Journal, Vol. XLV, p. 390, first series, accompanied by a communication from Prof. Draper. These communications gave me the impression that the law commonly received was not well ascertained, and it was under this impression that the experiments given in the following paper were made. But since it was written, I have found that I had mistaken the particular aim of Prof. Morse's experiments, which did not profess superior accuracy, but were only intended as experiments on a large scale by way of verification. Experiments have long since been made by different electricians, which afford strong support to the law in question, while others were thought to controvert it; but they have either been explained, or are not in their nature satisfactory. Still, my own method of experiment appears to possess advantages over any that I have seen; and notwithstanding the imperfect manner in which it has been carried out, it has given results more exactly corresponding with the supposed law. I must say, however, that my experiments have by no means been sufficiently extended, for those given are all I have made touching this question.

1. Supposing electricity to be a fluid, and an electric current to be no more than the motion of this fluid through a conductor, which, at the same time, opposes a resistance to its motion, it is a natural inference, that as electric motion is known to result from difference of tension, so conversely, there is always a difference of tension in the different parts of a conductor, while conducting a current—a regular gradation in the quantity of elec-



tric fluid, from one end to the other, as in the height of flowing water in a canal, and more or less rapid or abrupt, according to the conducting power of the different parts of the conductor.

Hence we should expect that if any two points of such a conductor, however near together, were connected by a second conductor, of whatever length, a current would at once flow through the latter. Accordingly, the poles of an ordinary galvanic battery being connected by a good metallic conductor of two or three feet length, the current generated in a second conductor was made instantly apparent; when it included between its extremities not more than a half inch of the battery conductor, and the effect, as might be expected, increased in proportion to the interval between the extremities of the second conductor. This satisfied me that by such experiments as I had proposed, the law of conduction could be ascertained with much certainty.\*

2. The law of Lenz embraces two propositions.

(1.) In a given conductor, the quantity of fluid conducted in a given period, is as the intensity, or difference of tension between the ends of the conductor.

(2.) In homogeneous conductors of the same length, and with the same difference of tension, the quantity conducted is as the section.

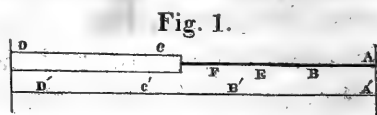
3. To test the truth of the first of these propositions, we divide the current of one or more wires, among two or more others of the same size, and then compare a given length of the former wire or wires, with such length of the latter as shall have the same difference of tension. If, for example, part of a galvanic circuit be composed of a single wire, and another part of two wires of the same kind, and if the difference of tension in a foot of the single wire be found equal to the difference of tension in two feet of either of the pair, the inference is that each of the latter, which conducts half the quantity of the former, requires half the intensity.

4. To find lengths which have equal differences of tension, two methods may be taken. The one will require a galvanometer having a double coil of two very fine wires of great length, so as to conduct a very small quantity, and still act with considerable

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\* Becquerel, it appears, entertained the same view of the electric state of a conducting wire, and illustrated it by an experiment of precisely the same kind.

nable power on the needle. Let AD (fig. 1) be a conductor made up of a single wire AC,\* and several CD. The battery circuit being completed, let the points C and D be connected by one of the wires of the galvanometer. The needle will be powerfully deflected. Now let E and F be connected by the other wire of the galvanometer, but so that the current arising may act in opposition to the former, and let the space EF be increased till the actions on the needle balance each other. Next, let the points A and B be connected by the same wire as C and D before, and AB increased till the needle is stationary. Then AB and CD will have equal differences of tension, for though the galvanometer wire did draw out a small fractional part of the battery current, still it was the same quantity in both cases. EF might be taken instead of AB, if we could be sure the wires of the galvanometer were exactly equal in their actions, and this adjustment might be made without much difficulty.



5. A better method, and the one I adopted, is the following. It requires only a galvanometer of the ordinary construction. Let A'D' be a uniform conducting wire placed alongside of AD, and well connected with it at the extremities. If, while a current is passing, any point of AD be connected through the galvanometer with a point of A'D', of different tension, the needle will be deflected, but a point may always be found in A'D', where no deflection will take place. Let A and A' be points of equal tension ascertained in this manner, as also B and B', C and C', and D and D', and let  $m$  represent the number of the wires AC, and  $n$  the number of CD. Then, if A'B' be made equal to C'D', AB and CD will have equal differences of tension, and according to the first proposition we shall have

$$n \cdot AB = m \cdot CD.$$

Or if A'B' and C'D' be not equal, we may reduce to equal lengths by substituting for the ratio of AB to CD, that of AB.C'D' to CD.A'B', and we shall have

$$n \cdot AB \cdot C'D' = m \cdot CD \cdot A'B'.$$

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\* If this method be taken, AC must either be a single wire, or, if several, they must be well joined near as may be to B, A being at the same time taken near the connected extremities; and the same caution must be applied to the common measure EF, unless it be taken on a single wire, introduced for the purpose, so as to convey the whole current. C and D also must be near the connected extremities of the wires.

SYNOPSIS  
OF THE  
GENERA OF GAMMARACEA.

BY JAMES D. DANA.

THE tribe of Amphipoda among Crustacea includes the subtribes Gammaracea and Hypericea. The former of these subtribes consists of six groups or families.

Fam. 1. ORCHESTIDÆ. Saltatoriæ. Palpus mandibularis obsoletus. Corpus compressum, epimeris latis. Styli caudales duo postici breviores.

Fam. 2. GAMMARIDÆ. Saltatoriæ vel natatoriæ. Mandibulæ palpigeræ. Corpus sæpius compressum. Antennæ flagello confectæ, non pediformes. Styli caudales duo postici sive longi sive breves.

Fam. 3. COROPHIDÆ. Gressoriæ. Corpus plus minusve depressum, lineare, abdomine recto, normali, epimeris angustissimis vel obsoletis. Mandibulæ palpigeræ. Antennæ pediformes.

Fam. 4. ICILIDÆ. Corpus depressum, latum, abdomine normali, inflexo, pedibus latè expansis instar Aranææ. Antennæ non pediformes.

Fam. 5. CHELURIDÆ. Corpus vix compressum. Abdomen abnormale, segmentis duobus tribusve coalitis et irregularibus; stylis caudalibus sex, dissimilibus. Antennæ breves pediformes.

Fam. 6. DULICHIDÆ. Isopodis affines. Corpus depressum, lineare. Antennæ pediformes. Abdomen abnormale, 5-articulatum, stylis duobus. Antennæ pediformes. Pedes tertii quartique breves, sex sequentes elongati, Caprelliformes.

In the following synopsis, the synonymy is included only so far as it is not contained in the work on Crustacea by Milne Edwards (Paris, tome iii, 1840); copious notes also are added. The number of new genera introduced since 1840 is quite large, and a few are instituted from the collections by the writer in the Exploring Expedition.\*

We add a word on a single point in the distinctions of genera. The size of the hands among the Orchestidæ and Gammaridæ has often been deemed to some extent an important generic character. But it is now well known that the gradations in the same group are imperceptible, and farther, females may have minute and hardly prehensile feet, while in males of the same species the corresponding hands are quite large. On this ground, Fr. Müller has lately denied the propriety of separating the Orchestiæ, and Talitri (Archiv für Naturg., 1848, p. 53). There is however a wide difference between the species having a styliform joint terminating the *second pair* of legs and those with a hand however minute or obsolescent. The only safe course appears to the writer to consist in drawing the line between *species having a finger or claw however small or large, closing upon the fifth joint*, and those *species having an extended finger or claw not closing up*. Kröyer's *Anonyx*, according to his descrip-

\* The Crustacea of the Exploring Expedition under Captain Wilkes will form a volume of text in 4to, accompanied with figures of all the species in a folio atlas. Brief descriptions will from time to time appear in the Proceedings of the American Academy of Arts and Sciences of Boston, a part of which, relating to the Entomostraca and including upwards of 150 species, has already been published. The number of new species of Amphipoda in the collections exceeds eighty.

tion, has the 4 anterior feet non-prehensile; but in his figures, these feet are sub-prehensile though minute, and they resemble in this, many *Amphitoe*, *Orchestia*, and *Allorchestes*. The two anterior feet of the Talitri vary widely, from an obsolescent hand to a large strong prehensile form. Here as elsewhere in nature, there is no saltus in the gradations to aid us in generic groupings.

The larger part of the new genera recently added, have been instituted by Kröyer from species obtained in high northern latitudes. It is remarkable that the forms in this tribe should be so greatly varied in the colder seas, and the genera so few in tropical latitudes.

## FAM. I. ORCHESTIDÆ.

1. Pedes secundi non subcheliformes. Antennæ superiores basi inferiorum breviores.

*Talitrus* (Latreille).

2. Pedes primi secundique subcheliformes. Antennæ superiores basi inferiorum breviores. Maxillipedes ad apicem obtusi.

*Orchestia* (Leach).

3. Pedes primi secundique subcheliformes. Antennæ superiores breviores, basi inferiorum longiores. Maxillipedes ad apicem unguiculati.

*Allorchestes* (Dana.\*)

## FAM. II. GAMMARIDÆ.

## SUB-FAM. I. LYSIANASSINÆ.

Antennæ superiores ad basin crassæ. Epimera grandia. Pedes sex postici non prehensiles.

I. Pedes subcheliformes nulli, secundis interdum exceptis.

a. *Pedes quinti sexti septimique directione similes.*

1. Antennæ superiores appendiculatæ.

*Lysianassa* (M. Edw.).

2. Antennæ superiores non appendiculatæ.

*Phlias* (Guérin).

b. *Pedes quinti tertii quartique directione similes.*

1. Antennæ sup. appendiculatæ. Palpus mandibularis 1-articulatus.

*Stegocephalus*† (Kröyer).

II. Pedes primi subcheliformes, secundi non subcheliformes; reliqui non prehensiles.

1. Antennæ sup. appendiculatæ.

*Opis*† (Kröyer).

2. Antennæ sup. non appendiculatæ. Pedes secundi vergiformes; tertii quartique brevissimi.

*Uristes* (Dana).

III. Pedes primi secundique subcheliformes, reliqui non prehensiles.

1. Antennæ sup. appendiculatæ.

*Anonyx*§ (Kröyer).

2. Antennæ sup. non appendiculatæ.

*Stenia* (Dana).

\* The species of this genus have the aspect of many *Amphitoe*, and have probably been hitherto referred to that genus. They have the very short posterior stylets of the *Orchestia*, and resemble them in habit and in the absence of a palpus to the mandible; while they differ in having the superior antennæ longest and in the stout spine or claw terminating the maxillipeds. The writer has dissected the mouth of nearly a dozen species of *Allorchestes*.

† Kröyer's *Naturhistorisk Tidsskrift*, (Copenhagen,) iv, 150, 1842. "Caput oculis, ut videtur, destitutum." "Antennæ breves (capitis altitudine non longiores)." "Pedes quinti paris pedibus tertii quartique paris structurâ et directione similes."

‡ *Tids.* iv. 149. "Pedes primi paris chelis armati portentosæ magnitudine. Reliqua cum genere *Anonyx* fermè conveniunt."

§ *Tids.*, ii, 256 and iv, 164. This genus is united with *Lysianassa* by Milne Edwards. Any species wholly without hands are properly *Lysianassa*; those with only two anterior hands, however minute or imperfect, belong to *Opis*.

## IV. Pedes tertii quartique subcheliformes.

1. Antennæ sup. appendiculatæ. Pedes tertii quartique validi, articulo quarto dilatato instar palmæ, ungue conico, aculeato.

*Pontoporeia*\* (Kröyer).

## SUBFAM. II. GAMMARINÆ.

Antennæ superiores ad basin tenues. Epimera sive grandia sive angusta. Pedes 6 postici non prehensiles.

## I. Pedes subcheliformes nulli, secundis parvulis interdum exceptis.

1. Antennæ superiores appendiculatæ.

*Alibrotus* (M. Edw.).

2. Antennæ sup. non appendiculatæ.

*Acanthonotus* (Owen).

II. Pedes primi subcheliformes, secundi non subcheliformes, reliqui non prehensiles.

1. Antennæ sup. appendiculatæ.

*Leptochirus*† (Zaddach).

## III. Pedes primi secundique subcheliformes, reliqui non prehensiles.

A. *Antennæ secundæ subtilis primas insitæ.*

\* Digiti toti uni-articulati.

a. *Pedes sex postici similes.*

1. Antennæ sup. appendiculatæ.

*Gammarus*‡ (Fabr.).

2. Antennæ sup. non appendiculatæ.

*Amphithöe*§ (Leach).

\* Tids. iv, 152. "Pedes primi et secundi paris perbreves, robusti; illi manu latâ instructi ungue vero brevior; hi manu carentes ungueque præditi rudimentari. Pedes tertii quartique paris longiores, validi, subcheliformes, articulo quarto dilatato palmam efficiente, ungue armati conico, aculeato. Pedes quinti et sexti paris recurvi, articulo primo parum modo dilatato ungue armati perpusillo. Pedes septimi paris recurvi, articulo primo permagno, clypeiformi; articulo sexto vel ungue rudimentari. Epimera magna."

† Syn. Crust. Pruss. Prodromus, 1844. This genus is stated to be allied to Amphithoe.

‡ From the genus *Gammarus*, Leach separates:—

MÆRA (Edinb. Encyc., vii, 403; Trans. Linn. Soc., xi, 359.) Manus secundæ valde inæquæ, majore bene cheliformi.

MELITA (Edinb. Encyc., vii, 403.) Digitus pedum secundi paris in latus manûs claudens.

The *Amathia* of Rathke (Fauna der Krym, Mem. Acad. Imp. St. Petersburg, iii, 1837, p. 291, and Beit. zur Fauna Norwegens, Act. Leop., xx Bd.) includes those Gammari which have the superior antennæ shortest—apparently an unimportant distinction.

§ Amphithöe includes the *Dexamine* and *Pherusa* of Leach. *Eusirus* of Kröyer (Tids., N. R., i, 501,) is somewhat peculiar in the form of the hands, but the gradations among the species are such that the character is not sufficient even for a subgenus.

Kröyer's *Microcheles* (Tids., N. R., vol. ii,) is also near Amphithöe. The principal point of difference mentioned is the absence of the molar prominence from the mandible. The *small hands* to which the name alludes is common to many Amphithöes, especially females.

The *Iphimedia* of Rathke (Beit. zur Fauna Norwegens, p. 85; Act. Leop., Bd. xx) appears to differ little from Amphithöe. The superior antennæ are shorter than the inferior, and this characterizes generally the species from the higher latitudes. *Acanthosoma* of Owen (Ross's 2d voyage to the north in 1829–1833, Append., p. xci) has the same characters. The description of *Iphimedia* by Rathke is as follows—p. 89. "Antennæ superiores inferioribus breviores; illarum pedunculus e tribus, harum e quatuor articulis, compositus: omnium flagellum tenue, multiarticulatum. Pedes secundi paris manibus simplicibus, primi paris, illis minores, chelis instructi, quarum pollex ex uno tantum articulo constat. Reliqui pedes iis Gammarorum similes. Pedes spurii in duos ramos plus minusve complanatos divisi."

b. *Pedes sex postici non similes.*

1. *Pedes quinti recurvati, inversi, ungue rudimentari. Antennæ sup. non appendiculatæ.*

*Photis\** (Kröyer).

2. *Pedes septimi longissimi, tenues, fere filiformes. Antennæ sup. non appendiculatæ. Frons in rostrum producta.*

*Ædicerus†* (Kröyer).

## † Duo quatuorve digiti bi-articulati.

1. *Pedes primi digitum bi-articulati. Antennæ sup. non appendiculatæ.*

*Leucothœe* (Leach).

2. *Pedes secundi digitum bi-articulati.*

*Erichthonius* (M. Edw.).

3. *Pedes primi secundique digitum bi-articulati. Antennæ tenues, sup. appendiculatæ.*

*Pardalisca‡* (Kröyer).

B. *Antennæ secundæ post primas insitæ, fronte in rostrum productâ.*

1. *Digitum uni-articulatum. Pedes 6 postici similes. Antennæ anticæ appendiculatæ.*

*Ischyroceras* (Kröyer).

IV. *Pedes tertii quartique prehensiles; sequentes non prehensiles.*A. *Antennæ secundæ subtus primas insitæ.*

1. *Manus tertiæ quartæque simplicissimæ, pollice instructæ. Digitum uni-articulatum. Antennæ sup. appendiculatæ.*

*Lepidactylis§* (Say).

2. *Manus tertiæ quartæque articulis tertio quartoque instructæ, et digiti articulis sequentibus coalitis. Corpus subdepressum. Antennæ sup. appendiculatæ.*

*Protomedeia||* (Kröyer).

3. *Manus tertiæ quartæque articulo tertio instructæ, et digiti articulis sequentibus junctis, articulo ultimo longissimo, gracillimo. Antennæ graciles. Epimera magna.*

*Ampelisca¶¶* (Kröyer).

4. *Manus tertiæ quartæque articulo quarto instructæ, et digiti articulis quinto sextoque. Corpus subdepressum. Antennæ sup. appendiculatæ; inf. subpediformes. Pedes primi secundique subcheliformes.*

*Aora\*\** (Kröyer).

\* *Tids.*, iv, 155. "Corpus sat altum, compressum. Antennæ subpediformes flagello appendiculari destitutæ." "Epimera permagna; quinque paria anteriora ad marginem inferiorem setis sat longis instructa; quantum eadem est ac quartum altitudine, postice profundius excisum."

† *Tids.*, iv, 155. "Frons in rostrum producta, plus minus acutum obtusumve, semper vero nodo pellucente, ovali, flavo rubescente, turgidum. Oculi nulli?" "Pedes primi et secundi paris manu armati subcheliformi permagna. Pedes tertii, quartique paris validi, ungue instructi lato, laminari; quod quoque usu venit quinto sextoque pari, quorum articulus primus dilatatus non est." "Epimera mediocris magnitudinis."

‡ *Tids.*, iv, 153. "Caput crassiusculum, subtumidum. Epimera exiguæ magnitudinis." "Pedes tertii quartique paris ungue sublaminari, posticè subtiliter serrulato. Pedes reliqui elongati, sat debiles, femoribus subangustis."

§ *Jour. Acad. Nat. Sci. of Philadelphia*, i, 380. Superior antennæ appendiculate, shorter than the inferior pair.

|| *Tids.*, iv, 154. "Antennæ inferiores pediformes, pedunculo longissimo, flagellum ter ad minus longitudine superante. Pedes secundi paris parvi, manu non instructi subcheliformi." "Epimera sat brevia."

¶¶ *Tids.*, iv, 154. "Pedes primi secundique paris nulla instructi manu subcheliformi." "Pedes quinti sextique paris articulis modo compositi quinque, quorum ultimus ad finem marginis posterioris ungue armatus est rudimentari, recurvo, immobili (vel parum mobili). Septimum pedum par ungue laminari, lato, natatorio (?)" "Oculi simplices (?)" "Epimera magna." "Sextum pedum abdominalium par natatorium. Reliqua ut in genere *Amphithœe*."

\*\* *Tids.*, N. R., i, 328, 1845. "Quantum pedum par brevissimum, robustum; sextum par septimumque quinto multo longiora sed graciliora." "Pedes abdominales quarti, quinti et sexti paris saltatorii."

B. *Antennæ secundæ post primas insitæ, fronte in rostrum productâ.*

1. Manus tertiæ quartæque articulis tertio quartoque instructæ, et digiti articulis sequentibus coalitis. Antennæ anticæ appendiculatæ, breves. Pedes primi secundique subcheliformes.

*Phorus\** (Kröyer).

## SUBFAM. III. ISÆINÆ.

Pedes sex quatuorve postici subprehensiles.

A. *Antennæ secundæ subtus primas insitæ.*

1. *Gammaro* similis. Pedes decem postici similes. Antennæ sup. appendiculatæ.

*Isæa* (M. Edw.).

2. Pedes tertii sexti septimique crassè cheliformes; secundi minores; primi quarti quinti minimi. Digiti toti uni-articulati.

*Anisopus* (Templeton).

B. *Antennæ secundæ post primas insitæ, fronte in rostrum productâ.*

1. Pedes decem postici subcheliformes, similes.

*Laphystius*† (Kröyer).

## FAM. III. COROPHIDÆ.

a. *Digiti duo 2-articulati.*

1. Antennæ totæ flagellis confectæ. Caput et segmentum proximum in unum coalita. Pedes quarti, quinti, sextique obsoleti?

*Cerapodina* (M. Edw.).

2. Antennæ flagellis carentes.

*Cerapus* (Say).

b. *Digiti nulli 2-articulati.*

\* Antennæ inferiores flagellis carentes.

1. Pedes secundi non subcheliformes.

*Corophium* (Lat.).

2. Pedes primi secundique subcheliformes.

*Podocerus*† (Leach).

† Antennæ quatuor flagellis gracilibus confectæ.

1. Pedes primi secundique subcheliformes. Antennæ superiores appendiculatæ.

*Unciola*§ (Say).

2. Pedes primi secundique subcheliformes. Antennæ superiores non appendiculatæ.

*Atylus* (Leach).

\* Tids., iv, 150. "Sextum pedum par ceteris multo longius." "Epimera permagna."

† Tids., iv, 156. "Antennæ sat breves, subulatæ, validæ." "Pes primi paris gracillimus, manu lineari, ungue elongato; pes secundi paris brevis, validus, manu quadrata, ungue sublaminari apice setoso. Reliqui decem pedes validi, subcheliformes, eadem ferme longitudine. Epimera mediocris magnitudinis; quartum par in acumen inferne productum."

‡ The Siphonæctes of Kröyer (Voy. Scand., etc., 1838-1840, pl. 20, fig. 1; Tids., N. R., i, 481, 1845) differs from *Podocerus* only in having the posterior legs longer than the four preceding. In his description he says, p. 491:—

"Pedes thoracici primi et 2di paris validissimi, manu instructi subcheliformi. Pedes 3tii et 4ti paris articulo primo latissimo, laminari; articulo quarto obcordato, laminari, manum præbente, cujus unguis efficitur articulo quinto subconico articuloque sexto aciculari. Pedes 5ti 6tique paris minutissimi, sed robusti, recurvati, articulo primo clavato, ungue furcato. Pedes 7mi paris graciles, recurvati, articulo primo laminari, ungue minutissimo, furcato. Pedes abdominales 1mi, 2di et 3tii paris natatorii breves validissimi, parte basali latissima, rhomboidali; pedes 4ti, 5ti que paris saltatorii, pes abdominalis sexti paris natatorii unica instructus lamina terminali."

§ *Glaucanome* of Kröyer (ibid., pl. 19, fig. 1; Tids., N. R., i, 491, 1845) has the hands and antennæ of *Unciola*. The following is the description, p. 501:—

"Antennæ subpediformes; superiores flagello ornatæ appendiculari perparvo. *Oculi* minuti, parum distincti. *Mandibula* apex in duos fissus ramos qui dentibus

‡ Antennæ longæ, flagello crasso rigidoque, obsolete articulo.

Antennæ styliformes, rectæ. Pedes filiformes, non prehensiles, sex postici prælongi.

*Clydonia* (Dana).

FAM. IV. ICILIDÆ.

1. Pedes postici sublamellati.
2. Pedes toti vergiformes, nulli prehensiles.

*Pterygocera* (Lat.).

*ICilius* (Dana).

FAM. V. CHELURIDÆ.

Abdomen ad extremitatem crassè styliforme, (segmentis quarto quinto sextoque in articulum styliformem coalitis).

*Chelura*\* (Philippi).

FAM. VI. DULICHIDÆ.

Caprelliformes. Abdomen 5-articulatum. Segmenta thoracis sextum septimumque coalita.

*Dulichia*† (Krøyer).

sunt armati conicis; tuberculus molaris dentibus confertissimis instructus. *Labium superius* breve, depressum latissimum, margine anteriori medio inciso; *labium inferius* quatuor compositum laminis setosis. *Laminae maxillares* pedum maxillarum dentibus armatæ validis; unguis palpi apice setosus. *Pes primi paris* robustissimus, manu subcheliformi; *pes secundi paris* gracilior, manu carens subcheliformi, pedes 3tii, 4tique paris pergraciles; pedes 5ti, 6ti, 7mique paris graciles femoribus parum dilatatis. Pedes abdominales 1mi 2di et 3tii paris natatorii, breves sed robustissimi; 4ti, 5tique paris saltatorii, validi; 6ti paris fere rudimentares, natatorii. Epimera minima fere evanescentia."

\* Philippi, *Archiv für Naturg.*, 1839. Also on *Chelura terebrans*, G. J. Allman, *Ann. and Mag. Nat. Hist.*, xix, 361, June, 1847.

† Krøyer, *Tids., N. R.*, i, 512, 1845, and *Voy. Scand.*, etc., pl. 22, fig. 1, 1a-1n. "Corpus valde elongatum gracili. Antennæ longissimæ (imprimis superiores) subpediformes; superiores flagello instructæ appendiculari. Oculi prominentissimi, acuminati. Pedes 1mi paris compressi, manu (articulo 4to) magna, ungueque biarticulato instructi (qui unguis articulo 5to 6toque junctis efficitur). Pedes 2di paris manu instructi subcheliformi (quæ apud mares maxima est). Pedes 3tii 4tique paris minimi, fere filiformes, invicem ejusdem fermè longitudine et forma. Pedes 5ti 6ti 7mique paris elongati, lineares (femore non dilatato) prehensiles. Sextus thoracis annulus cum septimo coalitus ut difficiliter distinguantur. Epimera nulla vel prorsus rudimentaria. Abdomen quinque modo compositum annulis et quinque præditum pedum paribus, quorum tria anteriora natatoria, duo posteriora saltatoria sunt."



2. *Gammaracea*.—The following recent genus is not included in the Synopsis of *Gammaracea* given in this volume, p. 135.

“*EPHIPPHORA*, White, (Phil. Mag., [3], i, 226, 1848.)—Head rather large; antennæ distant from each other, the upper pair with the basal joints very thick and corneous, inserted in a deep notch in front of head; two setæ at the end of each, the outer the thicker. Lower pair of antennæ with the basal joint somewhat elongated and furnished with hairs.

“Body much compressed, the lateral appendages on the first eight joints very large, and nearly concealing the legs; the appendage of the fourth joint much dilated behind at the end; eighth to eleventh joints slightly keeled on the back; appendages of the three last joints of the abdomen longish, with short spines on the edge behind.

“A genus allied to *Orchestia* and *Talitrus*.

“Sp. *Ephippora Kröyeri*.” \* \* \* \*

The description is hardly full enough to decide whether the genus is related most closely to the *Orchestidæ* or *Gammaridæ*. The large size of the basal joint of the upper antennæ, together with the large epimerals appear to show that it belongs with the *Callianassinæ*; and it may be identical with one of the genera in which the superior antennæ are appendiculate.

J. D. DANA.

Faint, illegible text, possibly bleed-through from the reverse side of the page.

*A new genus of Orchestidæ*; by J. D. DANA.—In a synopsis of the genera of Gammaracea, in this Journal, volume viii, p. 135, three genera of Orchestidæ are mentioned, Talitrus, Orchestia and Allorchestes. We here add a fourth; and for the purpose of giving a fuller comparative view of the four, and correcting a misprinted word, we insert the generic characters for the group.

1. Pedes primi non cheliformes nec subcheliformes, articulo styliformi confecti; secundi sæpe subcheliformes, manu sive parvulâ et debili sive nullâ. Antennæ superiores basi inferiorum breviores.

*Talitrus* (Latreille).

2. *Talitro* pedes primos antennisque similis. Pedes maris secundi valde subcheliformes, manu grandi.

*Talitronus* (Dana).

3. Pedes primi secundique plus minusve subcheliformes. Antennæ superiores basi inferiorum breviores. Maxillipedes apicem obtusi.

*Orchestia* (Leach).

4. Pedes primi secundique plus minusve subcheliformes. Antennæ superiores breviores, basi inferiorum longiores. Maxillipedes apicem unguiculati.

*Allorchestes* (Dana).

2. The Board of Directors of the Corporation, by its resolution, has authorized the Board of Directors to issue and sell, from time to time, such amount of the authorized capital stock of the Corporation as may be necessary to carry out the purposes of the Corporation, and to execute all necessary documents in connection therewith.

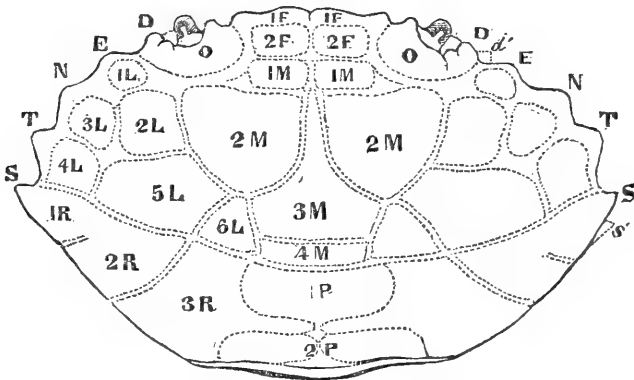
Witness my hand and seal of the Corporation this 1st day of January, 1901.

Attest: Secretary of the Corporation

ART. XII.—On the markings of the Carapax of Crabs; by  
JAMES D. DANA.

THE areas into which the surface of the carapax of Crabs is subdivided were imperfectly distinguished and named by Desmarest. This author designated the regions according to the internal parts which they covered. But there is a system in the markings which this mode of indicating does not express, and moreover there is a uniformity of character and number which it fails to exhibit. Had the uniformity of number, position and outline been generally recognized, the drawings in this department of Crustacea would not be so commonly incorrect; for even figures from high authority usually misrepresent the character of the surface, and few can be pointed to that are faithful sketches. Moreover these regions, correctly understood, indicate certain homologies in the skeleton of the Decapods. We propose at this time simply to describe the surface markings as they appear.

1.



The above figure (fig. 1,) shows the normal number and position as observed in species of the Cancer group. A depression crosses the carapax just back of the middle, and terminates anterior to the last of the normal lateral teeth. Another depression begins in this line either side of the middle and extends towards the eyes. These depressions divide the carapax into a *medial* region, two *antero-lateral* regions, and a *posterior* region. From the medial, we exclude a frontal portion as a *frontal* region, besides also an *orbital*; and from the posterior two *postero-lateral* regions. Each region has its several subdivisions or areolets.

In the figure referred to, the areolets of the *frontal* region are marked F; of the orbital, O; those of the *medial*, M; those of the *posterior*, P; those of the *antero-lateral*, L; and those of the *postero-lateral*, R;—R being the initial of the last syllable in the word lateral, while L is the initial of the first. The minor subdivisions correspond to prominences or tubercles of the surface and are normally as follows:—

*Frontal Region*.—1F, the front margin; 2F a prominence just posterior to the front either side of the middle.

*Medial Region*.—1M, two small anterior prominences, the *præ-medial*; 2M, two large areolets the *extra-medial*; 3M, a cen-

tral areolet, elongated anteriorly between the areolets 2M, the *intra-medial*; 4M, a transverse areolet just posterior to 3M, the *post-medial*. Two deep punctures usually mark the limit between 3M and 4M, even when there is no depression. 1M is annexed to the medial rather than the frontal region, because it more commonly coalesces with the former, and is a part of it often in general outline.

*Antero-lateral Region*.—In this region there are normally six areolets and they are often prominent:—1L, near the *first* tooth following the post-orbital. 2L, 3L, posterior to 1L, in a line nearly with the *second* tooth, and 4L, 5L, 6L, between 4M and the *third* tooth.

*Postero-lateral Region*.—This region on either side consists normally of 3 areolets 1R, 2R, 3R.

*Posterior Region*.—1P is situated directly behind 4M and is often well circumscribed, and sometimes in shape nearly like 3M reversed and shortened. 2P directly behind 1P, is sometimes simple, but it is more commonly divided in the middle into two areolets. Behind these, is the posterior margin of the carapax.

*Orbital Region*.—The elevation which encloses the upper side of the orbit is usually divided by sutures into three parts.

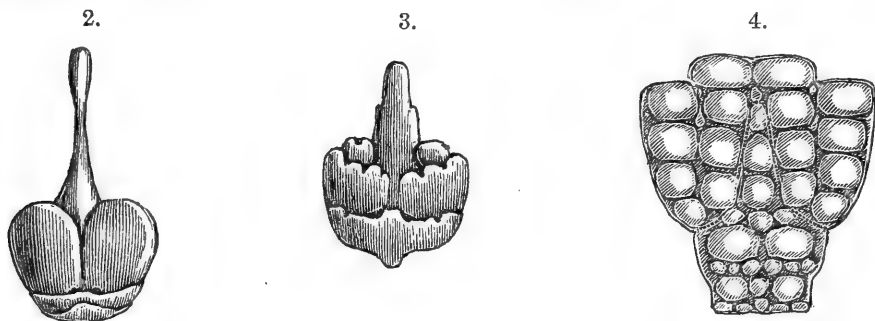
The variations in the markings of Crabs arise in the main from the *greater or less prominence of these areolets, their various subdivisions, or their obsolescence*. When only a few undulations are apparent on the carapax, a little study with the normal type in view will commonly discover that the system is there although but just apparent; and when once perceived a correct sketch is made without difficulty.

In the *obsolescence* of the areolets, the posterior are the first to disappear, in which case this part of the surface is flat. Next the postero-lateral fail of being distinct. Next 5L and 6L coalesce, and also 1M and 2M. Next, the posterior of the medial areolets becomes obsolete, and at the same time 5L, 6L disappear, or are indicated only by a slight undulation along the space that ordinarily separates them. The extra-medial may be only circumscribed anteriorly, and the slender elongation of the interno-medial is all that appears of that areolet; next, the remaining antero-lateral areolets may disappear with the frontal, and the surface is then quite smooth. 1L is sometimes indistinct when the other areolets are prominent, though usually it accompanies them.

When 4L, 5L, 6L become indistinct, the transverse depression then prominent instead of passing behind them bends more forward along 3M, and passes anterior to them, and so makes a different subdivision of the carapax in its general aspect and character. In another variety, the prominent transverse depression passes anterior to 5L, but not anterior to 4L, (which may be obsolete,) and has nearly a straight course across the carapax.

In the *subdivision* of the areolets, the first that partake of it are 2M, 5L and 3M. A commencement of this subdivision of 2M (the extra-medial) is very common, and when completed it

divides it into two parts longitudinally. This is an important specific character and though hitherto unmentioned in descriptions, it is easily described when a proper notation is adopted. 5L also subdivides from above downward or rather obliquely inward. 3M subdivides at times into 3 parts as shown in figure 2 which includes also 4M. Figure 3 represents another form of this areolet



and 4M. In a still further subdivision, each of the areolets is reduced to tubercles, some of them consisting of but one, and others of three or four. Figure 4 represents the medial region of the *Lagostoma nodosa*; the præmedial is a single tubercle; the extra-medial consists of 7 tubercles, 3 in an inner and 4 in an outer series; the intra-medial includes 4 besides some smaller; and the post-medial includes 2 large and some smaller tubercles. When the subdivisions are not carried as far, a portion may be separated anteriorly from each half of 2M, while the rest remains entire.

It is common for 1R to have a tubercle or two on its surface or areolets in the same transverse line with the tooth.

*Teeth of the antero-lateral margin.*—The teeth of the margin are normally five in number, commencing with the post-orbital as the first. These five are represented in figure 1, and are designated in order by the different letters of the word *dentes* (or *dents* in French) D, E, N, T, S. Each tooth is often separated from the adjoining by a minute suture at the bottom of the indentation between them, and hence the letters always mark rather a lobe of the margin than simply a tooth. These teeth vary by obsolescence or subdivision, like the areolets.

In *obsolescence*, the tooth E (second) is the first to disappear, this reducing the apparent number to four. Then N fades out, then T, leaving S alone which may also be wanting. Again S is sometimes smaller than T and even disappears.

In the *multiplication* of teeth, there is often, as a first addition, a tooth *s'* (or two *s'*, *s''*,) posterior to S. There is often also a tooth (*d'*) between D and E on a lower level than D. But the multiplication is generally dependent on the subdivision of the normal teeth E, N, T, in addition sometimes to S and D,—each of these teeth consisting of two or three teeth, either all equal or one more prominent. In order to determine the normal relations of the teeth when the number is large, we have a guide in the areolets adjoining when they exist; for the areolet 4L (or the range 6L, 5L, 4L,) terminates against tooth or lobe T, having about

the same breadth that belongs to this lobe, the depression anterior to 4L corresponding to the fissure between N and T. So 3L (or 3L, 2L) gives the breadth of the normal tooth or lobe N; and 1L, when present, that of E. We thus find that usually when there are seven teeth anterior to S, each E, N, T, are doubled; when eight E, N are doubled, and either T is trebled, or both T and D are doubled.

The medial and antero-lateral areolets may be viewed relatively in two ways. If we compare the medial region as a whole with either antero-lateral as a whole we find a resemblance in general form and subdivisions. Again we observe that the lobe T, areolets 4L, 5L, 6L, 3M or 4M form a transverse zone across the carapax; again lobe N, areolets 2L, 3L, 2M constitute another transverse zone; and lobe 1L and 1M may be viewed as in another zone. These zones are often very distinctly brought out. The lobes E and N are often a little posterior to the areolets adjoining, —or, the line of the lobe and these areolets has a direction a little obliquely backward of a straight transverse line. Again, when the posterior prominent transverse line passes from the limit between T and S inward, anterior to 5L and not to 4L, as alluded to on the preceding page, the apparent zones are nearly straight transverse.

The medial region in the Cancer group is usually narrower than the breadth measured between the outer angles of the orbits: but in the genus Cancer of *Leach* (*Platycarcinus*, M. Edwards), it is rather wider, owing to the smaller distance between the eyes. The depression limiting on either side this medial region terminates anteriorly in the line of a fissure in the upper margin of the orbit between 1O and 2O.

It is interesting to trace these regions in other families of the Brachyura; but this we reserve for another occasion. Suffice it to say, that in *Atelecyclus*, which is broader anteriorly than posteriorly, 3M is much elongated, 1P is as long as broad, and there are the normal teeth with others intermediate. In *Calappa* in which the posterior part of the carapax is broadest, the medial region is comparatively small, and does not reach back quite to the middle of the carapax. 1P is oblong instead of transverse. In the *Maiadæ*, the medial region is usually large, while the antero-lateral is very narrow anteriorly. The prominent lateral spine or tooth corresponds to S and is usually far back of the middle of the side or margin, and often in the same line with 1P (*cardiac* region of Desmarest). 4M is often obsolete. The deeper transverse depression, limiting the medial region behind, often, instead of extending outward to a point just exterior to S, (obliquely outward and backward in these Crustacea) extends more forward following the outline of the medial region and then bending outward along the depression between 1L and 2L, 3L, or between 2L, 3L, and 5L, 4L. In the former case the region of the tooth E is anterior to the suture or depression, and in the latter, the regions of both E and N. Traces of the depression separating the antero-lateral and postero-lateral regions are also often apparent in this group.



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## CLASSIFICATION

OF THE

## MAIROID CRUSTACEA OR OXYRRHYNCHA.

BY JAMES D. DANA.

THE MAIOIDEA are usually divided into three tribes, characterized by the relative lengths of the legs, viz., the *Macropodinea*, the *Maiinea*, and the *Parthenopinea*. A character of the kind here alluded to is of little importance as a distinction in classification, unless it is indicative of other more fundamental differences. The third of these subdivisions seems to be properly and distinctively a natural group. But the first two are essentially identical in all points, excepting the greater or less elongation of the eight posterior legs. The mouth, the antennæ, eyes, branchiæ, and other parts, afford no ground for separating them: moreover, the transitions are gradual and numerous. *Libinia* and *Doclea* pass into one another through *Libidoclea*, and these three genera are more closely related than *Doclea* and *Inachus*. *Eurypodius* contains a species with short legs; and the genus *Oregonia*, very near *Eurypodius*, has no longer legs than some of the admitted *Maiinea*. The mere length of the legs, if regarded, thus breaks up true natural groups.

De Haan sustains the separation of the *Inachidæ* (Edward's *Macropodinea*, *Doclea* and *Latreillia* being excluded,) on other grounds, acknowledging the unimportance of the characteristic derived from the legs. As in other departments of Crustacea, he basis his distinctions mainly on the maxillæ or maxillipeds. Thus his *Maia*, *Pisa* and *Doclea* groups include species having the fourth joint of the outer maxillipeds articulated with the inner apex of the third joint; while in his *Inachus* group, the articulation is with the summit of the third joint. This distinction would separate the intimately related genera *Eurypodius* and *Oregonia*, as this joint in the latter has the ordinary *Maia* form. On examining *Eurypodius* it is found that the peculiarity of the third joint referred to arises simply from its being lengthened or extended along the inner

side, so that the true apical margin slopes backward and outward. The fourth joint is articulated with the same part normally in both, and the only difference is in the greater or less inclination of the summit margin, when greatest it approximating to longitudinal. The little importance of the distinction based upon the maxillipeds among the Cancroidea as well as Maiioidea is shown by numerous instances. Even the single genus *Xantho* presents wide variations, as the joint may be either transverse or oblong. (Compare *Xantho Orbignii*, *Edw.* with other species.) The system of De Haan for this reason, although developing some new relations, contains many ambiguities and incongruous associations, notwithstanding the learning of its author, the remarkable skill and accuracy of his work, and the vast additions of facts he has made to the science. We have admired the wonderful fidelity of his plates, the thorough spirit of investigation displayed through his magnificent volume, and the judgment with which he has seized upon typical forms in instituting his genera. Yet we can not but object to his defective system of arrangement and description, by which his types are often thrown into wrong associations, and the groups they typify are laid down with false limits,—the characters to be derived, (as the system of Milne Edwards illustrates,) from organs of real importance in the species, being sacrificed in a great degree to indications from the maxillæ or maxillipeds.

In the distribution of the Maiioidea, we disregard, for the reasons stated, the older subdivisions of Macropodinea and Maiinea, and arrange their species into families and subfamilies as below, according to the characters of the eyes, antennæ and other organs, using these characters, in the order, as far as we can judge, of their relative bearing upon the functions or habits of the species.

De Haan has separated on good grounds *Latreillia* from the other genera, having shown that the posterior legs are short, dorsal, and more or less prehensile, as in *Dromia*, and that the vulvæ have the same position as in that genus (in the base of the feet of the third pair); and he therefore places the genus in the *Dromia* group. Still, in the number of branchiæ and some other characters, it is like the *Maiinea*, and it is properly an intermediate type. The outer antennæ are peculiar in being free and cylindrical from the very base, with the second joint much longer than the first, nearly as in the *Dromiacea*. These last facts with regard to the antennæ are also true of another genus having the posterior legs prehensile, somewhat *Dromia*-like, although they are not at all dorsal and also resemble the preceding legs. The genus referred to is *Oncinopus* of De Haan. It is apparently intermediate in character between the *Maia* tribe and *Latreillia*.

The aberrant form, *Oncinopus*, (and also *Latreillia*, if it be not thrown with the *Dromiacea*,) will naturally belong to a distinct group, and we therefore divide the Maioid Crustacea into three tribes, MAINEA, ONCININEA and PARTHENOPINEA.

The *Parthenopinea* have the basal joint of the outer antennæ usually filling a hiatus in the orbit, as in most *Cancroidea*, and not projecting beyond the eyes, besides being more inward and posterior in position, and free or bounded laterally by sutures; while in the *Maiinea* this joint lies directly below the eye, projects beyond it, and is commonly soldered to the shell outside of the joint. The *Parthenopinea* are thus intermediate

between the Maiinea and the Cancroid Crustacea, resembling the latter also in their short epistome. The greater length of the anterior legs is not a necessary characteristic. They are also intermediate between the Maiinea and Dromioid species. The genus *Trichia*, of which De Haan makes one of his grand divisions of the Brachyura, is most nearly related to the Parthenopinea—the orbits, and antennæ, epistome and general form of the body resembling the same in Parthenope. But in its maxillipeds it approaches *Dromia*, as shown by De Haan.

*Telmessus* of White appears to belong with the *Corystoidea*, as the outer antennæ, in connection with the form, indicate.

The following are the Families, Subfamilies and Genera of MAIINEA with their characteristics :

### FAM. I. MAIIDÆ.

#### OCULI RETRACTILES, IN ORBITIS SESE LATENTES.

##### 1. DIGITI ACUMINATI.

##### A. Carapax oblongus.

##### α. OCULI PLUS MINUSVE TRANSVERSIM PORRECTI.

##### α ANTENNÆ EXTERNÆ APERTÆ.

\* *Rostrum sive elongatum sive breve, porrectum, non tumidum.*

† Pedes 8 postici prælongi.

1. INACHINÆ.—Carapax triangulato-ovatus. Rostrum emarginatum aut integrum.

G. 1. *INACHUS*, *Fabricius*.—Carapax gibbosus, spinâ præorbitali sive parvulâ sive nullâ, rostro brevi. Pedes 8 postici filiformes, 2dis 3-4-plo longioribus quam carapax post-rostralis.

G. 2. *EGERIA*, *Latreille*.—Carapax gibbosus, orbiculato-ovatus, rostro sat brevi, paulo reflexo. Pedes 8 postici filiformes longissimi (iis *Inachi* duplo longiores).

G. 3. *MICRORHYNCHUS*, *Bell*.\*—Carapax gibbosus, latitudine trans-orbitali parvâ, dente præorbitali nullo, post-orbitali parvulo. Rostrum parvulum, integrum. Pedes 8 postici corpore fere duplo longiores.

2. MACROCHEIRINÆ.—Carapax latè ovatus. Rostrum furcatum. Pedes prælongi. Articulus antennarum externarum Imus solutus.

G. *MACROCHEIRA*, *De Haan*.†—Carapax gibbosus, orbiculato-ovatus, spinâ præorbitali parvulâ, rostro saliente, cornubus valde divaricatis. Pedes toti validi longi.

†† Pedes 8 postici longitudine mediocres.

† *Pars antennarum externarum mobilis margine orbitæ orta.*

3. MAIINÆ.—Carapax orbiculato-ovatus, rostro prominente, profundè bifido.

\* Zool. Trans., ii, 40.

† Crust. Fauna Japonica, 88.

G. MAIA, *Lamarck*.—Articulus antennarum ext. Imus spinis duabus longis apicem externum armatus. Spina inter-antennalis elongata, acuta. Tarsus infra non spinulosus.

‡‡ *Pars antennarum externarum mobilis orbitâ omnino exclusa.*

4. PISINÆ.—Carapax triangulato-ovatus, rostro bifido.

1. Pedes 8 postici non valde compressi; articulus 5tus processu infra non armatus.

G. 1. PARAMITHRAX, *Edwards*.—Carapax gibbosus, rostro elongato. Oculi graciles. Articulus antennarum externarum Imus spinis duabus longis apicem externum armatus (eoque *Maia* affinis).

G. 2. PISA, *Leach*.—Carapax elongatè pyriformis, gibbosus, spinâ præorbitali saliente, rostro longo, vix depresso. Articulus antennarum ext. Imus angustus. Pedes 2di 3tiis valde longiores.

G. 3. PELIA, *Bell*.\*—Carapax elongatè pyriformis, gibbosus, spinis præorbitali et post-orbitali carens, rostro longo, vix depresso. Articulus antennarum ext. Imus angustus. Pedes 1mi 2dis breviores.

G. 4. LISSA, *Leach*.—*Pisæ* affinis. Carapax pyriformis, rostro longiusculo, cornubus laminatis, truncatis, dente præorbitali saliente.

G. 5. RHODIA, *Bell*.†—Carapax pyriformis, paulo depressus, spinâ præorbitali saliente, rostro brevi, acuto. Articulus antennarum externarum Imus angustus, apicem acutè productus extus unidentatus. Pedes 1mi 2dis breviores.

G. 6. HYAS, *Leach*.—Carapax ovatus, sæpe lyratus, depressus, spinâ præorbitali carens, rostro longiusculo, acuto, depresso. Articulus antennarum ext. Imus angustus, 2dus depressus, tarsus infra non spinulosus.

G. 7. PISOIDES, *Edw. et Lucas*.‡—*Hyadi* affinis. Carapax latè ovatus, spinâ præorbitali carens, postorbitali parvâ, rostro longiusculo, acuto. Articulus antennarum ext. Imus latissimus, 2dus depressus, densè ciliatus.

G. 8. HERBSTIA, *Edwards*.—Carapax orbiculato-ovatus, depressus, spinâ parvâ præorbitali instructus, rostro brevi, cornubus paulo depressis acutis. Articulus antennarum ext. Imus angustus, apicem acutè productus, extus unidentatus. Pedes 1mi 2dis longiores.

2. Pedes 8 postici late compressi.

G. 10. THOE, *Bell*.§—Carapax late ovatus, rostro parvulo, bifido, dente præorbitali saliente. Oculi breves. Articulus antennarum ext. Imus latissimus. Pedes 1mi *maris* 2dis longiores.

3. Articulus pedum posteriorum 5tus processu infra armatus.

G. 11. DEHAANIUS, *M'Leay*.||—*Hyadi* paulo affinis. Carapax latus, spinâ præorbitali saliente, rostro sat brevi. *Leucippæ* affinis, si oculi non retractiles.

\* Zool. Trans., ii, 35.

† Zool. Trans., ii, 43.

‡ Crust. D'Orbigny's South America 10, pl. 5. The species *P. tuberosus* appears to be the *Hyas Edwardsii* of Bell, Zool. Trans. ii, 49.

§ Zool. Trans. ii, 47.

|| M'Leay, Smith's Illust. Zool. S. Africa.

\*\* *Rostrum saliens, porrectum, tumidum, apice emarginatum.*

5. LIBININÆ.—Carapax latè pyriformis, tumidus, lateribus altis. Oculi perbreves. Pedes sive mediocres sive prælongi.

G. 1. LIBINIA, *Leach.*—Pedes mediocres. Carapax dente præorbitali parvulo instructus. Abdomen *maris feminaeque* 7-articulatum. Articulus antennarum ext. Imus latiusculus, extus non denticigerus.

G. 2. LIBIDOCLEA, *Edw. et Lucas.\**—Pedes longi. Carapax spinis plus minusve armatus, dente præorbitali parvo. Articulus antennarum ext. Imus angustus, apicem acutè productus, extus denticigerus.

G. 3. DOCLEA, *Leach.*—Pedes prælongi. Carapax spinis plus minusve armatus, dente præorbitali carens. Articulus antennarum ext. Imus angustus, abdomen *maris* 7-articulatum, *feminae* 5-7-articulatum.

\*\*\* *Rostrum breve, latissimum, bilobatum, porrectum.*

6. PRIONORHYNCHINÆ.—Carapax ovatus, gibbosus. Oculi breves, Fossæ antennales marginem frontalem fere attingentes.

G. PRIONORHYNCHUS, *Hombroen et Jacquinet.†*

\*\*\*\* *Rostrum latum, valde deflexum.*

7. MICIPPINÆ.—

G. MICIPPA, *Leach.*—Oculi longiusculi. Carapax anticè parce angustior, rostro laminato.

β ANTENNÆ EXTERNÆ SUB ROSTRO CELATÆ.

8. CHORININÆ.—Carapax triangulato-ovatus. Rostrum furcatum. Pedes 8 postici vix compressi.

G. 1. CHORINUS, *Leach.*—Carapax gibbosus, spinis plus minusve armatus, rostro longo, cornubus acuminatis, spinâ præorbitali saliente. Margo orbitalis inferior largè interruptus. Articulus antennarum ext. Imus angustus. Pedes 2di 3tiis valde longiores.

G. 2. CHORILIA, *Dana.‡*—Carapax formâ rostroque *Chorino* affinis. Orbita infra latè interrupta, supra fissa, spinâ præorbitali acutâ. Articulus antennæ externæ Imus angustus, apice externo acutè producto. Pedes 1mi 2dis breviores, 8 postici similes, 2di 3tiis non multo longiores.

G. 3. LAHAINA, *Dana.§*—Carapax formâ rostroque *Chorino* plerumque affinis. Cornua rostri gracillima valde divaricata. Articulus antennæ externæ Imus latus, parce longior quam latior, apice cum processu spiniformi armato. Orbita infra supraque sinu rotundato interrupta, dente præorbitali acuto. Pedes toti graciles.

G. 4. NAXIA, *Edwards.*—Carapax gibbosus, rostro mediocri, cornubus subcylindricis, truncatis, dente præorbitali brevi. Margo orbitalis inferior fissus, non late interruptus. Articulus antennarum ext. Imus latus, apicem angustus.

\* Crust. D'Orbigny's South America, 6, pl. 3.

† Voy. Astrolabe et Zélée au pôle Sud, pl. 1. f. 1.

‡ This volume, p. 269.

§ This volume, p. 269.

G. 5. SCYRA, *Dana*.\*—Carapax gibbosus, rostro mediocri, laminato, cornubus acutis, dente præorbitali acuto. Margo orbitalis superior paulo unifissus. Articulus antennarum ext. Imus omnino angustus, 2dus depressus.

G. 6. HYASTENUS, *White*.†—*Chorino* affinis. Rostrum prælongum, cornubus non depressis, ante poneque oculos directus. Margo orbitalis superior unifissus. Pedes 2di longiores.

9. PYRINÆ.—Carapax subpyriformis. Pedes 8 postici valde compressi.

G. 1. PYRIA, *Dana*.—Carapax depressus, inermis, rostro lamellato, cornubus ovatis. Oculi perbreves, orbitâ spinis non armatâ.

b. OCULI LONGITUDINALITER PORRECTI, CARAPACE ANTICE TRUNCATO.

10. OTHONINÆ.—Carapax antice late truncatus, rostro fere obsoleto. Oculi elongati, cylindrici.

G. OTHONIA, *Bell*.‡—Carapax parce oblongus, suborbicularis, rostro bifido. Antennæ internæ minutissimæ; externæ latæ, articulo 1mo lato, 2do valde depresso, inverso-subtriangulato.

B. Carapax paulo transversus.

81. SALACINÆ.—Carapax fere orbicularis. Pedes 8 postici crassi, longi, articulo penultimo infra recto. Rostrum fere obsoletum integrum.

G. SALACIA, *Edwards* et *Lucas*.§—Carapax gibbosus. Fossa antennalis sub rostro partim excavata. Articulus maxillipedis externi 3ius medio apice emarginatus, hocque emarginatione articulum proximum gerens. *Inacho Grapsoque* affinis.

2. DIGITI APICE OBTUSI, INSTAR COCHLEARIS EXCAVATI.

12. MITHRACINÆ.—Oculi mediocres. Carapax sive paulo oblongus, sive transversus.

G. 1. MITHRAX, *Leach*.||—Carapax sæpe orbiculato-ovatus, interdum transversus. Rostrum aut saliens aut fere obsoletum, bifidum. Articulus antennarum ext. Imus apicem externum duabus spinis longis armatus.

\* This volume, p. 269.

† Ann. Mag. Nat. Hist. [2], xx, 61, and Crust. Voy. of Samarang, p. 11. The species is Seba's fig. 12, pl. 18 of the Thesaurus.

‡ Zool. Trans., ii, 55.

§ Crust. in D'Orbigny's S. Amer., 12, pl. 11.

|| The characters given by White for his genus *Schizophrys* (Ann. Mag. N. H. [2], ii, 282, 283, and Voy. Samarang, Crust., p. 16) do not serve to exclude the species from Paramithrax, Maia or Mithrax. The peculiarity of the orbit described and of the 1st joint of the outer antennæ, as far as understood by the writer from the description, are the same as in the genera just mentioned.

The genus *Dione* of De Haan (Fauna Japon. Crust. p. 82,) differs from Mithrax only in not having the interior apex of the third joint of the outer maxillipeds project inward a little over the insertion of the fourth joint. It corresponds to "*Mithrax triangulaires*" of Edwards.

G. 2. MITHRACULUS, *White*.—Carapax transversus. Articulus antennarum ext. Imus duabus spinis longis non armatus.

13. CYCLACINÆ.—Oculi longi.

G. CYCLAX, *Dana*.\*—Carapax paulo oblongus, orbiculato-ellipticus, rostro sat brevi, bifido, acuto. Pedes 8 postici longi.

FAM. II. TYCHIDÆ.

OCULI RETRACTILES, SUB CARAPACE LATENTES, ORBITIS  
CARENTES.

1. CRIOCARCININÆ.—Rostrum valde deflexum. Carapax oblongus.

G. CRIOCARCINUS, *Guerin*.—Oculi prælongi, orbitæ margo superior processu longo lamellato apicem armato instructus.

2. TYCHINÆ.—Carapax oblongus, anticè latus, latitudine trans-orbitali grandi, rostro non deflexo, sat longo, furcato. Oculi apice paululum exserti.

G. TYCHE, *Bell*.\*—Carapax depressus, anticè cornubus rostri spinisque duabus præorbitalibus totis parallelis et subæquis confectus, spinâ post-orbitali nullâ. Articulus antennarum ext. Imus oblongus, inermis.

3. CAMPOSCINÆ.—Carapax oblongus, rostro fere obsoleto, emarginato. Pedes 8 postici longi. Oculi longè pedunculati et exserti.

G. CAMPOSCIA, *Latreille*.—Carapax subpyriformis, non armatus. Pedes 8 postici subcylindrici, 2di 3tiis breviores.†

FAM. III. EURYPODIDÆ.

OCULI RETRACTILES, NON SESE LATENTES.

1. *Antennæ externæ apertæ.*

1. EURYPODINÆ.—Carapax triangulato-ovatus, rostro longo, furcato. Pedes longi, 4 postici non bene prehensiles. Oculi longi et longe salientes. Spina post-orbitalis oblonga.

G. EURYPODIUS, *Guerin*.—Pedes 8 postici longi, articulo penultimo valde compresso, ensiformi.

G. OREGONIA, *Dana*.‡—Pedes 8 postici sat longi, articulo penultimo subcylindrico.

2. *Antennæ externæ sub rostro celatæ.*

AMATHINÆ.—[An oculi retractiles, iis *Eurypodii* similes, eoque genus hac sede?] Carapax triangulato-ovatus, rostro furcato, latitudine trans-orbitali perangustâ. Pedes longi.

G. AMATHIA, *Roux*.—Carapax gibbosus, valde armatus, rostro prælongo, cornubus divaricatis. Pedes filiformes, prælongi. Oculi parvi. Articulus antennarum ext. Imus perangustus. Epistoma fere quadratum.

\* This vol., p. 269.

† Zool. Trans. ii, 57.

‡ This vol., p. 270.

## FAM. IV. LEPTOPODIDÆ.

OCULI NON RETRACTILES, SESE NON LATENTES. PEDES PRÆLONGI.

A. *Antennæ externæ apertæ.*

1. ACHÆINÆ.—Carapax triangulato-ovatus, rostro perbrevis, bifido. Oculi longi, longèque salientes. Pedes 4 postici subprehensiles.

G. 1. ACHÆUS, *Leach*.—Carapax gibbosus. Pedes 8 postici filiformes, longi, tarso pedum 4 posteriorum falciformi, articulis penultimis subcylindricis.

2. INACHOIDINÆ.—Carapax triangulato-ovatus, rostro elongato, simplice.

G. INACHOIDES, *Edw. et Lucas*.<sup>\*</sup>—Carapax valde gibbosus, rostro longiusculo, acuto, spinâ postorbitali parvâ. Pedes 8 postici sat longi, gracillimi. Articulus antennarum ext. Imus angustus.

B. *Antennæ externæ celatæ.*

3. LEPTOPODINÆ.—Carapax triangulato-ovatus, rostro elongato, simplice. Pedes longissimi.

G. LEPTOPODIA, *Leach*.—Oculi sat salientes. Pedes toti gracillimi.

4. STENORHYNCHINÆ.—Carapax triangulato-ovatus, rostro breve, bifido.

G. STENORHYNCHUS, *Lamarck*.—Oculi sat salientes. Pedes antici crassiusculi.

## FAM. V. PERICERIDÆ.

OCULI NON RETRACTILES, SESE NON LATENTES. PEDES LONGITUDINE MEDIOCRES.

A. *Antennæ externæ apertæ.*

1. PARAMICIPPINÆ.—Rostrum valde deflexum. *Micippæ* aspectu similes.

G. PARAMICIPPA.—Rostrum latum, articulus antennarum ext. 2dus breviter cordiformis. Epistoma perbreve.

2. PERICERINÆ.—Rostrum profundè bifidum, non deflexum.

G. 1. PERICERA, *Latreille*.—Carapax sæpe triangulatus, interdum orbiculato-ovatus, paucis spinis sæpius armatus, rostro divaricatè furcato. Articulus antennarum ext. Imus apice latus et spinâ armatus. Orbita tubulata, oculum strictè includens, margine superiore subtiliter unifisso.

G. 2. TIARINIA, *Dana*.<sup>†</sup>—Carapax subpyriformis, tuberculis plerumque pustuliformibus sæpeque aggregatis ornatus, rostri cornubus gracilibus contiguis. Articulus antennarum ext. Imus apicem latus et inermis, angulo externo interdum saliente tantum.

\* Crust. in D'Orbigny's S. Amer., 4, pl. 4.

† This volume, p. 271.



- G. 3. PERINIA, *Dana*.\*—Carapax orbiculato-ovatus, tuberculis paucis non acutis ornatus, rostri cornubus brevibus, discretis. Articulus antennarum ext. Imus oblongus, apicem non latior, angulo externo valde producto. Orbita anticè aperta, margine superiore non unifisso.
- G. 4. HALIMUS, *Latreille*.—Carapax triangulato-ovatus, cornubus rostri grandibus, divaricatis. Articulus antennarum ext. Imus angustus. Articulus pedum 8 posticorum 5tus valde compressus, processu infra non armatus.
- G. 5. PUGETTIA, *Dana*.†—Carapax triangulato-ovatus. Rostro antennisque ext. *Halimo* affinis. Articulus pedum 8 posticorum 5tus cylindricus.
3. MENÆTHINÆ.—Rostrum integrum aut subintegrum.
- G. 1. MENÆTHIUS, *Edwards*.—Carapax triangulato-ovatus, depressus, regione antero-laterali plicis tribus plus minusve ornatâ. Pedes 8 postici cylindrici. ‡
- G. 2. ACANTHONYX, *Latr.*—Carapax depressus, non tuberculatus, sive subtriangulatus sive subquadratus (dente post-orbitali dilatato), regionibus non conspicuis, dente præorbitali parvulo, rostro crasso, apice emarginato. Pedes 8 postici mediocres, articulo penultimo compresso, infra dilatato et sæpe dentigero.
- G. 3. ANTILIBINIA, *M'Leay*.§—Carapax valde convexus, regionibus non conspicuis, latitudine transorbitali minore (lat. max. 3plo latiore), rostro crasso, apice emarginato. Articulus pedum 8 posticorum penultimus infra non dilatatus nec dentigerus.
- G. 4. PELTINIA, *Dana*.||—Carapax depressus vix tuberculatus, dente præorbitali breviter instructus, latitudine transorbitali majore (lat. max. 2plo latiore), rostro lato, profundè bifido, sat brevi. Articulus pedum 8 posticorum penultimus infra non dilatatus nec dentigerus.

*B. Antennæ externæ sub rostro celatæ.*

1. Oculi prælongi.

4. STENOCIONOPINÆ.—Rostrum longum, furcatum, cornubus styli-formibus, divaricatis.

G. STENOCIONOPS, *Latreille*.—Carapax subpyriformis, gibbosus, spinâ præorbitali longissimâ. Articulus antennarum ext. oblongus.

2. Oculi aut longitudine mediocres aut perbreves.

5. EPIAL TINÆ.—Rostrum oblongum, crassum, sive integrum sive emarginatum. Antennæ ext. apicem rostri sæpius non attingentes. Pedes 8 postici subcylindrici.

\* This volume, p. 271.

† Ibid, p. 268.

‡ The genus *Xiphus* of Eydoux and Souleyet, as figured in the plates of the Voyage of the Bonite, has the beak, præorbital spine or tooth, outer antennæ, and general form of Menæthius. But the eyes may be longer pedunculate, and as there is no description, it is not apparent whether they are retractile or not. The species is called *Xiphus margaritiferus*. The beak is pointed, and the 3d basal joint of the outer antennæ reaches to apex of beak.

§ Smith's *Illust. S. Af. Zool.*

|| This volume, p. 272.

- G. 1. *EPIALTUS*, *Edw.*—Carapax inermis, vix tuberculatus, regionibus non conspicuis. Octo pedes postici nudi aut subnudi, articulo penultimo infra sæpe subdentigero.
- G. 2. *HUENIA*, *De Haan*.<sup>\*</sup>—Carapax 2-4 tuberculis acutiusculis sæpius armatus, interdum inermis, regionibus inconspicuis, rostro simplice, angulo carapacis postero-laterali prominente. Articulus pedum 8 posticorum penultimus plerumque infra dilatatus, denigerus.
- G. 3. *XENOCARCINUS*, *White*.<sup>†</sup>—Carapax tuberculis subacutis sparsim armatus, rostro simplice, truncato, margine postero-laterali non angulato, rotundato.
- G. 4. *LEUCIPPA*, *Edw.*—Carapax subtriangulatus fere inermis, regionibus non conspicuis, spinâ præorbitali nullâ. Pedes supra carinati, articulo penultimo infra non producto. Dens post-orbitalis prope oculum insitus, oculum vero non celante.
- Genus *ZEBRIDA*, *White*,<sup>‡</sup> incertæ sedis; antennis externis obitâque *Eumedono* similis, eoque Parthenopineis congruit.—Carapax depressus, non armatus antice latior, dente post-orbitali portentose expanso, rostro latissimo, lamellato, profundè furcato. Oculi paululum salientes. Pedes compressi, angulati. Articulus antenarum externarum 1-mus *hiatum orbitæ occupans*, antice non productus.

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<sup>\*</sup> Crust. Faun. Japon. 73.

<sup>†</sup> Jukes's Voy. H. M. S. Fly; Ann. Mag. N. H. [2], i, 331; Crust. Voy. Erebus and Terror, pl. 2, fig. 1.

<sup>‡</sup> Crust. Voy. of Samarang, p. 23.

ON THE

## CLASSIFICATION OF THE CANCROIDEA.

By JAMES D. DANA.

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THE Cancroidea (or Crustacea Cyclometopa), like the Maioida, are characterized by having, (1) the branchiæ 9 in number, 7 of which lie so as to form the exterior of the branchial pyramid; (2) the efferent passage from the branchial cavity passing over the lateral portions of the palate; (3) the male genital orifices situated in the base of the posterior legs and covered by the abdomen; (3) the male abdomen not narrower at base than the corresponding part of the sternum; (4) the buccal area subquadrate, and the 4th joint of the outer maxillipeds articulated with the 3d by its inner angle. The Telphusidæ have these characters, and may be considered true Cancroidea, though approximating to the Grapsoidea in the large vacant space in the branchial cavity, and having some peculiarities in the branchiæ fitting them for freshwater life.

The *Corystes* group also partake of the Cancroid character; yet they diverge from it, in the large outer antennæ more or less hairy, and both in this respect and in form, they approach the *Hippa* group, and thus have a much lower position in the series than the Cancroidea. They have no true relation in the character of the buccal area and efferent canal to the *Leucosia* group.

The genera *Acanthocyclus* and *Corystoides* (of Lucas) have the genital orifices, sternum and abdomen, and outer maxillipeds of the Cancroidea and *Corystoidea*; but the branchiæ (in *Acanthocyclus* at least)

are less numerous, as in the Grapsoidea. The outer antennæ are obsolete, and the inner in *Corystoides* have no fossettes. They are therefore genera of low grade, at the foot of the Cancroidea, and approach closely in rank to the *Corystoidea*.

Our grand divisions of the Cancroidea are hence,

1. CANCRINEA, or CANCROIDEA TYPICA.
2. TELPHUSINEA or CANCROIDEA GRAPSIDICA.
3. CYCLINEA, or CANCROIDEA CORYSTIDICA.

The character of the efferent passage or canal, separating the Leucosoid Crustacea or Oxystomata, is the most striking among the Brachyura. While, in all other species, this passage passes over the outer portions of the palate or prælabial area, in these, it passes over the medial portions, and terminates at the middle of the front margin of the buccal area which is therefore elongated, giving the area a triangulate outline: the character of this passage and not the form of the area is the important character of the Leucosoidea. The inner branch of the 1st pair of maxillipeds is modified to correspond, as it covers (more or less perfectly) in this and all the Brachyura the efferent passage.

The efferent passage, which affords the striking character alluded to, has its different degrees of perfection among the Cancroidea. In a large number of genera, the waters wash over the palate without any confining ridge: but in others there is a distinct ridge, running longitudinally, near the middle of either lateral half of the palate, and terminating at the front margin of the buccal area. This ridge is prominent in *Eriphia*, *Ruppellia*, *Ozius*, *Pilumnoides*, *Melia* (as the writer has observed) and some other genera, and is also distinct in *Pilumnus*. It is wanting in *Cancer*, *Xantho*, and the allied, or if a trace is to be observed, (as in *Menippe Rumphii* and some other species,) it does not reach to the front margin of the buccal area. We have in this character, therefore, an important distinction separating the non-natatory Cancrinea into two groups, the Cancridæ and the Eriphidæ. Mere breadth of carapax alone is of very little value as a characteristic: *Xantho* passes by its allied genera into species but little broader than long, and so with *Chlorodius*.

Among the swimming species, a large part, as detected by De Haan, have a small lobe attached to the inner margin of the inner branch of the 1st maxillipeds: while others, as *Platyonychus* and the allied have no such lobe and approximate somewhat to the *Corystoidea*, although not properly, as we think, of that group.

The species of *Lupa* and *Thalamita* have a ridge upon the palate either side bounding the efferent passage; but there is one exception in *Lupa cribraria*, which species consequently must pertain to a distinct group from the other *Lupas*.

In these brief remarks on the classification of the Cancroidea, we leave much to be gathered from the following synopsis. But a few words should be offered on the genera of De Haan and Edwards; partly because the two are to some extent in conflict, and partly because several of those of De Haan are of unessential importance. The publication of the first fascicle of De Haan's *Crustacea of the Fauna Japonica* in 1833, preceded Edwards by a year, but the descriptions of his genera were so concise and imperfect that it was not possible for any one to have recognized them all.

*Ruppellia* of Edwards, and *Eudora* of De Haan, have the same typical species. But De Haan neglected to observe in the type the important peculiarity of the orbit, (its being wholly closed within so as to exclude the base of the outer antennæ, a peculiarity found in no *Brachyura* except a few of the *Eriphidæ*,) and hence his genus includes, according to his own use of it, some Xanthoid species. The two names are by no means synonyms; and adopting the group as laid down by Edwards, we are forced to adopt his generic name. Modifications to some extent may be made in accepted genera, and this we have attempted in some instances below, but not the complete perversion that would happen by giving De Haan's name to Edwards's genus.

De Haan has not recognized the distinction between the pointed and spoon-shape figures as a generic characteristic, and this makes some difficulty in substituting his names for those of Edwards, where the groups are otherwise similar. This characteristic was first employed by Leach and subsequently by Edwards. The genera of the two kinds often graduate into one another: but the parallel relation between the series is best shown by retaining them apart in separate subfamilies. Between our *Xanthinæ* and *Chlorodinæ* there is nearly a perfect parallelism. De Haan's species of the genus *Xantho* are in part *Chlorodii*.

De Haan has multiplied much the genera of swimming Crabs, by subdividing *Lupa* and *Thalamita*. This has partly arisen from an unwarranted reliance for the characteristic on the form of the 3d joint of the outer maxillipeds, as well as on that of the inner branch of the 1st maxillipeds.

In a former paper it was observed that the 3d joint of the outer maxillipeds may undergo great variations in proportion in the same genus. This is well illustrated among the *Portunidæ*. *Amphitrite* of De Haan (a subdivision of *Lupa*) is described as having this joint *short and oblique*. But in species of true *Amphitrite*, it varies from this form to a form unusually oblong. Again he makes *Neptunus* and *Achelous* differ from *Amphitrite* in having this joint more oblong, the reverse of which is actually the fact among many of the species examined by the writer. So *Thalamita* is characterized by having this same joint short, when in fact it is sometimes longer than broad. The form in one species (*T. integra*, *D.*) scarcely differs in relative length or obliquity from that of *Lupa dicantha*. Again *Oceanus* (*Thalamita crucifera* of Edwards) is said to have the inner branch of the 1st maxillipeds three-lobed, and *Thalamita*, as having the inner margin unidentate. The latter has the inner lobe as in *Oceanus*, and this makes the one tooth; the margin outside of this lobe or tooth, is straight at top in some species (*T. crassimana* and *crenata*), but excavate in others, becoming even deep and angulate in *Th. integra*, a species very near *admetus* in form and general characters. There is thus a gradual transition to the form in *Oceanus*. Such variations in this margin are therefore unimportant, as many other cases illustrate.

Our grand divisions are named after the larger to which they approximate. This plan might be carried farther with much profit. Thus among the five families of *Cancrinea*—the *Cancridæ*, are the *Cancrinea Typica*; the *Eriphidæ*, are the *Cancrinea Grapsidica*, for in the ridges of the palate as well as form they approximate to *Grapsus*;

the Portunidæ, are the *Cancrinea Typica Natatoria*; the Platyonychidæ, the *Cancrinea Corystidica Natatoria*; the Podophthalmidæ, the *Cancrinea Grapsidica Natatoria*. Again, among the subfamilies of Cancridæ, the Cancrinæ, are the *Cancridæ Corystidicæ*; the Xanthinæ and Chlorodinæ, the *Cancridæ Typicæ*.

The following is a synopsis of the known genera of Cancroidea.—

## LEGIO I. CANCRINEA, VEL CANCROIDEA TYPICA.

### FAM. I. CANCRIDÆ.

Pedes postici gressorii. Ramus maxillipedis 1mi internus simplex. Palatum (vel area prælabiata) colliculo ad marginem anticum producto non divisum. Carapax sæpius late transversus, interdum angustus.

1. CANCRINÆ.—Antennæ internæ plus minusve longitudinales. Frons interorbitalis perangustus. Digi acuminati.

G. 1. CANCER,\* *Leach*.—Pars antennæ externæ mobilis hiatu orbitæ omnino exclusa. Carapax latissimus.

G. 2. PIRIMELA, *Leach*.—Pars antennæ externæ mobilis hiatu orbitæ non exclusa. Carapax perangustus.

2. XANTHINÆ.—Antennæ internæ plus minusve transversæ. Antennæ externæ basi firmè infixæ, parte mobili hiatu orbitæ non exclusâ. Frons interorbitalis latior. Digi acuminati.

1. *Regio carapacis postica convexa. Orbita hiatu externo non interrupta.*

G. 1. ATERGATIS, *De Haan*.†—Margo antero-lateralis postero-laterali longior. Pedes 8 postici compressi, cristati.

G. 2. CARPILIUS, *Leach, De Haan*.—Margo antero-lateralis postero-laterali longior. Frons sæpissime bene 4-lobatus. Ramus maxillipedis 1mi internus lobato-furcatus. Pedes 8 postici nudi, subcylindrici, non cristati.

G. 3. LIOMERA, *Dana*.‡—Frons leviter 2-lobatus aut rectiusculus. Margo antero-lateralis postero-laterali non brevior. Ramus maxillipedis 1mi internus non lobatus. Pedes 8 postici nudi, subcylindrici, non cristati.

G. 4. LIAGORA, *De Haan*.§—Margo antero-lateralis postero-laterali brevior. Frons leviter 2-lobatus aut rectiusculus. Pedes nudi, tarsi exceptis. Ramus maxillipedis 1mi internus non lobatus.

\* *Platycarcinus*, Milne Edwards, Crust. i, 412.

† Faun. Japon. 17.—*Cancer* of Edwards, Crust. i, 372; and *Platypodia* of Bell, Zool. Trans. i, 335, 1835.

‡ Includes *Carpilius cinetimanus* of White, Crust. Voy. Samarang, 37, pl. 7, f. 4. The lobato-furcate form of the inner branch of the 1st pair of maxillipeds in *Carpilius maculatus* and the allied, is so peculiar, as shown by De Haan, that it must be admitted as a generic distinction. The true *Carpilii* have a strongly 4-lobed margin to the front, though the front is sometimes so bent downward that the lobes are not seen in a vertical view, though distinct in a front view.

§ Faun. Japon. 19.

2. *Regio carapacis postica transversim non convexa.*

a. Carapax versus margines frontalem antero-lateralemque curvatim declivis.

G. 5. ΑΣΤΕΑ, *De Haan*,\* *Dana*.—Margo postero-lateralis brevis, sæpius concavus. Orbita hiatu externo non interrupta.

b. Carapax versus margines frontalem antero-lateralemque parce declivis.

α *Orbita hiatu externo non interrupta.*

G. 6. ΧΑΝΘΟ, *Leach*.—Margo antero-lateralis postero-laterali longior. Articulus antennæ externæ Imus oblongus, frontem bene attingens, articulo sequente e apicis medio articuli Imi orto.

G. 7. ΕΥΧΑΝΘΟΣ, *Dana*.—*Xantho* formâ similis: articulus antennæ externæ Imus hiatum ad summum implens, articulo sequente e latere excavato apicis orto.

G. 8. ΠΑΡΑΧΑΝΘΟΣ, *Lucas*.†—*Xantho* formâ similis: articulus antennæ externæ Imus abbreviatus processum frontis oblongum attingens tantum. Abdomen maris 5-articulatum.

G. 9. ΜΕΝΙΠΠΕ, *De Haan*.‡—Margo antero-lateralis postero-laterali brevior. Articulus antennæ externæ brevis nec frontem nec frontis processum attingens. Abdomen maris 7-articulatum.

β *Orbita hiatu externo interrupta, infra integra.*

G. 10. ΠΑΝΟΡÆΟΣ, *Edwards*.—Margo antero-lateralis tenuis, postero-laterali sæpius brevior, ad orbitæ angulum externum directus.

γ *Orbita infra extusque tribus dentibus instructa, uno externo, duobus inferioribus.*

G. 11. ΜΕΔÆΟΣ, *Dana*.—Angustus, paulo transversus, [nudus,] fronte sat brevi. Margo antero-lateralis sub orbitâ productus. Abdomen maris 5-articulatum, segmento ultimo brevi. Pedes antichi crassi, iis *Xanthi* similes.

G. 12. ΗΑΛΙΜΕΔΕ, *De Haan*.§—Angustus, parce transversus, [villosus,] fronte brevior. Abdomen maris 7-articulatum, segmento ultimo valde elongato. Pedes antichi crassi, iis *Xanthi* similes.—An *Pilumnis* propinquior?

3. CHLORODINÆ.—Antennæ internæ transversæ. Antennæ externæ basi firmè infixæ, parte mobili hiatu orbitæ raro exclusâ. Frons interorbitalis latior. Digni instar cochlearis excavati.—Quoad genera, *Xanthinæ* et *Chlorodinæ* ferme parallelæ.

\* Faun. Japon. 18.

† Crust. D'Orb. S. Am., 18. We see no sufficient character for sustaining this genus, excepting the short basal joint of the outer antennæ.

‡ Faun. Jap. 21.—*Pseudocarcinus* of Edwards, Crust. i, 407.—*Pelæus*, Eydoux and Souleyet, Voy. de la Bonite. *Pelæus armatus* is the name given to a Sandwich Island species figured in the plates of the Bonite, but not yet described.

§ Faun. Japon. 35. Our *Medæus* has nearly the outline of *Halimede*, but is naked and very deeply areolate. It is a *Xantho* in nearly all its characters, though narrow, and having the orbit below deeply divided. On this account, I have introduced *Halimede*, which resembles our genus in form, in this place, not having had an opportunity to study its characters from specimens.

1. *Hiatus orbitæ internus processu basis antennæ externæ occupatus, articulum 2dum occludens.*

G. 1. ETISUS, Leach.\*

2. *Hiatus orbitæ internus basi antennæ externæ occupatus, articulo 2do non occluso.*

1. Regio carapacis postica convexa.

G. 2. CARPILODES, Dana.—Carapax latus, nudus, margine antero-laterali crassè rotundato. Pedes 8 postici subcylindrici, nudi. *Liomeræ* habitu similis.

G. 3. ZOZYMUS, Leach.†—Carapax mediocriter latus, margine antero-laterali tenui. Pedes 8 postici valde compressi, cristati aut subcristati. *Atergati* habitu similis.

2. Regio carapacis postica fere plana.

a. *Carapax versus margines frontalem antero-lateralemque curvatim declivis.*

G. 4. ACTÆODES, Dana.‡—Pedes 8 postici non cristati. *Actææ* aspectu similis. Articulus maxillipedis externi 3tius apicem vix excavatus.

G. 5. DAÏRA, De Haan.§—Pedes 8 postici non cristati. Articulus maxillipedis externi 3tius apice valde emarginatus.

b. *Carapax versus margines frontalem antero-lateralemque vix declivis.*

G. 6. CHLORODIUS, Leach.||—Carapax plus minusve transversus. Articulus antennæ externæ 1mus oblongus frontem bene attingens. Articulus maxillipedis externi 3tius subrectangulatus. *Xantho* aspectu similis.

G. 7. PILODIUS, Dana.—Carapax paulo transversus. Articulus antennæ externæ abbreviatus, processum frontis oblongum attingens tantum. *Paraxantho* aspectu similis.

G. 8. CYCLODIUS, Dana.—Carapax parce transversus. Articulus antennæ externæ oblongus frontem bene attingens. Articulus maxillipedis externi 3tius triangulatus, latere interiore brevissimo.

G. 9. CYMO, De Haan.¶—Carapax non transversus, fere orbiculatus, disciformis. Antennis *Chlorodio* affinis.

\* Part of the species (the typical) have the arm long projecting, and a broad form somewhat like Cancer. Another part, quite different in habit, have a short arm as in Actæodes, and graduate into Actæodes. The latter may well be named ETISODES.

† *Zozymus* of Leach and *Ægle* of De Haan have the same species as type, the *Z. æneus*, and De Haan makes the cristate character of the 8 posterior legs a generic character. We follow him in this respect, though adding the character dependent on the spoon-shape of the fingers, as done by Leach.

‡ Includes *Zozymus tomentosus* and the allied, in which the 8 posterior legs are not cristate. The species are closely like Actææ except in the fingers.

§ Faun. Japon. 18; *Lagostoma*, Edwards, Crust. i, 386.

|| *Chlorodius* of De Haan (F. Jap. 13) of subsequent date, is synonymous with *Atelecyclus* of Leach.

¶ Faun. Japon. 22.



4. POLYDECTINÆ.—Antennæ internæ transversæ. Antennæ externæ basi solutæ, liberæ.—An *Pilumnis* propinquior?

G. POLYDECTUS, *Edw.*\*—Orbita dentibus tribus infra instructa. Manus elongata, digitis prælongis, attenuatis, uncinatis, cum dentibus tenuiter spinuliformibus sæpe armatis.

#### FAM. II. ERIPHIDÆ.

Pedibus maxillipedeque Imo *Cancridis* affinis. Palatum colliculo usque ad marginem anticum producto utrinque divisum. Carapax sæpius angustus, interdum latus, latitudine ante-medianâ sæpissimè majore, oculis remotis.

1. CETHRINÆ.—Carapax transversus, lateribus valde dilatatus et rotundatus. Antennæ internæ fere longitudinales.

G. 1. CETHRA, *Leach*.

2. OZINÆ.—Carapax plus minusve transversus. Digiti acuminati. Antennæ internæ transversæ. Orbita hiatu interno basi antennæ occupato instructa. Abdomen *maris* 7-articulatum.

1. *Articulus antennæ externæ Imus frontem bene attingens.*

G. 1. GALENE, *De Haan*.†—Carapax transversus, longitudinaliter multo convexus, antice declivis.—An *Potamiæ* propinquior?

G. 2. OZIUS, *Leach*.—Carapax transversus, latus, fere planus.

2. *Articulus antennæ externæ Imus frontem non attingens.*

G. 3. PSEUDOZIUS, *Dana*.‡—Carapax transversus, fere planus, latior, margine antero-laterali brevior.

G. 4. PILUMNUS, *Leach*.—Carapax angustus, parce transversus, sæpius convexus, margine antero-laterali brevior.

G. 5. PILUMNOIDES, *Edw.* et *Lucas*.§—Carapax angustus, parce transversus, valde convexus, margine antero-laterali longior, bene arcuato, super carapacem postice incurvato.

\* This genus is very peculiar in the hand: both fingers are long styliform and very slender, with incurved apices, and hardly touching except at tips, and when dentate the teeth are delicate spines on the inner margin; moreover, the part of the hand anterior to the fingers is quite short. A species collected by the writer is closely like the *P. cupulifer* in most of its characters. The form of the hand is very unlike anything among other Cancroidea; and Halimede which has been supposed to be near Polydectus, has (like Medæus) the ordinary form, like that in Xantho.

The genus *Iphiculus* of White (*Crust. Voy. Samarang*, 57, pl. 13, f. 5), has the general characters of our Polydectus—the same villous coat, similar fingers, even to the spiniform dentation of the fingers, and other resemblances; and we suspect although a broader species, that his *I. spongiosus* is a true *Polydectus*.

The specimen of the Polydectus, from which a description with a colored drawing was taken by me while it was living, is not now found in our collections, and I have not therefore been able to ascertain the character of the prælabial plate and thus assure myself whether the species are related to the Eriphidæ or not. It is very possible that the true place is after Ozinæ.

† Faun. Japon. 19.

‡ Near Pseudocarcinus, from which it differs in the ridge on the prælabial plate, as well as in its flatter form.

§ *Crust. D'Orb. S. Am.*, 21.

G. 6. MELIA, *Latr.*—Carapax subquadratus, fere planus, fronte lato, oculis versus angulos insitis. Pedes toti graciles. Basis antennæ externæ cylindricus.

An genus sequens hîc pertinet?

ACANTHODES, *De Haan.\**—Carapax angustus, *Pilumno* formâ affinis, spinis grandibus anticè armatus. Pedes spinosi.—Species *Acanthodes armatus* Haanii magnitudine portentosus.

3. ACTUMNINÆ.—Orbitâ *Ozinis* similis. Digiti instar cochlearis excavati.

G. ACTUMNUS, *Dana.†*—Carapax paulo transversus, valde convexus, antice lateraliterque curvatim declivis. Articulus antennæ externæ Imus processum frontis attingens tantum.

4. ERIPHINÆ.—Orbita infra bene clausa, hiatus interno carens, articulo antennæ e orbitâ omnino excluso. Carapax sive paulo transversus sive subquadratus.

G. 1. RUPPELLIA, *Edw.*—Carapax latior. Antennæ pars mobilis externæ orbitâ paululum remota. Articulus maxillipedis externi 3tius paulo transversus.

G. 2. ERIPHIA, *Latr.*—Carapax angustus, convexus, fronte sæpius valde declivi. Antennæ pars mobilis externæ orbitâ longe remota. Articulus maxillipedis externi 3tius paulo transversus.

G. 3. DOMÆCIUS, *Souleyet.‡*—*Ruppellia* formâ antennisque externis affinis. Articulus maxillipedis externi 3tius valde transversus, brevissimus, epistomam tegens.

G. 4. TRAPEZIA, *Latr.*—Carapax subquadratus, planus, glaber, fronte horizontalis, leviter 6–8-dentatus, aut sinuosus, lateribus longitudinalis. Tarsi non unguiculati, minute spinulosi. Brachium ultra carapacem longe exsertum.

G. 5. TETRALIA, *Dana.§*—Carapax aspectu *Trapezia* affinis. Frons horizontalis, rectiusculus, subtilissimè denticulatus. Tarsi breviter unguiculati. Brachium ultra carapacem paulo exsertum.

G. 6. QUADRELLA, *Dana.*—Carapax subquadratus, paulo convexus, lævis, fronte horizontalis, 6-spinoso-dentatus. Tarsi unguiculati. Brachium ultra carapacem longe exsertum.

#### FAM. III. PORTUNIDÆ.

Pedes postici natatorii, tarso laminato. Ramus maxillipedis Imi internus lobo interno instructus. Palatum colliculo utrinque sæpissime divisum. Corpus sive latum sive angustum, oculis sat brevibus.

\* Faun. Japon. 20.

† Very near *Actæa*, but the prælabial plate or palate is strongly divided by a ridge either side. Besides, the form is much narrower and more convex than in the *Actæa*, being subglobose above.

‡ Voy. of the Bonite; also, "Voy. au Pole Sud," under D'Urville, in the *Astrolabe* and *Zélée*, plate 6, figs. 3-7, by Hombron and Jacquinot.

§ This Journal, [2] xi, 223.

1. LUPINÆ.—Sutura sterni mediana segmenta tria intersecans. Palati colliculi prominentes.

1. *Pars antennæ externæ mobilis hiatu orbitæ non oclusa, orbitâ jacendo aptata.*

G. 1. SCYLLA, *De Haan*.\*—Valde latus et crassus, marginibus anterioribus simul sumtis bene arcuatus, antero-laterali longiore quam postero-lateralis. Pedes antici breviores, crassissimi, manu valde tumidâ, non angulatâ vel prismaticâ.

G. 2. LUPA, *Leach*.†—Valde latus, marginibus anterioribus totis simul sumtis bene arcuatus. Manus elongatè trigona aut prismatica, costata.

G. 3. AMPHITRITE, *De Haan*,‡ *Dana*.—Angustior. Margines frontalis antero-lateralisque angulo convenientes, antero-laterali raro brevior quam postero-lateralis. Manus elongata, prismatica. Basis antennæ externæ crassus, hiatu orbitæ parce angustior.

G. 4. CARUPA, *Dana*.—Transversus. Margines frontalis antero-lateralisque angulo convenientes, fronte recto, emarginato. Basis antennæ externæ subcylindricus, hiatu orbitæ multo angustior.

2. *Pars antennæ externæ mobilis hiatu orbitæ omnino per basis processum oclusa, orbitâ plus minusve remota.*

G. 5. THALAMITA, *Latr*.—Latus. Frons dimidio latitudinis carapacis longior; margo antero-lateralis longitudinalis. Articulus antennæ externæ 1mus prælongus, 2dus orbitâ remotissimus. Pedes antici longi, manu elongatâ.

G. 6. CHARYBDIS, *De Haan*, *Dana*.§—Angustior. Frons dimidio latitudinis carapacis brevior; margo antero-lateralis obliquus. Articulus antennæ externæ 1mus paulo oblongus, 2dus orbitâ paulo remotus. Pedes antici longi, manu elongatâ.

G. 7. LISSOCARCINUS, *White*.||—Suborbiculatus, lævis, subporcellanus. Articulus antennæ externæ 1mus brevis, fere longitudinalis, articulo sequente orbitâ parce remoto. Pedes nudi; antici breves, brachio ultra carapacem vix saliente, manu perbrevis.

2. ARENÆINÆ.—Sutura sterni mediana segmenta tria intersecans. Palatum colliculo utrinque non divisum. Ramus maxillipedis 1mi internus ad apicem late transversim triangulatus lineamque medianam fere attingens.

\* Faun. Japon. 11.

† *Neptunus*, *Pontus* and *Achelous* of De Haan, (Faun. Japon., 8, 9,) the distinctions between which genera appear not to be sustained.

‡ Faun. Japon. 8. Includes, as here adopted, the *Lupa* of De Haan, which division he restricts to the *Lupa forceps* (Edw. Crust. i, 456). The *Lupocyclus* of Adams and White, (Crust. Voy. Samarang, 47, pl. 12, f. 4,) appears to be identical with *Amphitrite*.

§ Fauna Japon. 10. Includes both *Charybdis* and *Oceanus* of De Haan, which divisions shade into one another by imperceptible gradations, and are not distinguished by any important characters. Corresponds to the "Thalamites Hexagonales" of Edwards.

|| Crust. Voy. Samarang, 45. We have taken the generic characters from a species collected by us, in connection with the description by White.

G. ARENÆUS, *Dana*.—*Lupa* affinis. Carapax valde latus, antice arcuatus. Pars antennæ externæ mobilis hiatu orbitæ insita. Manus prismatica.\*

3. PORTUNINÆ.—Sutura sterni mediana segmenta duo intersecans. Colliculi palati sæpius obsoleti.

G. PORTUNUS, *Fabr.*—Angustus, margine antero-laterali brevior quam postero-lateralis.

#### FAM. IV. PLATYONYCHIDÆ.

Pedes postici natatorii, tarso laminato. Ramus maxillipedis 1mi internus lobo interno non instructus. Palatum colliculo utrinque non divisum. Corpus angustum.

G. 1. CARCINUS, *Leach*.†—Pedes postici male natatorii, tarso angustè lanceolato. Carapax parce transversus.

G. 2. PORTUMNUS, *Leach*.—Pedes 5ti natatorii tantum, tarso lanceolato, acuto. Carapax non latior quam longior.

G. 3. PLATYONYCHUS, *Latr.*‡—Pedes 5ti natatorii tantum, tarso lato, elliptico. Carapax latior quam longior.

G. 4. POLYBIUS, *Leach*.—Pedes 2di, 3tii, 4ti, 5ti toti natatorii, tarsis late lanceolatis.

#### FAM. V. PODOPHTHALMIDÆ.

Pedes postici natatorii, tarso laminato. Ramus maxillipedis 1mi internus lobo interno instructus. Corpus latum, antice valde transversum, orbitis oculisque longissimis.

G. PODOPHTHALMUS, *Lamarck*.

### LEGIO II. TELPHUSINEA, VEL CANCROIDEA GRAPSIDICA.

#### FAM. I. TELPHUSIDÆ.

Carapax subquadratus aut orbiculato-quadratus. Palatum colliculo utrinque sæpius divisum. [Species Eriphiis paulo affines.]

G. 1. TELPHUSA, *Latr.*—Articulus maxillipedis externi 3tius subquadratus, 2dus oblongus. Carapax subquadratus.

G. 2. TRICHODACTYLUS, *Latr.*—Articulus maxillipedis externi 3tius subtriangulatus, 2dus oblongus.

\* This genus is instituted for the *Lupa cribraria*, which differs from the other *Lupas* in the characters stated. This species occurs in the shallow waters off a sand beach.

† *Xaiva* of M'Leay (Smith's *Illust. Zool. S. Africa*) is described as near *Carcinus*. The narrow form is the same; the antero-lateral margin 1-dentate and shorter than the postero-lateral; the tarsus of the 5th pair of legs wider than in *Carcinus*; the 3d joint of the outer maxillipeds subquadrate and carinate at base, with the inner margin emarginated for the next joint just above its middle, a form which occurs in *Platyonychus*.

‡ *Anisopus* of De Haan, *Faun. Japon.*

G. 3. VALDIVIA, *White*.\*—Articulus maxillipedis externi 2dus brevior quam latior, 3tius longior quam latior.

G. 4. POTAMIA, *Latr.*—Articulus maxillipedis externi 3tius apice subtriangulatus anguloque apicali 4tum gerens. Palatum colliculo utrinque bene partitum.

An hîc pertinet genus *Galene* Haanii?†

### LEGIO III. CYCLINEA, VEL CANCROIDEA CORYSTIDICA.

Pedibus maxillipedeque Imo CANCRIDIS affinis. Palatum colliculo utrinque non divisum. Antennæ externæ obsoletæ. Carapax angustus, suborbiculatus. Branchiæ numero septem.

G. 1. ACANTHOCYCLUS, *Lucas*.‡—Carapax orbiculatus. Pedes longitudine mediocres, tarso uncinato.

G. 2. CORYSTOIDES, *Lucas*.§—Carapax oblongus, ellipticus. Pedes longiores, tarso styliformi, longo. Antennæ internæ fossis carentes.

2. *Additional note to the Remarks on the Classification of the Maiioidea*; by JAMES D. DANA.||—The following genus by Krøyer¶ should be added to the synopsis given in the last number of this Journal. It appears to belong to the subfamily Inachinæ, and is classed near *Inachus* by its author. The species on which the genus is founded is the *Cancer phalangium* of Fabricius, Faun. Groenl. n. 214, and his *Cancer Opilio* in Det danske Vid. Selsk. Skr. nye Saml. iii, 180. It is from Greenland. Krøyer gives the following generic characters:—

G. CHIONÆCETES.—Cephalothorax depressus, subtriangularis, eadem fere longitudine ac latitudine, antice truncatus, fronte lata rostroque horizontali, bifido, brevissimo. Pedes 2di paris duplicem cephalothoracis longitudinem superantes, triplicem vero non attingentes; pedes 1mi paris 2dis tertiisque breviores, cephalothorace vero longiores (interdum duplo); chelis acuminatis, falcatis; *pedes 2di, 3tii, 4tique paris compressi*, 5ti paris subcylindrici. 3tius pedum maxillariorum externorum articulus fere quadratus eadem pæne longitudine ac latitudine; 4tus articulus angulo interno tertii adnexus; oculi crassi, in orbitam retractiles; pars antennarum externarum terminalis mobilis brevissima. Abdomen sex constat articulis.—The name Chionæcetes is from *χιων*, *nix*, and *οικητης*, *incola*.

\* Ann. and Mag. Nat. Hist., xx, (1847,) 206.

† See page 127, where it is placed with the Ozinæ. The branchial cavity is very large, as in Potamia, and contains outside of the branchiæ a large open space. The shell of a specimen from the Sandwich Ids. closely like the *G. natalensis* of Krauss, has the appearance of a fresh-water or land species, the texture being less calcareous than in most marine species. The specimen was not collected by the writer, and its exact habitat is not known. Krauss's species occurred under stones on the shores at the mouth of a river in South Africa.

‡ Crust. D'Orbign. S. Am. 29, pl. 15,

§ Crust. D'Orbign. S. Am. 31, pl. 16.

|| Last volume of this Journal, p. 425.

¶ Tidskrift, ii, 249.



ON THE  
CLASSIFICATION  
OF THE  
CRUSTACEA GRAPSOIDEA.

By JAMES D. DANA.

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THE GRAPSOIDEA, in the system here explained, correspond to the Cyclometopa of Edwards, excepting that we separate the Telphusa, group and place it with the Cancroidea.\*

A few of the species have the fourth joint of the outer maxillipeds articulated by the inner angle with the third, as in the Cancroidea: of these we make the family GONOPLACIDÆ, or the GRAPSOIDEA CANCRIDICA.

In all the other species, this articulation is remote from the inner angle, being either near the middle of the apical margin or at the outer angle. The near universality of this character among the Grapsoidea is proof of its importance, and sustains us in removing from along side of the Gonoplacidæ the Macrophthalmi.

The Macrophthalmus and Ocypod groups are closely related, and with Doto make our *second* family the MACROPHTHALMIDÆ,—characterized by the great length of the eye-peduncles, the very narrow front, and the 2nd joint of the male abdomen narrower than the corresponding part of the sternum.

The GRAPSUS family—the third has the same limits as in the system of Milne Edwards. The form is subquadrate, with the lateral margin anteriorly more or less acute; the front broad; the eyes of moderate length or short; the second joint of the male abdomen usually not narrower than the corresponding part of the sternum. We give more importance than has hitherto been done to the fact of the outer maxillipeds having an oblique piliferous crest on the surface or not; and we make this characteristic the basis of a subdivision of the Grapsidæ (exclusive of the Plagusinæ) into the subfamilies *Grapsinæ* and *Sesarminæ*,

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\* This volume, p. 130.

the former characterized by the absence of this crest. A survey of the groups will at once show, we believe, that we follow natural lines in this subdivision. The *Plagusinæ* are distinguished by longitudinal sinuses in the front of the carapax for the inner antennæ.

The family GECARCINIDÆ—the fourth—is the same in limits as the “Gecarciniens” of Edwards,—the species are remarkable for their thick obese forms, high rounded front and antero-lateral margin, and for having the second joint of the male abdomen but slightly narrower than the corresponding part of the sternum.

The family PINNOTHERIDÆ—the fifth—differs from the “Pinnotheriens” of Edwards in the removal of the genus *Doto*, closely related to *Ocypod*, and also the genus *Myctiris*, an aberrant form between *Pinnothera*, *Doto* and *Helæcius*, but very peculiar in being narrow anteriorly, and having no distinct orbits for the retraction of the eyes. The genus *Myctiris* constitutes the last or sixth family MYCTIRIDÆ. In the *Pinnotheridæ*, the male abdomen is much narrower than the sternum behind, which character separates them from the *Gecarcinidæ*.

We do not believe in a properly lineal order in classification; yet the succession we have given to the families is a natural succession, as nearly as can be made. The *first*, *Gonoplacidæ*, link the *Grapsodea* with the *Cancroidea*, and the genus *Eucrate* is very near *Eriphia* and *Panopæus* in form. The *second*, *Macrophthalmidæ*, is closely allied to the first, so much so that *Marophthalmus* and *Gonoplax* have been arranged in the same group. The *third*, *Grapsidæ*, are again very near the *Macrophthalmidæ*, and the genus *Helice* is almost as correctly placed with one as the other. Thence the transition is as gradual also to the *fourth* or *Gecarcinidæ*, and from the fourth to the *fifth* or *Pinnotheridæ*, and from the fifth to the *sixth* or *Myctiridæ*. Still, there are other relations of somewhat less prominence which this order does not exhibit. That of *Elamena* to *Inachus* has long been recognized.

The *Gonoplacidæ* are placed in the *Cancer* group by DeHaan, who neglected the important distinction based on the male verges. The other genera, exclusive of *Pinnothera* and the species related, he divides into two groups, the *Ocypus* and *Grapsus* groups, the former having the fourth joint of the outer maxillipeds articulated with the outer angle of the third, and the latter, articulated with the middle of the apical margin;—a distinction difficult to carry out and dividing natural groups, as the *Gecarcinidæ*, *Grapsidæ*, &c. His genera of the *Ocypus* group, are, *Doto*, *Scopimera*, *Myctiris*, *Gelasimus*, *Macrophthalmus*, *Cleistosoma*, *Cardisoma*, *Chasmagnathus*, *Helice*, *Uca*, *Ocypoda*, *Acanthopus* (a division of *Plagusia*); those of the *GRAPSUS* group, are, *Gecarcinus*, *Philyra* (division of *Plagusia*), *Plagusia* (another division), *Grapsus*, *Trichopus*, *Eriocheir*, *Pachysoma*, *Goniopsis*, *Platynotus*, *Brachynotus*, *Nautilograpsus*, *Cyclograpsus*, and in his “*Decas Septima*,” published in 1849, he unites with the group, *Pinnotheres* and *Hymenosoma*.

We add a few words on the genera of *GRAPSIDÆ*. Both De Haan\* and Randall† have divided the *Grapsus* of authors into two genera, according to the *short* or *oblong* form of the third joint of the outer max-

\* Faun. Japon., p. 33, 1833.

† Jour. Acad. Nat. Sci., Philad., viii, 124, 126.



illipeds. The former are De Haan's *Grapsi*, and Randall's *Pachygrapsi*; the latter De Haan's *Goniopses* and Randall's *Grapsi*. But the length of this joint, as we have shown in many other cases, is a characteristic of small importance, and such a basis for subdivision is therefore wrong. There are two natural groups; one with arcuate sides, like *G. pictus*, and the other with straight sides like *G. cruentatus* and *G. messor*; and in each, this joint may be short or oblong. *G. variegatus*, like *G. pictus*, has the joint oblong; yet a species every way similar and hitherto referred to the *variegatus* has the same joint not longer than broad.\* We hence reject this subdivision and adopt two others, viz: *Grapsus*, having arcuate sides, and *Goniograpsus*, having straight sides. The latter forms the transition to *Sesarma* and *G. cruentatus* is like the *Sesarmæ* in habit.

The genus *Cyclograpsus* of Edwards is characterized by its author as having a piliferous crest on the outer maxillipeds, though exceptions are admitted. Subsequently, M'Leay made his genus *Gnathochasmus* on the same type. Some recent authors have taken M'Leay's name for these typical species and restricted *Cyclograpsus* to the exceptions. We find no authority in the rules laid down by the British Association, or in the nature of the case, for thus perverting *Cyclograpsus* from its true type as first established, and we therefore make *Gnathochasmus* a synonym of it, and adopt a new name for the species without the piliferous crest. This we believe is due to M. Edwards.

The following is a synopsis of the Families, Subfamilies and Genera of Grapsoidea:—

## CRUSTACEA GRAPSOIDEA.

### I. ARTICULUS MAXILLIPEDIS EXTERNI 4TUS ANGULO 3TII INTERNO ARTICULATUS.

#### FAM. I. GONOPLACIDÆ.

Carapax transversus. Frons quartâ parte latitudinis carapacis longior, paulo deflexus, lamellatus. Antennæ internæ transversæ. Articululus abdominis *maris* 2dus sterno contiguo angustior.

G. 1. EUCRATE, *De Haan*.†—Carapax antice arcuatus, parce declivis, *Panopæo* formâ antennisque affinis. Appendices *maris* sexuales e sterno ortæ abdomineque tectæ. Pedes *maris* antici breves, crassi. Oculi breves. Abdomen *maris* 5-articulatum, versus basin sterno contiguo vix angustius.

G. 2. CURTONOTUS, *De Haan*.‡—Carapax antice arcuatus, parce declivis, margine antero-laterali rotundato. Appendices *maris* sexuales e basi pedum ortæ, in canaliculo sterni ductæ, deinde abdomine tectæ. Oculi breves. Pedes *maris* antici prælongi.

\* The species referred to is one from Valparaiso. The *G. variegatus*, according to its description by Edwards, and the figure by Guerin, has the joint quite oblong. The Valparaiso species, which we name the *Grapsus planifrons*, has this joint no longer than broad.

† Crust. Faun. Japon., p. 36. *Geryon*, Krøyer, Tidsskrift, i, (1837,) p. 15, pl. 1.

‡ De Haan, Crust. Faun. Japon., p. 20. *Pseudorhombila*, Edwards, Crust. ii, 53.

G. 3. GONOPLEX, *Leach*.—Carapax latus, trapezoidalis, antice elongatè transversus, angulis anticis acutis. Appendicibus *maris* sexualibus *Curtonoto* affinis. Oculi longi. Pedes *maris* antici prælongi.

2. ARTICULUS MAXILLIPEDIS EXTERNI 4TUS ANGULO 3TII INTERNO NON ARTICULATUS.\*

FAM. II. MACROPHTHALMIDÆ.

Oculi tertiâ parte latitudinis carapacis non breviores. Carapax subquadratus, sæpissimè transversus, antice latissimus, angulis anticis acutis, lateribus non arcuatis. Antennæ internæ sive transversæ sive longitudinales. Articulus abdominis *maris* 2dus sterno contiguo angustior. Articulus maxillipedis 3tius costâ obliquâ piliferâ nunquam ornatus.

1. MACROPHTHALMINÆ.—Antennæ internæ transversæ, sub fronte insitæ. Antennæ externæ basi frontem appressæ. Articulus maxillipedis externi 4tus apertus.

G. 1. CLEISTOSTOMA, *DeH.*\*—Carapax subquadratus, paulo transversus. Frons quartâ parte latitudinis carapacis vix brevior. Oculi longiusculi. Pedes antici *maris femineæ* breves. Articulus maxillipedis externi 3tius 2do vix minor, quadratus.

G. 2. MACROPHTHALMUS, *Latr.*—Carapax latus, transversim rectangulatus. Frons angustissimus. Oculi longissimi. Articulus maxillipedis externi 3tius 2do multo minor.

2. OCYPODINÆ.—Antennæ internæ longitudinales, juxta frontem utrinque insitæ. Antennæ externæ fronte paulum remotæ. Articulus maxillipedis externi 4tus apertus, 3tius 2do minor.

1. *Articulus maxillipedis externi 2dus 3tio valde major.*

G. 1. GELASIMUS, *Latr.*—Oculi graciles, corneâ parvulâ, parce oblongâ. Pedes *maris* antici portentosè inæqui. Manus minor debilis, digitis sæpissimè instar cochlearis excavatis aut spatulatis.

G. 2. HELÆCIUS, *Dana.*†—Oculis habituque *Gelasimo* affinis. Pedes antici subæqui. Abdomen versus basin sterno contiguo vix angustius. Maxillipedes externi sulco lineari fere longitudinali superficie notati.

G. 3. OCYPODA, *Fabr.*—Oculi crassi, corneâ longâ, fere ad pedunculi basin productâ. Pedes *maris* antici inæqui, minoris digitis acuminatis. Abdomen basi angustum. Carapax transversus.

2. *Articulus maxillipedis externi 2dus 3tio parce major, non oblongus.*

G. 4. SCOPIMERA, ‡ *DeH.*—Corpus globoso-cubicum. Pedes *maris* antici subæqui, non crassi. Habitu *Gelasimo* affinis.

3. DOTINÆ.—Articuli maxillipedis externi 4tus et sequentes 3tio celati.

Genus DOTO, *DeH.*§—Corpus subquadratum.

\* Crust. Faun. Japon., p. 26.—From κλειστος, *shut*, and στομα, *mouth*—not *Cleistotoma*.

† Includes *Gelasimus cordiformis*.

‡ Crust. Faun. Japon., p. 24.

§ Crust. Faun. Japon., p. 24.

## FAM. III. GRAPSIDÆ.

Oculi tertiâ parte latitudinis carapacis breviores. Carapax subquadratus, sæpius depressus, lateribus aut rectis aut arcuatis. Antennæ internæ transversæ. Articulus abdominis *maris* 2dus sterno postico sæpius vix angustior. Articulus maxillipedis externi 3tius sive inornatus sive costâ obliquâ ornatus. Palatum lineâ elevatâ viæ efferentis limite instructum.

1. GRAPSINÆ.—Antennæ internæ fronte tectæ. Articulus maxillipedis externi 3tius costâ obliquâ in 2dum productâ non notatus.

1. *Maxillipedes externi vix hiantes.*

G 1. PSEUDOGRAPSUS, *Edw.*—Articulus maxillipedis externi 3tius orbiculato-cordatus, aut subquadratus, 2do brevior. Frons dimidio latitudinis carapacis vix brevior. Carapax lateribus arcuatus.

G. 2. ERIOCHEIR, *De H.\**—Articulus maxillipedis externi 3tius uti in *Pseudograpsus*. Frons dimidio latitudinis carapacis multo brevior. Carapax subpolygonatus.

G. 3. PLATYNOTUS, *De H.†*—Articulus maxillipedis externi 3tius 2do longior, margine postico valde obliquo.

G. 4. TRICHOPUS, *De H.‡*—Articulus maxillipedis externi 3tius latior quam longior, extus dilatatus. Pedum articuli 5tus 6tusque posticorum compressi denseque ciliati.

2. *Maxillipedes externi rhomboidicè hiantes.*

G. 5. GRAPSUS, *Lamk.*—Carapax transversim lineolatus, lateribus plus minusve arcuatis. Frons dimidio latitudinis carapacis brevior. Antennæ externæ juxta frontis latera oblique exsertæ. Tarsi spinulis armati.

G. 6. GONIOGRAPSUS, *Dana.§*—Carapax transversim lineolatus. lateribus rectis, postice sæpe convergentibus. Frons dimidio latitudinis carapacis longior. Antennæ externæ sub frontis margine sæpius exsertæ. Tarsi spinulis armati.

\* *Faun. Japon.*, p. 32, 59.—The genus *Utica* of White, (*Ann. Mag. Nat. Hist.*, xx, 206, and *Crust. Voy. Samarang*, 52, pl. 13, fig. 6,) appears to have the essential characteristics of *Eriocheir*, and like *Eriocheir* differs but little from *Pseudograpsus*. The front is narrow, the form subpolygonal, and it lives like *E. Japonicus*, in fresh-water. The bushy hair on the band of the Japan species is not necessarily a generic character. The name *Eriocheir* is therefore unfortunate, and it would be better for the science to substitute the name given by White.

The *E. penicillatus* of De Haan, (p. 60, pl. 11, f. 6,) appears to be a true *Pseudograpsus*.

† *Faun. Jap.*, p. 34.

*BRACHYNOTUS* is the name of another genus by De Haan based on a Mediterranean species described by Risso, *Hist. Nat. de l'Eur. Merid.*, v, 13. The male abdomen is but 4-jointed, the female 7-jointed; 2d and 3d joints of the outer maxillipeds of equal length, and the 3d truncate at either extremity.

‡ *Faun. Jap.*, p. 32.—*Varuna* of Edwards, *Crust.* ii, 94.

§ In part, *Goniopsis* of De Haan, *F. Jap.*, p. 33, and *Pachygrapsus* of Randall, *J. Acad. Nat. Sci., Philad.*, viii, 126.

- G. 7. PLANES, *Leach*.\*—Carapax non lineolatus, lævis, fere quadratus, parce oblongus. Frons rectus. Articulus maxillipedis externi 3tius latior quam longior, cordatus. Tarsi spinulis armati.
- G. 8. HEMIGRAPsus, *Dana*.†—Carapax non lineolatus, fere lævis, lateribus plus minusve arcuatis. Frons rectus aut rectiusculus, antennis internis transversis. Articulus maxillipedis externi 3tius fere orbiculato-cordatus. Tarsi inermes.
- G. 9. CYRTOGRAPsus, *Dana*.—Carapax gibbosus, subhexagonus non lineolatus. Frons sursum sinuosus, antennis internis obliquis, implicis frontis insitis. Articulus maxillipedis externi 3tius suborbiculato-cordatus. Tarsi inermes.
2. SESARMINÆ.—Antennæ internæ fronte tectæ. Articulus maxillipedis externi 3tius costâ obliquâ in 2dum productâ notatus.
1. *Articulus maxillipedis externi 3tius apice rotundatus.*
- G. 1. SESARMA, *Say*.‡—Carapax quadratus, sæpe partim lineolatus, lateribus rectis, fronte rectè prærupto. Abdomen *maris* versus basin sterno contiguo vix angustius. Tarsi sæpe armati.
- G. 2. SARMATIUM, *Dana*.—Carapax subquadratus, lateribus arcuatis, fronte curvatim declivi. Abdomen *maris* versus basin sterno contiguo vix angustius. Tarsi inermes.
2. *Articulus maxillipedis externi 3tius apice truncatus et sæpe excavatus.*
- G. 3. CYCLOGRAPsus, *Edw*.§—Carapax lævis, medio planus, ad margines anteriores declivis, lateribus arcuatis, integris. Abdomen *maris* versus basin sterno contiguo vix angustius.
- G. 4. CHASMAGNATHUS, *DeH*.||—Carapax convexus, subquadratus, lateribus arcuatis et antice emarginatis, fronte curvatim declivi. Oculi breves. Abdomen *maris* versus basin sterno contiguo parce angustius.
- G. 5. HELICE, *DeH*.¶—Carapax quadratus, lateribus parallelis, rectis. Oculi longiusculi. Abdomen *maris* versus basin sterno contiguo multo angustius.
3. PLAGUSINÆ. Antennæ internæ sinibus frontis longitudinalibus apertæ.
- G. 1. ACANTHOPUS, *De H*.\*\*—Corpus valde depressum. Articulus maxillipedis externi 3tius oblongus, parvus, apice 2di multo angustior. Ramus maxillipedis 1mi internus apice angustus et not transversus.

\* Mss. Mus. Brit.; the genus is recognized in Bowdich's "Madeira and Porto Santo," p. 151; and more lately in Bell's Brit. Crust., p. 133.—*Nautilograpsus* of Edwards, Crust. ii, 89.

† *Grapsus* (subgenus) of De Haan, F. Jap., p. 31; *Cyclograpsus*, in part, of Edwards, Crust. ii, 77.

‡ Jour. Acad. Nat. Sci., i, 76, 1817. *Pachysoma*, of De Haan, Faun. Japon., p. 33.

§ Crust. ii, 77.—*Gnathochasmus*, of M'Leay, Smith's Illust. Zool. S. Africa, and Cat. Crust. Brit. Mus. by A. White, 1847, 40.

¶ Faun. Japon., p. 27.

¶ Faun. Japon., p. 28.

\*\* Faun. Japon., p. 29. Corresponds to *Plagusia clavimana*.

G. 2. *PLAGUSIA*, *Latr.\**—Corpus minus depressum, crassius. Articulus maxillipedis externi 3tus apice 2di vix angustius, raro longior quam latior. Ramus maxillipedis 1mi internus apice transversus.

FAM. IV. GECARCINIDÆ.

Oculi breves. Carapax obesus, paulo transversus, antice latus, curvatim declivis, lateribus arcuatis poneque oculos large rotundatis, vix dentatis. Antennæ internæ transversæ. Articulus abdominis maris 2dus sterno contiguo vix angustior. Articulus maxillipedis externi 3tus costâ obliquâ piliferâ non ornatus. Palatum lineâ elevatâ viæ efferentis limite non instructum.

1. *UCAINÆ*. Articulus maxillipedis externi 4tus apertus.

1. *Maxillipedes externi non hiantes.*

G. 1. *UCA*, *Leach.*—Articulus maxillipedis externi 4tus angulo 3tii externo insitus.

G. 4. *GECARCINUCUS*, *Edw.†*—Articulus maxillipedis externi 4tus marginis medio apicalis 3tii insitus.

2. *Maxillipedes externi rhomboidicè hiantes.*

G. 3. *CARDISOMA*, *Latr.*—Articulus maxillipedis externi 4tus apice 3tii externo insitus.

G. 4. *GECARCOIDEA*, *Edw.*—Articulus maxillipedis externi 4tus marginis medio excavato apicalis 3tii insitus.

2. *GECARCININÆ*. Articuli maxillipedis externi 4tus et sequentes 3tio celatus.

G. 1. *GECARCINUS*.

FAM. V. PINNOTHERIDÆ.

Oculi breves, orbitis insiti, raro non retractiles. Carapax sive obesus sive depressus, raro paulo oblongus et interdum parce rostratus, lateribus valde rotundatis. Antennæ internæ aut transversæ aut obliquæ. Abdomen *maris* angustum, versus basin sterno contiguo valde angustius. [Species omnes parvæ.]

2. *PINNOTHERINÆ*. Articulus maxillipedis externi 2dus parvulus aut obsoletus. Corpus sive obesum sive depressum.

\* *Plagusia* and *Philyra* of De Haan, Faun. Japon., p. 31; the latter genus in his system including *Plagusia depressa* of authors, and the former the *P. squamosa*. The distinction between his two genera consists in this; the palpus of the outer maxillipeds in *Plagusia* has a flagellum, and that of *Philyra*, none. The name *Philyra* belongs to another genus of earlier date, instituted by Leach; moreover, the resemblance between the species of these groups is so close in other characters, that we hardly consider the distinction important as a generic character.

† Jacquemont's Voy. dans l'Inde, plate 1.

1. *Oculi approximati. Fossæ antennales conjunctæ.*

a. Pedes 8 postici sat graciles, subæqui.

G. 1. PINNOTHERA, *Latr.*—Corpus obesum. Carapax superficie integerrimus, nunquam areolatus. Oculi normales.G. 2. FABIA, *Dana.*—Corpus obesum. Carapax superficie anticâ pone orbitas suturâ divisus. Oculi normales.G. 3. XENOPHTHALMUS, *White.\**—Corpus obesum, fronte incisio- nibus duabus profundis oculos gerentibus instructo.G. 4. XANTHASIA, *White.†*—Corpus depressum, supra fere pla- num margineque elevato utrinque instructum, fronte paulo pro- ducto. Oculi normales.

b. Pedes 4ti longiores et multo validiores.

G. 5. PINNIXA, *White.‡*—Corpus portentosè transversum.2. *Oculi sat remoti. Fossæ antennales septo latiusculo sejunctæ. Articulus maxil- lipedis externi 2dus fere dimidii 3tii longitudine.*G. 6. PINNOTHERELIA, *Lucas.§*—Pedes 8 postici sat graciles, subæqui. Corpus suborbiculare.

## 2. HYMENICINÆ. Corpus sæpius parce rostratum, depressum. Articulus maxillipedis externi 2dus dimidio 3tii major.

G. 1. HYMENOSOMA, *Leach.*—Carapax suborbiculatus, angulo extra- orbitali acuto. Frons angustissimus, non lobatus, oculis valde approximatis.G. 2. HALICARCINUS, *White.||*—Carapax suborbiculatus, angulo extra-orbitali nullo. Frons tridentatus, antennis internis inter dentes se porrigentibus, oculis remotioribus. Articulus maxilli- pedis externi 3tius 2do paulo major.G. 3. HYMENICUS, *Dana.¶*—Carapax suborbiculatus, angulo extra- orbitali nullo. Frons productus, simplex aut lobatus, antenna- rum basin celans, oculis remotioribus. Articulus maxillipedis externi 3tius 2do paulo major. Pedes gracillimi.G. 4. ELAMENA, *Edw.*—Carapax subtriangulatus, paulo oblongus, paulo rostratus, fronte antennas internas celante. Articulus maxillipedis externi 3tius 2do minor.

## FAM. VI. MYCTIRIDÆ.

Corpus obesum. Carapax fronte perangustus, orbitis carens; an- tennæ internæ longitudinales.

Genus MYCTIRIS, *Latr.*\* White, Ann. Mag. Nat. Hist., xviii, 178, and Voy. of Samarang, p. 63. The genus *Fabia* forms a transition from Pinnothera to Xenophthalmus; it includes the *P. chilensis*.

† Ann. Mag. Nat. Hist., xviii, 176.

‡ Ann. Mag. Nat. Hist., xviii, 177. Includes Say's *Pinn. cylindricum*, Jour. Ac. Nat. Sci., Philad., i, 452.

§ Crust. of D'Orbigny's S. Amer., p. 24. The genus forms a transition to the Gecarcinidæ.

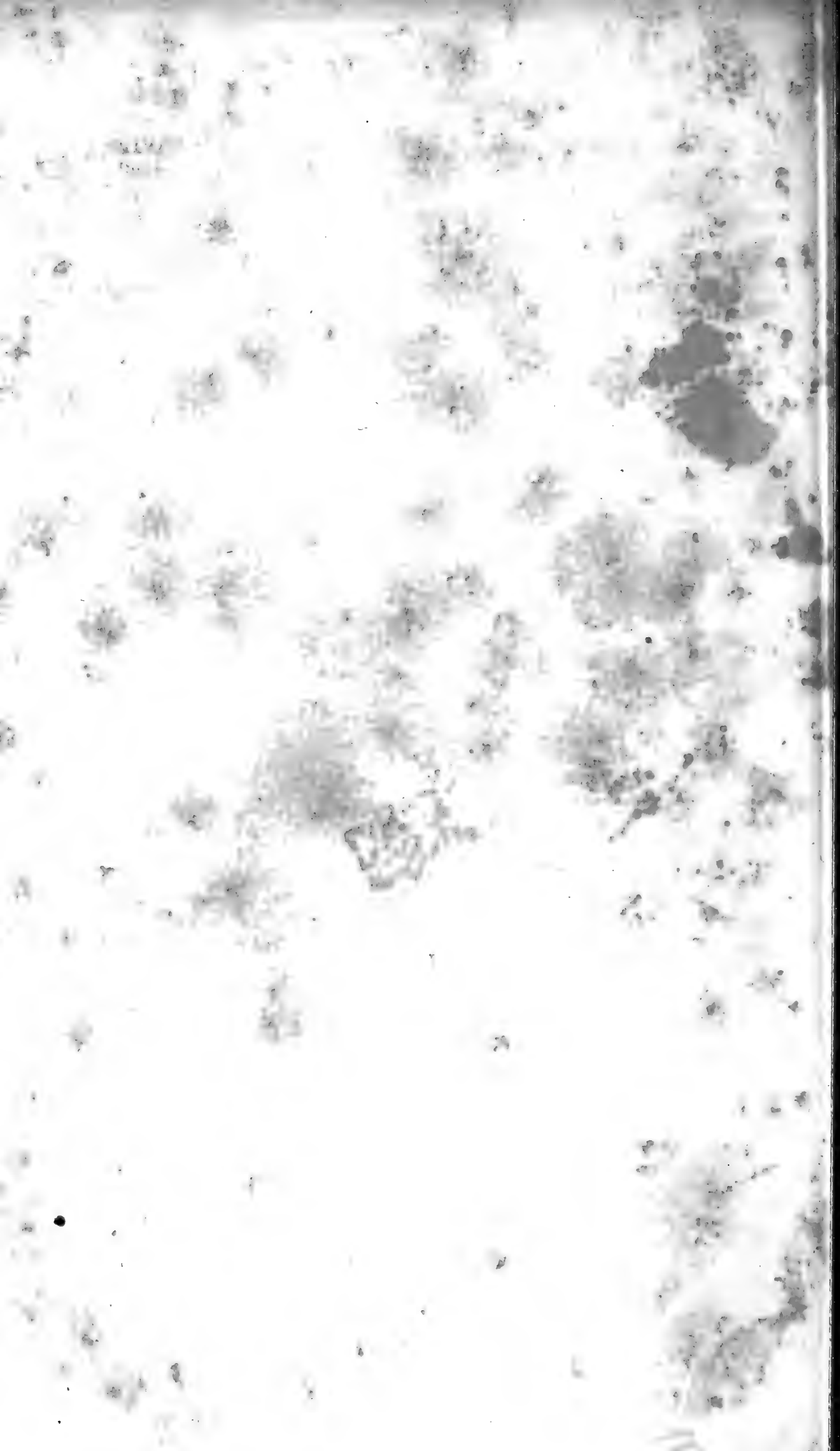
|| Ann. Mag. Nat. Hist., xviii, 178.

¶ The genus *Hymenosoma* belongs to the Cape of Good Hope, *Halicarcinus* to the extremity of S. America, and *Hymenicus* to New Zealand.

2. Note on the genera *Hexapus* and *Arges* of De Haan; by J. D. DANA.

—The genus *Hexapus* of De Haan, in his first publication of its characters, (in Decade I. and II. of the Fauna Japonica, pp. 5 and 35,) is arranged near Pinnothera, which it resembles in its short obese form and small size. But in his last Decade, published in 1849, which contains his final remarks on classification, at p. xiv, the genus is referred to the vicinity of Pilumnus.—The outer maxillipeds are as in Pilumnus. The genus is peculiar in the 5th pair of legs being obsolete. The species is the *H. sexpes*, (Jap., p. 63 and pl. 11, f. 6, *Cancer sexpes* of Fabricius, Ent. Syst., Suppl., p. 344, f. 37.)

The genus *Arges* of De Haan, (Faun. Japon., p. 21,) includes only a fossil species. It is Cancroid in its outer maxillipeds and near Pilumnus and also Menippe. The abdomen in both sexes is 7-jointed; in the male oblong-trigonal, in the female ovate. The lateral margins of the carapax are parallel and entire, and the general form is much like that of *Cyclograpsus Audouinii* and the allied. Distance between the eyes one-fifth the breadth of the thorax.—Sp. *A. parallelus* (F. Jap., p. 52, and pl. 5, f. 4) from Japan.





p. 114-124

ON THE  
 CLASSIFICATION  
 OF THE  
 CORYSTOIDEA, PAGURIDEA, ETC.

By JAMES D. DANA.

1. THE CORYSTOIDEA have their closest relations with the Cancroidea, and form a passage between this division of the Brachyura and the Hippidea. They are remote from the Oxystomata in the mouth and efferent branchial channels, the latter having these channels *medial* over the palate, and the former *lateral* like the Cancroids. In the projection of the outer maxillipeds over the epistome, the elongated and more or less pilose outer antennæ, and the partially free or less closely inflexed abdomen, the species exhibit their degradation below the Cancer type. The Platyonychidæ are the Cancroids which approximate most to the Corystoids, and they are placed with this group by De Haan. But they differ from the Corystoidea in the shorter and more naked outer antennæ; and we therefore incline rather to retain them with the Crancroidea, where they are arranged by Milne Edwards.

The degradation of the Cancroidea is also seen in another line leading through *Acanthocyclus* to *Corystoides*, Lucas, and *Bellia*, Edw.\* The last two genera are somewhat Corystoid in habit: yet they pertain to a distinct group, inasmuch as they have the outer antennæ obsolete or nearly so, and the inner antennæ *without fossettes*. This last character belongs only to the lower Anomoura and the Macroura, and places these genera quite low in rank in a group we name BELLIDEA which belongs near if not among the Anomoura.

In attempting to arrange the Corystoidea into groups, we consider, as in other cases, the relations of the species to the higher Crustacea, and by the transitions observed, we are led to our subdivisions. *Trichocera* is Cancroid in habit, in the absence of a beak, in the nearly naked outer antennæ, and in having the outer maxillipeds fitted neatly to the epistome. *Thia* and *Kraussia* are also without a beak, like the Cancroids, but have the outer maxillipeds overlapping the epistome. The remaining genera have the front somewhat rostrate, the inner antennæ longitudinal, the maxillipeds produced over the epistome and the outer antennæ elongate and pilose and flexed at base towards the medial line. The form of the third joint of the outer maxillipeds varies from narrow oblong to transverse in closely related genera, and affords no basis for a family distinction.

\* In the synopsis of the Cancroidea in this Jour., vol. xii, p. 131, *Corystoides* was placed near *Acanthocyclus*, to which it has close relations; but from this and the other Cancroids, it is removed by the absence of all power of retraction in the inner antennæ.

The name *Bellia* has been recently duplicated in the science, in an article by Mr. C. Spence Bate, on a new genus of Amphipods near *Lepidactylis*, published in the *Annals and Mag. Nat. Hist.*, [2], vii, 318, pl. 11, f. 8, 1851. The description of Milne Edwards's genus of this name is published in the *Ann. des Sci. Nat.* [3], ix, 1848, p. 192.

The following are the families thus deduced, with the genera of Corystoidea and their characteristics.

### FAM. I. TRICHOCERIDÆ.

Carapax formâ Cancroideus, fronte non rostratus. Antennæ internæ longitudinales. Antennæ externæ breves, flagello parce piloso. Maxillipedes externi super epistoma non producti, sed margini areæ buccalis bene adaptati.

Gen. TRICHOCERA, *DeHaan*.\*—Frons dentatus. Articulus maxillipedis externi 3tius apice truncatus. Articulus antennarum externarum 1mus elongatus, hiatum orbitæ bene occupans.

### FAM. II. THIIDÆ.

Carapax suborbicularis, non oblongus, fronte non rostratus. Antennæ internæ transversæ vel obliquæ. Antennæ externæ breves, flagello parce piloso. Maxillipedes externi super epistoma producti.

Gen. 1. THIA, *Leach*.—Frons integer, arcuatus. Antennæ internæ transversæ. Pedes nulli natatorii. Articulus maxillipedis externi 3tius vix oblongus.

Gen. 2. KRAUSSIA, *Dana*.† Carapax paulo transversus, margine postero-laterali brevi, fronte denticulato, medio emarginato. Antennæ internæ obliquæ. Pedes 8 postici natatorii, tarso falci-formi. Articulus maxillipedis externi 3tius vix oblongus.

### FAM. III. CORYSTIDÆ.

Carapax sive suborbicularis sive multum angustus, fronte plus minusve rostrato. Maxillipedes externi super epistoma producti.

#### 1. *Pedes nulli natatorii.*

G. 1. TELMESSUS, *White*.‡—Carapax parce transversus, pone medium latior, fronte paulo producto et medio emarginato. Articulus antennarum externarum 1mus elongatus, processu elongato hiatum orbitæ bene occupans. Articulus maxillipedis externi 3tius parce oblongus apice triangulatus, articulum 4tum prope apicem gerens.

G. 2. ATELECYCLUS, *Leach*.§—Carapax fere orbicularis, lateraliter arcuatus, fronte paulo producto. Articulus antennarum exter-

\* Faun. Japon. (1833), p. 16.

† Ad species complectendum *Xantho integrum* Haanii, (Faun. Japon. 66, tab. 18, f. 6) et *Platyonychum rugulosum* Kraussii ("Südaf. Crust." 26, tab. 1, f. 5), Thiæ affines et *Xantho* remotas, genus "Kraussia" institutum est. *Platyonycho* discrepat margine postero-laterali brevior quam antero-lateralis, carapace paulo transverso, fronte bilobato et denticulato, flagello antennarum internarum subpiloso. An *Trichocera porcellana* (A. White, "Voy. Samarang," p. 59) a Kraussii specie differt?

‡ A. White, "Ann. Mag. Nat. Hist.," xvii, 497, 1846; Voy. Samarang, 14, tab. 3. *Atelecyclus*, habitu, antennis aliisque, Kraussia affinis: ejus affinitas Maioides, ab Adamsio White edita, justa non videtur.

§ *Chlorodius* Haanii, Faun. Japon., 13.

narum Imus elongatus hiatum bene occupans. Articulus maxillipedis externi 3tius oblongus, apice oblique truncatus, in marginis interni emarginatione articulum 4tum gerens.

G. 3. PELTARION, *Hombron et Jacquinot*.<sup>\*</sup>—Carapax suborbicularis, ante medium latior, fronte triangulatè rostrato. Articulus antennæ externæ Imus perbrevis, 2do parce crassior. Articulus maxillipedis externi 3tius non oblongus, apice truncatus. Articulus pedum 8 posticorum 5tus 4to vix brevior.

G. 4. PSEUDOCORYSTES, *Edwards*.—Carapax suborbicularis, parce oblongus, triangulatè rostratus. Articulus maxillipedis externi 3tius vix oblongus. Articulus pedum 8 posticorum 5tus 4to duplo brevior.

G. 5. GOMEZA, *Gray*.<sup>†</sup>—Carapax oblongus, fere ellipticus, triangulatè rostratus. Oculi parvi vel mediocres. Articulus maxillipedis externi 3tius vix oblongus vel transversus, apice truncatus. Articuli pedum 8 posticorum 5tus et 4tus fere æqui.

G. 6. OEIDIA, *DeHaan* (partim).<sup>‡</sup>—Carapax oblongus, antice non angustans, fronte breviter rostrato. Oculi permagni. Articulus maxillipedis externi 3tius latus, oblongus, 2do paulo brevior. Articuli pedum 8 posticorum 5tus et 4tus fere æqui.

G. 7. CORYSTES, *Latreille*.—Carapax oblongus, rostratus. Oculi mediocres. Articulus maxillipedis externi 3tius angustè oblongus 2do vix brevior.

2. *Pedes postici natatorii.*

G. 8. DICERA, *DeHaan*.<sup>§</sup>—Carapax oblongus, rostro late triangulato. Pedes postici natatorii, tarso falciformi. Articulus maxillipedis externi 3tius angustè oblongus, 2do parce brevior.

2. *Conspectus Crustaceorum, &c.*—*Conspectus of the Crustacea of the Exploring Expedition under Capt. Wilkes, U.S.N.*; by JAMES D. DANA.—PAGURIDEA, (*Proc. Acad. Nat. Sci., Philad., 1851. p. 267.*)—This paper contains a distribution of the Paguridea into genera, and also a description of new species. The natural groups have been partly indicated by Milne Edwards in his work on Crustacea, and more lately in the *Annales des Sciences Naturelles* for 1848, p. 59. There are, however, in his arrangement, discrepancies between the characters of the species and those laid down for his subdivisions which we find it difficult to explain. Such are, the placing of *Pagurus tibicen* and some related species with his "*Æquimanes*," when the left hand is very much the larger, and the *guttatus* and *granulatus* with the "*Senestres*," although the hands are nearly equal in the former, and the right is the larger in the latter. Still his sections are in the main natural groups, and some of them have more important points of distinction than this distinguished author has mentioned.

\* *Hombron et Jacquinot*, "Voy. au pole Sud," tab. 8, f. 1.

† *Oeidia Haanii* (partim), *Faun. Japon.* 15. Species *Oeidiæ* typica (*O. 20-spinosa* denominata) *Gomezæ* vera est.

‡ *Faun. Japon.* 15. Species *Oeidia distincta* *Haanii*, typus est generis *Oeidiæ* accepti. Genus idem est *Jonas*, (*Hombron et Jacquinot*, "Voy. au pole Sud," tab. 8, f. 4-8.) Species *J. macrophthalmus*, oculis grandibus formâ characteribusque aliis, *Oeidiæ distinctæ* ferme similis.

§ *Faun. Japon.* 14, (1833). *Nautilocorystes*, *Edwardsii*, *Crust.* ii, 149 (1837).

The *Pagurus Bernhardus* is the type of one group, the species of which live mostly in the colder oceans. This genus is called BERNHARDUS, and the common species naturally bears Leach's specific name, *Bernhardus streblonyx*. The 2d genus is called DIOGENES; *Pagurus miles* is the type. The 3d, PAGURISTES, having for its type, *Pagurus gonagrus* or *P. pilosus*. The preceding have the fingers acuminate, while in the following genera they are spoon-excavate at tip. The 4th genus is PAGURUS, a large group including *P. punctulatus*, having corneous tips to the fingers, and no beak; the 5th, CALCINUS, with *P. tibicen* as the type, with calcareous tips and a short beak; [6th, ANICULUS, equal handed and beaked, and with corneous tips to the fingers like the following, but having a vertical movement in the fingers, as in *Pag. aniculus*; 7th, CLIBANARIUS, equal-handed and having a lateral or horizontal movement in the fingers, as in *Pagurus clibanarius*.\* The last two genera are here for the first time published, not being included in the paper in the Academy's Proceedings.—D.]

The following is a synopsis of the genera :

#### FAM. I. PAGURIDÆ.

Antennæ internæ mediocres, articulo 1mo brevissimo. Maxillipedis externi palpus flagello multiarticulato instructus.—Species aquaticæ vel littorinæ.

##### 1. PAGURINÆ.—Abdomen asymmetricum.

1. *Digiti acuminati. Flagellum antennarum internarum sæpe plus minusve pilosum.*

Gen. 1. PAGURISTES, (*D.*)—Pedes 4ti non subcheliformes, tarso terminali. 2-4 appendicibus pone pedum posticorum bases instructus. Basis antennarum internarum paulo longior, apice articuli 2di extremitatem oculorum fere attingente.

Gen. 2. DIOGENES, (*D.*)—Pedes 4ti subcheliformes. Pedes 1mi inæqui, sinister major. Annulum ophthalmicum rostriferum. Appendicibus pone pedum posticorum bases carens.

Gen. 3. BERNHARDUS, (*D.*)—Pedes 4ti subcheliformes. Pedes 1mi interdum subæquales, sæpius dexter major. Annulum ophthalmicum non rostriferum. Appendicibus articulatis pone pedum posticorum bases carens.

2. *Digiti instar cochlearis excavati. Flagellum antennarum internarum nudum vel nudiusculum.*

Gen. 4. PAGURUS.—Manus anticæ sæpius compressæ, interdum subæquæ, sæpius sinistrâ majore; digitis apice corneis, in plano verticali claudentibus. Frons medio non rostratus sed truncatus.

Gen. 5. CALCINUS, *D.*—Manus anticæ compressæ, inæquæ, sinistrâ majore, digitis apice calcareis, in plano verticali claudentibus. Frons medio breviter rostratus.

Gen. 6. ANICULUS, *D.*—Manus anticæ subæquæ, digitis apice corneis, in plano verticali claudentibus. Frons medio breviter rostratus.

\* The *Pagurus aniculus* may hereafter be named *Aniculus typicus* and the *P. clibanarius*, *Clibanarius vulgaris*.—D.

Gen. 7. CLIBANARIUS, *D.*—Manus anticæ plus minusve depressæ, subæquæ, digitis apice corneis, in plano horizontali claudentibus. Frons medio breviter rostratus.

## II. CANCELLINÆ.—Abdomen symmetricum.

Gen. CANCELLUS, *Edwards.*

### FAM. II. CENOBITIDÆ.

Antennæ internæ multo elongatæ, articulo 1mo oculis sæpius longiore, valde deflexo. Maxillipedis externi palpus flagello non instructus.—Species subterrestriales.

Gen. 1. CENOBITA, *Edw.*—Corpus angustum, carapace elongato, fronte non rostrato. Abdomen in cochleam retortum, superficie plerumque carnosum.

Gen. 2. BIRGUS, *Leach.*—Corpus latum, carapace parce oblongo postice latissimo, fronte triangulato. Abdomen directum, laminis crustaceis dorso plerumque tectum.

The following are the names of the species described in this paper: Bernhardus Novi-Zelandiæ, *B. armatus*, *B. hirsutiusculus*, *B. pubescens*, *B. tenuimanus*; Paguristes longirostris, *P. hirtus*; Pagurus fabimanus, *P. scabrimanus*; together with the following referred to Pagurus, but which pertain to the new division Clibanarius, *C. æquabilis*, *C. zebra*, *C. humilis*, *C. globoso-manus*. The last may be the *P. corallinus* of Edwards. Also Cenobita carnescens and *C. brunnea*. D.

3. *On the Genus Orthostoma*; by JAMES D. DANA.—The genus *Orthostoma* was referred by its describer, Dr. Randall, (*J. Acad. Nat. Sci., Philad.*, viii, 121, pl. 5, 1840,) to the family Gecarcinidæ. In its convex or obese form, it approaches that group. Yet the dentate antero-lateral margin, and thin dentate front led to his remarking that “the species has at first sight much resemblance to the Cancers.” Upon examining the specimens, recently, in the collections of the Academy at Philadelphia, I find that in their essential characters as well as the texture of the carapax, the species is related to the *Telphusidæ*. The male verges are situated as in *Telphusa*, and not as in the *Grapsoidæ*; and in general habit, the described species is near *Potamia* and *Trichodactylus*. It has the 2d joint of the outer maxillipeds oblong (but little shorter than the second), with the summit oblique, and the 4th joint articulated with it near the outer apex. The male abdomen is very broad triangular, and 5-jointed.

The known genera of *Telphusidæ*, are, then, as follows:—

G. 1. TELPHUSA, *Latr.*—Articulus maxillipedis externi 3tius subquadratus, 2dus multo brevior, 4tum angulo apicali interno gerens.

G. 2. VALDIVIA, *White.*—Articulus maxillipedis externi 3tius oblongus, 2dus transversus. [Carapax margine antero-laterali 4-dentatus.] Pedes longi.

G. 3. POTAMIA, *Latr.*—Articulus maxillipedis externi 3tius subquadratus, apice subtriangulatus anguloque apicali 4tum gerens.

G. 4. TRICHODACTYLUS, *Latr.*—Carapax marginibus subinteger. Articulus maxillipedis externi 2dus oblongus, 3tius vix oblongus, subtriangulatus, margine terminali valde obliquo anguloque externo 4tum gerens, 2do multo brevior.

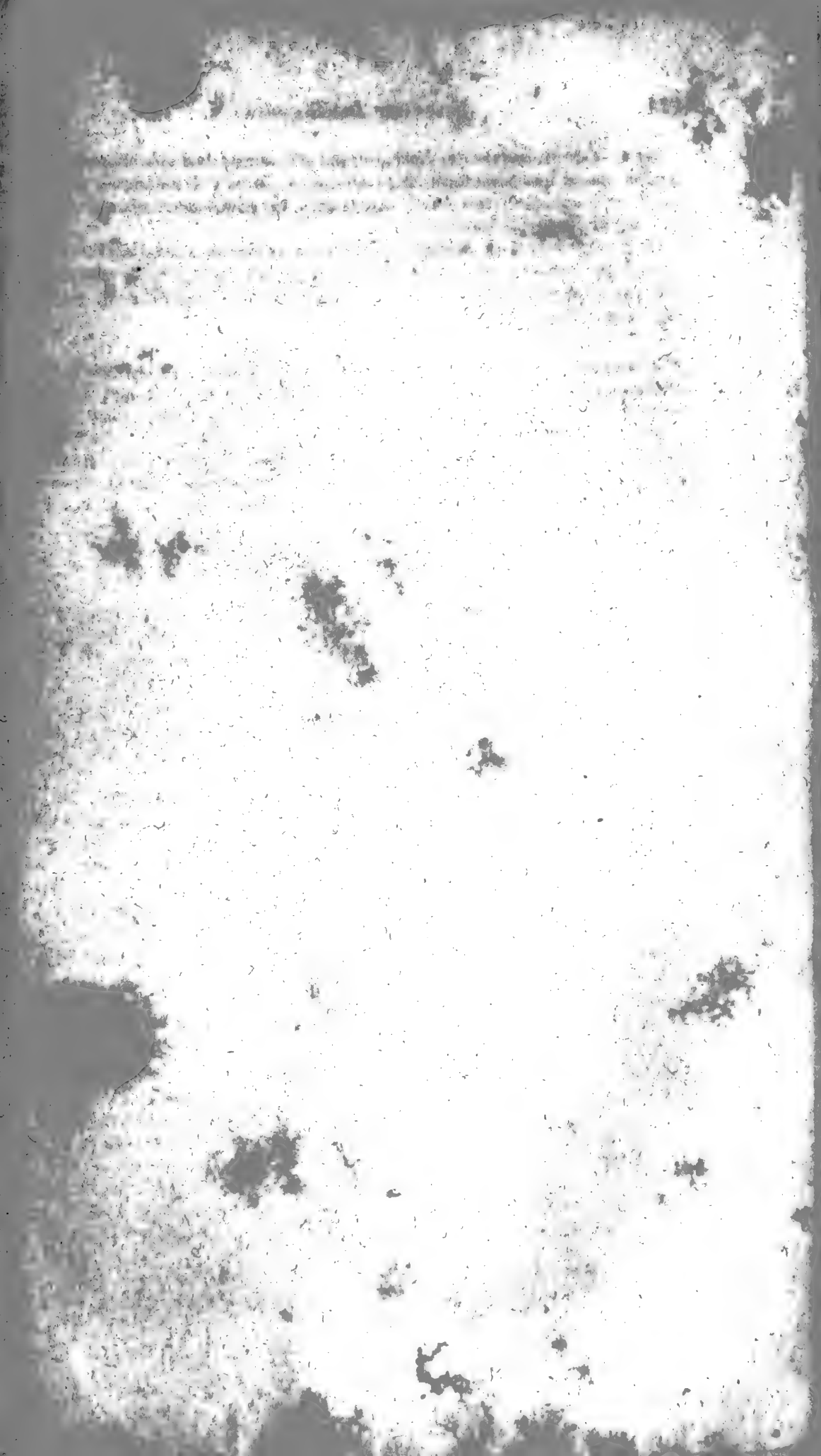
G. 5. ORTHOSTOMA, *Randall.*—Carapax margine antero-laterali dentatus. Articulus maxillipedis externi 2dus oblongus, 3tius oblongus, 2do paulo brevior, apice obliquus, prope angulum exteriorem articulum 4tum gerens.

4. Genus *Heterograpsus* of *Lucas*.—The genus *Heterograpsus*, described in the recent work on the Exploration of Algiers, and figured on plate 2 of Crustacea, f. 4, has the outer maxillipeds and most other characters of *Pseudograpsus*, *Edw.*,\* but differs from that genus in having the sides nearly straight and convergent backward as in most *Sesarmæ*, instead of arcuate. In the species described, the *H. sexdentatus*, the antero-lateral margin is bi-emarginate.

J. D. D.

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\* See this Journal, xi, 278.







## APPENDIX.

*On the Classification of the Crustacea Choristopoda or Tetrade-  
capoda*; by JAMES D. DANA.

THE term Choristopoda, applied to the Tetrade-capods, alludes to the subdivision of the thorax into segments, each devoted to a separate pair of legs; this is a prominent peculiarity of the species, distinguishing them from all the Podophthalmia, and with rare exceptions from the Entomostraca.

This division of Crustacea is subdivided by Latreille and other subsequent authors into three groups, the *Amphipoda*, *Læmipoda* and *Isopoda*. Krøyer has suggested that the Læmipods are essentially Amphipods in structure, and his investigations have shown that in the only important distinction between them, that based upon the abdomen, the two groups are united by gradual transitions. In the organs of the mouth, they are the same,—also in having thoracic branchial appendages and in the position of the thoracic legs; and moreover the abdominal appendages conform to the same type, as is seen when the abdomen in the Caprellidæ is partly elongated, as in the genus *Cercops* of Krøyer.

Rejecting the division Læmipoda, the number of tribes is reduced to two. There is however a third tribe, which hitherto has not been recognized. It is intermediate in its characteristics between the Amphipods and Isopods.

The AMPHIPODA are uniformly characterized by having—

1. The three posterior pairs of thoracic legs thrown backward and more or less obliquely outward, and constituting one series, while the four anterior pairs are thrown forward and outward, in another series; this arrangement may be represented by the figures 4 : 3, (or 2+2 : 3, as the four pairs of the first series are often in two sets of two pairs each).
2. The branchial appendages thoracic.
3. The abdominal members in two sets, the three anterior pairs sub-natatory, the three posterior styli-form—an arrangement represented by the figures 3 : 3.

The true ISOPODA, on the contrary, have—

1. The four posterior pairs of thoracic legs in the backward series, and three anterior pairs in the forward series—3 : 4.
2. The branchial organs abdominal.
3. The abdominal members in two sets, the 5 anterior pairs branchial (the first sometimes operculiform), and only the last styli-form—5 : 1.

These are two distinct types of structure of fundamental character; and any species which do not partake of these peculiarities are inter-

mediate forms and are naturally arranged in a separate group. These constitute the tribe here named

The ANISOPODA.

1. Like *Amphipoda*, the three posterior pairs of thoracic legs are in one series, and the four anterior in a different series or usually in sets of two pairs each;—4 (or 2+2) : 3.
2. Like *Isopoda*, the three posterior pairs of abdominal members are not styliform, only the last pair being of this character; the branchial organs are abdominal and not thoracic, with a rare exception.

These are constant characteristics of the whole group. Although strongly *Amphipodan*, the species have in general more external resemblance to the *Isopods*; yet the intermediate character of some genera is so obvious that they have been arranged in the former group by one author and in the latter by another.

The genera that pertain to this tribe, Anisopoda, are the following: *Arcturus* and the allied *Anthura*, *Tanais*, *Apseudes*, *Rhæa*, *Praniza*, *Anceus*, *Serolis*, *Bopyrus* and allied. Each of the larger subdivisions of the *Isopoda*, as laid down by Edwards, affords one or more genera, and they are genera which in his system are in some instances marked off as anomalous in character.

In *Arcturus* and *Anthura*, the *thoracic* members have the *Amphipod* character, the series being 4 (or 2+2) : 3, and not 3 : 4 as in the *Isopods*. The abdominal appendages are like those of *Idotæa*.

In *Tanais*, there is the same arrangement. The abdominal appendages are *Isopodan* in being characterized by the series 5 : 1, but the 5 anterior are elongated and subnatatory, the abdomen is more flexibly articulated, approximating to the *Amphipods*; the 6th pair is a pair of stylets. *Apseudes* and *Rhæa* are closely like *Tanais*, and actually more resemble *Amphipods* than *Isopods*. The abdomen is more elongated, and differs from the *Amphipodan* abdomen mainly in having but one pair of stylets with 5 pairs of subnatatories instead of three of stylets and three of natatories.

*Praniza* and *Anceus* have the *thoracic* legs *Amphipodan* in their arrangement. The abdomen in *Praniza* is considerably elongated and flexible, approaching the *Amphipodan*; but the arrangement of its appendages is *Isopodan*.

In *Serolis*, although the general aspect of the species is strikingly *Isopodan*, the arrangement of the *thoracic* legs is *Amphipodan*. Further than this, the abdomen is partly *Amphipodan*, for instead of the series 5 : 1, it has the series 3 : 3; yet while the 3 anterior pairs are natatory as in the *Amphipoda*, the next two, instead of being styliform, like the last, are branchial (one opercular to the other), and in this particular they are *Isopodan*.

In the *Bopyri*, the *thoracic* legs are so arranged in a single continuous series, that it is difficult to make out the series 4 : 3 or 3 : 4. Yet in some figures, the former (the *Amphipodan*) arrangement is indicated. The males are closely like *Tanais* in some instances, both in the length of the abdomen, its free articulations and its appendages.\* In a female not adult of the *Bopyrus abdominalis*, figured by Kröyer,† all the tho-

\* See Kröyer, in Voy. Scand., pl. 28, fig. 1 A., *Dajus Mysidis*. † Ibid. pl. 29, fig. 17.

racic legs of one side are obsolete excepting the 3 posterior, a fact pointing to the Amphipod arrangement 4:3. Rathke's figure of the "*Phryxus Hippolytes*"\* represents a male with the 3 posterior legs either side thrown backward and the 4 anterior forward, confirming the same view.

In *Ione*, there are *thoracic* branchial appendages, which is a wide divergence from the Isopoda. In view of these facts, we conclude that the Bopyri are properly Anisopods. The resemblance in habit to the Cymothoidæ is no objection, for we find this habit also in the Cyami, species still more remote. In fact, the male Bopyri show that the species in all essential points of structure, are nearest to *Jæra* and *Tanais*. Moreover the *Jæra* are mostly parasitic.

The genera *Crossurus*, and *Liriope* of Rathke† are near *Tanais*, though also related in form to male Bopyri. In *Liriope* the thoracic legs are grouped as in *Tanais*, and the abdominal appendages are subnatatory or nearly Amphipodan in structure, although, like *Tanais*, diverse from true Amphipods in having 5 pairs subnatatory, and only one pair of stylets. *Liriope* is referred to the Amphipoda by Rathke. *Cryptothir* is the name of another related genus, a species of which was found by the author in the cavity of a living barnacle (*Creusia*).

We therefore adopt as the grand divisions of the Choristopoda, the three tribes, ISOPODA, ANISOPODA and AMPHIPODA.

It is an important fact, the basis of a philosophical principle, that the most sluggish and most stupid of the Decapods are found in the transition group, *Anomoura*. So in the Tetradecapods, the transition group, *Anisopoda*, contains those species of the order that are lowest in activity and structural perfection; for the Bopyri, the females especially, when mature, are nearly memberless, motionless and senseless.

The *Isopoda* seem to have the same relation to the *Amphipoda* that the *Brachyura* have to the *Macroura*, and are the higher in rank.

Tribe I. *Isopoda*.—The Isopoda thus stripped of genera that are not properly of the tribe, are naturally divided into three subtribes, as follows:—

Subtribus I. IDOTÆIDEA.—Appendices abdominales duæ posticæ bene operculiformes, appendices alias optime tegentes.

Subtribus II. ONISCOIDEA.—Appendices abdominales duæ posticæ styliformes et non operculiformes, fere terminales, raro obsoletæ.

Subtribus III. CYMOTHOIDEA.—Appendices abdominales duæ posticæ lamellatæ, apud abdominis latera dispositæ.

Tribe 2. *Anisopoda*.—Among the Anisopoda, we find the three subtribes of the Isopoda represented. Allied to the *Idotæidea*, there are *Arcturus*, *Leachia*, *Anthura*; allied to the *Oniscoidea*, the genera *Tanais*, *Apseudes*, *Bopyrus* and others related; allied to the *Cymothoidea*, the genera *Serolis*, *Praniza*, &c. *Praniza* is an aberrant form, abnormal in the number of its legs. The three grand divisions are hence as follows:—

Subtribus I. SEROLIDEA, vel ANISOPODA CYMOTHOICA.—Appendices duæ posticæ abdominales lamellatæ, apud abdominis latera dispositæ.

\* Fauna Norwegens, pl. 2, f. 3.

† Fauna Norwegens, pp. 35 and 60, pl. 1.

Subtribus II. ARCTURIDÆ, vel ANISOPODA IDOTÆICA.—Appendices duæ posticæ abdominales lamellatæ et bene operculiformes, appendices branchiales tegentes.

Subtribus III. TANAIDEA, vel ANISOPODA ONISCICA.—Appendices duæ posticæ abdominales plus minusve styliformes, subterminales, interdum obsoletæ.

Tribe 3. *Amphipoda*.—The Amphipoda contain two prominent divisions, distinguished by the organs of the mouth, the eyes and general habit, the Gammarus and Hyperia sections, as laid down by Edwards. The addition of the Læmipoda to the Amphipoda introduces a third division. The sections are hence :—

Subtribus I. CAPRELLIDEA.—Maxillipedes elongati, palpiformes. Caput oculique mediocres. Abdomen obsolescens.

Subtribus II. GAMMARIDEA.—Maxillipedes elongati, palpiformes. Caput oculique mediocres. Abdomen appendicibus sex natatoriis sexque styliformibus instructum.

Subtribus III. HYPERIDEA.—Maxillipedes abbreviati, lamellati, operculiformes. Caput grande, oculorum corneis plerumque tectum. Appendices abdominales ac in *Gammarideis*, latius lamellatæ.

The Caprellidea have the habit of certain of the Anisopoda, and their short abdomen calls to mind the Isopoda. They therefore properly stand first among the Amphipoda. The Caprellids like the species of Arcturus and Tanais, cling and stand upon seaweeds, etc., by their six hinder legs, while the body and the other legs are extended, for the purpose of capturing their food and conveying it to the mouth.

In the following synopsis of the Families, Subfamilies and Genera, some new genera are included, discovered by the author in the course of the cruise of the Exploring Expedition under Capt. Wilkes.

#### TRIBUS I.

### ISOPODA.

#### Subtribus I. IDOTÆIDEA.\*

##### Fam. I. IDOTÆIDÆ.

Pedes fere consimiles, plus minusve ambulatorii.

- G. 1. IDOTÆA, *Fabr.*—Antennæ externæ longiores, flagello multiarticulato confectæ.  
 G. 2. EDOTEA, *Guerin.*—Antennæ externæ internis parce longiores, flagello pauci-articulato confectæ, basi paulo longiore quam basis internarum.  
 G. 3. ERICHSONIA, *Dana.*—Antennæ externæ internis multo longiores, geniculatæ, 6-articulatæ, flagello carentes. Pedes subæqui consimiles.  
 G. 4. CLEANTIS, *Dana.*—Antennæ externæ multo longiores, 5-6-articulatæ, non geniculatæ, flagello carentes. Pedes 4ti 3tiis valde breviores, et 4ti 5ti 6ti 7mi longitudine sensim increcentes. Abdominis opercula laminam appendiculatam ad articulationem gerentia.  
 G. 5. EPELYS, *Dana.*—Antennæ breves, longitudine subæquæ; externæ flagello carentes, non geniculatæ. Pedes subæqui.

##### Fam. 2. CHÆTILIDÆ.

Pedes 6ti longissimi, setiformes et multi-articulati.

- G. 1. CHÆTILIA, *Dana.*—Antennæ 1mæ longiores, superiores, 2dæ flagello multi-articulato confectæ. Pedes 7mi breves, non unguiculati. Abdominis opercula laminam appendiculatam ad articulationem gerentia.

\* The genera *Erichsonia*, *Cleantis*, *Epelys* and *Chatilia*, are described by the author in this Journal, [2,] viii, 424, 1849.

Subtribus II. ONISCOIDEA.

Fam. I. ARMADILLIDÆ.\*

Corpus bene convexum, stricte articulatum. Abdomen multi-articulatum, segmento ultimo parvo. Appendices caudales† ultra abdomen non exsertæ, lamellatæ. Mandibulæ non palpigeræ. Antennæ internæ inconspicuæ.

Subfam. 1. TYLINÆ.†—Appendices caudales infra abdominis segmentum posticum celatæ et operculiformes.

G. 1. TYLUS, *Latreille*.

Subfam. 2. ARMADILLINÆ.§—Appendices caudales inter duo abdominis segmenta postica partim visæ.

G. 1. ARMADILLO,|| *Latr.*, partim, *Brandt, Edw.*—Basis appendicum caudalium grandis, ramo interno parvulo, altero obsoleto.

G. 2. SPHERILLO, *Dana*.—Basis appendicum caudalium grandis, ramo interno parvulo, externo parvulo, in latere basis interiore versus apicem insito.

G. 3. ARMADILLIDIUM,¶¶ *Brandt*.—Basis appendicum caudalium brevis, ramo externo lato, terminali, interno parvulo.

G. 4. DIPLOEXOCHUS, *Brandt*.—*Armadilloni* appendicibus caudalibus similis. Segmenta thoracis processu horizontali utrinque armata.

Fam. II. ONISCIDÆ.

Corpus sæpius minus convexum, vel stricte vel laxè articulatum. Abdomen multi-articulatum, segmento ultimo parvo. Appendices caudales valde exsertæ, styliiformes. Mandibulæ non palpigeræ. Antennæ internæ inconspicuæ.

Subfam. 1. ONISCINÆ.\*\*—Maxillipedes 3-articulati, articulis duobus ultimis brevibus et parvulis. Antennæ externæ ad articulationem 5tam bene geniculatæ. Basis appendicum caudalium perbrevis, duos stylos multum inæquos gerens, stylo interno sub abdomine partim celato.

G. 1. ONISCUS, *Linn.*—Antennæ externæ subcylindricæ, ad basin fronte partim tectæ. Flagellum 1-3-articulatum,†† articulo precedente vix brevius vel longius.

Subgen. 1. TRICHONISCUS, *Brandt*.††—Antennæ externæ 6-articulatæ.

Subgen. 2. PORCELLIO, *Latr.*—Antennæ externæ 7-articulatæ.

Subgen. 3. ONISCUS, *Latr.*—Antennæ externæ 8-articulatæ.

G. 4. PHILOSCIA. *Onisco* affinis. Antennæ externæ usque ad basin apertæ, 7-articulatæ, subcylindricæ. Flagellum ac in *Porcellione*.

G. 5. PLATYARTHUS, *Brandt*.—Antennæ externæ quoad articulum 5tum latæ, latere externo dilatatæ.

G. 6. DÆTO, *Guerin*.—Flagellum antennarum externarum perbreve, 4-articulatum, articulo precedente multo brevius, articulo 5to cylindrico.

\* *Armadillidæ*, Koch, *Deutschl. Crust.*, 34th Heft, 1840; also *Cat. Brit. Crust. Brit. Mus.*, 1850, p. 73.

† Appendices normales abdominis 6tæ nobis denominatæ *appendices caudales*; segmentum abdominis ultimum *segmentum caudale* est.

‡ *Tylosiens*, Koch.

§ *Armadilliens*, Edw.

¶ *Pentheus*, Koch.

¶¶ *Armadillo*, Koch, et *Latr.* partim.

\*\* *Porcellioniens*, Edw. *Porcellionidæ*, *Cat. Brit. Crust. Brit. Mus.*, 1850. We deem it better to derive the family name from the *older* generic name, *Oniscus*.

†† Præter hos tres articulos, flagellum articulis minutis 1-3 inconspicuis ad extremitatem confectum, ultimo styliiforme et apice setigero. ††† *Itea*, Koch.

## 302 *On the Classification of the Crustacea Choristopoda.*

Subfam. 2. SCYPHACINÆ.—Maxillipedes 2-articulati, articulo 2do lamellato. Antennæ externæ ad articulationem 5tam non geniculatæ. Styli caudales ac in *Oniscinis*. Basis appendicum caudalium aut brevis aut oblongus, ramo interno interdum omnino aperto.

G. 1. SCYPHAX, *Dana*.—Flagellum antennarum 1-3-articulatum.

G. 2. STYLONISCUS, *Dana*.—Flagellum antennarum tenue, multi-articulatum.

Subfam. 3. LYGINÆ.—Maxillipedes 4-articulati, elongati. Antennæ externæ ad articulationem 5tam non bene geniculatæ. Styli caudales longi, basi longè exserto, ramis setiformibus, subæquis et æque apertis.

G. 1. LYGIA, *Fabr.*—Basis appendicum caudalium apice simplex, ramosque duos simul gerens.

G. 2. LYGIUM, *Brandt.\**—Basis appendicum caudalium apice furcatus, brachio utroque ramum setiformem gerente.

### Fam. 3. ASELLIDÆ.

Corpus sæpius plus depressum et laxè articulatum. Abdomen 6-articulatum, segmento ultimo grandi, scutellato. Appendices caudales styliformes, interdum brevissimæ. Mandibulæ palpigeræ. Antennæ internæ conspicuæ.

Subfam. 1. LIMNORINÆ.—Abdomen 5-6-articulatum.

G. 1. LIMNORIA.—Segmenta abdominis duo postica grandia, simul sumta scutellata.

Subfam. 2. ASELLINÆ.—Abdomen 1-2-articulatum.

#### 1. *Pedes thoracici subæqui.*

G. 1. JÆRA, *Leach*.—Appendices caudales perbreves; branchiales laminâ impari tectæ.

G. 2. JÆRIDINA, *Edw.*—Appendices caudales perbreves; branchiales apertæ.

G. 3. ASELLUS, *Geoffroy*.—Appendices caudales elongatæ. Pedes antichi subchelati.

G. 4. JANIRA, *Leach*.†—*Asello* affinis. Pedes toti unguiculati, ungue bifido.

G. 5. HENOPOMUS, *Kröyer*.‡—Pedes 1mi subchelati, digito 2-articulato; reliqui ambulatorii, articulo 6to sub-rudimentario. Appendices branchiales laminâ unicâ permagnâ tectæ. Thoracis segmenta latere incisa et dentata.

#### 2. *Pedes posteriores valde elongati.*

G. 6. MUNNA, *Kröyer*.§—Appendices caudales rudimentariæ. Pedes antichi crassiores, subchelati; posteriores corpore multo longiores.

### Subtribus III. CYMOTHOIDEA.

[The Cymothoidea correspond nearly to the *Isopodes nageurs* of Edwards.‖ The subtribe thus embraces along with Edwards's "Cymothodiens" (*Serolis* excluded) his "Spheromiens." The *Cymothoa*, *Æga* and *Spheroma* sections are closely related, and constitute a single natural group. The *first* (*Cymothoidæ*) has the antennæ attached to the under surface of the head somewhat remote from the front margin, and the caudal stylets are free; the *second* (*Ægidæ*) has the antennæ

\* *Zia*, Koch.

† *Oniscoda*, Latreille.

‡ *Nat. Tidsskr.*, [2], ii, 1847.

§ *Ibid.* ii, 1838, 1839, p. 612 and [2], ii, 1847.

‖ The exceptions consist in our removal of his *Pranisiens*, and the genus *Serolis*, to the Anisopoda.

attached to the front of the head, with the caudal stylets free; the *third* (*Spheromida*) has the antennæ attached to the front of the head, with the inner lamina of the caudal stylets united to the abdomen. In the Cymothoidæ, the legs are all ancoral and the caudal stylets and branchiæ are not ciliated; in the Ægidæ and Spheromidæ, only the two or three anterior pairs of legs are ancoral, if any, and the caudal stylets and branchiæ are commonly ciliated. A single genus of the Cymothoidæ (*Ægathoa*) has the habit of Æga and ciliated caudal stylets, with the antennæ and ancoral legs of Cymothoa. This ciliation of the lamellar abdominal appendages appears to be a mark of degradation in the species, and is strikingly characteristic of the abdominal natatory feet of the Amphipoda. The family Ægidæ contains two groups, distinct in habit; one (*Ægina*) often parasitic, having the 6 anterior legs ancoral, the other (*Cirolanina*) not parasitic, and with none of the legs ancoral.]

Fam. I. CYMOTHOIDÆ.\*

Maxillipedes breves, 3-4-articulati, operculiformes, articulis terminalibus angustis brevibus. Appendices caudales liberæ, marginibus rarissimè ciliatæ. Antennæ sub capite infixæ. Abdomen 4-6-articulatum, segmentis anterioribus raro connatis. Pedes toti ancorales. Branchiæ sæpissime non ciliatæ. Epimeræ conspicuæ.

Subfam. 1. CYMOTHOINÆ.—Lamellæ caudales nudæ. Abdomen multiarticulatum, segmentis liberis.

G. 1. CYMOTHOA, *Fabr.*—Femora lata, posteriora latissima. Segmenta thoracis 2 3ve postica multo breviora nunquam latere acutè producta. Segmentum caudale sæpissimè valde transversum. Antennæ graciles; 1mæ ad basin paulo remotæ.

G. 2. CERATOTHOA, † *Dana.*—*Cymothoe* affinis. Antennæ 1mæ crassæ basi conjunctæ. Caput postice latum, fronte productum et sæpe angustum.

G. 3. LIVONECA, *Leach.*—Femora latiuscula, 6ta vel 7ma 5tis vix latiora, non angustiora. Segmenta thoracis 3tium 4tum 5tum 6tumque fere æqua, 7mum paulo brevius. Abdomen thorace subito vix angustius. Caput parvulum. Frons non involutus et in processum inter-antennalem conspicue non productus. Segmentum caudale vix transversum. [Corpus sæpe oblique distortum.]

G. 4. ANILOCRA, *Leach.*—Femora angusta, posteriora angustiora. Segmentum thoracis 2dum 3tium 4tumve 5to 6to 7move multo brevius. Abdomen thorace subito angustius, segmentis processu laterali spiniformi infra non instructis, ultimo vix transverso.

Subgen. 1. ANILOCRÆ.—Rami appendicis caudalis multo inæqui.

Subgen. 2. CANOLIRA, *Leach.*—Rami appendicis caudalis subæqui.

G. 5. NEROCILA, *Leach.*—Femora et segmenta thoracis ac in *Anilocræ*. Abdomen thorace subito angustius, segmentis processu laterali spiniformi infra instructis, ultimo vix transverso.

G. 6. OLENCIRA, *Leach.*—Femora latitudine mediocria. Segmenta thoracis 3 postica anterioribus non longiora. Abdomen thorace subito multo angustius, segmentis cum processibus spiniformibus infra non instructis, ultimo non transverso.

Subfam. 2. OROZEUKTINÆ.—Segmentum abdominis posticum ac in *Cymothoâ*; segmenta alia coalita et non libera.

G. 2. OROZEUKTES, *Edw.*

\* *Cymothodiens Parasites*, Edw. Crust., iii, 228, 247.

† *Cymothoa Gaudichaudii* et *C. parallela* hic pertinent.

Subfam. 3. *ÆGATHOINÆ*.—Lamellæ caudales ciliatæ. Abdomen multiarticulatum, segmentis liberis.

- G. 1. *ÆGATHOA*, Dana.—Abdomen thoracis subito non angustius, segmentis subæquis. Caput subtriangulatum, latum, thorace parce angustius. Oculi grandes.

Fam. II. *ÆGIDÆ*.\*

Maxillipedes elongati, 4-6-articulati, articulis totis lamellatis, terminalibus latis et brevibus. Appendices caudales liberæ, marginibus ciliatæ. Antennæ ad frontis marginem capitis affixæ, apertæ. Abdomen 4-6-articulatum. Pedes 6 antici interdum ancorales aut prehensiles, sæpius simpliciter unguiculati, 8 postici unguiculati et nunquam ancorales. Branchiæ ciliatæ. Epimeræ conspicuæ.

Subfam. 1. *ÆGINÆ*.—Pedes 6 antici ancorales, unguibus validis; reliqui unguibus parvulis confecti.

- G. 1. *ÆGA*, Leach.—Pedes 6 antici æque ancorales. Antennæ 1mæ basi contiguæ, 2dæ per epistomatis processum sejunctæ. Frons capitis non saliens.

Subgen. 1. *ÆGA*.—Oculi remoti. Antennæ 1mæ basi complanatæ.

Subgen. 2. *CONILERA*, Leach.—Oculi remoti. Antennæ 1mæ basi subcylindricæ.

Subgen. 3. *ROCINELA*, Leach.—Oculi grandiores, inter se contiguæ. Antennæ 1mæ basi complanatæ.

- G. 2. *ACHERUSIA*, Lucas.†—*Ægæ* affinis. Antennæ 2dæ per processum non sejunctæ. Frons capitis saliens.

- G. 3. *PTERELAS*, Guerin.—*Ægæ* affinis. Pedes 2di 3tii sæpeque 1mi subdidactyli, processu e articulo penultimo instar digiti immobilis, processu sive acuminato sive acie instructo.

Subfam. 2. *CIROLANINÆ*.—Pedes nulli ancorales.

- G. 1. *CIROLANA*, Leach.‡—Segmenta thoracis subæqua. Pedes unguibus parvulis confecti. Antennæ 2dæ per processum epistomatis tenuem sejunctæ. Abdomen 6-articulatum.

- G. 2. *CORALLANA*, Dana.—Segmenta thoracis subæqua. Pedes unguibus parvulis confecti. Antennæ 2dæ epistomate transverso latissimè sejunctæ et partim tectæ, epistomate antennisque 1mis latè conniventibus.

- G. 3. *ALITROPUS*, Edw.—Segmenta thoracis 3 postica anterioribus longiora, ac in *Nerocila*. Pedes unguibus crassiusculis confecti.

Fam. III. *SPHEROMIDÆ*.§

Maxillipedes elongati 5-6-articulati et palpiformes. Appendices caudales margini abdominis laterali conjunctæ. Antennæ ad frontis marginem capitis affixæ, apertæ. Abdomen 1-2-articulatum. Pedes non ancorales (raro 4 antici ancorales). Branchiæ ciliatæ. Epimeræ non distinguendæ.

\* *Cymothoides errans*, Edw. Crust., iii, 233.—*Ægida*, Cat. Brit. Crust. Brit. Mus., 1850, p. 58. † Expl. de l'Algiers, pl. 8, f. 3.

‡ Genera *Velocira*, Leach, inclusa cum *Cirolana*. Eurydice discrepat abdomine 4-articulato tantum.

§ *Spheromida*, *Spheromidulæ*, Edw. Crust., iii, 199.—*Spheromida*, Cat. Brit. Crust. Brit. Mus., 1850, p. 58.



Subfam. 1. SPHEROMINÆ.—Lamella appendicis caudalis externa sub internâ se latens.

1. *Corpus in globum contractile.*

G. 1. SPHEROMA, *Latr.*—Lamellæ appendicis caudalis subæquæ.

2. *Corpus in globum non contractile.*

G. 2. CYMODOCEA, *Leach, Edw.\**—Caput valde transversum, multo convexum. Lamellæ appendicis caudalis subæquæ.

G. 3. CERCEIS, *Edw.*—Caput parce transversum, subtriangulatum, vix convexum. Antennæ 1mæ quoad basin capite tectæ, processu non sejunctæ.

G. 4. CASSIDINA, *Edw.*—Corpus latum; caput valde transversum. Lamellæ appendicis caudalis angustæ, valde inæquæ, externâ parvulâ. Antennæ 1mæ quoad basin processu frontis sejunctæ.

G. 5. AMPHOROIDEUM, *Edw.*—Antennæ quoad basin lamellate portentose productæ ultra capitis frontem.

Subfam. 2. NESÆINÆ.—Lamella appendicis caudalis externa saliens, sub internâ se non latens, usquam aperta. Pedes nulli ancorales.

G. 1. NESÆA, *Leach, Edw.†*—Lamella caudalis externa recta.

G. 2. CAMPECOPEA, *Leach.* Lamella caudalis externa arcuata.

Subfam. 3. ANCININÆ.—Pedes 4 antiqui ancorales.

G. 1. ANCINUS, *Edw.*—Appendices caudales unâ lamellâ oblongâ saliente basi quæ brevissimo instructæ.—An tribus Anisopodorum est genus Ancinus?

## TRIBUS II.

### ANISOPODA.

Subtribus I. SEROLIDEA, vel ANISOPODA CYMOTHOICA.

Fam. I. SEROLIDÆ.

Appendices abdominales sex anticæ liberæ, subnatoricæ, quatuor sequentes branchiales, bene lamellatæ, ultimæ ac in *Cymothoadis*. Antennæ 1mæ sub capite insitæ.

G. 1. SEROLIS, *Leach.*

Fam. II. PRANIZIDÆ.‡

Appendices abdominales totæ ac in *Ægidis*. Antennæ 1mæ sub capite insitæ. Pedes thoracis numero decem, paribus duobus anticis rudimentariis. Thoracis segmenta numero quinque non superantia.

Subfam. 1. PRANIZINÆ.—Caput parvum. Mandibulæ vix salientes.

G. 1. PRANIZA, *Leach.*

Subfam. 2. ANCEINÆ.—Caput grande. Mandibulæ ultra caput longè exsertæ.

G. 1. ANCEUS, *Risso.*

Subtribus II. ARCTURIDEA, vel ANISOPODA IDOTÆICA.

Fam. I. ARCTURIDÆ.

Subfam. 1. ARCTURINÆ.—Opercula abdominis ad ventrem stricte appressa.

\* Genus *Dynamena*, Leach, is included.

† Genus *Cilicæa*, Leach, is included.

‡ *Pranisiens*, Edw. Crust. iii, 92.

G. 1. *ARCTURUS*, *Latr.*—Segmenta thoracis subæqua. Antennæ 2dæ flagello longo confectæ.

G. 2. *LEACHIA*, *Johnston.*—Segmentum thoracis 4tum prælongum. Antennæ 2dæ longæ, ungue 1-3-articulato confectæ. Pedes 8 antici ciliati, non unguiculati.

Subfam. 2. *ANTHURINÆ*.—Opercula abdominis ad ventrem non bene appressa, sed libera et latera abdominis partim tegentia.

G. 1. *ANTHURA*, *Leach.*—Antennæ breves, 4-8-articulatæ. Pedes antici subchelati.

### Subtribus III. TANAIDEA, vel ANISOPODA ONISCICA.

#### Fam. I. TANAIIDÆ.

Pedes 1mi 2dive subchelati, sequentes non ancorales. Abdomen paribus 5 appendicum subnatoriis unoque postico stylo instructum.

Subfam. 1. *TANAINÆ*.—Corpus lineare, segmento thoracis 1mo sæpe oblongo capiteque parvulo. Styli caudales longo.

G. 1. *TANAIIS*, *Edw.\**—Antennæ 1mæ flagello non confectæ. Pedes antici breves, crassè chelati, reliqui unguiculati. Styli caudales sat longi, 3-7-articulati, simplices.

G. 2. *PARATANAIIS*, *Dana.*—*Tanai* similis. Styli caudales biramei, ramis inæquis, articulis uno vel pluribus instructis. Pedes antici breves.

G. 3. *LEPTOCHELIA*, *Dana.†*—Antennæ 1mæ longæ, flagello confectæ. Pedes antici longi, digitis hiantibus; reliqui unguiculati. Styli caudales sat longi, articulati, ramo laterali instructi.

G. 4. *APSEUDES*, *Leach.*—Antennæ 1mæ 2dæque flagello unico confectæ. Pedes antici breves, crassè chelati, 2di extremitate laminati, non unguiculati.

G. 5. *RHŒA*, *† Edw.*—Antennæ 1mæ 2dæque flagello confectæ, 1mis quoque flagello appendiculari. Pedes 1mi 2dique crassi, 1mis chelatis, 2dis unguiculatis.

Subfam. 2. *LIRIOPINÆ*.—Corpus antice latius, postice sensim angustans, segmento thoracis 1mo reliquis vix longiore, capite sat grandi. Appendices abdominales numero decem elongatæ.

G. 1. *LIRIOPE*, *Rathke.‡*—Pedes 4 antici subprehensiles, 5ti 6tique unguiculati, 7mi abbreviati, articuloque styliformi confecti. Antennæ 1mæ perbreves [setarum scopulâ ornatæ].

C. 2. *CRYPTOTHIR*, *Dana.*—*Liriopi* affinis. Pedes 7mi non abbreviati, unguiculati.

Subfam. 3. *CROSSURINÆ*.—Corpus antice latius, postice sensim angustatum, segmento thoracis 1mo vix longiore, capite sat grandi. Appendices abdominales inferiores numero sex, ciliatæ.

G. 1. *CROSSURUS*, *Rathke.§*—Pedes antici chelati, robusti, reliquis unguiculatis. "Abdomen duabus tænis semicircularibus e magno pilorum erectorum numero compositis fimbriisque duas exhibentibus cinctum."

#### Fam. II. BOPYRIDÆ.¶

Pedes toti plerumque aliquo modo subprehensiles vel ancorales. *Maris*, corpus angustum, abdomen 1-6-articulatum, appendicibus subnatoriis stylisque duobus sæpe instructum, interdum totis appendicibus obsoletis; *feminæ*, corpus latum et obesum, oculis carens, et quoad pedes sæpe partim obsoletum.

\* Genus *Zeuxo*, Templeton, (Trans. Ent. Soc., ii, 203,) is included.

† Amer. J. Sci. [2], iii, 425, 1849. Here falls *Tanais Edwardsii*, Kr. (Tids. iv, 1842.)

‡ Genus *Triura*, Tellkampf (Archiv. f. Nat., 1844, p. 321) *Rhœa* forsân affinis. Styli caudales longissimi et setiformes. Speciei descriptio et icon non bonæ.

§ Faun. Norw., 60, pl. 1, f. 8-12.

¶ Ibid. 35, pl. 1, f. 1-7.

¶¶ *Epicarides*, Latr.; *Isopodes sedentaires*, Edw. Crust., iii, 277.

Subfam. 1. BOPYRINÆ.—Thorax appendicibus branchialibus carens.

- G. 1. BOPYRUS, *Latr.*—Pedes thoracis *feminæ* manu imperfectâ confecti. Appendices abdominis branchiales laminatæ, laminâ unicâ compositæ et abdomine tectæ.  
 G. 2. PHRYXUS, *Rathke.\**—Pedes thoracis *maris* ancorales, *feminæ* manu imperfectâ confecti. Appendices abdominis *feminæ* branchiales magnæ, laminis duabus inæquis nudis compositæ, una vel ambæ laminæ laterales; *maris* rudimentariæ.  
 G. 3. CEPON, *Duvernoy.†*—Pedes thoracis *feminæ* non unguiculati, per pulvillum terminalem ancorales. Appendices abdominis *feminæ* branchiales numero duodecim, elongatè lamellatæ et bene ciliatæ.  
 G. 4. DAJUS, *Kröyer.‡*—*Maris* abdomen 6-articulatum, segmento ultimo prælongo; pedes thoracis bene unguiculati; appendices abdominis numero decem, oblongæ, ciliatæ, aliis duabus terminalibus minutis. *Feminæ* appendices abdominis laterales, duæ posticæ caudales breves, exsertæ.

Subfam. 2. IONINÆ.—Pedes thoracis ad basin appendices simplices branchiales gerentes.

- G. 1. IONE, *Latr.*—Pedes thoracis manu imperfectâ confecti. Appendices abdominales laterales, *maris* tenuiter cylindricæ, *feminæ* ramosæ præter duas ultimas simplices.  
 G. 2. ARGELA, *Dana.*—Pedes thoracis manu imperfectâ confecti. Appendices *feminæ* abdominales laterales, birameæ, ramis simplicissimis, nudis; *maris* nullis, abdomine non articulado, nudo.

### TRIBUS III.

## A M P H I P O D A .

### Subtribus I. CAPRELLIDEA.

#### Fam. I. CAPRELLIDÆ.

Corpus longum et fere filiforme. Antennæ 2dæ longitudine medioeres. [Species non parasiticæ.]

##### 1. *Pedes thoracis numero 14.*

- G. 1. PROTO, § *Leach.*—Mandibulæ palpigeræ. Branchiæ segmentis 2do 3tio 4toque affixæ. Pedes thoracis toti articulis normales.  
 G. 2. PROTELLA, *Dana.*—Mandibulæ palpigeræ. Branchiæ segmentis 3tio 4toque affixæ. Pedes 3tii 4ti que obsoleti articulo 1mo styliformi excepto.

##### 2. *Pedes thoracis 3tii 4ti que omnino obsoleti.*

- G. 3. CAPRELLA, *Lamk.*—Mandibulæ non palpigeræ. Branchiæ segmentis thoracis 3tio 4toque affixæ. Abdomen brevissimum, 1-2-articulatum.  
 G. 4. ÆGINA, *Kröyer.¶*—Mandibulæ palpigeræ, palpibus 3-articulatis. Branchiæ ac in *Caprellâ*. Abdomen brevissimum, 1-2-articulatum.  
 G. 5. CERCOPS, *Kröyer.¶¶*—Mandibulæ palpigeræ. Branchiæ segmentis 2do 3tio 4toque affixæ. Abdomen 5-articulatum, appendicibus 4 elongatis 3-articulatis.

##### 3. *Pedes 3tii 4ti 5ti que obsoleti.*

- G. 6. POPALIBIUS, *Kröyer.\*\**—Branchiæ segmentis 3tio 4toque affixæ.

#### Fam. 2. CYAMIDÆ.

Corpus latum, depressum. Antennæ 2dæ obsoletæ. [Species parasiticæ.]

- G. 1. CYAMUS.

\* Fauna Norwegens, p. 40.

† Annales des Sci. Nat. [2], xv, 110, pl. 4.

‡ Voy. Scand., etc., Crust. tab. 28, 29.

§ *Leptomera*, Latreille.

¶ Tids. iv, 1842.

¶¶ Ibid.

\*\* Voy. Scand., pl. 25, and Tids. [2], i, 283.

## Subtribus II. GAMMARIDEA.

[Among the Gammaridea, the author finds that the posterior caudal stylets offer important characters for distinguishing natural groups or genera, and upon this ground, some new genera have been recognized among the Corophidæ and Gammaridæ, and others *that have been rejected* are sustained. Thus *Iphimedia* is distinct from *Amphithoe*, *Mæra* and *Dercythoe* from *Gammarus*, etc.]

## Fam. I. DULICHIDÆ.

Gressoriæ, habitu Caprelloideæ. Corpus lineare, epimeris obsoletis. Pedes posteriores longi, subprehensiles. Abdomen 5-articulatum.

G. 1. DULICHIA, *Krøyer*. \*—Pedes 5ti 6ti 7mique, subæqui, 2di manu confecti. Antennæ quatuor longæ, superiores prælongi.

## Fam. II. CHELURIDÆ.

Corpus fere cylindricum, epimeris mediocribus. Abdomen segmentis 4to 5toque coalitis et oblongis, stylis inter se valde dissimilibus.

G. 1. CHELURA, *Philippi*. †

## Fam. III. COROPHIDÆ.

Gressoriæ, pedibus partim lateraliter porrectis. Corpus plus minusve depressum, sæpe latum, epimeris perbrevibus, interdum obsoletis. Abdomen formâ appendicibusque normale. Antennæ sæpe pediformes.

Subfam. 1. CLYDONINÆ.—Styli caudales sex simplices, subulati.

G. 1. CLYDONIA, *Dana*. ‡—Pedes filiformes, 5ti 6ti 7mique, longitudine increscentes, 1mi 2di non prehensiles. Antennæ duæ longæ, crassæ, rigidæ.

Subfam. 2. COROPHINÆ.—Antennæ plus minusve pediformes. Styli caudales 1mi 2dique biramei.

## A. DIGITUS NULLUS 2-ARTICULATUS.

1. *Styli caudales 3tii minuti, simplices, 2di 1mique ramo externo cultriformi.*

G. 1. COROPHIUM, *Latr*—Antennæ inferiores longiores et crassiores, flagello carentes. Pedes 2di non prehensiles, 1mis crassiores, articulo 4to latiore quam 5tus.

G. 2. SIPHONOCETES, *Krøyer*. §—Antennæ inferiores longiores, flagello carentes. Pedes 1mi 2dique subchelati. [Pedes 3tii 4tique articulo 4to laté obcordato. Tubum lapillis fragmentisque concharum formatum inhabitat.]

\* Tids. [2], i, 512, 1845.

† Arch. f. Nat. 1839; and G. J. Allman, Ann. and Mag. N. H. xix, 361, June, 1847.

‡ Amer. J. Sci. [2], viii, 140; *Icilius*, D., on same page.

§ Voy. Scand., etc., 1838-1840, pl. 20, f. 1; Tidsskr. [2], i, 481, 1845. *Krøyer* in his description says:—

“Pedes thoracici primi et 2di paris validissimi, manu instructi subcheliformi. Pedes 3tii et 4ti paris articulo primo latissimo, laminari; articulo quarto obcordato, laminari, manum præbente, cujus unguis efficitur articulo quinto subconico articuloque sexto aciculari. Pedes 5ti 6tique paris minutissimi, sed robusti, recurvati, articulo primo clavato, ungue furcato. Pedes 7mi paris graciles, recurvati, articulo primo laminari, ungue minutissimo, furcato. Pedes abdominales 1mi, 2di et 3tii paris natatorii breves validissimi, parte basali latissima, rhomboidali; pedes 4ti, 5tique paris saltatorii, pes abdominalis sexti paris natatorius unica instructus lamina terminali.”

2. *Styli caudales 3tii minuti, vix exerti, simplices, 2di 1mique ramis extus non præcipue spinosis nec cultriformibus, interdum nudis.*

G. 3. *PLATOPHIUM, Dana.*—Corpus superne visum subellipticum, abdomine bene inflexo. Antennæ flagello brevi sæpe instructæ, inferiores longiores, superiores appendiculatæ. Pedes 1mi 2dique subchelati, 2dis validioribus. Pedes 10 postici mediocres.

G. 4. *CYRTOPHIUM, Dana.*—*Platophio* similis. Antennæ superiores non appendiculatæ.

3. *Styli caudales 3tii parvuli, biramei, ramo externo non uncinato, 2di 1mique ramis extus non præcipue spinosis nec cultriformibus.*

G. 5. *UNCIOLA, Say.\**—Pedes 1mi 2dique manu confecti, 1mis validioribus. Antennæ flagellis confectæ, subpediformes, validæ, superiores paulo longiores, appendiculatæ.

4. *Styli caudales 3tii paulo elongati, biramei, ramo externo uncinato.*

G. 6. *PODOCERUS, Leach.†*—Pedes 1mi 2dique subchelati, 2dis validioribus. Antennæ superiores breviores, non appendiculatæ. [An maris digitus 2dus interdum 2-articulatus Kröyero teste.]

G. 7. *CRATOPHIUM, Dana.*—Pedes 1mi 2dique subchelati, 2dis validioribus. Antennæ superiores breviores, appendiculatæ.

B. DIGITUS 2DUS 2-ARTICULATUS.

G. 8. *CERAPUS, Say.*—Antennæ pediformes, subæquæ, flagellis carentes. Pedes 1mi 2dique prehensiles, 1mis parvulis, 2dis manu bene confectis. *Styli caudales 3tii biramei, ramis subæquis, longiusculis.* [Tubum membranaceum inhabitat.]

G. 9. *CERAPODINA, Edw. (Cerapus, Templeton).* Antennæ totæ flagellis confectæ. Pedes 4ti 5ti 6tique obsoleti (?) [Tubum papyraceum inhabitat.]

G. 10: *ERICHTHONIUS, Edw.‡*—Antennæ flagellis confectæ. Pedes 10 postici mediocres. Epimeræ anteriores obsoletæ. [An *styli caudales 3tii simplicissimi* ?]

Subfam. 3. *ICILINÆ.*—Antennæ non pediformes nec subpediformes, flagellis sat longis basi que sat brevi instructæ. *Styli caudales ac in Corophinis.*

G. 1. *ICILIUS, Dana.*—Pedes toti unguiculati et tenues, 4 antici longi, non prehensiles, ciliati, 10 postici fere similes. Antennæ superiores breviores non appendiculatæ.

G. 2. *PTERYGOCERA, Latr.*—Pedes posteriores sublamellati. Antennæ superiores breviores, appendiculatæ, inferiores basi dilatatæ.

\* Jour. Acad. Nat. Sci. Philad., i, 388.

*Glaucome* of Kröyer has the hands and antennæ and apparently the other characters of *Unciola*. Say describes the hands of the 2nd pair in *Unciola* as *adactyle*; but they still are probably like those of *Glaucome*. The following is Kröyer's description:—

“*Antennæ* subpediformes; superiores flagello ornatæ appendiculari perparvo. *Oculi* minuti, parum distincti. *Mandibulæ* apex in duos fissus ramos qui dentibus sunt armati conicis; tuberculus molaris dentibus confertissimis instructus. *Labium superius* breve, depressum latissimum, margine anteriori medio inciso; *labium inferius* quatuor compositum laminis setosis. *Laminæ maxillares* pedum maxillarum dentibus armatæ validis; unguis palpi apice setosus. *Pes primi paris* robustissimus, manu subcheliformi; *pes secundi paris* gracilior, manu carens subcheliformi, pedes 3tii, 4tique paris pergraciles; pedes 5ti, 6ti, 7mique paris graciles femoribus parum dilatatis. Pedes abdominales 1mi 2di et 3tii paris natatorii, breves sed robustissimi; 4ti, 5tique paris saltatorii, validi; 6ti paris fere rudimentares, natatorii. Epimera minima fere evanescentia.”

† *Jassa* of Leach may without inconvenience be united to *Podocerus*, as there is no essential generic difference between them.

‡ The author obtained three species in the cruise of the Expedition having the hands and many other characters of *Erichthonius*, but with the epimerals of the anterior thoracic segments of considerable size; and moreover no gressorial habits were observed. They are therefore with some hesitation arranged in a genus named *Pyctilus*, among the *Gammaridæ*, subfamily *Gammarinæ*.

## Fam. IV. ORCHESTIDÆ.\*

Saltatoriæ, pedibus nullis lateraliter porrectis. Corpus compressum, epimeris magnis. Abdomen appendicibus normale. Antennæ non bene pediformes. Styli caudales 1mi 2dique biramei; 3tii simplices, brevissimi et ultra 2dos non prolongati. Mandibulæ non palpigeræ. Maxillæ 1mæ palpo sive parvulo et 1-articulato sive obsoleto instructæ.

G. 1. ORCHESTIA.—Maxillipedes non unguiculati. Antennæ 1mæ basi 2darum breviores. Epimeræ 5tæ 4tis parce breviores.

Subgen. 1. TALITRUS.—Pedes 1mi *maris feminae*ve manu non instructi.

Subgen. 2. TALORCHESTIA, *D.*—Pedes 1mi *maris* ac in *Talitro*, *feminae* manu parvulâ instructi.

Subgen. 3. ORCHESTIA.—Pedes 1mi *maris feminae*que manu plus minusve instructi.

G. 2. ALLORCHESTES, *Dana.*—Maxillipedes unguiculati. Antennæ 1mæ minores, basi 2darum longiores. Epimeræ 5tæ 4tis sæpius multo breviores.

## Fam. V. GAMMARIDÆ.

Saltatoriæ vel natatoriæ, pedibus nullis lateraliter porrectis. Corpus sæpius compressum, raro subdepressum, epimeris sive magnis sive parvis. Styli caudales laxiores, duobus ultimis oblongis sæpiusque ultra 2dos prolongatis, raro simplicibus. Mandibulæ sæpissimè palpigeræ. Maxillæ 1mæ palpo 2-3-articulato (rarissimè 1-articulato) instructæ.

## I. PEDES 10 POSTICI NON PREHENSILES.

Subfam. 1. STEGOCEPHALINÆ.—Antennæ breves, superiores basi crassæ. Mandibulæ acie denticulatâ instructæ, palpo brevi uniarticulato intus dentato. Epimeræ permagnæ.

G. 1. STEGOCEPHALUS, *Kröyer*.†—Epimeræ 4tæ maximæ, 5tis parvis. Antennæ superiores appendiculatæ. Pedes 1mi 2di manibus carentes. [Pedes 5ti 3tii 4tique directione similes.]

Subfam. 2. LYSIANASSINÆ.—Antennæ breves, superiores basi crassæ. Mandibulæ apice parce dentatæ, acie vix instructæ, palpo 2-3-articulato. Maxillipedes lamellis internis grandibus. Epimeræ permagnæ.

1. *Pedes 1mi 2dique non subchelati, 2dis parvulis interdum exceptis.*

G. 1. LYSIANASSA, *Edw.*—Antennæ superiores appendiculatæ.

G. 2. PHLIAS, *Guerin.*—Antennæ superiores non appendiculatæ.

2. *Pedes 1mi subchelati, 2dis non subchelatis.*

G. 3. OPIS, *Kr.*‡—Antennæ superiores appendiculatæ. Pedes 1mi crassè chelati, 2di debiles.

\* The author gives a different arrangement of the species of Orchestidæ from that published in this Journal, [2], viii, 135 and ix, 295, and rejects the genus Talitronus there instituted. He follows Fr. Müller (*Archiv f. Nat.*, 1848, 53) in considering the Talitri and Orchestiæ as forming a single genus, his recent investigations confirming this view. The Gammaridæ also are rearranged.

† *Kröyer's Nat. Tids.* iv, 150, 1842. "Caput oculis ut videtur destitutum."

‡ *Tids.* iv, 149. "Pedes 1mi paris chelis armati portentosæ magnitudinis. Reliqua cum genere Anonyce ferme conveniunt."

G. 4. URISTES, *Dana*.\*—Antennæ superiores non appendiculatæ. Pedes 1mi subchelati, 2di articulo styliformi confecti.

3. *Pedes 1mi 2dique plus minusve subchelati.*

G. 5. ANONYX, *Kr.*†—Epimeræ permagnæ. Antennæ superiores appendiculatæ, basi breves. Maxillipedes lamellis internis grandibus. Styli caudales postici biramei, ramis subulatis.

G. 6. UROTHOE, *Dana*.—Epimeræ permagnæ, 5tis parvis. Antennæ 1mæ breviores, appendiculatæ, basi sat elongato. Styli caudales postici longi, biramei, ramis foliaceis, ciliatis. Mandibulæ palpo 3-articulato.

Subfam. 3. LEUCOTHOINÆ.—Antennæ superiores basi plus minusve graciles. Maxillipedes elongati, angusti, articulo longo unguiformi confecti, *lamellis internis perbrevibus*. Mandibulæ sive palpigeræ sive non palpigeræ, processu molari carentes. [An semper?] Epimeræ magnæ.

G. 1. STENOThOE, *Dana*.—Epimeræ permagnæ, 4tæ maximæ, 5tæ parvulæ. Pedes 4 antiqui subchelati, 2dis validioribus. Antennæ superiores longiores, non appendiculatæ. Mandibulæ non palpigeræ, *processu molari carentes*. Styli caudales 1mi 2dique ramis bene subulati, 3tii simplicissimi, subulati, spinâ crassâ confecti.

G. 2. LEUCOTHOE, *Leach*.†—Epimeræ magnæ, 5tæ parvulæ. Pedes 4 antiqui subchelati, 2dis validioribus. Antennæ superiores longiores, non appendiculatæ. Mandibulæ palpigeræ. Styli caudales toti biramei, ramis subulatis.

[Cujus sedis est *Microcheles*, Krøyer, § Amphithoe affinis, cui mandibulæ processu molari carentes: quoque *Amphithoe Marionis*, Edw., cui mandibulæ non palpigeræ.]

Subfam. 4. GAMMARINÆ.—Antennæ 1mæ basi graciles. Maxillipedes sat lati, lamellis internis sat elongatis. Mandibulæ acie denticulatâ instructæ et alterâ accessoriâ quoque processu molari et palpo 3-articulato. Pedes 10 postici non subprehensiles.

A. FRONS PRODUCTUS ET INFRA ANTENNIGERUS NON EST, ANTENNIS 1MIS INFERIORIBUS NON ANTERIORIBUS.

1. *Styli caudales postici biramei, ramis subæquis.*

A. PEDES 2DI NON SUBCHELATI.

G. 1. ACANTHONOTUS, *Owen*.—Antennæ quatuor subæquæ, 1mæ non appendiculatæ. Epimeræ magnæ. Pedes 2di filiformes, manu omnino carentes, 1mi manu vix confecti.

G. 2. ALIBROTUS, *Edw.*—Antennæ 1mæ breves, appendiculatæ. Epimeræ magnæ. Pedes 1mi validi non subchelati.

\* Amer. J. Sci. [2], viii, 135. The genus *Stenia* is rejected.

† Tids. ii, 256, and iv, 164.

The genus *Ephippiphora* of White (Ann. and Mag. N. Hist. [2], i, 226, 1848) has been but briefly described, and we cannot pronounce upon its exact relation to either of the genera of Lysianassinae. The habit is like that of Anonyx, the epimerals large, the superior antennæ appendiculate, the posterior caudal stylets elongate as in Anonyx and not short like the Orchestidæ. But the character of the termination of the 4 anterior legs is not stated, neither are they in view in the figure of the species on plate 5 of the Zool. of the Erebus and Terror. This figure represents the 5th and 6th pair of legs as rudimentary, or the basal joints twice as long as the following part, and the basal joint of the 6th smaller than that of the 5th or 7th.

‡ Krøyer states that the *bi-articulate* finger of Leucothoe is not a true generic characteristic, and adds two species to the genus, one of which has this character imperfectly and the other not at all. (Nat. Tids. iv, 141, 1842, and [2], i, p. 539, 1845). This character of the hand depends mainly on the prolongation of the inferior apex of the antepenult joint, which prolongation is variously developed in species of allied genera. They agree with Leucothoe in their peculiar slender maxillipeds; in the very small epimerals to the 1st segment, large 4th, and small 5th, 6th and 7th; in the caudal stylets; the very short 3d joint of the superior antennæ, and other characters.

§ Tids. N. R. ii, 5.

## 312 *On the Classification of the Crustacea Choristopoda.*

G. 3. LEPTOCHIRUS, *Zaddach*.\*—Antennæ 1mæ appendiculatæ. Pedes 1mi bene subchelata, 2di manu carentes.

### B. PEDES 2DI 1MIQUE SUBCHELATI.

\* Antennæ 1mæ non appendiculatæ.

G. 4. IPHIMEDIA, *Rathke*,† *D.*—Epimeræ magnæ, 4tæ maximæ, 5tis multo brevioribus et vix bilobatis. Styli caudales postici ramis duobus oblongis consimilibus apice setigeris et non uncinatis instructi. Antennæ 1mæ sæpius breviores.

G. 5. ŒDICERUS, *Kröyer*.‡—*Iphimedia* affinis. Pedes 7mi longissimi, fere filiformes. Antennæ 1mæ breviores.

G. 6. AMPHITHOE, *Leach*, *D.*§—Epimeræ magnæ, 5tæ maximæ, vix bilobatæ lobo posteriore minimo. Styli caudales postici ramis duobus brevibus dissimilibus instructi, ramo externo apice recurvatim bi-uncinato, interno compresso apice non spinuloso sed pilis parce ciliato. Antennæ 1mæ sæpissime longiores.

\*\* Antennæ 1mæ appendiculatæ.

G. 7. GAMMARUS, *Fabr.*, *D.*||—Epimeræ sive mediocres sive breves. Styli caudales postici 2dis non similes, ramis sæpe longis cum pilis raro spinulis ornatis, apice non uncinatis. Antennæ superiores sæpius longiores.

2. *Styli caudales postici sive ramo uno longo altero parvulo instructi, sive simplicissimi et apice non paulo reflexi.*

\* Antennæ 1mæ non appendiculatæ.

G. 8. PHOTIS, *Kröyer*.¶—Epimeræ magnæ, 5tæ 4tis non breviores et postice profundius excisæ. Styli caudales ramo interno rudimentario.

\* The genus *Leptochirus*, (Syn. Crust. Borus. Prodr. 1844) is described by Zaddach as having no appendicular branch to the superior antennæ. But Fr. Muller states (Archiv für Naturgeschichte, 1848, xiv, 62) that there is a small one-jointed appendage in the *Leptochirus pilosus*. The legs of the 2nd pair are described as having no proper hand, but terminating as in the genus *Talitrus*. May the form be female only?

† Beit. zur Fauna Norwegens, p. 85, Act. Leop. xx. *Decamine* of Leach, may perhaps be included here.

The genus *Hyale* of H. Rathke (Fauna der Krym, Mem. Acad. Imp. St. Petersburg, iii, 1837, p. 378, pl. 5) contains no characters in its description by this author which do not apply equally well to species of *Iphimedia*. The description is as follows:—"Corpus elongatum, compressum. Antennæ inferiores superioribus aliquantulum longiores; earum quælibet e tribus articulis atque flagello composita. Oculi disciformes. Pedes 14: duo eorum paria antica chelis monodactylis complanatis, 2di paris multo majoribus. Stylorum abdominalium paria tria. Abdominis appendicula terminalis simplex, erecta, verruciformis." The posterior stylets are 2-branched though short; and the species (*H. pontica*) is thus distinct from the *Allorchestes*.

‡ Tids. iv, 155, 1842. "Frons in rostrum producta, plus minus acutum obtusumve, semper vero nodo pellucenti, ovali, flavo-rubescente turgidum. Oculi nulli?" "Pedes 3tii 4tique paris validi, ungue instructi lato laminari, quod quoque usu venit 5to 6toque pari, quorum articulus 1mus dilatatus non est."

§ Includes *Pherusa* of Leach.

|| *Amathia*, Rathke (Fauna der Krym, Mem. Acad. Imp. St. Petersburg, iii, 1837, p. 291, and Beit. zur Faun. Norw. Act. Leop. xx) includes those *Gammari* that have the superior antennæ the shorter—not a proper basis for a genus. The eye is described as reniform.

The genus *Eusirus* of *Kröyer* is very near *Gammarus*, and it is doubtful whether it should be separated. Its habit however is somewhat different. The hands of the 2 anterior pairs of legs are large and equal, and the carpus is articulated with the upper margin of the hand near its middle. The eye is reniform. The superior antennæ have a short appendicular branch, consisting of a minute joint. "Mandibula parva, apice bifurco, dentato, flabello setarum marginis interioris, tuberculo molari transverso-elliptico dentibus minutissimis confectis formato; palpus triarticulatus duplam fere æquat mandibulæ longitudinem. Sex branchiarum paria in maribus (annuli thoracici 2di-7mi), 4 laminarum in feminis paria (annuli 2di-5ti)."—Tids. [2], i, 501.

¶ Tids. iv, 155, 1842, "Pes 5ti paris recurvatus, inversus, ungue rudimentari. Epimera permagna, 5 paria anteriora ad marginem inferiorem setis sat longis instructa, 5tum eadem est ac 4tum altitudine, postice profundius excisum. Lamina terminalis interior pedis saltatorii 3tii paris rudimentaris."

The *inversion* of the 5th pair of legs is not a generic character.



G. 9. MELITA, *Leach, D.*—Epimeræ 5tæ 4tis multo breviores (sic an semper?) Styli caudales uno ramo longo, sive subcylindrico sive foliaceo, altero brevi vel obsoleto. [Digitus in manus latus sæpe claudens.] Antennæ 1mæ sæpius longiores.

\*\* Antennæ 1mæ appendiculatæ.

G. 10. MÆRA, *Leach, D.*—Epimeræ et styli caudales postici ac in *Melita*.

3. *Styli caudales postici simplicissimi, ramo uno brevi et nudo, apice paulo reflexo et spinas duas perbreves paulo exsertas gerente.*

G. 11. DERCOThOE, *Dana.*—Epimeræ mediocres, 5tæ bene bilobatæ, 4tis sæpius vix breviores. Pedes 1mi 2dique digito uni-articulato confecti.

G. 12. PYCTILUS, *Dana, (Erichthonius, Edu.?)*—Epimeræ mediocres vel breves corpore lineari, subdepresso. Antennæ longæ, flagellis sat longis. Manus 1mæ articulis 4to 5toque sæpe instructæ, digito uni-articulato; 2dæ digito 2-articulato.

G. 13. (An hujus sedis?) PARDALISCA, *Krøyer.\**—Epimeræ breves. Pedes 1mi 2dique digito 2-articulato manūque 1-articulatâ instructi. Antennæ tenues, 1mæ appendiculatæ.

B. FRONS PRODUCTUS ANTENNASQUE 1MAS VERSUS EXTREMITATEM GERENS.

[AN SPECIES COROPHIDIS AFFINIORES.]

G. 14. ATYLUS, *Leach.*—*Iphimedia* paulo affinis. Antennæ subpediformes, breviores, non appendiculatæ. Digi 1mi 2dique uni-articulati.

G. 15. ISCHYROCERUS, *Krøyer.†*—*Gammaro* paulo affinis. Antennæ pediformes, 1mæ appendiculatæ. Palpus mandibularis longus, articulo ultimo obovato. Pedes 2di maris manu validissimâ instructi. Digi uni-articulati. Epimeræ mediocres.

## II. PEDES 10 POSTICI PARTIM PREHENSILES.

Subfam. 5. PONTOPORINÆ.—Pedes 3tii 4tique plus minusve prehensiles; 6 postici non prehensiles.

### 1. Antennæ 2dæ inferiores et non posteriores.

G. 1. LEPIDACTYLIS, *Say.‡*—Epimeræ magnæ. Antennæ superiores appendiculatæ, inferiores basi infra valde dilatatæ et partim dolabriformes. Pedes 4 antichi filiiformes; 3ti 4tique manu compressâ digitoque laminato instructâ; 5ti 6ti 7mique valde compressi, 7mis longioribus, articulis superne valde productis.

G. 2. PONTIPOREIA, *Kr.§*—Epimeræ magnæ. Antennæ superiores appendiculatæ. Pedes 1mi 2dique perbreves, robusti, 1mi manu latâ ungue brevi confecti, 2di manu carentes; 3tii 4tique validi, manu articulo 4to dilatato instructâ, ungue conico aculeato; 7mi ungue vel articulo 6to rudimentario.

G. 3. AMPELISCA, *Kr.¶*—Epimeræ magnæ. Antennæ graciles. Pedes 1mi 2dique manu nullâ subcheliformi; 3tii 4tique manu articulo 3tio instructâ, digito articulis 3 sequentibus formato, articulo ultimo vel ungue longissimo et gracillimo; 5ti 6tique 5-articulati, ungue rudimentario recurvo, immobili (vel parum mobili). Styli caudales postici natatorii.

G. 4. PROTOMEDEIA, *Kr.¶¶*—Corpus subdepressum, epimeris sat brevibus. Antennæ superiores appendiculatæ, inferiores pediformes, basi prælongo. Manus 3tiæ 4tæque articulis 3tio 4toque instructæ et digiti longi articulis sequentibus coalitis. Pedes 2di parvi, manu subcheliformi non instructi.

\* Tids. iv, 153, 1842. "Caput crassiusculum." "Mandibula apice dilatata, quadridentata, palpo 3-articulato." "Pedes 3tii 4tique paris ungue sublaminari postice subtiliter serrulato." "Pedes spurii [abdominales] 2di et 3tii paris natatorii, reliqui saltatorii."

† Tids. iv. "Pedes spurii 4ti 5ti 6tique paris saltatorii; articulus basalis 6ti paris articulis terminalibus triplo vel quadruplo longior."

‡ Jour. Acad. Nat. Sci. Philad., i, 379. Here falls *Bellia* of C. Spence Bate (*Ann. and Mag. N. Hist.* 1851, [2], vii, 318.)

§ Tids. iv, 152. "Pedes 5ti et 6ti paris recurvi, articulo 1mo parum modo dilatato ungue armati pusillo."

¶ Tids. iv, 154. "Oculi simplices?" "Sextum pedum abdominalium par natatorium."

¶¶ Tids. iv, 154.

G. 5. AORA, Kr.\*—Corpus subdepressum, epimeris sat parvis. Antennæ superiores longæ, appendiculatæ, inferiores subpediformes. Pedes 1mi 2dique manu subcheliformi, 1mis maximis, articulo 3tio posticè in apicem longissimum producto, manu angustâ, ungue fere lamellari. Manus 3tiæ 4tæque articulo 4to ovali instructæ digitis articulis 5to 6toque. Styli caudales saltatorii, 6tis 7mis setis non aculeis apice instructis.

2. *Antennæ 2dæ multo posteriores, fronte in rostrum producto.*

G. 6. PHOXUS, Kr.†—Epimeræ permagnæ. Pedes 1mi 2dique manu subcheliformi validâ instructi. Manus 3tiæ 4tæque articulo 3tio 4toque junctis instructæ, digitis 5to 6toque. Pedes 6ti multo longiores. Caput longum, triangulare, antice productum et acuminatum. Antennæ anteriores perbreves (capite breviores), elongate appendiculatæ; posteriores paulo longiores. Mandibulæ palpo longissimo. Segmentum caudale laminis constans duâbus.

Subfam. 6. ISÆINÆ.‡—Pedes quatuor vel sex postici subprehensiles.

G. 1. ISÆA, Edw.—*Gammaro* similis. Pedes 10 postici similes, articulo 5to apice dilatato et truncato, ungue in articulo 5ti extremitatem latiusculam claudente. Pedes 2di manu grandi confecti. Antennæ superiores appendiculatæ.

G. 2. ANISOPUS, *Templeton*.—Pedes 4 postici ac in *Isæâ*, validiores, articulo 5to apice inferiore dentato, ungue magno. Pedes 1mi tenues et breves; 2di manu angustâ; 3tii manu grandiore; 4ti 5ti 1mis similes.

### Subtribus III. HYPERIDEA. §

[In the first family of the Hyperidea, (the *Hyperidæ*) neither of the 5 posterior pairs of legs are subchelate, and the antennæ are not folded up beneath the head or thorax. In the second, (the *Phronimidæ*), one or more of the 3 posterior pairs of legs are subchelate or much enlarged, apparently for grasping in coition, and the antennæ are as in the *Hyperidæ*. The third family (the *Typhidæ*) differs from both the preceding in the concealment and folding of the inferior antennæ beneath the head or thorax, and in many of the species, the abdomen closes up against the venter.]

### Fam. I. HYPERIDÆ. ||

Antennæ 2dæ exsertæ. Abdomen in ventrem se non flectens. Pedes 5ti 6ti 7miquæ formâ longitudineque mediocres, 5tis 6tisve non percrassis nec prehensilibus.

Subfam. 1. VIBILINÆ. ¶—Corpus formâ paulo *Gammaroideum*. Caput oculique mediocres. Maxillipedes palpo parvulo instructi. Palpus mandibularis tenuis.

\* Tids. [2], i, 335, 1845.

† Tids. iv, 150.

‡ An genus *Laphystius* (Krøyer, Tids. iv, 156, 1842) *Isæinis* vel *Corophidis* affine. Species in *Sturiones Squalosve* parasitica! Descriptio sequens:—

Corpus latum, depressum, epimeris mediocribus, 4tis infra acutè productis. Caput transversum, rostratum. Antennæ sat breves, subulatæ, validæ, 1mæ validissimæ, anteriores, 2dæ posteriores. Mandibulæ palpo instructæ. Pedes 1mi gracillimi, manu lineari; 2di breves, manu validâ, ungue sublaminari. Reliqui decem pedes validi, subcheliformes, longitudine subæqui. Styli caudales debiles. Palpus maxillarum 1marum uniarticulatus.

§ *Hyperines* of Edwards, Crust. iii, 70: *Hyperita*, Cat. Brit. Crust. Brit. Mus. 56.

|| Familiæ duæ nostræ *Hyperidæ* et *Phronimidæ* sunt Tribus "Hypérines ordinaires." Edw. (Crust. iii, 74; et *Phronimadæ* Cat. Brit. Crust. Brit. Mus., p. 56.

¶ *Hyperines Gammaroides*, of Edwards, Crust. iii, 72.

G. 1. VIBILIA, *Edw.*—Antennæ 4 breves, 1mæ obtusæ. Pedes 1mi 2dique subprehensiles.

Subfam. 2. HYPERINÆ.—Caput tumidum. Oculi pergrandes. Palpus mandibularis tenuis.

1. *Antennæ sive 1mæ sive 2dæ flagello longo confectæ.*

G. 1. LESTRIGONUS, *Edw.*—Antennæ 1mæ 2dæque flagello longo confectæ. Pedes 1mi 2dique paulo prehensiles.

G. 2. TYRO, *Edw.*—Antennæ 1mæ flagello longo confectæ; 2dæ perbreves, flagello nudo.

2. *Antennæ totæ breves. Caput oculique pergrandes.*

G. 3. HYPERIA, *Latr.*—Antennæ 1mæ 2dæque conspicuæ, 2dis gracilioribus. Pedes 2di sæpiusque 1mi subprehensiles, manibus multum imperfectis, articulo 4to ad apicem inferiorem paulo producto tantum.

G. 4. METOECUS, *Kröyer.*—*Hypericæ* affinis. Pedes 1mi 2dique perbreves, manibus melioribus bene didactylis confecti.

G. 5. TAURIA, *Dana.*—Antennæ ac in *Hyperidæ*. Pedes 2di non prehensiles, articulo 4to apice inferiore non expanso nec producto.

G. 6. DAIRA, *Edw.*—Antennæ 1mæ non conspicuæ, 2dæ exsertæ. Pedes 1mi 2dique plus minusve prehensiles: tarsi pedum reliquorum breves. Rami stylium caudalium longi.

G. 7. CYSTISOMA, *Guérin.\**—Antennis pedibusque 1mis *Dairæ* affine. Tarsi prælongi. Styli caudales longi, ramis brevibus.

Subfam. 2. SYNOPINÆ.—Corpus gracilius. Palpus mandibularis sat brevis, latissimus. Oculi grandes.

G. 1. SYNOPIA, *Dana.*—Caput subtriangulatum, non oblongum. Pigmentum oculorum unicum. Pedes 1mi parvuli, prehensiles; 2di setis longiusculis confecti; 4ti subprehensiles; 5ti 6ti 7mi que subæqui.

## Fam. II. PHRONIMIDÆ.

Antennæ 2dæ exsertæ. Abdomen in ventrem se non flectens. Pedes 5ti 6tive sive crassi sive elongati, sæpius prehensiles, quoque 3tii 4tique sæpe prehensiles.

Subfam. 1. PHRONIMINÆ.—Abdomen versus basin sat gracile. Pedes 5ti magnâ manu didactylâ vel monodactylâ confecti; 3tii 4ti extremitate graciles, non prehensiles. Antennæ breves.

G. 1. PHRONIMA, *Latr.*—Manus pedis 5ti didactylæ. Segmentum thoracis 1mum oblongum.

G. 2. PRIMNO, *Guérin.*—Manus pedis 5ti monodactylæ. Segmentum thoracis 1mum non oblongum.

Subfam. 2. PHROSININÆ.—Abdomen versus basin sat crassum. Pedes 5ti prehensiles, monodactyli; quoque 3tii 4tique prehensiles. [Antennæ sat breves.]

1. *Manus pedis 5ti latæ, digito arcuato.*

G. 1. ANCHYLOMERA, *Edw.†*—Manus pedis 5ti latè et crassè subtriangulatæ. Pedes 6ti non prehensiles.

G. 2. PHROSINA, *Risso.‡*—Manus pedis 5ti latæ, oblongæ. Pedes 6ti prehensiles, 5tis fere similes, minores. Mandibulæ non palpigeræ.

\* Guérin, Rev. Zool., i, (1842) p. 214. Species *C. neptunus* portentosæ magnitudinis ( $3\frac{1}{2}$ ''.)

† *Hieraconyx*, Guérin.

‡ *Dactylocera*, Latreille.

## 316 On the Classification of the Crustacea Choristopoda.

2. *Manus pedis 5ti elongatè lineares, digito recto, longissimo, tenui.*

G. 3. THEMISTO, *Guérin*.—Pedes 3tii 4tique prehensiles, manibus latis.

Subfam. 3. PHORCINÆ.—Pedes 5ti 6tive valde elongati et crassi, sed manu non confecti. [Antennæ breves.]

G. 1. PHORCUS, *Edw.*—Pedes 1mi 2di 3tii 4tique graciles, unguiculati, 5ti 6tique prælongi, 5ti aciculares, 6ti crassissimi.

### Fam. III. TYPHIDÆ.\*

Antennæ 2dæ sub capite thoraceve celatæ et sæpius replicatæ. Abdomen in ventrem sæpe se flectens. Pedes 6 postici interdum abbreviati, articulo 1mo operculiformi, interdum longitudine mediocres.

Subfam. 1. TYPHINÆ.—Abdomen in ventrem se flectens.

G. 1. DITHYRUS, *Dana*.—Pedes 5ti 6tique articulo 1mo latè lamellati, articulis reliquis omnino obsoletis. Antennæ 2dæ breves, sub capite celatæ, non replicatæ, articulo 1mo longiore quam 2dus.

G. 2. TYPHIS, *Risso*.—Pedes 5ti 6tique articulo 1mo late lamellati, articulis reliquis paulo abbreviatis. Antennæ 2dæ biplicatæ, articulo 1mo longiore quam 2dus.

G. 3. THYROPUS, *Dana*.†—Pedes 5ti 6tique articulo 1mo late lamellati, articulis reliquis paulo abbreviatis. Antennæ 2dæ 4-5-plicatæ, sub thoracis latere celatæ, articulo 1mo multo breviorum quam 2dus.

Subfam. 2. PRONOINÆ.—Abdomen in ventrem se non flectens. Caput non oblongum, antennis frontalibus.

G. 1. PRONOE, *Guérin*.—Pedes 2di non prehensiles. Pedum 6 posticorum articuli 1mi lati, reliquâ parte paris 7mi fere obsoletâ.

G. 2. LYCÆA, *Dana*.—Pedes 1mi 2dique subchelati. Articuli pedum 6 posticorum 1mi angusti, subæqui, reliquâ parte paris 7mi paulo abbreviatâ.

Subfam. 3. OXYCEPHALINÆ.—Abdomen in ventrem se non flectens. Caput oblongum, antennis 1mis superficiem capitis inferiorem insitis.

G. 1. OXYCEPHALUS, *Edw.*—Caput breviter acuminatum. Styli caudales longitudine mediocres.

G. 2. RHABDOSOMA, *White*.‡—Caput rostro longo styliiformi armatum. Styli caudales valde elongati.

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\* *Hypérines anormales* of Edwards, *Crust.* iii, 94. *Typhidæ*, *Cat. Brit. Crust. Brit. Mus.*, 57.

† Species *Typhis ferox* (Edw.) is here included.

‡ *Crust. Voy. Samarang*, p. 63, pl. 13, f. 7.

### *Errata in J. D. Dana's paper on the Crustacea Choristopoda.*

P. 302, 15th line from top, for 6-articulatum, read 1-6-articulatum.

P. 305, last line, for 92, read 192.

P. 306, 5 lines from bottom, for iii, read viii.

P. 307, 14th line from top, after *thoracis* insert *feminæ*.

P. 308, 25th line from bottom, for *sex*, read 1mi 2dique.

P. 315, 9th line from top, for *nudo*, read *nullo*.

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ON THE

GEOGRAPHICAL DISTRIBUTION OF

CRUSTACEA.

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# ON THE GEOGRAPHICAL DISTRIBUTION OF CRUSTACEA.

By JAMES D. DANA.\*

In volume xvi, of this Journal, the author presented a chart of oceanic isothermal (or rather isocrymal) lines, for the illustration of marine zoological geography, prepared more especially with reference to the geographical distribution of Crustacea, and taken from his Report on the Crustacea of the Exploring Expedition around the world under Capt. Wilkes. The following is a brief abstract of the remainder of the Chapter on the Distribution of Crustacea; the Tables which occupy near 30 pages are omitted besides other details.

The lines on the chart, it may be here repeated, are lines of equal winter (or coldest month) temperature for the water, the "cold" lines being adopted because the distribution of species away from the Tropics is limited by cold temperature. The temperatures corresponding to the lines are 74°, 68° (limiting temperature of coral reefs), 62°, 56°, 50°, 44°, 35° F. Between the lines of 68° F. north and south of the equator lies the *Torrid Zone* of oceanic water temperature; from the line of 68° to that of 35°, the *Temperate Zone*; beyond the line of 35°, the *Frigid Zone*. These Zones are divided by the lines into Regions or Sub-zones as follows.

I. TORRID ZONE.

- |                               |                |
|-------------------------------|----------------|
| 1. TORRID REGION OR SUB-ZONE, | 74° and above. |
| 2. SUBTORRID                  | " 68° to 74°   |
| 1. WARM TEMPERATE             | " 62° to 68°   |
| 2. TEMPERATE                  | " 56° to 62°   |
| 3. SUBTEMPERATE               | " 50° to 56°   |
| 4. COLD TEMPERATE             | " 44° to 50°   |
| 5. SUBFRIGID                  | " 35° to 44°   |

III. FRIGID ZONE.

\* From the Author's Report on Crustacea, (2 vols. 4to, 680 and 1620 pages).

The reader is referred to the former paper and map for other details, where the Zoological Provinces in these zones are laid down, and explained.

The Tables are in two series. The first contains for each genus of Crustacea the number of species *according to present knowledge* in each temperature Region or Sub-zone.\* The second, the number for each genus in each *Geographical Province*.

We proceed with a summary of the results presented in the first series of the Tables.

## I. BRACHYURA.

	a. Torrid.	b. Sub-torrid.	Total of Torrid zone.	c. Warm Temperate.	d. Temperate.	e. Sub-temperate.	f. Cold Temperate.	g. Sub-frigid.	Total of temperate zone.	h. Frigid.
Maiioidea, - - - -	82	57	122	35	27	21	16	14	92	3 (2)
Cancroidea - - - -	157	112	229	22	25	23	25	8	69	3 (3)
Grapsoidea, - - - -	72	88	131	21	14	27	10	9	63	
Leucosoidea, - - - -	35	33	48	11	8	5	3	2	24	
Corystoidea, - - - -	2	3	5	2	4	2	6	6	16	1 ?
	348	293	535	91	78	78	60	39	264	

This table contains the number of species of the orders of Brachyura, according to present knowledge, in each Region and Zone.

The following general facts or conclusions may be deduced from the Tables of the Brachyura.

I. The line of division, separating the Torrid and Temperate zones of ocean temperature, following the isocryme of 68° or the outer limit of coral reef seas, marks a grand boundary in organic life, well exemplified in Crustacean species. Out of the five hundred and thirty-five species of the Torrid and Subtorrid Regions (the Torrid zone,) there are over one hundred now known to be common to the two. But of the two hundred and sixty-four in the Temperate Regions, only thirty-four occur in the Torrid zone. A large number of genera, containing more than a single known species, are confined wholly to the Torrid zone: such are *Micippa* (5 species), *Menæthius* (9), *Huenia* (4), *Parthenope* (3), *Atergatis* (17), *Carpilius* (13), all the *Chlorodinæ*, including forty-nine species, nearly all the *Eriphinæ*, including eighteen species, *Charybdis* (15). At the same time, the species of the Torrid and Subtorrid Regions are in many cases equally numerous. Of species of *Charybdis*, eleven species occur in each of these Regions; of the *Carpilii*, eleven are reported from the Subtorrid and but five from the Torrid; of the *Menæthii*, five are found in the Torrid Region, and six in the Subtorrid, only two being common to both. These proportions may be much varied by future in-

\* Since the ocean's waters decrease in temperature as we descend in depth, there will be some error in the tables from the cold water species thus passing into regions nearer the equator. But this error will diminish the number of species regarded as peculiar to the colder regions, and if eliminated, the following conclusions would be still more strongly sustained.

vestigations. Still it cannot fail to be evident from a survey of the tables, that the line between the Torrid and Temperate zones is a natural zoological limit.

II. The Torrid species of Brachyura (Torrid and Subtorrid Regions) greatly preponderate over those of the Temperate zone, the proportion being above two to one. This fact is the subject of remarks by Edwards, but with different conclusions from those which we would deduce.

III. The Frigid zone, as far as known, includes *one* species peculiar to it, the *Chionæcetes opilio*. And *Stenorhynchus phalangium*, *Hyas araneus*, *Portunus pusillus*, *Carcinus mænas*, and *Cancer pagurus*, are all that are known to extend into it from the Temperate zone. Perhaps the *Cancer chirogonus* from Kamtschatka (*Telmessus chirogonus* of White) should be added. This may be in part evidence of the little exploration hitherto made in the Frigid Seas. Yet, after the investigations of Beechey, Fabricius, Krøyer, Rathke, and others, we may be assured that the number of species is exceedingly small.

IV. Within the Temperate zone, the species are most numerous in the Warm Temperate, Temperate, and Subtemperate Regions; beyond this, the number diminishes, being a *quarter less* in the Cold Temperate than in the Subtemperate, and *half less* in the Subfrigid. Moreover, in the last-mentioned region, seventeen out of the thirty-nine species, or nearly one-half, occur in warmer temperate latitudes, only twenty species being confined to the Region.

V. In the Torrid zone, the species of the torrid region, amounting to three hundred and forty-eight, exceed in number those of the Subtorrid by only forty-five, although the Subtorrid region is not one-third as great, both as to surface and extent of coast line.

VI. Passing now from these general considerations respecting the Brachyura as a class to the several orders, we may look at their ratios among these orders and their subdivisions, for the several regions, in order to discover what is the relation of the species to temperature, and whether the cold or warm-water species are the higher or lower in grade, or whether the torrid or the temperate zone can claim species of the highest perfection or magnitude among the Brachyura.

The following table gives the ratio which the number of species of the several orders in the Temperate and Frigid zones, bears to that of the Torrid zone.

1. Maiioidea,	-	-	-	-	-	-	-	-	-	1 : 1·3
2. Cancroidea,	-	-	-	-	-	-	-	-	-	1 : 3·3
3. Grapsoidea,	-	-	-	-	-	-	-	-	-	1 : 2·1
4. Leucosoidea,	-	-	-	-	-	-	-	-	-	1 : 2·0
5. Corystoidea,	-	-	-	-	-	-	-	-	-	1 : 0·3

It hence appears that the Maiioidea and Corystoidea are proportionally much more abundant in the colder seas than the Cancroidea, Grapsoidea, or Leucosoidea.



If we examine into the subdivisions of the Maiioidea and Cancroidea, we shall find the difference between the two groups in distribution more strikingly brought out. We shall find, moreover, that both groups may be divided into a warm-water and cold-water section, as below.

I. MAIOIDEA.

1. COLD WATER OR TEMPERATE ZONE SECTION.

	Torrid species.	Temperate species.
1. Inachidæ, . . . . .	1	10
2. Maiidæ, subfamilies, <i>Libininæ</i> , <i>Maiinæ</i> , <i>Pisinæ</i> , <i>Othoninæ</i> , . . . . .	15	35
3. Eurypodidæ, . . . . .	0	7
4. Leptopodidæ, . . . . .	1	8
	17	60

2. WARM WATER OR TORRID ZONE SECTION.

	Torrid.	Temperate.
1. Maiidæ, subfamilies <i>Micippinæ</i> , <i>Chorininæ</i> , <i>Pyrinæ</i> , . . . . .	16	3
2. Mithracidæ, . . . . .	11	6
3. Tychidæ, . . . . .	4	0
4. Periceridæ, . . . . .	43	14
5. Parthenopinea, . . . . .	28	8
6. Oncininea, . . . . .	2	0
	104	31

II. CANCROIDEA.

1. TEMPERATE ZONE SECTION.

	Torrid.	Temperate.
Cancridæ, . . . . .	0	11
Platyonychidæ, . . . . .	2	7
Portunidæ, subfamily <i>Portuninæ</i> , . . . . .	0	15
Cyclinea, . . . . .	0	1
	2	34

2. TORRID ZONE SECTION.

	Torrid.	Temperate.
Xanthidæ, . . . . .	129	16
Eriphidæ, . . . . .	44	12
Portunidæ, excluding the <i>Portuninæ</i> , . . . . .	52	7
Podophthalmidæ, . . . . .	2	0
	227	35

We have here two singular facts brought out.

*First*, that the cold-water section of the Cancroidea embraces those species that approach most nearly to the Corystoidea, and which we have elsewhere shown to be the *lowest* in grade of the Cancrinea. All have the lax character of the outer maxillipeds, which is a mark of degradation in the Corystoids; and the Cyclinea are still nearer that group. Many of the species moreover have the hind legs a swimming pair, another mark of degradation. The Corystoidea, as before shown, are two-thirds cold-water species.

*Second*, that the cold-water section of the Maiioidea contains the species that are *highest* in grade, and largest in size. It is headed by the *Macrocheira* of Northern Japan, the king of all crabs, whose body is seventeen inches in length and a foot broad;

with extended legs, it sometimes covers a breadth of eleven feet, and the anterior legs or arms are *four feet* long!\* The species of the other genera are mostly among the larger of the Maioids, and have no mark of inferiority. Such are the species of *Maia*, *Pisa*, *Libinia*, *Eurypodius*, etc.

But among the species of the warmer section, we find the Oncininea and Parthenopinea, both manifestly inferior in grade, the former approaching even the Anomoura, and the latter forming the passage of the Maioids to the Cancroids, as has been explained. We observe also the Periceridæ and the Tychidæ, all very small species, excepting a few Periceræ: the Menæthii, Tiariniæ, and Acanthonyces, are examples of the group. In addition, there are the Mithracidæ, which although attaining a large size show their inferiority in their shorter epistome, shorter body, which is sometimes even transverse, and their spoon-shaped fingers. In the last character, the Chlorodinæ among the Cancroids, similarly show their inferiority to the Xanthidæ. That this kind of finger is such a mark of inferiority is apparent from its diminishing in many species as the adult size of the animal is attained, the tendency being towards producing the acuminate finger found in the highest grades.

We are hence sustained in the conclusion that the Maioids of the Temperate zone are generally those that are highest in grade. It also shows the congeniality of cold waters to the Maioids, that the only Brachyuran peculiar to the Frigid zone is of this group. We refer to the *Chionæcetes opilio*.

VII. The Brachyura, therefore, although most numerous in the Torrid zone, do not reach in this zone their highest perfection. On the contrary, the Temperate zone or colder waters are the habitat of the highest species. Hence, as the Maioidea stand first among all Crustacea, the highest development of the class Crustacea takes place, not in the Torrid zone, the most profuse in life, but beyond the tropics and coral-reef seas, in the middle Temperate Regions.†

VIII. The prevalence also of the inferior Corystoids in the colder waters does not invalidate this conclusion, as the fact respecting the Maioids is wholly an independent one; for these last, by attaining their highest perfection in these coldest waters, determine the principle as regards themselves, the highest grade of Crustacea. Lower grades occur also in the colder waters, and the laws governing their distribution demand separate study and consideration.

IX. Passing a step below the Maioids, we come to the Cancroids, and these, with the exception of the lower Corystoid species, and only *one-eighth* of the rest, are Torrid zone species.

\* De Haan's Fauna Japon., Crust. p. 101.

† On the coasts of Britain, the Cancroids (excluding the swimming species,) are only half as numerous as the Maioids.

X. If the Torrid zone is the proper region for the full development of the Cancroid type, and its heat is needed for this end, it is natural that species of Cancroids like the *Portuninæ*, *Platyonychidæ*, and *Cancriidæ*, found in the less genial waters of the Temperate zone, should bear some mark of inferiority;—and it is a fact that they have such marks in their structure. This inferiority is not seen in their smaller size,—for a larger size under certain conditions, may equally evince a lower grade,—but in the inferior concentration of the life-system, exhibited either in the lax outer maxillipeds, the elongation of the antennæ and abdomen, or in the smaller size or swimming character of the posterior legs.

For a like reason also, the species of Corystoidea, a grade still lower, naturally occur in the cold and ungenial region they frequent.

We hence perceive, that the degradation among the Maioids takes place when the species become warm-water species, and the degradation among the Cancroids, in the reverse manner, when the species become cold-water species; for the reason that the colder waters are the proper habitat for the Maioid type, and the warmer for the Cancroid type.

XI. In the tables of the Maiioidea and Cancroidea of the Temperate and Torrid zones, page 317, the species are included by families and subfamilies, and consequently the peculiarities of the genera are not shown. In the families or subfamilies referred to the cold-water section, there is only one warm-water genus, viz., *Doclea*, of the subfamily *Libininæ*; it contains four Torrid and one Temperate zone species.

Among those referred to the warm-water section, there are the following cold-water genera:—

		Species in Torrid zone.	Species in Temperate zone.
Parthenopinea, genus	Eurynome, . . . . .	0	2
“	“ Eurynolambrus, . . . . .	0	1
Xanthidæ,	“ Paraxanthus, . . . . .	0	2
Ozinæ,	“ Ozius, . . . . .	2	3

The species of Cancrinea of the Torrid zone section, which reach farthest into the Temperate zone, are those of the following genera:—*Xantho*, which has eight Temperate zone species out of twenty-eight in all; *Panopeus*, which in the same way has four out of ten; *Pilumnus*, which has seven out of twenty-two; and *Lupa*, which has four out of ten. The cold Temperate Region is the highest for each of these genera, excepting *Lupa* and *Pilumnus*, a species of each of these latter genera extending just within the limits of the Subfrigid Region, on the coast of Massachusetts.

XII. The Grapsoidea, if divided between the Torrid zone and Temperate zone, according to families or subfamilies, will fall within the Torrid zone, excepting a single family of the Pinno-

theridæ, which contains eight species in the Torrid zone and fifteen in the Temperate. Considering the genera, however, we find that several among the Grapsidæ may be called cold-water genera, or are about equally divided between the Torrid and Temperate zones. They are as follows :

	Torrid species.	Temp'te species.
Pseudograpsus, . . . . .	1	2
Heterograpsus, . . . . .	0	1
Brachynotus, . . . . .	0	1
Planes, . . . . .	2	2
Hemigrapsus, . . . . .	4	5
Cyrtograpsus, . . . . .	0	1
Chasmagnathus, . . . . .	2	2

Five out of twelve species of Grapsus also reach into the colder seas. Further particulars will be gathered from the tables.

XIII. The Leucosoids include as cold-water genera the following :

	Torrid.	Temperate.
Genus Ebalia, . . . . .	0	8
“ Iliia, . . . . .	0	1

The other genera are mainly confined to the Torrid zone ; out of the species they contain, sixty-seven in all, forty-eight are of this zone. *Hepatus*, however, contains as many cold-water as warm-water species, and the same is true of *Dorippe*, although but one of the species of the latter is exclusively Temperate.

XIV. The tropics afford not only a larger number of species of Brachyura than the temperate zone, but also a much greater proportion of individuals of the several species. Crustacean life, of this tribe, is far the most prolific in the warm waters of the globe. Species are very abundant about coral islands, far exceeding what may be found in other regions.

XV. The actual mass of Brachyura appears also to be the largest in the tropics, although there are genera, as *Macrocheira* and *Cancer*, which have their largest species in the colder waters, and which exceed in size any other Brachyura. The genera *Atergatis*, *Carpilius*, *Xantho*, *Menippe*, *Zozymus*, *Eriphia*, *Thalamita*, *Charybdis*, *Calappa*, besides others of the Torrid zone, contain many large species, which are of very common occurrence ; while the cold-water genera of Maioids appear to be much less prolific in species, and the other genera, though abounding in individuals, as *Cancer* and *Lupa*, are still but few in number. Any very exact comparison, however, of the two zones in this particular cannot be made without more data than have yet been collected.

## II. ANOUMOURA.

XVI. The Anoumoura are nearly equally divided between the torrid and temperate zones, there being hardly *one-tenth* more torrid than cold-water species. Only fifteen species out of two

hundred and twenty-five are common to the torrid and temperate zones.

Yet it is seen from the table, that if we except the Galatheidea, Lithodea, and part of the Paguridea, the species hardly extend beyond the warmer half of the temperate zone. There are but six known frigid species, and these are of the two last-mentioned groups.

XVII. The torrid zone and temperate zone sections of the Anomoura, are as follows; the frigid zone species being here added to the temperate.

1. TEMPERATE ZONE SECTION.

	Torrid zone.	Temperate zone.
Dromidæ, G. <i>Latreillia</i> , . . . . .	0	3
<i>Homola</i> , . . . . .	0	2
Bellidea, . . . . .	0	2
Raninidea, G. <i>Notopus</i> , . . . . .	0	1
<i>Lyreidus</i> , . . . . .	0	1
Hippidea, G. <i>Albunhippa</i> , . . . . .	0*	2
Lithodea, . . . . .	0	10
Porcellanidea, . . . . .	27	20
Paguridæ, G. <i>Paguristes</i> , . . . . .	3	6
<i>Bernhardus</i> , . . . . .	3	29
<i>Ægleidea</i> , . . . . .	0	2
Galatheidea, G. <i>Munida</i> , . . . . .	0	2
<i>Grimothea</i> , . . . . .	0	1
<i>Galathea</i> , . . . . .	5	4

} 1 torrid and  
4 frigid.

2. TORRID ZONE SECTION.

	Torrid zone.	Temperate zone.
Dromidæ, G. <i>Dynomene</i> , . . . . .	1	0
<i>Dromia</i> , . . . . .	8	2 (1 torrid).
Cymopolidæ, G. <i>Cymopolia</i> , . . . . .	1	1
<i>Caphyra</i> , . . . . .	2	0
Raninidea, G. <i>Raninoides</i> , . . . . .	1	0
<i>Ranina</i> , . . . . .	1	0
<i>Ranilia</i> , . . . . .	1	0
<i>Cosmonotus</i> , . . . . .	1	0
Hippidea, G. <i>Albunæa</i> , . . . . .	3	3 (2 torrid).
<i>Remipes</i> , . . . . .	5	1 (1 torrid).
<i>Hippa</i> , . . . . .	2	2 (1 torrid).
Paguridæ, G. <i>Diogenes</i> , . . . . .	5	2 (2 torrid).
<i>Pagurus</i> , . . . . .	14	7 (1 torrid).
<i>Calcinnus</i> , . . . . .	6	0
<i>Aniculus</i> , . . . . .	1	0
<i>Clibanarius</i> , . . . . .	19	4
<i>Cancellus</i> , . . . . .	1?	0?
Cenobitidæ, . . . . .	10	1

The Dromidea and Paguridea have *one-third* to *one-fourth* more torrid than cold-water species.

The Raninidea and Hippidea are mainly tropical. The two extra-tropical species of Raninidea occur only in the warmer of the temperate regions, and the species of Hippidea in the temperate zone (eight out of the whole number fourteen) have among them four that occur also in the tropics.

The Lithodea belong to the coldest temperate regions, abounding especially in the subfrigid region. The Galatheidea are mainly of the temperate zone; there are five known torrid species, and seven temperate, the latter pertaining to the colder seas.

The genus *Porcellana* has but two-thirds as many species in the temperate as in the torrid zone. Yet the subtemperate region contains but one less than the subtropical, and some of the largest species of the genus occur here; while, on the contrary, the torrid-zone species are quite small. Although, therefore, *Porcellana* may rank as a torrid zone genus, if we consider the relative number of species in the two zones, it is more properly a temperate zone genus.

The Paguridea range through both the tropics and temperate zone, even passing into the frigid zone. *Bernhardus* is mainly a cold-water genus, while *Pagurus*, *Calcinus*, and *Clibanarius* are mostly torrid genera. *Pagurus* has seven out of twenty-one species in the temperate zone. But it is in the torrid zone where the species of the largest size occur; the extra-tropical species belong almost exclusively to the Mediterranean. The species are exceedingly prolific in the tropics, far exceeding what occurs as regards any Paguridea in the temperate zone.

XVIII. It was found in the Brachyura, that the highest species among the Maioids, and the highest of Crustacea occur in the *extra-tropical* regions; and that as we descend to the Cancroids, the species become mainly *tropical*; moreover, as we descend among the Cancroids (the type of which is tropical), there is in general a return to the less genial colder waters, as exemplified in the true Cancers or Cancridæ and the Corystoidea, these last being mainly cold-water species. By these steps we find the more degraded forms among the Brachyura occurring in both the colder and warmer waters. We cannot therefore expect that the Anomoura, which are properly Brachyura of a still lower grade, should be arranged according to rank in one zone in preference to the other. And it is a fact that the genera of higher species occur about equally in the two zones. *Latreillia*, but a single step below the Inachidæ, is found in the warmer temperate regions; and *Dromia*, a little lower, has three-fourths of its species in the tropics. *Homola*, again, has been found only in the temperate zone.

Among the Paguridea, the Bernhardi or cold-water species are probably the superior in rank; and the Lithodea, which are a grade higher still, are from the neighborhood of the frigid zone.

The Hippidea, which we have considered as in the Corystoid series, but below the Corystoidea, are mostly from *warmer* waters.

The most bulky forms among the Anomoura are found in the genera *Lithodes*, *Ranina*, and *Dromia*. The common *Ranina dentata* has a length of five inches in the Japan Seas, while in

the warm East Indies (at the Moluccas), as De Haan states, four inches is the greatest length.

III. MACROURA.

XIX. The Macrourea, according to the table, [see Report,] are nearly equally divided between the torrid and extra-torrid zones, the former including one hundred and forty-seven species, and the latter one hundred and fifty-three species.

In the table we have not included the fresh-water Astacidæ, as we are treating only of marine species. Yet in a comparison of numbers between the zones, these should be brought in. They are about thirty-six in number, and all, excepting perhaps one, belong to the temperate zone as regards the temperature of the waters they frequent. With this addition, the numbers become 147 for the torrid zone, and 189 for the extra-torrid. Sixteen of the cold-water species are common to both the torrid and temperate zones, and twenty-nine occur in the *frigid* zone, twenty-seven being peculiar to this zone. This is strikingly in contrast with the Brachyura, of which two-thirds are torrid species, and only five or six are known to extend into the cold zone, of which but *one* as far is known, is confined to it.

XX. The Thalassinidea are mainly extra-torrid species.

The Astacidea are divided between the warm and cold seas; the Palinuridæ and Scyllaridæ being mostly of the former, and the Astacidæ almost exclusively of the latter.

The Caridea spread largely over both zones; but extensive groups are extra-torrid, and some genera contain many frigid species.

The Penæidea are mainly of the torrid zone.

The exact ratios may be gathered from the tables.

XXI. The geographical relations of the subordinate groups are shown in the following table.

I. TEMPERATE AND FRIGID ZONE SECTION.

	Species in the Torrid zone.	Species in the Temperate and Frigid zones.
Thalassinidea, . . . . .	6	17
Astacidea, . . . . .	24	50
Astacidæ, . . . . .	1	46
Scyllaridæ, G. <i>Arctus</i> , . . . . .	0	1
Palinuridæ, G. <i>Palinurus</i> , . . . . .	2	3
Caridea, . . . . .		
Crangonidæ, . . . . .	2	25
Atyidæ, G. <i>Ephyra</i> , . . . . .	0	2
Palæmonidæ, . . . . .		
Alpheinæ, G. <i>Betæus</i> , . . . . .	1	4
<i>Alope</i> , . . . . .	0	1
<i>Athanas</i> , . . . . .	0	1
<i>Hippolyte</i> , . . . . .	8	37 (19 frigid).
Pandalinæ, G. <i>Pandalus</i> , . . . . .	0	4 (2 frigid).
Palæmoninæ, G. <i>Cryphiops</i> , . . . . .	0	1
Pasiphæidæ, G. <i>Pasiphæa</i> , . . . . .	0	3 (1 frigid).
Penæidea, G. <i>Eucopia</i> , . . . . .	0	1 (frigid).

## 2. TORRID ZONE SECTION.

	Species in the Torrid zone.	Species in the Temper- ate and Frigid zones.
Astacidea.		
Scyllaridæ, except <i>Aretus</i> ,	10	2
Palinuridæ, G. <i>Panulirus</i> ,	12	1
Caridea.		
Atyinae,	8	1
Palæmonidæ.		
Alpheinae, G. <i>Alpheus</i> ,	31	7
Palæmoninae, G. <i>Pontonia</i> ,	4	2
<i>Edipus</i> ,	3	0
<i>Harpilius</i> ,	1	0
<i>Anchistia</i> ,	3	0
<i>Palæmonella</i> ,	2	0
<i>Palæmon</i> ,	32	19 (1 frigid).
<i>Hymenocera</i> ,	1	0
Oplophorinae,	3	1
Penæidea,	19	12

XXII. Considering the Scyllaridæ and Palinuridæ as the Macrourea highest in grade, this division of the Podophthalmia appears at first to have its superior developments in the tropics. But it may still be questioned whether this is altogether true. The Palinuridæ include two genera, one *Palinurus*, mainly a cold-water genus, the other *Panulirus*, a warm-water or Torrid zone genus; and is the Torrid zone genus the superior in rank, as should be the case, if the tropics are the most congenial to the highest Macroureal developments? *Palinurus* has the outer antennæ nearly in contact at base, and the flagella of the inner antennæ are very short; *Panulirus*, the warm-water genus, has the outer antennæ remote at base, and the flagella of the inner antennæ very long. The genera are thus characterized by marks analogous to those that distinguish the higher and lower species among the Brachyura, or that exhibit the superiority of the Brachyura as a class over the Macrourea; and if such evidence is here to be regarded, the cold-water genus, *Palinurus*, is the higher in rank. Moreover, the aspect of the Palinuri, the harder shell and more compact body, strike the eye at once as indicating their higher character. In size, they are not at all inferior; they even exceed the Panuliri in bulk if not in length. Among the Palinuri, one species is afforded by the warm seas of the West Indies; but it is not half the size lineally, of the *Lalandii* of the Cape of Good Hope, or the *vulgaris* of the Mediterranean, both gigantic species, sometimes a foot and a half in length independent of the antennæ.

The Astacidæ, the remaining family in the tribe Astacidea, is confined almost wholly to the colder waters, and the species are numerous.

Among the Caridea, the Crangonidæ certainly have the precedence. The fact that the first pair of legs have perfect hands,



while the other legs are vergiform, shows a relation to the Brachyura, which is evidence of superiority. These Crangonidæ, thus the highest of the Caridea, are almost exclusively cold-water species.

In the family Palæmonidæ, some genera have the anterior legs furnished with stout hands, while in others the second is the stout chelate pair. The former, for the reason just alluded to while speaking of the Crangonidæ, and elsewhere further explained, are superior in rank. It is among these genera of this superior grade, the Alpheinæ, that we find the cold-water and boreal species. The genus Hippolyte alone contains thirty-seven cold-water species, nineteen of which are of the Frigid zone; and there are only eight torrid species.

On the contrary, among the Palæmoninæ, the inferior group, there are forty-six torrid to twenty-two extra-torrid species; and only one of the latter is boreal. Species of Alpheus are common in the tropics about coral-reefs; but the largest species of the genus, two or three inches long, occur beyond the tropics.

The Penæidea, the lowest of the tribes of Macroura, are mainly tropical. Yet, the very lowest species (like the lowest Brachyura) occur partly in the colder waters, or even in the Frigid zone.

XXIII. Comparing the torrid and temperate species of Macroura, we are led to conclude, that the latter are probably most numerous in individuals, and the most bulky in mass. Excepting the Panuliri, Scyllari, and some Palæmons, the tropical species are small, and moreover, they are not particularly abundant about coral-reefs. The species of the torrid genera, Pontonia, Œdipus, Harpilius, Anchistia, Palæmonella, Hymenocera, and Atya, are all quite small, the greater part not exceeding an inch and a quarter in length; moreover, the tropical Alpei are also small species, as stated above. The Penæidea are partly larger species. Contrast these particulars with the facts as to the genera of the Temperate zone. Palinurus, Astacus, Nephrops, Paraneohrops, Homarus, Arctus, Crangon and the related genera, Hippolyte, Pandalus, Cryphiops, contain species mostly of large size, and the adult Homari and Palinuri are not exceeded in weight by any other Macroura.

The Thalassinidea, which belong almost exclusively to the temperate regions are smallest in the warmer part of the Temperate zone, and larger in the middle and colder part. A Puget Sound species (subfrigid region) of Callinassa (*C. gigas*) is at least four and a half inches long, the *C. uncinata* of Chili, five inches, and the *Thalassina scorpionides* of Chili, six inches. The facts respecting this subtribe, added to those mentioned above, strengthen much the conclusion, that the cold-water genera have the largest species; for all the species are over an inch and a half in length.

## IV. ANOMOBRANCHIATA.

XXIV. The Mysidea, to which the Penæidea are related, are, to a considerable extent, cold-water species, although many are found also in the tropics. There are among them twenty torrid species and seventeen extra-torrid species.

In the Squilloidea, we have an example of an inferior grade in a large lax body, with a small head and long abdomen; and they remind us of overgrown larval forms, or species vegetatively enlarged beyond the normal or most efficient size. In this particular they have some analogies with the earlier forms of life. They are found mostly within the tropics. Twenty-four of the Squillidæ are torrid zone species, and only seven pertain exclusively to the Temperate zone. Of the Erichthidæ, twenty-one out of twenty-two species are reported from the Torrid zone. The Amphionidea, a related group, include seventeen Torrid zone species and two of the Temperate zone.

## V. TETRADECAPODA.

Before stating the conclusions from the tables\* of the Tetradecapoda, it should be observed that this division of Crustacea has been less thoroughly explored than that of the Podophthalmia, and future investigations must vary much the proportions between the species of the different regions. The coasts of Europe and the northern seas, are within the reach of European zoologists, and have been carefully examined; while voyagers through the tropics have usually contented themselves with collecting the larger Crustacea. In the genus *Gammarus*, not a tropical species had been reported, until our investigations, which brought ten or eleven to light, being one-third the whole number of those of ascertained localities reported to this genus.

Some general conclusions may, however, be safely drawn from the facts already known, although the exact ratios deduced from the tables may hereafter be much modified.

I. The Tetradecapoda are far more numerous in extra-tropical latitudes than in the tropical.

The proportion in the table is 521:146; allowing for future discoveries, it may be set down at 2:1, without fear of exceeding the truth.

II. The *genera* of extra-tropical seas are far more numerous than those of the tropical.

Out of the forty-nine genera of *Isopoda*, only nineteen are known to occur in the tropics, and but four of these are peculiar to the tropics.

Out of twenty genera of *Anisopoda*, six only are known to be tropical, and but two are exclusively so.

\* As already mentioned the Tables published in the original Report are here omitted.

Among the *Amphipoda*, out of fifty genera of *Gammaridea*, only seventeen are known to contain tropical species; nine are exclusively tropical, and but ten, including these nine, have more tropical than extra-tropical species. The Caprellidea and Hyperidea embrace thirty genera, fifteen or sixteen of which include tropical species.

The variety of extra-tropical forms compared with the tropical, is hence very great.

III. From the tables, the ratio of extra-tropical and tropical species in the

Isopoda, is . . . . .	4 : 1
Anisopoda, . . . . .	6 : 1
Amphipoda, . . . . .	3 : 1

Among the Isopoda, the Idotæidea are the most decidedly cold-water species, and the Cymothoidea, the least so. The ratio of species for the

Idotæidea, is . . . . .	8 : 1
Oniscoidea, . . . . .	7 : 1
Cymothoidea, . . . . .	2½ : 1

Two-ninths of the extra-tropical Idotæidea (or nine species) belong to the Frigid zone, and nearly one-tenth of the extra-tropical Oniscoidea (or nine species); while less than a twenty-fifth of the Cymothoidea occur in the Frigid zone, and but one of these has not also been found in lower latitudes.

Of the Amphipoda, the Gammaridea are most strongly extra-tropical, the proportion being for the extra-tropical and tropical species 3½ : 1; while the ratio in the Caprellidea, is 3 : 1; and in the Hyperidea, 1½ : 1. Out of one hundred and seventy-eight extra-tropical species of Gammaridea, sixty-six are Frigid zone species, besides two which have been found both in the Frigid and Temperate zones.

IV. The genera which extend into the frigid region are the following. The names of those more especially frigid, according to present knowledge, are italicised; and the proportion of frigid species to the whole number of extra-tropical, is mentioned in decimals, where they are not exclusively frigid.

IDOTÆIDEA.—*Idotæa* (0·3), *Glyptonotus*.

ONISCOIDEA.—*Jæra* (0·25), *Jæridina*, *Asellus* (0·20), *Janira* (0·5), *Henopomus*, *Munna* (0·66).

CYMOTHOIDEA.—*Æga* (0·4).

SEROLIDEA.—*Serolis* (0·2), *Praniza* (0·15), *Anceus* (0·25).

ARCTURIDEA.—*Areturus* (0·5).

TANAIDEA.—*Tanais* (0·5), *Liriope*, *Crossurus*, *Phryxus*, *Dajus*.

CAPRELLIDEA.—*Proto* (0·5), *Caprella* (0·24), *Ægina*, *Cercops*, *Podalirius*.

GAMMARIDEA.—*Dulichia*, *Siphonæcetes*, *Unciola* (0·5), *Podocerus*, (0·5), *Laphystius*, *Orchestia* (0·07), *Stegocephalus*, *Opis* (0·66), *Uristes*, *Anonyx*, (0·9), *Leucothoe* (0·66), *Acanthonotus*, (0·75), *Iphimedia* (0·6), *Edicerus* (0·5), *Gammarus* (0·33), *Melita* (0·5), *Pardalisca*, *Ischyrocerus*, *Microcheles*, *Pontoporeia*, *Ampelisca*, *Protomedea*, *Phoxus*.

HYPERIDEA.—*Hyperia* (0·14), *Metæcus*, *Tauria*, *Themisto*, (3·0).

The Spheromidæ are nearly all cold-water species, though not reaching into the Frigid zone. There are forty-nine known species of Spheromidæ in the Temperate zone, and but *four* in the Torrid. *Serolis* is a peculiar cold-water form, belonging mainly to the subfrigid and frigid regions. *Orchestia* is to a large extent of the Temperate zone, while *Allorchestes* is more equally distributed through the torrid and temperate. Amphithoe, as restricted by us, is alike common in the torrid and temperate regions; while Iphimedia, the other section of the old group, is mainly a cold-water genus.

The Hyperidea are mostly tropical genera.

V. The species and genera of Tetracapoda are not only most abundant in the extra-tropical regions, but besides, the individuals of species appear to be more numerous, or at least not less so. At Fuegia, the quantity of Gammaridæ collected on bait dropped in the water was exceedingly large; and in no region visited by us, did we find evidence of as great profusion. The Spheromæ were also very abundant along the shores.

VI. Moreover, the species of extra-tropical waters are the largest of the tribe. In the Frigid zone, there are Idotæidæ three to four inches long, while the average size of the tropical species is less than three-fourths of an inch; there are Spheromæ an inch long, while those of the tropics seldom exceed a fourth of an inch; there is a Lysianassa three inches long, while the warmer seas afford only small species half an inch in length; there is a Pterelas over an inch in length, while the Ægidæ of the tropics are less than half an inch. The Gammari of the tropics are small slender species, not half the size of those of the colder seas. The species of *Serolis* are an inch to two inches long. Thus, through the Idotæidæ, the Ægidæ, Serolidæ, Spheromidæ, Caprellidea, and Gammaridea, the largest species belong to the colder seas, and the giants among Tetracapods, are actually found in the Frigid zone.

Among the Hyperidea there is one gigantic species, belonging to the genus *Cystisoma*, which is over three inches long. It is reported from the Indian Ocean, but whether tropical or not, is unascertained. Of the species of this group examined by the writer, the largest, a *Tauria*, was from the Frigid zone.

VII. Again, the Tetracapoda of extra-tropical waters are the highest in rank. Among the Isopoda (which stand first), the Idotæidea appear to be of superior grade, and these, as observed, are especially developed in the colder seas, reaching their maximum size in the Frigid zone. Again, the Serolidæ, the highest of the Anisopoda, are cold-water species. The Orchestiæ among the Amphipoda, although reaching through both the Torrid and Temperate zones, are largest and much the most numerous in the latter.

VIII. Those species of a genus that occur in the colder waters, are often more firmly put together, and bear marks of superiority in their habits. The Amphithoe and Gammari of the tropics are lax and slender species, of small size compared with those of the colder seas.

IX. There is a tendency in the colder waters to the development of spinous species. This fact is as true of the Podophthalmia as of the Tetracapoda. Among the former, there are the thorny *Lithodes*, the numerous *Maioids* armed with spines, the *Acanthodes*; while the Cancroids and Grapsoids of the tropics are usually very smooth and often polished species. There are the spinous boreal Crangons, the species of which genus in the warmer seas are without spines. Among the Tetracapods, the boreal Iphimediæ are often spinous or crested; *Acanthonotus* and *Dulichia* are spinous genera. The same tendency is seen in the third pair of caudal stylets in some cold-water Gammari, which have the branches spinulous instead of furnished with a few minute hairs like those of the tropics.

There are also some spinous Crustacea in the tropics, as the Palinuridæ and species of *Stenopus*. Such facts, however, do not lead to any modification of the previous remark; for the tendency observed is still a fact as regards the several genera mentioned; moreover the spinous tropical species are few in number.

#### VI. ENTOMOSTRACA.

The Entomostraca have been little studied out of the Temperate zone, if we except the results of the author's labors. The described species of most of the families are, therefore, almost exclusively from the temperate regions, and we know little of the corresponding species or groups in the warmer seas. The following table presents the number of known species of the torrid and extra-torrid zones, omitting the Lernæoids:—

TABLE IV.

	Torrid zone.	Extra-torrid zone.
LOPHYROPODA.		
Cyclopoidea, . . . . .	120	76
Daphnioidea, . . . . .	5	46
Cyproidea, . . . . .	13	61
PHYLLOPODA.		
Artemioidea, . . . . .	0	10
Apodoidea, . . . . .	0	3
Limnadioidea, . . . . .	2	2
PÆCILOPODA.		
Ergasiloidea, . . . . .	1	4
Caligoidea, . . . . .	16	33

Were we to leave out of view the researches of the author, the number of species and the proportion for the Cyclopoidea, instead of 120 to 76, would be about 3:50, thus not only reversing the ratio, but giving to the Temperate zone almost all the

species of the group.\* Moreover, no Daphnioids and few Caligoids have been yet reported from the Torrid zone, excepting those described in this Report. The author's time when on land in the tropics was devoted mainly to the department of Geology, and consequently the fresh-water Entomostracans were not as thoroughly collected as those of the oceans. He therefore attempts to draw no conclusions from the above ratios.

A few facts may, however, be deduced with respect to some genera, and especially those of the Cyclopoidea. The following table gives the number, as nearly as known, of the species of each genus of the Cyclopoidea, occurring in the torrid and extra-torrid zones. The number common to the extra-torrid and torrid zones is mentioned in brackets.

TABLE V.

## CYCLOPOIDEA.

	Torrid.	Extra-torrid.		Torrid.	Extra-torrid.
I. CALANIDÆ.			2. <i>Harpacticinæ</i> ,		
1. <i>Calaninæ</i> .			Canthocamptus, . . . 2 . . . 4		
			Harpacticus, . . . 15		
			Westwoodia, . . . 1		
			Alteutha, . . . 1		
			Metis, . . . 1		
			Clytemnestra, . . . 1		
			Setella, . . . 5 . . . 1 (1)		
			Laophon, . . . 1		
			Oncæa, . . . 1		
2. <i>Oithoninæ</i> .			Ænippe, . . . 1		
			Idya, . . . 1		
			3. <i>Steropinæ</i> .		
3. <i>Pontellinæ</i> .			Zaus, . . . 1		
			Sterope, . . . 4		
			Diaptomus, . . . 2		
			Hemicalanus, . . . 4		
			Candace, . . . 5 . . . 1		
			Acartia, . . . 3 . . . 1		
			Pontella, . . . 22 . . . 9 (3)		
			Catopia, . . . 1		
4. <i>Notodelphinæ</i> ,			III. CORYCÆIDÆ.		
			1. <i>Corycæinæ</i> ,		
			Corycæus, . . . 18 . . . 1		
			Antaria, . . . 3 . . . 1 (1)		
			Copilia, . . . 2		
			Sapphirina, . . . 15 . . . 5		
II. CYCLOPIDÆ.			2. <i>Miracinæ</i> .		
1. <i>Cyclopinæ</i> .			Miracia, . . . 1		
			Cyclops, . . . 2 . . . 9		
			? Psammathe, . . . 1		
			? Idomene, . . . 1		
			? Euryta, . . . 1		
			Total CALANIDÆ, . . . 71 . . . 29 (6)		
			Total CYCLOPIDÆ, . . . 10 . . . 44 (1)		
			Total CORYCÆIDÆ, . . . 39 . . . 8 (1)		

The properly oceanic genera include all the *Calanidæ*, excepting *Diaptomus* and *Notodelphys*; all the *Corycæidæ*; with only the single genus *Setella* among the Cyclopidæ.

\* The whole number of Cyclopoidea described previous to May, 1842, by which time the author's observations were completed, was less than *twenty-five*; and of the oceanic Cyclopoids, one hundred and fifty species of which the author has described, not *ten* were then known. We may judge from these results of a single cruise what still remains to be done in the department of Entomostraca.

Among the Calanidæ, the genera are mainly tropical, yet each affords some extra-tropical species; and those which are most abundant in the colder waters are Calani or closely allied. *Setella* occurs beyond the tropics; but all the species thus far examined are found in the Torrid zone. *Pontella* is more of a warm-water genus than Calanus. The Corycæidæ are to a large extent tropical; the genus *Corycæus* is almost exclusively so, while *Sapphirina* is common in the Temperate zone. The Steropinæ are Frigid species.

Although the Calanidæ are more varied in species within the tropics, they abound more in individuals in the colder seas. Vast areas of "bloody" waters were observed by us off the coast of Chili, south of Valparaiso (latitude 42° south, longitude 78° 45' west, and latitude 36° south, longitude 74° west), which were mainly due to a species of this group; and another species was equally abundant in the North Pacific, 32° north, 173 west.\* They have been reported as swarming in other seas, constituting the food in part of certain species of whale. Such immense shoals we did not meet with, within the tropics.

Among the *Daphnioidea*, the genera *Daphnella*, *Penilia*, *Ceriodaphnia*, and *Lynceus* were observed by us in the Torrid zone. Of the *Cyprids*, *Cypridinia*, *Conchœcia*, and *Halocypris* are oceanic forms, and mainly of the tropical oceans.

The *Caligoids* spread over both zones. *Caligus* and *Lepeophtheirus* reach from the equator to the frigid seas; *Nogagus*, *Pandarus*, and *Dinematura* are represented in both the Torrid and Temperate zones.

## GENERAL REMARKS AND RECAPITULATION.

We continue by presenting a few general deductions from the tables, and a recapitulation of some principles.

A survey of all the great divisions of Crustacea, shows us that exclusive of the Entomostraca, they are distributed, according to present knowledge, as follows:

	a. Torrid zone.	b. Temperate zone.	c. Frigid zone.
Brachyura, . . .	535	257 (34 a)	2 (5 b)
Anomoura, . . .	125	110 (15 a)	4 (1 b)
Macroura, . . .	148	125 (16 a)	29 (2 b)
Anomobranchiata, . . .	82	33 (9 a)	2
Isopoda, . . .	56	208 (1 a)	21 (3 b)
Anisopoda, . . .	8	34	15
Amphipoda, . . .	82	157	83 (4 b)
Total, . . .	1036	924 (75 a)	159 (14 b)

Taking the sum of the Frigid and Temperate zone species (subtracting the fourteen common to the two) we have 1036 species in the torrid regions to 1069 in the extra-torrid, seventy-five

\* The species in the former case was the *Pontella* (subgen. *Calanopia*) *brachiata*; and in the latter, *Calanus sanguineus*.

of which are common to the two. This shows a nearly equal distribution between the zones. But excluding the Brachyura, the numbers become 501 to 811, giving a preponderance of more than one-half to the Temperate zone.\*

The species of highest rank among the Brachyura, Macroura, Isopoda, and Amphipoda, the four principal types in the above, belong to the extra-torrid zones; and in subordinate groups or families, it is often true that the genera of superior grade are extra-torrid, in contrast with the others which are torrid genera. Higher groups, characteristic of the colder regions, sometimes show degradation among those species of the group that are tropical; and the tropical sections also may continue the line of degradation by an extension again into the colder seas.

As we descend in the scale of Crustacea from the Podophthalmia to the Tetracapoda, the number of cold-water species increases, becoming in the latter group, three times greater than the warm-water species. It is an important fact, nevertheless, that this increase of cold-water species is still no mark of degradation; the particular facts that have been discussed, leading to a very different conclusion. Other principles follow. These are—

*First*, that the two types, the Decapodan and Tetracapodan, are distinct types, to be independently considered, and not parts

\* Adding to the numbers above, the species which have been necessarily left out as of uncertain locality, amounting to one hundred and forty in all, and inserting also the Entomostraca, it makes the total of described living species in 1853, as follows:—

Brachyura,	830
Anomoura, . . . . .	262
Macroura, . . . . .	297
	—1389
Anomobranchiata, (Mysidea, Squilloidea, Amphionidea,) . . . . .	115
Isopoda, . . . . .	295
Anisopoda, . . . . .	57
Amphipoda, . . . . .	341
	—693
Entomostraca, . . . . .	492
	—
Total, . . . . .	2689

The number of species collected in the cruise of the Expedition (exclusive of those lost in the wreck of the Peacock, which included nearly all the collections of two seasons in the tropical regions of the Pacific) is nearly 900; and the number of new species described is 658, distributed among the groups as follows:

Brachyura, . . . . .	151
Anomoura, . . . . .	50
Macroura, . . . . .	57
Anomobranchiata, . . . . .	28
	—286
Isopoda, . . . . .	67
Anisopoda, . . . . .	7
Amphipoda, . . . . .	110
	—184
Entomostraca, . . . . .	188
	—
Total, . . . . .	658



of a series or chain of species—a fact illustrated in the chapter on the Classification of Crustacea.

*Second*, that the preponderance of cold-water species is the reverse of what must have been true in the earlier geological epochs, when the oceans had a somewhat higher temperature; or were to a large extent tropical.

*Third*, that the progress of creation as regards Crustacea, has ended not where it begun, in multiplying the species of warmer waters and giving them there their superior developments, but in carrying species to a higher perfection in the colder regions of the oceans. A preponderance of species in the warmer seas is perhaps to be expected, since warm waters have prevailed even more largely than now in earlier epochs. But it would seem, that the introduction of the higher grades of Crustacea required, not merely the cooler waters of the present tropics, but even the still colder temperature of the Temperate zone, and therefore the present condition of the globe.

The genera of Fossil species commence with the Entomostracans and Trilobites in the Palæozoic rocks. Next appear certain *Thalassinidea* and *Astacoid* species, in the Permian system; then *Mysidea*, *Penæidea*, many *Thalassinidea*, *Astacoidea*, and *Anomoura*, in the Oolitic system; then a few *Cancroids* and *Leucosoids* in the Cretaceous, which become much more numerous in the *Tertiary* system, along with some *Grapsoids*. None of the *Maioids*, the highest of Crustacea, have yet been reported from either of the Geological epochs.

The *number* of individuals and the *size* are, for the Brachyura, greater in the Torrid zone than in the colder regions. But for the Macroura, the species of cold-water genera average nearly twice the lineal dimensions of those of warm waters; and the number of individuals also may possibly be greater.

In stating the conclusion respecting the Macroura, on a preceding page (last volume, p. 325), we omitted to give in detail the mean sizes of the different groups. The following are the results, including the Galatheidea which are closely related to the Macroura:—

	Mean length of Torrid zone species.	Mean length of Extra-torrid species.
Galatheidea, . . . . .	0·3 inches.	3·0 inches.
Thalassinidea, . . . . .	2·0 "	3·0 "
Scyllaridæ, . . . . .	6·0 "	6·0 "
Palinuridæ, . . . . .	12·0 "	15·0 "
Astacidæ.—Homarus, . . . . .		14·0 "
Astacinæ, . . . . .		3·0 "
Nephrophinæ, . . . . .		5·0 "
Crangonidæ, . . . . .		2·0 "
Palæmonidæ.—Alpheinæ, . . . . .	1·5 "	1·5 "
Pandalinæ, . . . . .		3·0 "
Palæmoninæ, . . . . .	2·3 "	2·4 "
Oplophorinæ, . . . . .	1·0 "	
Penæidæ, . . . . .	3·6 "	4·5 "

The table shows that the torrid species, in one of the groups, average larger than the extra-torrid. The cold-water Palinuridæ are as large as the largest warm-water species, and will outweigh them; the cold-water Galatheidea, are ten times the average length of the warm-water; the Alpheinæ, Palæmoninæ, and Penæidæ are at least as large in the temperate regions as in the torrid. There is hence nothing in the tropics to balance the Astacidæ, a group of large species, some of them gigantic; nor the Crangonidæ, nor Pandalinæ. The genus Palæmon, in the Torrid zone, averages larger than in the Temperate, the ratio being 3·5 to 2·4; the former amount being reduced to 2·3 for the Palæmoninæ, by the species of the other tropical genera, which are mostly quite small. Yet, taking the ratio of 3·5 to 2·4, it affects but little the balance against the Torrid zone.

As to *bulk*, also, the Temperate zone probably has the preponderance; yet our data are less definite. In the Galatheidea, the cold-water species are not only ten times larger lineally (which implies at least eight hundred times cubically), but they are far more prolific, swarming in vast numbers where they occur. The Thalassinidea are more numerous in extra-torrid species than torrid, as well as larger in size. The Scyllaridæ are mainly tropical; but the species are not of common occurrence, compared with the Astacidæ, which abound everywhere, and these, as well as the Crangonidæ and Pandalinæ, are all temperate zone species. The Palæmoninæ and Penæidæ probably preponderate in the tropics, and this may be also true of the Alpheinæ. Taking a general view of the whole, and considering the fact, that the extra-torrid species rather outnumber the torrid, we believe that the deduction above stated is correct.

In the *Tetradecapoda*, the number of species, the number and diversity of genera, the number of individuals, and the bulk, are all greater in the extra-torrid seas than in the torrid, as has been explained on a preceding page; and this is especially true of the Amphipoda.

The tendency to spinose forms among the species of the colder temperate regions, or Frigid zone, has been remarked upon on page 9, as exemplified among the Gammaridea, the Crangonidæ, Lithodes, and Maioids.

Having in the preceding pages on the geographical distribution of Crustacea, treated of their distribution according to zones of temperature, I now take up the other branch of the subject.—

*The Distribution of Crustacea according to Geographical Provinces.*

In presenting a series of tables in which the distribution of the Genera is given, I divide the surface of the globe, for marine zoological geography, into three sections, the *Occidental*, the *Africo-European*, and the *Oriental*; the first, including the east and west coasts of America and adjoining islands; the second, the eastern side of the Atlantic Ocean, the coasts of Europe, and also of Africa as far as the Cape of Good Hope; the third, embracing the Indian Ocean, and its coasts and islands, the East Indies and the Pacific Ocean, with its coasts and islands, exclusive of the western coast of America and the neighboring islands. The total number of species in each is given in a separate column.

I make further groupings or subdivisions, by which the several portions of these great regions are distinguished. These general tables are not here copied from the author's Report, and particular explanations therefore need not be given.

The following is an abstract of some of the results:

The division A, includes the Atlantic and Pacific coasts and islands of America; B, the European and West African coasts and islands, from Cape Horn to Greenland inclusive; and C, the coasts and islands of the Indian and Pacific Oceans (America excluded).\*

I. BRACHYURA.			
MAIOIDEA.	A.	B.	C.
Maïinea, - - - -	69	24 (1 a)†	63 (1 b)†
Parthenopinea, - - - -	1	5	29
Oncininea, . - - - -	0	0	2
Total Maioidea, - - -	70	29 (1)	104 (1)
CANCROIDEA,	A.	B.	C.
Cancridæ, - - - -	10	3	1
Xanthidæ - - - -	17	7 (1 a)	129 (1 b)
Eriphidæ, - - - -	7	5	52 (1 b)
Portunidæ, Platyonychidæ and Podophthalmidæ, } - - - -	13	19 (1 a)	54 (1 a)
Telphusinea, - - - -	6	1	7
Cyclinea, - - - -	1	0	0
Total Cancroidea, - - -	54	35 (2)	243 (3)

\* The discrepancies between the enumeration here and the summaries of the preceding tables, arise from species omitted in one or both, on account of the uncertainty of their localities.

† 1a, means that 1 of the 24 is identical with a species under A; and 1b, that 1 of the 63, is identical with a species under B. So, below.

GRAPSOIDEA, - - - -	51	-	18 (5)	-	124 (5 a)
LEUCOSOIDEA, - - - -	9	-	12	-	48 (1 b)
CORYSTOIDEA, - - - -	6	-	5	-	8
	<hr/>		<hr/>		<hr/>
Total BRACHYURA,	190		99 (8)		526 (10)

## II. ANOMOURA.

	A.	B.	C.
Dromidea, - - - -	1	9	15 (1 b)
Bellidea, - - - -	2	0	0
Raninidea, - - - -	1	0	5
Hippidea, - - - -	7	2	7
Porcellanidea, - - - -	24	4	19
Lithodea, - - - -	5	1 (1 a)	3
Paguridea, - - - -	26	27 (1 a)	61 (1 b)
Ægleidea, - - - -	2	0	0
Galatheidea, - - - -	3	6 (1 a)	5
	<hr/>	<hr/>	<hr/>
Total ANOMOURA,	71	49 (3)	115 (2)

## III. MACROURA.

	A.	B.	C.
Thalassinidea, - - - -	7	8	9 (1 b)
Astacidea, - - - -	29	9	27
Caridea, - - - -	40	77 (3 a)	85 (3 b)
Penæidea, - - - -	4	8	22
	<hr/>	<hr/>	<hr/>
Total MACROURA,	80	102 (3)	143 (4)

## IV. ANOMOBRANCHIATA.

	A.	B.	C.
Squilloidea, - - - -	10	16	32 (3 b)
Mysidea, - - - -	3	18	15
Amphionidea - - - -	0	9	11
	<hr/>	<hr/>	<hr/>
Total ANOMOBRANCHIATA,	13	43	58 (3)

## V. TETRADECAPODA.

	A.	B.	C.
ISOPODA.			
Idotæidea, - - - -	11	25	6 (1 b)
Oniscoidea, - - - -	30	72 (1 a)	11
Cymothoidea, - - - -	32	57 (1 a)	42 (2 b)
	<hr/>	<hr/>	<hr/>
Total Isopoda,	73	154 (2)	59 (3)
ANISOPODA, - - - -	10	38	6
AMPHIPODA.			
Caprellidea, - - - -	13	24	6
Gammaridea, - - - -	55	114	51
Hyperidea, - - - -	9	27	17
	<hr/>	<hr/>	<hr/>
Total Amphipoda,	77	165	74
	<hr/>	<hr/>	<hr/>
Total TETRADECAPODA,	160	357 (2)	139 (3)

The table affords the following lists of genera of the three grand divisions, according to the present state of the science.

1. GENERA EXCLUSIVELY AMERICAN OR OCCIDENTAL.

	Coast on which found.		Coast on which found.
1. <i>Maiioidea</i> .		3. <i>Grapsoidae</i> .	
Microrhynchus,	west.	Cyrtograpsus,	east.
Salacia,	"	Uca,	west and east.
Libidoclea,	west and east.	Gecarcoidea,	east.
Libinia,	"	Fabia,	west.
Pelia,	west.	Pinnixa,	west and east.
Rhodia,	"	Pinnotherelia,	west.
Pisoides,	"	Halicarcinus,	west and east.
Thoe,	west and east.	4. <i>Leucosoidea</i> .	
Chorilia,	west.	Platymera,	west.
Scyra,	"	Hepatus,	west and east.
Othonia,	"	Guaia,	"
Mithraculus,	west and east.	5. <i>Corystoidea</i> .	
Tyche,	"	Telmessus,	west.
Eurypodius,	"	Peltarion,	east.
Oregonia,	west.	Pseudocorystes,	west.
Inachoides,	"	6. <i>Anomoura</i> .	
Pugettia,	"	Corystoides,	west.
Epialtus,	west and east.	Bellia,	"
Leucippa,	"	Ranilia,	"
2. <i>Cancroidea</i> .		Albunhippa,	west.
Pilumnoides,	west.	Echidnocerus,	"
Trichodactylus,	east.	<i>Macroura</i> .	
Arenæus,	"	7. <i>Cambarus</i> ,	west and east.
Potamia,	west and east.	Paracrangon,	west.
Orthostoma,	east.	Æglea,	"
Acanthocyclus,	west.	Cryphiops,	"

2. GENERA EXCLUSIVELY OF THE AFRICO-EUROPEAN DIVISION.

1. *Maiioidea*.—Lissa, Stenorhynchus, Amathia, Eurynome.

2. *Cancroidea*.—Perimela, Portumnus, Polybius.

3. *Grapsoidae*.—Gonoplax, Heterograpsus, Brachynotus, Hymenosoma.

4. *Leucosoidea*.—Ilia.

5. *Corystoidea*.—Thia, Corystes.

6. *Anomoura*.—Homola.

7. *Macroura*.—Axius, Calocaris, Ephyra, Gnathophyllum.

3. GENERA EXCLUSIVELY ORIENTAL, OR OF THE THIRD DIVISION.

1. *Maiioidea*.—Macrocheira, Paramithrax, Micippa, Lahaina, Naxia, Hyastenus, Pyria, Cyclax, Camposcia, Paramicippa, Tiarinia, Perinea, Halimus, Menæthius, Stenocionops, Huenia, Xenocarcinus, Parthenope, Eumedonus, Ceratocarcinus, Gonatonotus, Eurynolambrus.

2. *Cancroidea*.—Atergatis, Liomera, Liagora, Medæus, Halimede, Etisus, Carpilodes, Zozyms, Daira, Cymo, Polydectus, Cethra, Galene, Pseudozius, Melia, Acanthodes, Actumnus, Ruppellia, Domæcius, Trapezia, Tetralia, Quadrella, Scylla, Charybdis, Lissocarcinus, Podophthalmus.

3. *Grapsoidae*.—Curtonotus, Cleistostoma, Macrophthalmus, Helæcius, Scopimera, Doto, Eriocheir, Platynotus, Trichopus, Sarmatium, Helice, Gecarcinicus, Xenophthalmus, Xanthasia, Hymenicus, Elamena, Myctiris.

4. *Leucosoidea*.—Mursia, Orythia, Thealia, Matuta, Philyra, Leucisca, Nucia, Nursia, Myra, Ixa, Iphis, Arcania, Oreophorus, Tlos, Ethusa.

5. *Corystoidea*.—Kraussia, *Æidia*, *Dicera*.
6. *Anomoura*.—*Caphyra*, *Raninoides*, *Ranina*, *Notopus*, *Lyreidus*, *Cosmonotus*, *Lomis*, *Diogenes*, *Aniculus*, *Birgus*.
7. *Macroura*.—*Laomedia*, *Glaucothoe*, *Callianidea*, *Callisea*, *Thenus*, *Ibacus*, *Astacoides*, *Paranephrops*, *Cyclorhynchus*, *Atyoida*, *Alope*, *Ædipus*, *Harpilius*, *Anchistia*, *Palæmonella*, *Hymenocera*, *Oplophorus*, *Regulus*, *Stenopus*, *Spongicola*, *Acetes*, *Eucopia*.

4. GENERA COMMON TO THE AMERICAN AND AFRICO-EUROPEAN DIVISIONS, BUT NOT IN THE THIRD, OR ORIENTAL.

1. *Maiioidea*.—*Hyas*, *Herbstia*, *Leptopodia*, *Stenorhynchus*.
2. *Cancroidea*.—*Atelecyclus*.
3. *Anomoura*.—*Munida*, *Grimothea*.
4. *Macroura*.—*Homarus*.

5. GENERA COMMON TO THE AFRICO-EUROPEAN AND ORIENTAL DIVISIONS, NOT YET FOUND IN THE OCCIDENTAL.

1. *Maiioidea*.—*Inachus*, *Doclea*, *Maia*, *Achæus*, *Lambrus*.
2. *Cancroidea*.—*Actæa*, *Actæodes*, *Thalamita*, *Portunus*, *Telphusa*.
3. *Leucosoidea*.—*Cycloes*, *Ebalia*, *Dorippe*.
4. *Anomoura*.—*Latreillia*, *Cymopolia*, *Remipes*.
5. *Macroura*.—*Nika*, *Lysmata*, *Caridinia*.

6. GENERA COMMON TO THE THREE DIVISIONS.

1. *Maiioidea*.—*Pisa*, *Mithrax* (mainly Occid.), *Acanthonyx*.
2. *Cancroidea*.—*Xantho*, *Panopæus* (mainly Occidental), *Pilumnus*, *Eriphia*, *Lupa*, *Amphitrite*, *Carcinus*, *Platyonychus*.
3. *Grapsoidea*.—*Grapsus*, *Goniograpsus*, *Sesarma* (sparingly European), *Acanthopus*, *Plagusia*, *Pinnothera*, *Calappa*.
4. *Anomoura*.—*Dromia* (sparingly Occid.), *Albunæa*, *Porcellana*, *Lithodes*, *Paguristes*, *Bernhardus*, *Pagurus* (mainly Orient.), *Clibanarius*, *Galathea*.
5. *Macroura*.—*Gebia*, *Scyllarus*, *Panulirus*, *Palinurus*, *Astacus*, *Crangon*, *Alpheus*, *Betæus*, *Hippolyte*, *Pandalus*, *Palæmon*, *Sicyonia*, *Penæus*.

The following are lists of *species* common to two or more of the three divisions. They may be much changed by farther study, through the discovery that the specimens from distant localities are not conspecific. Should this happen, there is a relation indicated based on their close similarity, which is important.

1. SPECIES STATED TO BE COMMON TO DIVISIONS A. AND B., OR THE AMERICAN AND THE AFRICO-EUROPEAN WATERS.

*Hyas coarctata*: Massachusetts and Long Island, in United States; France; England; Shetlands.

*Leptopodia sagittaria*: Canaries; West Indies; Valparaiso.

*Panopæus Herbstii*: Mediterranean; Key West, South Carolina, and New York in United States.

*Carcinus menas* : Mediterranean at Nice ; Crimea ; England ; Massachusetts, United States.

*Grapsus pictus* : Madeira ; Peru and Chili ; (also various Pacific islands).

*Planes minutus* : Atlantic Ocean, and occasionally found on both the American and European coasts.

*Goniograpsus varius* : Canaries ; Mediterranean at Algiers, Nice, Italy ; Crimea ; Brittany ; and probably at Rio Janeiro, Brazil.

*Sesarma reticulata* : Key West and South Carolina, in United States ; and in South Africa, according to McLeay.

*Acanthopus planissimus* : West Indies ; Canaries ; Madeira ; Cape Town and Port Natal, South Africa ; (also various tropical Pacific islands).

*Plagusia squamosa* : West Indies ; Key West, South Carolina, in United States ; Canaries ; Madeira (also, Isle of France ; Indian Ocean ; Red Sea ; Port Natal).

*Plagusia tomentosa* : Chili ; Cape Town ; (also New Zealand).

*Albunœa symnista* : Canaries ; Mediterranean (also Pondicherry) ; and if the *A. oxyophthalmus* is the same species, it occurs in the West Indies, and on the coast of South Carolina.

*Lithodes Maia* : Great Britain ; Shetlands ; Norway ; coast of Massachusetts (rare).

*Bernhardus streblonyx* : Great Britain ; France ; Mediterranean ; Norway ; Massachusetts, in United States ; (also Kamtschatka).

*Cenobita diogenes* : West Indies ; Mediterranean, (Hawaii ?).

*Crangon vulgaris* : Great Britain ; France ; United States ; San Francisco and Puget's Sound, Western America.

*Crangon boreas* : Norway ; Iceland ; Greenland ; Massachusetts (in fish) ; (also, Kamtschatka).

*Pandalus annulicornis* : Scotland and Shetlands ; Norway ; Iceland ; Massachusetts (rare).

*Gonodactylus chiragrus* : Mediterranean ; Key West ; (also, Red Sea ; Port Natal, South Africa ; Isle of France ; East Indies ; Swan River, Australia ; Pacific Ocean, at Feejees, Tongatabu, &c.).

## 2. SPECIES COMMON TO B. AND C., THE AFRICO-EUROPEAN AND ORIENTAL SEAS.

*Mithrax dichotomus* : Mediterranean ; East Indies.

*Achæus Cranchii* : Mediterranean ; Japan (probably same species).

*Actæa rufo-punctata* : Canaries and Mediterranean ; Isle of France, Indian Ocean.

*Thalamita admete* : Canaries ; Port Natal, South Africa ; Red Sea ; Indian Ocean, and East Indies ; Pacific Ocean, at the Fejees, Samoa, Hawaiian Islands, Wake's Island, &c.

*Pilumnus Forskalii* : Canaries ; Red Sea.

*Grapsus pictus* : see above.

*Grapsus strigosus* : Canaries ; South Africa ; Red Sea ; East Indies.

*Goniograpsus messor* : Canaries ; Port Natal, South Africa ; Red Sea ; East Indies.

*Planes minutus* : Atlantic ; Japan.

*Acanthopus planissimus* : see above.

- Plagusia tomentosa* : Chili ; South Africa ; New Zealand.  
*Plagusia squamosa* : see above.  
*Cycloes granulosa* : Canaries ; Japan (probably same species).  
*Remipes scutellata* : Ascension Island ; Swan River, Australia ; St. Christopher's.  
*Lysmata seticaudata* : Mediterranean ; Japan.  
*Alpheus Edwardsii* : Mediterranean ; Cape Verdes ; Port Natal, South Africa.  
*Pandalus pristin* : Mediterranean ; Japan.  
*Squilla mantis* : Mediterranean ; Canaries ; Tschusan.  
*Pagurus striatus* : Mediterranean ; Japan.

### 3. COSMOPOLITES.

The above lists include the following species occurring in the Occidental, Africo-European, and Oriental seas.

- |                                 |                                |
|---------------------------------|--------------------------------|
| <i>Grapsus pictus</i> .         | <i>Bernhardus streblonyx</i> . |
| <i>Acanthopus planissimus</i> . | <i>Crangon boreas</i> .        |
| <i>Plagusia squamosa</i> .      | <i>Crangon vulgaris</i> .      |
| <i>Plagusia tomentosa</i> .     | <i>Gonodactylus chiragra</i> . |

These are cosmopolite species.\* The *Grapsus*, *Acanthopus*, *Plagusia*, *squamosa* and *Gonodactylus* preëminently deserve this name, being found both north and south of the equator. They thrive in the hottest equatorial waters, and have their extreme limit in the temperate region. The temperature they admit of is hence at least from 56° to 88° F.

The other species are cold-water species. *Plagusia tomentosa* belongs to the southern subtemperate region, being reported from Cape Town, New Zealand, and Chili, and the rest are found in high northern latitudes, and probably pass from the Atlantic to the Pacific Ocean through the Arctic Seas.

Besides the above species, a few are found in the West Indies, which occur also in the Oriental Seas, but are not yet known from the European or West African coasts. These, which also may be styled cosmopolites, are as follows :

*Mithrax asper* : East Indies ; probably the same on the Peruvian coasts.

*Atergatis lobatus* : Red Sea and Indian Ocean ; West Indies.

*Carpilius maculatus* : East Indies ; South France ; Japan ; various Pacific Islands from the Paumotus to the Feejees and Hawaiian Islands ; West Indies ; *Eriphia gonagra* ; East Indies ; Port Natal ; Key West.

*Menippe Rumphii* : East Indies ; Rio Janeiro and the West Indies.

*Chlorodius exaratus* : Pacific Islands ; East Indies ; West Indies.

*Lysiosquilla scabricaudis* : Indian Ocean ; West Indies ; Brazil ; South Carolina.

\* The *Platyonychus bipustulatus* may possibly be another cosmopolite, for it is reported from Table Bay, the East Indies, Japan and Valparaiso. But we believe the Valparaiso species to be different from that of the East Indies, and have so named it.



From the survey already made, it is apparent, that the three grand divisions of the seas and coasts adopted in the preceding table, have very few species in common, and they correspond to a natural geographical arrangement. They constitute three kingdoms, to which two should be added, one for the Arctic Seas, and the other for the Antarctic. These kingdoms are:

I. The *Occidental* Kingdom, embracing the Atlantic and Pacific coasts of America to the frigid region, or some point in the subfrigid region.

II. The *European* Kingdom, extending from Cape Horn (or Cape Agulhas) to the Shetlands inclusive, and embracing the adjoining islands.

III. The *Oriental* Kingdom, including the east coast of Africa, the south and east of Asia, and the islands of the Indian and Pacific Ocean, exclusive of the American continent.

IV. The *Arctic* Kingdom, including Norway, Iceland, Greenland, the Alascha Archipelago, and adjoining parts of the coasts of America und Kamtschatka, with other Arctic lands.

V. The *Antarctic* Kingdom, embracing Fuegia, the Falklands, Southern New Zealand, and the lands or islands of the Antarctic Seas.

It will not be understood that the torrid species in one of these kingdoms resembles the temperate more than do the torrid of another kingdom; for this is far from true, since the distribution of genera is to a great extent determined by temperature, as already shown. But taking the range of species of the kingdoms through, there is a striking difference between the kingdoms in species of the same temperature region or zone.

Each of the first three kingdoms are naturally divided into three subkingdoms: a *north*, a *middle*, and a *south*, corresponding severally to the North Temperate, Torrid, and South Temperate zones of sea temperature. The importance of these divisions will be a subject of further remark beyond.

The summary of the results in the preceding table, presents some striking facts.

We observe, first, that there is a ratio of 1 : 1.5 between the Maioids of the A and C divisions (that is between those of the *Occidental* and *Oriental* seas, as just explained), while the ratio is about 1 : 4½ for the Cancroids. So also, while the ratio of the A and B divisions together (*Occidental* and *European*) to C (*Oriental*) is for the Maioids, nearly 1 : 1, it is for the Cancroids, 1 : 3. Here is a wide difference between the *Occidental* and *Oriental* seas as regards these groups. This last ratio is for the Corystoids nearly that for the Maioids, or more exactly, 1 : 0.75; and for the Grapsoids it is 1 : 2; for the Leucosoids, 1 : 2½. (The Arctic and Antarctic Seas are here merged in the other kingdoms, with which they are most nearly associated.)

If we compare these ratios with those which the same groups sustain as regards temperature, as exhibited on a former page, we discover that there is a very close parallelism; showing plainly that the prevalence of Maioids in the Occidental Seas must be owing to the comparative prevalence of cold waters; and the prevalence of the warm water groups, the Cancroids and Leucosoids, in the Oriental Seas, is owing conversely to the great extent of warm waters.

Again, the ratio between the A and B divisions together of the Macroura, and the C division, is nearly as 1:0·8, which sustains the same conclusion as to the influence of temperature.

The corresponding ratio for the Tetradecapoda is as 1:0·26. But as this group, owing to the smallness of the species, has not been thoroughly investigated, except in European regions, directly under the eyes of European observers, we cannot use satisfactorily the facts they present for deducing general conclusions, or for characterizing zoological districts or provinces. Still, it should be observed that the facts conform to the same principle.

It is hence of the highest importance before comparing the zoological character of different coasts, that the temperature-regions of those coasts should be ascertained.

Comparative tables of the East Indies and Mediterranean, or of the Peruvian coast and the East Indies, or of the southeast and southwest coast of Africa (and so on), would lead us far astray, if this element were left out of view; for a difference of temperature region, implies a difference of genera and species, independent of other considerations. On these grounds, whole continents, or sides of continents, may have a common character and differ widely from other continents in the same latitude.

If we look at the American continent in this point of view, we at once perceive a striking peculiarity. All the coasts of North and South America with the Gallapagos on the west belong to the Temperate zone, excepting a few degrees along by Panama, and a connected range of coast from Key West to Rio Janeiro. Chili and Peru are excluded even from the warm temperate region, and so also, the coast of the United States, north of Cape Hatteras. (See Chart, this Jour., vol. xvi.)

Now contrast America with the Oriental Seas. The whole east coast of Africa, north of the parallel of 30° south, the coasts of India and the East India Islands, and the northern half of Australia, together with the numerous islands of the Pacific, belong alike to the Torrid zone. In the American Seas, the torrid coasts make a single range, and have many species in common throughout. In the Oriental Seas, they reach with an uninterrupted surface over one-half of the circumference of the globe, and there is room for many distinct provinces within the same temperature region. The fact is more striking, if we consider that the At-

lantic east of the West Indies contains no islands in the Torrid zone, besides St. Helena, Ascension, and the Cape Verdes, all of which are of small size.

Again in order to compare the coasts of America and Europe, we must observe that the warm temperate region is represented along the former by a small district from Northern Florida to Cape Hatteras, while this region does not reach at all the latter, and only the Canaries in the Eastern Atlantic are within it. Moreover, the temperate and subtemperate regions have no existence on the North American coast at Cape Hatteras; while on the European side, the former embraces the larger part of the Mediterranean, and a portion of North-western Africa, and the latter includes the Atlantic coast of Portugal. But north of Cape Hatteras, the coast of America is rightly compared with that of Europe, north of Portugal.

To compare the coast of Asia and Europe, we first observe in the same manner the temperature regions. There is in fact a striking similarity with the coast of the United States. Yet, the torrid and subtropical regions are confined to limits much nearer the equator; and the warm temperate, although embracing as many degrees of latitude as the warm temperate on the United States, does not, on the China coasts extend farther north than the subtropical region of the Florida coast. The temperate region hardly has a place on the coast of China, while the subtemperate occupies the Yellow Sea. North of this Gulf, the coast corresponds mostly with the coast of the United States, north of Cape Cod.

It is unnecessary to adduce other explanations, as the chart furnishes all that is needed for a ready comparison between the different coasts.

The propriety of uniting in one kingdom both coasts of America, the eastern and western, and thus shutting off the latter from the great Pacific Ocean, may at first appear unnatural. Yet it is supported by all facts bearing on the subject. There are no species known to be common to Western America and the Middle Pacific, excepting two or three cosmopolites. Moreover, the genera are to a great extent distinct, and where so, they often occur on both sides of the continent. The genera of Podophthalmia peculiar to America are mentioned on a preceding page, and also the particular coast on which they occur.

A review of some of the facts will exhibit in a strong light the zoological resemblances of the two sides of the continent.

Of *Cancer*, there are *four* species found on the west coast of South America, *three* on the west coast of North America, and *two* on the east coast of North America.

Of *Hepatus*, there is *one* species common to the West Indies and Brazil, a *second*, found at Rio Janeiro; a *third* at Valparaiso, Chili; a *fourth* on the Carolina coast.

*Libinia*, in the same manner, has its species on the Atlantic and Pacific coast of the United States, and the coasts of Western and Eastern South America. *Mithrax* is as widely distributed.

*Epialtus* occurs in the West Indies, California, Brazil, Gallapagos, and Valparaiso. *Potamia* has two West Indian and one Chilean species.

*Eurypodius* of Southern South America has its representative at Puget's Sound, in the genus *Oregonia*.

Again, the *Libinia dubia* of the West Indies, is hardly distinguishable, according to Prof. L. R. Gibbes, from the *L. affinis*, Rand., of the California coast. *L. spinosa* of Brazil, is also found in Chili. *Leptopodia sagittaria* occurs in the West Indies, and also, according to Bell, at Valparaiso; *Acanthonyx Petiverii* (?), in the West Indies, Brazil, and Gallapagos; *Epialtus marginatus*, on the coast of Brazil and at the Gallapagos (Bell); *Epialtus bituberculatus*, in Chili, and at Key West; *Uca una*, Guayaquil and West Indies; *Albunœa scutellata*, West Indies and San Lorenzo, Peru; *Hippa emerita* and *talpoides*, both on East and West America, North and South.

It is obvious, therefore, that the east and west sides of America are very closely related, and differ widely in a zoological sense, from either of the other kingdoms.

We observe further, that nearly all the genera peculiar to America are *cold-water* genera. They are mostly Maioids; the large group of the Cancroids, which belong mainly to warm waters, does not include a single genus exclusively American, and of the family Leucosidæ, of the Leucosoids, there are only three known species.

We also perceive why the western coast of America has no zoological affinity with the Pacific Islands. The temperature of their waters is widely different; and, moreover, the oceanic currents of the tropics run *from* the American coast to the westward, and are a barrier to migration eastward.

The relations of the American or Occidental to the Africo-European kingdom are of much interest. The two kingdoms are widely different in most respects.

In the first place, the genera *Lupa*, *Gelasimus*, *Ocypoda*, *Libinia*, *Epialtus*, *Hepatus*, well represented on the American coasts, are not known on the European, besides others (Table 1, on a preceding page) of less prominence.

Again, there are several genera common in Europe, not known in America, as *Inachus*, *Maia*, *Achæus*, *Portunus*, *Ebalia*, *Latreillia*, *Athanas*, in addition to those included in Table 2.

Still, the American and Africo-European kingdoms have a common character separating them from the Oriental. For example: the great genus *Cancer* occurs in both of these kingdoms,

and is not known in Oriental seas, except in New Zealand and Tasmania. So also the important genus *Homarus*; besides *Hyas*, *Herbstia*, *Leptopodia*, *Atelecyclus*, *Munida*, and *Grimothea*. The genus *Homarus* has one species on the coast of the United States, one on the coast of Europe, and one at Table Bay, South Africa, thus ranging over the whole Atlantic.

We may now treat separately of the several Kingdoms, and their subdivision into *Provinces*, pointing out the naturalness of their limits, and the characteristics of these Provinces. Each temperature region along a coast makes a distinct Province, which facts, where ascertained, show to be well characterized. In some cases, a further subdivision may be desirable, and when so, the subordinate divisions may be called *Districts*. In each Kingdom, the Provinces of each zone together may constitute a *Sub-kingdom*, as the *Torrid* Subkingdom, *Temperate* Subkingdom, &c.

In continuing the extracts from the writer's Report on Crustacea, the notes relating to the genera and species characterising the several provinces exhibiting their relations and distinctive characters may be here for the most part omitted. The following are a few facts of special interest.

The relations of the Mediterranean region to Japan are mentioned by De Haan. The genera strikingly Mediterranean which occur in Japan, are *Latreillia*, *Nika*, *Caridina*, *Ephyra*, *Sicyonia*, *Achæus*, *Pandalus*, *Lysmata*; and the species of the last three, together with *Squilla mantis*, are probably identical, viz., *Pandalus pristis*, *Lysmata seticaudata*, and *Achæus Cranchii*, which last is at least hardly distinguishable, according to De Haan, from the *A. japonicus*. *Portunus corrugatus* is also closely like a Japan species, according to De Haan. The *Cycloes* of the Canaries is another of the Atlantic species, allying the Atlantic region to Japan, as above mentioned. *Doclea* is also an Oriental genus, represented in the Occidental kingdom by *Libinia*. It has but one described species out of the Oriental kingdom.

DECAPODA COMMON TO THE CELTIC PROVINCE AND THE MEDITERRANEAN.\*

1. <i>Brachyura</i> .	
Maia squinado, A.	Portunus Rondeletii, A.
Pisa tetraodon, A.	“ depurator (plicatus), A.
“ lanata (Gibbsii), A.	“ marmoreus.
Achæus Cranchii, A.	“ corrugatus, A.
Stenorhynchus phalangium, A.	“ holsatus.
Eurynome aspera.	Carcinus mænas, A.
Perimela denticulata, A.	Portunus latipes, A.
Xantho floridus, A.	Gonoplax angulata, A.
“ rivulosus, A.	Goniograpsus varius, A.
Pilumnus hirtellus.	Pinnothera pisum.
Portunus pusillus.	Thia polita.
	Corystes dentatus.

\* Those species that are reported by Lucas from Algiers, are followed by the letter A. They also occur elsewhere in the Mediterranean.

2. *Anomoura*.  
*Dromia vulgaris*, A.  
*Porcellana platycheles*, A.  
 " *longicornis*, A.  
*Bernhardus Prideauxii*, A.  
 " *Forbesii*.  
 " *streblonyx*.  
*Clibanarius oculatus*.  
*Galathea strigosa*, A.  
 " *squamifera*.  
 3. *Macroura*.  
*Callianassa subterranea*.  
*Arctus ursus*, A.

*Palinurus vulgaris*, A.  
*Homarus vulgaris*, A.  
*Nephrops norvegicus*.  
*Crangon fasciatus*, A.  
 " *vulgaris*.  
 " *cataphractus*, A.  
*Nika edulis*, A.  
*Alpheus ruber*, A.  
*Athanas nitescens*, A.  
*Hippolyte varians*, A.  
 " *viridis*, A.  
*Palæmon serratus*, A.  
*Pasiphaea sivado*.  
*Penæus sulcatus* (caramote), A.

The genus *Xantho*, in *X. rivulosus* and *X. floridus* here reaches its extreme cold limit in the Celtic Province. *Nephrops norvegicus*, although more properly pertaining to the next province north, occurs also within the limits of this; and it has even been taken in the Mediterranean. *Stenorhynchus phalangium* and *Portunus pusillus*, reach south into the Mediterranean and north to the Frigid zone; *Portunus holsatus*, *Galathea strigosa*, and *Porcellana platycheles*, south to the Canaries and north into the subfrigid. \* \* \*

Turning Cape Agulhas, we soon come into a zoological world widely different from that of the Atlantic coasts. The coast immediately east to longitude 30°, belongs still to the temperate zone, and constitutes a distinct province, which we call the Algoa Province (from Algoa Bay), the length of which, measured from Cape Agulhas, is full five hundred and fifty miles.

Passing beyond this, we reach the Natal province, and here we recognise at once the seas of India and the Pacific Ocean. Krauss mentions eighty-one Natal species of Podophthalmia, not thirty of which are peculiar to this region. *Twenty* are found in the Indian Ocean, *eighteen* in the Red Sea, *thirteen* in Japan, *eight* in Australia, *five* in the Isle of France, besides *three* European species, and *three* American. We observe further that, twenty-two of the species of Podophthalmia occur in the Pacific Islands, among which are four species supposed by Krauss to be peculiar to Natal, viz., *Pagurus* (*Clibanarius*, D.) *virescens*, Kr., *Pagurus* (*Calcinus*, D.) *elegans*, *Galene natalensis*, Kr., *Platyonychus* (*Kraussia*, D.) *rugulosus*, Kr., all of which occur at the Hawaiian Islands.\*

Of the *European* species, one is the cosmopolite *Gonodactylus chiragra*, Latr. The others are *Alpheus Edwardsii*, and *Gammarus pulex*, Fabr. *Megalopa mutica* and *Hippolyte ensiferus*, also reported from South Africa, do not occur at Port Natal. The *American* are the cosmopolites *Goniograpsus pictus*, and *Gono-*

\* The *Galene hawaiiensis*, D., is so closely like the *G. natalensis*, that we believe there is not sufficient reason for considering them distinct.

*dactylus chiragra*, together with *Eriphia gonagra*, Edw. The *Sesarma reticulata*, Say, and *Plagusia tomentosa*, Lk., also South African, are not from Port Natal.

The wide distribution of the same species over the Oriental seas, from the African coast through the Pacific Ocean, is well shown in the following tables—a distribution due to the wide range of the tropical and subtropical waters. The *African* section here includes the east coast of Africa, with the adjoining islands; the *Indian*, the East Indies, southeast and east coast of Asia, and Eastern Australia; the *Pacific*, the Pacific Ocean.\*

SPECIES COMMON TO THE THREE SECTIONS, THE AFRICAN, THE INDIAN, AND THE PACIFIC.

1. <i>Brachyura</i> .	
Parthenope horrida.—I. Fr., Red Sea; E. I.; Haw.	Calappa tuberculata.—Nat.; I. Fr.; R. Sea; E. I.; Feej., Tonga, Haw.
Atergatis limbatus.—Red Sea; E. I.; Feej.	Calappa fornicata.—I. Fr.; E. I.; Feej.
Atergatis floridus.—Natal; E. I.; Tonga, Paumotus; Tahiti.	2. <i>Anomoura</i> .
Carpilius maculatus.—I. Fr.; E. I.; Jap. Samoa, &c., to Paumotus.	Pagurus difformis.—I. Fr.; E. I.; Feej.
Carpilius convexus.—R. Sea: E. I.; Jap.; Feej., Haw.	Pagurus punctulatus.—E. I.; Haw.
Actæa hirsutissima.—R. Sea; Samoa.	Calcinus tibicen.—Nat.; E. I.; Samoa: Wake's, Tahiti, Paumotus, Haw.
Chlorodius niger.—R. Sea (N.); E. I.; Feej., Tonga, Samoa.	Calcinus elegans.—Nat.; E. I. ?; Wake's, Paumotus, Haw.
Trapezia ferruginea.—R. Sea; E. I.; Pacific.	Aniculus typicus.—I. Fr.; Jap.; Wake's, Paumotus.
Cymo Adreosyi.—R. Sea; E. I. ?; Samoa, Tahiti.	Clibanarius virescens.—Nat.; E. I.; Feej.
Scylla serrata.—Natal; R. Sea; E. I.; Jap.; Samoa.	Cenobita rugosa.—Nat.; E. I., Jap.; Feej.; Samoa, Tonga, Paumotus.
Lupa sanguinolenta.—Nat.; I. Fr.; R. Sea; E. I.; Haw.	Birgus latro.—I. Fr.; E. I., Jap.; Samoa, Swain's, Paumotus.
Thalamita admete.—Nat.; R. Sea; E. I.; Samoa, Wake's, Haw.	3. <i>Maeroura</i> .
Thalamita crenata.—Nat.; R. Sea (S.); E. I., Jap., Feej.	Parribacus antarcticus.—I. Fr.; E. I.; Samoa, Paumotus.
Cleistostoma Boscii.—Nat.; R. Sea; [E. I. ?]; Feej.	Panulirus penecillatus.—R. Sea; E. I.; Pacific.
Podophthalmus vigil.—I. Fr.; E. I.; Jap.; Haw.	Hippolyte marmoratus.—E. I.; Pacific; Haw.
Ocypoda brevicornis.—I. Fr.; E. I.; Tonga.	Stenopus hispidus.—I. Fr.; E. I.; Paumotus.
Acanthopus planissimus.—Nat.; E. I. ?; Samoa, Tahiti, Paumotu, Haw. [also Madeira.]	4. <i>Anomobranchiata</i> .
	Pseudosquilla styliifera.—I. Fr.; Feej.; Haw.
	Gonodactylus chiragra.—Nat.; I. Fr., R. Sea; E. I.; Feej., Tonga.

Of the above species, a few occur in both the torrid and subtropical regions of these three sections of the Oriental kingdom, that is, in the Erythrean, Natalensian, Indian, Liukiuan, Polynesian, and Hawaiian Provinces. These are:—*Lupa sanguinolenta*, *Podophthalmus vigil*, *Calappa tuberculata*, *Acanthopus planissimus*, *Calcinus tibicen*, *C. elegans*, and *Gonodactylus*

\* I. Fr. stands for Isle of France; E. I. for East Indies; Haw. for Hawaiian Islands; Jap. for Japan; Nat. for Natal; Feej. for Feejees.

*chiragrus*. *Grapsus pictus* is not included; it has not been reported from the eastern coast of Africa. The above list must be much increased as the species of the different regions are better understood. Some of the species have a range of over twelve thousand miles. Many species common to Natal and Japan or the Hawaiian Islands, are given in the above list. We add below a list of—

SPECIES COMMON TO THE NATAL AND THE LIUKIUAN (SOUTH JAPAN) OR HAWAIIAN PROVINCES OF THE SUBTORRID REGIONS, AND NOT YET OBSERVED IN THE TORRID REGION INTERMEDIATE.

Micippa thalia.—Nat. and Jap.	Ocyropa cordimana.—Nat. and Jap.
Xantho affinis, De H.—Nat. and Jap.	Sesarma picta.—Nat. and Jap.
Xantho obtusus, De H.—Nat. and Jap.	Sesarma affinis.—Nat. and Jap.
Carpilius petraeus, De H.—Nat. (I. Fr.) and Jap.	Kraussia rugulosa.—Nat. and Haw.
Charybdis granulatus.—Nat. and Jap.	Galene natalensis.—Nat. and Haw.
Thalamita prymna.—Nat. and Jap.	Dromia hirsutissima.—S. Afr. and Haw.
Gelasimus arcuatus.—Nat. and Jap.	Calappa spinosissima.—I. Fr. and Haw.
Gelasimus lacteus, De H.—Nat. and Jap.	Doto sulcatus, Nat., Jap., and R. Sea.

The species of New Zealand, while somewhat related to those of southeastern Australia, have rather close relations to those of Chili, and also some resemblance to those of Britain. The genera *Ozius*, *Hemigrapsus* and *Chasmagnathus* are common to both New Zealand and the part of Australia referred to. The following genera characterize both Chili and North New Zealand:—*Cancer*, *Ozius*, *Cyclograpsus*, *Paguristes*, and *Betæus*; and the *Cancer Edwardsii* and *Plagusia tomentosa* appear to be common to the two provinces, while the genus *Cancer* is not elsewhere known out of America and Northern Europe. *Palæmon affinis* of the Bay of Islands, as Edwards observes, is hardly distinguishable from *P. squilla* of the coasts of France and Britain. The species of *Portunus* in these southern seas are representatives of the most characteristic of European genera, and they belong rather to the cold temperate than subtemperate regions of the Australian and New Zealand seas. *Portunus integrifrons* is reported from Tasmania (Van Diemens Land). *Ozius* represents *Xantho* of the British Channel.

The occurrence in New Zealand of this representative of a cold water *Xantho*, of the *Palæmon affinis* so near a European species, of *Cancer* and *Portunus*, which are found together only in British seas, shows a striking zoological relation between these antipodes—a relation plainly dependent on the similar insular character and oceanic temperature of the two regions, Britain and New Zealand.

In the north Polar seas, the species have often a wide range, and probably pass from one ocean to the other through the Polar oceans. Thus *Crangon boreas*, *Carcinas mænas*, *Pagurus streblonyx*, *Hippolyte aculeatus*, are not only found on opposite sides of the Atlantic, but also in the North Pacific.



*Origin of the Geographical Distribution of Crustacea.*

The origin of the existing distribution of species in this department of zoology deserves attentive consideration. Two great causes are admitted by all, and the important question is, how far the influence of each has extended. The first, is *original local creations*; the second, *migration*.

Under the first head, we may refer much that we have already said on the influence of temperature, and the restriction of species to particular temperature regions. It is not doubted that the species have been created in regions for which they are especially fitted; that their fitness for these regions involves an adaptation of structure thereto, and upon this adaptation, their characteristics as species depend. These characteristics are of no climatal origin. They are the impress of the Creator's hand, when the species had their first existence in those regions calculated to respond to their necessities.

The following questions come up under this general head:—

1. Have there been local centres of creation, from which groups of species have gone forth by migration?
2. Have genera only and not species, or have species, been repeated by creation in distinct and distant regions?
3. How closely may we recognise in climatal and other physical conditions, the predisposing cause of the existence of specific genera or species?

With regard to the *second* head, migration, we should remember, that Crustacea are almost wholly maritime or marine; that marine waters are continuous the globe around; and that no sea-shore species in zoology are better fitted than crabs for migration. They may cling to any floating log and range the seas wherever the currents drift the rude craft, while the fish of the sea-shores will only wander over their accustomed haunts. Hence it is, that among the Pacific Islands the fishes of each group of islands are mostly peculiar to the group, while the Crustacea are much more generally diffused.

A direction and also a limit to this migration exist, (1) in the currents of the ocean, and (2) in the temperature of its different regions. Through the Torrid zone, the currents flow mainly *from the east* towards the west; yet they are reversed in some parts during a certain portion of the year. But this reversed current in the Pacific never reaches the American continent, and hence it could never promote migration to its shores. Again, beyond 30° or 35° of north or south latitude, the general course of the waters is *from the west*, and the currents are nearly uniform and constant. Here is a means of eastward migration in the middle and higher temperate regions. But the temperature regions in these latitudes are more numerous than in the tropics,

and species might readily be wafted to uncongenial climates, which would be their destruction; in fact they could hardly escape this. Moreover, such seas are more boisterous than those nearer the equator. Again, these waters are almost entirely bare for very long distances, and not dotted closely with islands like the equatorial Pacific.

In the northern hemisphere, on the eastern coasts especially, there are warm currents from the south and cold currents from the north. The former overlie the latter to a great extent in the summer and may aid southern species in northward migrations. Cape Hatteras is nearly the termination of the summer line of  $70^{\circ}$  (see Maury's Chart), a temperature which belongs to the subtorrid region in winter. On the China coast, at Macao, there is a temperature of  $83^{\circ}$  in July, and in the Yellow Sea, of  $78^{\circ}$  to  $80^{\circ}$ . But such northward migrations as are thus favored, are only for the season; the cold currents of the winter months destroy all such adventurers, except the individuals of some hardier species that belong to the seas or have a wide range in distribution. Sea-shore Crustacea are not in themselves migratory, and are thus unlike many species of fish. Even the swimming Por-tunidæ are not known voluntarily to change their latitudes with the season.

The following is a brief recapitulation of the more prominent facts bearing on these points.

1. The distribution of individuals of many species through twelve thousand miles in the Torrid zone of the Oriental seas.

2. The very sparing distribution of Oriental species in Occidental seas.

3. The almost total absence of Oriental species from the west coast of America.

4. The world-wide distribution within certain latitudes of the species we have called cosmopolites.

5. The occurrence of closely allied genera at the Hawaiian Islands and in the Japan seas.

6. The occurrence of the same subtorrid species at the Hawaiian Islands and at Port Natal, South Africa, and not in the Torrid zone intermediate, as *Kraussia rugulosa* and *Galene natalensis*.

7. The occurrence of identical species in the Japan seas and at Port Natal.

8. The occurrence of the same species (*Plagusia tomentosa*) in South Africa, New Zealand, and Valparaiso; and the occurrence of a second species (*Cancer Edwardsii* (?)) at New Zealand and Valparaiso.

9. The occurrence of closely allied species (as species of *Amphoroidea* and *Ozius*) in New South Wales and Chili.

10. The occurrence of the same species in the Japan seas and the Mediterranean, and of several identical genera.

11. The occurrence of a large number of identical species in the British seas and the Mediterranean; and also in these seas and about the Canary Islands.

12. The occurrence of closely allied, if not identical, species (as of *Palæmon*) in New Zealand and the British seas; and also of certain genera that are elsewhere peculiarly British, or common only to Britain and America.

13. An identity in certain species of Eastern and Western America.

The following are the conclusions to which we are led by the facts.—

I. The migration of species from island to island through the tropical Pacific and East Indies may be a possibility; and the same species may thus reach even to Port Natal in South Africa. The currents of the oceans favor it, the temperature of the waters is congenial through all this range, and the habits of many Crustacea, although they are not voluntarily migratory, seem to admit of it. The species which actually have so wide a range are not Maioids (which are to a considerable extent deep-water species), but those of the shores; and some, as *Thalamita admete*, are swimming species.

II. The fact, that very few of the Oriental species occur in the Occidental seas, may be explained on the same ground, by the barrier which the cold waters of Cape Horn and the South Atlantic present to the passage of tropical species around the Cape westward, or to their migration along the coasts.

Moreover, the diffusion of Pacific tropical species to the Western American coast is prevented, as already observed, by the westward direction of the tropical currents, and the cold waters that bathe the greater part of this coast.

III. When we compare the seas of Southern Japan and Port Natal and find species common to the two that are not now existing in the Indian Ocean or East Indies, we hesitate as to migration being a sufficient cause of the distribution. It may, however, be said that driftings of such species westward through the Indian Ocean may have occasionally taken place; but that only those individuals that were carried during the season quite through to the *subtorrid* region of the South Indian Ocean (Port Natal, etc.), survived and reproduced, the others, if continuing to live, soon running out under the excessive heat of the intermediate equatorial regions. That they would thus run out in many instances is beyond question; but whether this view will actually account for the resemblance in species pointed out is open to doubt.

IV. When further, we find an identity of species between the Hawaiian Islands and Port Natal—half the circumference of the globe, or twelve thousand miles, apart—and the species, as *Ga-*

*lene natalensis*, not a species found in any part of the torrid region, and represented by another species only in Japan, we may well question whether we can meet the difficulty by appealing to migration. It may however be said, that we are not as yet thoroughly acquainted with the species of the tropics, and that facts may hereafter be discovered that will favor this view. The identical species are of so peculiar a character that we deem this improbable.

V. The existence of the *Plagusia tomentosa* at the southern extremity of Africa, in New Zealand, and on the Chilian coasts, may perhaps be due to migration, and especially as it is a southern species, and each of these localities is within the subtemperate region. We are not ready however to assert, that such journeys as this range of migration implies are possible. The oceanic currents of this region are in the right direction to carry the species eastward, except that there is no passage into this western current from Cape Horn, through the Lagullas current, which flows the other way. It appears to be rather a violent assumption that an individual or more of this species could reach the western current from the coast on which it might have lived; or could have survived the boisterous passage, and finally have had a safe landing on the foreign shore. The distance from New Zealand to South America is five thousand miles, and there is at present not an island between.

VI. Part of the difficulty in the way of a transfer of species between distant meridians might be overcome, if we could assume that the intermediate seas had been occupied by land or islands during any part of the recent epoch. In the case just alluded to, it is possible that such a chain of interrupted communication once had place; and this bare possibility weakens the force of the argument used above against migration. Yet as it is wholly an assumption, we cannot rely upon it for evidence that migration has actually taken place.

VII. The existence of the same species on the east and west coasts of America, affords another problem, which migration cannot meet, without sinking the isthmus of Darien or Central America, to afford a passage across. We know of no evidence whatever that this portion of the continent has been beneath the ocean during the recent epoch. An argument against such a supposition might be drawn from the very small number of species that are identical on the two sides, and the character of these species. *Libinia spinosa* occurs at Brazil and Chili, and has not been found in the West Indies. *Leptopodia sagittaria*, another Maioid, occurs at Valparaiso, the West Indies, and the Canaries.

VIII. The large number of similar species common to the Mediterranean and British seas may be due to migration, as there is a continuous line of coast and no intermediate temperature

rendering such a transfer impossible; and the passage farther south to the Canaries of several of the species is not beyond what this cause might accomplish. Still, it cannot be asserted that in all instances the distribution here is owing to migration; nor will it be admitted unless other facts throw the weight of probability on that side.

IX. But when we find the same Temperate zone species occurring in distant provinces, these provinces having between them no water communication except through the Torrid or Frigid zone, and offering no ground for the supposition that such a communication has existed during the recent epoch, we are led to deny the agency of voluntary or involuntary migration in producing this dissemination. An example of this, beyond all dispute, is that of the Mediterranean Sea and Japan. No water communication for the passage of species can be imagined. An opening into the Red Sea is the only possible point of intercommunication between the two kingdoms; but this opens into the Torrid zone, in no part of which are the species found. The two regions have their peculiarities and their striking resemblances; and we are forced to attribute them to original creation and not intercommunication.

X. The resemblances found are not merely in the existence of a few identical species. There are genera common to the two seas that occur nowhere else in the Oriental kingdom, as *Latreillia*, *Ephyra*, *Sicyonia*, &c.; and species where not identical have an exceedingly close resemblance.

Now this *resemblance* in genera and species (without exact identity in the latter) is not explained by supposing a possible intercommunication. But we may reasonably account for it on the ground of a similarity in the temperature and other physical conditions of the seas; and the well-known principle of "like causes, like effects" forces itself upon the mind as fully meeting the case. Mere intercommunication could not produce the resemblance; for just this similarity of physical condition would still be necessary. And where such a similarity exists, creative power may multiply analogous species; we should almost say, *must*, for, as species are made for the circumstances in which they are to live, identical circumstances will necessarily imply identity of genera in a given class, and even of specific structure or of subgenera.

If, then, the similarity in the characters of these regions is the occasion of the identity of genera, and of the very close likeness in certain species (so close that an identity is sometimes strongly suspected where not admitted), we must conclude that there is a possibility of actual identity of species, through original creation. This, in fact, becomes the only admissible view, and the actually identical species between Japan and the Mediterranean are examples.

XI. When we find a like resemblance of genera and species between Temperate zone provinces in opposite hemispheres that are almost exact antipodes, as in the case of Great Britain and New Zealand, we have no choice of hypotheses left. We must appeal directly to creative agency for the peopling of the New Zealand seas as well as the British, and see in both, like wisdom, and a like adaptedness of life to physical nature. The *Palæmon affinis* of the New Zealand seas is hardly distinguishable from the common *P. squilla* of Europe, and is one example of this resemblance. It may not be an identity; and on this account it is a still better proof of our principle, because there is no occasion to suspect migration or any other kind of transfer. It is a creation of species in these distant provinces, which are almost identical, owing to the physical resemblances of the seas; and it shows at least, that a very close approximation to identity may be consistent with Divine Wisdom.

The resemblance of the New Zealand and British seas has been remarked upon as extending also to the occurrence in both of the genera *Portunus* and *Cancer*. It is certainly a wonderful fact that New Zealand should have a closer resemblance in its Crustacea to Great Britain, its antipode, than to any other part of the world—a resemblance running parallel, as we cannot fail to observe, with its geographical form, its insular position, and its situation among the temperate regions of the ocean. Under such circumstances, there must be many other more intimate resemblances, among which we may yet distinguish the special cause which led to the planting of peculiar British genera in this antipodal land.

The close resemblance in species and genera from Britain and New Zealand, and from Japan and the Mediterranean, and the actual identity in some species among the latter, proves therefore that, as regards the species of two distant regions, identity as well as resemblance may be attributable to independent creations, these resemblances being in direct accordance with the physical resemblances of the regions. As this conclusion cannot be avoided, we are compelled in all cases to try the hypothesis of migration by considering something beside the mere possibility of its having taken place under certain assumed conditions. The possibility of independent creations is as important a consideration. After all the means of communication between distant provinces have been devised or suggested, the principle still comes up, that it is in accordance with Divine Wisdom, to create similar and identical species in different regions, where the physical circumstances are alike; and we must determine by special and thorough investigation, whether one or the other cause was the actual origin of the distribution in each particular case. Thus it must be with reference to the wide distribution of species in the

Oriental tropics, as well as in the European temperate regions, and the Temperate zone of the South Pacific and Indian Oceans.

XII. With respect to the creation of identical species in distant regions, we would again point to its direct dependence on a near identity of physical condition. Although we cannot admit that circumstances or physical forces have ever created a species (as like can only beget like, and physical force must result simply in physical force), and while we see in all nature the free act of the Divine Being, we may still believe the connexion between the calling into existence of a species and the physical circumstances surrounding it to be as intimate nearly as cause and effect. The Creator has, in infinite skill, adapted each species to its place, and the whole into a system of admirable harmony and perfection. In His wisdom, any difference of physical condition and kind of food at hand, is sufficient to require some modification of the intimate structure of species, and this difference is expressed in the form of the body or members, so as to produce an exactness of adaptation, which we are far from fully perceiving or comprehending with our present knowledge of the relations of species to their habitats.

When therefore we find the same species in regions of unlike physical character, as, for example, in the seas of the Canaries and Great Britain—regions physically so unlike—we have strong reason for attributing the diffusion of the species to migration. The difference between the Mediterranean and Great Britain may require the same conclusion for the species common to these seas. They are so far different, that we doubt whether species *created* independently in the two could have been identical, or even have had that resemblance that exists between varieties; for this resemblance is usually of the most trivial kind, and affects only the least essential of the parts of a species.

The continental species of Crustacea from the interior of different continents, are not in any case known to be identical; and it is well understood that the zoological provinces and districts of the land are of far more limited extent than those of the ocean. The physical differences of the former are far more striking than those of the latter. As we have observed elsewhere, the varieties of climate are greater; the elevation above the sea may vary widely; and numberless are the diversities of soil and its conditions, and the circumstances above and within it. Hence, as the creation of each species has had reference most intimately to each and all of these conditions, as well as to other prospective ends, an identity between distant continental regions is seldom to be found, and the characteristic groups of genera are very widely diverse. Comparatively few genera of Insects have as wide a range as those of Crustacea; and species with rare exceptions, have very narrow limits. Where the range of a species in this class is great, we

should in general look to migration as the cause rather than original creation; but the considerations bearing on both should be attentively studied before either is admitted as the true explanation.

Throughout the warmer tropical oceans, a resemblance in the physical conditions of distant provinces is far more common and more exact than in the Temperate zone. And hence it would seem that we could not safely appeal to actual differences as an argument against the creation of a species in more than one place in the tropics. The species spread over the Oriental Torrid zone may hence be supposed to owe their distribution to independent creations of the same species in different places, as well as to migration. Yet we may in this underrate the exactness of physical identity required in regions for independent creations of the same species. We know that for some chemical compounds, the condition of physical forces for their formation is exceedingly delicate; and much more should we infer that when the creation of a living germ was concerned, a close exactness in the conditions would be required in order that the creation should be repeated in another place. Infinite power, it is true, may create in any place; but the creation will have reference to the forces of matter, the material employed in the creation. The few species common to the Oriental and Occidental torrid seas seem to be evidence on this point. The fact that the Oriental species have so rarely been repeated in the Occidental seas, when the conditions seem to be the same, favors the view that migration has been the main source of the diffusion in the Oriental tropics.

As we descend in the order of Invertebrates, the species are less detailed in structure, with fewer specific parts and greater simplicity of functions, and they therefore admit of a wider range of physical condition; the same argument against multiplication by independent creations in regions for the most part different, does not, therefore, so strongly hold. As we pass, on the contrary, to the highest groups in Zoology, the argument receives far greater weight; and at the same time there are capabilities of migration increasing generally in direct ratio as we ascend, which are calculated to promote the diffusion of species, and remove the necessity of independent creations.

Migration cannot therefore be set aside. It is an actual fact in nature, interfering much with the simplicity which zoological life in its diffusion would otherwise present to us. Where it ends, and where independent creations have taken place, is the great problem for our study. This question has its bearings on all departments of Zoology; but in few has migration had the same extended influence as in that of Crustacea. Molluscs, if we except oceanic species, are no travellers, and keep mostly to narrow limits.

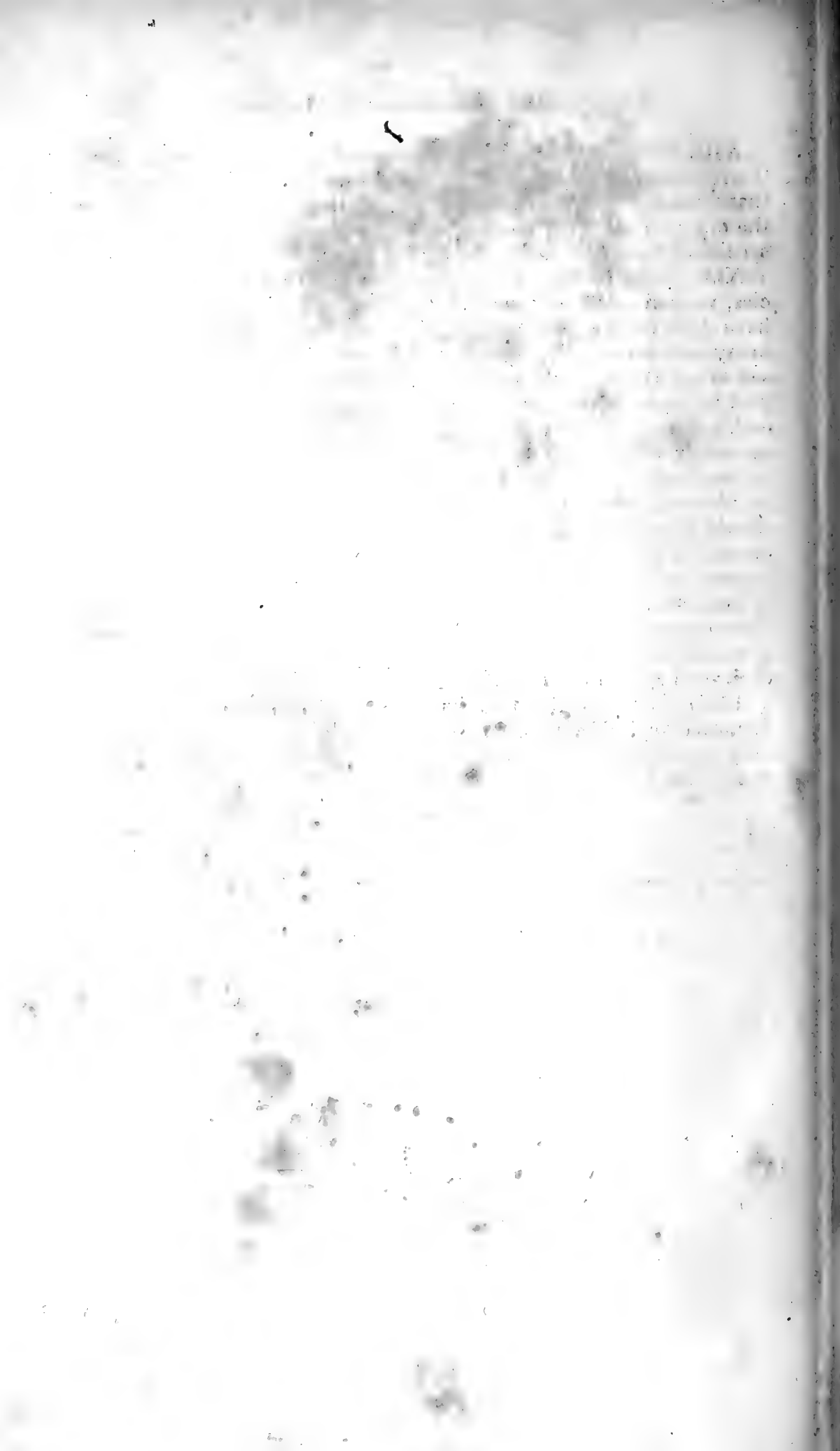


XIII. There is evidence in the exceedingly small number of Torrid zone species identical in the Atlantic and Indian Oceans, that there has been no water communication across from one to the other in the Torrid zone, during the period since existing species of Crustacea were first on the globe.

XIV. As to zoological centres of diffusion for groups of species, we can point out none. Each species of Crustacea may have had its place of origin and single centre of diffusion in many and perhaps the majority of cases. But we have no reason to say that certain regions were without life, and were peopled by migration from specific centres specially selected for this end. If such centres had an existence, there is at present no means by which they may be ascertained. The particular temperature region in which a species originated may be ascertained by observing which is most favorable to its development: we should thus conclude that the *Ranina dentata*, for example, was created in the subtorrid region and not the torrid, as it attains its largest size in the latter. By pursuing this course with reference to each species, we may find some that are especially fitted for almost every different locality. Hence, we might show, as far as reason and observation can do it, that all regions have had their own special creations.

The world throughout all its epochs in past history, has been furnished with life in accordance with the times and seasons, each species being adapted to its age, its place, and its fellow species of life.\*

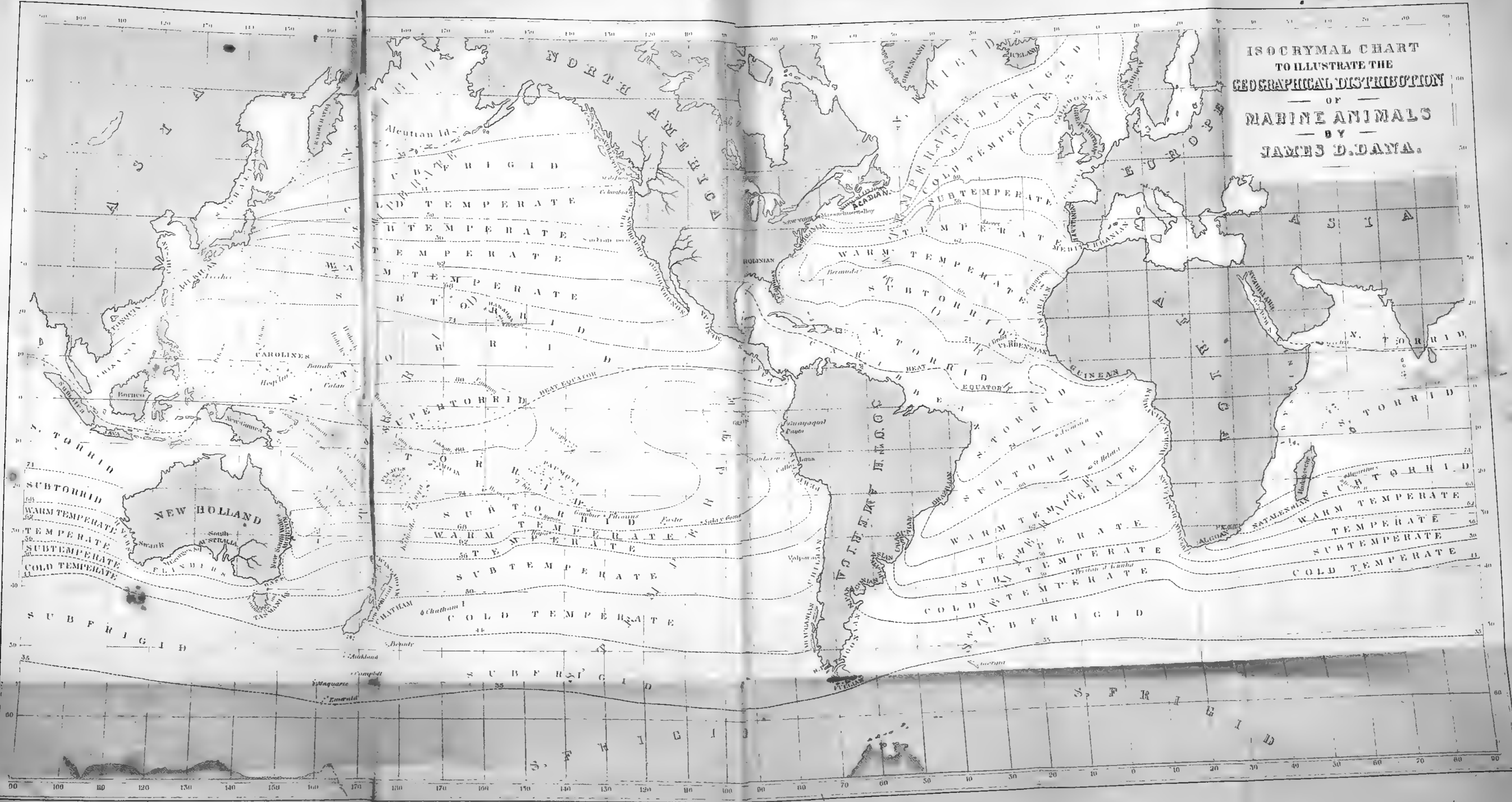
\* The abstracts in the American Journal of Science from the author's Report, relating to the Geographical Distribution of Crustacea, which are here concluded, are contained in volumes xvi, xviii, xix and xx. The map illustrating the subject of Oceanic temperature, the Zones and Zoological Provinces, is in volume xvi.



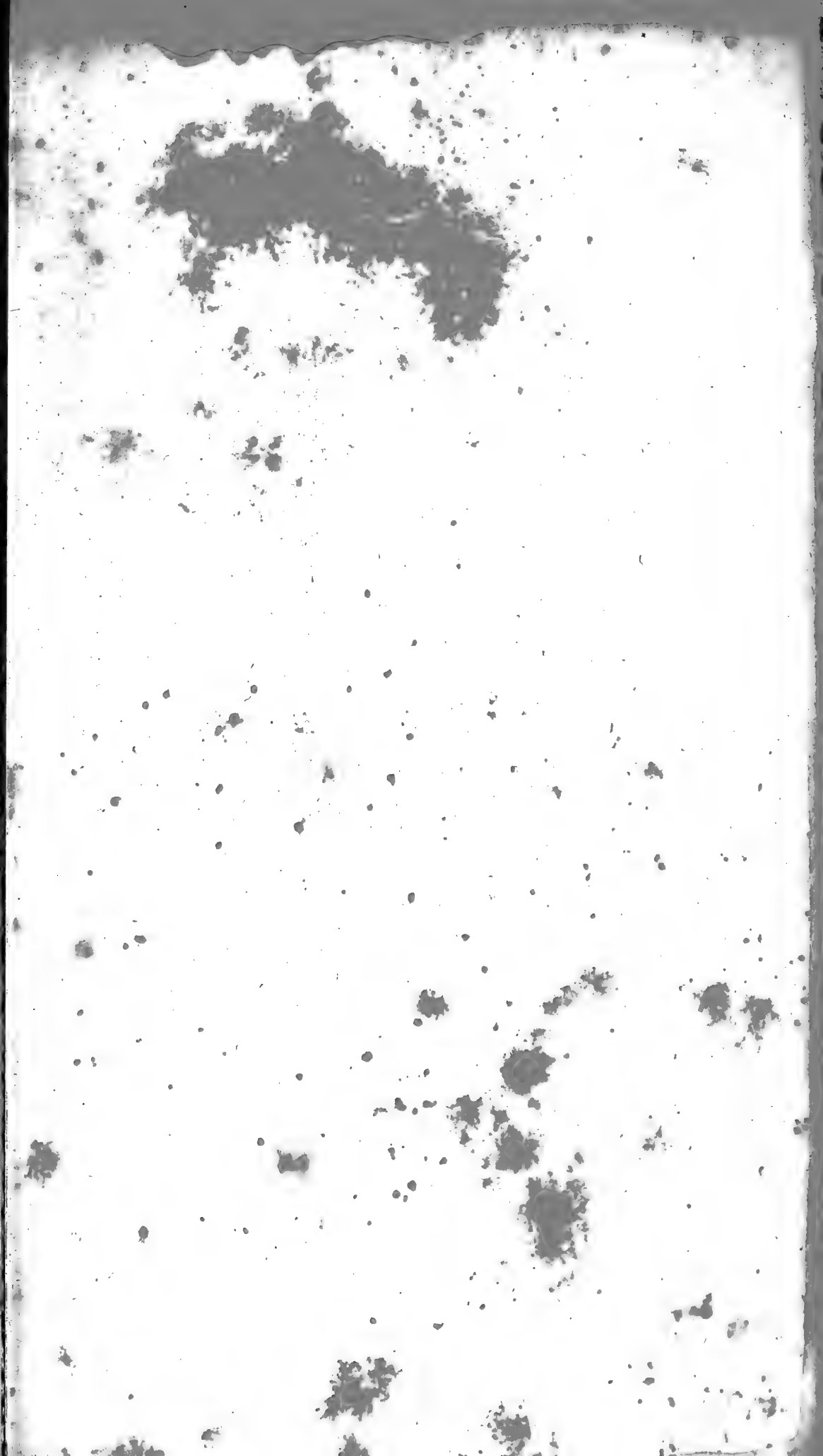




ISOCRYMAL CHART  
TO ILLUSTRATE THE  
GEOGRAPHICAL DISTRIBUTION  
— OF —  
MARINE ANIMALS  
— BY —  
JAMES D. DAYA.



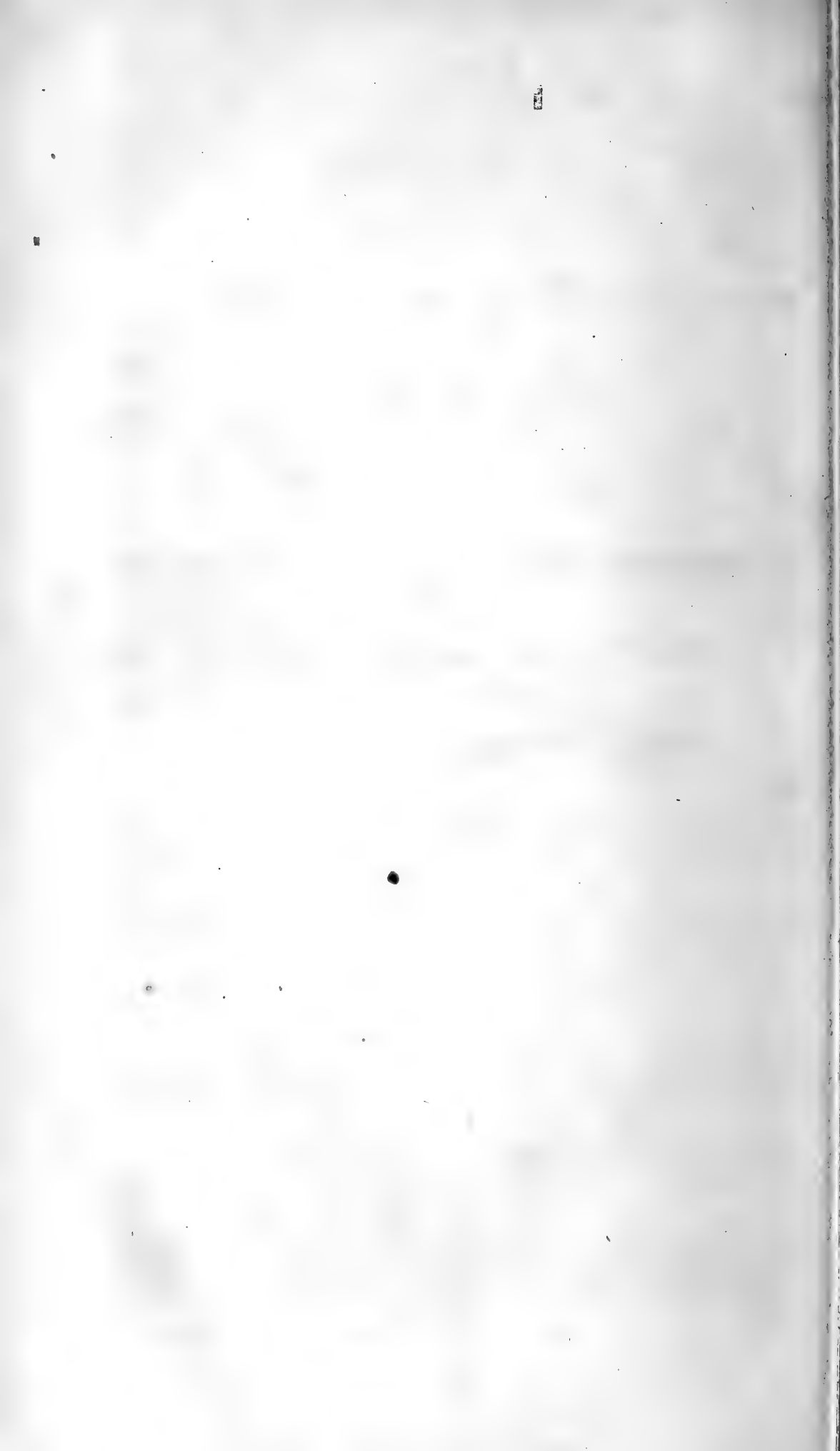








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A REVIEW  
OF THE  
CLASSIFICATION OF CRUSTACEA

WITH REFERENCE TO  
CERTAIN PRINCIPLES OF CLASSIFICATION.

BY JAMES D. DANA.

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[*Extracted from the American Journal of Science and Arts, 2nd Series, Vol. XXII,  
July, 1856.*]

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## REVIEW, & c.

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THE class Crustacea exhibits a clearness of outline in its types, and a display of relations, transitions, and distinctions, among its several groups, exceeding any other department of the animal kingdom. This fact arises from the very great range in structure occupied by the species. The limits in size exceed those of any other class, exclusive of the Radiata; the length varying from nearly two feet to a small fraction of a line, the largest exceeding the smallest lineally more than a thousand-fold. In the structure of the limbs, the diversity is most surprising, for even the jaws of one division may be the only legs of another; the number of pairs of legs may vary from fifty to one, or none. The antennæ may be either simple organs of sense or organs of locomotion and prehension; and the joints of the body may be widely various in number and form. In the branchial and the internal systems of structure, the variety is equally remarkable; for there may be large branchiæ, or none; a heart, or none; a system of distinct arterial vessels, or none; a pair of large liver glands, or but rudiments of them; a series of ganglions in the nervous cord, or but one ganglion for the whole body.

Taking even a single natural group, the Decapods;—the abdomen may be very small, without appendages, and flexed beneath the broad cephalothorax out of view, or it may be far the larger part of the body, and furnished with several pairs of large natatory appendages;—the inner antennæ may be very small, and retractile into fissures fitted to receive them, or they may be very long organs, constantly thrown forward of the head; and descending but a single step, we come to species of Decapoda without proper branchiæ, some having the abdominal legs furnished with branchial appendages, and others with no abdominal members at all.

When we consider, that these diversities occur in a class that may not embrace in all over ten thousand species (not half of which are now known), we then comprehend the wide diversity in the distinctions that exist. The series of species followed through, gives us an enlarged view of those distinctive characteristics upon which the limits and relations of groups depend. The network of affiliations, it is true, is like that in other departments; but it is more magnified to the view.

Moreover, the distinctions are obviously distinctions of rank. There is no ambiguity as to which is the higher or superior group, as among Insects. The variations are manifestly variations in grade, and we may readily trace out the several steps

of gradation, as we descend from the highest Brachyura to the lowest Lernæa. And while we so readily distinguish these gradations, we as plainly see that they are not steps of progress followed by nature in the production of species; but, simply successive levels (grades of types), upon which species have been multiplied.

We, therefore, may consider the class Crustacea as especially well adapted for instruction in some of the higher principles of classification in Zoology; and, if we mistake not, laws may be educed which have not hitherto taken form in science. These have already been partially alluded to in the previous pages of this Report. But we here bring together the facts in a connected view, in order to state the principles more definitely, and exhibit the full extent of their bearing. We leave out, however, a large part of the details, which may be found elsewhere in the work.

The fundamental idea, which we shall find at the basis of the various distinctions of structure among the species is, the *higher centralization of the superior grades, and the less concentrated central forces of the inferior*,—a principle which has been applied to the animal kingdom in some of its larger subdivisions, but which has not been followed out into all the details of structure exemplified among Crustacea.

This centralization is literally a *cephalization* of the forces. In the higher groups, the larger part of the whole structure is centred in the head, and contributes to head functions, that is, the functions of the senses and those of the mouth. As we descend, the head loses one part after another, and with every loss of this kind, there is a step down in rank. This centralization may be looked for in the nervous cords; but the facts are less intelligibly studied there, than in the members, the production and position of which measure the condition of the forces:—just as we can better measure the forces of a galvanic battery by the work done, than by the size or external appearance of the plates which constitute it.

In the Crustacea type, there are normally twenty-one segments to the body, and correspondingly twenty-one pairs of members,—as laid down by Milne Edwards,—the last seven of which pertain to the abdomen, and the first fourteen to the cephalothorax. Now, we may gather from an examination of the crab, or Macroural Decapod, acknowledged to be first in rank, what condition of the system is connected with the highest centralization in Crustacea.

In these highest species, *nine* segments and *nine* pairs of appendages out of the *fourteen* cephalothoracic, belong to the senses and mouth, and only *five* pairs are for locomotion. Of these *nine*, three are organs of senses, six are the mandibles and

maxillæ. Moreover, these organs are clustered into the smallest possible space, so that the six pairs of mouth organs hardly occupy more room than the first pair of legs. The organs are all small, the antennæ exceedingly short, the maxillæ small lamellar organs sparingly jointed. The vegetative powers of growth have had but little play. The inner antennæ are rather large as regards the basal joint, which is devoted to one of the senses, but the rest is nearly rudimentary, and the whole is snugly boxed away, to be extruded at the will of the animal. The exterior maxillæ (or outer maxillipeds) cover exactly the other pairs, and shut closely down over the mouth, like a well-fitting operculum to the buccal area.

We hence learn, that the condition of highest centralization in Crustacea, is where the cephalic part embraces the largest portion of the normal structure of the cephalothorax, and the whole is contracted within the smallest compass, with the least vegetative growth or elongation of the parts. The forces are concentrated in the more perfectly developed senses and the higher functions of the animal—not in giving size to the organs of the senses, but acuteness to the sensorial function. The perfection of the senses is evinced by the small antennæ; for we infer therefrom, not only that the organ is exclusively an organ of sense, but also, that the delicacy of the sense itself is such, as not to require a long-jointed appendage to aid the function.

This *cephalization* of the animal is farther observed in the structure of the rest of the thorax and the abdomen. The abdomen, in the first place, is reduced to its minimum size. Vegetative elongation is here cut short, as in the anterior part of the animal; and the sphere of growth has a narrow limit, owing to the very intensity of its concentration; and we find that the limit widens as the intensity diminishes.

Again: the central power is indicated by the fact, that the first pair of legs is the strong pair; being properly hands, they contribute especially to the higher functions, that is, the support of the living animal, through their strength and powers of prehension, and not like the following, to locomotion. Thus, as we pass from the centre, the organs are of more and more humble function.

This *centre*, as we have observed in another place, is properly between the second antennæ and mandibles. The second antennæ and the rudimentary mouth, are among the first parts that appear in the embryo. If we look at it as a centre of force or of growth, we remark that the radii on opposite sides of this centre, before and behind, are very unequal, the latter being six or eight times as long as the former,—a relation which is the inverse of the functional importance of the parts pertaining to each.

Our idea of the condition of highest centralization is thus drawn from a study of the species.

The most perfect state of it is seen in the *Maia* group, (the triangular crabs,) in which the bases of the antennæ and eyes are crowded into the narrowest possible compass, and the mouth organs are well compacted within the buccal area, and the legs and whole system have the highest completeness.

The form of the body of a *Maia* is a somewhat flattened ovoid, narrowest in front; and the middle point between the mouth and the second antennæ, which we call the potential centre of the animal, is situated near the front, say about half an inch from the front outline (excluding the beak), supposing the cephalothorax three inches long. We may call the part anterior to this centre, A; the part posterior, B; and the length of the former, measured on the axis,  $a$ ; of the latter,  $b$ . These parts may be viewed, as regards development, as potentially equal; and yet the anterior, A, is six times shorter and as much narrower and lower than the following. It would not, therefore, be far out of the way to say, in mathematical language, that the functional importance of the two parts varies inversely as the cubic contents of the parts.

We pass now to the degradations from this, the highest type.

These degradations are seen—

*First*, in a widening of the space between the antennæ.

*Second*, in a slight enlargement of the outer maxillipeds, so that they do not fit snugly over the buccal area.

*Third*, in an elongation of the antennæ.

These are all evidences of a slight relaxing of the concentrating element. The *first*, marks the transition of the *Maia* group to the Parthenopidæ, and thence to the Cancridæ. The *second*, carries the grade a step lower, to species of the old genus *Cancer*, also to the swimming crabs and the *Corystoids*; and the *third*, marks off the *Corystoids* as the lowest of the true *Brachyura*.

While there are such marks of degradation exhibited through the growth or elongation of parts, there is also a mark, equally significant, in the obsolescence of the posterior thoracic legs, a peculiarity of many *Grapsoids*. In the *Maioids*, the species are well balanced; the type is perfect in its development; the sustaining of the central functions allows of the full and complete growth of all the other parts. But the diminution of force may not only be attended with a loosening of the cephalic hold on the remoter of the cephalic organs, but also, in a failure in the production of the posterior organs of the body, or those on the outer limits of the system: and this is what happens in many *Grapsoids*. The swimming form of the legs in *Lupa* and allied species is a similar mark of inferiority.

Besides the above evidences of degradation, there are still others in the *Brachyural* structure, which act conjointly with

the preceding, producing lower grades of species. They are all marks of a relaxation of the centralization.

*Fourth.* An enlargement or widening of the sternum and abdomen.

*Fifth.* The abdomen becoming somewhat relaxed from the venter instead of remaining close-appressed to it.

*Sixth.* The vulvæ becoming more remote from one another, being situated in the bases of the third pair of legs, instead of the sternum.

*Seventh.* The inner antennæ losing their fossettes, and being constantly exsert.

*Eighth.* The branchiæ being more than nine in number on either side.

The first of these peculiarities distinguishes many of the Grapsoids, as well as lower species. The second is observed in the Corystoids, and is an additional mark of their inferior grade. The third occurs in *Dromia* and allied. The fourth, in *Latreillia*. The fifth, in *Dromia*. *Dromia* and *Latreillia* have the posterior legs abbreviated, and in *Dromia*, this evidence of degradation is still stronger, in that the fourth as well as fifth pair is short and dorsal.

The last three characteristics, above mentioned, mark a transition towards the Macroural type, and the genera of this kind belong with the Anomoura. This transition is seen further in—

*Ninth.* The eyes being without fossettes.

*Tenth.* The second pair of antennæ becoming exterior to the eyes.

*Eleventh.* The outer maxillipeds more enlarged and subpediform.

*Twelfth.* The abdomen more lax and furnished with a pair of caudal appendages.

*Thirteenth.* The abdomen more elongated, and hardly inflexed.

These several changes exhibit a continuation of the process of relaxation in the central forces. There is thereby an enlargement of the antennæ, and their more remote position at the anterior extremity of the animal; and also, an enlargement of the posterior or abdominal parts of the animal, and a development of appendages in the posterior direction. These marks of degradation, excepting the thirteenth, are found in the Hippa and Porcellana groups, and the thirteenth in the Paguridea. At the same time that these Macroural characteristics appear, the body becomes elongated. The species all bear a stamp of imperfection in the abbreviated posterior legs, as explained above, as well as in the other points alluded to. The subordination of the nine anterior annuli to cephalic functions, which is so striking in the Maioids, has become less and less complete, and the organs less perfect; moreover, the habits of the animals are more sluggish,



and they are less fitted for self-preservation. The large *Dromia* picks up a waste shell, and by means of its hind legs, lifts it over its body for protection, and the *Pagurus* finds shelter in the water-worn univalves of a coast.

The degradation pointed out, is hence, not merely a variation in the position and size of certain organs, but an actual deterioration in rank and intelligence.

Other minor points exhibiting difference of grade, might be mentioned: but they have already been subjects of remark. We state here only one—the character of the fingers of the large hands. In the higher species, these fingers are pointed; in a grade below, in some groups, they have a spoon-like extremity. This excavate form is often more perfect in young individuals than in adults, which is one evidence that it is in fact proof of inferiority. By this mark we learn that the *Chlorodinae* are of lower grade than the *Xanthinae*; the *Paguri*, than the *Bernhardi*; the *Mithracidae*, than the *Maiadae*, etc.

Let us now pass to the *Macroura*. In the typical Macroural species, the antennæ, instead of being minute, with the inner retractile, are long exsert organs, and the outer have a large plate as an appendage at base; the eyes are without sockets; the outer maxillipeds are pediform, and do not closely cover the outer mouth organs; the abdomen is often longer than the rest of the body, and has its six regular pairs of appendages. All these points show a still further relaxing of the centralization or cephalization of the species. There is an elongation of the parts anterior to the mouth, and also of those posterior, and this elongation of the two extremities is approximately proportional to the relative dimensions of the corresponding parts in the *Brachyura*. If we were to draw out an ovoid with the relative length and breadth of a Macroural cephalothorax, and place its focus so as to correspond with the position of the posterior margin of the epistome, in a manner like that proposed for the *Maia* among *Brachyura*, the ovoid for the *Macroura* would be very narrow, and the focus or centre proportionally farther from the front than in the *Brachyura*.

In following down the degradation of the *Brachyura* to the *Anomoura*, we have found the posterior legs becoming abbreviated, and the whole structure in its aspect imperfect. But, in the typical *Macroura*, there is nothing of this seeming imperfection. The legs are all fully formed; the animals are exceedingly quick in their motion, instead of being sluggish; and every organ is apparently in its most perfect state for the uses of the system to which it is tributary. We should, therefore, understand, that the process of degradation, alluded to above, is not one actually passed through in the system of creation; for by its progress we should never reach the Macroural structure;

nor, in the reverse order, should we from the Macroura reach the Brachyural structure. In the remarks above, we speak only of the comparative actual conditions of the species as regards centralization.

The Macroura and Brachyura belong to independent yet correlated and subordinate types of structure, each perfect in itself, and admitting of wide modifications, and having its own system of degradations. We add a few words on these degradations among the Macroura. We have seen that, in the Brachyura, the powerful prehensile legs are those of the *first pair*, these acting for the collection of food, and so contributing to the mouth. In the Macroura, there are species of high rank that have the anterior legs strong-handed, like the Macroura. There are others, in which the second or third pair is the strong-handed pair; others having all the legs weak appendages, with only rudimentary hands or none. The several marks of degradation are as follows:—

*First.* The outer maxillipeds pediform.

*Second.* The maxillipeds next anterior pediform.

*Third.* Second pair of legs cheliform and stouter than the first.

*Fourth.* The third pair of legs cheliform and stouter than either of the preceding.

Thus as we descend, we find one and even two pairs of mouth appendages beginning to pass from the mouth series to the foot series, and the cephalic portion is thus losing its appendages and high centralized character. Moreover, the power belonging to the first pair of legs in the higher species is transferred to the second pair of legs, as in the Palæmons; or, to the third pair, as in the Penæidæ; indicating a further decrease of that centralization so remarkable in the Brachyura. Still lower among the species, as in the Sergestidæ, all the legs are weak, and the posterior pair may be short or obsolete,—the same deterioration that occurs in the lower Brachyura.

As we descend farther, there is an increased obsolescence of organs, and every step is one of marked imperfection as well as degradation.

*Fifth.* The branchiæ become external and small.

*Sixth.* The branchiæ become wholly wanting, or part of the abdominal appendages.

*Seventh.* The last two pairs of thoracic legs become obsolete.

*Eighth.* The abdominal appendages become obsolete.

*Ninth.* The eyes and antennæ have separate segments, and the abdomen is very long and large.

The fifth point of degradation is seen in the *Euphausidæ*; the sixth, in the *Mysidæ* and other Anomobranchiates; the seventh is found in several genera of the same group; the eighth in certain *Mysidæ*. The Anomobranchiates are thus degraded Ma-

croura. There is not merely a relaxing of the centralization; but the forces are so weakened as not to succeed in finishing out the members in the system of structure to which they pertain. The species consequently are not modifications upon the level of the Macroural type, nor upon a distinct level or distinct type; but simply imperfect developments of the Macroural structure below the true level of that type. They bear nearly the same relation to the Macroura, that the Anomoura bear to the Brachyura. The *ninth* step is seen in the Squilloidea, whose relaxation of system and elongation in the cephalic part, as well as abdomen are remarkable.

The continuation of the line of degradation represented in the Anomoura, is not to be found, as we have remarked, among the typical Macroura. But the structure of the Paguri may be traced into the aberrant Macroura, called *Thalassinidea*; and thence, both in the abdomen, the legs, and the branchiæ, we observe a transition to the Squilloids, one division of the Anomobranchiates. If then, we were to trace out the lines of affinity in the species, it would be from the Mysis group to the typical Macroura, and from the Squilla group to the *Thalassinidea*, as elsewhere explained. From the latter, the lines lead mainly to the Anomoura and higher species.

In our review, thus far, we recognise one only of the *primary* types of structure among Crustacea. This primary type is characterized by having *nine* normal annuli or segments devoted to the senses and mouth, that is, to the cephalic portion of the body. It includes *two*, or, we perhaps may say, *three* secondary types. The first of these secondary types is the Brachyural; it has the antennæ small, the inner pair in fossettes, the abdomen without appendages. In the other type (or other two, if so considered), the antennæ are elongated, and both pairs free, the abdomen is elongated, and furnished with a series of appendages. This, the second type, is the Macroural; or, if we assume that it embraces two distinct types (a second and third), the two correspond to the typical Macroura and the *Thalassinidea*.

Each secondary type embraces types of more subordinate character, which it is unnecessary here to dwell upon.

There is a tendency in the lowest Macroural species to a transfer of the two posterior mouth appendages to the foot series, so as to leave but seven cephalic annuli; but it is only a modification of the primary type, as the species have every mark of being degraded or imperfect forms, and are not examples of a new type.

In this primary type, the species vary in length from half an inch to twenty inches. Two inches may be set down as the average length and breadth for the Brachyura; while three inches is the average length of the Macroura, the average breadth being half an inch or less.

The *second primary type* among Crustacea is as well defined in its limits, and as distinct in its characters as the first. Instead of having *nine* annuli devoted to the senses and mouth, there are but *seven*, the mouth, including a pair of mandibles, two pairs of maxillæ, and one of maxillipeds. The number is permanent and characteristic. There are, consequently, seven pairs of legs in these species, instead of five, the Decapod number; and the species have been appropriately styled the *Tetradecapoda*. Instead of exhibiting any appearance of imperfection, or any obsolescent organs, like those lower Macroura that show a transition to a fourteen-footed structure, the organs are all complete, and the whole structure is perfect in symmetry and unique in character. They have not a Macroural characteristic. The eyes are not pedicellate; there is no carapax, but a body divided into as many segments as there are legs (whence our name *Choristopoda*); the antennæ, legs, and the whole internal structure are distinct in type. The branchiæ are simple sacs, either thoracic or abdominal.

We have, therefore, in the Tetradecapods an expression of that structure of body, and that size, which belongs to a system, in which but seven annuli or segments are concentrated in the cephalic portion of the structure. The structure is far inferior to the Decapodan. The size rarely exceeds two inches, though in extreme cases three to four inches; and probably *half an inch* is the average length. The contrast between the first and second of the primary types, is therefore as distinct in the average size of their structures, as in their actual grade or rank.

Superior rank among the Tetradecapods may be distinguished by some of the same points as in the Decapods. The short antennæ, short compact bodies, and abbreviated abdomen of the Isopods, are proofs of their superiority of grade. The abdominal appendages are simply branchial, and in the higher species are naked or non-ciliated lamellæ. The transitions to a lower grade are seen in the elongation of these abdominal lamellæ, their becoming ciliated, and the abdomen being also more elongated and flexible; then in the abdominal lamellæ becoming elongated natatory appendages, and the abdomen taking a length usually not less than that of the thorax, as in the Amphipods, in which the branchiæ are appendages to the thoracic legs. And while this elongation goes on posteriorly, there is also anteriorly an enlargement of the antennæ, which in the Amphipoda are usually long organs. There are thus two secondary types of structure among the Tetradecapods, as among the Decapods; a transition group between, analogous to the Anomoura, partakes of some of the characters of both types, without being a distinct type itself. These are our Anisopoda. The species graduate from the Isopod degree of perfection to the Bopyri, the lowest

of the Tetradeapods. There is thus another analogy between this group and the Anomoura.

The Trilobita probably belong with this second type, rather than the Entomostracan. Yet they show an aberrant character in two important points. First, the segments of the body are multiplied much beyond the normal number, as in the Phyllopoda among the Entomostraca; and Agassiz has remarked upon this as evidence of that larval analogy which characterizes in many cases the earlier forms of animal life. In the second place, the size of the body far transcends the ordinary Isopodan limit. This might be considered a mark of superiority; but it is more probably the reverse. It is an enlargement beyond the normal and most effective size, due to the same principle of vegetative growth, which accords with the inordinate multiplication of segments in the body.

The *third primary type* (the Entomostracan) includes a much wider variety of structure than either of the preceding, and is less persistent in its characteristics. It is, however, more remote in habit from the Tetradeapods, than from the lowest Decapods, and is properly a distinct group. Unlike the Decapods and Tetradeapods, there are normally but *six* annuli devoted to the senses and mouth in the highest of the species, and but *five* in others, the mouth including a pair of mandibles, and either one or two pairs of maxillæ (or maxillipeds). This is an abrupt step below the Tetradeapods. We exclude from these mouth organs the prehensile legs, called maxillipeds by some authors, as they are not more entitled to the name than the prehensile legs in Tanais, and many other Tetradeapods. There is an exception to the general principle in a few species. A genus of Cyproids has three pairs of maxillæ; but this may be viewed as an example of the variations which the type admits of, rather than as an essential feature of it,—possibly a result of the process of obsolescence which marks a low grade, as in the Mysidæ, whose abdomen by losing its appendages, approximates in this respect to the Brachyural structure, though, in fact, far enough remote.

The species of the Entomostracan type show their inferiority to either of the preceding in the absence of a series of abdominal appendages, and also in having the appendages of the eighth, ninth, tenth, and eleventh normal rings, when present, natatory in form.

The range of size is very great,—and this is a mark of their low grade, for in this respect they approach the Radiata, whose limits of size are remarkably wide. Nearly all of the species, and those which, by their activity, show that they possess the typical structure in its highest perfection, are minute, not averaging over a line in length, or perhaps more nearly three-fourths of a line.

Taking this as the true expression of the mean normal size of the type, the three primary types will vary in this respect as 24 (two inches) : 6 : 1.

The size in this third type, reaches its maximum in the Limuli ; and these are unwieldy species, whose very habits show that vegetative growth has given them a body beyond the successful control of its weak system, that is, a larger frame than it has power to wield with convenience, or defend, for it is at the mercy even of the waves upon a beach.

This type has its highest representatives among the Cyclopoids, which remind us of the Mysis group of the higher Crustacea. In these, the cephalic part includes *six* out of the fourteen cephalothoracic annuli. In the Daphnioids and the Caligoids, they include only *five*. In *Limulus*, only the first *four* can properly be counted as of the cephalic series. In many other Entomostraca, the mouth organs are nearly as perfect legs as in *Limulus*, and the species although evidently of a low grade, cannot properly be removed from the group. *Limulus* has its nearest ally in *Apus*, although this genus has the mouth organs of a *Daphnia*.

The lowest species of the type are the Lernæoids.

A *fourth primary type* includes the Cirripeds. It is of the same rank as regards cephalization as the Entomostraca ; yet, it has so many peculiarities of structure, that it should be regarded as a distinct type rather than a subordinate division of the *third* type.

The mean size of the species of this group is much greater than the same among the higher Entomostraca. But if we regard the young in its active Cypris state, and compare it with the corresponding condition of species of Cyroids, we shall discover that the species have, in fact, an abnormal growth ; a growth which takes place at the expense of the powers of motion or action in the individuals. The body, when it commences a sedentary life, increases in magnitude far beyond the Cypris or *Daphnia* size ; and there is a corresponding loss of *power*. The same force will not move a heavy structure, that is sufficient for the tiny model ; and when the model is enlarged without a corresponding increase in the seat of power, sluggish motion is the necessary consequence. Thus it is with the Medusæ. Individuals of the minuter species, or the larger species when in the young state, are gifted with active powers of motion ; the structure conforms to the forces within : but as the species enlarge, they become slow in movement, or lose almost every attribute of life. The same principle is illustrated again in the Bopyri. The male is a small active animal, related to *Jæra* and *Tanais*. The female, of sedentary habits, becomes grossly enlarged and corpulent, so as to exceed by twenty-fold lineally the length of the male, and nearly ten thousand times its bulk. It is manifest, that the nervous system, or motive power of the female, is abso-

lutely no greater than that of the male; and consequently, the capabilities of locomotion will be ten thousand times less, or the female will move but a ten-thousandth of an inch at the most, while the male is moving one inch, a fact with regard to them, as any one is aware of who has seen the incapability of the female to make any progress by locomotion. This then, is an example beyond dispute, of a system overgrown through the vegetative process, so as to be too much for the motive energies within. The Lernæoids afford a similar illustration of this principle.

For the same reason, therefore, as in the Bopyri, the Medusæ, the Lernæoids, and the Limuli, we cannot compare the actual mean size of the adult Cirripeds, with those of the other primary types. We should rather infer the mean normal size for such a comparison, from the size of the young before it becomes sedentary, or from that of free males, if such exist. Such males are announced by Darwin, as actually occurring in some species. Moreover, they are very minute, varying from a line to half a line or less in length. This, therefore, is some reason for taking as the mean normal size, the same as given for the Entomostraca,

A *fifth primary type* includes the ROTATORIA. In these animalcular species, the mouth includes a pair of mandibles and often a rudimentary pair of maxillæ; and consequently, the cephalic portion may contain the same number of annuli as in the Daphnia group, with which group many of them have near relations. They have usually an articulated abdomen, furcate at extremity, like the Cyclopoids. The grand point of inferiority to the Entomostraca, evincing the more infinitesimal character of the system of life within, is the absence of all thoracic appendages or legs. The organs of locomotion are simply ciliæ arranged about the head; and it is quite probable that two sets (or more) of them correspond to the second pair of antennæ, as these are organs of prehension and motion in many Entomostraca. In Callidina, there are two sets, some distance from the extremity of the head, which may have this relation; and the two sets in the true Rotifers may also be of this character. In others, the corresponding parts are actually somewhat elongated.

The species vary in size from a line to a sixtieth of a line. Probably *one-sixth* of a line is the average size.

The actual relation of the Rotatoria to the Entomostraca (which view the author sustained in his Report on Zoophytes (1845)), can hardly be doubted by those who have the requisite knowledge of the lower Crustacea for comparison. The structure of the body, the jointing and form of the abdomen, when it exists, the mandibles, and alimentary system, the eyes when present,—all are Crustacean; and a slight transformation of some Entomostraca—an obliteration of the legs and substitution of locomotive ciliæ—would almost turn them into Rotatoria.

In the classification which has been developed, we have made out *five* primary types of structure among Crustacea. A grand distinction has been shown to consist in the different degrees of cephalization of the normal Crustacean structure. The consecration of *nine* annuli, out of the fourteen cephalothoracic, to the senses and mouth, distinguishes the highest type; of *seven*, the second type; of *six* or *five*, the third and fourth; of *five* or *four*, the fifth. In connexion with other distinctions in these types, we find that they correspond to structures of different size, the size being directly related to the grade. These particulars may be tabulated as follows:—

	Typical number of cephalic annuli.	Mean normal length, in twelfths of inches or lines.
Type I. PODOPTHALMIA } Subtype I. Brachyura, } or DECAPODA, } II. Macroura, }	9	{ 24 (and breadth, 24). 36 (and breadth, 6).
Type II. TETRADECAPODA, - - - - -	7	6
Type III. ENTOMOSTRACA, - - - - -	6-5	1
Type IV. CIRRIPIEDIA, - - - - -	6-5	1
Type V. ROTATORIA, - - - - -	5-4	$\frac{1}{6}$

The first type is alone in having true thoracic branchiæ, and pedicellate eyes.

The second type has branchial sac-like appendages, either abdominal or thoracic, and sessile eyes.

The third type has generally no branchiæ, the surface of some part or all of the body serving for aeration. A few species, however, are furnished with special organs for this function. This is, however, no mark of superiority in such species, for they occur even in the Limuli, among the lowest of the Entomostraca. The necessity of them in this case arises from the abnormal size of the species, both the mark and occasion of its inferiority; for the system is thus too large for the mode of surface aeration, found among ordinary Entomostraca; moreover, the shell, which so large an animal possesses and requires for the attachment of its muscles and its movements, is thick and firm, and this is inconsistent with aeration by the exterior surface of the body. The same remarks apply to the liver glands, which are very small or wanting in the small species.

The third and fourth types show their inferiority to the second, by the absence of a series of abdominal appendages; and the fifth a lower state still, in the absence of both thoracic and abdominal legs. The more degraded Macroura (certain Mysidæ) show a transition in this obsolescence of abdominal organs to the third type.

Some of the conclusions from these facts are the following.

I. Each type corresponds to a certain system of force more or less centralized in the organism, and is an expression of that force,—the higher degree being such as is fitted for the higher



structures developed, the lower such as is fitted for structures of inferior grade and size. In other words, the life-system is of different orders for the different types, and the structures formed exhibit the extent of their spheres of action, being such as are adapted to use the force most effectively, in accordance with the end of the species.

II. In a given type, as the first, for example, the same system may be of different dimensions, adapted to structures of different sizes. But the size in either direction for structures of efficient action is limited. To pass these limits, a life-system of another order is required. The Macroura, as they diminish in size, finally pass this limit, and the organisms (*Mysidæ*, for example) are no longer perfect in their members; an obsolescence of some parts begins to take place, and species of this small size are actually complete only when provided with the structure of a Tetradecapod.

The extreme size of structure admitting of the highest efficient activity is generally three to six times lineally the average or mean typical size. Of these gigantic species, three or four times longer than the mean type, there are examples among the *Brachyura* and *Macroura*, which have all the highest attributes of the species. There are also *Amphipoda* and *Isopoda* three inches in length, with full vigorous powers. Among *Entomostraca*, the *Calanidæ*, apparently the highest group, include species that are three lines long, or three times the length of the mean type.

III. But the limit of efficient activity may be passed; and when so it is attended with a loss of active powers. The structure, as in the female *Bopyrus* and *Lernæoids*, and the *Cirripeds*, outgrows vegetatively the proper sphere of action of the system of force within. This result is especially found in sedentary species, as we have exemplified in our remarks on the *Cirripeds*.

IV. Size is, therefore, an important element in the system of animal structures. As size diminishes, in all departments of animal life, the structure changes. To the human structure there is a limit; to the quadrupeds also, beyond which the structure is an impossibility; and the same seems to be the case among *Crustacea*. The *Decapod*, as the size diminishes, reaches the lowest limit; and then, to continue the range of size in species, another structure, the *Tetradecapodan*, is instituted; and as this last has also its limit, the *Entomostracan* is introduced to continue the gradation; and, as these end, the *Rotatoria* begin. Thus *Crustacea* are made to embrace species, from a length of nearly two feet (or two hundred and fifty lines) to that of a one-hundred-and-fiftieth of a line. These several types of structure among *Crustacea* do not graduate, as regards size, directly from one to another, but they constitute overlapping lines, as has been sufficiently shown.

V. In the opposite extreme of organic beings, the vegetable kingdom, the same principle is illustrated. Plants may be so minute as to have free motion and activity, as in animals. The spores of certain Algæ are known to have powers of locomotion, and some so-called Infusoria, are now admitted to belong to the vegetable kingdom. These are examples of locomotive plants. Now, ordinary plants, like Cirripeds, are examples of sedentary species, that have outgrown the limits of activity. The life-system of a plant, is in fact sufficient in power to give locomotion only to the minute plant-individuals alluded to; and infusorial species of plants retain it, as long as they live. But when, as in the Algæ, vegetative growth proceeds in the enlargement of the minute infusorial spore, it immediately outgrows its activity, and becomes a sedentary plant. In most other plants, the seed have never the minute size which admits of motion.

The mean size of the Entomostracan type was stated to be *one line*; of the Rotatorial type, *one-sixth* of a line; and we may add, that the mean size of the Plant type—understanding by this, as in other cases, the mean size admitting of the highest activity—if deduced from the size of plant-infusoria, would be about one-sixtieth of a line.

We observe, that the smallest size of the perfect Macrourea (first type) is very nearly the mean size as to length of the animals of the second type. So also, the smallest size of the perfect animal of the second type (Tetradecapoda) is very nearly the mean size of the most perfect animals of the third type; and the smallest size of the perfect animal of the third type is nearly the largest size in the fifth type.

In order to compare allied animals of different sizes, it should be noted, that while there is some foundation for the conclusion, that under certain limitations, size is a mark of grade, rapidity of movement or action should also be considered; and the more proper comparison would be between multiples of size and activity. This deduction, is, however, true only in the most general sense, and rather between species of allied groups than those of different types. We may occasionally find something like an exemplification of the law among bipeds, ludicrous though the idea may be.

VI. We observe with regard to the passage in Crustacea to inferior grades under a given type, that there are two methods by which it takes place.

1. A diminution of centralization, leading to an enlargement of the circumference or sphere of growth at the expense of concentration, as in the elongation of the antennæ and a transfer of the maxillipeds to the foot series, the elongation of the abdomen and abdominal appendages, etc.

2. A diminution of force as compared with the size of the structure, leading to an abbreviation or obsolescence of some circumferential organs, as the posterior thoracic legs or anterior antennæ, or the abdominal appendages (where such appendages exist in the secondary type embracing the species). These circumstances, moreover, are independent of a degradation of intelligence, by an extension of the sphere of growth beyond the proper limits of the sphere of activity.

VII. A classification by grades, analogous to that deduced for Crustacea, may no doubt be made out for other classes of animals. But the particular facts in the class under consideration, are not to be forced upon other classes. Thus, while inferiority among Crustacea is connected with a diminished number of annuli cephalically absorbed (for the senses and mouth), it by no means follows, that the Insecta, which agree in the number of cephalic annuli with the lower Crustacea, are allied to them in rank, or inferior to the higher species. On the contrary, as the Insecta pertain to a distinct division, being aerial instead of aqueous animals, they can be studied and judged of, only on principles deduced from comparison among insects themselves. They are not subject to Crustacean laws, although they must exemplify beyond doubt, the fundamental idea at the basis of those laws.

The views which have been explained, lead us to a modification, in some points, of the classification of Crustacea. The question, whether the eyes are pedicellate or not, upon which the names Podophthalmia and Edriophthalmia are based, proves to be one of secondary importance. And although still available in distinguishing almost infallibly the species of the first type, it is far from rendering it necessary or natural to embrace together under a common division the species that have *sessile* eyes (so-called Edriophthalmia), as done by most writers on this subject.

The term Decapoda, in view of these principles, has a higher signification than has been suspected since by expressing the number of feet, it implies the number of cephalic annuli characterizing the species. It would not be employing it inconveniently, therefore, if it were extended to embrace all the Podophthalmia, or all species of the first type, including the Mysis and Squilla groups.

For a like reason, the term *Tetradecapoda* has a high significance, as applied to the species of the second type. The position of the Trilobita still remains in doubt. The Cirripedia and Entomostraca, third and fourth types, stand properly on nearly the same level.

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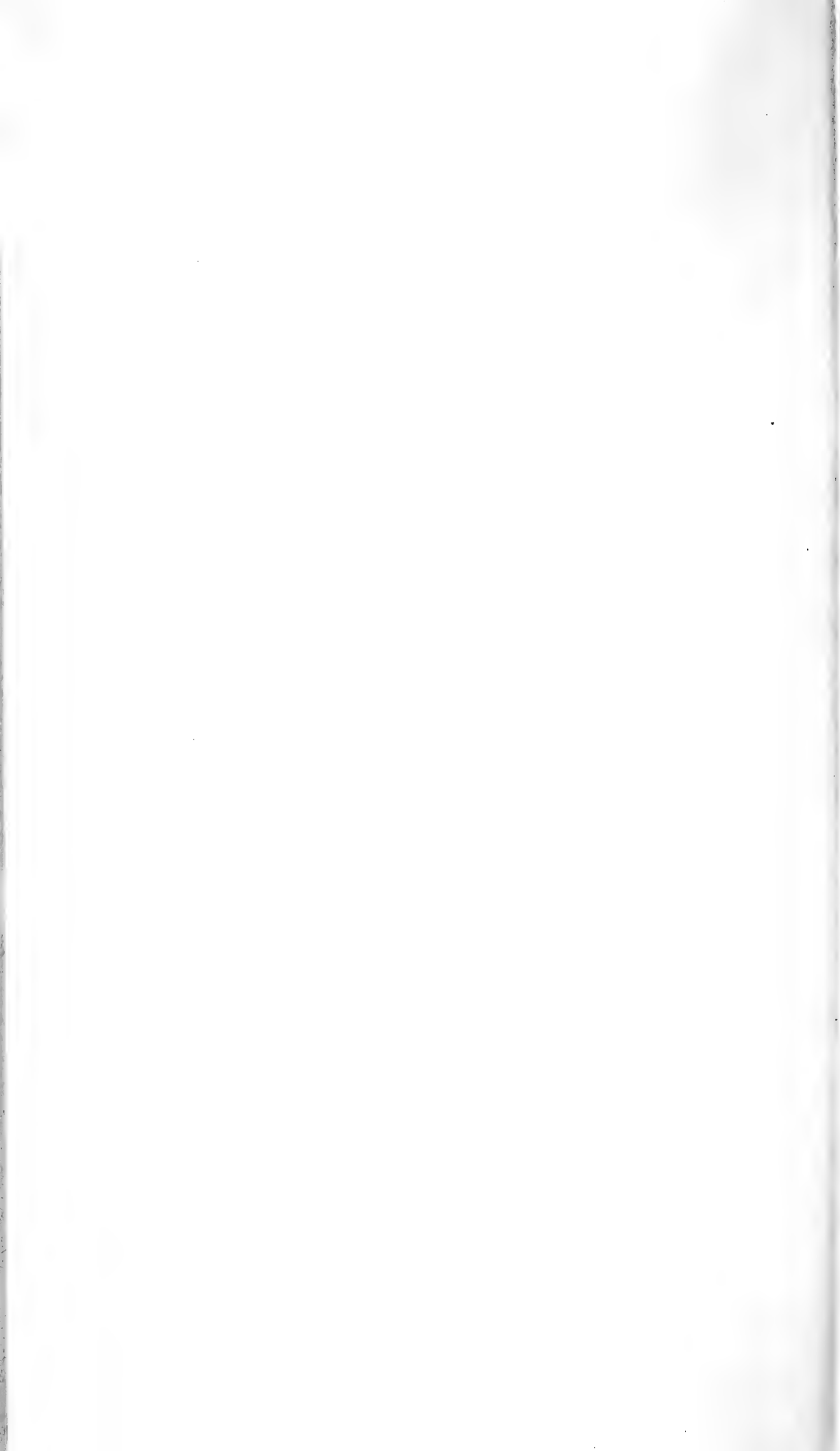
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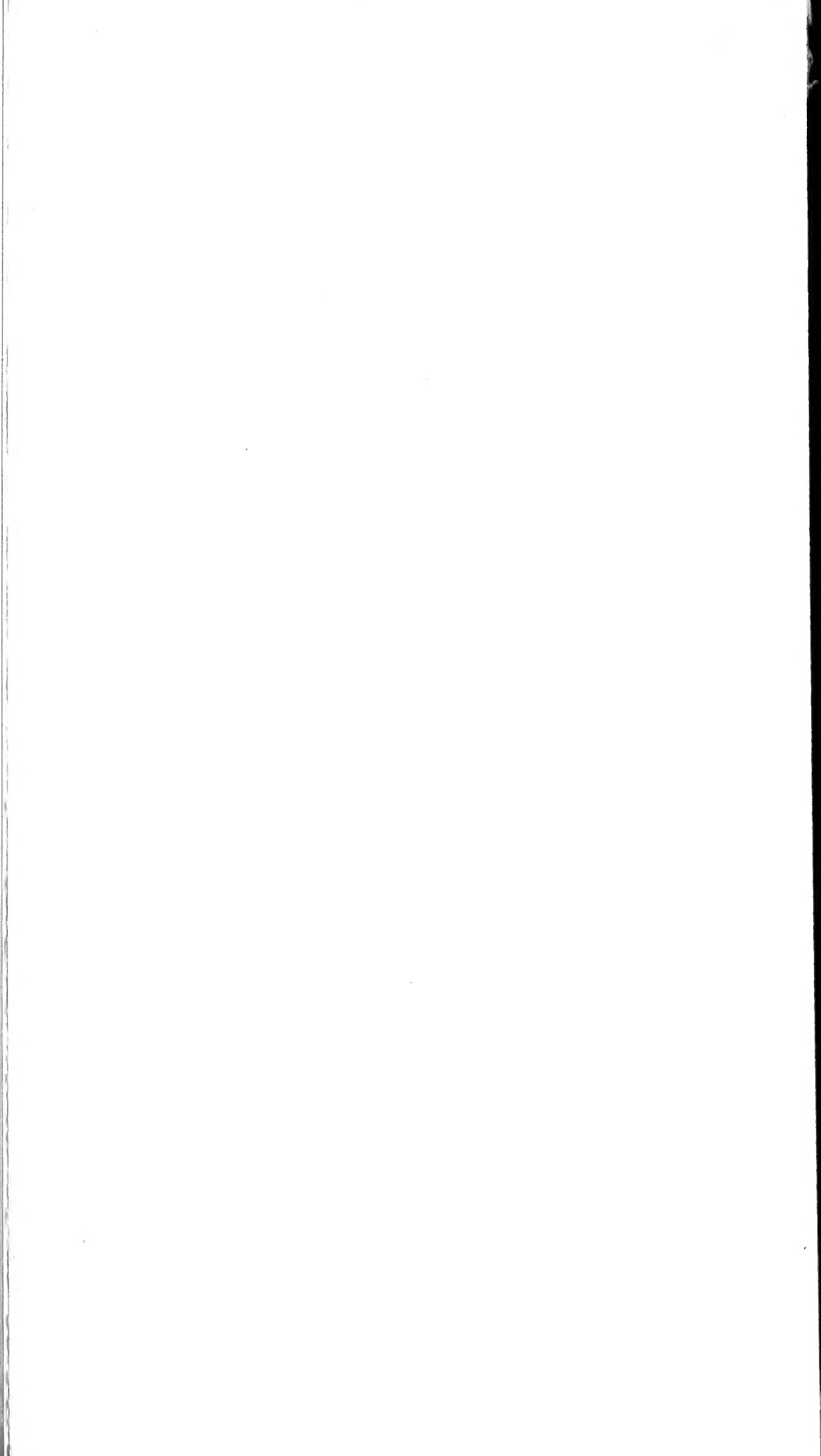


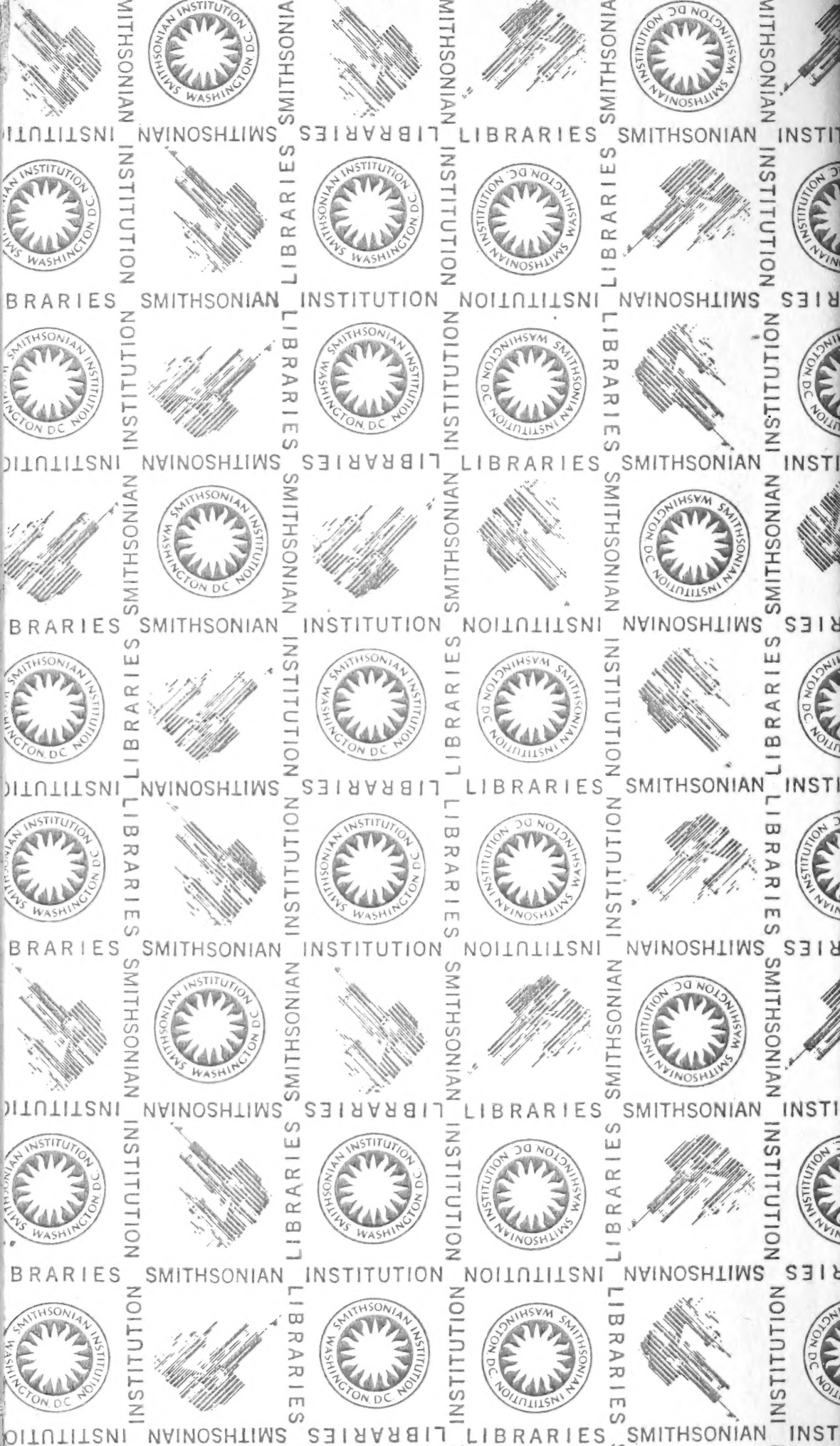


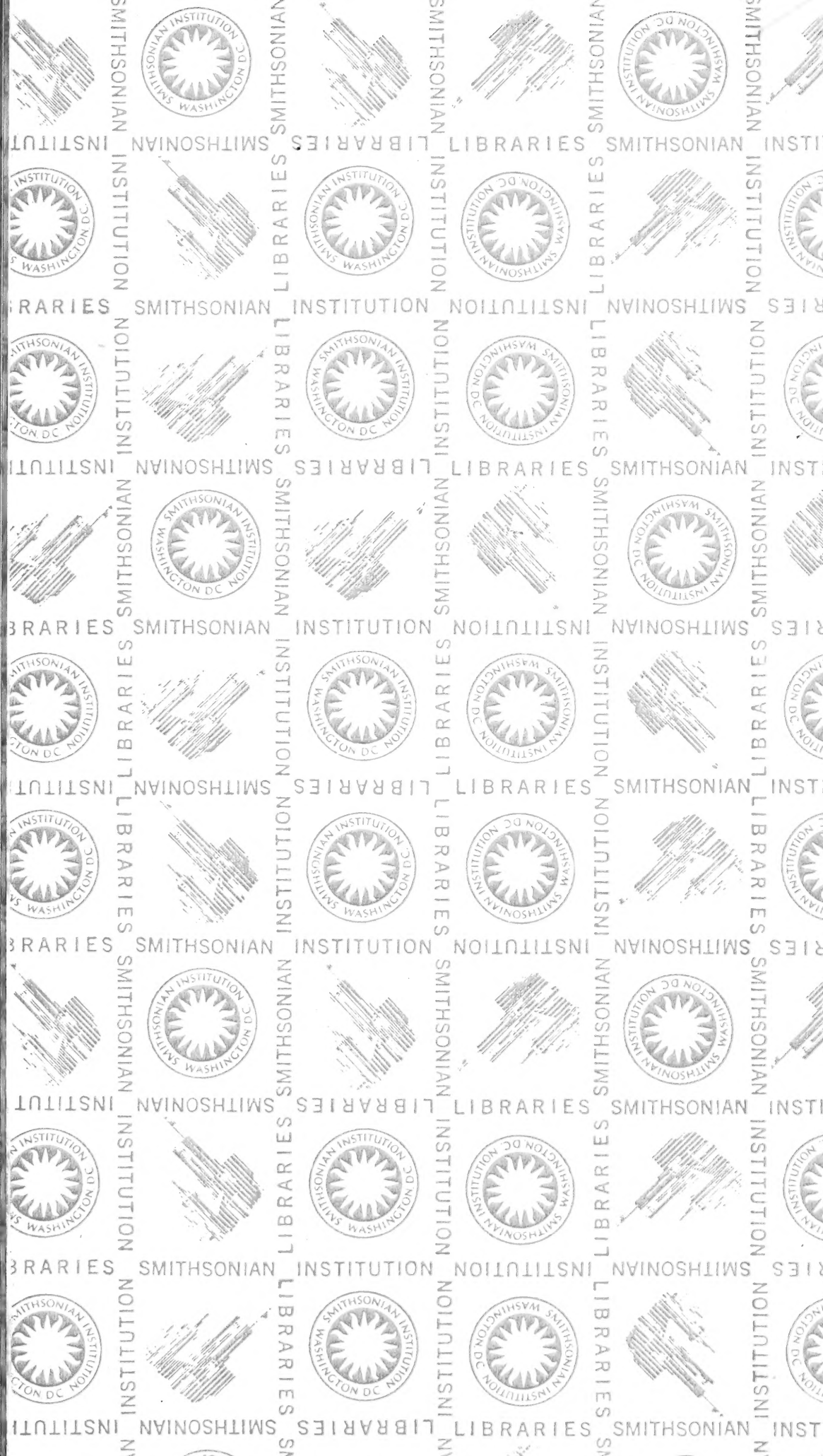












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