

Estheria gihoni seen in a glass of clear water is a beautiful object; it swims upright, with the finely-sculptured valves of its carapace slightly open, so as to allow part of its bright red body to be seen. The branchial feet are in constant motion except when the animal, after a lengthened swim, goes to the bottom and either burrows in the mud or falls over on its side on the surface, when the branchiæ move very feebly. When fully grown the male (which is somewhat larger than the female) measures 5 lines in its longest diameter. For the first month of life they seem to be continually active, but when adult are often in repose, sometimes for many hours together. When copulating the female is seized by the prehensile feet and held firmly by the strong hooks with which they are armed, and in this attitude, which looks as if she were carried in the male's mouth (almost like a dog with a rat), she is hurried along round and round the jar, the male retaining his hold for hours, and occasionally expanding the valves of the carapace in his flight.

The same evolution as above described in the case of *Branchipus*, of throwing up mud and sweeping it with the branchiæ towards the mouth, while turned on its back, is equally true of *Estheria*. I have kept the *Estheriæ*, *Daphniæ*, and *Cypridæ* for four months, but *Branchipus*, *Diaptomus*, and *Cyclops* are more short-lived.

XLIII.—*A Revision of the Pontoniidæ*. By L. A. BORRADAILE, M.A., Lecturer in Natural Sciences at Selwyn College, Cambridge.

THE first of the species of the Pontoniidæ was described by Forskål in the year 1775, when he gave the name of *Cancer custos* to a small prawn found living in the mantle-chamber of a bivalve mollusk. In 1829, after certain wanderings, this species, under the name of *P. tyrrhena* (Risso), found a home in the genus *Pontonia*, established for it by Latreille; and by 1837, the date of publication of H. Milne-Edwards's 'Crustacées,' the number of species of *Pontonia* had risen to four. A closely allied genus, *Conchodytes*, was described by Peters in 1851.

After the appearance of Milne-Edwards's work no step of great importance in the history of the family was taken till Dana, in 1852, reporting on the Crustacea of the United States Exploring Expedition, separated from *Pontonia* groups

of species which he erected into the genera *Ædipus* and *Harpilius*. At the same time he described a genus *Anchistia*, allied to the foregoing in the nature of the antennules and mandibles, and indicated in a footnote that the true position of *Typton*, Costa, 1844, was in this neighbourhood. The name *Ædipus* was already in use, and Stimpson accordingly changed it to *Coralliocaris* in 1860. *Anchistia*, on the other hand, must yield to *Periclimenes*, Costa, 1844, on the ground of priority. *Pelias* is a name that has also been applied by Roux and Heller to species of this genus, but, though prior to *Periclimenes*, it was already preoccupied when made use of by Roux.

In 1879, Kingsley, revising the Palæmonidæ, dealt with the above group of genera as a coherent section of his sub-family Palæmoninæ, suppressing only the somewhat ill-characterized *Conchodytes*. Bate, in the Report on the 'Challenger' Macrura (1888), raised them to the rank of a separate family, and Ortmann, writing in 1891, has some valuable remarks on the Pontoniidæ. The genera, however, have not been considered together since Kingsley's paper.

The description of the important species *Harpilius inermis*, Miers, 1884, and *H. Miersi*, de Man, 1888, and the occurrence of several interesting forms, both old and new, in some material from the South Seas, have led the writer to think that the time is ripe for a further revision of the family. To this end the present synopsis is offered.

The characters of the Pontoniidæ are first summarized and a list of the genera given, including one here defined for the first time. This is followed by a discussion of the inter-relationships of the genera. Then the characteristics of each genus are given separately, with a list of the species to be assigned to it. New species are diagnosed but briefly, since full descriptions and figures are to be given in reports on the Crustacea collected in the South Seas by Dr. A. Willey* and Mr. J. Stanley Gardiner. Finally, an empirical key to the genera follows.

The systematic position of the Pontoniidæ may be defined as follows:—

* In the 'Zoological Results' of Dr. Willey's voyage, now being published by the Cambridge University Press.

Suborder *MACRURA*.Tribe *CARIDEA*.Subtribe *MONOCARPINEA*.Family *Pontoniidæ*, Bate, 1888.

Pontoniidæ, Bate, 'Challenger' *Macrura*, p. 927 (1888); Ortmann, *Zool. Jahrb. v.*, Syst. p. 460 (1891).

Monocarpinea with the body often depressed; rostrum not movable on carapace, often short, compressed or depressed, with or without dentations; outer flagellum of first antenna consisting of a thick hairy part, bearing a thin hairless part, the latter usually arising from the former at a short distance from the free end, and thus giving it a bifid appearance; mandible deeply cleft into two divisions and always without a palp; endopodite of second maxilliped not biramous; third maxilliped pediform, but usually with some of the joints broadened; all the legs without exopodites or mastigobranchs; first two pairs of legs chelate, first pair slender, second pair larger than the first, not foliaceous. Mode of life often semi-parasitic.

Genera:—*Periclimenes*, Costa, 1844; *Coralliocaris*, Stimpson, 1860; *Harpilius*, Dana, 1852; *Anchistus*, gen. nov.; *Pontonia*, Latreille, 1829; *Conchodytes*, Peters, 1851; *Typton*, Costa, 1844.

The new genus *Anchistus* included in the above list is proposed for the reception of *Harpilius inermis*, Miers, *H. spinuliferus*, Miers, *H. Miersi*, de Man, and a new species from New Guinea. These species differ from *Harpilius* in the structure of the rostrum and second pair of maxillipeds and also somewhat in that of the third maxillipeds. The rostrum is deep, but owes its depth to the inferior keel, which is well developed along its whole length, the superior dentate crest being absent. The free end of the structure is rounded (in *A. spinuliferus* it diminishes abruptly to a point) and is bent downwards. In *A. Miersi* there are a few dentations on the rounded free end. The second maxillipeds have the penultimate joint broader than the last joint and bearing it terminally. The third maxillipeds have the antepenultimate joint of moderate breadth and somewhat different in shape from that of *Harpilius*.

On consideration of the mutual relationships of the genera enumerated above, they appear to fall into four groups:—

(a) *Periclimenes*.

(b) *Coralliocaris*, *Harpilius*.

(c) *Anchistus*, *Pontonia*, *Conchodytes*.

(d) *Typton*.

(a) *Periclimenes* stands out at once as the most primitive genus of the family. Its *Palæmon*-like form of body, compressed dentate rostrum (except in *P. aurantiacus*), dactyles of the last three pairs of legs straight and not swollen at the base, narrow third maxillipeds, and its free-living habits, all point to this conclusion.

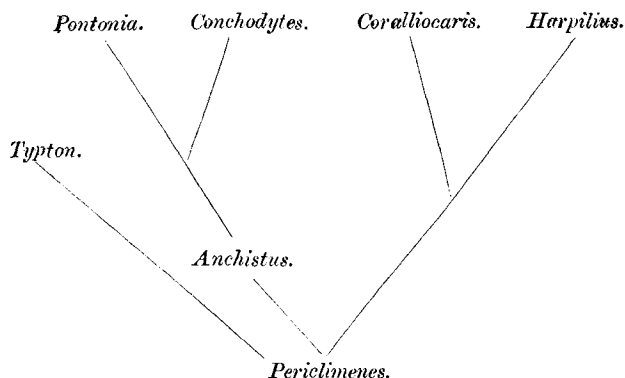
(b) In the second group the compressed dentate rostrum of *Periclimenes* usually becomes broader and shallower, and is often shorter; but the dentations, though showing signs of reduction, are generally present, at least on the upper surface, and the free end is pointed both in dorsal and in lateral view, and is not curved downwards. The last joint of the second maxilliped is as broad as—usually broader than—the preceding joint, and the antepenultimate joint of the third maxilliped is broadened, though not to a great extent, in *Coralliocaris*. The dactyles of the last three legs are short, stout, curved, and without small teeth on the underside. The two genera of the group differ between themselves in the attachment of the last joint of the second maxilliped to the penultimate, which takes place terminally in *Coralliocaris*, but laterally on the inner side in *Harpilius*. A further distinction is afforded by the third maxilliped, which in *Coralliocaris* has the antepenultimate joint of moderate breadth and the last two joints about equalling it in this dimension. In *Harpilius*, on the other hand, the last two joints are narrow and the preceding joint is broad. Lastly, the dactyles of the hinder three pairs of legs are provided in the former genus with a large basal protuberance on the underside. This protuberance is wanting in *Harpilius*.

(c) In the third group the rostrum is more or less depressed at its base, but distally is deep and strongly compressed (except in some species of *Pontonia*). Dentations are absent or restricted to the tip, which is bent downwards and in side view rounded or diminishing abruptly to a point. The penultimate joint of the second maxilliped is broader than the last joint and bears it terminally. The third maxilliped, fairly narrow in *Anchistus*, is broad in the antepenultimate joint in *Pontonia* and in all the joints in *Conchodytes*. The dactyles of the last three pairs of legs are straight in some of the species and of varying degrees of curvature in others. They may or may not bear teeth on the underside, and in

Conchodytes they present also a basal prominence somewhat recalling that of *Coralliocaris*. It is worth noting that the latter two genera are not without resemblances in the structure of their third maxillipeds and second pair of legs.

(d) *Typton* shows considerable likeness to *Pontonia*. The flagella, however, of the first antenna are both simple and the scale of the second is rudimentary. The evidence of these characters, which by themselves might be disregarded as due to reduction consequent on a protected mode of life, is strengthened by the narrowness of the third maxilliped, the (short) upturned rostrum, compressed along its whole length and narrowing to a point at the free end, and the two very large supraorbital spines. These peculiarities, taken together, mark out *Typton* as the most aberrant genus of the family.

The foregoing remarks may be illustrated by a graphic table as follows :—



Genus PERICLIMENES, Costa, 1844.

Pelias, Roux, Mém. sur les Salicoques, p. 25 (1831); H. M.-Edwards, H. N. Crust. ii. p. 381 (1837); Heller, Sitz. k. Ak. Wiss. Wien, xlv. 1, p. 400 (1862).

Periclimenes, Costa, Ann. Ac. degl. Aspir. Nat. Nap. ii. (1844); Faun. Reg. Nap. ii. 1 (1846).

Anchistia, Dana, U.S. Expl. Exped., Crust. i. p. 577 (1852); Kingsley, Proc. Ac. N. Sci. Philad. 1879, p. 423 (1880); Carus, Prodr. Faun. Medit. i. p. 474 (1885).

Denmsia, Norman, Ann. & Mag. Nat. Hist. (3) viii. p. 278 (1861).

Pontiidae with rostrum long, compressed, usually dentate, in side view diminishing gradually to a sharp point at the free end, not bent downwards; thicker flagellum of first antenna long or moderate, bifid; scale of second antenna long, usually narrow; second maxilliped with penultimate

joint as broad as—usually broader than—the last joint, which it bears terminally; third maxilliped narrow, last two joints together may be longer or shorter than the preceding joint; dactyles of the last three pairs of legs slender, nearly straight, without basal protuberance.

1. *Periclimenes scriptus* (Risso), 1826. (Type.)

Alpheus scriptus, Risso, Hist. Nat. Eur. MÉR. v. p. 78 (1826).
Pelias scriptus, Roux, Mém. sur les Salicoques, p. 25 (1831); Heller, Sitz. k. Ak. Wiss. Wien, xlv. 1, p. 406 (1862).
Periclimenes insignis, Costa, Ann. Ac. degl. Aspir. Nat. Nap. ii. (1844); id. Faun. Regn. Nat. Nap. ii. 1, pl. vi. figs. 1-6 (1846).
Dennisia sagittifera, Norman, Ann. & Mag. Nat. Hist. (3) viii. p. 278, pl. xiii. figs. 8-13 (1861).
Anchistia scripta, Carus, Prodr. Faun. Med. i. p. 476 (1885).
Palæmon bivnguiculatus, Lucas (fide Carus).

Mediterranean; Guernsey.

2. *Periclimenes amethysteus* (Risso), 1826.

Alpheus amethysteus, Risso, Hist. Nat. Eur. MÉR. v. p. 77, pl. iii. fig. 16 (1826).
Pelias amethysteus, Roux, Mém. sur les Salicoques, p. 25 (1831); Heller, Sitz. k. Ak. Wiss. Wien, xlv. 1, p. 406 (1862).
Anchistia amethystea, Carus, Prodr. Faun. Med. i. p. 476 (1885).

Mediterranean, European shores.

3. *Periclimenes Petitthouarsi* (Aud.).

Palæmon Petitthouarsi, Audouin, Descr. Egypt., Hist. Nat. i. 4, p. 91; Savigny, Atlas Crust. pl. x. fig. 3.
Anchistia inæquimana, Heller, Sitz. k. Ak. Wiss. Wien, xlv. p. 283 (1861); Crust. 'Novara,' p. 109.
Anchistia Petitthouarsi, Kossmann, Zool. Ergebn. Reise Rot. Meer. p. 83 (1880); de Man, Arch. Naturg. liii. 1, p. 541 (1887).

Red Sea; East Indies; Tahiti.

4. *Periclimenes gracilis* (Dana), 1852.

Anchistia gracilis, Dana, U.S. Expl. Exped., Crust. i. p. 578, pl. xxxvii. figs. 5 a-l (1852).

Sooloo Sea.

5. *Periclimenes longimanus* (Dana), 1852.

Anchistia longimana, Dana, loc. cit. p. 579, pl. xxxvii. figs. 6 a, b (1852).

Loc. — ?

6. *Periclimenes ensifrons* (Dana), 1852.

Anchistia ensifrons, Dana, *loc. cit.* p. 580, pl. xxxviii. figs. 1 *a-g* (1852); Müller, *Verh. nat. Ges. Basel*, 8, ii. p. 471 (1887); de Man, *Arch. Naturg.* liii. 1, p. 545 (1887); Ortmann, *Semon's Forschungsreisen in Austral.* v. 1, p. 16 (1894).

East Indies; Ceylon; East Africa.

7. *Periclimenes aurantiacus* (Dana), 1852.

Anchistia aurantiaca, Dana, *loc. cit.* p. 581, pl. xxxviii. figs. 2 *a-d* (1852).

Fiji.

8. *Periclimenes grandis* (Stimpson), 1860.

Anchistia grandis, Stimpson, *Proc. Ac. N. Sci. Philad.* 1860, p. 39.
(?) *Anchistia Petithcuarsi*, Miers, 'Alert' Report, *Crust.* p. 293 (1884).

Ousima Island.

9. *Periclimenes brachiatus* (Stimpson), 1860.

Anchistia brachiata, Stimpson, *Proc. Ac. N. Sci. Philad.* 1860, p. 39.

Ousima Island.

10. *Periclimenes Danæ* (Stimpson), 1860.

Anchistia Danæ, Stimpson, *Proc. Ac. N. Sci. Philad.* 1860, p. 39.

Tahiti; [Ellice Group] *.

11. *Periclimenes migratorius* (Heller), 1862.

Pelias migratorius, Heller, *Sitz. k. Ak. Wiss. Wien*, xlv. 1, p. 409 (1862).

Egypt.

12. *Periclimenes æsopi* (Bate), 1863.

Anchistia æsopia, Bate, *P. Z. S.* 1863, p. 502, pl. xli. fig. 5; Haswell, *Cat. Austral. Crust.* p. 194 (1887).

Gulf St. Vincent, Australia.

13. *Periclimenes notatus* (Heller), 1868.

Anchistia notata, Heller, *Voyage of 'Novara,' Crust.* p. 109, pl. x. fig. 3 (1868).

Nicobar Islands.

* Localities in brackets are recorded for the first time.

14. *Periclimenes americanus* (Kingsley), 1878.

Anchistia americana, Kingsley, Proc. Ac. Nat. Sci. Philad. 1878, p. 96.
Florida.

15. *Periclimenes tenellus* (S. I. Smith), 1882.

Anchistia tenella, S. I. Smith, Bull. Mus. C. Z. Harv. x. p. 55, pl. ix.
figs. 1, 1 b (1882).
North America, east coast.

16. *Periclimenes amboinensis* (de Man), 1887.

Anchistia amboinensis, de Man, Arch. Naturg. 53, i. p. 546 (1887).
Amboina.

17. *Periclimenes Brocki* (de Man), 1887.

Anchistia Brocki, de Man, Arch. Naturg. 53, i. p. 546 (1887).
Amboina.

18. *Periclimenes spinigerus* (Ortmann), 1891.

Anchistia spinigera, Ortmann, Zool. Jahrb. v., Syst. p. 511, pl. xxxvi.
figs. 23, 23 a (1891).
Samoa; [Rotuma; Loyalty Islands].

19. *Periclimenes vitiensis*, sp. n.

A *Periclimenes* with rostrum nearly as long as thicker flagellum of first antenna, with 6 teeth above and 4 below; supraorbital, antennal, hepatic spines present; scale of second antenna nearly equal to thick flagellum of first; merus of second pair of legs with a spine below, slightly longer than carpus, which bears a spine inside and exceeds the antennal scales; palm somewhat longer than carpus, fingers more than half the length of palm.

Length to end of rostrum 20 millim.

[Fiji.]

20. *Periclimenes rotumanus*, sp. n.

A *Periclimenes* with rostrum barely longer than peduncle of first antenna, almost straight, with 6 teeth above and 2 below; antennal and hepatic spines present; scale of second antenna longer than rostrum, shorter than thick flagellum of first antenna; carpus about as long as palm and with one spine above; merus with one spine below.

Length 11 millim.

[Rotuma.]

21. *Periclímenes lifuensis*, sp. n.

A *Periclímenes* with rostrum longer than antennal scales, straight, with 6 teeth above; thick flagellum of first antenna slightly longer than rostrum; supraorbital spine present, hepatic absent; merus not armed; carpus short, with one spine on dorsal surface.

Length 11 millim.

[Loyalty Islands.]

22. *Periclímenes parvus*, sp. n.

A *Periclímenes* with rostrum slightly shorter than peduncle of first antenna, which in turn is shorter than the antennal scale, though the thick flagellum exceeds it; rostrum armed with 6 teeth above, 1 below; no supraorbital spine; no teeth on carpus or merus of second legs; merus short.

Length 8.5 millim.

[New Britain.]

23. *Periclímenes parasíticus*, sp. n.

A *Periclímenes* with rostrum convex above, armed with 7 teeth above, none below; antennal scale almost as long as thick flagellum of first antenna; no supraorbital spines; no spines on the second legs; carpus short.

Length 7 millim.

Found on black *Linckia*.

[British New Guinea.]

24. *Periclímenes tenuipes*, sp. n.

A *Periclímenes* with all the appendages very elongate; rostrum with 10 teeth above, 7 below, longer than antennal scale, shorter than thick flagellum of first antenna; antennal scale longer than peduncle of first antenna, narrow; merus of second leg with spine beneath; carpus longer than palm, with spine above; propus of last three legs armed with spines.

Length 25 millim.

[New Britain]

Genus CORALLIOCARIS, Stimpson, 1860.

Ædipus, Dana, U.S. Expl. Exped., Crust. i. p. 572 (1852).

Coralliocaris, Stimpson, Proc. Ac. N. Sci. Philad. 1860, p. 38;

Kingsley, Proc. Ac. N. Sci. Philad. 1879, p. 423 (1880).

Pontoniidæ with rostrum long or moderate, with or without dentations, usually somewhat depressed, shallow, at most

only slightly bent downwards; flagella of first antenna of moderate length, thicker of the two bifid; scale of second antenna long, broad; flagellum of same not short; second maxilliped with last joint as broad as or broader than the penultimate joint, which bears it terminally; third maxilliped with antepenultimate joint moderately broad, last two joints of about the same breadth as, and together as long as or longer than, the antepenultimate; chelæ of second pair large; dactyles of last three legs short, strong, curved, with a large basal protuberance on the underside.

1. *Coralliocaris superba* (Dana), 1852. (Type.)

Ædipus superbus, Dana, *loc. cit.* p. 573, pl. xxxvii. figs. 2 a-f (1852).
Coralliocaris superba, Stimpson, *loc. cit.* p. 38; de Man, Arch. Naturg. 53, i. p. 536 (1887).

East Indies; Tongatabu; Tahiti.

Var. *japonica* Ortmann, 1891.

Coralliocaris superba, var. *japonica*, Ortmann, Zool. Jahrb. v., Syst. p. 509 (1891).

Japan.

2. *Coralliocaris macrophthalma* (H. M.-Edwards), 1837.

Pontonia macrophthalma, H. M.-Edwards, H. N. Crust. ii. p. 359 (1837); id. Cuvier's R. An., Crust. Atlas, pl. lii. figs. 3, 3 a-k.
Ædipus macrophthalmus, Dana, *loc. cit.* p. 573 (1852).

"Mers d'Asie."

3. *Coralliocaris graminea* (Dana), 1852.

Ædipus gramineus, Dana, *loc. cit.* p. 574, pl. xxxvii. figs. 3 a-e (1852).
Coralliocaris graminea, Stimpson, *loc. cit.* p. 38; Miers, 'Alert' Report, Crust. p. 563 (1884); de Man, Arch. Naturg. 53, i. p. 536 (1887).

Seychelles; East Indies; Hongkong; Fiji.

4. *Coralliocaris lamellirostris* Stimpson, 1860.

Coralliocaris lamellirostris, Stimpson, *loc. cit.* p. 38.

Loo-Choo Island.

5. *Coralliocaris nudirostris* (Heller), 1862.

Ædipus nudirostris, Heller, Sitz. k. Ak. Wiss. Wien, xlv. 1, p. 279, pl. iii. fig. 25 (1882).

Red Sea.

6. *Coralliocaris inæqualis* Ortmann, 1891.

Coralliocaris inæqualis, Ortmann, Zool. Jahrb. v., Syst. p. 510, pl. xxvi. figs. 21, 21 *d-i* (1891).

Japan; Samoa; [Loyalty Islands].

7. *Coralliocaris brevirostris*, sp. n.

A *Coralliocaris* with rostrum unarmed, reaching only the middle of the antepenultimate joint of the peduncle of the first antenna; inner flagellum of first antenna reaching to some distance beyond the fringe of the antennal scales; last two joints of peduncle of first antenna subequal; immovable finger of chela with two swellings, separated by a notch, into which the single small tooth on the movable finger fits.

Length 19 millim.

[Ellice Islands.]

(?) *Coralliocaris tridentata* Miers, 1884.

Coralliocaris (?) *tridentata*, Miers, 'Alert' Report, Crust. p. 294, pl. xxxii. fig. c (1884).

Thursday Island.

Genus *HARPILIUS*, Dana, 1852.

Harpilius, Dana, U.S. Expl. Exped., Crust. i. p. 575 (1852); Kingsley, Proc. Ac. N. Sci. Philad. 1879, p. 423 (1880).

Rostrum long, compressed, dentate, pointed at the tip in side view, not curved downwards; thicker flagellum of first antenna of moderate length, bifid; scale of second antenna large; second maxilliped with penultimate joint narrower than last joint, which it bears laterally on the inner side; third maxilliped with the last two joints narrow, together longer than preceding joint, which is broad; dactyles of last three legs short, stout, curved, not bearing teeth or protuberances below.

1. *Harpilius lutescens* Dana, 1852. (Type.)

Harpilius lutescens, Dana, *loc. cit.* p. 576, pl. xxxvii. figs. 4 *a-h* (1852); de Man, Arch. Naturg. 53, i. p. 536.

East Indies.

2. *Harpilius Beaupresii* (Aud.).

Palæmon Beaupresii, Audouin, Savigny, Egypte, Atlas Crust. pl. x. fig. 4. *Harpilius Beaupresii*, Heller, Sitz. k. Ak. Wiss. Wien, xlv. p. 280 (1861); de Man, Arch. Naturg. 53, i. p. 539 (1887).

- (?) *Harpilius depressus*, Stimpson, Proc. Ac. N. Sci. Philad. 1860, p. 38.
 (?) *Pontonia (Harpilius) dentata*, Richters, Decap. Mauritius, p. 165,
 pl. xvii. figs. 36-38.

Red Sea ; East Indies.

Genus ANCHISTUS, nov.

Pontoniidæ with rostrum long, compressed, in side view deep, bent downwards, with broad, usually rounded end, dentate at the tip only or without teeth ; thicker flagellum of first antenna moderate, bifid ; scale of second antenna large ; second maxilliped with penultimate joint broader than last joint and bearing it terminally ; third maxilliped with last two joints narrow, together longer than preceding joint, which is moderately broad ; dactyles of last three pairs of legs short, curved, of at least moderate breadth, with or without a small tooth on the lower border, without a basal protuberance.

1. *Anchistus Miersi* (de Man), 1888. (Type.)

Harpilius Miersi, de Man, Journ. Linn. Soc., Zool. xxii. p. 274, pl. xxii. figs. 6-10 (1888) ; Whitelegge, Funafuti Atoll, Crust. p. 148 (1897).

Mergui Archipelago ; Ellice Group ; [British New Guinea].

2. *Anchistus inermis* (Miers), 1884.

Harpilius inermis, Miers, 'Alert' Report, Crust. p. 291, pl. xxxv. fig. B (1884) ; Müller, Verh. nat. Ges. Basel, 8, ii. p. 471 (1887).

West Australia ; Ceylon.

3. *Anchistus spinuliferus* (Miers), 1884.

Harpilius spinuliferus, Miers, 'Alert' Report, Crust. p. 292 (1884).

Loc. — ?

4. *Anchistus biunguiculatus*, sp. n.

An *Anchistus* with rostrum not exceeding antepenultimate joint of antennular peduncles, much bent downwards, without teeth ; antennal scale rather longer than the peduncle of the first antenna ; immovable finger of legs of second pair much longer than movable finger and curved at the end ; dactyles of legs of last three pairs with a hooked spine in the middle of the under edge.

Length 50 millim.

[British New Guinea.]

(?) *Anchistus armatus* (H. M.-Edwards), 1837.

Pontonia armata, H. M.-Edwards, H. N. Crust. ii. p. 359 (1837).

New Ireland.

Genus PONTONIA, Latreille, 1829.

Pontonia, Latreille, Cuvier's R. An. 2nd ed. iv. p. 96 (1829); Roux, Mém. sur les Salicoques, p. 26 (1831); H. M.-Edwards, H. N. Crust. ii. p. 358 (1837); De Haan, Faun. Jap. p. 175 (1850); Dana, U.S. Expl. Exped., Crust. i. p. 570 (1852); Kingsley, Proc. Ac. N. Sci. Philad. 1879, p. 422 (1880); Joliet, Arch. zool. expér. x. p. 119 (1882); Carus, Prodr. Faun. Medit. i. p. 475 (1885).

Pontoniidæ with body depressed; rostrum short, depressed, bent downwards, not dentate, with or without a keel below at the free end; both flagella of first antenna short, thicker of two bifid; scale of second antenna of moderate length only, broad; flagellum of same not short; second maxilliped with penultimate joint broader than last joint and bearing it terminally; third maxilliped with last two joints narrow, together shorter than the preceding joint, which is broad; dactyles of last three legs straight, simple or with small teeth on the underside, without basal protuberance; one of the second pair of legs with very large chela.

1. *Pontonia custos* (Forskål), 1775. (Type.)

Cancer custos, Forskål, Descrip. anim. p. 94 (1775).

Astacus tyrrhenus, Petagua, Ent. pl. v. fig. 5 [fide Risso].

Gnathophyllum tyrrhenus, Desmarest, Consid. sur les Crust. p. 229.

Alpheus pinnophylax, Otto, Mém. Ac. cur. nat. Bonn, xiv. pl. xxi. fig. 2.

Pontonia tyrrhena, Latreille, Encycl. pl. cccxxvi. fig. 10; id. Cuvier's R. An. 2nd ed. p. 96 (1829); H. M.-Edwards, Crust. ii. p. 360 (1837); id. Atlas Crust. in Cuvier's R. An. pl. lii. fig. 4; Heller, Crust. südl. Eur. p. 251, pl. viii. figs. 10, 11 (1863); Ortmann, Zool. Jahrb. v., Syst. p. 509, pl. xxvii. figs. d-i (1891).

Callianassa tyrrhenus, Risso, Hist. Nat. Eur. MÉR. p. 54 (1826).

Pontonia custos, Guérin, Expéd. Morée, Zool. p. 36, pl. xxxvii. fig. 1; Carus, Prodr. Faun. Medit. p. 475 (1885).

(?) *Pontonia parasitica*, Roux, Mém. sur les Salicoques, p. 26 (1831).

Mediterranean.

2. *Pontonia nipponensis* De Haan, 1850.

Pontonia nipponensis, De Haan, Faun. Japon., Crust. p. 180 (1850).

Hymenocera nipponensis, De Haan, loc. cit. pl. xli. fig. 8 (1850).

Japan.

3. *Pontonia flavomaculata* Heller, 1864.

Pontonia flavomaculata, Heller, Verh. zool.-bot. Ges. Wien, xiv. p. 51 (1864); Carus, Prodr. Faun. Medit. i. p. 475 (1885); Ortmann, Zool. Jahrb. v., Syst. p. 509 (1891).

Pontonia diazoneæ, Joliet, Arch. zool. expér. x. p. 101 (1882).

Pontonia phallusiæ, Marion, Ann. Mus. N. H. Marseille, Zool. i. (1883); Gourret, Compt. Rend. civ. p. 187 (1887).

Mediterranean.

4. *Pontonia unidens* Kingsley, 1883).

Pontonia unidens, Kingsley, Proc. Ac. N. Sci. Philad. 1879, p. 422, pl. xiv. fig. 9 (1880).

(?) *Pontonia mexicana*, Guérin, de la Sagra's Hist. Cuba (1856).

West Indies.

5. *Pontonia brevisrostris* Miers, 1884.

Pontonia brevisrostris, Miers, 'Alert' Report, Crust. p. 562, pl. li. fig. B (1884).

Seychelles.

6. *Pontonia pinnae* Ortmann, 1894.

Pontonia pinnae, Ortmann, Semon's 'Forschungsreisen in Austral.' p. 16, pl. i. (1894).

East Africa.

7. *Pontonia ascidicola* sp. n.

A *Pontonia* with antennal scale barely reaching end of peduncle of first antenna and with rostrum short, barely reaching middle of antepenultimate joint of peduncle of first antenna, without keel below.

Length 18 millim.

[New Britain.]

(?) *Pontonia domestica* Gibbes, 1851.

Pontonia domestica, Gibbes, P. Am. Assoc. iii. p. 196 (1851); Kingsley, Proc. Ac. N. Sci. Philad. 1878, p. 95.

Bahamas.

Genus CONCHODYTES, Peters, 1851.

Conchodytes, Peters, Ges. naturf. Freunde Berlin, 1851 (fide Heller); id. Ber. k. Ak. Wiss. Berlin, 1852, p. 591; Hilgendorf, Monatsber. k. Ak. Wiss. Berlin, 1878, p. 835.

Pontoniidæ with body much depressed; rostrum short, depressed, bent downwards, without dentations, bearing a keel below at the free end; both flagella of the first antenna very short, thicker of the two bifid; scale of second antenna short, broad; flagellum of same short; second maxilliped with penultimate joint broader than last joint, which it bears terminally; third maxilliped with last two joints fairly broad, together shorter than preceding joint, which is broad; dactyles of last three legs short, stout, curved, bearing on the underside a hooked spine and a low basal protuberance.

Ann. & Mag. N. Hist. Ser. 7. Vol. ii.

27

1. *Conchodytes tridacnæ* Peters, 1881. (Type.)

Conchodytes tridacnæ, Peters, Ges. naturf. Freunde Berlin, 1851 (fide Heller); Ber. k. Ak. Wiss. Berlin, 1852, p. 594; Hilgendorf, Monatsber. k. Ak. Wiss. Berlin, 1878, p. 835.

Pontonia tridacnæ, Dana, *loc. cit.* p. 571, pl. xxxvii. figs. 1 *a-d* (1852); ? Ortmann, Zool. Jahrb. v., Syst. p. 509, pl. xxxvi. figs. 10 *d-i* (1891).

Samoa; East Africa; Red Sea.

2. *Conchodytes meleagrincæ* Peters, 1851.

Conchodytes meleagrincæ, Peters, Ber. k. Ak. Wiss. Berlin, 1852, p. 594; Hilgendorf, Monatsber. k. Ak. Wiss. Berlin, 1878, p. 836.

Pontonia meleagrincæ, Bate, 'Challenger' Macrura, p. 707, pl. cxxiv. figs. 1, 2 (1888).

(?) *Pontonia maculata*, Stimpson, Proc. Ac. Nat. Sci. Philad. 1830, p. 38.

(?) *Pontonia tridacnæ*, Miers, 'Alert' Report, Crust. p. 290 (1884).

(?) *Pontonia enflée*, H. M.-Edwards, H. N. Crust. ii. p. 360 (1837).

East Africa; Torres Straits; [British New Guinea; Conflict Group; Loyalty Islands; Rotuma].

Genus TYPTON, Costa, 1844.

Typton, Costa, Ann. Ac. degl. Aspir. Nat. Nap. ii. (1844); id. Faun. Regn. Nap. ii. 1 (1846); Heller, Crust. südl. Eur. p. 254 (1863); Bate, Ann. & Mag. Nat. Hist. (4) ii. p. 119 (1868); Kingsley, Proc. Ac. N. Sci. Philad. 1879, p. 422 (1880); Costa, Prodr. Faun. Medit. i. p. 475 (1885); Ortmann, Zool. Jahrb. v., Syst. p. 508 (1891).

Pontonella, Heller, Verh. zool.-bot. Ver. Wien, vi. p. 629 (1856).

Pontoniidæ with rostrum small, compressed, bent upwards at the free end, pointed towards the tip, not dentate; thicker flagellum of first antenna short, not bifid; scale of second antenna rudimentary; second maxilliped with penultimate joint somewhat broader than last joint, which it bears terminally; third maxilliped narrow, last two joints together somewhat longer than preceding joint; dactyles of last three thoracic legs moderately straight and slender, with a small tooth below, without basal protuberance; one of the second pair of legs with very large chela.

1. *Typton spongicola* Costa, 1844. (Type.)

Typton spongicola, Costa, Ann. Ac. degl. Aspir. Nat. Nap. ii. (1844); id. Faun. Regn. Nap. ii. 1 (1846); Heller, Crust. südl. Eur. p. 254 (1863); Norman, Ann. & Mag. Nat. Hist. (4) ii. p. 176 (1868); Costa, Prodr. Faun. Med. i. p. 475 (1885); Ortmann, Zool. Jahrb. v., Syst. p. 508, pl. xxxvii. fig. 8 (1891).

Typton spongiosus, Bate, Ann. & Mag. Nat. Hist. (4) ii. p. 119 (1868).

Alpheus Edwardsii, Couch, Proc. Linn. Soc., Zool. v. p. 210 (1860).
Pontonella glabra, Heller, Crust. südl. Eur. p. 254, pl. viii. figs. 12-17
 (1863).

Mediterranean; Cornwall.

Key to the Genera of Pontoniidæ.

- I. Scale of second antenna not rudimentary.
 - A. Antepenultimate joint of third maxilliped never more than moderately broad. Last two joints not contrasting sharply in breadth with the antepenultimate.
 1. Dactyles of last three pairs of legs without basal protuberance. Last two joints of third maxilliped narrow.
 - a. Dactyles of last three pairs of legs straight. Rostrum almost always with dorsal dentate crest, not bent downwards, not with abrupt or rounded end *Periclimenes*, Costa, [1844.
 - b. Dactyles of last three pairs of legs curved. Rostrum without dentate dorsal crest, bent downwards, with abruptly pointed or rounded end *Anchistus*, gen. nov.
 2. Dactyles of the last three pairs of legs with basal protuberance. Last two joints of third maxilliped broad *Coralliocaris*, Stimp-son, 1860.
 - B. Antepenultimate joint of third maxilliped broad. Last two joints usually contrasting sharply in breadth with the antepenultimate.
 1. Last two joints of third maxilliped together longer than the preceding joint. Last joint of second maxilliped borne laterally by the penultimate joint *Harpilius*, Dana, 1852.
 2. Last two joints of third maxilliped together shorter than the preceding joint. Last joint of second maxilliped borne terminally by the penultimate.
 - a. Dactyles of last three pairs of legs curved, with a low basal prominence. Flagellum of second antenna short. Last two joints of third maxilliped fairly broad *Conchodytes*, Peters, [1851.
 - b. Dactyles of last three pairs of legs straight, without basal prominence. Flagellum of second antenna not short. Last two joints of third maxilliped narrow *Pontonia*, Latreille, [1829.
- II. Scale of second antenna rudimentary *Typton*, Costa, 1844.