

The Caridean Shrimps (Crustacea:
Decapoda) of the *Albatross*
Philippine Expedition, 1907–1910,
Part 7: Families Atyidae, Eugonatonotidae,
Rhynchocinetidae, Bathypalaemonellidae,
Processidae, and Hippolytidae

FENNER A. CHACE, Jr

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ABSTRACT

Chace, Fenner A., Jr. The Caridean Shrimps (Crustacea: Decapoda) of the *Albatross Philippine Expedition, 1907-1910, Part 7: Families Atyidae, Eugonatonotidae, Rhynchocinetidae, Bathypalaemonellidae, Processidae, and Hippolytidae*. *Smithsonian Contributions to Zoology*, number 587, 106 pages, 29 figures, 1997.—Two new genera, *Clytomanningus* and *Hyashidonus*, are proposed in the Family Processidae. Four new species are described: *Caridina blancoi* from the mouth of the Tayabas River, Luzon, Philippines; *Rhynchocinetes albatrossae* from Surigao Strait, Philippines; *Lysmata philippinensis* from Albay Gulf, Philippines; and *Paralebbeus zygius* from Indonesia; and a new replacement name, *Lysmata kemp*, is proposed for *Lysmata dentata* Kemp (not De Haan). Identification keys are offered for all genera of Processidae and Hippolytidae, Philippine-Indonesian genera of Atyidae, all species of *Rhynchocinetes*, *Clytomanningus*, *Exhippolysmata*, *Latreutes*, *Lysmata*, *Paralebbeus*, *Parhippolyte*, *Saron*, *Thor*, and *Tozeuma*, and the Philippine species of *Caridina*. World checklist of the 37 genera and 280 species and subspecies of the family Hippolytidae herein recognized, with their synonyms, type species, and type localities, is included.

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Introduction

General considerations about the *Albatross* Philippine Expedition and its collections have been presented in Part 1 of this series (Chace, 1983a). Repeated below are those format particulars that are common to all of the parts.

The taxa numbered and itemized are those that are known from the Philippines and Indonesia, whether or not they are represented in the *Albatross* collections; those taken by that Expedition are indicated by an asterisk (*). The genera and species are arranged alphabetically and the latter are numbered sequentially by order of appearance, under each family, in the taxonomic portion of the report. The generic entries comprise at least the reference to the original description, followed by designation of the type species and of the gender of the generic name, a diagnosis, and the geographic and, sometimes, the bathymetric ranges of the genus. The original reference and range are given for each Philippine and/or Indonesian species and subspecies. There has been no attempt to list all references under those taxa headings. Usually, the species and subspecies entries are limited to (1) the original reference and type locality of both senior and junior synonyms mentioned; (2) a reference to a published illustration, if possible; (3) a diagnosis; and (4) the range of the taxon. Under "Material" of species and subspecies represented in the *Albatross* collections are listed the following particulars if known: (1) general locality; (2)

station number; (3) latitude and longitude; (4) depth in meters (in brackets when estimated); (5) character of the bottom; (6) bottom temperature in degrees Celsius; (7) date and astronomical time intervals (hours between midnight and midnight) that the gear operated at the indicated depth; (8) gear used; and (9) the number and sex of the specimens in each lot, with minimum and maximum postorbital carapace lengths in millimeters in square brackets (the numbers and size ranges of ovigerous females are included in the female totals as well as separately). Additional station data may be available in Anonymous (1910). For additional details and illustrations of all caridean genera, see Holthuis (1993).

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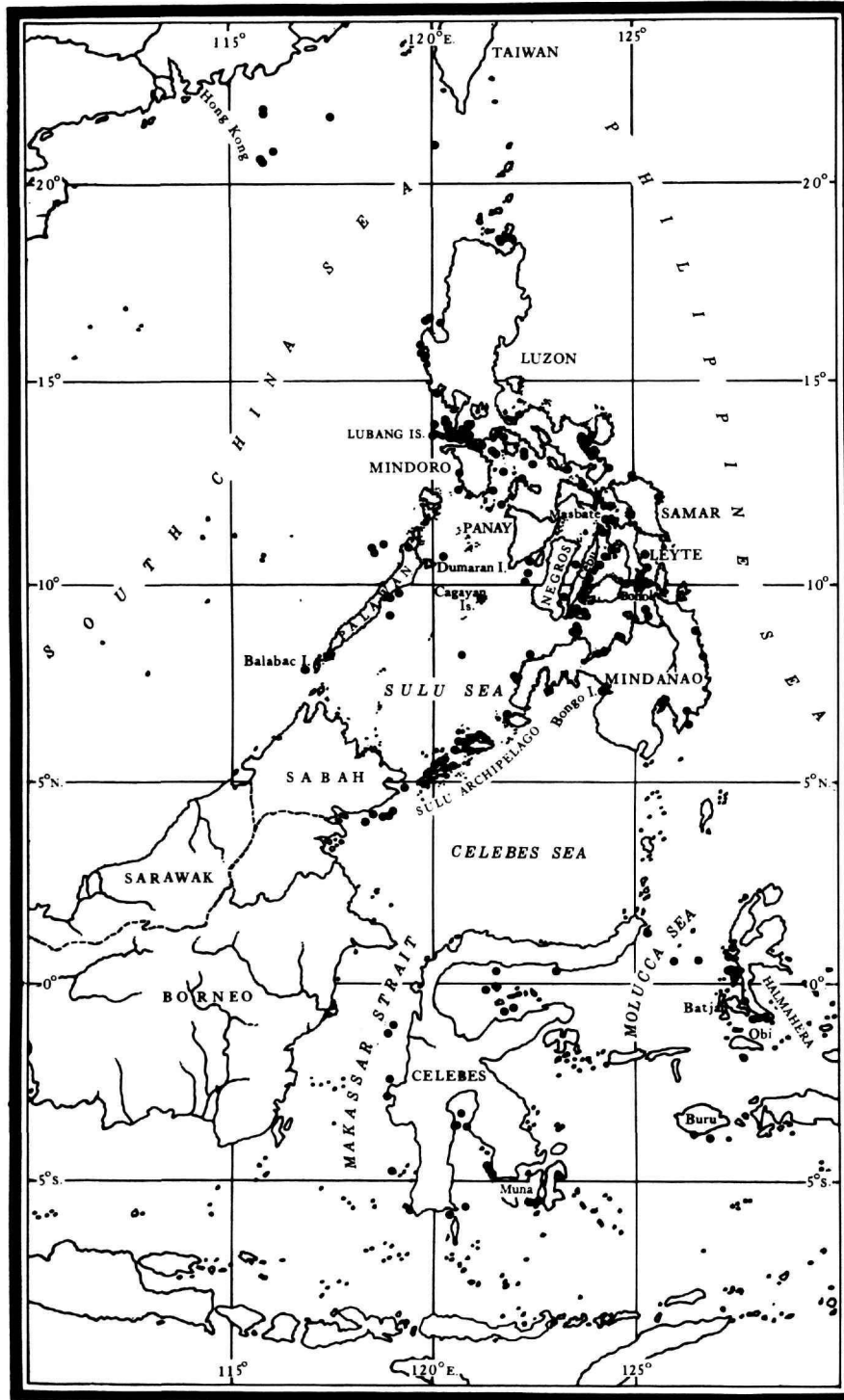


FIGURE 1.—The Philippines and central Indonesia, showing the positions of *Albatross* offshore stations at which caridean shrimps were collected.

ideas about the Bathypalaemonellidae and some of the hippolytid genera. In the course of a visit from Tin-Yam Chan (Institute of Marine Biology, National Taiwan Ocean University in Keelung), we discussed the characters that distinguish the two known species of the Eugonatonotidae. William J. Cooke furnished material of a Hawaiian species of *Lysmata* that clearly showed its affinity to a western Atlantic species, rather than to one from the Indo-Pacific, as previously believed. Charles H.J.M. Fransen (Nationaal Natuurhistorisch Museum in Leiden) prepared detailed drawings to demonstrate that possible morphological distinctions between Pacific and Atlantic populations of two species of *Lysmata* were no more than developmental differences. As with most of the preceding parts of this series, I have profited greatly from the consummate knowledge of decapod crustaceans, especially carideans, of L.B. Holthuis (Leiden Museum) and from his characteristically altruistic willingness to share that knowledge in an effort to preserve and expand our carcinological data base, without regard for his own research agenda. With comparable expertise, Tomoyuki Komai (Natural History Museum and Institute, Chiba, Japan) reviewed the entire manuscript (with the exception of the atyid section) and offered numerous suggestions for improvement. My Smithsonian associate, Raymond B. Manning, has similarly shared his knowledge of the processids and the generic composition of that family. With his customary liberality, C.B. Powell (University of Harcourt, Nigeria) gave permission to publish herein his discovery of *Merguia* in western Africa. Richard Preece (Department of Zoology, University of Cambridge) kindly verified the true type locality of *Nikoides maldivensis*. Curtis W. Sabrosky, Chairman of the Editorial Committee during more than half of the time devoted to the preparation of the Third Edition of the International Code of Zoological Nomenclature, joined Dr. Holthuis in overcoming my resistance to their contention that an "available name," even an "invalid" primary homonym, precludes the adoption of a junior secondary homonym in the case of the hippolytid *Lysmata dentata*. Finally, John Yaldwyn (Museum of New Zealand, Te Papa Tongarewa) facilitated the inclusion of *Hippolysmata morelandi* in the "Key to Species of *Lysmata*" by amplifying his description of that species.

***ATYIDAE De Haan, 1849**

ATYADEA De Haan, 1849:168, 184.
 ATYIDAE Dana, 1852a:13, 16.—Chace, 1992:70, 72, 76.

DIAGNOSIS.—Rostrum, if present, inflexibly attached to rest of carapace. Carapace without longitudinal lateral ridges or suture and without cardiac notch in posterior margin. Eyes neither unusually long nor concealed beneath carapace. Antennule with 2 flagella, neither with accessory branch. Mandible with palp, with subtruncate molar process not distinctly separated from incisor process. Second maxilla with endite well developed, scaphognathite with proximal lobe tapering, bearing series of long setae, and extending far into branchial chamber. First maxilliped with exopod terminating in lash, not in broad, partially detached lobe. Caridean lobe not acutely produced, not overreaching distally produced endite. Second maxilliped with exopod, endopod composed of 4 segments, not terminating in 2 segments attached side-by-side to preceding segment, terminal segment attached to slender, sickle-shaped extension of preceding segment. Third maxilliped composed of 5 segments, slender, pereopod-like. Pereopods usually (except *Limnocaridina*) with strap-like epipods (mastigobranchs) on at least 3 anterior pairs, epipods without naked appendix extending vertically into branchial chamber; 2 anterior pairs of pereopods similar, with fingers of chela usually terminating in tuft of setae; 2nd pereopod with carpus undivided.

RANGE.—Throughout the tropics and most temperate regions of the world; adults almost exclusively confined to fresh water.

REMARKS.—Rather surprisingly, only five of the 35 genera currently recognized throughout the world are apparently known from the Philippine-Indonesian region. Those five may be identified from the following key. Holthuis (1986:104) suggested that the Atyidae be divided into five subfamilies: Xiphocaridinae Ortmann, 1895 (see Chace, 1992:71, 72, 77); Paratyinae Holthuis, 1986; Typhlatyinae Holthuis, 1986; Atyinae De Haan, 1849; and Caridellinae Holthuis, 1986. Of the Philippine-Indonesian genera, *Paratya* belongs to the Paratyinae, *Edoneus* to the Caridellinae, and the remaining three to the Atyinae.

Key to Philippine-Indonesian Genera of Atyidae

1. Carapace armed with supraorbital spine; pereopods bearing exopods . . . *Paratya*
 Carapace not armed with supraorbital spine; pereopods without exopods 2
2. Carapace with pterygostomian angle acute, sometimes spinose; 2nd pereopod with carpus deeply excavate, little if at all longer than wide 3
 Carapace with pterygostomian angle usually rounded; 2nd pereopod with carpus not deeply excavate, distinctly longer than wide 4
3. Telson with posterolateral angles not overreaching setiferous posterior margin *Atyoida*
 Telson with posterolateral angles overreaching setiferous posterior margin *Atyopsis*
4. Eyes pigmented, not degenerate *Caridina*
 Eyes degenerate, not pigmented *Edoneus*

****Atyoida* Randall, 1840**

Atyoida Randall, 1840:140 [type species, by monotypy: *Atyoida bisulcata* Randall, 1840:140; gender: feminine].—Chace, 1983b:4.

Ortmannia Rathbun, 1901:120 [type species, by original designation: *Ortmannia henshawi* Rathbun, 1901:120; gender: feminine].

Pseudatya J. Roux, 1928:209 [type species, by monotypy: *Pseudatya beauforti* J. Roux, 1928:209 (= *Atya pilipes* Newport, 1847:160); gender: feminine].

Vanderbiltia Boone, 1935:159 [type species, by monotypy: *Vanderbiltia rosamondae* Boone, 1935:160 (= *Atya pilipes* Newport, 1847:160); gender: feminine].

DIAGNOSIS.—Carapace without supraorbital spine, pterygostomian angle acute, sometimes bluntly so. Telson with posterolateral angles not overreaching setiferous posterior margin. Eyes pigmented, not degenerate. Pereopods without exopods, 2nd pair with carpus deeply excavate, little if at all longer than wide.

RANGE.—High islands of the Indo-Pacific region from Madagascar to the Philippines and Indonesia and eastward to Hawaii and the Marquesas and Gambier islands.

REMARKS.—A key has been offered by Chace (1983b:4) to the three species of *Atyoida* currently recognized: *A. bisulcata* Randall, 1840, from Hawaii; *A. pilipes* (see below), and *A. serrata* (Bate, 1888) from Madagascar, the Comoro Islands, the Seychelles, Mauritius, and La Réunion.

***1. *Atyoida pilipes* (Newport, 1847)**

Atya pilipes Newport, 1847:160 [type locality: "Apia, Upoln, New Zealand" (corrected to "Apia, Upolu, Navigator or Samoan Group" by Dana, 1852b:533)].

Atyoida pilipes.—Chace, 1983b:10, figs. 3–8 [synonymy].

DIAGNOSIS.—Rostrum bent somewhat ventrad, unarmed or bearing single ventral tooth (less commonly 2 teeth, very rarely 3). Carapace with pterygostomian angle bluntly acute, not spinous. Telson without conspicuous fixed teeth on posterior margin. Chelae dimorphic, either without palmar portion or with palmar portion shorter than movable finger, not trimorphic, with palmar portion longer than movable finger as in some specimens of other 2 species. Maximum postorbital carapace length of males 6.6 mm, of females about 9 mm.

MATERIAL.—PHILIPPINES. Mountain stream back of Romblon, Romblon Island, Sibuyan Sea [12°35'N, 122°15'E], 26 Mar 1908: 1 male [6.6].—Nonucan River, Iligan Bay, Mindanao, 8°13'N, 124°2'E, 6 Aug 1909 (0800), dynamite: 18 males [5.0–5.6], 26 females [5.8–8.3], 15 ovig. [5.8–8.3].

RANGE.—Philippines and eastern Lesser Sunda Islands, Indonesia, eastward through the Pacific high islands, as far north as Rota in the Marianas at about 14°N, as far south as Rapa in the Iles Tubuai at about 27½°S, and as far east as Magareva in the Iles Gambier at about 135°W.

****Atyopsis* Chace, 1983**

Atyopsis Chace, 1983b:26 [type species, by original designation: *Atya spinipes* Newport, 1847:159; gender: feminine].

DIAGNOSIS.—Carapace without supraorbital spine, pterygostomian angle spinous. Telson with posterolateral angles overreaching setiferous posterior margin. Eyes pigmented, not degenerate. Pereopods without exopods, 2nd pair with carpus deeply excavate, little if at all longer than wide.

RANGE.—High islands of the Indo-Pacific region from Sri Lanka to the Philippines and Indonesia eastward to the Samoa Islands and the Asiatic mainland from India to Thailand and the Malay Peninsula.

REMARKS.—A key to the two closely related species of *Atyopsis*, which seem to have similar geographic ranges, was included in Chace (1983b:27). Those key characters are used below in the diagnoses of the two species.

2. *Atyopsis moluccensis* (De Haan, 1849)

Atya moluccensis De Haan, 1849:186, pl. O [type locality: Moluccas, Indonesia].

Atyopsis moluccensis.—Chace, 1983b:27, figs. 16–19 [synonymy].

DIAGNOSIS.—Rostrum gradually tapering to slender apex, armed ventrally with 7–16 (commonly 10–14) indistinct serrations. Endopod of 1st pleopod of male less than 1½ times as long from proximal articulation to base of retinaculate projection as maximum width, not including marginal spines. Maximum postorbital carapace length about 25 mm.

Range.—Sri Lanka through Thailand and Malaya to Sumatra, Java, Bali, Sarawak, Celebes, and Moluccas in Indonesia and possibly the Philippines.

***3. *Atyopsis spinipes* (Newport, 1847)**

Atya spinipes Newport, 1847:159 [type locality: Philippine Islands].

Atyopsis spinipes.—Chace, 1983b:35, figs. 20–22 [synonymy].

DIAGNOSIS.—Rostrum rather abruptly narrowing to somewhat broad apex, armed ventrally with 2–6 discrete teeth. Endopod of 1st pleopod of male more than 1¾ times as long from proximal articulation to base of retinaculate projection as maximum width, not including submarginal spines. Maximum postorbital carapace length about 20 mm.

MATERIAL.—PHILIPPINES. Near mouth of Tayabas River, Luzon [13°54'N, 121°36'E], 25 Feb 1909: 1 male [13.0].—"Cabugao" River, Catanduanes Island [13°37'N, 124°17'E], 9 Jun 1909 (0900), 25-foot seine: 1 male [13.0].—"Varadero Mountain," Mindoro (?), 23 Jul 1908: 1 female [13.7].—Malaga River, Hinunangan Bay, Leyte [10°24'N, 125°12'E], 30 Jul 1909: 1 female [10.7] 4 juveniles [2.9–5.0]. Mananga River, Cebu [10°14'N, 123°50'E], 25 Aug 1909: 1 female [11.3].

RANGE.—Ryukyu Islands, Taiwan, Philippines, eastward to Caroline, Fiji, and Samoa islands.

****Caridina* H. Milne Edwards, 1837**

Caridina H. Milne Edwards, 1837:362 [type species, by monotypy: *Caridina typus* H. Milne Edwards, 1837:363; gender: feminine].

DIAGNOSIS.—Carapace without supraorbital spine, pterygostomial margin usually rounded. Telson with posterolateral angles sometimes produced posteriorly but never overreaching setiferous posterior margin. Eyes usually well pigmented, not degenerate. Pereopods without exopods, 2nd pair with carpus not deeply excavate, distinctly longer than wide.

RANGE.—Western equatorial Africa, Egypt, eastern Africa from Somalia to Natal, Madagascar and neighboring islands, Syria, Iran, Iraq, India, Sri Lanka, Burma, Andaman Islands, Malaya, Viet Nam, China, Korea, Japan, Ryukyu Islands, Philippines, Indonesia, Papua New Guinea, Bismarck Archipelago, northern and eastern Australia, New Caledonia, Fiji Islands, Hawaii, Marquesas Islands, and Rapa.

REMARKS.—Few caridean groups offer taxonomic problems of greater difficulty than do the approximately 160 species and subspecies that are currently recognized in this genus. Populations with restricted ranges that seem to have acquired reasonably constant morphological characters may be nearly indistinguishable from highly variable species that range widely through the Indo-Pacific region and even Africa. In spite of the painstaking studies of such eminent carcinologists

as Bouvier, Holthuis, De Man, Ortmann, and J. Roux, few populations can yet be named with satisfactory confidence, and the material collected by the *Albatross* Philippine Expedition is no exception. For that reason, I have tried to illustrate the presumed species in that collection in some detail in order to minimize the confusion that could result from misidentifications.

Although tropical freshwater shrimps have rather finely drawn habitat preferences, there is some indication that nearly all of the species occurring in a broad geographic region may be found in a single stream, if that stream offers the required habitats. Such a postulate seems to be supported by the *Caridina* material in the present collection. Of the eight species represented, no less than six were taken from the Malaga River, on Leyte, five were found in the Calawagan River on Mindoro, and four were collected from the Baganga River on Mindanao.

Hopefully, I have listed all of the species that have been recorded from the Philippines and Indonesia, but attempts to construct a key to the species known from the entire area had to be curtailed because of incomplete descriptions in the literature. The key that follows is limited only to the species recorded from the Philippines.

Key to Philippine Species of *Caridina*

1. Rostrum ascendent in anterior 1/2, overreaching antennal scale. (Rostrum armed dorsally and ventrally. No more than 3 teeth on carapace posterior to orbital margin; ventral angle of orbit not indistinguishably fused with antennal spine. Sublateral pair of spines on posterior margin of telson longer than intermediate pairs. Stylocerite not reaching nearly as far as distal margin of basal segment of antennular peduncle.) 2
 Rostrum nearly horizontal or slightly downcurved anteriorly; if overreaching antennal scale, unarmed dorsally. (Posterior margin of telson with median triangular projection or fixed tooth.) 5
2. Rostrum unarmed on anterior 1/2 of dorsal margin. First pereopod with carpus deeply excavate for reception of proximal portion of chela. Third pereopod with dactyl little more than twice as long as wide. (Telson with median triangular projection on posterior margin. Eggs small, less than 0.5 mm in major diameter.) *8. *C. brevicarpalis endehensis*
 Rostrum with 1-3 subapical teeth separated from rest of dorsal series. First pereopod with carpus not deeply excavate. Third pereopod with dactyl about 4 times as long as wide 3
3. Telson with posterior margin of telson regularly convex, without median triangular projection. Eggs large, at least 0.8 mm in major diameter *28. *C. nilotica*
 Telson with posterior margin bearing median triangular projection. Eggs small, less than 0.5 mm in major diameter 4
4. Rostrum very long and slender, armed on posterior portion of dorsal margin with 5-11 rather widely spaced teeth, including at most 1 on carapace posterior to orbital margin *14. *C. gracilirostris*
 Rostrum not extremely long and slender, armed on posterior portion of dorsal margin with close-set series of 13-27 teeth, including 1-3 on carapace posterior to orbital margin *23. *C. longirostris*

5. Rostrum unarmed ventrally. (Rostrum with 1 or more dorsal teeth, but none on carapace posterior to orbital margin. Ventral angle of orbit fused with antennal spine. Stylocerite not reaching as far as distal margin of basal segment of antennular peduncle. First pereopod with carpus not deeply excavate.) 6
 Rostrum with 1 or more teeth on ventral margin 7
6. Rostrum reaching about as far as distal margin of 1st segment of antennular peduncle, armed dorsally with 1 tooth at about midlength 9. *C. celestinoi*
 Rostrum reaching about as far as midlength of 2nd segment of antennular peduncle, armed dorsally with 8–10 teeth 19. *C. leytenensis*
7. Rostrum unarmed dorsally. (Ventral angle of orbit fused with antennal spine. Stylocerite not reaching as far as distal margin of basal segment of antennular peduncle. First pereopod with carpus deeply excavate. Eggs small, less than 0.5 mm in major diameter.) 8
 Rostrum with 9 or more dorsal teeth. (Rostrum not reaching as far as distal end of antennular peduncle.) 9
8. Rostrum not nearly reaching level of distal end of antennular peduncle. Telson without prominent posteromedian projection. First pereopod with fingers shorter than palm of chela. Third pereopod with carpus about 3 times as long as wide 39. *C. typus*
 Rostrum extending nearly as far as or slightly beyond distal end of antennular peduncle. Telson with prominent posteromedian projection. First pereopod with fingers slightly longer than palm of chela. Third pereopod with dactyl less than 3 times as long as wide *40. *C. villadolidi*
9. First pereopod with carpus 3–4 times as long as wide, not deeply excavate for reception of chela. Third pereopod with dactyl more than 4 times as long as wide. (Three or more teeth of dorsal rostral series situated on carapace posterior to orbital margin. Telson with posterior margin bearing median triangular projection.) 10
 First pereopod with carpus no more than twice as long as wide, deeply excavate for reception of chela. Third pereopod with dactyl no more than 3½ times as long as wide. (Telson with sublateral pair of spines on posterior margin shorter than seta-like intermediate pairs.) 11
10. Rostrum with dorsal spines decreasing regularly in size from posteriormost to anteriormost, 3 situated on carapace posterior to orbital margin. Telson with sublateral pair of spines on posterior margin longer than intermediate pairs. Stylocerite falling short of distal margin of basal segment of antennular peduncle *6. *C. blancoi*, new species
 Rostrum with dorsal spines smallest posteriorly and anteriorly, longest near middle of series, 5–13 situated on carapace posterior to orbital margin. Telson with sublateral pair of spines on posterior margin shorter than seta-like intermediate pairs. Stylocerite overreaching distal margin of basal segment of antennular peduncle *33. *C. serratirostris*
11. No teeth of dorsal rostral series situated on carapace posterior to orbital margin. Telson with posterior margin bearing median triangular projection *18. *C. laoagensis*
 About 3 teeth of dorsal rostral series situated on carapace posterior to orbital margin. Telson with posterior margin regularly convex, without median triangular projection 16. *C. laevis* Blanco [not Heller]

4. *Caridina acutirostris* Schenkel, 1902

Caridina acutirostris Schenkel, 1902:496, pl. 8: figs. 3a–c, 4b [type locality: south of Danau Poso, Sulawesi (Celebes), Indonesia].—Bouvier, 1925:166, figs. 353–355.

DIAGNOSIS.—Rostrum not reaching as far as distal end of antennular peduncle, slightly upturned anteriorly, armed dorsally with 10 teeth in posterior ½, including 3 on carapace posterior to orbital margin, without subapical teeth, armed

ventrally with 6 teeth. Suborbital angle obscure but not completely fused with antennal spine; pterygostomian margin of carapace rounded. Sublateral pair of posterior telson spines longer than intermediate pairs. Stylocerite reaching nearly as far as distal end of basal segment of antennular peduncle. Carpus of 1st pereopod slightly, not deeply, excavate for reception of chela. Epipods on all but 5th pereopod. Maximum postorbital carapace length 5.2 mm.

RANGE.—Known only from the female holotype.

5. *Caridina atyoides* Nobili, 1900

Caridina atyoides Nobili, 1900:478 [type locality: Sioban, Pulau, Sipura, Kepulauan Mentawai, off west coast of Sumatra, Indonesia].—Bouvier, 1925:256, figs. 587–591.—J. Roux, 1928: 205.

DIAGNOSIS.—Rostrum short, triangular, not reaching as far as distal end of basal segment of antennular peduncle, sloping ventrad, unarmed dorsally, ventral margin with 0–2 teeth anteriorly. Suborbital angle fused with obtuse, nondentate antennal lobe; pterygostomian margin obtuse, not dentate. Telson with small posteromedian projection, lateral pair of spines on posterior margin shorter than seta-like intermediate pairs. Stylocerite not reaching as far as distal margin of basal segment of antennular peduncle. First pereopod with fingers slightly longer than palm of chela, carpus $1\frac{1}{2}$ times as long as wide, rather deeply excavate distally for reception of chela. Third pereopod of male robust, merus armed with strong fixed spine near distal end of flexor margin, followed by crest surmounted by 2 or 3 denticles. Epipods on all but 5th pereopod. Eggs small, 0.38–0.40 mm in major diameter. Maximum postorbital carapace length about 8 mm.

RANGE.—Western Sumatra and Seram, Indonesia.

REMARKS.—It seems unlikely that this species can long remain in the genus *Caridina* merely because of the elongate carpi of the first and second pereopods. The general facies of the shrimp, the robust third pereopod of the male, and, especially, the form of the appendix masculina on the second pleopod all suggest a closer relationship to *Atya* than to *Caridina*, but it is probably best to await a revisionary study of the family before removing the species from the present genus.

*6. *Caridina blancoi*, new species

FIGURE 2

DIAGNOSIS.—Rostrum (Figure 2a) not reaching as far as distal end of antennular peduncle, sloping ventrad anteriorly, armed dorsally with 18 teeth, including 3 on carapace posterior to orbital margin, apex unarmed, armed ventrally with 2 teeth. Suborbital angle acute, distinctly separated from antennal spine; pterygostomian margin rounded. Telson (Figure 2c,d) with small posteromedian projection, sublateral pair of spines longer than intermediate pairs. Stylocerite (Figure 2f) not reaching as far as distal margin of basal segment of antennular peduncle. First pereopod (Figure 2i) with fingers longer than

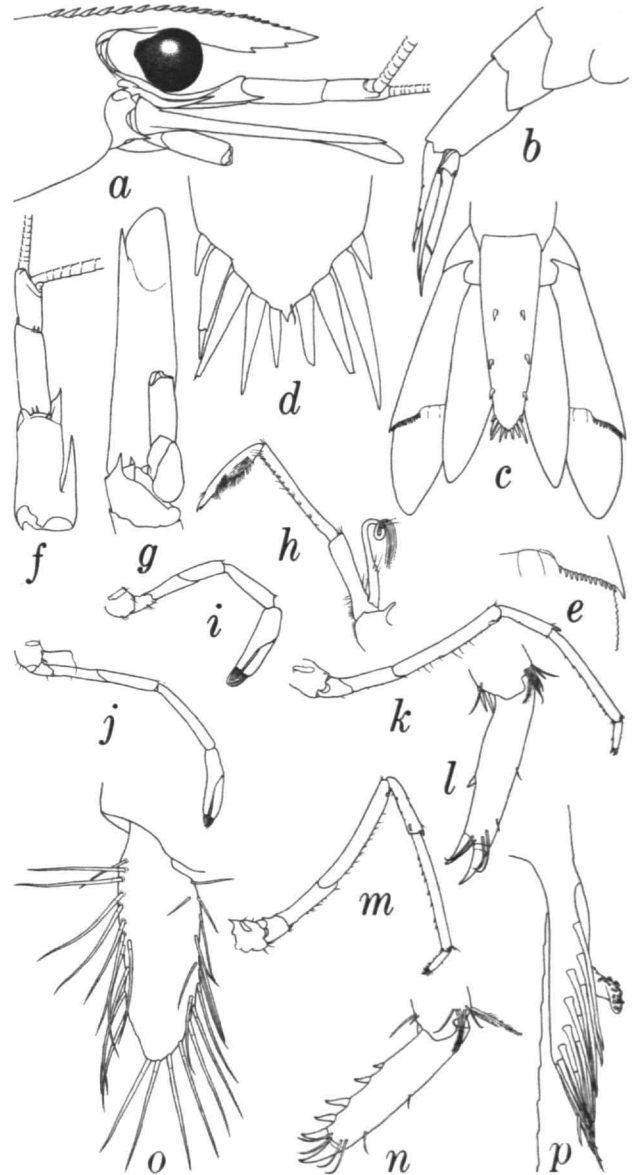


FIGURE 2.—*Caridina blancoi*, new species, male holotype from near mouth of Tayabas River, Luzon, carapace length 2.9 mm: a, anterior carapace and appendages, lateral aspect; b, posterior abdomen, lateral aspect; c, tail fan, dorsal aspect; d, posterior margin of telson, dorsal aspect; e, diaeresis of exopod of right uropod; f, right antennule, dorsal aspect; g, right antenna, ventral aspect; h, right 3rd maxilliped; i, right 1st pereopod; j, right 2nd pereopod; k, right 3rd pereopod; l, same, dactyl; m, right 4th pereopod; n, same, dactyl; o, endopod of right 1st pleopod; p, right appendix masculina and appendix interna.

palm, carpus more than 4 times as long as wide, not deeply excavate distally. Third pereopod (Figure 2k,l) with dactyl more than 5 times as long as wide. Epipods on all but 5th

pereopod. Postorbital carapace length 2.9 mm.

MATERIAL.—PHILIPPINES. Near mouth of Tayabas River, Luzon [13°54'N, 121°36'E], 25 Feb 1909: 1 male holotype, USNM 264045.

TYPE LOCALITY.—Tayabas River, Luzon.

RANGE.—Known only from the type specimen.

REMARKS.—The proposal of a new species, based on a single specimen, in a genus that is noteworthy for its variable species, may be questionable, but it seems desirable to call attention to a taxon that apparently differs from all others known in a combination of characters: the form and dentition of the rostrum and telson; the prominence of the suborbital angle; and the form of the chelae and carpi of the two anterior pereopods and of the dactyls of the third and fourth pereopods.

ETYMOLOGY.—The species is named for Guillermo J. Blanco, whose two commendable papers on the atyids of the Philippines have been the only available guides to the identity of these little shrimps that are so abundant and important as a secondary source of food throughout those islands.

7. *Caridina brevicarpalis brevicarpalis* De Man, 1892

Caridina brevicarpalis De Man, 1892:397, pl. 24: fig. 30–30d [type locality: near Palopo, Sulawesi (Celebes), Indonesia].—Bouvier, 1925:178, figs. 372–374.—Edmondson, 1935a:7, fig. 2a–f.

DIAGNOSIS.—Rostrum slightly overreaching antennular peduncle, dorsal margin nearly horizontal, armed with 11–14 teeth on posterior $\frac{2}{3}$, none on carapace posterior to orbital margin or on anterior $\frac{1}{3}$ of rostrum, armed ventrally with 4–7 teeth. Suborbital angle fused with antennal spine; pterygostomian margin rounded. Stylocerite not reaching as far as distal margin of basal segment of antennular peduncle. Carpus of 1st pereopod no longer than wide, deeply excavate for reception of chela. Epipods on all but 5th pereopod. Eggs with major diameter of about 0.53 mm. Maximum postorbital carapace length about 7 mm.

DISTRIBUTION.—Sulawesi (Celebes) and Waigeo islands, Indonesia, and Fiji Islands.

*8. *Caridina brevicarpalis endehensis* De Man, 1892

FIGURE 3

Caridina brevicarpalis var. *endehensis* De Man, 1892:399, pl. 24: fig. 30e [type locality: Nuawari, near Ende, Flores, Indonesia].—Bouvier, 1925:34, 180, pl. 2: fig. 25.—Blanco, 1935:34, pl. 2: fig. 25.

DIAGNOSIS (Philippine specimens).—Rostrum (Figure 3a) far overreaching antennal scale, ascendant in anterior $\frac{1}{2}$, armed dorsally in posterior $\frac{1}{2}$ with 9–23 teeth, including 0 or 1 on carapace posterior to orbital margin, dorsally unarmed in anterior $\frac{1}{2}$, armed ventrally with 4–24 teeth. Suborbital angle subrectangular, distinct from antennal spine; pterygostomian margin rounded. Telson (Figure 3c,d,f) with rather prominent posteromedian projection elevated above true posterior margin, sublateral pair of posterior spines longer than intermediate

pairs. Stylocerite (Figure 3g) falling far short of distal margin of basal segment of antennular peduncle. Carpus of 1st pereopod (Figure 3j) about $1\frac{1}{2}$ times as long as wide, deeply excavate for reception of chela. Third pereopod (Figure 3l,m) with dactyl little more than twice as long as wide. Epipods on all but 5th pereopod. Eggs small, major diameter little more than 0.4 mm. Maximum postorbital carapace length 7.3 mm.

MATERIAL.—PHILIPPINES. Calawagan River 3 miles [4.8 km] from mouth, Mindoro [13°25'N, 120°28'E], 11 Dec 1908 (1500), 16' seine: 2 ovig. females [5.2, 5.8].—Malaga River, Leyte [10°24'N, 125°12'E], 30 Jul 1909: 248 males [2.2–3.8] 334 females [2.2–7.3], 138 ovig. [4.5–7.3], 146 juv [1.3–2.1].—Baganga River, Mindanao [7°35'N, 126°33'E], 13 May 1908 (1300): 1 ovig. female [6.0].

RANGE.—Philippines and Flores and Sumba, Indonesia.

REMARKS.—The rostrum is so long in Philippine specimens that they resemble *C. longirostris* and even *C. gracilirostris*, but they can be readily distinguished from those species by the absence of a subapical tooth on the rostrum, as well as by the distinct form of the pereopods. The rostrum, suborbital angle, and posterior spines of the telson are so very different from those in the typical form of *C. brevicarpalis* that the identification of these specimens as subspecies of that species is justified only because of the desirability of avoiding name changes until taxa are studied more intensively.

9. *Caridina celestinoi* Blanco, 1939

Caridina celestinoi Blanco, 1939:392, pl. 3: figs. 8–10 [type locality: mountain stream at "Helosig," Leyte, Philippines].

DIAGNOSIS.—Rostrum very short, not overreaching basal segment of antennular peduncle, dorsal margin nearly horizontal, armed with single tooth at about midlength, ventral margin unarmed but with pair of long divergent setae in posterior $\frac{1}{2}$. Suborbital angle fused with antennal spine; pterygostomian margin acute. First pereopod with carpus nearly 3 times as long as wide, not excavate distally for reception of chela. Maximum postorbital carapace length probably no more than 1 mm.

RANGE.—Known only from the unique type specimen.

REMARKS.—Until additional material becomes available, the possibility must be considered that *C. celestinoi* merely represents the juvenile form of *C. leytensis*, a species found in the same general area.

10. *Caridina cognata* De Man, 1915

Caridina cognata De Man, 1915:397, pl. 28: figs. 3–3g, 4–4b [type locality: several localities in northern New Guinea].

DIAGNOSIS.—Rostrum seldom overreaching antennular peduncle, dorsal margin usually almost horizontal, occasionally curving dorsad distally, armed with 11–27 teeth, including 0–4 on carapace posterior to orbital margin, usually without subapical teeth, armed ventrally with 0–10 teeth. Suborbital angle almost completely fused with antennal spine; pterygosto-

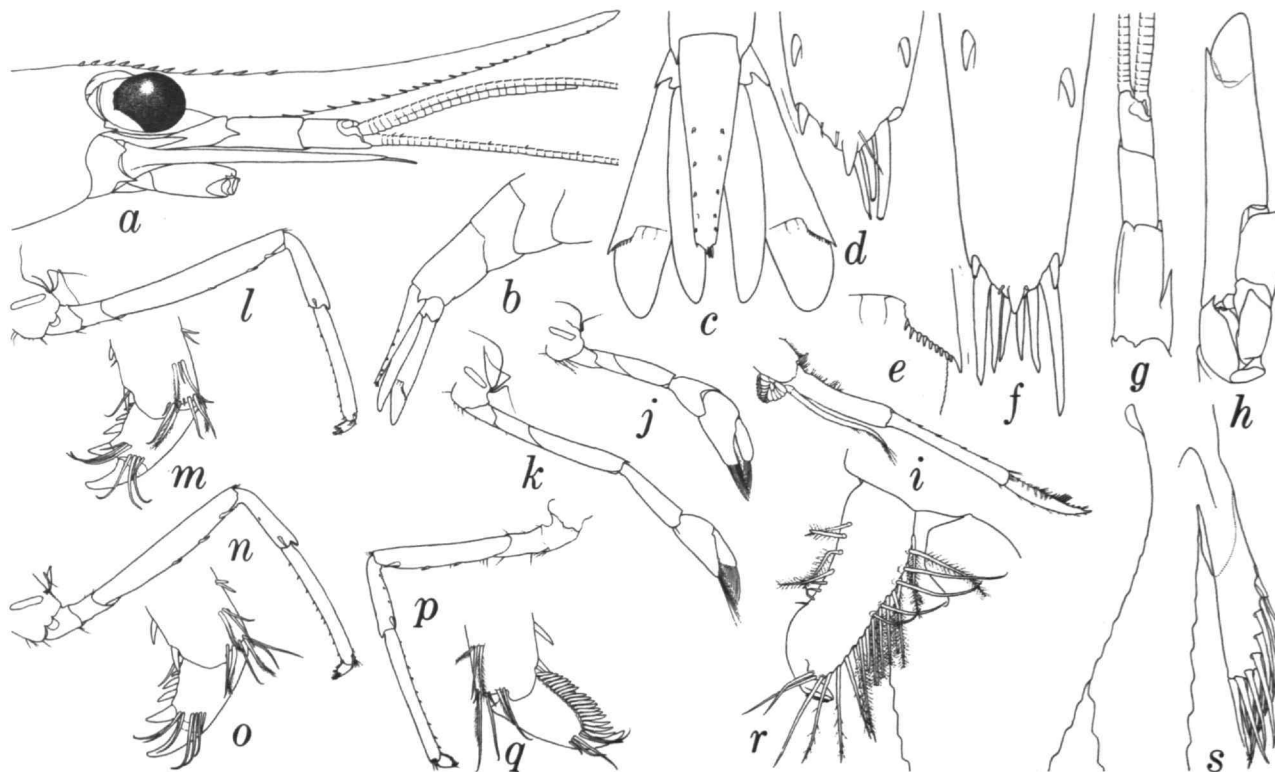


FIGURE 3.—*Caridina brevicarpalis endehensis*, a,f-s, male from Malaga River, Hinunangan Bay, Leyte, carapace length 3.6 mm; b-e, male from same locality, carapace length 3.3 mm: a, anterior carapace and appendages, lateral aspect; b, posterior abdomen, lateral aspect; c, tail fan, dorsal aspect; d, posterior margin of telson, dorsal aspect; e, diaeresis of exopod of right uropod; f, posterior end of telson, dorsal aspect; g, right antennule, dorsal aspect; h, right antenna, ventral aspect; i, right 3rd maxilliped; j, right 1st pereopod; k, right 2nd pereopod; l, right 3rd pereopod; m, same, dactyl; n, right 4th pereopod; o, same, dactyl; p, left 5th pereopod; q, same, dactyl; r, endopod of right 1st pleopod; s, right appendices masculina and interna.

mian margin rounded. Stylocerite falling slightly short of distal margin of basal segment of antennular peduncle. First pereopod with fingers longer than palm of chela, carpus more than twice as long as wide, not deeply excavate distally. Third pereopod with dactyl about 4 times as long as wide. Eggs large, major diameter 0.9-1.0 mm. Maximum postorbital carapace length probably about 4 mm.

RANGE.—Known only from the type series.

11. *Caridina demani* J. Roux, 1911

Caridina demani J. Roux, 1911:94 [type locality: Tawarin River, north coast of West New Guinea, Indonesia].

Caridina De Mani.—Bouvier, 1925:172, figs. 361, 362.

DIAGNOSIS.—Rostrum reaching, at most, as far as distal end of antennular peduncle, dorsal margin nearly horizontal, armed with 10-20 teeth, including 2 or 3 on carapace posterior to orbital margin, without subapical teeth, armed ventrally with 0-5 teeth. Suborbital angle indistinct, partially fused with

antennal spine; pterygostomian margin blunt, slightly wider than rectangular. Telson with sublateral posterior spines longer than intermediate pairs. Stylocerite not reaching quite as far as distal margin of basal antennular segment. First pereopod with fingers slightly longer than palm. Epipods on all except 5th pereopod. Eggs rather large, major diameter about 0.75 mm; maximum postorbital carapace length probably about 3.6 mm.

RANGE.—New Guinea.

12. *Caridina ensifera* Schenkel, 1902

Caridina ensifera Schenkel, 1902:490, pl. 8: figs. 1a-e, 4d [type locality: Danau Poso, Sulawesi (Celebes), Indonesia].—Bouvier, 1925:163, figs. 344-352.

DIAGNOSIS.—Rostrum far overreaching antennal scale, ascendant in anterior $\frac{2}{3}$, armed dorsally with 9-15 teeth in posterior $\frac{1}{2}$, including 1-3 on carapace posterior to orbital margin, without subapical teeth, armed ventrally with 14-26 teeth. Suborbital angle distinct but not produced; pterygosto-

mian margin very obscurely angular. Telson without posteromedian projection, sublateral pair of posterior spines longer than intermediate pairs. Stylocerite not reaching as far as margin of basal segment of antennular peduncle. First pereopod with fingers distinctly longer than palm, carpus 4 times as long as wide, not deeply excavate distally. Three posterior pereopods without epipods. Major diameter of eggs 0.6 mm. Maximum postorbital carapace length about 5.5 mm.

RANGE.—Known only from the type locality.

13. *Caridina fecunda* J. Roux, 1911

Caridina fecunda J. Roux, 1911:95 [type locality: Danau Jamur, West New Guinea, Indonesia].—Bouvier, 1925:176, figs. 368–371.

DIAGNOSIS.—Rostrum falling slightly short of or slightly overreaching distal end of antennular peduncle, dorsal margin almost horizontal, armed nearly to apex with 18–23 teeth, including 3 on carapace posterior to orbital margin, armed ventrally with 5–7 teeth. Suborbital angle obscure, almost completely fused with antennal spine; pterygostomian margin broadly rounded. Telson apparently lacking posteromedian projection, sublateral pair of posterior spines longer than intermediate pairs. Stylocerite not nearly reaching level of distal margin of basal segment of antennular peduncle. First pereopod with fingers $\frac{1}{2}$ again as long as palm of chela, carpus 3 times as long as wide, not excavate for reception of chela. Epipods well developed on 3 anterior pereopods, absent from 4th and 5th. Eggs large, major diameter 0.8 mm. Maximum postorbital carapace length probably about 3 mm.

RANGE.—Known only from the type locality.

*14. *Caridina gracilirostris* De Man, 1892

FIGURE 4

Caridina gracilirostris De Man, 1892:399, pl. 25: fig. 31–31d [type locality: Balangnipa, Sulawesi (Celebes), Indonesia].—Bouvier, 1925:142, figs. 305–307.—Blanco, 1935:32, pl. 2: figs. 11–17.—Holthuis, 1965:23, fig. 7.

DIAGNOSIS.—Rostrum (Figure 4a) reaching far beyond distal end of antennal scale, curving strongly dorsad throughout, armed dorsally in posterior $\frac{1}{2}$ with 7–13 widely spaced teeth, rarely including 1 or 2 on carapace posterior to orbital margin, armed ventrally with 15–34 teeth. Suborbital angle distinct, subrectangular or subacute; pterygostomian margin rounded. Telson (Figures 4c,d) with posteromedian projection elevated above true posterior margin, sublateral pair of posterior spines longer than intermediate pairs. Stylocerite (Figure 4f) not nearly reaching level of distal margin of basal segment of antennular peduncle. First pereopod (Figure 4i) with fingers longer than palm of chela, carpus more than twice as long as wide, not excavate distally for reception of chela. Third pereopod (Figure 4k,l) with dactyl more than 4 times as long as wide. Epipods on all but 5th pereopod. Eggs small, major diameter little more than 0.4 mm. Maximum postorbital

carapace length about 7 mm.

MATERIAL.—PHILIPPINES. “Cabugao” River, Catanduanes Island [13°37'N, 124°17'E], 9 Jun 1909 (0900), 25' seine: 9 females [4.9–6.3], 6 ovig. [5.0–5.9].—Nato River, Lagonoy Gulf, Luzon, 13°36'N, 123°33'E, tidewater, 18 Jun 1909: 9 males [3.8–4.3] 192 females [4.3–6.8], 176 ovig. [4.7–6.8].—Paluan River, Mindoro [13°25'N, 120°28'E], 4 Dec 1908; 130' seine: 1 ovig. female [4.5].—Calawagan River, 3 miles [4.8 km] from mouth, Mindoro [13°25'N, 120°28'E], 11 Dec 1908 (1500), 16' seine: 7 males [3.2–4.1] 8 females [3.5–4.7].—Pangauaran River, Port Caltom, Busuanga Island [12°11'N, 120°05'E], 16 Dec 1908 (0700), 25' seine: 5 males [3.5–3.9] 7 females [4.3–4.9], 4 ovig. [4.3–4.9].—Malaga River, Hinunangan Bay, Leyte [10°24'N, 125°12'E], 30 Jul 1909: 67 males [2.7–4.1], 32 females [3.4–5.5], 28 ovig. [4.2–5.5].—Baganga River, Mindanao [7°35'N, 126°33'E], 13 May 1908 (1300): 3 males [3.4–5.6], 1 female with abdominal bopyrid [5.6].—Zamboanga Canal, Mindanao [6°54'N, 122°04'E], 8 Oct 1909, 25' seine: 1 male [2.9].

BORNEO. “Tawao” River, 30 Sep 1909 (0930), mud, sand; dynamite: 1 male [3.9].

RANGE.—Madagascar, India, Philippines, Indonesia, and Palau [Belaue], Caroline Islands.

REMARKS.—Philippine specimens seem to agree well with those described from Madagascar by Holthuis (1965), except in the armature of the telson, especially of the posterior margin, which is noted by Holthuis as lacking intermediate spines or with only a single pair.

In three of the eight males from the Calawagan River, Mindoro, with carapace lengths of 3.2 to 3.6 mm, the appendix interna on the endopod of the first pleopod is rudimentary (Figure 4s). In the large male from the Baganga River, Mindanao, on the other hand, the endopod of the first pleopod is extended as in adult females (Figure 4t).

The single small male from the Zamboanga Canal, Mindanao, differs from all of the other specimens in having two teeth of the dorsal series situated on the carapace posterior to the orbital margin and in having the suborbital angle unusually produced; in this specimen, also, there are more (13) than the usual number of dorsal rostral teeth and fewer (17) than the usual number of ventral teeth.

15. *Caridina laevis* Heller, 1862

Caridina laevis Heller, 1862a:411 [type locality: Java, Indonesia].—Bouvier, 1925:183, figs. 382–385.

DIAGNOSIS.—Rostrum not overreaching antennular peduncle, dorsal margin slightly sinuous, armed with 14–22 teeth, including 3 or 4 on carapace posterior to orbital margin, without subapical teeth, armed ventrally with 4–15 teeth. Pterygostomian margin bluntly subrectangular or obtuse. Telson with sublateral pair of posterior spines longer than intermediate pairs. Stylocerite not reaching level of distal

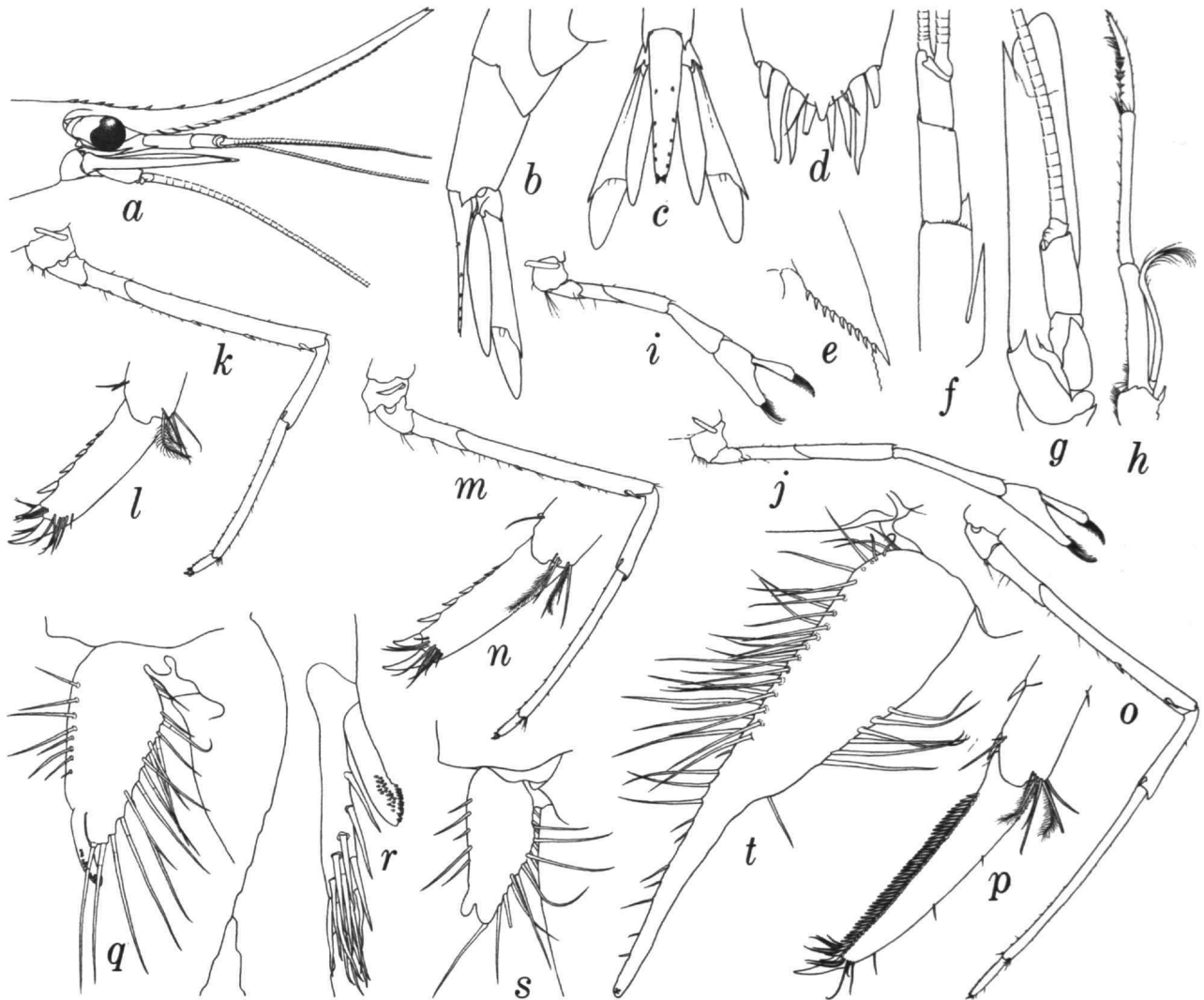


FIGURE 4.—*Caridina gracilirostris*, a–r, male from Nato River, Lagonoy Gulf, Luzon, carapace length 4.25 mm; s, male from Calawagan River, Mindoro, carapace length 3.7 mm; t, male from Baganga River, Mindanao, carapace length 5.6 mm: a, anterior carapace and appendages, lateral aspect; b, posterior abdomen; c, tail fan, dorsal aspect; d, posterior margin of telson, dorsal aspect; e, diaeresis of exopod of right uropod; f, right antennule, dorsal aspect; g, right antenna, ventral aspect; h, right 3rd maxilliped; i, right 1st pereopod; j, right 2nd pereopod; k, right 3rd pereopod; l, same, dactyl; m, right 4th pereopod; n, same, dactyl; o, right 5th pereopod; p, same, dactyl; q, endopod of right 1st pleopod; r, right appendix masculina and appendix interna; s, endopod of right 1st pleopod; t, endopod of left 1st pleopod.

margin of basal segment of antennular peduncle. First pereopod with fingers much longer than palm of chela, carpus $2\frac{1}{2}$ times as long as wide, only slightly excavated distally for reception of chela. Epipods well developed on 2 anterior pereopods, reduced, rudimentary, or absent on 3 posterior pairs. Eggs large, major diameter 0.70–0.91 mm. Maximum postorbital carapace length probably about 5 or 6 mm.

RANGE.—Known with certainty only from Java.

16. *Caridina laevis* Blanco, 1935 [not Heller]

Caridina laevis.—Blanco, 1935:34, pl. 3: figs. 26–32.

DIAGNOSIS.—Rostrum not overreaching antennal scale, dorsal margin faintly convex, armed nearly to apex with 15–19

teeth, including 2-5 on carapace posterior to orbital margin, armed ventrally with 2-6 depressed teeth. Telson without posteromedian projection, sublateral pair of posterior spines slightly longer than mesially adjacent pair but considerably shorter than intermediate pairs of setae. First pereopod with fingers slightly shorter than palm of chela, carpus about as wide as long, deeply excavate for reception of chela. Third pereopod with dactyl slightly less than 3 times as long as wide. Maximum postorbital carapace length probably about 4 mm.

LOCALITY.—“Pulamgue” Lake, Albay Province, Luzon, Philippines.

REMARKS.—The specimens assigned to *C. laevis* by Blanco almost surely do not belong to the species from Java described by Heller, as indicated by the different arrangement of spines on the posterior margin of the telson and the very different form of the chela and carpus of the first pereopod. Blanco's specimens seem to be nearer *P. pareparensis* from Sulawesi (Celebes), but they apparently differ from that species in having a larger mean number of ventral teeth on the rostrum, the carpus of the first pereopod slightly shorter and more deeply excavate, and the posterior margin of the telson armed differently. It seems best, however, not to propose a new name for the Philippine population until it can be re-examined and re-described.

17. *Caridina lanceolata* Woltereck, 1937

Caridina lanceolata Woltereck, 1937a:224, figs. I, 7a-c; pls. 3, 6 [type locality: lakes in central Sulawesi (Celebes), Indonesia]; 1937b:307, fig. 11.

DIAGNOSIS.—Rostrum far overreaching antennal scale, dorsal margin strongly incurved, armed with 10-16 teeth, chiefly in posterior $\frac{1}{2}$, including 0-4 on carapace posterior to orbital margin and 1-3 subapical, armed ventrally with 5-11 teeth. Telson without posteromedian projection, sublateral pair of posterior spines longer than intermediate pairs. Stylocerite not overreaching distal margin of basal segment of antennular peduncle. First pereopod with fingers very slightly longer than palm of chela, carpus 2-4 times as long as wide. Epipods on 2 anterior pairs of pereopods only. Eggs large, major diameter 0.63-0.97 mm. Maximum postorbital carapace length probably about 5 or 6 mm.

RANGE.—Known only from the original records from three lakes in central Sulawesi (Celebes), Indonesia.

*18. *Caridina laoagensis* Blanco, 1939

FIGURE 5

Caridina laoagensis Blanco, 1939:390, pl. 2 [type locality: not indicated; presumably Laoag River, Laoag, Province of Ilocos Norte, Luzon, Philippines].

DIAGNOSIS.—Rostrum (Figure 5a) not overreaching 2nd segment of antennular peduncle, dorsal margin nearly horizontal but elevated slightly above dorsal margin of carapace, armed

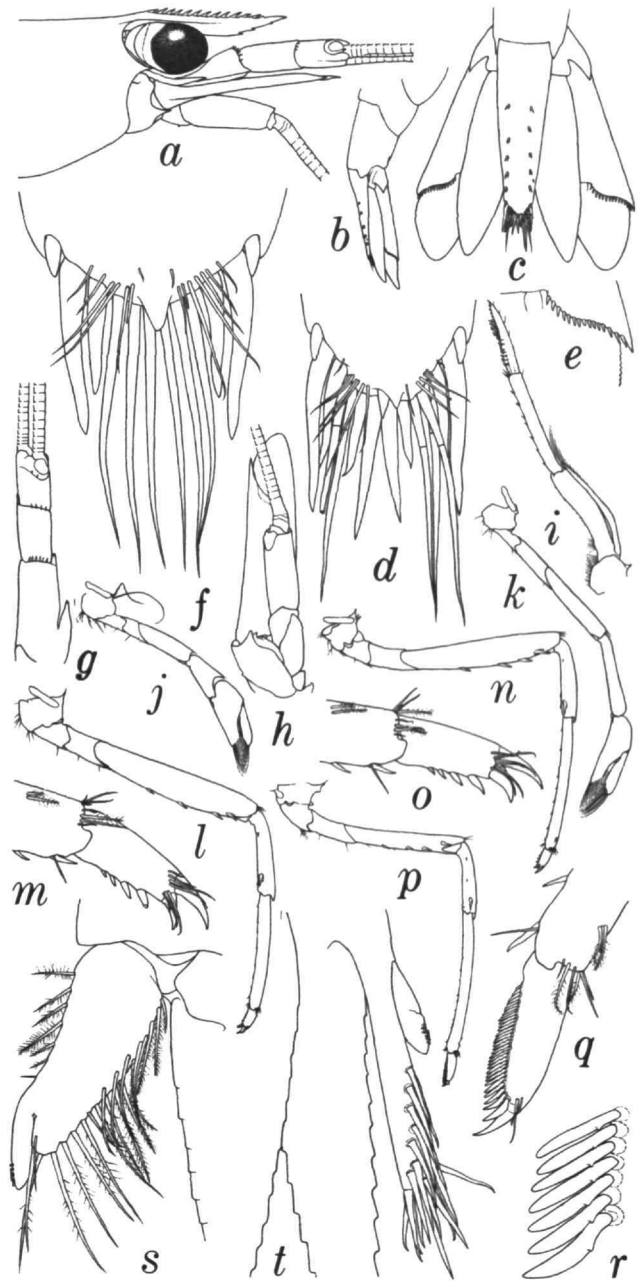


FIGURE 5.—*Caridina laoagensis*, a-e,g-t, male from Malaga River, Leyte, carapace length 3.0 mm; f, ovigerous female from same locality, carapace length 4.7 mm: a, anterior carapace and appendages, lateral aspect; b, posterior abdomen; c, tail fan, dorsal aspect; d, posterior margin of telson, dorsal aspect; e, diaeresis of exopod of right uropod; f, posterior margin of telson, dorsal aspect; g, right antennule, dorsal aspect; h, right antenna, ventral aspect; i, right 3rd maxilliped; j, right 1st pereopod; k, right 2nd pereopod; l, right 3rd pereopod; m, same, dactyl; n, right 4th pereopod; o, same, dactyl; p, right 5th pereopod; q, same, dactyl; r, same, spines on flexor margin; s, endopod of right 1st pleopod; t, right appendices masculina and interna.

with 9–17 subequal, evenly spaced teeth, all on rostrum considerably anterior to orbital margin, without subapical teeth, armed ventrally with 1–6 rather inconspicuous teeth. Suborbital angle fused with antennal spine; pterygostomian margin narrowly rounded. Telson (Figure 5c,d,f) with posteromedian projection elevated above true posterior margin, sublateral pair of posterior spines longer than immediately mesial pair but much shorter than seta-like intermediate pairs (end of telson obviously abnormally double in specimen illustrated in Figure 5c,d). Stylocerite (Figure 5g) barely reaching midlength of basal segment of antennular peduncle. First pereopod (Figure 5j) with fingers longer than palm of chela, carpus less than twice as long as wide, deeply excavate for reception of chela. Third pereopod (Figure 5l,m) with dactyl about $3\frac{1}{2}$ times as long as wide. Epipods on all but 5th pereopod. Eggs small, less than 9.4 mm in major diameter. Maximum postorbital carapace length about 7 mm.

MATERIAL.—PHILIPPINES. Yawa River, Luzon [13°10'N, 123°45'E], 7 June 1909 (0600): 2 females [4.9, 5.3], 1 ovig. [4.9].—Malaga River, Hinunangan Bay, Leyte [10°24'N, 125°12'E], 30 Jul 1909: 2 males [3.0, 3.3] 4 females [4.6–6.3], 3 ovig. [4.6–6.3], 1 juv [1.8].

RANGE.—Known previously only from the type series.

REMARKS.—It is possible that *C. laoagensis* will eventually fall into synonymy with the variable *C. weberi* from Indonesia, but it seems best to retain Blanco's name for the Philippine populations for the time being.

19. *Caridina leytensis* Blanco, 1939

Caridina leytensis Blanco, 1939:391, pl. 3: figs. 1–7 [type locality: "Helosig," Leyte, Philippines].

DIAGNOSIS.—Rostrum not overreaching 2nd segment of antennular peduncle, dorsal margin horizontal, armed with 8–10 subequal teeth, all on rostrum anterior to orbital margin, without subapical teeth, ventral margin unarmed. Suborbital angle fused with antennal spine; pterygostomian margin subacute, not rounded. Telson with posteromedian projection, sublateral pair of posterior spines longer than intermediate pairs. Stylocerite not reaching level of distal margin of basal segment of antennular peduncle. First pereopod with carpus about twice as long as wide, not excavate distally for reception of chela. Third pereopod with dactyl slightly more than 3 times as long as wide. Maximum postorbital carapace length probably about 1.5 mm.

RANGE.—Known only from the type locality.

20. *Caridina linduensis* J. Roux, 1904

Caridina linduensis J. Roux, 1904:541, pl. 9: figs. 1–4 [type locality: Danau Lindu, Sulawesi (Celebes), Indonesia].—Bouvier, 1925:224, figs. 497–503.

DIAGNOSIS.—Rostrum reaching about as far as distal end of antennular peduncle, dorsal margin horizontal or faintly

sinuous, armed with 7–13 teeth on posterior $\frac{2}{3}$, none on carapace posterior to orbital margin and none subapical, armed ventrally with 0–6 rather long, slender teeth. Suborbital angle not prominent, antennal spine very short; pterygostomian margin rounded. Telson without posteromedian projection, sublateral pair of posterior spines longer than intermediate pairs. Stylocerite not reaching level of distal margin of basal segment of antennular peduncle. First pereopod with fingers slightly shorter than palm of chela, carpus slightly less than twice as long as wide, deeply excavate for reception of chela. Epipod reasonably well developed on 1st pereopod, reduced on 2nd, lacking on 3 posterior pairs. Eggs large, major diameter 0.95 mm. Maximum postorbital carapace length 4.5 mm.

RANGE.—Known only from the type locality.

21. *Caridina lingkonae* Woltereck, 1937

Caridina Lingkonae Woltereck, 1937a:218, figs. 1, 1; pls. 3, 6 [type locality: Danau Towuti, Sulawesi (Celebes), Indonesia].

Caridina lingkonae.—Woltereck, 1937b:299, fig. 6.

DIAGNOSIS.—Rostrum usually overreaching antennular peduncle, dorsal margin slightly concave, armed throughout length with 16–27 teeth, including 3 on carapace posterior to orbital margin, armed ventrally with 8–16 teeth. Telson without posteromedian projection, sublateral pair of posterior spines longer than intermediate pairs. Stylocerite not overreaching distal margin of basal segment of antennular peduncle. First pereopod with fingers longer than palm of chela, carpus 4–6 times as long as wide. Epipod reduced on 1st pereopod, lacking on 4 posterior pairs. Eggs large, major diameter 0.70–0.98 mm. Maximum postorbital carapace length probably about 5 mm.

RANGE.—Known only from the type locality lake in central Celebes.

22. *Caridina loehae* Woltereck, 1937

Caridina Loehae Woltereck, 1937a:222, figs. 1, 5a–d; pls. 3, 6 [type locality: Danau Matana and Danau Towuti, Sulawesi (Celebes), Indonesia].

Caridina loehae.—Woltereck, 1937b:304, fig. 9.

DIAGNOSIS.—Rostrum reaching about as far as distal end of antennular peduncle, dorsal margin faintly sinuous, armed on posterior $\frac{2}{3}$ or $\frac{3}{4}$ with 10–17 teeth, including 1–3 on carapace posterior to orbital margin, without subapical teeth, armed ventrally with 4–7 teeth. Telson without posteromedian projection, sublateral pair of posterior spines longer than intermediate pairs. Stylocerite not overreaching distal margin of basal segment of antennular peduncle. First pereopod with fingers subequal to palm of chela, carpus about twice as long as wide. Epipods on two anterior pairs of pereopods only. Eggs large, major diameter 0.76–0.99 mm. Maximum postorbital carapace length probably about 4 mm.

RANGE.—Known only from lakes in central Sulawesi (Celebes), Indonesia.

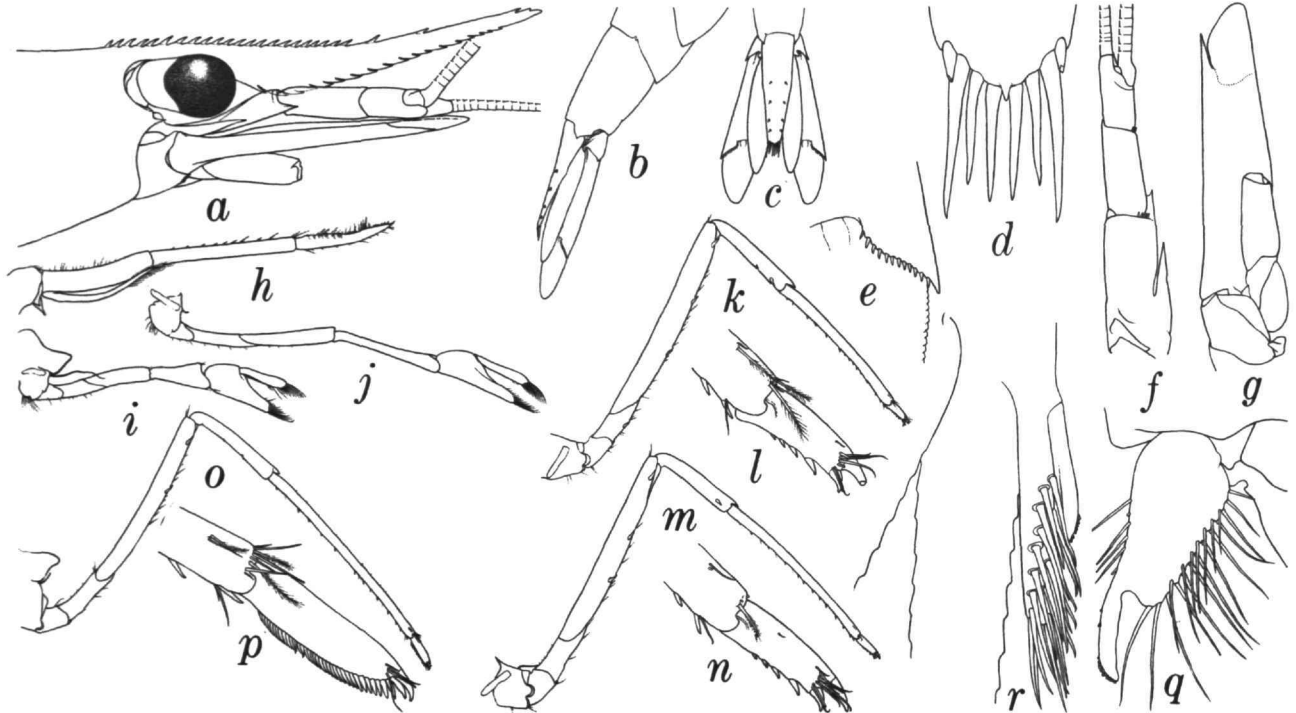


FIGURE 6.—*Caridina longirostris* from Zamboanga Canal, Mindanao, *a, f-r*, male with carapace length of 3.3 mm; *b-e*, male with carapace length of 3.4 mm: *a*, anterior carapace and appendages, lateral aspect; *b*, posterior abdomen; *c*, tail fan, dorsal aspect; *d*, posterior margin of telson; *e*, diaeresis of exopod of right uropod; *f*, right antennule, dorsal aspect; *g*, right antenna, ventral aspect; *h*, right 3rd maxilliped; *i*, right 1st pereopod; *j*, right 2nd pereopod; *k*, right 3rd pereopod; *l*, same, dactyl; *m*, right 4th pereopod; *n*, same, dactyl; *o*, right 5th pereopod; *p*, same, dactyl; *q*, endopod of right 1st pleopod; *r*, right appendix masculina and appendix interna.

***23. *Caridina longirostris* H. Milne Edwards, 1837**

FIGURES 6-8

Caridina longirostris H. Milne Edwards, 1837:363 [type locality: Macta River, near Oran, Algeria (probably erroneous)].—Holthuis, 1965:20, fig. 6.

Caridina gracillima.—Blanco, 1935:32, pl. 1: figs. 5-10 [not *C. gracillima* Lancheester, 1901].

Caridina modigliani.—Blanco, 1935:34, pl. 2: figs. 19-24 [not *C. modigliani* Nobili, 1900].

DIAGNOSIS.—Rostrum (Figures 6*a*, 7*a*) overreaching antennal scale, dorsal margin ascendant in anterior $\frac{1}{2}$, armed with 15-30 teeth, chiefly in posterior $\frac{2}{3}$, including 1-3 on carapace posterior to orbital margin and 1-3 subapical teeth separated by unarmed space from remainder of series, armed ventrally with 2-22 teeth. Suborbital angle distinct, sometimes subacute; pterygostomial margin rather narrowly rounded. Telson (Figures 6*c, d*, 7*d, e, g*) with posteromedian projection elevated above true posterior margin, sublateral pair of posterior spines longer than intermediate pairs. Stylocerite (Figures 6*f*, 7*h*) not nearly reaching level of distal margin of basal segment of antennular peduncle. First pereopod (Figures 6*i*, 7*k*) with fingers distinctly longer than palm of chela, carpus about twice

as long as wide, not deeply excavate distally for reception of chela. Third pereopod (Figures 6*k, l*, 7*m, n*) with dactyl nearly 4 times as long as wide. Epipods on all but 5th pereopod. Eggs small, major diameter about 0.4 mm. Maximum postorbital carapace length about 7 mm.

MATERIAL.—PHILIPPINES. "Batangas" River, Batangas, Luzon [13°45'N, 121°03'E], 7 Jun 1908, 15' seine: 4 ovig. females [4.6-5.4].—Nato River, Lagonoy Gulf, Luzon; 13°36'N, 123°33'E, tidewater, 18 Jun 1909 (0630): 1 male [3.4] 14 ovig. females [4.4-5.7].—"Cabugao" River, Catanduanes Island [13°37'N, 124°17'E], 9 Jun 1909 (0900), 25' seine: 1 male [4.1] 3 ovig. females [4.4-5.4].—River and beach, Tilik, Lubang Island [13°49'N, 120°12'E], 14 Jul 1908: 10 males [3.3-3.9] 10 ovig. females [4.7-5.8].—Calawagan River 3 miles [4.8 km] from mouth, Mindoro [13°25'N, 120°28'E], 11 Dec 1908 (1500), 16' seine: 75 males [1.8-3.8] 63 females [1.7-5.8], 6 ovig. [3.8-5.8].—Pangauaran River, Port Caltom, Busuanga Island [12°11'N, 120°05'E], 16 Dec 1908 (0700), 25' seine: 1? [3.7].—Malaga River, Hinunangan Bay, Leyte [10°24'N, 125°12'E], 30 Jul 1909: 138 males [2.0-3.9] 203 females [2.0-6.3], 91 ovig. [4.2-6.3], 5 juv [1.7-1.9].—Malabang River, Mindanao [7°36'N, 124°04'], 21 May 1908

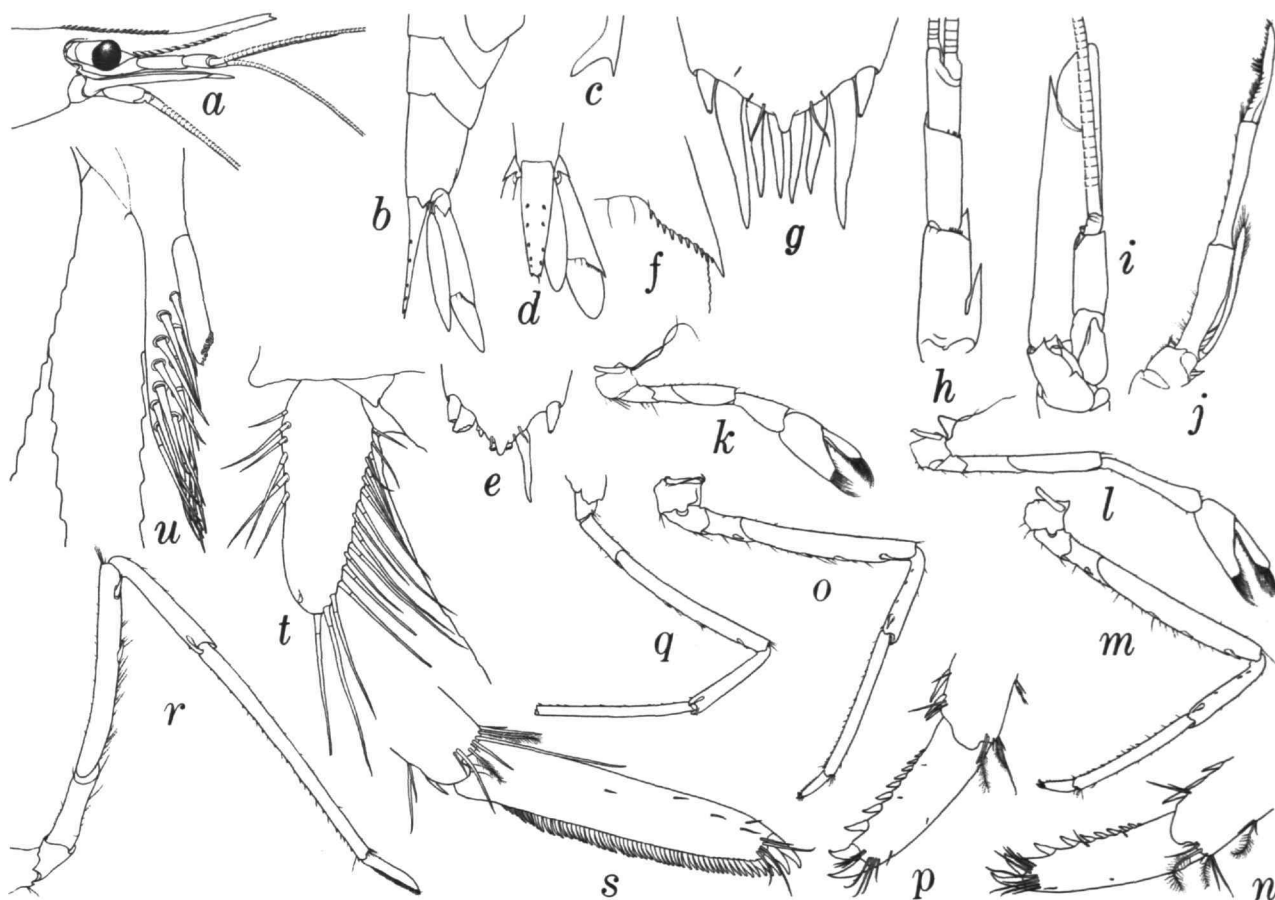


FIGURE 7.—*Caridina longirostris* from Nato River, Lagonoy Gulf, Luzon, *a-f, h-q, t, u*, male with carapace length of 3.4 mm; *g, r, s*, ovigerous female with carapace length of 5.4 mm: *a*, anterior carapace and appendages, lateral aspect; *b*, posterior abdomen; *c*, pre-anal tooth, lateral aspect; *d*, tail fan, dorsal aspect; *e*, posterior margin of telson; *f*, diaeresis of exopod of right uropod; *g*, posterior margin of telson; *h*, right antennule, dorsal aspect; *i*, right antenna, ventral aspect; *j*, right 3rd maxilliped; *k*, right 1st pereopod; *l*, right 2nd pereopod; *m*, right 3rd pereopod; *n*, same, dactyl; *o*, right 4th pereopod; *p*, same, dactyl; *q*, right 5th pereopod; *r*, right 5th pereopod; *s*, same, dactyl; *t*, endopod of right 1st pleopod; *u*, right appendix masculina and appendix interna.

(1500): 1 ovig. female [3.7].—Baganga River, Mindanao [7°35'N 126°33'E], 13 May 1908 (1300): 1 male with abdominal bopyrid [4.4] 10 females [4.0–6.1], 9 ovig. [4.4–6.1].—Cotabato, Mindanao, small stream on south side of river [7°13'N, 124°15'E], 20 May 1908: 4 females [3.2–3.7].—Zamboanga Canal, Mindanao [6°54'N, 122°04'E], 8 Oct 1909, 25' seine: 10 males [3.1–3.4] 32 females [3.5–6.4], 28 ovig. [5.0–6.4].—Lake Ernestine, Cagayan Sulu Island [6°59'N, 118°31'E], 8 Jan 1909: 3 males [3.8–4.2] 4 females [4.6–5.1], 3 ovig. [4.6–5.1].

BORNEO. "Tawao" River, 30 Sep 1909 (0930), mud, sand; dynamite: 1 male [4.2].

CELEBES. Gorontalo [0°33'N, 123°03'E], 15 Nov 1909, market: 134 males [3.2–4.8] 103 females [3.9–5.3], 67 ovig. [4.4–5.3].

RANGE.—Because this species has usually been identified under other names, its overall range is still uncertain. Apparently it occurs throughout the Philippines and Indonesia, as well as in Madagascar, and it may be considerably more widespread.

REMARKS.—If the presence or absence of an appendix interna on the endopod of the first pleopod were accepted as a primary specific character (Holthuis, 1965:9), 37 of the males from the Calawagan River, Mindoro, should be assigned to *C. longirostris*, and 38 to another species. Similarly, only 52 of the males from the Malaga River, Leyte, have an appendix interna on that appendage, and 86 do not. All attempts to correlate other characters with the presence or absence of that appendix have failed. As shown in Figure 8, that appendix displays various degrees of development, irrespective of specimen size,

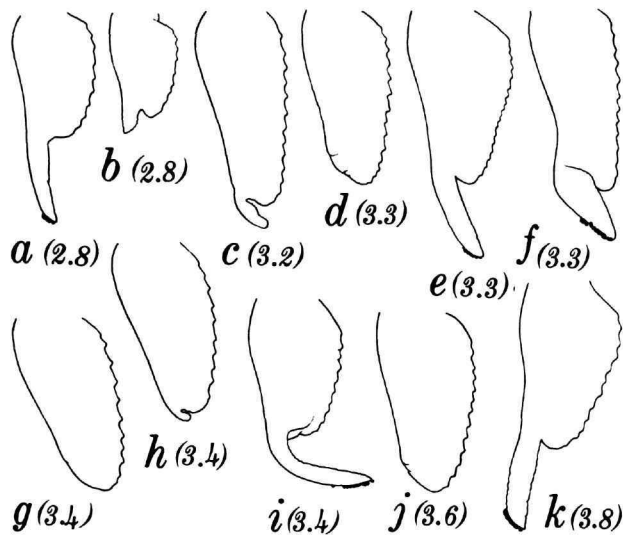


FIGURE 8.—*Caridina longirostris*, endopods of right 1st pleopods of males from Malaga River, Leyte, 30 July 1909; numerals in parentheses indicate postorbital carapace lengths.

and it therefore seems to be an unreliable character in this species.

There is even slight doubt that *C. longirostris* is distinct from *C. nilotica*, as maintained by Holthuis (1965:21), but it is so treated here in order to emphasize the differences between populations from various localities in the Philippines, based largely on the presence or absence of a posteromedian tooth on the telson.

In the series from the Malaga River, Leyte, young males with the appendix masculina less than fully developed vary in carapace length from 2.0 to 2.3 mm.

24. *Caridina masapi* Woltereck, 1937

Caridina Masapi Woltereck, 1937a:223, figs. 1, 6a–h; pls. 3, 6 [type localities: the lakes (Danau): D. Matana, D. Mahalona, D. Towuti, and D. Wawontoa, furthermore a lake near Masapi, and a stream between the first two lakes, all localities in S.E. Central Sulawesi (Celebes), Indonesia].

Caridina masapi.—Woltereck, 1937b:306, fig. 10.

DIAGNOSIS.—Rostrum falling short of or overreaching distal end of antennular peduncle, dorsal margin nearly straight or slightly ascendant anteriorly, armed on posterior $\frac{2}{3}$ or more with 11–19 teeth, including 1–4 on carapace posterior to orbital margin, without subapical teeth, armed ventrally with 4–10 teeth. Telson without posteromedian projection, sublateral pair of posterior spines shorter than, or subequal to, intermediate pairs. Stylocerite not overreaching distal margin of basal segment of antennular peduncle. First pereopod with fingers about as long as palm of chela, carpus 2–3 times as long as wide. Epipod on 1st pereopod only. Eggs very large, major

diameter 0.94–1.30 mm. Maximum postorbital carapace length probably less than 5 mm.

RANGE.—Known only from the original records from five lakes and a stream in southeast central Sulawesi (Celebes), Indonesia.

25. *Caridina mertoni* J. Roux, 1911

Caridina mertoni J. Roux, 1911:84 [type locality: “Grand-Kei,” Kepulauan Ewab (Kepulauan Kai), Indonesia].

Caridina Mertoni.—Bouvier, 1925:191, figs. 398–408.

DIAGNOSIS.—Rostrum not nearly reaching distal end of antennular peduncle, dorsal margin mostly horizontal, curving slightly ventrad near apex, armed nearly to apex with 15–27 teeth, including 3–5 on carapace posterior to orbital margin, armed ventrally with 3–10 teeth. Suborbital angle obscure, largely fused with antennal spine; pterygostomian margin rectangularly rounded. Telson with posterior spines subequal.

Stylocerite not reaching nearly to level of distal margin of basal segment of antennular peduncle. First pereopod with carpus about twice as long as wide, distinctly but not deeply excavate distally. Third pereopod with dactyl nearly 4 times as long as wide. Epipods on all but 5th pereopod. Eggs small, major diameter 0.35 mm. Maximum postorbital carapace length 4.5 mm.

RANGE.—Waigeo and Kepulauan Ewab.

26. *Caridina modiglianii* Nobili, 1900

Caridina Modiglianii Nobili, 1900:477 [type locality: “Kifa-juc,” Pulau Enggano, Indonesia].

Caridina Modigliani.—Bouvier, 1925:159, figs. 332–335.

DIAGNOSIS.—Rostrum overreaching antennal scale, ascendant anteriorly, armed dorsally with 20 teeth in posterior portion, including 5 on carapace posterior to orbital margin and 1 subapical tooth, armed ventrally with 21 teeth. Pterygostomian margin rounded. First pereopod with fingers longer than palm of chela, carpus nearly twice as long as wide, not deeply excavate distally. Maximum postorbital carapace length about 5 or 6 mm.

RANGE.—Known with certainty only from the type locality.

REMARKS.—This species, which is based on a single incomplete female, seems to be identical with *C. longirostris*, except for the number of teeth of the dorsal rostral series that are situated on the carapace posterior to the orbital margin. According to Bouvier (1925:160), *C. modiglianii* has five postorbital teeth, whereas I have seen no more than three in any material of *C. longirostris* that I have examined. It seems best, therefore, to retain Nobili's name until additional material from the type locality can be studied.

27. *Caridina multidentata* Stimpson, 1860

Caridina multidentata Stimpson, 1860:29 [type locality: Bonin Islands (Ogasawara Gunto)].—Bouvier, 1925:220, figs. 487–492.

DIAGNOSIS.—Rostrum not reaching distal end of antennular peduncle, dorsally convex or straight and directed slightly ventrad, armed dorsally with 20–30 teeth, including 1 or 2 on carapace posterior to orbital margin, without subapical teeth, armed ventrally with 5–14 teeth. Suborbital angle fused with antennal spine; pterygostomian margin rounded. Stylocerite falling far short of distal margin of basal segment of antennular peduncle. First pereopod with carpus more than twice as long as wide, deeply excavate distally for reception of chela. Third pereopod with dactyl less than 3 times as long as wide. Eggs large, major diameter nearly 1 mm. Maximum carapace length about 7.5 mm.

RANGE.—Recorded from Sumatra, Celebes, and Batjan, but Indonesian material has not been compared directly with specimens from the Bonin Islands, and its identification must be considered questionable for the time being.

***28. *Caridina nilotica* (P. Roux, 1833)**

FIGURES 9, 10

Pelias niloticus P. Roux, 1833:73, fig. 1 [type locality: Cairo, Egypt].

Caridina Wyckii var. *gracilipes* De Man, 1892:387, pl. 24: fig. 29–29e [type localities: Sulawesi (Celebes) and Selajar, Indonesia].

Caridina nilotica var. *minahassae* De Man, 1902:895 [type locality: Minahasa, Sulawesi (Celebes), Indonesia].

Caridina nilotica var. *brachydactyla* De Man, 1908:269, pl. 20: fig. 8 [type locality: Sulawesi (Celebes), Selajar, and Flores, Indonesia].—Blanco, 1935:33, pl. 2: fig. 18.

Caridina aruensis J. Roux, 1911:82 [type locality: Kepulauan Aru, Indonesia].

Caridina nilotica var. *brevidactyla* J. Roux, 1919:320 [type locality: 9 localities in Kepulauan Aru, Indonesia].

Caridina nilotica.—Holthuis, 1965:15, fig. 5.

DIAGNOSIS (Philippine specimens).—Rostrum (Figures 9a, 10a) overreaching antennal scale, dorsal margin ascendant in anterior $\frac{1}{2}$, armed with 8–19 teeth, chiefly in posterior $\frac{2}{3}$, including 0–3 on carapace posterior to orbital margin and 1 or 2 subapical teeth separated by unarmed space from remainder of series, armed ventrally with 7–26 teeth. Suborbital angle distinct, acute or subacute; pterygostomian margin broadly rounded, not produced. Telson (Figures 9c,d, 10c,d) without posteromedian projection but with 1 or 2 minute median spinules, sublateral pair of posterior spines longer than intermediate pairs. Stylocerite (Figures 9f, 10f) not nearly reaching level of basal segment of antennular peduncle. First pereopod (Figures 9i, 10i) with fingers longer than palm of chela, carpus about twice as long as wide, not noticeably excavate distally for reception of chela. Third pereopod (Figures 9k,l, 10k,l) with dactyl $4\frac{1}{2}$ times as long as wide. Epipods on all but 5th pereopod. Eggs fairly large, major diameter 0.78–0.86 mm. Maximum postorbital carapace carapace length about 5 mm.

MATERIAL.—PHILIPPINES. Vicars Landing, Lake Lanao, Mindanao, 22 May 1908, seine: 1 male [3.3] 19 females [3.1–4.8], 5 ovig. [4.0–4.8].—Passi, Panay [10°43'N,

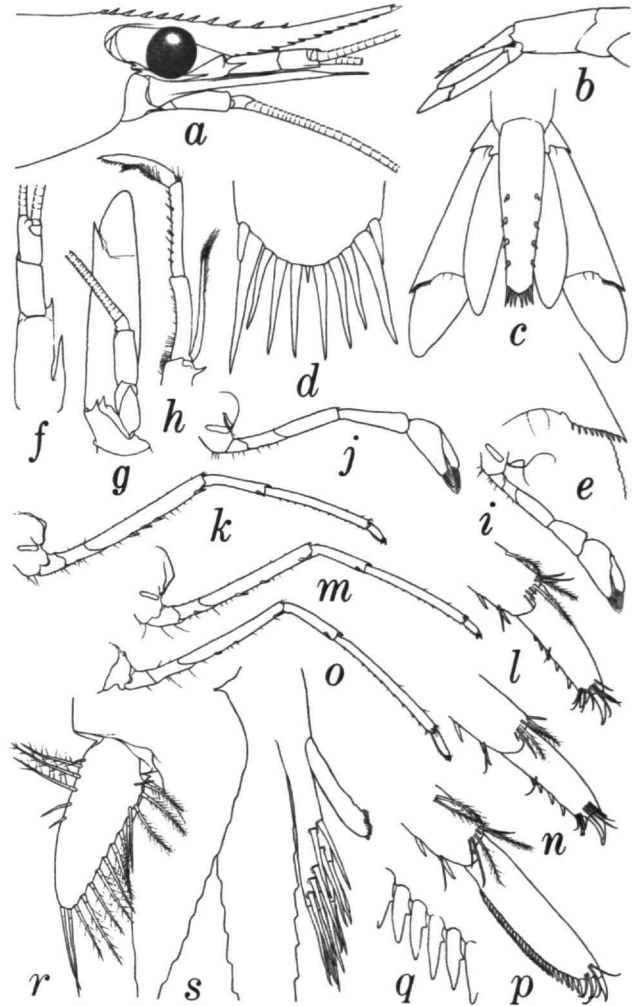


FIGURE 9.—*Caridina nilotica*, male with carapace length of 2.5 mm from Passi, Panay: a, anterior carapace and appendages, lateral aspect; b, posterior abdomen; c, tail fan, dorsal aspect; d, posterior margin of telson; e, diaeresis of exopod of right uropod; f, right antennule, dorsal aspect; g, right antenna, ventral aspect; h, right 3rd maxilliped; i, right 1st pereopod; j, right 2nd pereopod; k, right 3rd pereopod; l, same, dactyl; m, right 4th pereopod; n, same, dactyl; o, right 5th pereopod; p, same, dactyl; q, same, spines on flexor margin; r, endopod of right 1st pleopod; s, right appendix masculina and appendix interna.

122°03'E], 13 Jan 1909: 13 males [2.0–2.7] 21 females [2.1–4.0], 3 ovig. [3.6–4.0].

RANGE.—Recorded over an extensive range from eastern Africa to Polynesia but in need of additional study and analysis.

REMARKS.—The two Philippine lots identified as *C. nilotica* are consistently different and may subsequently be assigned to distinct species. The specimens from Panay (Figure 9) have 8–14 dorsal teeth on the rostrum, of which at most one (more

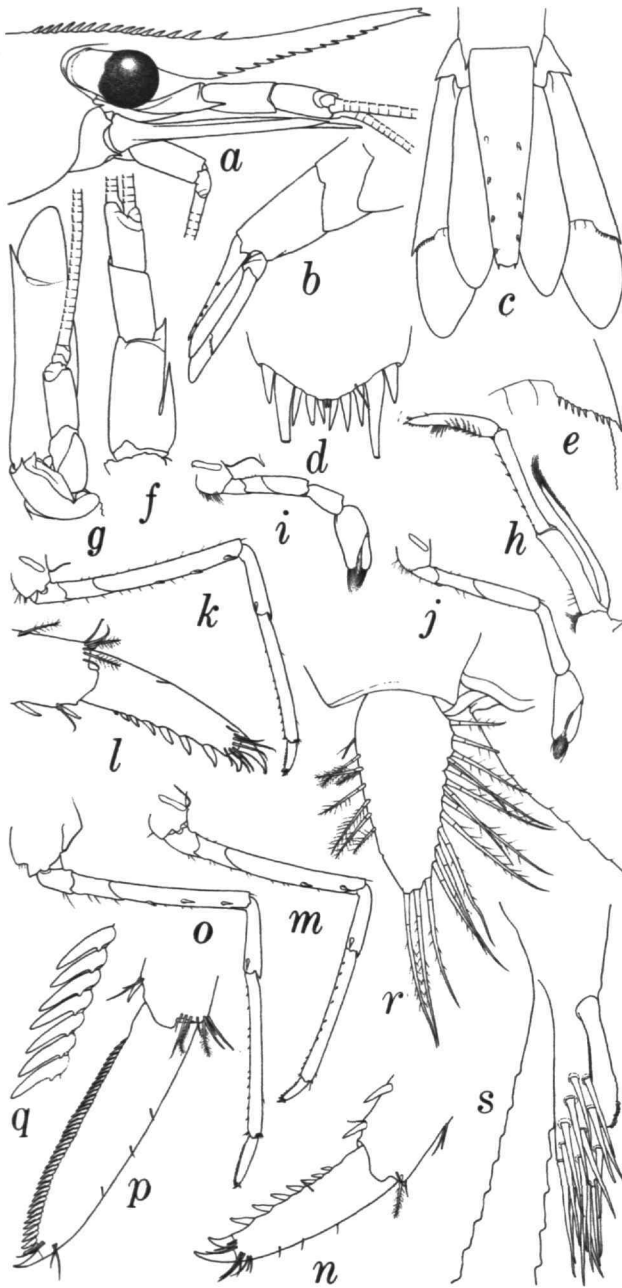


FIGURE 10.—*Caridina nilotica* from Lake Lanao, Mindanao, *a-c, e-s*, male with carapace length of 3.3 mm; *d*, ovigerous female with carapace length of 4.0 mm: *a*, anterior carapace and appendages, lateral aspect; *b*, posterior abdomen; *c*, tail fan, dorsal aspect; *d*, posterior margin of telson; *e*, diaeresis of exopod of right uropod; *f*, right antennule, dorsal aspect; *g*, right antenna, ventral aspect; *h*, right 3rd maxilliped; *i*, right 1st pereopod; *j*, right 2nd pereopod; *k*, right 3rd pereopod; *l*, same, dactyl; *m*, right 4th pereopod; *n*, same, dactyl; *o*, right 5th pereopod; *p*, same, dactyl; *q*, same, spines on flexor margin; *r*, endopod of right 1st pleopod; *s*, right appendix masculina and appendix interna.

frequently none) are situated on the carapace posterior to the orbital margin, and they have the posterior margin of the telson armed with long, slender spines. The Mindanao specimens (Figure 10) have 10–19 dorsal rostral teeth, of which two or three are on the carapace, and 12–26 ventral teeth, and the posterior margin of the telson is armed with short, stout spines. Otherwise, the specimens in both lots agree with the description of the species in Holthuis (1965), except for the absence of an appendix interna on the endopod of the first pleopod (see “Remarks” under *C. longirostris*).

29. *Caridina opaensis* J. Roux, 1904

Caridina opaensis J. Roux, 1904:547, pl. 9: figs. 8–10 [type locality: Opa Swamp in southeast Sulawesi (Celebes), Indonesia, at about 4°10'S, 122°10'E].

DIAGNOSIS.—Rostrum reaching about as far as midlength of 2nd segment of antennular peduncle, dorsal margin horizontal or inclined slightly ventrad, armed with 17 or 18 teeth, including 3–5 on carapace posterior to orbital margin, without subapical teeth, armed ventrally with 3 or 4 teeth. Suborbital angle rounded, not prominent; pterygostomial margin rounded. Telson with sublateral pair of posterior spines slightly longer than intermediate pairs. Stylocerite not reaching level of distal margin of basal segment of antennular peduncle. First pereopod with fingers slightly shorter than palm of chela, carpus 3 times as long as wide, distal end not deeply excavate for reception of chela. Epipods on 2 anterior pereopods, lacking on 3 posterior pairs. Maximum postorbital carapace length 3.25 mm.

RANGE.—Known only from the type locality.

30. *Caridina pareparensis* De Man, 1892

Caridina pareparensis De Man, 1892:379, pl. 22: fig. 25–25b [type locality: near Parepare, Sulawesi (Celebes), Indonesia].—Bouvier, 1925:236, figs. 538–543.

DIAGNOSIS.—Rostrum not reaching as far as distal end of antennular peduncle, faintly sinuous dorsally with 13–18 teeth, including 3 or 4 on carapace posterior to orbital margin, unarmed near apex, armed ventrally with 0–3 teeth. Suborbital angle obscure; pterygostomial margin rounded. Posterior margin of telson convex, sublateral pair of posterior spines longer than intermediate pairs. Stylocerite not reaching as far as distal margin of basal segment of antennular peduncle. First pereopod with carpus rather deeply excavate for reception of chela. Third pereopod with dactyl nearly 4 times as long as wide. Epipods well developed on 1st and 2nd pereopods, greatly reduced on 3rd, rudimentary on 4th. Eggs fairly large, 0.8–0.9 mm in major diameter. Maximum postorbital carapace length probably less than 3 mm.

RANGE.—Apparently known only from the type locality.

31. *Caridina rouxi* De Man, 1915

Caridina rouxi De Man, 1915:387, pl. 27: figs. 1-11 [type locality: Bouganville Mountains on the north coast of New Guinea at about 141°E].

DIAGNOSIS.—Rostrum not overreaching 2nd segment of antennular peduncle, dorsal margin nearly horizontal, armed with 13-18 teeth, including 2-4 on carapace posterior to orbital margin, without subapical teeth, armed ventrally with 3-8 teeth. Suborbital angle barely discernible, almost completely fused with antennal spine; pterygostomial margin rounded. Telson with posteromedian projection, sublateral pair of posterior spines longer than intermediate pairs. Stylocerite not reaching level of distal margin of basal segment of antennular peduncle. First pereopod with fingers longer than palm of chela, carpus about twice as long as wide, very feebly excavate distally. Third pereopod with dactyl less than 4 times as long as wide. Eggs large, 1.15 mm in major diameter. Maximum postorbital carapace length probably about 4 mm.

RANGE.—Known only from the type locality.

32. *Caridina sarasinorum* Schenkel, 1902

Caridina sarasinorum Schenkel, 1902:492, pl. 8: figs. 2a-e, 4a [type locality: Danau Poso, Sulawesi (Celebes), Indonesia].

Caridina Sarasinorum.—Bouvier, 1925:168, figs. 356-359.

DIAGNOSIS.—Rostrum falling short of or slightly overreaching distal end of antennal scale, slightly ascendant anteriorly, armed dorsally with 12-19 teeth on posterior $\frac{3}{4}$, including 3-7 on carapace posterior to orbital margin, unarmed on anterior $\frac{1}{4}$, armed ventrally with 8-17 teeth. Suborbital angle distinct but not prominent; pterygostomial margin rounded but not broadly so. Telson with sublateral pair of posterior spines longer than intermediate pairs. Stylocerite reaching nearly as far as distal margin of basal segment of antennular peduncle. First pereopod with fingers shorter than palm of chela, carpus about twice as long as wide, not excavate distally. Epipod on 1st pereopod only. Major diameter of eggs 0.60 mm. Maximum postorbital carapace length about 3.8 mm.

RANGE.—Known only from the type locality.

*33. *Caridina serratiostris* De Man, 1892

FIGURE 11

Caridina serratiostris De Man, 1892:382, pl. 23: figs. 28-28e [type locality: "Bangkalan" and "Bonea" rivers, Selajar, Indonesia].—Bouvier, 1925:218, figs. 480-486.—Kubo, 1938:92, fig. 21.—Holthuis, 1965:25, fig. 8.

Caridina serratiostris var. *celebensis* De Man, 1892:385, pl. 23: figs. 28f-h [type locality: river at Palopo, Luwu, Sulawesi (Celebes), Indonesia].

DIAGNOSIS.—Rostrum (Figure 11a) not reaching as far as distal end of antennular peduncle, dorsal margin nearly horizontal, armed virtually to apex with 16-33 teeth, including 5-13 on carapace posterior to orbital margin, armed ventrally with 3-7 teeth. Suborbital angle not prominent but distinct from antennal spine; pterygostomial margin rounded. Telson

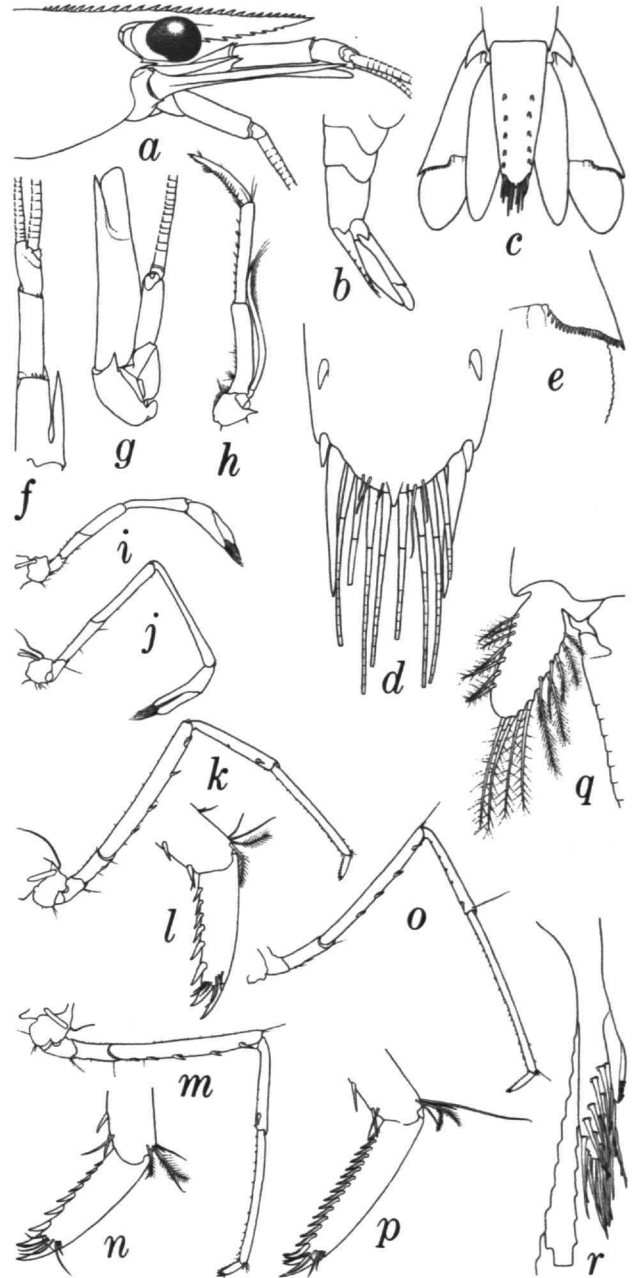


FIGURE 11.—*Caridina serratiostris*, male with carapace length of 2.7 mm from Malaga River, Leyte, 30 July 1909: a, anterior carapace and appendages, lateral aspect; b, posterior abdomen; c, tail fan, dorsal aspect; d, posterior margin of telson; e, diaeresis of exopod of right uropod; f, right antennule, dorsal aspect; g, right antenna, ventral aspect; h, right 3rd maxilliped; i, right 1st pereopod; j, right 2nd pereopod; k, right 3rd pereopod; l, same, dactyl; m, right 4th pereopod; n, same, dactyl; o, right 5th pereopod; p, same, dactyl; q, endopod of right 1st pleopod; r, right appendix masculina and appendix interna.

(Figure 11*c,d*) with posteromedian projection elevated above true posterior margin, sublateral pair of posterior spines shorter than intermediate setae. Stylocerite (Figure 11*f*) overreaching distal margin of basal segment of antennular peduncle. First pereopod (Figure 11*i*) with fingers longer than palm of chela, carpus more than 4 times as long as wide, not deeply excavate distally. Third pereopod (Figure 11*k,l*) with dactyl fully 4 times as long as wide. Epipods on all but 5th pereopod. Eggs small, major diameter about 0.35 mm. Maximum postorbital carapace length little more than 5 mm.

MATERIAL.—PHILIPPINES. Palawig River, Port San Vicente, Luzon [18°28'N, 122°09'E], 14 Nov 1908, seine: 1 ovig. female [5.0].—"Batangas" River, Batangas, Luzon [13°45'N, 121°03'E], 7 Jun 1908, 15' seine: 1 ovig. female [3.4].—Calawagan River, Mindoro [13°25'N, 120°28'E], 11 Dec 1908 (1500), 16' seine: 2 females [2.8, 3.8], 1 ovig. [3.8].—Malaga River, Hinunangan Bay, Leyte [10°24'N, 125°12'E], 30 Jul 1909: 149 males [1.9–3.4] 94 females [2.5–5.2], 83 ovig. [3.2–5.2].—Zamboanga Canal, Mindanao [6°54'N, 122°04'E] 8 Oct 1909, 25' seine: 1 ovig. female [5.1].

RANGE.—Madagascar, Seychelles, and Mauritius to Okinawa, northeastern Australia, and the Fiji Islands.

34. *Caridina spinata* Woltereck, 1937

Caridina spinata Woltereck, 1937a:221, figs. 1, 3; pls. 3, 6 [type locality: Danau Towuti and Danau Matana, Sulawesi (Celebes), Indonesia]; 1937b:302, fig. 8.

DIAGNOSIS.—Rostrum overreaching antennular peduncle, dorsal margin slightly upcurved anteriorly, armed with 16–23 teeth, including 3 on carapace posterior to orbital margin and 1 or 2 subapical, armed ventrally with 5–10 teeth. Telson without posteromedian projection, sublateral pair of posterior spines longer than intermediate pairs. Stylocerite not overreaching distal margin of basal segment of antennular peduncle. First pereopod with fingers longer than palm of chela, carpus 4 or 5 times as long as wide. Epipods lacking from all pereopods. Eggs rather large, major diameter 0.70–0.77 mm. Maximum postorbital carapace length probably about 3 or 4 mm.

RANGE.—Known only from lakes in central Sulawesi (Celebes), Indonesia.

35. *Caridina sundanella* Holthuis, 1978

Caridina sundanella Holthuis, 1978a:32, figs. 11, 12 [type locality: "Waikamburu" Brook, 4 km north of Waimangura, western Sumba, Indonesia, about 250 m above sea level].

DIAGNOSIS.—Rostrum reaching little if at all beyond 2nd segment of antennular peduncle, straight or curved slightly ventrad, armed dorsally over most of length with 19–26 close-set denticles, including 3 or 4 on carapace posterior to orbital margin, armed ventrally with 6–8 teeth. Suborbital angle distinct, blunt, subacute; pterygostomian margin rounded. Telson with small posteromedian projection, sublateral pair of posterior spines no longer than intermediate pairs.

Stylocerite not nearly reaching level of distal margin of basal segment of antennular peduncle. First pereopod with fingers longer than palm of chela, carpus twice as long as wide, excavated distally for reception of chela. Third pereopod with dactyl more than twice as long as wide. Epipods on all but 5th pereopod. Maximum postorbital carapace length 9 mm.

RANGE.—Known only from the type locality on Sumba, Lesser Sunda Islands, Indonesia.

36. *Caridina tenuirostris* Woltereck, 1937

Caridina tenuirostris Woltereck, 1937a:224, figs. 1, 8; pls. 3, 6 [type locality: Danau Towuti near Lingkona, Sulawesi (Celebes), Indonesia]; 1937b:309, fig. 12.

DIAGNOSIS.—Rostrum overreaching antennal scale, dorsal margin slightly concave, armed on posterior $\frac{1}{2}$ with 11–17 teeth, including 1 or 2 on carapace posterior to orbital margin, without subapical teeth, armed ventrally with 12–15 teeth. Telson without posteromedian projection, sublateral pair of posterior spines longer than intermediate pairs. Stylocerite not overreaching distal margin of basal segment of antennular peduncle. First pereopod with carpus less than twice as long as wide. Epipod on 1st pereopod only. Eggs fairly large, major diameter 0.72 mm. Maximum postorbital carapace length probably little more than 3 mm.

RANGE.—Known only from the type locality.

37. *Caridina timorensis* De Man, 1893

Caridina timorensis De Man, 1893:300, pl. 8: fig. 6 [type locality: Lake Nefko, east of Kuoang, S. Timor, Indonesia].—Bouvier, 1925:189, figs. 394–397.

DIAGNOSIS.—Rostrum reaching to or slightly beyond distal margin of basal segment of antennular peduncle, dorsal margin nearly horizontal, armed with 1–5 irregularly spaced teeth, none postorbital or subapical, armed ventrally with 3–5 teeth. Suborbital angle obscure but not fused with antennal spine; pterygostomian margin broadly rounded. Sublateral pair of posterior spines of telson slightly longer than intermediate pairs. Stylocerite not nearly reaching level of distal margin of basal segment of antennular peduncle. First pereopod with fingers little longer than palm of chela, carpus $1\frac{1}{2}$ times as long as wide, rather deeply excavate distally for reception of chela. Epipods on all but 5th pereopod. Eggs large, major diameter 1.2 mm. Maximum postorbital carapace length probably less than 4 mm.

RANGE.—Known only from the type locality.

38. *Caridina towutensis* Woltereck, 1937

Caridina Towutensis Woltereck, 1937a:220, figs. 1, 2; pls. 3, 6 [type locality: south end of Danau Towuti, Sulawesi (Celebes), Indonesia].
Caridina towutensis.—Woltereck, 1937b:301, fig. 7.

DIAGNOSIS.—Rostrum not reaching as far as distal end of antennular peduncle, dorsal margin slightly convex, especially in posterior $\frac{1}{2}$, armed with 14–22 teeth becoming widely

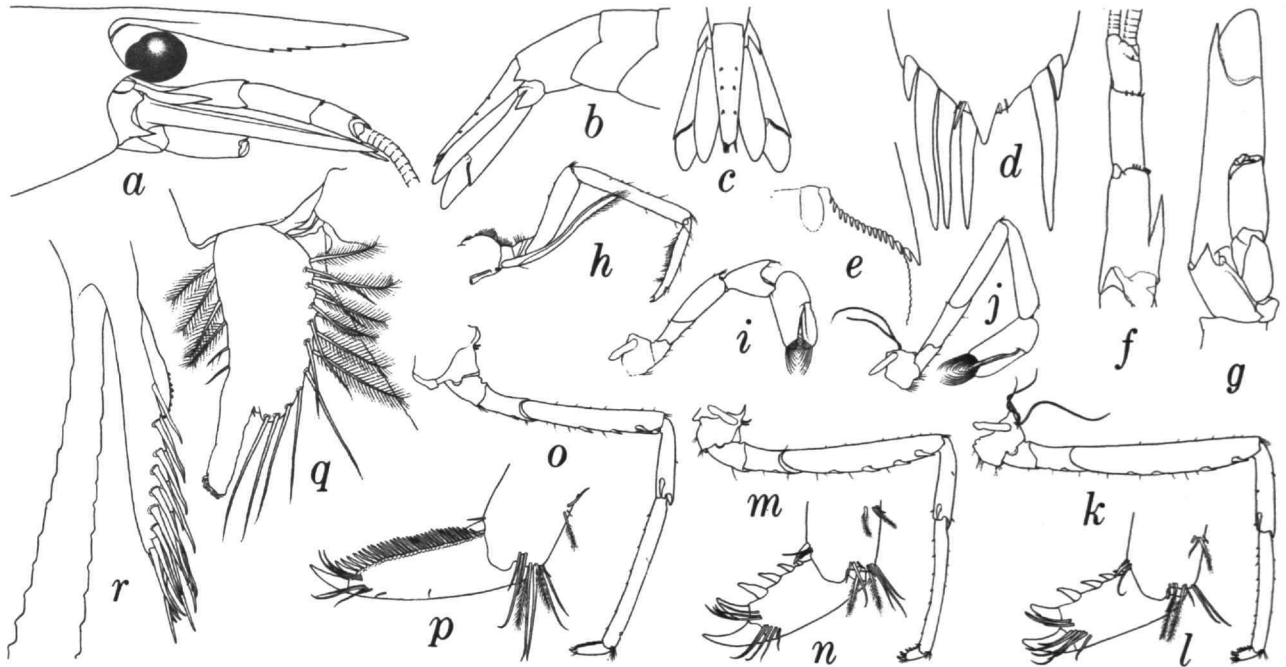


FIGURE 12.—*Caridina villadolodi*, male with carapace length of 3.7 mm from Calawagan River, Mindoro: *a*, anterior carapace and appendages, lateral aspect; *b*, posterior abdomen; *c*, tail fan, dorsal aspect; *d*, posterior margin of telson; *e*, diaeresis of exopod of right uropod; *f*, right antennule, dorsal aspect; *g*, right antenna, ventral aspect; *h*, right 3rd maxilliped; *i*, right 1st pereopod; *j*, right 2nd pereopod; *k*, right 3rd pereopod; *l*, same, dactyl; *m*, right 4th pereopod; *n*, same, dactyl; *o*, right 5th pereopod; *p*, same, dactyl; *q*, endopod of right 1st pleopod; *r*, right appendix masculina and appendix interna.

spaced anteriorly, including about 4 on carapace posterior to orbital margin, without subapical teeth, armed ventrally with 0–5 teeth. Telson without posteromedian projection, sublateral pair of posterior spines longer than intermediate pairs. Stylocerite not overreaching distal margin of basal segment of antennular peduncle. First pereopod with fingers nearly twice as long as palm of chela, carpus about 6 times as long as wide. Epipods lacking from all pereopods. Maximum postorbital carapace length 3 or 4 mm.

RANGE.—Known only from the type locality.

39. *Caridina typus* H. Milne Edwards, 1837

Caridina typus H. Milne Edwards, 1837:363 [type locality unknown]; 1840, pl. 25bis: figs. 4, 5.—Holthuis, 1965:10, fig. 3.

DIAGNOSIS.—Rostrum not overreaching antennular peduncle, dorsal margin convex, especially near apex, unarmed, armed ventrally with 1–6 teeth. Suborbital angle indistinguishably fused with antennal spine; pterygostomian margin subrectangular.

Telson without prominent posteromedian projection but with strong posterolateral one, sublateral pair of posterior spines slightly shorter than seta-like intermediate pairs. Stylocerite not

nearly reaching level of distal margin of basal segment of antennular peduncle. First pereopod with fingers shorter than palm of chela, carpus about $1\frac{1}{2}$ times as long as wide, deeply excavate distally for reception of chela. Third pereopod with dactyl about 3 times as long as wide. Epipods on all but 5th pereopod. Eggs small, major diameter about 0.4 mm. Maximum postorbital carapace length about 8 mm.

RANGE.—Eastern Africa to Japan and Polynesia. (In the Smithsonian collections is a lot consisting of two males and two females collected in March, 1976, by Martha McCullough, from streams on Napo Point, near Moron, Bataan, Luzon, Philippines, that I identify with this species.)

*40. *Caridina villadolodi* Blanco, 1939

FIGURE 12

Caridina villadolodi Blanco, 1939:389, pl. 1 [type locality: Laoag River, Laoag, Province of Ilocos Norte, Luzon, Philippines].

DIAGNOSIS.—Rostrum (Figure 12*a*) extending nearly to or slightly beyond distal end of antennal scale, trending slightly ventrad anteriorly, unarmed dorsally, armed ventrally with 1–7 inconspicuous teeth. Suborbital angle completely and indistinguishably fused with antennal spine; pterygostomian margin

rather narrowly rounded. Telson with rather prominent posteromedian projection elevated above true posterior margin, sublateral pair of posterior spines longer than, but not appreciably overreaching, intermediate pairs. Stylocerite (Figure 12*f*) nearly reaching level of distal margin of basal segment of antennular peduncle. First pereopod (Figure 12*i*) with fingers longer than palm, carpus only slightly longer than palm, carpus only slightly longer than wide, deeply excavate for reception of chela. Third pereopod (Figure 12*k,l*) with dactyl less than 3 times as long as wide. Epipods on all but 5th pereopod. Eggs small, little more than 0.4 mm in major diameter. Maximum postorbital carapace length about 9 mm.

MATERIAL.—PHILIPPINES. Fish ponds across "Malabon" River at "Malabon," Luzon [14°12'N, 122°53'E], 12 Jul 1908: 1 ovig. female [5.4].—Vigo River near Port Tilic, Lubang Island [13°50'N], 15 Jul 1908: 1 ovig. female [6.5].—Calawagan River, 3 miles [4.8 km] from mouth, Mindoro [13°25'N, 120°28'E], 11 Dec 1908 (1500), 16' seine: 7 males [2.8–4.4] 5 females [2.8–6.8], 1 ovig. [6.8].—Malaga River, Hinunangan Bay, Leyte [10°24'N, 125°12'E], 30 Jul 1909: 3 males [4.5–5.0] 4 females [2.8–8.5], 3 ovig. [6.7–8.5].—Baganga River, Mindanao [7°35'N, 126°33'E], 13 May 1908 (1300): 2 males [2.8, 3.4], 2 ovig. females [4.8, 5.6].—Lake Ernestine, Cagayan Sulu Island [6°59'N, 118°31'E], 8 Jan 1909: 1 female [6.1].

RANGE.—Known previously only from the type locality.

REMARKS.—This species is probably a synonym of *C. typus* var. *longirostris* De Man, 1892:369, from Sulawesi (Celebes) and Selajar, Indonesia, and possibly, in turn, of *C. exilirostris* Stimpson, 1860:29, from the Ryukyu Islands, but the Philippine populations are so morphologically uniform that it seems best to call them by Blanco's name for the present.

41. *Caridina weberi* De Man, 1892

Caridina Weberi De Man, 1892:371, pl. 22: figs. 23–23g [type locality: Kotting, Flores, Indonesia].—Bouvier, 1925:242, figs. 562–571. *Caridina weberi* Edmondson, 1935b:8, figs. 3a–f, 4g,h.

DIAGNOSIS.—Rostrum not reaching as far as distal end of antennular peduncle, dorsal margin horizontal or slanting ventrad, armed with 7–20 teeth reaching nearly to apex, including 0–6 on carapace posterior to orbital margin, armed ventrally with 0–10 teeth. Suborbital angle indistinguishably fused with antennal spine; pterygostomian margin rounded. Stylocerite not reaching as far as distal margin of basal segment of antennular peduncle. First pereopod with carpus variably excavate for reception of chela. Eggs small, about 0.3 mm in major diameter. Maximum postorbital carapace length probably not exceeding 8 mm.

RANGE.—Indonesia and Polynesia as far east as the Marquesas Islands.

REMARKS.—Several varieties of this species (*celebensis* Schenkel, 1902; *keiensis* J. Roux, 1911; *papuana* Nobili, 1905a; *parvirostris* De Man, 1892; and *sumatrensis* De Man,

1892) are recognized by Bouvier (1925). They are characterized chiefly by the dentition and inclination of the rostrum, the form of the chela and carpus of the first pereopod, and the proportions of the distal segments of the fifth pereopod.

Edoneus Holthuis, 1978

Edoneus Holthuis, 1978b:219 [type species, by original designation: *Edoneus atheatus* Holthuis, 1978b:220; gender: masculine].

DIAGNOSIS.—Carapace without supraorbital or any other spines, pterygostomian margin broadly rounded. Telson with posterolateral angles not produced. Eyes unpigmented, degenerate. Pereopods without exopods, 2nd pair with carpus not noticeably excavate, fully 5 times as long as wide.

RANGE.—Known only from the Philippines; subterranean.

REMARKS.—Only one species is known.

42. *Edoneus atheatus* Holthuis, 1978

Edoneus atheatus Holthuis, 1978b:220, figs. 5, 6 [type locality: cave near Disilud, barrio Palasian, Aglipay municipality, Quirino province, N. Luzon, Philippines, 16°27'N, 121°38.5'E].—Balet and Holthuis, 1992:99.

DIAGNOSIS.—Characters of genus; maximum carapace length 5.5 mm.

RANGE.—Known only from the type locality, a cave in north central Luzon.

Paratya Miers, 1882

Paratya Miers, 1882:194 [type species, by monotypy: *Ephyra compressa* De Haan, 1844, pl. 46: fig. 7; gender: feminine]. *Xiphocaridina* Bouvier, 1909:1729 [type species, selected by Holthuis, 1955:21: *Ephyra compressa* De Haan, 1844, pl. 46: fig. 7; gender: feminine]. *Xiphatyoida* J. Roux, 1915:225 [type species, selected by J. Roux, 1926:196: *Paratya* (*Xiphatyoida*) *typa* J. Roux, 1926:196; gender: feminine].

DIAGNOSIS.—Carapace with supraorbital spine, pterygostomian margin rounded. Telson with posterolateral angles not produced. Eyes pigmented, not degenerate. All pereopods with exopods, 2nd pair with carpus not deeply excavate, distinctly longer than wide.

RANGE.—As noted by Holthuis (1970:103) and Carpenter (1977:42), the dozen or so species of *Paratya* occur in an arc extending from eastern Siberia, Korea, and Japan to Vietnam and the Lesser Sunda Islands to Australia, Lord Howe and Norfolk islands, New Zealand, and Chatham Island. It may be coincidental that all of these localities are situated to the west of the Andesite Line and all but Chatham Island are confined to the Eurasian and Indian-Australian lithospheric plates (see Springer, 1982).

43. *Paratya martensi* J. Roux, 1925

Paratya martensi J. Roux, 1925:146 [type locality: Adonara, Lesser Sunda Islands, Indonesia].

DIAGNOSIS.—Rostrum reaching level of distal end of antennal scale, armed dorsally with 6–10 teeth, ventrally with

1–3. First pereopod with carpus less than twice as long as wide. Second pereopod with carpus less than 5 times as long as wide. Third pereopod with propodus less than 2½ times as long as dactyl.

RANGE.—Known only from the type locality slightly east of Flores, Lesser Sunda Islands, Indonesia.

***EUGONATONOTIDAE Chace, 1937**

GOMPHONOTIDAE Chace, 1936:25.

EUGONATONOTIDAE Chace, 1937a:15.—Holthuis, 1955:39.

GONATONOTIDAE Gurney in Gurney and Lebour, 1941:122.

DIAGNOSIS.—Rostrum discrete grossly dentate extension of and inflexibly attached to remainder of carapace. Carapace with longitudinal lateral ridges, without longitudinal suture or cardiac notch in posterior margin. Eyes normal, neither unusually long nor concealed beneath carapace. Antennule with 2 flagella, neither with accessory branch. Mandible with 3-jointed palp, usually without incisor process, molar process subtruncate, not flared distally. Second maxilla with normal endite, scaphognathite produced proximally only moderately into branchial chamber. First maxilliped with exopod not abutting endite, not displacing palp out of plane, exopod without partially detached lobe, lash well developed, caridean lobe bluntly produced slightly, distinctly overreaching endite. Second maxilliped with exopod, endopod composed of 4 segments, not terminating in 2 segments attached side by side to preceding segment, terminal segment applied as narrow strip to mesial margin of penultimate segment. Third maxilliped with exopod, composed of 5 segments, slender, pereopod-like, antepenultimate segment fused with next proximal segment. Pereopods with exopods on all 5 pairs, with strap-like epipods (mastigobranchs) on 4 anterior pairs without naked appendix extending vertically into branchial chamber, with arthrobranches on 3 anterior pairs, 2 anterior pairs rather robust, fingers without terminal tuft of setae but bearing long lateral and terminal spines forming basket-like cage when closed, 1st pair subequal, stouter and shorter than 2nd pair, with 1 finger movable, 1 finger fixed. Second pair of pereopods subequal, fixed finger not curving subrectangularly around short, broad movable finger, carpus entire, undivided. Third pereopod with flexor margin of dactyl spinose. First pleopod of male with endopod laminar, not large or elaborately convoluted.

RANGE.—Indo-West Pacific from Japan and northwestern Australia to the Tonga Islands; 100–610 meter. Western Atlantic from off Georgia to Gulf of Mexico and Caribbean as far as Nicaragua and Grenada; 53–610 meters.

REMARKS.—Only one genus is known.

****Eugonatonotus* Schmitt, 1926**

Gonatonotus A. Milne-Edwards, 1881:10 [type species, by monotypy: *Gonatonotus crassus* A. Milne-Edwards, 1881:10; gender: masculine. Invalid junior homonym of *Gonatonotus* Adams and White, 1847:57 (Crustacea Brachyura)].

Eugonatonotus Schmitt, 1926: "Corrigenda et Addenda" [substitute name for *Gonatonotus* A. Milne-Edwards, 1881; type species: *Gonatonotus crassus* A. Milne-Edwards, 1881:10; gender: masculine].

Gomphonotus Chace, 1936:25 [substitute name for *Gonatonotus* A. Milne-Edwards, 1881; type species therefore *Gonatonotus crassus* A. Milne-Edwards, 1881:10; gender: masculine].

DIAGNOSIS.—See family "Diagnosis," above.

REMARKS.—Chan and Yu (1991) have listed the diagnostic characters of the two species recognized in the genus.

***44. *Eugonatonotus chacei* Chan and Yu, 1991**

FIGURES 13a–f, 14

Eugonatonotus chacei Chan and Yu, 1991:144, fig. 1 [type locality: Ta-Shi, I-Lan County, Taiwan].

DIAGNOSIS.—Rostrum (Figure 13a–f) unarmed dorsally for at least distal 3/10 of rostral length in adults, armed ventrally with 6–8 teeth. Third abdominal somite with median teeth about as long as marginal tooth on pleuron. Fifth tergite with paired dorsal ridges eroded, not sharply carinate, posterior margin armed with 4 teeth. Antennal spine not overreaching dorsal spine on basicerite. Ventral spine on basicerite not overreaching midlength of 2nd antennular segment. Third maxilliped (Figure 14u) with pair of distinct subdistal spines on flexor margin of antepenultimate segment in adult specimens. Two anterior pairs of pereopods with chelae heavily setose, especially on palm of 1st pair. Maximum postorbital carapace length 41.5 mm.

MATERIAL.—PHILIPPINES. Off Tawitawi Island, Sulu Archipelago: sta 5162, 5°10'N, 119°47'30"E, 421 m, coarse sand, broken shells, 11.6°C, 22 Feb 1908 (1031–1046), 12' Agassiz beam trawl, mud bag: 1 juvenile (?) [18.0].

INDONESIA. West of Halmahera: sta 5621, 0°15'00"N, 127°24'35"E, 545 m, gray and black sand, 28 Nov 1909 (0950–1010), 12' Agassiz beam trawl, mud bag: 1 juvenile (?) [17.0]; sta 5626, 0°07'30"N, 127°29'00"E, 485 m, gray mud, fine sand, 29 Nov 1909 (1534–1552), 12' Agassiz beam trawl: 1 female [24.0].—Southern end of Selat Patinti, southern Halmahera: sta 5629, 0°50'00"S, 128°12'00"E, 375 m, coral sand, 2 Dec 1909 (0643–0645), 12' Agassiz beam trawl (badly damaged): 2 juveniles (?) [15.7, 17.3].—South of Pulau Muna, Sulawesi (Celebes), sta 5645, 5°29'06"S, 122°36'06"E, 377 m, 16 Dec 1909 (0954–0955), 12' Agassiz beam trawl: 1 female [28.8].—West of Selat Salajar, southwestern Sulawesi (Celebes), sta 5661, 5°49'40"S, 120°24'30"E, 329 m, hard bottom, 10.3°C, 20 Dec 1909 (1624–1627), 12' Agassiz beam trawl (net torn below lead line): 1 juvenile (?) [17.8].

RANGE.—Extreme eastern Indian Ocean northwest of Australia and western Pacific from Japan, Taiwan, Philippines, Indonesia, off Queensland, Chesterfield Islands, New Caledonia, Iles Loyaute, and the Tonga Islands; 100–610 meters.

REMARKS.—Inasmuch as specific differences between the Indonesian and western Atlantic populations were finally recognized in 1972, after having been overlooked during the

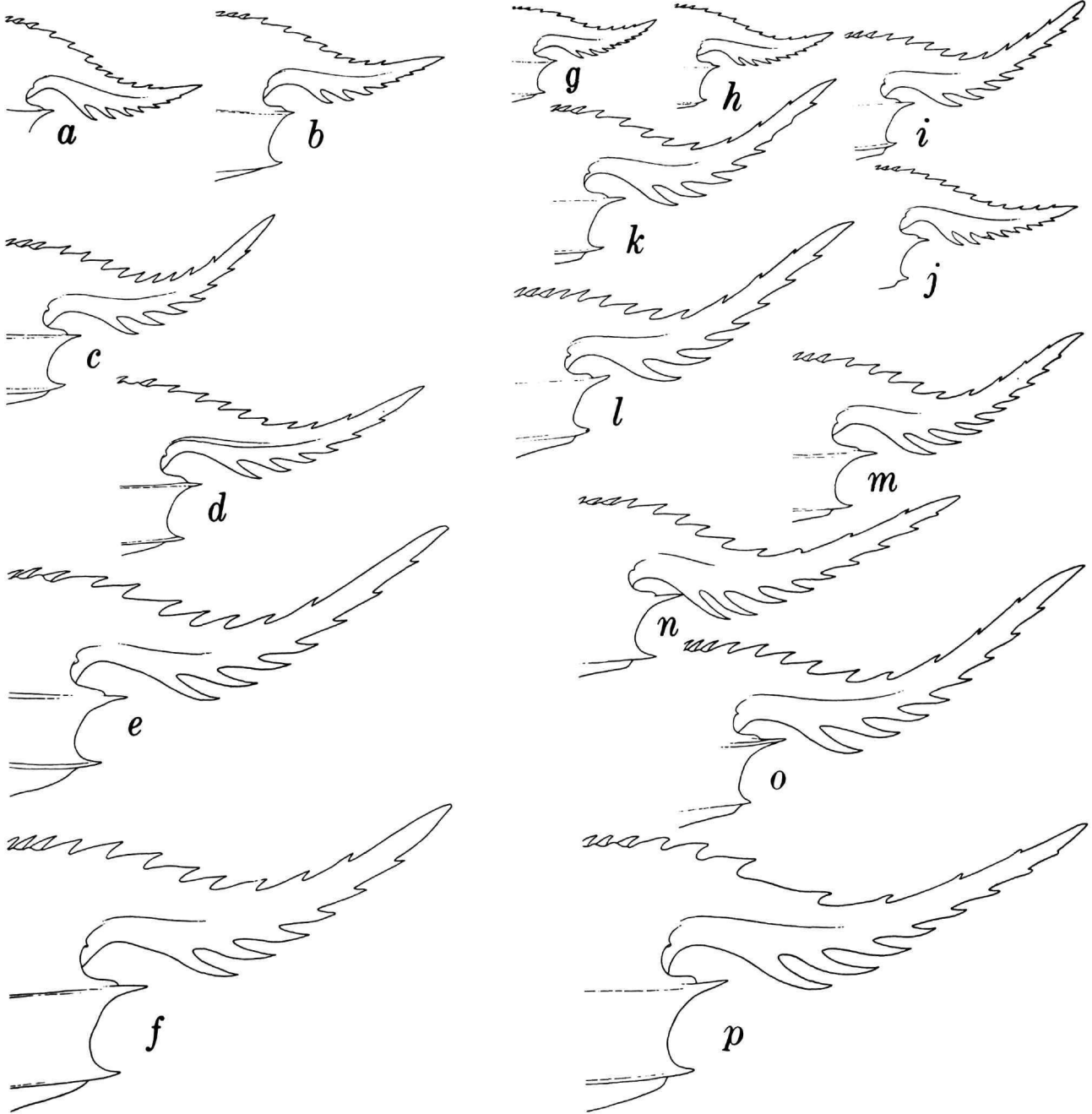


FIGURE 13.—Rostra of *Eugonatonotus*, a-f, *E. chacei*; g-p, *E. crassus*: a, juvenile (?) with carapace length of 15.7 mm from *Albatross* sta 5629; b, juvenile (?) with carapace length of 17.3 mm from *Albatross* sta 5629; c, female with carapace length of 17.8 mm from *Albatross* sta 5661; d, female with carapace length of 18.0 mm from *Albatross* sta 5162; e, female with carapace length of 24.0 mm from *Albatross* sta 5626; f, female with carapace length of 28.8 mm from *Albatross* sta 5645; g, juvenile (?) with carapace length of 10.9 mm from the Bahamas; h, juvenile (?) with carapace length of 11.7 mm from the Straits of Florida; i, juvenile (?) with carapace length of 13.3 mm from the Yucatan Channel; j, juvenile (?) with carapace length of 13.7 mm from southeast of the Dry Tortugas; k, female with carapace length of 17.5 mm from the Yucatan Channel; l, male with carapace length of 18.5 mm from the Straits of Florida; m, female with carapace length of 18.8 mm from east of Yucatan; n, male with carapace length of 21.0 mm from the Straits of Florida; o, female with carapace length of 21.1 mm from northwest of the Dry Tortugas; p, male with carapace length of 29.9 mm from northwest of the Dry Tortugas.

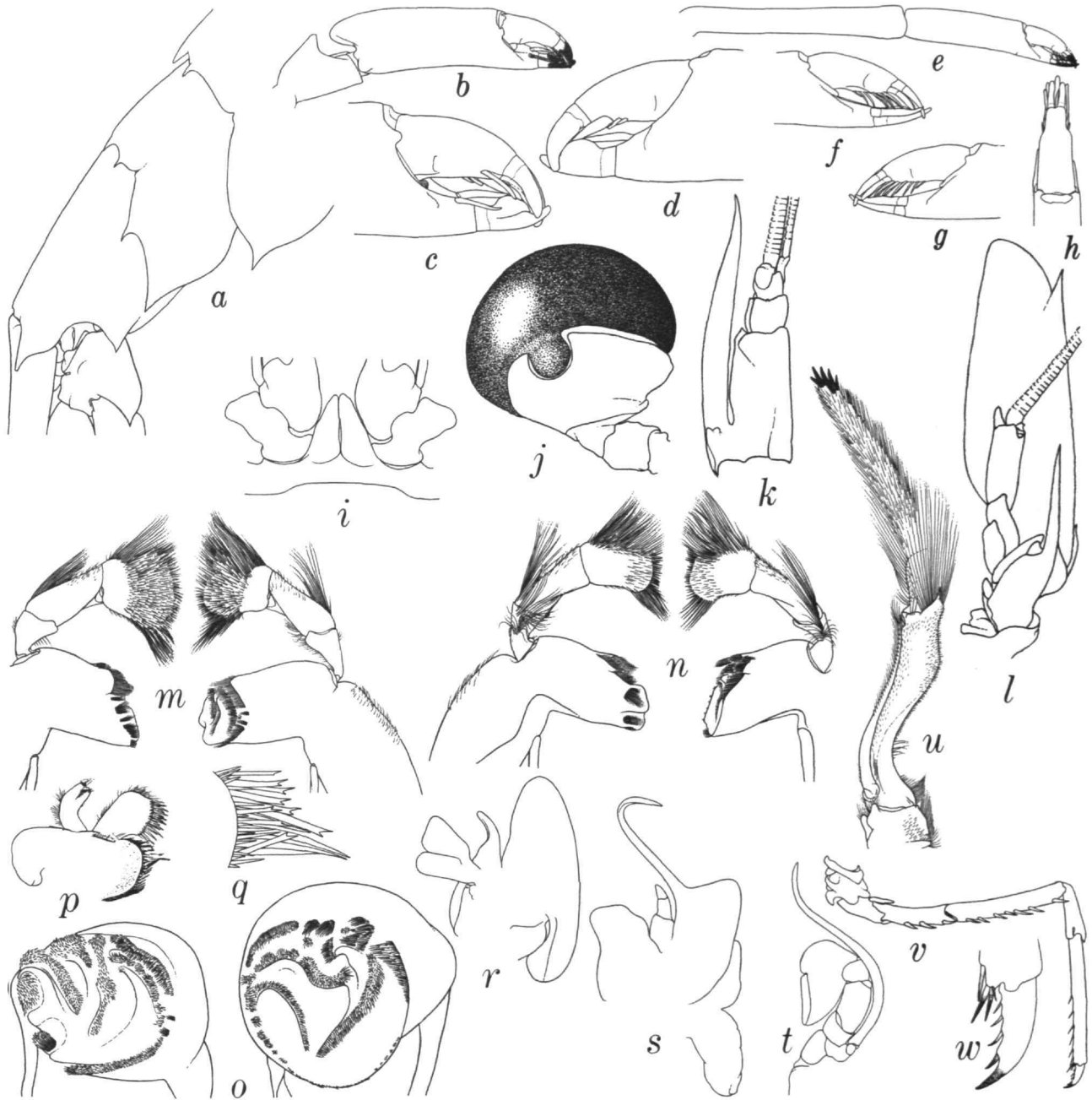


FIGURE 14.—*Eugonatonotus chacei*, a-i, female with carapace length of 28.8 mm from Albatross sta 5645; j-w, female with carapace length of 24.0 mm from Albatross sta 5626: a, 5th and 6th abdominal somites; b, chela and carpus of right 1st pereopod; c, same, fingers, lateral aspect; d, same, mesial aspect; e, chela and carpus of right 2nd pereopod; f, same, fingers, lateral aspect; g, same, mesial aspect; h, same, extensor aspect; i, paired processes on 5th sternal somite; j, left eye, dorsal aspect; k, left antennule, dorsal aspect; l, left antenna, ventral aspect; m, right and left mandibles, oral aspect; n, left and right mandibles, oral aspect; o, left and right mandibles, contact surfaces; p, right 1st maxilla; q, same, marginal setae on proximal endite; r, left 2nd maxilla; s, left 1st maxilliped; t, left 2nd maxilliped; u, left 3rd maxilliped; v, right 3rd pereopod; w, same, dactyl.

preceding 40 years that comparable collections were available to me, most of the illustrations that were prepared at that time are reproduced here for what they may be worth and, especially, for comparison with those of the species of *Rhynchocinetes* that follow.

It may be determined from the six examples of *E. chacei* and the 10 specimens of *E. crassus* illustrated in Figure 13 that the unarmed subapical portion of the dorsal margin of the rostrum ranges from 29 to 39 per cent of the rostral length in *E. chacei*, whereas that unarmed portion amounts to only 15 to 21 per cent of the total length in *E. crassus*. Also, in these examples, the number of ventral teeth is either six or seven in *E. chacei* versus seven to nine in *E. crassus*; Chan and Yu (1991, table 1) found seven or eight in *E. chacei*, eight or nine in *E. crassus*.

*RHYNCHOCINETIDAE Ortmann, 1890

RHYNCHOCINETIDAE Ortmann, 1890:459.

DIAGNOSIS.—Rostrum discrete grossly dentate extension of remainder of carapace but typically incompletely fused therewith. Carapace without longitudinal lateral ridges or suture or cardiac notch. Telson with 3 pairs of posterior marginal spines. Eyes normal, neither unusually long nor concealed beneath carapace. Antennule with 2 completely separate flagella, neither with accessory branch. Mandible with 3-jointed palp, rather broad incisor process, and molar process with transversely ridged grinding surface but not flared. Second maxilla with normal endite, scaphognathite produced proximally far into branchial chamber. First maxilliped with exopod

not abutting endite, not displacing palp out of plane, exopod without partially detached lobe, lash well developed, caridean lobe not produced distally, distinctly overreaching endite. Second maxilliped with exopod, endopod composed of 4 segments, not terminating in 2 segments attached side by side to preceding segment, terminal segment applied as narrow strip to much wider penultimate segment. Third maxilliped with exopod, composed of 5 segments, slender, pereopod-like, antepenultimate segment fused with next proximal segment. Pereopods without exopods, with strap-like epipods (masti-gobranchs) on 4 anterior pairs without naked appendix extending vertically into branchial chamber, with arthrobranchs on at least anterior pair, anterior pair subequal, stouter than second, with 1 finger movable, 1 finger fixed, 2nd pair subequal, fixed finger not curving subrectangularly around movable finger, carpus entire, undivided. Third pereopod with flexor margin of dactyl armed with few spines. First pleopod of male with endopod laminar, not unusually large or elaborately convoluted.

RANGE.—Throughout most tropical and several temperate regions of the world; littoral to 220 meters.

REMARKS.—Only one genus is recognized, but two seem justified, based on the first couplet in the following key to species.

**Rhynchocinetes* H. Milne Edwards, 1837

Rhynchocinetes H. Milne Edwards, 1837:168 [type species, by monotypy: *Rhynchocinetes typus* H. Milne Edwards, 1837:168; gender: masculine].

DIAGNOSIS.—See family "Diagnosis," above.

Key to Species of *Rhynchocinetes*

1. Two teeth in midline of carapace posterior to rostral articulation. Abdomen with all terga unarmed on posterior margin 2
- Three teeth in midline of carapace posterior to rostral articulation. Abdomen with prominent lateral tooth on posterior margin of 5th tergum at least 12
2. Supraorbital tooth represented by blunt nodule. Orbital margin continuous with antennal spine, not forming projecting lobe at base thereof
- *R. ikatere* (Yaldwyn, 1971:87)
(Bay of Plenty, New Zealand; 146–220 meters)
- Supraorbital tooth prominent, sharp. Orbital margin with distinct projecting lobe posterior to antennal spine 3
3. Rostrum with 16–21 ventral teeth 4
- Rostrum with 8–15 ventral teeth 5
4. Basal antennular segment with distolateral spine extending about as far as tip of stylocerite at level of distal margin of penultimate segment. Appendix interna on 2nd pleopod of male overreaching appendix masculina. Arthrobranch at bases of 3 anterior pereopods only 47. *R. durbanensis*
- Basal antennular segment with distolateral spine far overreaching stylocerite and extending nearly or quite to level of distal margin of ultimate segment. Appendix masculina on 2nd pleopod of male overreaching appendix interna
- *R. typus* (H. Milne Edwards, 1837:165)
(Peru, Chile)

5. First pleopod of male with prominent lobe on lateral margin of endopod opposite appendix interna 6
 First pleopod of male with lateral margin of endopod nearly entire, without prominent lobe 8
6. Antennal scale about 3 times as long as wide
 *R. kuiteri* (Tiefenbacher, 1983:121)
 (Victoria, Australia, and Tasmania)
 Antennal scale at least 4 times as long as wide 7
7. Sixth abdominal somite with posterolateral tooth flared laterad. Fifth pereopod without spine on ischium. Arthrobranch on each of 3 anterior pereopods
 *R. rugulosus* (Stimpson, 1860:36)
 (New South Wales, Australia)
 Sixth abdominal somite with posterolateral tooth not flared laterad. Fifth pereopod with spine on ischium. Arthrobranch on each of only 2 anterior pereopods
 *R. uritai* (Kubo, 1942:30)
 (Southern Korea and southern Japan)
8. Stylocerite overreaching 2nd antennular segment 9
 Stylocerite not overreaching 2nd antennular segment 10
9. Tegumental striae apparent. Arthrobranch on 2 anterior pairs of pereopods
 *R. australis* (Hale, 1941:270)
 (Victoria, South Australia, and Tasmania)
 Tegumental striae obscure. Arthrobranch on 1st pereopod only
 *R. balssi* (Gordon, 1936a:85)
 (New Zealand and Juan Fernandez)
10. Orbital angle rounded *45. *R. albatrossae*, new species
 Orbital angle acute 11
11. Third maxilliped with exopod not nearly reaching distal end of antepenultimate segment. First cheliped with fingers dentate on opposable margins, carpus and merus strongly dentate distally. Arthrobranch on 3 anterior pairs of pereopods
 46. *R. brucei*
 Third maxilliped with exopod nearly reaching distal end of antepenultimate segment. First cheliped with fingers unarmed on opposable margins, carpus and merus not strongly dentate distally. Arthrobranch on 2 anterior pairs of pereopods only
 *R. conspiciocellus* (Okuno and Takeda, 1992:64)
 (Southern Japan)
12. Rostrum with posterior 4 spines in ventral series isolated from much smaller spines anterior thereto, 3rd spine overreaching 4th spine [see Okuno, 1994b:69, figure 3A]
 *R. concolor* (Okuno, 1994:66)
 (Zanzibar, southern Japan,
 Papua New Guinea, Western Australia,
 and Queensland; 7–17 meters)
 Rostrum with ventral spines decreasing rather regularly in size anteriorly, 3rd spine not overreaching 4th 13
13. Third pereopod with dactyl bearing 3 stout spines on flexor margin, 3–4 spines on posterior margin of merus 14
 Third pereopod with dactyl bearing 2 spines on flexor margin, 1 or 2 spines on posterior margin of merus 15
14. Rostrum with 8–10 ventral teeth. Carapace with pterygostomian tooth. Stylocerite not reaching distal end of antennular peduncle. Antennal scale with distolateral tooth reaching level of distal margin of blade
 *R. hendersoni* (Kemp, 1925:265)
 (India eastward to Hawaii)
 (= *R. intermedius* Edmondson, 1952:72)
 (= *R. marshallensis* Edmondson, 1952:75)

- Rostrum with 11–13 ventral teeth. Carapace without pterygostomian tooth. Stylocerite reaching distal end of antennular peduncle. Antennal scale with distolateral tooth not nearly reaching level of distal margin of blade
 *R. striatus* (Nomura and Hayashi, 1992:199)
 (Ryukyu Islands, Japan, and Great Barrier Reef of Australia; shallow water)
15. Carapace with minute pterygostomian tooth. Third pereopod with 1 spine on posterior margin of merus *R. hiatti* (Holthuis and Hayashi, 1967:162)
 (Taiwan and Ryukyu and Caroline islands to Hawaii)
- Carapace without pterygostomian tooth. Third pereopod with 2 spines on posterior margin of merus *R. rigens* (Gordon, 1936a:76)
 (Eastern and western tropical and subtropical Atlantic and possibly western Pacific; littoral and sublittoral)

***45. *Rhynchocinetes albatrossae*, new species**

FIGURES 15, 16

DIAGNOSIS.—Rostrum (Figure 15*a,b*) overreaching antennal scale, movably attached to remainder of carapace, armed dorsally with 2 teeth in posterior $1/2$, 4 in cluster at tip, ventrally with 12 teeth. Integument with fine transverse striae. Carapace (Figure 15*a*) bearing 2 teeth in midline posterior to rostral juncture, sharp supraorbital tooth, and distinct pterygostomian tooth; orbital margin terminating ventrally in distinct rounded lobe at base of antennal spine. Abdomen (Figure 15*c*) without posterior tergal tooth on any somite; pleuron of 3rd somite with obscure marginal tooth, those of 4th and 5th somites acute at posteroventral angle; 6th somite with small posteroventral tooth not flared laterad. Telson with 3 pairs of dorsolateral and 3 pairs of posterior spines. Eye (Figure 15*d*) with prominent dorsal ocellus. Antennule (Figure 15*e*) with distolateral spine of basal segment slightly overreaching stylocerite and reaching nearly to distal margin of 2nd segment. Antennal scale (Figure 15*f*) nearly 5 times as long as wide, distolateral tooth far overreaching distally narrow blade. Mouthparts as illustrated (Figure 15*g–m*); 3rd maxilliped (Figure 15*l,m*) with cluster of 8 terminal and subterminal spines on ultimate segment, exopod nearly reaching distal end of antepenultimate segment. First pair of pereopods (Figure 16*a,b*) subequal; fingers not dentate on opposable margins, carpus and merus without unusually strong distal tooth. Second pereopod (Figure 16*c,d*) slender, no more robust than 3rd pereopod. Third pereopod (Figure 16*e,f*) with 2 spines on carpus, 3 on merus, and 1 on ischium. Fourth and 5th pereopods similarly armed. First pleopod of male with endopod (Figure 16*g*) distally acute, "appendix interna" with few distal cincinnuli, no distinct lobe on lateral margin. Appendix interna and appendix masculina on 2nd pleopod (Figure 16*h*) arising slightly distal to midlength of endopod, appendix interna distinctly overreaching appendix masculina.

Arthrobranch on each of 3 anterior pereopods only. Maximum postorbital carapace length 4.5 mm.

MATERIAL.—PHILIPPINES. Surigao Strait, east of Leyte, sta 5482, 10°27'30"N, 125°18'E, 123 m, broken shells, sand, and green mud, 30 Jul 1909 (0911–0935), 12' Agassiz beam trawl: 2 males [4.0, 4.5], larger is holotype (USNM 264046).

TYPE LOCALITY.—Surigao Strait, Philippines; 123 meters.

RANGE.—Known only from the holotype and paratype from Surigao Strait; 123 meters.

REMARKS.—Confirmation of the validity of this species may depend on the determination of the color pattern, which seems to be an essential character in many species of *Rhynchocinetes*. In combining two teeth in the midline of the carapace posterior to the rostral articulation, a sharp supraorbital spine, a projecting lobe on the orbital margin at the base of the antennal spine, a pterygostomian tooth, abdominal terga without posterior marginal teeth, the stylocerite not overreaching the second antennular segment, and lacking a distinct lobe on the lateral margin of the endopod of the male first pleopod, *R. albatrossae* differs from all previously recognized species except *R. durbanensis* from South Africa and *R. typus* from Peru and Chile. From both of those species, it may be distinguished by having only 12, rather than more than 15, ventral teeth on the rostrum. In addition, it apparently differs from *R. durbanensis* by having only two, rather than three, dorsal teeth on the posterior two-thirds of the rostrum and the lobe on the orbital margin rounded rather than angular. The unequal anterior pereopods noted by Gordon (1936a:85, 87) in a specimen of *R. durbanensis* in the British Museum undoubtedly resulted from regeneration; Barnard (1950:764) described a specimen, similar in size to the one recorded by Gordon, in which the first pereopods were equal. From *R. typus*, too, it disagrees by having the distolateral spine on the basal segment of the antennular peduncle reaching nearly to the distal margin of the ultimate segment, the appendix interna on the endopod of the male second pleopod overreaching the

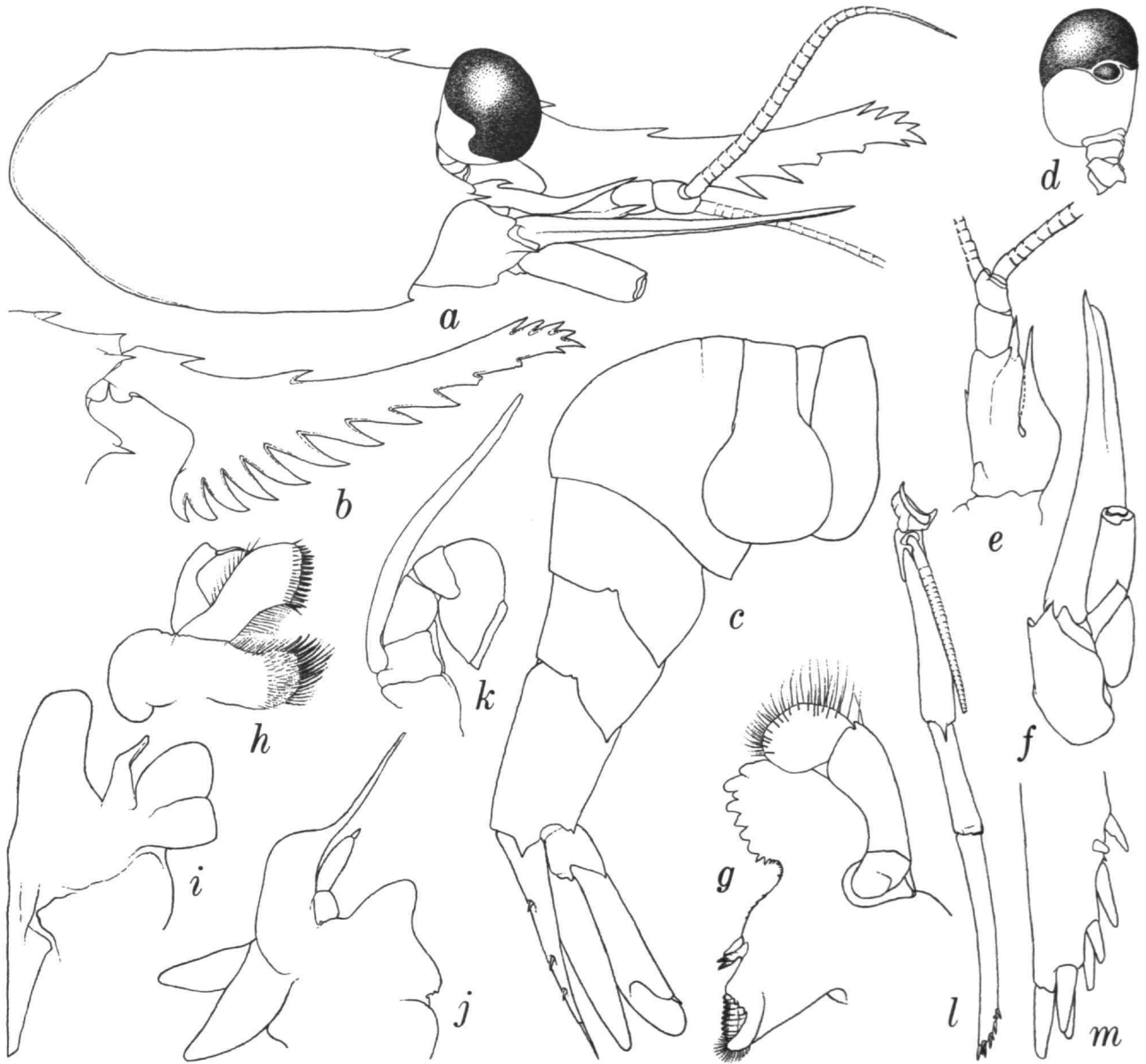


FIGURE 15.—*Rhynchocinetes albatrossae*, new species, male holotype from Surigao Strait, carapace length 4.5 mm: a, carapace and anterior appendages; b, rostrum; c, abdomen; d, right eye, dorsal aspect; e, right antennule, dorsomesial aspect; f, right antenna, ventral aspect; g, right mandible; h, right 1st maxilla; i, right 2nd maxilla; j, right 1st maxilliped; k, right 2nd maxilliped; l, right 3rd maxilliped, denuded; m, same, distal end.

appendix masculina, and the fourth pereopod without an arthrobranch.

ETYMOLOGY.—The species is named for the U.S. fisheries steamer that devoted the entire years of 1908 and 1909 to amassing the Philippine and Indonesian collections that are still yielding substantial information about the planet we live on.

46. *Rhynchocinetes brucei* Okuno, 1994

Rhynchocinetes brucei Okuno, 1994a:29, figs. 1–4, pl. 1.

DIAGNOSIS.—Rostrum overreaching antennal scale, movably attached to remainder of carapace, armed dorsally with 2 teeth in posterior $1/2$, 4–6 in cluster at tip, ventrally with 12–15

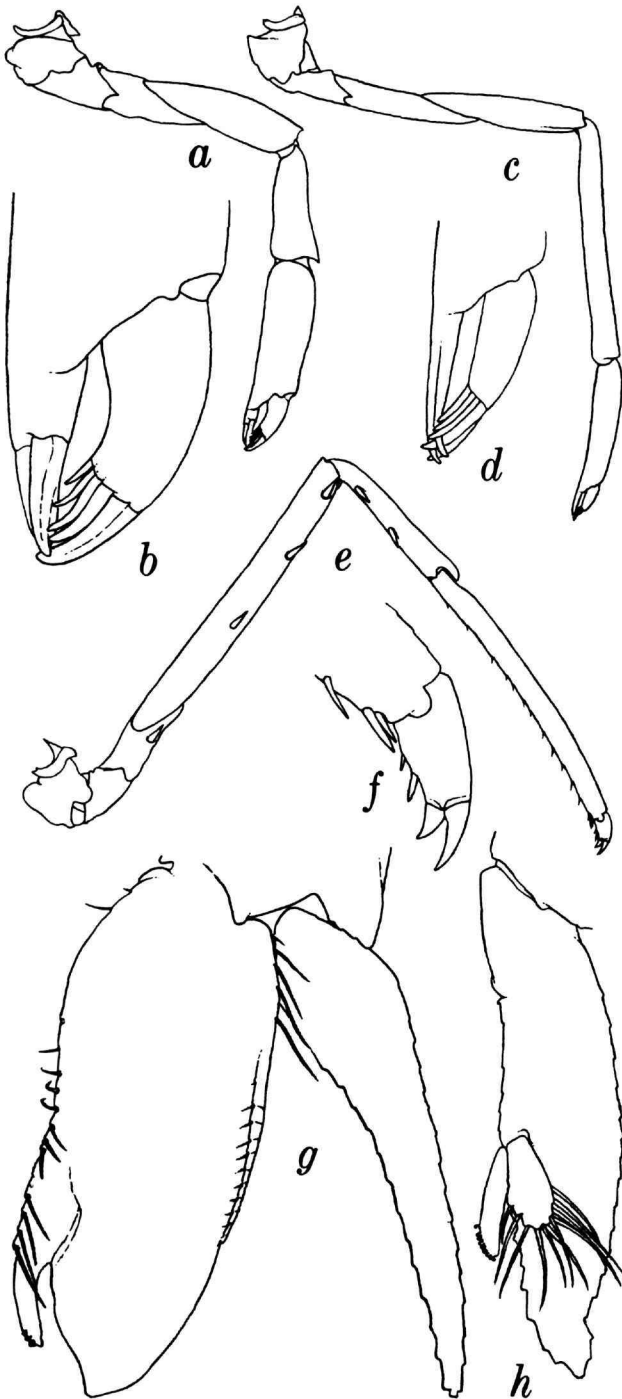


FIGURE 16.—*Rhynchocinetes albatrossae*, new species, male holotype from Surigao Strait, carapace length 4.5 mm: a, right 1st pereopod, denuded; b, same, fingers; c, right 2nd pereopod, denuded; d, same, fingers; e, right 3rd pereopod, denuded; f, same, dactyl; g, endopod and exopod of right 1st pleopod; h, appendix interna and appendix masculina on endopod of left 2nd pleopod.

teeth. Integument with fine transverse striae. Carapace bearing 2 teeth in midline posterior to rostral juncture, sharp supraorbital tooth, and blunt pterygostomial tooth; orbital margin terminating ventrally in acute angle at base of antennal spine. Abdomen without posterior tergal tooth on any somite; pleura of 3 anterior somites rounded, those of 4th and 5th somites acute posteroventrally; 6th somite with small posteroventral tooth. Telson with 3 pairs of dorsolateral and 3 pairs of posterior spines. Antennule with distolateral spine of basal segment slightly overreaching stylocerite and reaching nearly to distal margin of 2nd segment. Antennal scale about $4\frac{1}{2}$ times as long as wide, distolateral tooth far overreaching distally narrow blade. Third maxilliped with tip armed with 5–8 dark spines, exopod not nearly reaching distal end of antepenultimate segment. First pereopod with fingers dentate on opposable margins, carpus and merus with strong distal tooth. Third pereopod with 2 spines on carpus, 3 on merus, and 1 on ischium. First pleopod of male with endopod bearing small, acute distal lobe, without distinct lobe on lateral margin. Appendices interna and masculina on 2nd pleopod subequal. Arthrobranch on each of 3 anterior pereopods. Maximum postorbital carapace length 15.4 mm.

RANGE.—Hong Kong, Philippines, and Great Barrier Reef of Australia.

47. *Rhynchocinetes durbanensis* Gordon, 1936

Rhynchocinetes typus.—Stebbing, 1917:27, pl. 6 [not *R. typus* H. Milne Edwards, 1837].

Rhynchocinetes durbanensis Gordon, 1936a:83, figs. 5b,c, 7c,d [type locality: Durban, South Africa].—Okuno and Takeda, 1992b:85, figs. 1, 3–5 [right], 6–8.

DIAGNOSIS.—Rostrum overreaching antennal scale, movably attached to remainder of carapace, armed dorsally with 3 teeth in posterior $\frac{3}{5}$, 5–7 in cluster at tip, ventrally with 16–18 teeth. Integument with fine transverse striae. Carapace bearing 2 teeth in midline posterior to rostral juncture, sharp supraorbital spine, and sometimes indistinct pterygostomial tooth; orbital margin terminating ventrally in rather distinct lobe at base of antennal spine. Telson with 3 pairs of dorsolateral and 3 pairs of posterior spines. Antennule with distolateral spine of basal segment slightly overreaching stylocerite. Antennal scale about 4 times as long as wide, distolateral tooth far overreaching distally narrow blade. Third maxilliped with about 5 spines near apex of ultimate segment. Third pereopod with 3–5 small dark spines on dactyl, 3–4 on merus. First pleopod of male with endopod distally acute, without distinct lobe on lateral margin. Arthrobranch on each of 3 anterior pereopods. Maximum postorbital carapace length 12.7 mm.

RANGE.—Reputedly widely distributed in the Indo-Pacific region, but recorded with certainty only from South Africa, the Ryukyus, the Philippines, and Indonesia; sublittoral.

***BATHYPALAEONELLIDAE de Saint-Laurent, 1985**

BATHYPALAEONELLIDAE de Saint-Laurent, 1985:473.—Chace, 1992:71, 72, 78.

DIAGNOSIS.—Rostrum discrete, partially dentate extension of remainder of carapace, inflexibly attached thereto. Carapace without longitudinal lateral ridges, postantennal suture, or cardiac notch. Eystalks normal, neither unusually long nor concealed beneath carapace. Antennule with 2 completely separate flagella, neither with accessory branch. Mandible with palp, with molar and incisor processes not deeply divided, molar process subtruncate, with transversely ridged grinding surface, not flared. Second maxilla with endite normal, scaphognathite rounded proximally, not deeply produced into branchial cavity.

First maxilliped with epipod not abutting endite, not displacing palp out of line, exopod without partially detached lobe, lash well developed, caridean lobe not much produced distally but distinctly overreaching endite. Second maxilliped with exopod, endopod composed of 4 segments, not terminating in 2 segments attached side by side to preceding segment, terminal segment attached obliquely to penultimate segment. Third maxilliped with exopod, composed of 5 segments, slender, pereopod-like, antepenultimate segment fused with next proximal segment. Pereopods without exopods, epipods, if present, not terminating in naked appendix extending vertically into branchial chamber, with arthrobranches on 4 anterior pairs. Anterior pair subequal, slender, 1 finger movable, 1 fixed. Second pair unequal, fixed finger not curving subrectangularly around movable finger, carpus entire, undivided. Third pereopod with dactyl spinose on flexor margin. First pleopod of male with endopod laminar, not unusually large or elaborately convoluted.

RANGE.—Pantropical between latitudes 27°N and 13°S; 308–1463 meters.

REMARKS.—It is with gratitude to L.B. Holthuis (in correspondence) and embarrassing apologies to M. de Saint-Laurent that I relinquish the invalid authorship of this family (Chace, 1992:78).

***Bathypalaemonella Balss, 1914**

Bathypalaemonella Balss, 1914a:597 [type species, by monotypy: *Bathypalaemonella zimmeri* Balss, 1914a:598; gender: feminine].

DIAGNOSIS.—See family “Diagnosis,” above.

REMARKS.—A key to the eight currently recognized species was included in Bruce (1986:263).

As noted by Crosnier and Forest (1973:154, footnote), there are minor discrepancies between the illustration published by Zarenkov (1968:60, fig. 4) and the original description of *B. humilis* Bruce, 1966. It seems probable, however, that the male and ovigerous female recorded by Zarenkov from off Vietnam at 15°07'00"N, 109°42.4'E, 310 m (locality kindly furnished by Zarenkov, in litt.), are correctly assigned to Bruce's species.

I have had the opportunity of examining type specimens of *B. pandaloides* (Rathbun, 1906), *B. serratipalma* Pequegnat, 1970, *B. texana* Pequegnat, 1970, and *B. delsolari* Wicksten and Mendez, 1983. Although the three female specimens recorded by Crosnier and Forest (1973:151) from off Morocco agree in most respects with the description of *B. serratipalma*, the holotype, allotype, and paratypes of that species deposited in the Smithsonian collections all have the rostrum considerably longer and upturned more noticeably than in the illustration offered by Crosnier and Forest (1973:152, fig. 45). Probably the acquisition of additional material from both the western and eastern Atlantic will be required to determine whether the two populations are specifically identical or not. Similarly, positive confirmation that the unique specimen of *B. texana* is specifically distinct and not an aberrant example of *B. serratipalma* (a juvenile specimen of which was collected at the same *Alaminos* station as was the holotype of *B. texana*) can be realized only by the study of additional specimens. Both forms have the major second chela peculiarly grooved on the extensor margin, as noted in the eastern Atlantic material by Crosnier and Forest, and at least one-half of the presumably eight posterior spines on the telson of the holotype of *B. texana* are missing; also, Pequegnat's belief that the complete rostrum of the latter specimen might have borne as many as ten ventral teeth is debatable.

The two paratypes of *B. delsolari* in the Smithsonian collections were received from Dr. Del Solar in 1976. Other commitments and misunderstandings about the availability of additional specimens, including a male, interfered with description of the species at that time. Among the numerous labels in the Smithsonian paratype lot is one inserted by Wicksten indicating that the specimens were paratypes of “*Bathypalaemonella peruviana* Wicksten and Mendez.” That evidence that the latter name was originally considered for the species undoubtedly accounts for the appearance of that nomen nudum among the “Remarks” following the description of *B. delsolari* in Wicksten and Mendez (1983:231).

***48. *Bathypalaemonella pilosipes* Bruce, 1986**

FIGURE 17

Bathypalaemonella pilosipes Bruce, 1986:257, figs. 6–10 [type locality: Australian Northwest Shelf, 13°33.8'S, 122°53.4'E; 390–394 meters].

DIAGNOSIS.—Rostrum (Figure 17a) overreaching antennal scale bearing 14 or 15 basally articulate, spine-like teeth on posterior 1/2 of dorsal margin, posteriormost nearly in line with posterior margin of orbit, unarmed on distal 1/2 except for fixed subapical tooth, armed with 7–9 teeth on posterior 2/3 of ventral margin, 5 or 6 posterior ones basally articulate (Figure 17b) less distinctly so than dorsal teeth. Carapace, proper, dorsally rounded, not carinate anteriorly. Telson (Figure 17e,f) with median posterior tooth, 2 lateral pairs in posterior 1/2 of length, and 3 pairs of posterior spines. Cornea broader than eyestalk, without ocellus or papilla on stalk. Antennal scale (Figure 17i)

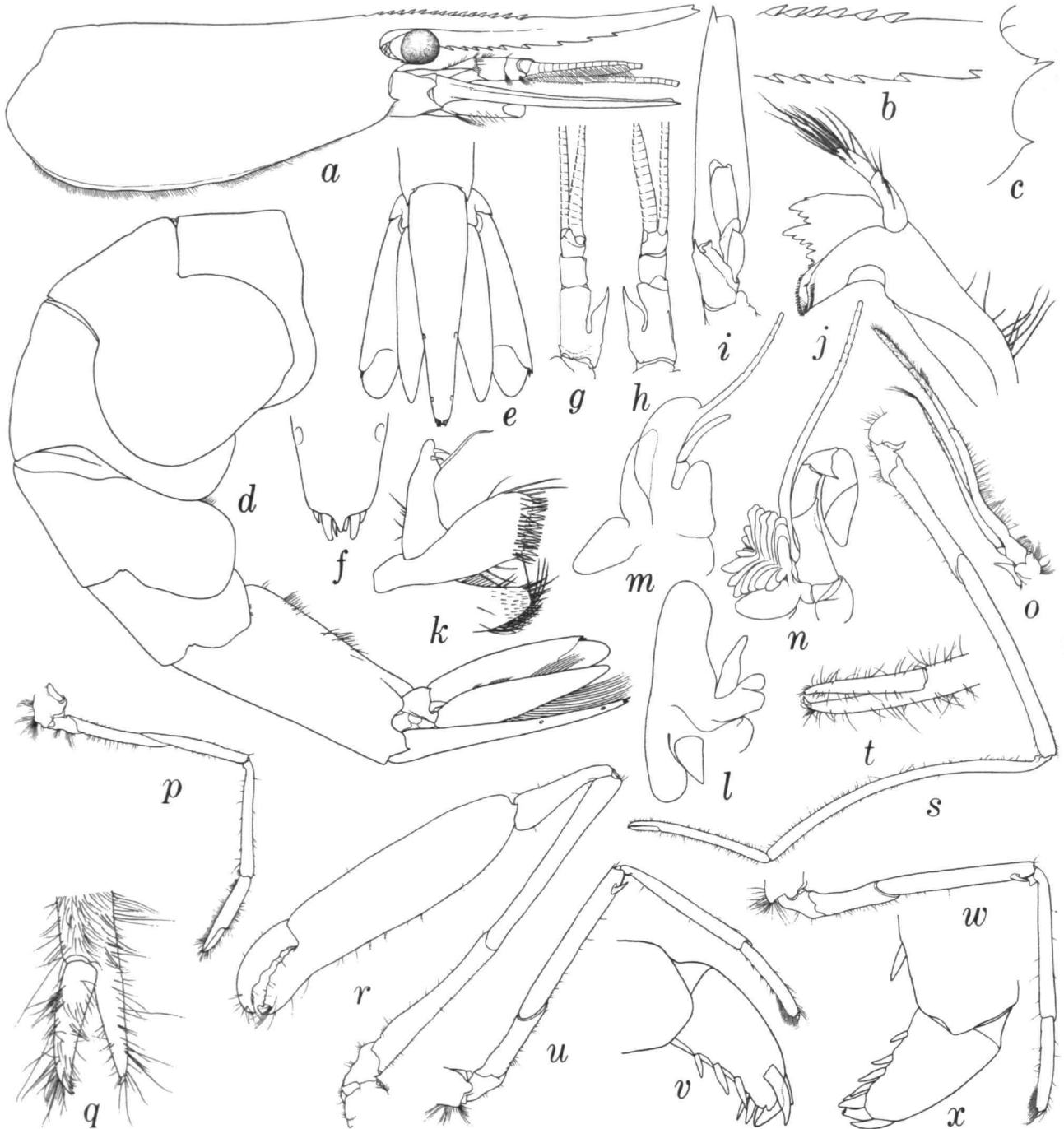


FIGURE 17.—*Bathypalaemonella pilosipes*, ovigerous female with carapace length of 9.5 mm from *Albatross* sta 5325: a, carapace and anterior appendages; b, central part of rostrum; c, anterior margin of carapace; d, abdomen; e, telson and uropods; f, posterior end of telson; g, right antennule, dorsal aspect; h, same, ventral aspect; i, right antennal scale, ventral aspect; j, right mandible; k, right 1st maxilla; l, right 2nd maxilla; m, right 1st maxilliped; n, right 2nd maxilliped; o, right 3rd maxilliped; p, right 1st pereopod; q, same, fingers; r, right 2nd pereopod; t, same, fingers; u, right 3rd pereopod; v, same, dactyl; w, right 4th pereopod; x, same, dactyl.

with lateral margin convex in distal 1/2. Major 2nd pereopod (Figure 17r) with fingers armed with broadly obtuse teeth on opposable margins, chela pinched and somewhat setose laterally at base of fixed finger, presumably representing adhesive mechanism. Third pereopod with dense growth of setae on distal 1/3 of flexor margin of propodus largely concealing numerous spinose dactyl. Maximum carapace length 9.5 mm.

MATERIAL.—PHILIPPINES. Babuyan Channel, north of Luzon: sta 5325, 18°34'15"N, 121°51'15"E, 410 m, green mud, 11.8°C, 12 Nov 1908 (1113–1132), 12' Tanner beam trawl, mud bag: 1 ovig. female [9.5].

RANGE.—Known previously only from the type locality on the Australian Northwest Shelf; 390–394 meters.

REMARKS.—There is little doubt that the *Albatross* specimen is conspecific with the ovigerous female holotype of *P. pilosipes* collected by the *Soela* on the Australian Northwest Shelf. Inasmuch as the Philippine specimen is in slightly better condition, the illustrations prepared when it was an undescribed species are furnished herewith for whatever value they may be to those who may be involved with the genus in the future. It may be noted that the entire rostrum is no longer than the incomplete one on the holotype and that its dentition is slightly different, the ventral teeth being less clearly articulate; that the complete telson displays a median acute tooth on the posterior margin that has not been noted in other species of the genus and that this projection is flanked by only three pairs of posterior spines and that the presumed locking mechanism on the major second chela is more sparsely clothed with far less conspicuous setae.

***PROCESSIDAE Ortmann, 1896**

NIKADEA De Haan, 1844, pl. N.

NIKIDAE Bate, 1888:xii, xli, 480, 503.

HECTARTHROPIDAE Bate, 1888:481, 883.

PROCESSIDAE Ortmann, 1896:415, 424.

DIAGNOSIS.—Rostrum discrete structure inflexibly attached to remainder of carapace, unarmed except (usually) pair of teeth delimiting terminal seta-filled notch. Carapace without longitudinal lateral ridges, complete postantennal suture, or cardiac

notch. Telson bearing 2 pairs of posterior marginal spines and 1 or more pairs of mesial setae. Eyestalks normal, neither abnormally long nor concealed beneath carapace. Antennule with 2 completely separate flagella, neither with accessory branch. Mandible without palp or incisor process, latter obliquely truncate, sometimes slightly flared. Second maxilla with endite reduced, scaphognathite with proximal lobe produced only moderately into branchial cavity. First maxilliped with exopod abutting endite and displacing palp out of plane, exopod without partially detached lobe, lash well developed, caridean lobe not much produced distally, not distinctly overreaching endite. Second maxilliped with exopod, endopod composed of 4 segments, not terminating in 2 segments attached side by side to preceding segment, terminal segment narrow strip attached obliquely to wide penultimate segment. Third maxilliped with exopod, composed of 5 segments, slender, pereopod-like, antepenultimate segment fused with next proximal segment. Pereopods without epipods, anterior pair more robust than 2nd pair, often asymmetrical, 2nd pair equal, with undivided carpus, fixed finger not curving subrectangularly around short, broad movable finger, fingers not concealed in dense setae. Third pereopod with dactyl simple, unarmed on flexor margin. First pleopod of male with endopod laminar, not unusually large or elaborately convoluted.

RANGE.—Pantropical and subtropical, occasionally temperate, except for the apparent absence of processid taxa on the west coast of South America. Many species are confined to shallow grass flats and tide pools, but others form a component of the offshore fauna, one living at a maximum depth of more than 566 meters.

REMARKS.—Of the five processid genera and 59 species, plus four subspecies, recognized herein, four genera and 18 species have been recorded from the Philippines and/or Indonesia, and they are accorded extended treatment below. The three species currently representing the atypical genus *Ambidexter* are confined to shallow American waters, from southern Florida in the Atlantic and southern California to Panama in the Pacific. The following key to the genera includes that genus, as well as two new genera that are represented in the Philippine-Indonesian region.

Key to Genera of Processidae

1. Rostrum broad, subequilaterally triangular in dorsal aspect, reaching at least to cornea of anteriorly extended eye. Telson with dorsolateral spines minute or absent. Mandible with molar process about 1/6 as wide as minimal length. (Third maxilliped without exopod. Anterior pereopods with 1 member (usually right) chelate, other with simple dactyl, without exopod. Shorter second pereopod with carpus subdivided into more than 6 articles.) **Hayashidonus*, new genus
- Rostrum slender in dorsal aspect, if not, very short, not nearly reaching cornea of anteriorly extended eye. Telson with dorsolateral spines distinct. Mandible with molar process more than 1/5 as wide as minimal length 2

2. Mandible exceptionally large and massive, subequal in overall length to that of antennal scale, molar process wider than minimal length. Second pereopods subequal, carpus subdivided into 6 articles *Clytomanningus*, new genus
Mandible not unusually large or massive, molar process no more than 1/2 as wide as minimal length. Second pereopods with carpus (of shorter member) subdivided into more than 6 articles. (Third maxilliped with exopod.) 3
3. Anterior pereopods with exopod (not both chlate) **Nikoides*
Anterior pereopods without exopod 4
4. Anterior pereopods symmetrically chelate
. *Ambidexter* Manning and Chace, 1971:3
Only 1 (usually right) member of anterior pair of pereopods chelate, other with simple dactyl **Processa*

***Clytomanningus*, new genus**

TYPE SPECIES.—*Processa molaris* Chace, 1955:11.

DIAGNOSIS.—Rostrum slender in dorsal aspect. Telson with distinct dorsolateral spines. Mandible exceptionally large and massive, subequal in overall length to that of antennal scale, molar process wider than minimal length. Anterior pereopods without exopod, not symmetrically chelate, 1 member of pair (usually left) simple, nonchelate. Second pereopods subequal, carpus subdivided into 6 articles.

RANGE.—Red Sea, Gulf of Aden, Kenya, Indonesia, Marshall Islands; littoral to 15 meters.

REMARKS.—As noted by Hayashi (1975a:125), the two species assigned to this genus apparently differ remarkably from the species of *Processa* in having the mandibles possibly proportionately more massive than in any other caridean shrimp now known and in having the carpus of the second pereopods subdivided into only six articles. By having the rostrum simple, instead of bifid or bearing a dorsal tooth at midlength, the two species differ from all but the following four of the other processid species: *Hayashidonus japonicus* (De

Haan, 1844), *Processa acutirostris* Nouvel and Holthuis, 1957, *P. hawaiiensis* (Dana, 1852a), and *P. macrognatha* (Stimpson, 1860). They may be distinguished from each other by the key offered below.

ETYMOLOGY.—The genus is named for Raymond B. Manning (with appropriate prefix from the Greek *klytos*, “heard of, famous, renowned”), who has skillfully synchronized extensive major contributions to our knowledge of stomatopod and decapod Crustacea (including the Processidae) with intense commitment to curatorial responsibility, the development of the innovative techniques of the “magnificent forager” of both study specimens and literature, and the promotion of carcinological research and zoological nomenclature; who has, since the occupation of the West Wing of the National Museum of Natural History in 1965, tolerated an open-door policy between our adjoining rooms that has been an advantage to me hopefully in excess of its annoyance to him; and who suggested the desirability of recognizing additional genera among the Indo-Pacific members of the Processidae. The gender of *Clytomanningus* is masculine.

Key to Species of *Clytomanningus*

- Rostrum overreaching anteriorly extended eyes. Telson with posterior median point.
Third maxilliped with well-developed exopod
. *C. coutierei* (Nobili, 1904:234), new combination
(Gulf of Aden and Kenya; to 15 meters)
- Rostrum not reaching level of distal margins of anteriorly extended eyes. Telson with rounded posterior margin. Third maxilliped without exopod
. 49. *C. molaris*, new combination

**49. *Clytomanningus molaris* (Chace, 1955),
new combination**

Processa molaris Chace, 1955:11, fig. 5 [type locality: Rongelap Atoll, Marshall Islands; intertidal].—Hayashi, 1975a:124, figs. 29, 30.

DIAGNOSIS.—Rostrum not reaching level of distal surfaces of anteriorly extended eyes. Telson with posterior margin rounded. Third maxilliped without exopod. Maximum postorbital carapace length 3.1 mm.

RANGE.—Red Sea and Kenya to Indonesia and Marshall Islands; littoral to 12 meters.

****Hayashidonus*, new genus**

TYPE SPECIES.—*Nika japonica* De Haan, 1844, pl. N; Pl. 46: fig. 6.

DIAGNOSIS.—Rostrum broad, subequilaterally triangular in dorsal aspect, reaching at least to cornea of anteriorly extended

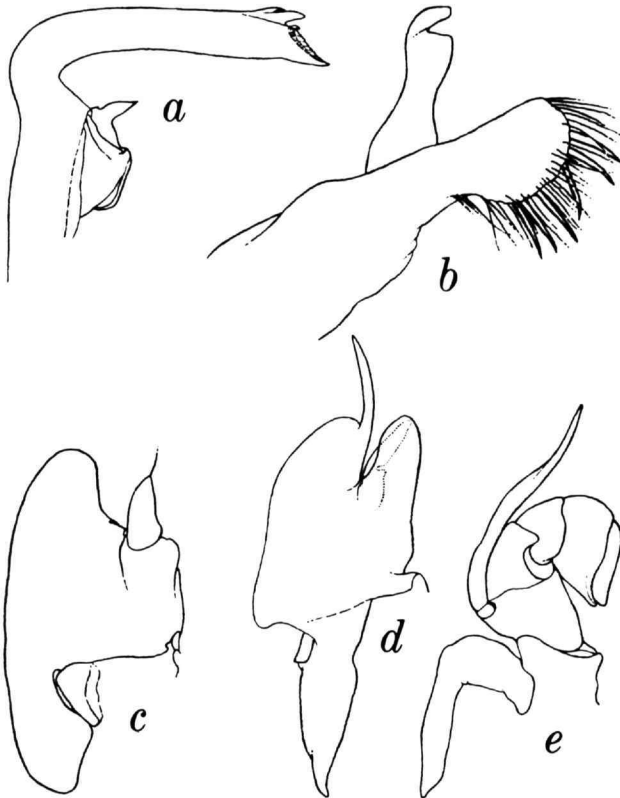


FIGURE 18.—*Hyashidonus japonicus*, ovigerous female with carapace length of 11.9 mm from Mogi, Japan, F.C. Dale, U.S.S. *Palos*, collector, USNM cat. no. 28520, mouthparts from right side: a, mandible; b, 1st maxilla; c, 2nd maxilla; d, 1st maxilliped; e, 2nd maxilliped.

eye. Telson with dorsolateral spines minute or absent. Mandible (Figure 18a) with molar process about $\frac{1}{6}$ as wide as minimal length. Third maxilliped without exopod. Pereopods without exopods, 1 member of anterior pair (usually right) chelate, other with simple dactyl. Second pereopods unequal, minor carpus subdivided into more than 6 articles.

RANGE.—Eastern Africa to Japan, Philippines, and Indonesia; to a depth of 150 meters.

REMARKS.—The broadly triangular rostrum, the obscure or absent dorsolateral spines of the telson, and the exceptionally long molar process of the mandible seem sufficiently unusual among the processids to justify the establishment of a separate genus for the single species generally known as *Processa japonica*.

ETYMOLOGY.—The generic name is proposed as an honorarium (Latin "donum") to Ken-Ichi Hayashi in recognition of his magnificent 1975 review of the Indo-West Pacific Processidae, containing the first modern key to all species then known in the genera *Nikoides* and *Processa*, thus all processid species except the three American species of *Ambidexter*. The gender of the generic name is masculine.

***50. *Hyashidonus japonicus* (De Haan, 1844),
new combination**

FIGURE 18

Nika japonica De Haan, 1844, pl. N; pl. 46: fig. 6; 1849:184 [type locality: Japan].

Processa japonica.—Parisi, 1919:88, fig. 8A.—De Man, 1920:208, pl. 18: fig. 53.—Gurney, 1937:88, pl. 1: figs. 16–19.—Hayashi, 1975a:110, fig. 24.—Noël, 1986:287, 296.

DIAGNOSIS.—Rostrum not overreaching eyes, not bifid, ventral margin nearly straight. Abdomen with pleural margin of 5th somite and lateral lobe of 6th somite unarmed. Antennular peduncle with 2nd segment longer than 3rd, twice as long as wide, stylocerite not truncate, unarmed. Antennular scale with distolateral tooth not overreaching blade. Basicerite unarmed. Longer 2nd pereopod with 41–50 carpal articles. Shorter 2nd pereopod with 15–19 carpal articles. Third pereopod with propodus more than 5 times as long as dactyl. Maximum postorbital carapace length about 16 mm.

MATERIAL.—PHILIPPINES. Off Tawitawi, Sulu Archipelago: sta 5161, 5°10'15"N, 119°53'E, 29 m, fine sand, 22 Feb 1908 (0907–0908), 9' Johnston oyster dredge, net fouled bottom: 1 male [6.5].

RANGE.—See "Range" of genus.

****Nikoides* Paulson, 1875**

Nikoides Paulson, 1875:98 [type species, by monotypy: *Nikoides Danae* Paulson, 1875:98; gender: masculine].

DIAGNOSIS.—Rostrum slender in dorsal aspect. Telson with distinct dorsolateral spines. Mandible with minimal length of molar process less than 5 times width. Third maxilliped with exopod. Anterior pereopods with exopod, only 1 of pair (usually right) chelate, other terminating in simple dactyl. Second pereopods unequal, shorter member with more than 6 carpal articles.

RANGE.—Red Sea and eastern Africa to Japan, Philippines, Indonesia, and eastern Australia to Hawaii, and western Atlantic from Florida to Guyana; littoral to about 150 meters.

REMARKS.—The fact that the two species of *Clytomanninus* differ most significantly in the presence or absence of an exopod on the third maxilliped suggests that Gurney (1937:89) was justified in believing that "the separation of the genus *Nikoides* can only be maintained as a simple matter of convenience," but that "convenience" will probably insure retention of the genus for some time to come. It may be noted that seven of the eight species of *Nikoides* are Indo-Pacific, five of them occurring in eastern Africa, and only one is found outside of the Indo-Pacific, in the western Atlantic, whereas more than half of the 45 species of *Processa* are Atlantic, 14 of them in the eastern Atlantic and Mediterranean, and only one is known from the Red Sea, two from eastern Africa, and four from South Africa.

A key to the eight currently recognized species of *Nikoides* may be found in Noël (1986:295). Six of the eight have been

recorded from the Philippine-Indonesian region and are treated individually below.

***51. *Nikoides danae* Paulson, 1875**

Nikoides Danae Paulson, 1875:98, pl. 14: figs. 5-5d [type locality: Red Sea].
Nikoides danae.—Hayashi, 1975a:53, figs. 1, 2.—Noël, 1986:263.

DIAGNOSIS. Rostrum long, often overreaching anteriorly extended eyes, apex distinctly bifid, dorsal tooth subdistal, ventral margin concave. Fifth abdominal somite with pleuron faintly angular, not pointed. Sixth abdominal somite with posterolateral lobe dentate. Telson with 2 pairs of dorsolateral spines, posterior margin pointed. Antennular peduncle with stylocerite armed with strong distolateral tooth. Antennal scale with distolateral tooth distinctly overreaching blade, basicerite bearing 1 pointed and 1 blunt process. Longer 2nd pereopod with 51-66 carpal articles, shorter with 21-32. Third and 4th pereopods with 2 spines on ischium. Maximum postorbital carapace length 7.4 mm.

MATERIAL.—PHILIPPINES. Reef off Cebu, 5 Apr 1908: 1 ovig. female [6.9].—Reef opposite Cebu, 7 Apr 1908: 1 ovig. female [6.2].

RANGE.—Red Sea, eastern Africa, Madagascar, India, Andamans, Japan, Philippines, Indonesia, Great Barrier Reef of Australia, and Hawaii; littoral to 37 meters.

52. *Nikoides gurneyi* Hayashi, 1975

Nikoides danae.—Gurney, 1937:89, pl. 1: figs. 20-25; pl. 2: figs. 26-29 [not *Nikoides danae* Paulson, 1875].

Nikoides gurneyi Hayashi, 1975a:58, figs. 3, 4 [type locality: Kikambala, Kenya; weedy pools inner reef flat at LWS].

DIAGNOSIS.—Rostrum long, sometimes overreaching anteriorly extended eyes, apex distinctly bifid, dorsal tooth subdistal, ventral margin nearly straight. Fifth abdominal somite with pleuron armed with small, acute tooth. Sixth abdominal somite with posterolateral lobe dentate dorsodistally. Telson with 2 pairs of dorsolateral spines, apex pointed. Antennular peduncle with stylocerite bidentate. Antennal scale with distolateral tooth reaching as far as or overreaching blade, basicerite with blunt process only. Longer 2nd pereopod with 47-72 carpal articles, shorter with 22-32. Third and 4th pereopods with 2 spines on ischium. Maximum postorbital carapace length 7.0 mm.

RANGE.—Red Sea, Kenya, Zanzibar, Mozambique, Philippines, and Indonesia; littoral to 27 meters.

REMARKS.—Noël (1986:296) suggested that *N. gurneyi* may be a synonym of *N. danae*.

53. *Nikoides longicarpus* Noël, 1986

Nikoides longicarpus Noël, 1986:264, figs. 1-8 [type locality: north of Lubang Island, southwest of Manila Bay, Philippines, 13°59'N, 120°10'E; 164-150 meters (MUSORSTOM I sta 16, teste: A. Crosnier, in litt.)].

DIAGNOSIS.—Rostrum long, overreaching anteriorly extended eyes, apex bifid, dorsal tooth reaching nearly as far as

tip of ventral one, ventral margin sinuous. Fifth abdominal somite with minute, obscure, blunt tooth on pleuron. Sixth abdominal somite with posterolateral lobe subtruncate, not dentate. Telson with 2 pairs of dorsolateral spines, posterior margin convex. Antennular peduncle with stylocerite rounded, unarmed. Antennal scale with distolateral tooth adpressed to and not reaching nearly as far as distal margin of blade, basicerite with feeble lateral tubercle only. Longer 2nd pereopod with 90-101 carpal articles, shorter with 28-33. Third and 4th pereopods with 2 spines on ischium. Maximum postorbital carapace length about 17 mm.

RANGE.—Known only from and near the type locality southwest of Manila Bay, Philippines; 136-164 meters

54. *Nikoides maldivensis* Borradaile, 1915

Nikoides maldivensis Borradaile, 1915:209 [type locality: Amirante Islands (see "Remarks")], 1917:411, pl. 58 fig. 11. Gurney, 1937:91, pl. 2 figs. 30-32.—Hayashi, 1975a:62, fig. 5

Processa Jacobsoni De Man, 1921:95 [type locality: Sinabang, Pulau Simeulue, Sumatra]

DIAGNOSIS.—Rostrum long, sometimes overreaching anteriorly extended eyes, apex acute, dorsal tooth strong, arising at about midlength, ventral margin sinuous. Fifth abdominal somite with pleuron obscurely dentate. Sixth abdominal somite with posterolateral lobe unequally bidentate. Telson with 2 pairs of dorsolateral spines, apex pointed. Antennular peduncle with stylocerite armed with strong distolateral tooth. Antennal scale with distolateral tooth distinctly overreaching blade, basicerite bearing 1 pointed and 1 blunt process. Longer 2nd pereopod with 55-56 carpal articles, shorter with 19-25. Third and 4th pereopods with 2 spines on ischium. Maximum postorbital carapace length about 6.7 mm.

RANGE.—Kenya, Amirante Islands, Sumatra, Caroline, Fiji, Samoa islands, and Hawaii; littoral.

REMARKS.—When Borradaile briefly described *N. maldivensis* in his 1915 "Notes on Carides," he cited the locality, quite logically, as "Maldiv Is." In his 1917 report "On Carides from the Western Indian Ocean" in the reports of The Percy Sladen Trust Expedition of 1905, he illustrated that species without adding significantly to the original description but introduced the account with the following statement: "A single specimen, taken at the Amirante Is., is closely related to *N. danae*." Manning and Chace (1971:8) cited both localities, in the belief that the Amirante specimen represented a second record for the species. Evidence kindly furnished by Richard Preece of the Department of Zoology at the University of Cambridge suggests that Borradaile might have been willing to hide his embarrassment behind such an assumption. The catalog entry covering the single type specimen in that institution bears the following information:

Amirante I. 25-28f - Gardiner Collⁿ
Ann. Mag. Nat. Hist.(8) xv. p. 209
Percy Sladen Trust Exp. XVII. pt 3. P. 411
Tube 1982 Accession no. AR 3, 1920.

***55. *Nikoides sibogae* De Man, 1918**

Nikoides Sibogae De Man, 1918:160 [type locality: Indonesia (the four specimens from *Siboga* stations 71, 274, and 282 recorded in this paper must be treated as syntypes)]; 1920:193, pl. 16: fig. 50 [the ovigerous female from station 260, designated as "the type" is unacceptable as a holotype or lectotype because it was not part of the type series recorded in the original description].—Hayashi, 1975a:65, figs. 6, 7.

DIAGNOSIS.—Rostrum long, reaching nearly to distal surface of anteriorly extended eye, apex distinctly bifid, dorsal tooth subdistal, ventral margin sinuous. Fifth abdominal somite with pleuron armed with inconspicuous tooth. Sixth abdominal somite with posterolateral lobe bidentate. Telson with 2 pairs of dorsolateral teeth, posterior margin truncately produced. Antennular peduncle with stylocerite truncate, not dentate. Antennal scale with distolateral tooth small, partially appressed to, and not reaching level of distal margin of blade, basicerite with small rounded process at ventrolateral angle. Longer second pereopod with 74–89 carpal articles, shorter one with 22–28. Third and 4th pereopods with 2 spines on ischium. Maximum postorbital carapace length 13.6 mm.

MATERIAL.—PHILIPPINES. Lingayen Gulf, western Luzon: sta 5442, 16°30'36"N, 120°11'06"E, 82 m, coral sand, 10–11 May 1909 (1858–0532), 25' Agassiz beam trawl (apparently drifted 15.5 miles [24.8 km] S, 12° from original position): 1 ovig. female [11.6].

RANGE.—Persian Gulf, Zanzibar Channel, Madagascar, India, Vietnam, Japan, Philippines, Singapore, Indonesia, Mariana and Marshall islands; littoral to 100 meters.

56. *Nikoides steinii* (Edmondson, 1935)

Processa steinii Edmondson, 1935b:3, fig. 1 [type locality: Maui, Hawaii; shoal water reef].

Nikoides nanus Chace, 1955:8, fig. 4 [type locality: Runit Island, Eniwetok [Enewetak] Atoll, Marshall Islands; intertidal].

Nikoides steinii Hayashi, 1975a:69, figs. 8, 9.

DIAGNOSIS.—Rostrum very short, not reaching base of eyestalk, apex simple or indistinctly bifid, ventral margin concave. Fifth abdominal somite with pleuron armed with small posteroventral tooth. Sixth abdominal somite with posterolateral lobe dentate. Telson with 2 pairs of dorsolateral spines, posterior margin pointed. Antennular peduncle slender, stylocerite acutely triangular. Antennal scale with distolateral tooth not overreaching blade, basicerite unarmed. Longer 2nd pereopod with 39–52 carpal articles, shorter one with 19–22. Third and 4th pereopods with 1 spine on ischium. Maximum postorbital carapace length 4.2 mm.

RANGE.—Kenya, Zanzibar, Japan, Irian Jaya, Palau and Marshall islands, and Hawaii; littoral.

****Processa* Leach, 1815**

Thalassalpes Bosc, 1813:233 [type species, selected by Holthuis, 1955:116: *Nika Edulis* Risso, 1816:85; gender: masculine].

Processa Leach, 1815: explanation of plate 41 [type species, by monotypy: *Processa canaliculata* Leach, 1815: explanation of plate 41; gender: feminine].

Nika Risso, 1816:84 [type species, selected by H. Milne Edwards, 1837, pl. 52: fig. 1: *Nika Edulis* Risso, 1816:85; gender: feminine].

Velocina Gistel, 1848:x [substitute name for *Processa* Leach, 1815; gender: feminine].

?*Chiereghina* Nardo, 1869:320 [type species, by monotypy: *Cancer pellucidus* Nardo, 1847:5; gender: feminine].

Hectarthropus Bate, 1888:889 [type species, selected by Holthuis, 1955:117: *Hectarthropus expansus* Bate, 1888:892; gender: masculine].

DIAGNOSIS.—Rostrum usually slender in dorsal aspect. Telson with distinct dorsolateral spines. Mandible with molar process more than $\frac{1}{5}$ as wide as minimal length. Third maxilliped usually with exopod. Anterior pereopods without exopod, 1 member (usually right) chelate, other with simple dactyl. Second pereopods with shorter member composed of more than 6 carpal articles.

RANGE.—Red Sea and eastern and southern Africa to Japan, Philippines, Indonesia, and southern Australia to Hawaii, Gulf of California, and Clipperton Island; western Atlantic from North Carolina and Bermuda to Uruguay; eastern Atlantic and Mediterranean from the North Sea to Namibia; littoral to more than 566 meters.

REMARKS.—As mentioned in the "Remarks" on the genus *Nikoides*, more than half of the 45 species of *Processa* have been recorded from the Atlantic Ocean, with a slight majority of those from the eastern Atlantic. No species are common to the eastern Pacific and the Atlantic or to the western and eastern Atlantic, but an additional species from mid-Atlantic Ascension Island has been described by Manning and Chace (1990:24). Just one species, *P. compacta* Crosnier, 1971, has been suggested by Noël (1986:273) to occur in the eastern Atlantic (Congo) and the Indo-Pacific (South Africa, West Pakistan, India, and South Australia), a most unusual distribution (see Kensley, 1983). Nearly half of the 22 species now known from the Indo-Pacific region have been recorded from the Philippine-Indonesian area and are treated individually below.

A key to all species then recognized in *Processa* may be found in Noël (1986:296). With the herein proposed removal of *P. japonica* and *P. molaris* from the assemblage, only one species (*P. foresti*) may now represent the first half of the first couplet in that key (species lacking an exopod on the third maxilliped).

57. *Processa aequimana* (Paulson, 1875)

Nika aequimana Paulson, 1875:97, pl. 14: figs. 6, 6a [type locality: Red Sea]. *Processa aequimana*.—Hayashi, 1975a:80, figs. 10, 11.

DIAGNOSIS.—Rostrum not overreaching eyes, bifid, ventral margin slightly sinuous. Antennal spine prominent. Fifth abdominal somite with pleural margin unarmed. Sixth abdominal somite with posterolateral lobe dentate. Antennular peduncle with 2nd segment longer than 3rd, fully 3 times as long as wide, stylocerite subtruncate, unarmed. Antennal scale with distolateral tooth not overreaching blade, basicerite with single ventrolateral tooth. Second pereopods subequal, carpus composed of 9–11 articles. Third pereopod with propodus

about 4 times as long as dactyl. Maximum postorbital carapace length about 8.5 mm.

RANGE.—Red Sea, eastern and southern Africa, Vietnam, Japan, and Java; littoral.

58. *Processa affinis* Hayashi, 1975

Processa sp. De Man, 1920:203, pl. 17: fig. 52.

Processa affinis Hayashi, 1975a:85, fig. 12 [type locality: Teluk Sanana, Pulau Sanana, Kepulauan Sula, Indonesia; 22 meters].

DIAGNOSIS.—Rostrum not overreaching eyes, bifid, ventral margin concave. Antennal spine distinct. Fifth abdominal somite with pleural margin unarmed. Sixth abdominal somite with posterolateral lobe truncate. Antennular peduncle with 2nd segment longer than 3rd, fully 4.5 times as long as wide, stylocerite subtruncate, unarmed. Antennal scale with distolateral tooth reaching about to level of distal margin of blade, basicerite unarmed. Second pereopods unequal, longer one with about 20 carpal articles, shorter one with 15. Postorbital carapace length of holotype 5.0 mm.

RANGE.—Known only from the type locality in Kepulauan Sula, Indonesia, in 22 meters.

59. *Processa australiensis* Baker, 1907

Processa australiensis Baker, 1907:185, pl. 25: fig. 2 [type locality: South Australian coast].—Hayashi, 1975a:86, fig. 13.

DIAGNOSIS.—Rostrum not overreaching eyes, bifid, ventral margin slightly concave. Antennal spine usually absent. Fifth abdominal somite with pleural margin dentate. Sixth abdominal somite with posterolateral lobe unarmed. Antennular peduncle with 2nd segment no longer than 3rd, about as wide as long, stylocerite truncate, unarmed. Antennal scale with distolateral tooth not overreaching blade, basicerite with blunt projection at distoventral angle. Second pereopods unequal, longer one with 14–20 carpal articles, shorter one with 11–13. Third pereopod with propodus 3.7 times as long as dactyl. Maximum postorbital carapace length probably about 5 mm.

RANGE.—Seychelle Islands, Philippines, Singapore, Indonesia, and South Australia; littoral to 36 meters.

60. *Processa demani* Hayashi, 1975

Processa demani Hayashi, 1975a:98, figs. 19, 20 [type locality: Banda Elat, Kai Besar, Kepulauan Kai, Indonesia; 27 meters].

DIAGNOSIS.—Rostrum reaching to end of or beyond eye, unequally bifid, ventral margin faintly sinuous. Antennal spine prominent. Fifth abdominal somite with pleural margin unarmed. Sixth abdominal somite with posterolateral lobe obscurely bidentate. Antennular peduncle with 2nd segment longer than 3rd, more than 2.5 times as long as wide, stylocerite obliquely truncate, obscurely dentate. Antennal scale with distolateral tooth not overreaching blade, basicerite with small ventrolateral tooth. Second pereopods subequal in length, right one with 14–16 carpal articulations, left one with 10–12. Third

pereopod with propodus nearly twice as long as dactyl. Maximum postorbital carapace length about 5 mm.

RANGE.—Vietnam and Indonesia; 4–27 meters.

61. *Processa foresti* Noël, 1986

Processa foresti Noël, 1986:280, fig. 13 [type locality: north of Lubang Island, southwest of Manila Bay, Philippines, 13°59'N, 120°18'E; 187–205 meters].

DIAGNOSIS.—Rostrum not overreaching eyes, bifid, ventral margin slightly sinuous. Antennal spine prominent. Fifth abdominal somite with pleural margin unarmed. Sixth abdominal somite with posterolateral lobe dentate. Antennular peduncle with 2nd segment longer than 3rd, more than 2.5 times as long as wide, stylocerite tapering to sharp tooth. Basicerite with distinct ventrolateral tooth. Postorbital carapace length of holotype 7.5 mm.

RANGE.—Known only from the type locality southwest of Manila Bay, Philippines; 187–205 meters.

REMARKS.—The unique holotype of *P. foresti* lacks the third maxillipeds and all of the pereopods, except the right member of the anterior pair. Noël (1986:282) believed that the third maxilliped lacked an exopod because, "La mutilation des appendices s'opère le plus souvent au niveau de la ligne d'autotomie située à la base de l'ischion et laisse donc normalement en place les exopodites insérés sur le basis, s'ils sont présents." But he added, "Toutefois, étant donné la mutilation importante du spécimen en question, il est possible que les exopodites aient également été amputés." Inasmuch as the removal from the genus of *P. japonica* and *P. molaris*, the only other species without exopods on the third maxillipeds previously included in *Processa*, is proposed above, the opportunity to examine an intact specimen of *P. foresti* is of more than passing interest.

62. *Processa macrognatha* (Stimpson, 1860)

Nica macrognatha Stimpson, 1860:26 [type locality: Hong Kong].
Processa macrognatha.—Hayashi, 1975a:121, fig. 28.

DIAGNOSIS.—Rostrum not reaching nearly as far as cornea of anteriorly extended eye, not bifid, ventral margin somewhat sinuous. Antennal spine absent. Fifth abdominal somite with pleural margin unarmed. Sixth abdominal somite with posterolateral lobe unarmed. Antennular peduncle with 2nd segment slightly longer than 3rd, 1¹/₃ times as long as wide, stylocerite diagonally truncate, unarmed. Antennal scale with distolateral tooth minute, not overreaching blade, basicerite unarmed. Second pereopods subequal, carpus composed of 11 articles. Third pereopod with propodus about 3 times as long as dactyl. Maximum postorbital carapace length probably about 6 mm.

RANGE.—Hong Kong and Indonesia; 8–15 meters.

63. *Processa neglecta* Hayashi, 1975

Processa neglecta Hayashi, 1975a:127, figs. 31, 32 [type locality: Bay of Nha Trang, Vietnam; 11 meters].

DIAGNOSIS.—Rostrum not overreaching eyes, bifid, ventral margin slightly concave. Antennal spine small or absent. Fifth abdominal somite with pleural margin unarmed. Sixth abdominal somite with posterolateral lobe unarmed. Antennular peduncle with 2nd segment longer than 3rd, nearly $3\frac{1}{2}$ times as long as wide, stylocerite obliquely truncate, with minute lateral tooth or unarmed. Antennal scale with small distolateral tooth slightly overreaching blade, basicerite with distinct ventrolateral tooth. Second pereopods subequal, carpus composed of 12 or 13 articles. Third pereopod with propodus slightly less than 3 times as long as dactyl. Maximum postorbital carapace length 3.1 mm.

RANGE.—Vietnam, Sulu Archipelago, Philippines, and Indonesia; 9–54 meters.

64. *Processa philippinensis* Noël, 1986

Processa philippinensis Noël, 1986:288, fig. 18 [type locality: north of Lubang Island, southwest of Manila Bay, Philippines, 13°53'N, 120°08'E; 134–129 meters].

DIAGNOSIS.—Rostrum not quite overreaching eyes, bifid, ventral margin slightly sinuous. Antennal spine strong. Fifth abdominal somite with pleural margin unarmed. Sixth abdominal somite with posterolateral lobe acute, not otherwise dentate. Antennular peduncle with 2nd segment little longer than 3rd, not quite 3 times as long as wide, stylocerite transversely subtruncate mesially with strong tooth laterally. Antennal scale with distolateral tooth reaching about to level of distal margin of blade, basicerite with distinct ventrolateral tooth. Second pereopods unequal, longer one with 25 or 26 carpal articles, shorter one with 15–18. Third pereopod with propodus about 3 times as long as dactyl. Maximum postorbital carapace length 10 mm.

RANGE.—Known only from southwest of Manila Bay, Philippines; 129–205 meters.

65. *Processa processa* (Bate, 1888)

Nika processa Bate, 1888:527 [type locality: Ambon, Indonesia; 27 meters].
Processa processa Hayashi, 1975a:132, fig. 33.

DIAGNOSIS.—Rostrum bifid. Antennal spine absent. Fifth abdominal somite with pleural margin unarmed. Sixth abdominal somite with posterolateral lobe truncate. Stylocerite truncate. Basicerite unarmed. Second pereopods unequal, longer one with 20 or 21 carpal articles. Postorbital carapace length of holotype about 9 mm.

RANGE.—Known with certainty only from Ambon, Indonesia; 27 meters.

*66. *Processa sulcata* Hayashi, 1975

Processa sulcata Hayashi, 1975a:134, fig. 34 [type locality: Ainosshima, Fukuoka Prefecture, Kyushu, Japan; littoral].

DIAGNOSIS.—Rostrum not overreaching eyes, bifid, ventral margin slightly concave. Antennal spine distinct. Fifth abdominal somite with pleural margin dentate. Sixth abdominal somite

with posterolateral lobe unarmed. Antennular peduncle with 2nd segment slightly longer than 3rd, nearly $1\frac{1}{2}$ times as long as wide, stylocerite obliquely truncate, unarmed. Antennal scale with distolateral tooth not overreaching blade, basicerite unarmed. Second pereopods unequal, longer one with 21–30 carpal articles, shorter one with 10–14. Third pereopod with propodus about 4 times as long as dactyl. Maximum postorbital carapace length 7.6 mm.

MATERIAL.—PHILIPPINES. Surigao Strait, east of Leyte: sta 5482, 10°27'30"N, 125°18'E, 123 m, broken shells, sand, green mud, 30 Jul 1909 (0917–0935), 12' Agassiz beam trawl: 2 ovig. females [4.5, 4.6].—Off Jolo Island, Sulu Archipelago: sta 5145, 6°04'30"N, 120°59'30"E, 42 m, coral sand, shells, 15 Feb 1908 (1344–1359), 12' Agassiz beam trawl, mud bag: 1 ovig. female [4.0].

RANGE.—Southern Arabia, South America, Madagascar, Vietnam, Japan, and Indonesia; 0–123 meters.

*HIPPOLYTIDAE Bate, 1888

LYSMATINAE Dana, 1852a:16, 20.

THORINAE Kingsley, 1878a:64.

HIPPOLYTIDAE Bate, 1888:xii, xli, 480, 503, 574, 576 [determined in Opinion 470 of The International Commission on Zoological Nomenclature to be given precedence over the family-group names Lysmatinae and Thorinae by those who consider the genera *Hippolyte*, *Lysmata*, and/or *Thor* to belong to the same family-group taxon].

LATREUTIDAE Ortmann, 1896:415, 424.

HIPPOLYSMATIDAE Reish, 1972:80.

ALOPIDAE Christoffersen, 1987:350, 354.

BARBOURIDAE Christoffersen, 1987:350, 352, 353 [corrected to Barbouriidae by Christoffersen, 1990:96].

NAUTICARIDIDAE Christoffersen, 1987:350.

BYTHOCARIDIDAE Christoffersen, 1987:350, 354, 355.

MERGUIIDAE Christoffersen, 1990:96, 97.

MERHIPPOLYTIDAE Christoffersen, 1990:96, 97.

THORELLINAE Christoffersen, 1990:97.

DIAGNOSIS.—Rostrum usually discrete, uninflated extension of remainder of carapace. Carapace without cardiac notch (except in *Saron*). Eyes fully exposed, not unusually elongate. Mandible usually composed of incisor and molar processes and palp. Second maxilla with proximal endite reduced, scaphognathite proximally rounded or bluntly angular. First maxilliped with exopod distally flagellate, not abutting endite. Second maxilliped with exopod, endopod composed of 4 serially arranged segments, terminal segment attached diagonally or transversely to preceding segment, not abutted by slender, sickle-shaped extension from latter. Third maxilliped composed of fewer than 7 segments. Neither 1st nor 2nd pair of pereopods bearing terminal tufts of setae on fingers. First pair more robust than 2nd pair, usually subequal, not swollen, distinctly chelate, chela forming 1 movable and 1 fixed finger. Second pereopod with carpus subdivided into 2 or more articles. First pleopod of male with endopod laminar, not unusually large or elaborately convoluted.

RANGE.—Cosmopolitan, "arboreal" (*Merguia*), anchialine,

and marine to a depth of 3803 meters. Because most of the large hippolytid genera are confined chiefly to temperate and arctic seas, only 13 of 36 genera and only 32 of 270 species and 5 subspecies worldwide are known from the Philippine-Indonesian region.

REMARKS.—It is hoped that the errors of commission and omission will not be so numerous in the following checklist of genera and species and in the admittedly artificial key to the hippolytid genera as to make their inclusion deleterious rather than advantageous to carcinological colleagues. They were compiled as part of a personal effort to understand some of the relationships and the possible need for subdivision of the family Hippolytidae. A 107-character noncladistic analysis of the 40 genera originally assigned to the family seemed to support the concept of a reasonably homogeneous group, with the possible exception of *Leontocaris*, and the number of genera were eventually reduced to 37 because of my inability to find satisfactory generic characters to separate *Koror* and *Somersiella* from *Parhippolyte* and because of the transfer of *Yagerocaris* to the Alpheidae (Chace and Kensley, 1992). The

apparently consistent presence of one or more supraorbital teeth in eight of the 37 genera and their similarly constant absence in 26 others suggested the adoption of that reasonably distinct feature as the primary character in the opening couplet of the generic key. Because that consistency was lacking, however, in three of the genera (*Parallebbeus*, *Thor*, and *Tozeuma*) it became necessary to duplicate mention of those genera in both subsequent parts of the key. Although I found no clear evidence to support the superfamilial categories suggested by Christoffersen (1987), there is considerable reason to endorse his establishment of the family Barbouriidae, limited to the genera *Barbouria*, *Janicea*, and *Parhippolyte*, all of which are armed with a rather unique subocular tooth posterodorsal to the orbital angle; a similar but not identical tooth is present in *Latreutes*, but there is none in *Ligur*. Apologies are herewith tendered for the all-too-frequent absence of type-locality information in this list. Blame therefore may be charged to the time-consuming attribute of a thorough literature search and to a selfishly stronger desire for timely rather than posthumous publication.

Checklist of Genera and Species of Hippolytidae

(Valid genus- and species-group names in boldface,
synonyms and species inquirendae in lightface,
type localities in roman)

- Aglaope* Rafinesque, 1814:24 [not *Aglaope* Latreille, 1809]
Type species: *Aglaope striata*
= ***Lysmata***
- Aglaope striata* Rafinesque, 1814:24
= ***Lysmata seticaudata***
- Alope* White, 1847:123
Type species: *Alope palpalis* (= ***Alope spinifrons***)
Hetairocaris
- Alope australis* Baker, 1904:154
Smith's Bay, Kangaroo Island, South Australia
= ***Alope orientalis***
- Alope orientalis*** (De Man, 1890)
Hetairocaris orientalis De Man, 1890:122, pl. 6: fig. 16
Ponape, Caroline Islands
Hippolyte ponapensis
Alope australis
- Alope palpalis* White, 1847:75
New Zealand
= ***Alope spinifrons***
- Alope spinifrons*** (H. Milne Edwards, 1837)
Hippolyte spinifrons H. Milne Edwards, 1837:377
Coasts of New Zealand
Alope palpalis
- Alpheus elongatus* Risso, 1827:77
Maritime Alps; among fucus
? = ***Hippolyte inermis*** [Holthuis, in correspondence]

- Alpheus ensiferus* Risso, 1827; See ***Ligur ensiferus***
Alpheus marmoratus Latreille, 1806:53
? = ***Saron marmoratus*** [Holthuis, in correspondence]
- Alpheus polaris*; See ***Lebbeus polaris***
Amphiplectus Bate, 1888:622
Type species: *Amphiplectus depressus*
Not hippolytid, perhaps nematocarinid
- Amphiplectus depressus* Bate, 1888:623, pl. 110: fig. 3.
Off Recife, Brazil; 9°05'S, 34°50'W; 6640 meters
- Angasia* Bate, 1863:498
Type species: *Angasia pavonina*
= ***Tozeuma***
- Angasia elongata*; See ***Tozeuma elongatum***
Angasia kimberi; See ***Tozeuma kimberi***
Angasia pavonina; See ***Tozeuma pavoninum***
Angasia robusta Baker, 1904:150
Gulf of Saint Vincent, South Australia; 18–22 meters
= ***Tozeuma pavoninum***
- Angasia Stimpsonii* Henderson, 1893:437, pl. 40: figs. 18–20
Gulf of Martaban, India
= ***Tozeuma armatum***
- Angasia tomentosa*; See ***Tozeuma tomentosum***
Arno P. Roux, 1831:18, 19
Replacement name for ***AGLAOPE*** Rafinesque
= ***Lysmata***
- Astacus coerulescens*; See ***Hippolyte coerulescens***
Astacus Groenlandicus; See ***Lebbeus groenlandicus***
Astacus histrio Fabricius, 1775
Greenland
Species inquirenda (see Holthuis, 1947:20)
- Astacus varius* Fabricius, 1781

- “Oceano Norwagico”
= Probably *Lebbeus polaris* (see Holthuis, 1947:39)
- Barbouria* Rathbun, 1912:455
Type species: *Barbouria poeyi*
Barbouria antiguensis; See *Janicea antiguensis*
Barbouria cubensis (Von Martens, 1872)
Hippolyte cubensis Von Martens, 1872:136
Cuba
Barbouria poeyi
Barbouria poeyi Rathbun, 1912:455
“Cave near seashore, between Morro Castle and Cojimar,” Cuba
= *Barbouria cubensis*
- Bathyhippolyte* Hayashi and Miyake, 1970:41
Type species: *Bathyhippolyte yaldwyni*
Bathyhippolyte yaldwyni Hayashi and Miyake, 1970:42, figs. 1–16
Chatham Rise, New Zealand; 44°44'S, 175°42'E; 995–1110 meters
- Bellidia* Gosse, 1877:313
Type species: *Bellidia huntii*
= *Hippolyte*
- Bellidia huntii*; See *Hippolyte huntii*
- Birulaecaris* Dons, 1915:26
Type species: *Hippolyte mysis*
= *Lebbeus*
- Birulia* Brashnikov, 1903:xliv
Type species: *Birulia sachalinensis*
Paraspirontocaris
- Birulia kishinouyei* (Yokoya, 1930)
Paraspirontocaris kishinouyei Yokoya, 1930:536
Mutsu Wan, northern Honshu, Japan
- Birulia sachalinensis* Brashnikov, 1903:xliv
South and southwest coast of Sakhalin; 15–118 meters
- Bythocaris* G.O. Sars, 1870:149
Type species: *Bythocaris simplicirostris*
- Bythocaris akidopleura* Fransen, 1993:588, 595, figs. 41–62
West of Formigas, Azores; 37°17'N, 25°14'W; 2070–2120 meters
- Bythocaris biruli* Kobjakova, 1964
Bythocaris leucopsis biruli Kobjakova, 1964:326
Arctic; 475–2857 meters
? = *Bythocaris leucopsis*
- Bythocaris cosmetops* Holthuis, 1951:135
Off Sierra Leone; 7°29'N, 13°38'W; 74–78 meters
- Bythocaris cryonesus* Bowman and Manning, 1972:189
Arctic Ocean; 81°33.9'N, 157°12.5'W; 3803 meters
- Bythocaris curvirostris* Kobjakova, 1957:363
Arctic Basin, eastern sector; 3255 meters
- Bythocaris elegans* Bryazgin, 1982:603
Arctic Basin, USSR zone
- Bythocaris floridensis* Abele and Martin, 1989:29, fig. 1
Blake Plateau, east of Georgia; 31°09'N, 79°33'30"W;
- 644 meters
- Bythocaris gorei* Abele and Martin, 1989:38, fig. 2
Blake Plateau, east of St. Augustine, Florida; 29°41'N, 79°55'W; 682 meters
- Bythocaris gracilis* Smith, 1885:497
East of Cape Hatteras and New Jersey; 1908 and 1624 meters
- Bythocaris grumanti* Burukovsky, 1966:538, fig. 2
Off Spitsbergen; 76°42'N, 24°32'E; 50 meters
- Bythocaris irene* Retovskiy, 1946:298, fig. 1
Arctic Ocean
- Bythocaris leucopsis* G.O. Sars, 1879:427
Greenland Sea; 71.59°N, 11.40°W; 2030 meters
- Bythocaris leucopsis biruli*; See *Bythocaris biruli*
- Bythocaris miserabilis* Abele and Martin, 1989:41, fig. 3
Northern Straits of Florida; 27°11', 79°30'W; 677 meters
- Bythocaris nana* Smith, 1885:499
About 75 miles south of Marthas Vineyard, Massachusetts; 119–260 meters
- Bythocaris payeri* (Heller, 1875)
Hippolyte Payeri Heller, 1875:26, pl. 1: figs. 1–4
Arctic Ocean; 182 meters
- Bythocaris simplicirostris* G.O. Sars, 1870:149
Lofoten, Norway; 457 meters
Hippolyte panschi
Bythocaris spinipleura
- Bythocaris spinipleura* Squires, 1990:158, figs. 82–84
Off Bonavista Bay, Newfoundland (48°49'N, 51°30'W); 309 meters
= *Bythocaris simplicirostris*
- Calliasmata* Holthuis, 1973:37
Type species: *Calliasmata pholidota*
- Calliasmata pholidota* Holthuis, 1973:37, figs. 12, 13; pl. 1: fig. 2; pl. 2: fig. 1
Ras Muhammad Crack, near Ras Muhammad, southern tip of Sinai peninsula; in salt water in narrow crack in elevated coral rock about 150 meters from the sea
- Calliasmata rimolii* Chace, 1975:37, figs. 5–7
Cave 4 km from town of Estero Hondo (19°51'N, 71°11'W), Provincia de Puerto Plata, northern Dominican Republic; cave filled with slightly brackish water separated from sea by about 500 meters
- Cancer aculeatus* O. Fabricius, 1780:239
“Naularnak,” Greenland
= *Lebbeus groenlandicus*
- Cancer Astacus gibbosus* Montagu, 1808
Torcross, England
?= *Hippolyte longirostris* (see Holthuis, 1947:20)
- Cancer Nautilor* Herbst, 1796
Locality unknown
Species inquirenda (see Holthuis, 1947:21)
- Cancer Spinus*; See *Spirontocaris spinus*

- Caradina cincinnuli* Bate, 1863:500
St. Vincent Gulf, South Australia; 8 meters
= *Hippolyte ventricosa*
- Caradina tenuirostris* Bate, 1863:501
St. Vincent Gulf, South Australia; 8 meters
= *Hippolyte caradina*
- Caradina tenuis* Bate, 1866:28, pl. 2: fig. 1
Plymouth, England
= *Hippolyte varians*
- Caradina truncifrons* Bate, 1863:499
St. Vincent Gulf, South Australia
= *Latreutes compressus*
- Caricyphus acutus*; See *Hippocaricyphus acutus*
Caricyphus bigibbosus; See *Hippocaricyphus bigibbosus*
- Caridion* Goes, 1863:170
Replacement name for *DORYPHORUS* Norman
Doryphorus Norman, 1861 [not Cuvier, 1829]
- Caridion gordonii* (Bate, 1858)
Hippolyte Gordonii Bate, 1858:51
Off British shores; probably sublittoral
- Caridion monctoni* Citarella, 1993:15 [nomen nudum]
Off Buctouche, New Brunswick
Larva
- Caridion stevensi* Lebour, 1930:185
Bays in vicinity of Plymouth, England; rocky pools
under stones at low water, and between tide-marks
- Chorismus* Bate, 1888:577, 616
Type species: *Chorismus tuberculatus*
- Chorismus antarcticus* (Pfeffer, 1887)
Hippolyte antarctica Pfeffer, 1887:51, pl. 1: figs.
22-27
South Georgia; 13-17 meters
Hippolyte Romanchei
- Chorismus tuberculatus* Bate, 1888:617
Off Marion Island, Prince Edward Islands, south-
western Indian Ocean; 46°41'S, 38°10'E; 567 meters
- Concordia* Kingsley, 1880:413
Type species: *Concordia gibberosus*
= *Latreutes*
- Concordia gibberosus* Kingsley, 1880:414
Fort Macon [Beaufort Inlet], North Carolina
= *Latreutes parvulus*
- Cryptocheles* G.O. Sars, 1870:150
Type species: *Cryptocheles pygmaea*
- Cryptocheles abyssicola* M. Sars, 1868:262 [nomen
nudum]
= *Cryptocheles pygmaea*
- Cryptocheles pygmaea* G.O. Sars, 1870:150
Lofoten Islands, Norway; 220 meters
Cryptocheles abyssicola
- Cyclorhynchus* De Haan, 1849:173, 174, 175 [not
Cyclorhynchus Kaup, 1829, *Cyclorhynchus* Sunde-
vall, 1836, or *Cyclorhynchus* Macquart, 1841]
Type species: *Hippolyte planirostris*
- = *Latreutes*
- Doryphorus* Norman, 1861:276 [not *Doryphorus* Cuvier,
1829]
Type species: *Hippolyte Gordonii*
= *Caridion*
- Eretmocaridion* Bate, 1888:894
Type species: *Eretmocaridion remipes*
= *Lysmata*
- Eretmocaridion corniger* Bate, 1888:900, pl. 145: fig. 4
Cape Verde
= *Lysmata*, sp. (larva)
- Eretmocaridion dolichops* Ortmann, 1893:79, pl. 5: fig. 1
Near Boa Vista, Cape Verde Islands
= *Lysmata*, sp. (larva)
- Eretmocaridion longicaulis* Bate, 1888:897, pl. 145: fig. 2
South of Japan; 17°29', 141°21'E; surface
= *Lysmata*, sp. (larva)
- Eretmocaridion remipes* Bate, 1888:895, pl. 145: fig. 1
South of Japan
= *Lysmata*, sp. (larva)
- Eretmocaridion stylostris* Bate, 1888:898, pl. 145: fig. 3
Off Cape Verde Islands; surface
= *Lysmata*, sp. (larva)
- Eualus* Thallwitz, 1891b:23, 50
Type species: *Eualus obsus*
Helia
Spirontocarella
- Eualus avinus* (Rathbun, 1899)
Spirontocaris avina Rathbun, 1899:557
North of Unalaska Island, Alaska; 54°00'45"N,
166°53'50"W; 642 meters
- Eualus barbatus* (Rathbun, 1899)
Spirontocaris barbata Rathbun, 1899:556
Bering Sea southeast of Pribilof Islands; 56°18'N,
160°38'W; 157 meters
- Eualus berkeleyorum* Butler, 1971:1615, figs. 1, 2
Strait of Georgia; 49°09.0'N, 123°32.6'W; 384 meters
- Eualus biunguis* (Rathbun, 1902)
Spirontocaris biunguis Rathbun, 1902a:899
Off Cape St. James, Queen Charlotte Islands, British
Columbia; 51°23'00"N, 130°34'00"W; 1602 meters
- Eualus bulychevae* Kobayakova, 1955:238
South Kurile Straits
- Eualus ctenifer* (Barnard, 1950)
Spirontocaris ctenifera Barnard, 1950:696, fig. 129c-k
Algoa Bay, South Africa
- Eualus dozei* (A. Milne-Edwards, 1891)
Hippolyte Dozei A. Milne-Edwards, 1891:46
Isla Grevy, Chile.; 65 meters
- Eualus drachi* Noël, 1978:23
Banyuls-sur-mer, Mediterranean coast of France
- Eualus fabricii* (Krøyer, 1841)
Hippolyte Fabricii Krøyer, 1841:571
Greenland

- Eualus gaimardii*** (H. Milne Edwards, 1837)
Hippolyte Gaimardii H. Milne Edwards, 1837:378
 Seas of Iceland
Hippolyte gibba
Hippolyte lentiginosa
Hippolyte recurvirostris
Hippolyte Retzii
Hippolyte gracilis Lilljeborg, 1850
Hippolyte pandaliformis
Hippolyte belcheri
Eualus obses
Spirontocaris recurvirostris
Eualus geniculata var. *longirostris* Kobjakova, 1936:211,
 fig. 38
 = ***Heptacarpus geniculatus***
Eualus gracilipes Crosnier and Forest, 1973:163, fig. 50
 Sao Tiago, Cape Verde Islands; 1509–2750 meters
Eualus gracilirostris (Stimpson, 1860)
Hippolyte gracilirostris Stimpson, 1860:34
 Hakodate, Hokkaido, Japan; laminaria zone
Eualus kikuchii Miyake and Hayashi, 1967:261
 Tomioka Wan, Amakusa Shimo Jima, Kyushu, Japan
Eualus kinzeri Tiefenbacher, 1990:117, fig. 1
 Weddell Sea, Antarctica
Eualus kuratai Miyake and Hayashi, 1967:253
 Between Rebun To and Rishiri To, northwestern
 Hokkaido, Japan; 100–150 meters
Eualus lebourae Holthuis, 1951:124
 Off Guinea; 10°49'N, 16°39'W; 42 meters
Eualus leptognathus (Stimpson, 1860)
Hippolyte leptognatha Stimpson, 1860:34
 Hakodate-wan, Hokkaido, Japan; common on algal
 sand bottom, 4–11 meters
Spirontocaris japonica
 ?*Spirontocaris fabricii* var. *minuta*
Eualus lindbergi Kobjakova, 1955:240
 Okhotsk Sea, S. Sakhalin
Eualus lineatus Wicksten and Butler, 1983:3
 1.5 miles southwest of Gull Island, off Santa Cruz
 Island, California; 33°56'00"N, 119°50'55"W; 89
 meters
Eualus longirostris; See *Eualus geniculata* var. *longiros-*
tris
Eualus macilentus (Krøyer, 1841)
Hippolyte macilenta Krøyer, 1841:574
Spirontocaris stoneyi
Eualus macrophthalmus (Rathbun, 1902)
Spirontocaris macrophthalma Rathbun, 1902a:900
 Off Destruction Island, Washington; 47°46'00"N,
 125°10'00"W; 325 meters
Eualus middendorffii Brashnikov, 1907:165
Eualus obses Thallwitz, 1891b:23
 Greenland
 = ***Eualus gaimardii***
- Eualus occultus*** (Lebour, 1936)
Spirontocaris occulta Lebour, 1936:96, pl. 1, pl. 2:
 figs. 2, 4, 5, 7, 8; pl. 3: figs. 2, 6–11; pl. 4: figs. 1–3,
 8; pl. 5: figs. 1–3, 7, 12–14; pl. 6: figs. 1–4, 6, 9; pl.
 7: fig. 3
 Plymouth, England
Eualus pax (Stebbing, 1915)
Spirontocaris pax Stebbing, 1915:91
 False Bay, South Africa; 34°11', 18°31'E; 37 meters
Eualus pusiolus (Krøyer, 1841)
Hippolyte pusiola Krøyer, 1841:576
 West coast of Norway
Hippolyte subula
Hippolyte vittata
Hippolyte Barleei
Hippolyte Andrewsii
Hippolyte Korenii
Eualus ratmanovi Makarov, 1941:125, 163
 Bering Sea
Eualus sinensis (Yu, 1931)
Spirontocaris sinensis Yu, 1931:514, fig. 2
 Chefoo, China
Eualus spathulirostris (Yokoya, 1933)
Spirontocaris spathulirostris Yokoya, 1933: fig. 10
 Off northeastern and southeastern Honshu, Japan;
 110–285 meters
Eualus subtilis Carvacho and Olson, 1984:61, figs. 1, 2
 Punta Banda, southern limit of Bahía de Todos Santos,
 Baja California, Mexico; 30 meters in a bed of
 urchins,
Strongylocentrotus sp., on a rocky bottom
Eualus suckleyi (Stimpson, 1864)
Hippolyte Suckleyi Stimpson, 1864:154
 Puget Sound: "circumlittoral zone"
Eualus townsendi (Rathbun, 1902)
Spirontocaris townsendi Rathbun, 1902a:897
 Strait of Juan de Fuca, Washington; 48°22'00"N,
 122°51'00"W; 88 meters
Exhippolysmata Stebbing, 1915:94
 Type species: *Hippolysmata ensirostris*
 67. ***Exhippolysmata ensirostris ensirostris*** (Kemp, 1914)
Hippolysmata ensirostris Kemp, 1914:113, 118
 Colombo, Sri Lanka
 68. ***Exhippolysmata ensirostris punctata*** (Kemp, 1914)
Hippolysmata ensirostris var. *punctata* Kemp,
 1914:120
 "Sandheads," Ganges delta, India, and Amherst and
 Thongwa, Burma
Exhippolysmata hastatoides (Balss, 1914)
Mimocaris hastatoides Balss, 1914a:596
 Victoria, Cameroon; shallow water
Exhippolysmata oplophoroides (Holthuis, 1948)
Hippolysmata (Exhippolysmata) oplophoroides
 Holthuis, 1948:1106, figs. 2, 3.

- Mouth of Suriname River near De Resolutie, Surinam
Exhippolysmata tugelae Stebbing, 1915:94, pl. 89.
 Off Natal, South Africa; 22–47 meters
- ****Gelastocaris*** Kemp, 1914:106
 Type species: *Latreutes Paronae*
- *69. ***Gelastocaris paronae*** (Nobili, 1905)
Latreutes Paronae Nobili, 1905b:2
 Zanzibar
- Gelastreutes*** Bruce, 1990a:138
 Type species: *Gelastreutes crosnieri*
- Gelastreutes crosnieri*** Bruce, 1990a:139
 Off New Caledonia; 19°08'30"S, 163°29'30"E; 65–120 meters
- Helia*** Thallwitz, 1891b:24, 50 [not *Helia* Huebner, 1818]
 Type species: *Hippolyte Fabricii*
 = *Eualus*
- Heptacarpus*** Holmes, 1900:195
 Type species: *Hippolyte palpator*
- Heptacarpus brachydactylus*** (Rathbun, 1902)
Spirontocaris brachydactyla Rathbun, 1902a:898
 Off Santa Cruz Island, California; 33°55'30"N,
 119°41'30"W; 487 meters
- Heptacarpus brevirostris*** (Dana, 1852)
Hippolyte brevirostris Dana, 1852a:24
 Strait of Juan de Fuca near Dungeness, Washington
- Heptacarpus camtschaticus*** (Stimpson, 1860)
Hippolyte camtschatica Stimpson, 1860:33
 Type locality not indicated
- Heptacarpus carinatus*** Holmes, 1900:202
 Monterey Bay, California; shallow water
- Heptacarpus commensalis*** Hayashi, 1979:14, figs. 1, 2
 Shirahama, Wakayama Prefecture, Japan; associated
 with *Acropora*, sp.
- Heptacarpus decorus*** (Rathbun, 1902)
Spirontocaris decora Rathbun, 1902a:896
 Off Santa Cruz Island, California; 33°58'00"N,
 119°30'45"W; 274 meters
- Heptacarpus flexus*** (Rathbun, 1902)
Spirontocaris flexa Rathbun, 1902a:896
 North of Bird Island, Shumagin Islands, Alaska;
 54°52'00"N, 154°46'00"W; 38 meters
- Heptacarpus franciscanus*** (Schmitt, 1921)
Spirontocaris franciscana Schmitt, 1921:60
 1/4 mi off Bonita Point Light, San Francisco Bay,
 California; 9–13 meters
- Heptacarpus fuscimaculatus*** Wicksten, 1986:47, figs. 1, 2
 Big Fisherman's Cove, Santa Catalina Island, California;
 33°27'N, 118°28'W; among algae on floating
 dock
- Heptacarpus futillirostris*** (Bate, 1888)
Nauticariscaris futillirostris Bate, 1888:606
 Akashi Kaikyo, Inland Sea of Japan; 34°38'N,
 135°01'E; 91 meters
- Heptacarpus geniculatus*** (Stimpson, 1860)
Hippolyte geniculata Stimpson, 1860:34
 Hakodate-wan, Hokkaido, Japan; among stones to a
 depth of 4 meters
- Spirontocaris alcimede*
Eualus geniculata var. *longirostris*
- Heptacarpus grebnitzkii*** (Rathbun, 1902)
Spirontocaris grebnitzkii Rathbun, 1902b:44
 Muroan, Hokkaido, Japan
- Heptacarpus herdmani*** (Walker, 1898)
Spirontocaris herdmani Walker, 1898:277
 Puget Sound
- Heptacarpus igarashii*** Hayashi and Chiba, 1989:71, figs.
 1–3
 Toni Bay, Kamaishi City, Iwate Prefecture, Japan
- Heptacarpus jordani*** (Rathbun, 1902)
Spirontocaris jordani Rathbun, 1902b:44
 Hakodate, Hokkaido, Japan
- Heptacarpus kincaidi*** (Rathbun, 1902)
Spirontocaris kincaidi Rathbun, 1902a:899
 Off Santa Cruz, Monterey Bay, California; 36°55'10"N,
 122°04'00"W; 38 meters
- Heptacarpus littoralis*** Butler, 1980:220
 Bunsby Islands, Vancouver Island, Canada; 50.06°N,
 127.32°W; 2–9 meters [T.H. Butler, in correspon-
 dence]
- Heptacarpus maxillipes*** (Rathbun, 1902)
Spirontocaris maxillipes Rathbun, 1902a:898
 Off Seguam Island, Aleutian Islands, Alaska;
 52°06'00"N, 171°45'00"W; 518 meters
- Heptacarpus minutus*** (Yokoya, 1930)
Spirontocaris minutus Yokoya, 1930:531
 Off "Arito", Mutsu Wan, northern Honshu, Japan; 35
 meters
- Heptacarpus moseri*** (Rathbun, 1902)
Spirontocaris moseri Rathbun, 1902a:897
 Off Seguam Island, Aleutian Islands, Alaska;
 52°06'00"N, 171°45'00"W; 518 meters
- Heptacarpus palpator*** (Owen, 1839)
Hippolyte palpator Owen, 1839:89
 Monterey, California
Hippolyte? *Hemphillii*
- Heptacarpus paludicola*** Holmes, 1900:201
 Humboldt Bay, Shelter Cove, and Bodega Bay,
 California
- Heptacarpus pandaloides*** (Stimpson, 1860)
Hippolyte pandaloides Stimpson, 1860:34
 Hakodate-wan, Hokkaido, Japan; among stones to a
 depth of 4 meters
- Spirontocaris propugnatrix*
- Heptacarpus pugettensis*** Jensen, 1983:314
 Alki Point, Seattle, Washington; 47°34'N, 122°25'W;
 low intertidal, under rock
- Heptacarpus rectirostris*** (Stimpson, 1860)
Hippolyte rectirostris Stimpson, 1860:33

- Hakodate, Hokkaido, Japan; deep sea
Heptacarpus sitchensis (Brandt, 1851)
Hippolyte sitchensis Brandt, 1851:116
 Sitka, Alaska
Hippolyte picta
- Heptacarpus stimpsoni*** Holthuis, 1947:13, 44
 Replacement name for *Hippolyte cristata* Stimpson, 1860 [not *Hippolyte cristata* De Haan, 1841]
- Heptacarpus stylus*** (Stimpson, 1864)
Hippolyte stylus Stimpson, 1864:154
 Strait of Juan de Fuca, Washington
Hippolyte esquimaltiana
- Heptacarpus taylori*** (Stimpson, 1857)
Hippolyte taylori Stimpson, 1857:500
 Monterey, California
- Heptacarpus tenuissimus*** Holmes, 1900:203
 Monterey, California
Hippolyte gracilis Stimpson, 1864 [not Lilljeborg, 1850]
Hippolyte amabilis
- Heptacarpus tridens*** (Rathbun, 1902)
Spirontocaris tridens Rathbun, 1902a:896
 Admiralty Inlet to Puget Sound, Washington;
 48°12'00"N, 122°49'00"W; 73 meters
- Heptacarpus yaldwyni*** Wicksten, 1984:241
 South of Puerto Angel [apparently not "Off Salina Cruz"], Oaxaca, Mexico; 14°47'N, 96°19'W - 14°50.5'N, 96°13'W; 1052–1145 meters
- Hetairocaris* De Man, 1890:120
 Type species: *Hetairocaris orientalis*
 = ***Alope***
- Hetairocaris orientalis*; See ***Alope orientalis***
- Hetairus* Bate, 1888:577, 610
 Type species: *Alpheus Polaris*
 = ***Lebbeus***
- Hetairus brandti*; See ***Lebbeus brandti***
- Hetairus brevipes*; See ***Lebbeus brevipes***
- Hetairus debilis* Bate, 1888:615, pl. 109: fig. 4
 South of Halifax, Nova Scotia; 43°03'N, 63°39'W; 155 meters
 = ***Lebbeus polaris***
- Hetairus fasciata*; See ***Lebbeus fasciatus***
- Hetairus grandimana*; See ***Lebbeus grandimana***
- Hetairus heterochaela*; See ***Lebbeus heterochaela***
- Hetairus japonicus*; See *Hetairus unalaskensis japonicus*
- Hetairus longidactyla*; See ***Lebbeus longidactyla***
- Hetairus longipes*; See ***Lebbeus longipes***
- Hetairus ochotensis*; See *Hetairus unalaskensis ochotensis*
- Hetairus schrencki*; See ***Lebbeus schrencki***
- Hetairus spinirostris*; See ***Lebbeus spinirostris***
- Hetairus tenuis* Bate, 1888:613, pl. 109: fig. 3
 South of Halifax, Nova Scotia; 43°03'N, 63°39'W; 155 meters
- = ***Lebbeus polaris***
- Hetairus unalaskensis japonicus* Kobjakova, 1936:202 (*japonia*), 204, 210, 218, 222, pl. 2: fig. 14
- = ***Lebbeus unalaskensis***
- Hetairus unalaskensis ochotensis* Kobjakova, 1936:191, 194, 210, 218, 222, pl. 2: fig. 15
- = ***Lebbeus unalaskensis***
- Hetairus ushakovi*; See ***Lebbeus ushakovi***
- Hetairus zebra* Makarov, 1935:319, fig. 1
 Ostrov Bering, off Mys Olyutorskiy, and "Awatscha-Golf" near "Bucht Betschewinskaja"; littoral to 32 meters
- = ***Lebbeus fasciatus***
- Hippocarycyphus* Coutière, 1907
 Type species: *Hippocarycyphus acutus*
- Hippocarycyphus acutus* (Coutière, 1905)
Carycyphus acutus Coutière, 1905:21. fig. 7
 Near the Azores
 Hippolytid larva
- Hippocarycyphus bigibbosus* (Coutière, 1905)
Carycyphus bigibbosus Coutière, 1905:26, fig. 8
 Near the Azores
 Hippolytid larva
- Hippolite armata* Owen, 1839:88
 = ***Lebbeus groenlandicus***
- Hippolite cornuta* Owen, 1839:89
 = ***Lebbeus groenlandicus***
- Hippolysmata* Stimpson, 1860:26
 Type species: *Hippolysmata vittata*
 = ***Lysmata***
- Hippolysmata acicula* Rathbun, 1906:912, pl. 24: fig. 6
 Puolo Point, Kauai, Hawaii; S.51°30'E 4.9'
 = ***Lysmata ternatensis***
- Hippolysmata amboinensis*; See *Hippolysmata vittata* var. *amboinensis*
 = ***Lysmata amboinensis***
- Hippolysmata californica*; See ***Lysmata californica***
- Hippolysmata dentata* Kemp, 1914:117, pl. 6: fig. 5
 Off mouth of Irrawaddy River, Burma; 15°20'N, 94°55'E; 37 meters
 = ***Lysmata kempii***
- Hippolysmata durbanensis* Stebbing, 1921a:20, pl. 5
 Durban Bay, South Africa
 = ***Lysmata vittata***
- Hippolysmata ensirostris*; See ***Exhippolysmata ensirostris***
- Hippolysmata (Exhippolysmata) ensirostris* var. *punctata*;
 See ***Exhippolysmata ensirostris punctata***
- Hippolysmata grabhami*; See ***Lysmata grabhami***
- Hippolysmata intermedia*; See ***Lysmata intermedia***
- Hippolysmata marleyi* Stebbing, 1919:120
 Sezela, Natal, South Africa
 = ***Lysmata kuekenthalii***
- Hippolysmata moorei*; See ***Lysmata moorei***

- Hippolysmata (Hippolysmata) morelandi* Yaldwyn, 1971:90; See *Lysmata morelandi*
- Hippolysmata multiscissa*; See *Lysmata multiscissa*
- Hippolysmata (Exhippolysmata) oplophoroides*; See *Exhippolysmata oplophoroides*
- Hippolysmata paucidens* Rathbun, 1906:913, pl. 24: fig. 4
Waikiki Beach, Oahu, Hawaii
= *Lysmata trisetacea*
- Hippolysmata Porteri*; See *Lysmata porteri*
- Hippolysmata punctata*; See *Exhippolysmata ensirostris punctata*
- Hippolysmata rhizophorae*; See *Merguia rhizophorae*
- Hippolysmata subtilis*; See *Hippolysmata vittata subtilis*
= *Lysmata vittata*
- Hippolysmata vittata*; See *Lysmata vittata*
- Hippolysmata vittata* var. *amboinensis*; See *Lysmata amboinensis*
- Hippolysmata vittata subtilis* Thallwitz, 1891b:22
Cebu, Philippines
= *Lysmata vittata*
- **Hippolyte* Leach, 1814:431
Type species: *Hippolyte Varians*
Nectoceras
Virbius
Bellidia
- Hippolyte acuminatus* Dana, 1852a:24
North Atlantic Ocean with Sargassum
= *Hippolyte coerulescens*
- Hippolyte acuta* (Stimpson, 1860)
Virbius acutus Stimpson, 1860:35
Ryukyu Islands; on weed-covered littoral rocks
?= *Hippolyte ventricosa*
- Hippolyte affinis* Owen, 1939:90, pl. 27: fig. 4
Monterey, California
Species inquirenda (see Holthuis, 1947:21)
- Hippolyte amabilis* Lenz, 1901:432
Bare Island, San Juan County, Washington; 48°43.8'N,
123°0.7'W.
= *Heptacarpus tenuissimus*
- Hippolyte Amazo* Pfeffer, 1886:46
= *Lebbeus polaris*
- Hippolyte amboinensis*; See *Thor amboinensis*
- Hippolyte Andrewsii* Kinahan, 1857 [reference unascertained]
Ireland
= *Eualus pusiolus*
- Hippolyte antarctica*; See *Chorismus antarcticus*
- Hippolyte armoricana*; See *Hippolyte longirostris armoricana*
- Hippolyte Barleei* Bate, 1852
Shetland Islands
= *Eualus pusiolus*
- Hippolyte belcheri* Bell, 1855:402
Arctic
= *Eualus gaimardii*
- Hippolyte bermudensis*; See *Hippolyte pleuracantha bermudensis*
- ?= *Hippolyte zostericola*
- Hippolyte bidentatus* Bate, 1888:591
Atlantic Ocean; on gulf-weed and surface among gulf-weed; 32°07'–35°29'N, 50°53'–52°32'; surface among gulf weed
= *Hippolyte coerulescens*
- Hippolyte bifidirostris* (Miers, 1876)
Virbius bifidirostris Miers, 1876:81, pl. 2: fig. 1
New Zealand
- [*Hippolyte bispinosa* De Haan, 1844 = *Sicyonia bispinosa*]
- Hippolyte borealis* Ross, 1835:lxviii
= *Lebbeus polaris*
- Hippolyte brevirostris*; See *Heptacarpus brevirostris*
- Hippolyte Bunseni* Neumann, 1878:36 [accredited to Pagenstecher by Neumann]
Palma, Majorca
= *Thoralus cranchii*
- Hippolyte californiensis* Holmes, 1895:576
Bodega Bay, California
- Hippolyte camtschatica*; See *Heptacarpus camtschaticus*
- Hippolyte capensis* (Lenz and Strunck, 1914)
Virbius capensis Lenz and Strunck, 1914:319, pl. 20: figs. 1–4
Simons Bay, South Africa
- Hippolyte caradina* Holthuis, 1947:14, 54
Replacement name for *Caradina tenuirostris* Bate, 1863 [not *Hippolyte tenuirostris* H. Milne Edwards, 1837]
Caradina tenuirostris Bate, 1863
- Hippolyte Carneus* P. Roux, 1831:28 [Risso identification]
= *Ligur ensiferus*
- Hippolyte clarki* Chace, 1951:37, fig. 1f–p
Friday Harbor, Washington; in eel grass
- Hippolyte coerulescens* (Fabricius, 1775)
Astacus coerulescens Fabricius, 1775:414
“Pelago inter Tropicos”
Palaemon pelasgicus
Hippolyte tenuirostris
Hippolyte acuminatus
Hippolyte bidentatus
Hippolyte Martiali
- Hippolyte commensalis* Kemp, 1925:331
Coral reef off Reed Point, Nancowry Island, Nicobar Islands
- Hippolyte consobrinus* A. Milne-Edwards, 1891:47, pl. 5: fig. 4
Bahia Orange, Isla Hoste, Chile
= *Nauticaris magellanica*
- [*Hippolyte costata* Leuckart, 1847 = *Pontophilus*, sp.?]
Hippolyte Cranchii; See *Thoralus cranchii*

- Hippolyte Crassicornis* H. Milne Edwards, 1837:375
St. Malo, Brittany, France
= *Eualus occultus* or *Thorulus cranchii* (see Holthuis, 1947:22)
[*Hippolyte cristata* De Haan, 1844:194 = *Sicyonia cristata*]
Hippolyte cristata Stimpson, 1860:33 [not De Haan, 1844]
San Francisco, California; 9–18 meters
= *Heptacarpus stimpsoni*
- Hippolyte Cubensis*; See *Barbouria cubensis*
- Hippolyte cultellata* Norman, 1867:200
= *Lebbeus polaris*
- Hippolyte curacaoensis* Schmitt, 1924
Hippolyte curacaoensis Schmitt, 1924a:68, fig. 4
Westpunt, Curaçao, Netherlands Antilles
[*Hippolyte denticulata* De Haan, 1844 = *Caridina denticulata*]
Hippolyte Dozei; See *Eualus dozei*
- Hippolyte edmondsoni* Hayashi, 1982:185, figs. 1–3
Waimanalo, Oahu, Hawaii
[*Hippolyte elongatus* Guerin-Meneville, 1857 = *Xiphocaris elongata*]
Hippolyte ensiferus H. Milne Edwards, 1837:374
High sea near Azores
= *Latreutes fucorum*
- Hippolyte ensis*; See *Hippolyte Whitei* var. *ensis*
- Hippolyte esquimaltiana* Bate, 1864:666
Esquimalt Harbor, Vancouver Island, British Columbia
= *Heptacarpus stylus*
- Hippolyte exilirostrata* Dana, 1852
Hippolyte exilirostratus Dana, 1852a:24
Rio de Janeiro
- Hippolyte Fabricii*; See *Eualus fabricii*
- Hippolyte falcatus*; See *Hippolyte Whitei* var. *falcatus*
- Hippolyte fascigera* Gosse, 1853:153
= *Hippolyte varians*
- Hippolyte Gaimardii*; See *Eualus gaimardii*
- Hippolyte geniculata*; See *Heptacarpus geniculatus*
- Hippolyte gibba* Krøyer, 1841:572
= *Eualus gaimardii*
- Hippolyte gibberosus* H. Milne Edwards, 1837:378
Shores of Australia
= *Saron marmoratus*
- Hippolyte Gordoni*; See *Caridion gordoni*
[*Hippolyte gracilipes* Randall, 1840 ?= *Palaemon*, sp.]
- Hippolyte gracilirostris*; See *Eualus gracilirostris*
- Hippolyte gracilis* Leuckart, 1847:92
Iceland
Nomen nudum
- Hippolyte gracilis* Lilljeborg, 1850:83
= *Eualus gaimardii*
- Hippolyte gracilis* Stimpson, 1864:155 [not Lilljeborg (1850)]
Puget Sound, Washington; deep water
= *Heptacarpus tenuissimus*
- Hippolyte Grayana* Thompson, 1853
= *Hippolyte inermis*
- Hippolyte Grayi* Cunningham, 1871:496
= *Austropandalus grayi*
- Hippolyte? Hemphillii* Lockington, 1877:35
San Diego, California
= *Heptacarpus palpator*
- Hippolyte Hemprichii* Heller, 1861:29
Red Sea
= *Saron marmoratus*
- Hippolyte holthuisi* Zariquiey Alvarez, 1953:104
Cadaques, northeastern Spain; to a depth of 60 meters
- Hippolyte huntii* (Gosse, 1877)
Bellidia Huntii Gosse, 1877:313, pl. 10
Torquay, Devonshire, England; 11 meters
- Hippolyte ignobilis* Kinahan, 1858 [reference unascertained]
Port Philip, Victoria, Australia
Species inquirenda
- Hippolyte incerta* Buchholz, 1874:272
= *Lebbeus polaris*
- Hippolyte inermis* Leach, 1815:347
South coast of Devon
Palaemon Olivieri
Palaemon Margaritaceus
Hippolyte Moorii
Hippolyte Prideauxiana
Hippolyte Brullei
Hippolyte viridis
Hippolyte mauritanicus
Hippolyte Grayana
Hippolyte Mitchelii
Hippolyte Whitei
Hippolyte Whitei var. *ensis*
Hippolyte Whitei var. *falcatus*
Hippolyte virescens
Virbius Brullei forma *elongata*
Virbius Brullei forma *fortior*
- Hippolyte jarvisensis* Hayashi, 1982:190, figs. 4, 5
Jarvis Islands, Line Islands
- Hippolyte Korenii* Danielssen, 1859:6
Vadso, Norway; 110 meters, mud bottom
= *Eualus pusiolus*
- Hippolyte kraussiana* (Stimpson, 1860)
Virbius Kraussianus Stimpson, 1860:36
Simons Bay, South Africa
- Hippolyte kukenthalii* De Man, 1902:850; See *Lysmata kuekenthalii*
- Hippolyte lamellicornis*; See *Spirontocaris lamellicornis*
- Hippolyte Layi* Owen, 1839:90, pl. 27: fig. 3
Monterey, California
Species inquirenda
- Hippolyte Leachii* Guérin-Méneville, 1838, pl. 21: fig. 4

- Kusaie, Caroline Islands
= *Saron marmoratus*
Hippolyte lentiginosa Rathke, 1843:14
= *Eualus gaimardii*
Hippolyte leptocerus (Heller, 1863)
Virbius leptocerus Heller, 1863:289
Genoa, Italy
Hippolyte leptognatha; See *Eualus leptognathus*
Hippolyte leptometrae Ledoyer, 1969:342
Off Provence, France, near Marseille; 110 meters
Hippolyte Lilljeborgii; See *Spirontocaris lilljeborgii*
Hippolyte lineata Lockington, 1877:35
San Diego, California
= *Lysmata californica*
Hippolyte longirostris longirostris (Czerniavsky, 1884)
Virbius gracilis var. *longirostris* Czerniavsky, 1884:68,
Virbius gracilis Heller, 1862a
Virbius gracilis var. *brevirostris*
Virbius gracilis var. *longirostris*
Virbius gracilis var. *articulirostri*
Virbius gracilis forma *typica*
? *Virbius rectifrons*
? *Virbius tenuirostris*
Hippolyte longirostris armoricana Sollaud, in Bourdon,
1965:6, [39]
Roscoff, France
Hippolyte Lovenii Rathke, 1843
Molde, Norway
= *Eualus occultus* or *Thoralus cranchii* (see Holthuis,
1947:22)
Hippolyte Lygdamis White, 1847:76
Chile
Nomen nudum
Hippolyte Macandreae Bell, 1847
British coast
Nomen nudum
Hippolyte macilenta; See *Eualus macilentus*
[*Hippolyte macrocheles* Hailstone, 1835 = *Alpheus macrocheles*]
Hippolyte magellanicus; See *Nauticariscar magellanica*
Hippolyte marioni Gourret, 1887
Gulf of Marseille, France
Species inquirenda
Hippolyte Martiali A. Milne-Edwards, 1891:47
Beagle Channel off Lapataia, Tierra del Fuego; 198
meters
= *Hippolyte coerulescens*
Hippolyte mauritanicus Lucas, 1846:42
Algeria
= *Hippolyte inermis*
Hippolyte Metis White, 1847:76
Philippine Islands
Nomen nudum
Hippolyte mexicana Chace, 1937b:127
Bahia Santa Ines, Baja California, Mexico; 26°59'N,
111°59'W; 2 meters
= *Hippolyte williamsi*
Hippolyte microceras; See *Lebbeus microceros*
Hippolyte Mitchelli Thompson, 1853:114, pl. 6: fig. 4
= *Hippolyte inermis*
Hippolyte Moorii Leach, 1817: plate 38: fig. 2
Plymouth Sound, England
= *Hippolyte inermis*
Hippolyte multicolorata Yaldwyn, 1971:90
Island Bay, Wellington, New Zealand; intertidal algae
Hippolyte mutila Krøyer, 1841:573
= *Thoralus cranchii*
Hippolyte mysis Birula, 1898:184
White Sea
= *Lebbeus polaris*
Hippolyte nicholsoni Chace, 1972:113
Milford Bay, between Pigeon Point and Crown Point,
Tobago, West Indies; 9–12 meters
Hippolyte obliquimanus Dana, 1852a:24
Rio de Janeiro
Virbius gracilis var. *brasiliensis*
Hippolyte ochotensis; See *Spirontocaris ochotensis*
Hippolyte oligodon; See *Merguia oligodon*
Hippolyte orientalis Heller, 1862b:277
Red Sea
= *Hippolyte ventricosa*
Hippolyte palliola Kensley, 1970:183, figs. 1, 2
Mowe Point, northern S.W. Africa; from algae in rock
pool
Hippolyte palpator; See *Heptacarpus palpator*
[*Hippolyte paludosa* Gibbes, 1850 = *Palaemonetes pa-*
ludosus]
Hippolyte pandaliformis Bell, 1851:294
Loch Fyne, Scotland; 37 meters
= *Eualus gaimardii*
Hippolyte pandaloides; See *Heptacarpus pandaloides*
Hippolyte panschi Buchholz, 1874:277, pl. 1: fig. 1
Eastern Greenland
= *Bythocaris simplicirostris*
[*Hippolyte parvulus* De Haan, 1844 = *Sicyonia parvula*]
Hippolyte paschalis; See *Thor paschalis*
Hippolyte Payeri; See *Bythocaris payeri*
Hippolyte pectinifera; See *Spirontocaris pectinifera*
Hippolyte Phippsii; See *Spirontocaris phippsii*
Hippolyte picta Stimpson, 1871:125
Monterey, California
= *Heptacarpus sitchensis*
Hippolyte planirostris; See *Latreutes planirostris*
Hippolyte pleuracantha (Stimpson, 1871)
Virbius pleuracanthus Stimpson, 1871:127
Norfolk, Virginia, and Somers Point, Great Egg Harbor,
New Jersey; “among *Zostera* just below low water
mark”

- Hippolyte pleuracantha bermudensis* Gurney, 1936:27, pl. 1: figs. 4–12; pl. 2: figs. 13–21
Castle Harbour and Tobacco Bay, Bermuda; among *Zostera* and attached *Sargassum*
?= *Hippolyte zostericola*
- Hippolyte ponapensis* Ortmann, 1890:502
Ponape, Caroline Islands
= *Alope orientalis*
- Hippolyte Prideauxiana* Leach, 1817: pl. 38: figs. 1, 3–5
Near Bantham, Devon, England
= *Hippolyte inermis*
- Hippolyte prionota*; See *Spirontocaris prionota*
- Hippolyte producta* Norman, 1861:275
= *Hippolyte varians*
- Hippolyte projecta* Bate, 1888:594, pl. 105: fig. 3
South of Halifax, Nova Scotia; 43°03'N, 63°39'W; 155 meters
= *Lebbeus polaris*
- Hippolyte proteus* (Paulson, 1875)
Virbius Proteus Paulson, 1875:109, pl. 16: figs. 2–5, pl. 18: fig. 1–1k
Red Sea
- Hippolyte pusiola*; See *Eualus pusiolus*
- Hippolyte Quoyanus* H. Milne Edwards, 1837:375
New Guinea
Species inquirenda
- Hippolyte rectirostris*; See *Heptacarpus rectirostris*
- Hippolyte recurvirostris* Rathke, 1843:12
= *Eualus gaimardii*
- Hippolyte restrictus*; See *Trachycaris restricta*
- Hippolyte Retzii* Rathke, 1843:16
= *Eualus gaimardii*
- Hippolyte Romanchei* A. Milne-Edwards, 1891:45
= *Chorismus antarcticus*
- [*Hippolyte? rubra* Hailstone, 1835 = *Alpheus macrocheles* (Hailstone)]
- Hippolyte rubrosignata* Wagner, 1885
White Sea
Nomen nudum
- Hippolyte sapphica* d'Udekem d'Acoz, 1993:55, figs. 1, 5, 7–9
Lesbos Island, Greece; 0.2–1 meter
- Hippolyte St. Pauli* Brandt, 1851:118
= *Lebbeus polaris*
- Hippolyte securifrons* Norman, 1862:151
= *Spirontocaris lilljeborgii*
- Hippolyte serratus* H. Milne Edwards, 1837:377
“baie de Jarvis”
Species inquirenda
- Hippolyte sitchensis*; See *Heptacarpus sitchensis*
- Hippolyte smaragdina* Krøyer, 1841:570
= *Hippolyte varians*
- Hippolyte Sowerbaei* Leach, 1817: pl. 39: figs. 1–10
= *Spirontocaris spinus*
- [*Hippolyte spinicaudus* H. Milne Edwards, 1837 = *Chlorotocella spinicauda*]
- Hippolyte spinifrons*; See *Alope spinifrons*
- Hippolyte Stewarti* Thomson, 1889:259
Paterson Inlet, Stewart Island, New Zealand
= *Nauticaris marionis*
- Hippolyte stylus*; See *Heptacarpus stylus*
- Hippolyte subula* Rathke, 1843:9
= *Eualus pusiolus*
- Hippolyte Suckleyi*; See *Eualus suckleyi*
- Hippolyte taylori*; See *Heptacarpus taylori*
- Hippolyte tenuirostris* H. Milne Edwards, 1837:374
On the high seas near the Azores
= *Hippolyte coerulescens*
- [*Hippolyte Thompsoni* Bell, 1851 = *Pandalina brevirostris* (Rathke)]
- Hippolyte trisetacea*; See *Lysmata trisetacea*
- Hippolyte turgida* Krøyer, 1841:575
= *Spirontocaris phippisii*
- Hippolyte varians* Leach, 1814:431
Alpheus elongatus
Hippolyte smaragdina
Hippolyte fascigera
Hippolyte producta
Caradina tenuis
- *70. *Hippolyte ventricosa* H. Milne Edwards, 1837:371
Seas of Asia
? *Virbius acutus*
Virbius australiensis
Hippolyte orientalis
Caradina cincinnuli
Virbius Mossambicus
- Hippolyte vibrans* Stimpson, 1871:125
Massachusetts Bay
= *Spirontocaris phippisii*
- Hippolyte virescens* H. Milne Edwards, 1837, pl. 53: fig. 3
Type locality not indicated
= *Hippolyte inermis*
- Hippolyte viridis* Otto, 1828:338
= *Hippolyte inermis*
- Hippolyte vittata* Rathke, 1843:10
= *Eualus pusiolus*
- Hippolyte Whitei* Thompson, 1853
= *Hippolyte inermis*
- Hippolyte Whitei* var. *ensis* Thompson, 1853
= *Hippolyte inermis*
- Hippolyte Whitei* var. *falcatus* Thompson, 1853
= *Hippolyte inermis*
- Hippolyte williamsi* Schmitt, 1924b:163
Isla Eden, off Isla Santa Cruz, Galapagos Islands; 9 meters
Hippolyte mexicana
- Hippolyte Wurdemanni*; See *Lysmata wurdemanni*
- Hippolyte Yarrellii* Thompson, 1853

- Weymouth Bay, southern England
 = *Eualus occultus* or *Thoralus cranchii*
Hippolyte zostericola (Smith, 1873)
Virbius zostericola Smith, 1873:550, pl. 3: fig. 11
 Vineyard Sound, Massachusetts
Hippolyte pleuracantha bermudensis
Hippolytes carneus (Risso ms) Monod, 1931
 Mediterranean
 Nomen nudum
Hippolytes incarnatus (Risso ms) Monod, 1931
 Mediterranean
 Nomen nudum
 [*Hippolythes variegatus* Risso, 1826 = *Athanas nitescens* (Leach)]
Hippolytus Brullei Guérin-Méneville, 1832:41, pl. 27: fig. 2
 = *Hippolyte inermis*
Hippolytus Incarnatus Hope, 1851:18
 Nomen nudum
 = *Ligur ensiferus*
Hyppolite Kraussii Bianconi, 1869:200
 Mozambique
 = *Saron marmoratus*
 [*Hyppolyte Desmarestii* Millet, 1831 = *Atyaephyra desmarestii*]
Janicea Manning and Hart, 1984:657
 Type species: *Barbouria antiguensis*
Janicea antiguensis (Chace, 1972)
Barbouria antiguensis Chace, 1972:107, figs. 40, 41
 English Harbour, Antigua, West Indies; alga-covered seawall
Koror Clark, 1989:445
 Type species: *Koror misticius*
 = *Parhippolyte*
Koror misticius; See *Parhippolyte misticius*
 **Latreutes* Stimpson, 1860:27
 Type species: *Hippolyte ensiferus*
Cyclorhynchus De Haan, 1849
Rhynchocyclus
Concordia
Platybema
Latreutes acicularis Ortmann, 1890:506, pl. 37: fig. 6, 6d-k, 6n
 "Kadsiyama," Japan
 *71. *Latreutes anoplonyx* Kemp, 1914:104, pl. 4: figs. 3-5
 Bombay, India
Latreutes antiborealis Holthuis, 1952:62, fig. 14
 Inner part of Canal San Antonio, Golfo de Ancud, Chile; 41°44'10"S, 73°15'15"W; 15 meters
Latreutes ceylonensis Pearson, 1905:81, pl. 2: fig. 7
 Sri Lanka pearl banks
 Species inquirenda
Latreutes compressus (Stimpson, 1860)
Rhynchocyclus compressus Stimpson, 1860:28
 Port Jackson, Sydney Harbour, Australia
Caradina truncifrons
Latreutes dorsalis Stimpson, 1860:27
 Hakodate-wan, Hokkaido, Japan
 = *Latreutes planirostris*
Latreutes foliistrostris Kobjakova, 1935:91
 Zaliv Petra Velikogo [Peter the Great Bay], Maritime Territory, U.S.S.R.
Latreutes fucorum (Fabricius, 1798)
Palaemon fucorum Fabricius, 1798:404
 Floating gulfweed
Hippolyte ensiferus
Latreutes Gravieri Nobili, 1904:230
 Djibouti
 = *Latreutes mucronatus*
Latreutes inermis Chace, 1972:122, figs. 51, 52
 Reef just south of Marigot Harbour, Saint Lucia Island, West Indies; 4-6 meters
Latreutes laminirostris Ortmann, 1890:506, pl. 37: fig. 5
 "Tanagava," Japan
 *72. *Latreutes mucronatus* (Stimpson, 1860)
Rhynchocyclus mucronatus Stimpson, 1860:27
 Lei Yue Mun Pass, Hong Kong; shelly bottom in 46 meters
Latreutes Gravieri
Latreutes mucronatus var. *multidens*
Latreutes mucronatus var. *multidens* Nobili, 1905c:394
 Red Sea
 = *Latreutes mucronatus*
Latreutes multidens; See *Latreutes mucronatus* var. *multidens*
 = *Latreutes mucronatus*
Latreutes natalensis Lenz and Strunck, 1914:320, pl. 21: figs. 1-11
 Natal
Latreutes Paronae; See *Gelastocaris paronae*
Latreutes parvulus (Stimpson, 1866)
Rhynchocyclus parvulus Stimpson, 1866:48
 Saint Joseph Island, Texas
Concordia gibberosus
Latreutes phycologus Nobili, 1905d, fig.
 Arabian coast; on a floating brown alga
Latreutes planirostris (De Haan, 1844)
Hippolyte planirostris De Haan, 1844, pl. 45: fig. 7 [the undotted "i" in the specific name on the De Haan plate might suggest that the original spelling is "plamrostris," a misinterpretation effectively dismissed by L.B. Holthuis in correspondence].
 Japan
Latreutes dorsalis
 73. *Latreutes planus* Bate, 1888:584, pl. 89: fig. 5
 Off Sibago Island, Moro Gulf east of Basilan Strait, Philippines
Latreutes porcinus Kemp, 1916:397, fig. 3, pl. 36: fig. 3

- Off Ross Island jetty, Port Blair, Andaman Islands;
among weeds
- Latreutes pristis*** (Nobili, 1899)
Platybema pristis Nobili, 1899:233
Beagle Entrance, Papua, Australian New Guinea
- Latreutes pygmaeus* Nobili, 1906:37
Erroneous spelling of ***Latreutes pymoews***
- Latreutes pymoews*** Nobili, 1904:230
Djibouti
Latreutes pygmaeus
74. ***Latreutes unidentatus*** Bate, 1888:586, pl. 89: fig. 6
Off Sibago Island, Moro Gulf east of Basilan Strait,
Philippines
- Lebbeus*** White, 1847:76, 135
Type species: *Lebbeus orthorhynchus* [= *Alpheus*
Polaris]
Hetairus
Birulaecaris
- Lebbeus antarcticus*** (Hale, 1941)
Spirontocaris antarcticus Hale, 1941:267, figs. 5, 6
Off Adelie Coast, Wilkes Land, Antarctica; 66°21'S,
138°28'E; 640 meters
- Lebbeus balssi*** Hayashi, 1992:112, figs. 1–3
East China Sea; 33°59.4'N, 128°48.0'E; dredge, 102
meters
- Lebbeus bidentatus*** Zarenkov, 1976:13, fig. 5
Peru
- Lebbeus brandti*** (Brashnikov, 1907)
Hetairus brandti Brashnikov, 1907:157, fig. 20
Sea of Okhotsk
- Lebbeus brevipes*** (Kobjakova, 1936)
Hetairus brevipes Kobjakova, 1936:194, 210, 218, 222,
fig. 9a–c
Sea of Okhotsk; 335 meters
= ***Lebbeus unalaskensis***
- Lebbeus carinatus*** Zarenkov, 1976:9, fig. 2
Peru; 1850 meters
- Lebbeus carinatus*** de Saint Laurent, 1984:356 [? not
Zarenkov, 1976]
Albatross Plateau, eastern Pacific; 2620 meters
- Lebbeus catalepsis*** Jensen, 1987:89, figs. 1–3
Strait of Juan de Fuca between Sekiu and Neah Bay,
Washington; 48°19'N, 124°28'W; low intertidal
- Lebbeus compressus*** Holthuis, 1947:9, 40
Replacement name for *Spirontocaris gibberosa*
Yokoya, 1933 [not Balss, 1914]
- Lebbeus curvirostris*** Zarenkov, 1976:12, fig. 4
Off Peru; 1680–1860 meters
- Lebbeus fasciatus*** (Makarov, 1936)
Hetairus fasciatus Makarov, 1936 [cited by Kobjakova,
1936:191, 210, 218]
Bering Sea, Bering Island, and SE Kamchatka; 1–32 m
Hetairus zebra Makarov, 1935 [not Leim, 1921]
Spirontocaris makarofi Urita
- Lebbeus grandimana*** (Brashnikov, 1907)
Hetairus grandimana Brashnikov, 1907:152
S and E Ostrov Sakhalin; 19–118 m
- Lebbeus groenlandicus*** (Fabricius, 1775)
Astacus Groenlandicus Fabricius, 1775:416
“Habitat in mari groenlandico”
Cancer aculeatus
Hippolyte armata
Hippolyte cornuta
- Lebbeus heterochaela*** (Kobjakova, 1936)
Hetairus heterochaela Kobjakova, 1936:194, 210, 218,
222, figs. 18, 19
Sea of Okhotsk; 165 meters
75. ***Lebbeus indicus*** Holthuis, 1947:40, figs. 1–3
Bali Sea; 7°28'.2S, 115°24'.6E; 1018 meters
- Lebbeus kuboi*** Hayashi, 1992:123, figs. 6–8
Sea of Japan off Namerikawa; 200 meters
- Lebbeus lagunae*** (Schmitt, 1921)
Spirontocaris lagunae Schmitt, 1921:57, fig. 35
Laguna Beach, California; 22–27 meters
- Lebbeus longidactyla*** (Kobjakova, 1936)
Hetairus longidactyla Kobjakova, 1936:194, 210, 218,
222, figs. 12, 13
Sea of Okhotsk; 440–504 meters
- Lebbeus longipes*** (Kobjakova, 1936)
Hetairus longipes Kobjakova, 1936:202, 204, 210, 218,
222, pl. 2: fig. 16
Peter the Great Bay (Zaliv Petra Velikogo) and Tatarsky
Strait (Tatarskyi Proliv), Sea of Japan
- Lebbeus microceros*** (Krøyer, 1841)
Hippolyte microceras Krøyer, 1841:579
W Greenland
Spirontocaris zebra Leim, 1921
- Lebbeus miyakei*** Hayashi, 1992:127, figs. 10, 11
Orono-shima Island, Fukuoka Prefecture, Japan; 30–40
meters
- Lebbeus montereyensis***; See ***Lebbeus vicinus***
montereyensis
- Lebbeus orthorhynchus*** White, 1847:76
= ***Lebbeus polaris***
- Lebbeus polaris*** (Sabine, 1824)
Alpheus polaris Sabine, 1824:ccxxxviii
Melville Island, Parry Islands, Northwest Territories,
Canada; 91 meters
Hippolyte borealis
Lebbeus orthorhynchus
Hippolyte St. Pauli
Hippolyte cultellata
Hippolyte incerta
Hippolyte Amazo
Hetairus debilis
Hetairus tenuis
Hippolyte projecta
Hippolyte mysis

- Lebbeus possjeticus* Kobjakova, 1967:235
Possjet Bay, Sea of Japan
= *Lebbeus speciosus*
- Lebbeus profundus* (Rathbun, 1906)
Spirontocaris profunda Rathbun, 1906:914
Center of Nihoa [= Modu Manu, Bird Island], Hawaii,
S. 77°30', E 11.1'; 1394–1829 meters
- Lebbeus saldanhae* (Barnard, 1947)
Spirontocaris saldanhae Barnard, 1947:385
Off Constable Hill, Saldanha Bay, South Africa; 265
meters
- Lebbeus schrencki* (Brashnikov, 1907)
Hetairus schrencki Brashnikov, 1907:161
East coast of Ostrov Sakhalin; 43–100 m
- Lebbeus scrippsi* Wicksten and Mendez, 1982:106, pls.
1, 2
Off Arica, Chile; 18°40.5'S, 70°36.0'W to 18°32.2'S,
70°29.8'W; 768–968 meters
- Lebbeus speciosus* (Urita, 1942)
Spirontocaris makarofi speciosa Urita, 1942:18, fig. 3
Otomari, Sakhalin; 4–6 meters
Lebbeus possjeticus
- Lebbeus spinirostris* (Kobjakova, 1936)
Hetairus spinirostris Kobjakova, 1936:194, 210, 216,
222, fig. 10
Sea of Okhotsk; 165 meters
- Lebbeus splendidus* Wicksten and Mendez, 1982:110, pls.
3–5
Southwest of Isla Lobos de Tierra, Peru; 6°31'S,
81°01'W; 712–744 meters
- Lebbeus unalaskensis* (Rathbun, 1902)
Spirontocaris unalaskensis Rathbun, 1902a:895
Bering Sea north of Unalaska Island, Alaska;
54°01'40"N, 166°48'50"W; 640 meters
Hetairus unalaskensis japonicus
Hetairus unalaskensis ochotensis
Hetairus brevipes
- Lebbeus ushakovi* (Kobjakova, 1936)
Hetairus ushakovi Kobjakova, 1936:210, 218, 222,
fig. 11
Sea of Okhotsk; 165 meters
- Lebbeus vicinus vicinus* (Rathbun, 1902)
Spirontocaris vicina Rathbun, 1902a:895
Bering Sea north of Unalaska Island, Alaska;
54°01'00"N, 166°48'45"W; 566 meters
- Lebbeus vicinus montereyensis* Wicksten and Mendez,
1982:114
West of Cabo Punta Banda, Baja California, Mexico;
31°18'N, 117°36'W; 2068–2086 meters
- Lebbeus vinogradowi* Zarenkov, 1960:346
Sea of Okhotsk; 56°57.5'N, 145°57'E; 204 meters
- Lebbeus washingtonianus* (Rathbun, 1902)
Spirontocaris washingtoniana Rathbun, 1902a:895
Off Washington; 47°29'00"N, 125°33'30"W; 1253
meters
- Lebbeus yaldwyni* Kensley, Tranter, and Griffin, 1987:304
East of Sydney, New South Wales, Australia; 33°43'S,
151°51–53'E; 450 meters
- Leontocaris* Stebbing, 1905:21, 98
Type species: *Leontocaris paulsoni*
? *Problemacaris*
- Leontocaris amplectipes* Bruce, 1990b:121
South of Point Hicks, Victoria, Australia; 38°21.9'S,
149°20.0'E; 1000 meters
- Leontocaris lar* Kemp, 1906:299
West and southwest of Ireland; 914–1147+ meters
? *Problemacaris boschmai*
- Leontocaris pacificus* Zarenkov, 1976:10, fig. 3
Chile; 680–700 meters
- Leontocaris paulsoni* Stebbing, 1905:99
25 miles off Lions Head, Cape Town, South Africa
? *Problemacaris spinetum*
- Ligur* Sarato, 1885:2
Type species: *Ligur Edwardsii* [= *Palemon Ensiferus*]
Lybia Risso, 1844 [not H. Milne Edwards, 1834]
- Ligur ensiferus* (Risso, 1816)
Palaemon Ensiferus Risso, 1816:106
Nice
Alpheus ensiferus
Hippolyte Carneus
Lybia ensifera
Hippolytus Incarnatus
Palaemon Veditantus
(See Holthuis, 1977:50 for complete synonymy)
Lybia 1844:95 [not H. Milne Edwards, 1834]
Type species: *Palemon Ensiferus*
= *Ligur*
- Lybia ensifera* Risso, 1844; See *Ligur ensiferus*
- Lysippe* Kinahan, 1858:266 [name suppressed under
plenary power of the International Commission,
Opinion 671, 1963].
Type species: *Hippolyte Cranchii*
= *Thoralus*
- **Lysmata* Risso, 1816:175 (footnote)
Replacement name for *Melicerta* Risso, 1816
Aglaope
Niphea
Arno
Hippolysmata
Eretmocariss
Lysmata aberrans Czerniavsky, 1884:63, pl. 3: fig.
7A–K
Sukhumi, Black Sea; 1–1.5 meters, nocturnally nata-
tory
= *Lysmata seticaudata*
- Lysmata affinis* Borradaile, 1915:209
Laccadive Islands, Seychelles, and Chagos Archipel-
ago, Indian Ocean

- = *Lysmata ternatensis*
76. *Lysmata amboinensis* (De Man, 1888)
Hippolysmata vittata var. *amboinensis* De Man, 1888:495
 Ambon, Indonesia
- Lysmata anchisteus* Chace, 1972:125, figs. 53, 54
 Point Saline, Grenada, West Indies; rocks at southwest end of first beach on lee coast
- Lysmata californica* (Stimpson, 1866)
Hippolysmata californica Stimpson, 1866:48
 San Diego, California
Hippolyte lineata
Lysmata chiltoni Kemp, 1914:110
 Meyer Island, Kermadec Islands
 = *Lysmata trisetacea*
76. *Lysmata debelius* Bruce, 1983:115
 Polillo Island, east of Luzon, Philippines; 28 meters
- Lysmata dentata* (De Haan, 1844)
Palaemon dentatus De Haan, 1844, pl. 45: fig. 13 [not *Palaemon dentatus* Roemer, 1841]
 Japan
 = *Lysmata ternatensis*
- Lysmata galapagensis* Schmitt, 1924b:165
 Northeast of Isla Eden, Galapagos Islands; 13 meters
- Lysmata grabhami* (Gordon, 1935)
Hippolysmata grabhami Gordon, 1935:319, figs. 10, 11a,b
 Funchal, Madeira Islands
- Lysmata intermedia* (Kingsley, 1878)
Hippolysmata intermedia Kingsley, 1878b:90
 Dry Tortugas, Florida
- Lysmata kempii*, new name for *Hippolysmata dentata* Kemp, 1914, not *Palaemon dentatus* De Haan, 1844
78. *Lysmata kuekenthali* (De Man, 1902)
Hippolyte kuekenthali De Man, 1902:850
 Replacement name for *Merhippolyte orientalis* De Man, 1892 [not Bate, 1888]
 Near Maumere, Flores, fringing reef [and Ternate], Indonesia
Hippolysmata marleyi
- Lysmata moorei* (Rathbun, 1901)
Hippolysmata moorei Rathbun, 1901:115, fig. 23
 Playa de Ponce, Puerto Rico
- Lysmata morelandi* (Yaldwyn, 1971)
Hippolysmata (*Hippolysmata*) *morelandi* Yaldwyn, 1971:90
 Bay of Islands, North Auckland, New Zealand; subtidal algal beds on rocky substrate to a depth of about 6 meters
- Lysmata multiscissa* (Nobili, 1904)
Hippolysmata multiscissa Nobili, 1904:231, pl. 2: fig. 5
 Djibouti
- Lysmata nilita* (Risso ms) Monod, 1931
 Mediterranean
- Nomen nudum
Lysmata nilita Dohrn and Holthuis, 1950:339, fig. 1, pl. 9
 Western half of Bay of Naples
- Lysmata olavoi* Fransen, 1991:63, figs. 1–34
 Pico, Ponto da Ilha, Azores; 38°25'00", 27°59'10"; 135 meters
- *79. *Lysmata philippinensis*, new species
 Albay Gulf, southeastern Luzon, Philippines; 13°12'N, 123°49'18"E; 267 meters
- Lysmata porteri* (Rathbun, 1907)
Hippolysmata Porteri Rathbun, 1907:49, pl. 3: fig. 4
 Valparaiso, Chile
- Lysmata pusilla* Heller, 1862b:287, pl. 3: fig. 26
 Red Sea
 = *Lysmata trisetacea*
- Lysmata rathbunae* Chace, 1970:59, figs. 1–4
 Off Boynton Beach, Florida; 26°31'N, 80°01'W; 55–64 meters
- Lysmata seticaudata* (Risso, 1816)
Meliceria Seti Caudata Risso, 1816:110, pl. 2: fig. 1
 Nice
Aglaope striata
Palaemon cognatii
Lysmata aberran
Miersia clavigera
Lysmata seticaudata var. *ternatensis*; See *L. ternatensis*
- Lysmata stenolepis* Crosnier & Forest, 1973:177, figs. 55, 56a–e
 Off Sao Tiago, Cape Verde Islands; 275–150 meters
- *80. *Lysmata ternatensis* De Man, 1902
Lysmata seticaudata var. *ternatensis* De Man, 1902:846
 Ternate, Indonesia
Palaemon dentatus De Haan
Hippolysmata acicula
Lysmata affinis
81. *Lysmata trisetacea* (Heller, 1861)
Hippolyte trisetacea Heller, 1861:29
 Red Sea
Lysmata pusilla
Hippolysmata paucidens
Lysmata chiltoni
- Lysmata uncicornis* Holthuis and Maurin, 1952:198, figs. 1, 2
 Casablanca, Morocco; 4–5 meters
82. *Lysmata vittata* (Stimpson, 1860)
Hippolysmata vittata Stimpson, 1860:26
 Hong Kong; 11 meters, mud bottom
Nauticaris unirecedens
Hippolysmata vittata subtilis
Hippolysmata durbanensis
Lysmata vittata var. *amboinensis*; See *Lysmata amboinensis*
- Lysmata wurdemanni* (Gibbes, 1850)

- Hippolyte wurdemanni* Gibbes, 1850:197
Key West, Florida (restricted by Holthuis, 1959:112)
- Lysmata zacae* Armstrong, 1941:10, fig. 4
Matautu Bay, Savai'i, Samoa Islands; coral from 2 meters on eastern reef
- Lysmatella* Borradaile, 1915:206
Type species: *Lysmatella prima*
- *83. *Lysmatella prima* Borradaile, 1915:209
Maldive Islands
- Melicerta* Risso, 1816:109 [not *Melicerta* Schrank, 1803]
Type species: *Melicerta Seti Caudata*
= *Lysmata*
- Melicerta Seti Caudata*; See *Lysmata seticaudata*
- Merguia* Kemp, 1914:121
Type species: *Hippolyte oligodon*
84. *Merguia oligodon* (De Man, 1888)
Hippolyte oligodon De Man, 1888:277, pl. 18: figs. 1–6
Elphinstone Island, Mergui Archipelago, Burma
- Merguia rhizophorae* (Rathbun, 1900)
Hippolysmata rhizophorae Rathbun, 1900:153, pl. 8: fig. 9
Rio Paraiba do Norte, Estado da Paraiba, Brazil; on mangroves
- Merhippolyte* Bate, 1888:577, 618
Type species: *Merhippolyte agulhasensis*
- Merhippolyte agulhasensis* Bate, 1888:619, pl. 110: fig. 4
Agulhas Bank, South Africa; 35°04'S, 18°37'E; 274 meters
- Merhippolyte americana* Holthuis, 1961:1, fig. 1
Yucatan Channel; 20°59'30"N, 86°23'45"W; 238 meters
- Merhippolyte ancistrola* Crosnier and Forest, 1973:167
Cape Verde Islands; 15°34.5'N, 23°11.5'W; 185 meters
figs. 52, 53
- Merhippolite australis* Hodgson, 1902:233, pl. 29 ("Hippolyte australis")
Auckland Island, New Zealand; 18 meters
= *Nauticaris marionis*
- Merhippolyte calmani* Kemp and Sewell, 1912:20, pl. 1: figs. 1–4
Off Kerala State, southwest India; 9°14'10"N, 75°45'E; 433 meters
- Merhippolyte chacei* Kensley, Tranter, and Griffin, 1987:309, figs. 18, 19
Northeast of Sydney, New South Wales, Australia; 33°43–37'S, 151°55'–152°55'–152°02'E; 686 meters
- Merhippolyte kauaiensis* (Rathbun, 1906)
Spirontocaris kauaiensis Rathbun, 1906:913, pl. 24: fig. 5
Off Kauai Island, Hawaii; Ukula Point, S. 71°, E. 9.7'; 430–417 meters
- Merhippolyte orientalis* Bate, 1888:621
West of Kepulauan Aru, Indonesia; 5°41'00"S, 134°04'00"E; 1463 meters
- Species inquirenda (possibly a pandalid; see Holthuis, 1947:23)
- Merhippolyte orientalis* De Man, 1902 [not Bate, 1888]
= *Lysmata kuekenthali*
- Miersia* Chun, 1888 [not Kingsley, 1880]
Type species: *Miersia clavigera*
= *Lysmata*
- Miersia clavigera* Chun, 1888:34, pl. 4: fig. 6
= *Lysmata seticaudata*
- Mimocaris* Nobili, 1903:5
Type species: *Mimocaris heterocarpoides*
- Mimocaris hastatoides*; See *Exhippolysmata hastatoides*
85. *Mimocaris heterocarpoides* Nobili, 1903:6, fig. 2
Pulau Burong, Sarawak, Malaysia; 1°44'N, 110°48'E or 1°44'N, 109°52'E
- Nauticaris* Bate, 1888:577, 602
- Nauticaris brucei* Stebbing, 1914:292
Gough Island (Diego Alvarez), South Atlantic; 183 meters
- Nauticaris chilensis*; See *Nauticaris Marionis* var. *chilensis*
= *Nauticaris magellanica*
- Nauticaris futillirostris*; See *Heptacarpus futillirostris*
- Nauticaris grandirostris* Pearson, 1905:79, pl. 1: fig. 6
Galle, Sri Lanka
= *Saron marmoratus*
- Nauticaris magellanica* (A. Milne-Edwards, 1891)
Hippolyte magellanicus A. Milne-Edwards, 1891:46, pl. 5: fig. 2
Orange Bay and Isla Grevy, Cape Horn; 17–65 meters
- Hippolyte consobrinus*
Nauticaris Marionis var. *chilensis*
- Nauticaris marionis* Bate, 1888:603, pl. 108
Prince Edward Islands, southern Indian Ocean, and Falkland Islands, South Atlantic Ocean; 20–256 meters
- Hippolyte Stewarti*
Merhippolyte australis
- Nauticaris Marionis* var. *chilensis* Doflein and Balss, 1912:29, 30
Stanley, Falkland Islands, and Strait of Magellan
= *Nauticaris magellanica*
- Nauticaris unirecedens* Bate, 1888:608, pl. 110: fig. 1
Hong Kong
= *Lysmata vittata*
- Nectoceras* Rafinesque, 1817:41
Type species: *Nectoceras pelagica* (= *Astacus coerulescens*)
= *Hippolyte*
- Niphea* Rafinesque, 1815:98
Replacement name for *Aglaope* Rafinesque
= *Lysmata*;
- Palaemon dentatus* De Haan, 1844, pl. 45: fig. 13 (not

- Roemer, 1841)
Japan
= *Lysmata ternatensis*
Palaemon Ensiferus; See *Ligur ensiferus*
Palaemon fucorum; See *Latreutes fucorum*
Palaemon marmoratus; See *Saron marmoratus*
Palaemon Microramphos Risso, 1816:104
Nice, France
= *Eualus occultus* or *Thoratus cranchii*; See Holthuis, 1947:23
Palaemon pelasgicus Bosc, 1802:105
High seas on floating weeds
= *Hippolyte coeruleascens*
Palaemon Veditanti Monod, 1931:133
Nomen nudum
= *Ligur ensiferus*
Palaemon Cognetii Risso, 1816
Nice
= *Lysmata seticaudata*
Palaemon Margaritaceus Risso, 1816:108
Nice, France
= *Hippolyte inermis* (See Holthuis, 1977:520)
Palaemon Olivieri Risso, 1816:107
Nice
= *Hippolyte inermis*
Paralatreutes Kemp, 1925:334
Type species: *Paralatreutes bicornis*
Paralatreutes bicornis Kemp, 1925:334, figs. 23, 24
Ross Channel, Port Blair, Andaman Islands; 5–7 meters
**Paralebbeus* Bruce and Chace, 1986:237
Type species: *Paralebbeus zotheerculatus*
*86. *Paralebbeus zotheerculatus* Bruce and Chace, 1986:238, figs. 1–6
Off Imperieuse Reef, west of Dampier Land, Western Australia; 17°30.1'S, 118°28.9'E, in hexactinellid sponge, probably *Euplectella*
*87. *Paralebbeus zygus*, new species
Selat Butung, Celebes, Indonesia; 5°35'00"E; 1023 meters
Paraspirontocaris Yokoya, 1930:535
Type species: *Paraspirontocaris kishinouyei*
= *Birulia*
Paraspirontocaris kishinouyei; See *Birulia kishinouyei*
Parhippolyte Borradaile, 1900:414
Type species: *Parhippolyte uveae*
Somersiella
Koror
Parhippolyte misticia (Clark, 1989)
Koror misticius Clark, 1989:446, figs. 1–4
South Point Cave, Koror, Palau Islands, Caroline Islands; 7°18'32"N, 134°30'05"E
Parhippolyte sterreri (C.W. Hart and Manning, 1981)
Somersiella sterreri C.W. Hart and Manning, 1981:442, figs. 1–28
Tucker's Town Cave, Tucker's Town, Bermuda; anchi-
aline
88. *Parhippolyte uveae* Borradaile, 1900:414, pl. 38: fig. 11a–g
Uvea, Loyalty Islands
Paschocaris Nobili, 1905c:395
Type species: *Hippolyte paschalis*
= *Thor*
Phycocaris Kemp, 1916:391
Type species: *Phycocaris simulans*
Phycocaris simulans Kemp, 1916:392, fig. 2, pl. 36: fig. 2
Ross Island, Port Blair, Andaman Islands; among weeds off jetty
Platybema Bate, 1888:576, 578
Replacement name for *Cyclorhynchus* De Haan, 1849
= *Latreutes*
Platybema pristis; See *Latreutes pristis*
Platybema rugosus; See *Trachycaris rugosa*
Problemacaris Stebbing, 1921b:626
Type species: *Problemacaris spinetum*
= probably larval stage of *Leontocaris*
Problemacaris boschmai Gordon, 1964:337, figs. 3–6
East of Ireland; 48°03'N, 9°04'W; 500–0 meters
= probably *Leontocaris lar*
Problemacaris spinetum Stebbing, 1921b:626
40 miles west by north of Table Mountain, near Cape Town, South Africa; about 550 meters
= probably *Leontocaris paulsoni*
Rhynchocyclus Stimpson, 1860:27
Replacement name for *Cyclorhynchus* De Haan
= *Latreutes*
Rhynchocyclus compressus; See *Latreutes compressus*
Rhynchocyclus mucronatus; See *Latreutes mucronatus*
Rhynchocyclus parvulus; See *Latreutes parvulus*
Saron Thallwitz, 1891a:99
Type species: *Hippolyte gibberosus* (= *Palaemon marmoratus*)
89. *Saron inermis* Hayashi, in Debelius, 1983:117[part], illustrated
Indonesia
*90. *Saron marmoratus* (Olivier, 1811)
Palaemon marmoratus Olivier, 1811:665
Australia
? *Alpheus marmoratus* (nomen nudum)
Hippolyte gibberosus
Hippolyte Leachii
Hippolyte Hemprichii
Hyppolite Kraussii
Nauticaris grandirostris
91. *Saron neglectus* De Man, 1902:854
Ternate, Indonesia
92. *Saron rectirostris* Hayashi, in Debelius, 1984:116, illustrated

- Indonesia
Somersiella C.W. Hart and Manning, 1981:442
 Type species: *Somersiella sterreri*
 = *Parhippolyte*
Somersiella sterreri; See *Parhippolyte sterreri*
Sowerbyus Hoek, 1887:ccviii—Nomen nudum
 Type species: *Sowerbyus spinus* (= *Cancer spinus*)
 = *Spirontocaris*
Spirontocarella Brashnikov, 1907:170
 Type species: *Hippolyte macilentata*
 = *Eualus*
Spirontocaris Bate, 1888:576, 595
 Type species: *Cancer Spinus*
Sowerbyus
Spirontocaris alcimede De Man, 1906:404
 Inland Sea of Japan
 = *Heptacarpus geniculatus*
Spirontocaris antarcticus; See *Lebbeus antarcticus*
Spirontocaris arcuata Rathbun, 1902a:893
 Washington Sound, Washington; 48°22'00"N,
 122°51'00"W; 88 meters
Spirontocaris arcuatooides Kobjakova, 1962:244
 Southern Kurile Islands, Sea of Japan; 4–80 meters
Spirontocaris avina; See *Eualus avinus*
Spirontocaris barbata; See *Eualus barbatus*
Spirontocaris bispinosus Holmes, 1900:207 [not *Hippolyte bispinosa* (De Haan, 1944); See Holthuis, 1947:38]
 Puget Sound
 = *Spirontocaris holmesi*
Spirontocaris biunguis; See *Eualus biunguis*
Spirontocaris brachydactyla; See *Heptacarpus brachydactylus*
Spirontocaris brashnikovii Kobjakova, 1936:190, 192, 202, 214
 Replacement name for *Spirontocaris dalli* Brashnikov, 1907 [not Rathbun, 1902a]
 Sea of Okhotsk and northern Sea of Japan; 2–37 meters
Spirontocaris brevidigitata Kobjakova, 1935:88, fig. 3
 Off eastern Siberia from Zaliv Petra Velikoga to Nel'ma; 75–1380 meters
 = *Spirontocaris spinus*
Spirontocaris crassirostris Kubo, 1951:274, figs. 11, 12
 Heda, Izu Hanto, Honshu, Japan; 300 meters
 = *Spirontocaris pectinifera*
Spirontocaris ctenifera; See *Eualus ctenifer*
Spirontocaris dalli Rathbun, 1902a:894
 Coal Harbor, Unga Island, Alaska; 15–17 meters
Spirontocaris decora; See *Heptacarpus decorus*
 “*Spirontocaris fabricii* var. *minuta*” Urita, 1942:25, fig. 6 [not *Spirontocaris minuta* Yokoya, 1930]
 “Otomari, Sachalin,” 4–6 meters
 ? = *Eualus leptognathus*
 Japan
Spirontocaris flexa; See *Heptacarpus flexus*
Spirontocaris franciscana; See *Heptacarpus franciscanus*
Spirontocaris gibberosa Yokoya, 1933:25, fig. 8 [not Bals, 1914b]
 “Siwoya-zaki,” Japan; 232 meters
 = *Lebbeus compressus*
Spirontocaris grebnitzkii; See *Heptacarpus grebnitzkii*
Spirontocaris gurjanovae Kobjakova, 1955:238
 Northern Kurile Islands; 100 meters
Spirontocaris herdmani; See *Heptacarpus herdmani*
Spirontocaris holmesi Holthuis, 1947:8
 Replacement name for *Spirontocaris bispinosa* Holmes, 1900 (not *Hippolyte bispinosa* De Haan, 1844)
Spirontocaris intermedia; See *Spirontocaris spina intermedia*
Spirontocaris japonica Yokoya, 1930:533, fig. 3
 Between Yuno-Shima and “Asamushi,” Mutsu Wan, northern Honshu, Japan; 9–11 meters, in seaweeds
 = *Eualus leptognathus*
Spirontocaris jordani; See *Heptacarpus jordani*
Spirontocaris kauaiensis; See *Merhippolyte kauaiensis*
Spirontocaris kincaidi; See *Heptacarpus kincaidi*
Spirontocaris laevidens; See *Spirontocaris spina laevidens*
 = *Spirontocaris spinus*
Spirontocaris lagunae; See *Lebbeus lagunae*
Spirontocaris lamellicornis (Dana, 1852)
Hippolyte lamellicornis Dana, 1852a:567
 Dungeness, Strait of Juan de Fuca
Spirontocaris lilljeborgii (Danielssen, 1859)
Hippolyte Lilljeborgii Danielssen, 1859:5
 Lofoten Islands; 73 meters
Hippolyte securifrons
Spirontocaris macrodonta J.F.L. Hart, 1930:102, pl. 1
 Gonzales Point, False Narrows, and Departure Bay, southeastern Vancouver Island, British Columbia, Canada; tide pool to depth of 18 meters
 = *Spirontocaris prionota*
Spirontocaris macrophthalma; See *Eualus macrophthalmus*
Spirontocaris makarofi Urita, 1942:18
 Replacement name for *Hetairus zebra* Makarov, 1935 [not Leim, 1921]
 = *Lebbeus fasciatus*
Spirontocaris makarofi speciosa; See *Lebbeus speciosus*
Spirontocaris makarovi Kobjakova, 1936:221
 = *Spirontocaris ochotensis*
Spirontocaris makarovi spatula Kobjakova, 1936:221 = *Spirontocaris ochotensis*
Spirontocaris makrognathus Stebbing, 1921a:19
 Durban, South Africa
 Species inquirenda (probably not *Eualus*)
Spirontocaris maxillipes; See *Heptacarpus maxillipes*

Spirontocaris microdentata Kobjakova, 1962

Kurile Islands; 18 meters

Spirontocaris minuta; See *Heptacarpus minutus*

Spirontocaris minuta Urita, 1942; See *Spirontocaris fabricii* var. *minuta*

Spirontocaris mororani Rathbun, 1902b:43, fig. 16

Muroran, Hokkaido, Japan

= *Spirontocaris ochotensis*

Spirontocaris moseri; See *Heptacarpus moseri*

Spirontocaris murdochi Rathbun, 1902a:893

Ostrov Sakhalin off Tyulenly Ostrov (Robben Island);
51 meters

Spirontocaris occulta; See *Eualus occultus*

Spirontocaris ochotensis (Brandt, 1851)

Hippolyte ochotensis Brandt, 1851:120

Spirontocaris mororani

Hetairus zebra

Spirontocaris makarovi

Spirontocaris Makarovi spatula

Spirontocaris onagawaensis

Spirontocaris onagawaensis Yokoya 1939:268, fig. 5

Takashiro, Onagawa, NE Honshu, Japan; 7.5 meters

= *Spirontocaris ochotensis*

Spirontocaris pax; See *Eualus pax*

Spirontocaris pectinifera Stimpson, 1860

Hippolyte pectinifera Stimpson, 1860:35

Hakodate, Hokkaido, Japan

Spirontocaris crassirostris

Spirontocaris phippisii (Kroyer, 1841)

Hippolyte Phippsii Kroyer, 1841:575

Spitsbergen, west coast of Norway (and Greenland?)

Hippolyte turgida

Hippolyte vibrans

Spirontocaris prionota (Stimpson, 1864)

Hippolyte prionota Stimpson, 1864:153

Puget Sound; 4–22 meters

Spirontocaris macrodonta

Spirontocaris profunda; See *Lebbeus profundus*

Spirontocaris propugnatrix De Man, 1906:404

Inland Sea of Japan; 11 meters

= *Heptacarpus pandaloides*

Spirontocaris recurvirostris Molander, 1913:1, fig. 1

Vaigattet, Greenland; 315 meters

= *Eualus gaimardii*

Spirontocaris saldanhae; See *Lebbeus saldanhae*

Spirontocaris sica Rathbun, 1902a:894

Santa Barbara Channel, California; 34°15'00"N,
120°14'30"W; 485 meters

Spirontocaris sinensis; See *Eualus sinensis*

Spirontocaris snyderi Rathbun, 1902a:8

Monterey Bay, California

Spirontocaris spathulirostris; See *Eualus spathulirostris*

Spirontocaris spatula; See *Spirontocaris makarovi spatula*

= *Spirontocaris ochotensis*

Spirontocaris speciosa; See *Spirontocaris makarovi speciosa*

Spirontocaris spina intermedia Kobjakova, 1936:221

Sea of Okhotsk

= *Spirontocaris spinus*

Spirontocaris spina laevidens Kobjakova, 1936:221

Western Sea of Japan

= *Spirontocaris spinus*

Spirontocaris spinus (Sowerby, 1805)

Cancer Spinus Sowerby, 1805:47

"among oysters on the Scottish coast"

Hippolyte Sowerbaei

Spirontocaris brevidigitata

Spirontocaris spina intermedia

Spirontocaris spina laevidens

Spirontocaris stoneyi Rathbun, 1902a:899

Bering Sea WNW of Scammon Bay, Alaska; 62°15'N,
167°48'W

= *Eualus macilentus*

Spirontocaris townsendi; See *Eualus townsendi*

Spirontocaris tridens; See *Heptacarpus tridens*

Spirontocaris truncata Rathbun, 1902a:894

Heceta Bank, Oregon; 43°59'00"N, 124°56'30"W; 91
meters

Spirontocaris unalaskensis; See *Lebbeus unalaskensis*

Spirontocaris urupensis Kobjakova, 1962

Southern Kurile Islands; 5–7 meters

Spirontocaris vicina; See *Lebbeus vicinus*

Spirontocaris washingtoniana; See *Lebbeus washingtonianus*

Spirontocaris zebra Leim, 1921:133, pls. 2, 3

New Brunswick and Nova Scotia; 0–30 meters

= *Lebbeus microceros*

Thor Kingsley, 1878b:94

Type species: *Thor floridanus*

Paschocaris

Thor algicola Wicksten, 1987:27, figs. 1–3

"Bahia Bocochibampo," Guaymas, Sonora, Mexico;
27°57'N, 111°02'W; 5 meters, in *Sargassum*

93. *Thor amboinensis* (De Man, 1888)

Hippolyte amboinensis De Man, 1888:535

Ambon, Indonesia

Thor discosomatis

Thor discosomatis Kemp, 1916:388, fig. 1, pl. 36: fig. 1

Port Blair, Andaman Islands

= *Thor amboinensis*

Thor dobkini Chace, 1972:133, fig. 57

Punta Rassa, Florida; 2 meters

Thor floridanus Kingsley, 1878b:95

Key West, Florida

94. *Thor intermedius* Holthuis, 1947:14, 51, figs. 4–6

"Sissie" near Misool, Indonesia; shore and reef

Thor maldivensis Borradaile, 1915:208

- Minicoy, Maldive Islands, and Salomon, Chagos Archipelago
See generic "Remarks" under *Thor*
Thor manningi Chace, 1972:137, figs. 59–61
English Harbour, Antigua, West Indies; from bottom of yacht anchored for several months
Thor marguitae Bruce, 1978:159, figs. 1–6
Heron Island, Capricorn Islands, Queensland, Australia; associated with single colony of *Porites andrewsi* on reef flat
95. ***Thor paschalis*** (Heller, 1862)
Hippolyte paschalis Heller, 1862b:276, pl. 3: fig. 24
Red Sea
Thor Sollaudi; See *Thoralus sollaudi*
Thor spinipes Bruce, 1983b:1, figs. 1–6
Burford Island, Cobourg Peninsula, Northern Territory, Australia
96. ***Thor spinosus*** Boone, 1935:192, pl. 52
Bali, Indonesia
Thoralus Holthuis, 1947:5, 14, 45
Type species; *Hippolyte Cranchii*
Thoralus cranchii (Leach, 1817)
Hippolyte Cranchii Leach, 1817, pl. 38: figs. 17–21
"...southern point of Saltstone, in the Kingsbridge Estuary," Devon, England
Hippolyte mutila
Hippolyte Bunseni
Thoralus sollaudi (Zariquiey Cenarro, 1936)
Thor Sollaudi Zariquiey Cenarro, 1936:10, figs. 17–21
Cadaques and Arenys de Mar, Spain; 1–40 meters
Thorella Bruce, 1982:451
Type species; *Thorella cobourgi*
Thorella cobourgi Bruce, 1982:452, figs. 1–5
Black Point, Port Essington, Cobourg Peninsula, Northern Territory, Australia, Station CP/10, 11°09.0'S, 132°08.2'E, 1–2 meters, in *Sargassum* [coordinates corrected by Bruce, in correspondence].
Tozeuma Stimpson, 1860:26
Type species: *Tozeuma lanceolatum*
Angasia
97. ***Tozeuma armatum*** Paulson, 1875:99, pl. 15: figs. 2–20
Red Sea
Angasia Stimpsonii
Tozeuma carolinense Kingsley, 1878b:90
Fort Macon [Beaufort Inlet], North Carolina
Tozeuma cornutum A. Milne-Edwards, 1881:16
Near Barbados; 73 meters
Tozeuma elongatum (Baker, 1904)
Angasia elongata Baker, 1904:147, pl. 27: figs. 1–4
South Australia; about 27 meters
Tozeuma erythraeum Nobili, 1904:231
Red Sea
Tozeuma kimberi (Baker, 1904)
Angasia kimberi Baker, 1904:149, pl. 27: fig. 5
Port Willunga, South Australia; 7 meters
- *98. ***Tozeuma lanceolatum*** Stimpson, 1860:26
Hong Kong; 11 meters, muddy bottom
Tozeuma novaeseelandiae Borradaile, 1916
Tozeuma novae-zealandiae Borradaile, 1916:86, fig. 3
New Zealand
Tozeuma pavoninum (Bate, 1863)
Angasia pavonina Bate, 1863:498, pl. 40: fig. 1
Gulf of Saint Vincent; 18–22 meters
Angasia robusta
Tozeuma serratum A. Milne-Edwards, 1881:16
Off Barbados; 102 meters
Tozeuma tomentosum (Baker, 1904)
Angasia tomentosa Baker, 1904:152, pl. 29
South Australian coast; 37 meters
Trachycaris Calman, 1906:31, 33
Type species: *Platybema rugosus*
Trachycaris restricta (A. Milne-Edwards, 1878)
Hippolyte restrictus A. Milne-Edwards, 1878:231
Cape Verde Islands
Trachycaris rugosa (Bate, 1888)
Platybema rugosus Bate, 1888:579, pl. 104: fig. 2
Off St. Thomas, Virgin Islands; 713 meters
Vianellia Nardo, 1847:8
Type species: *Vianellia dorsioculata*
Vianellia dorsioculata Nardo, 1847; sp. 51, fig. 66
Adriatic Sea
Species inquirenda
Virbius Stimpson, 1860:35
Type species: *Hippolyte acuminatus*
= ***Hippolyte***
Virbius acutus Stimpson, 1860:35
Ryukyu Islands; on weed-covered littoral rocks
= ***Hippolyte acuta***
Virbius articulostris; See *Virbius gracilis* var. *articulostris*
= ***Hippolyte longirostris***
Virbius australiensis Stimpson, 1860:35
Port Jackson, Sydney Harbour, Australia; among algae in 4 meters
= ***Hippolyte ventricosa***
Virbius bifidirostris; See *Hippolyte bifidirostris*
Virbius brasiliensis; See *Virbius gracilis* var. *brasiliensis*
= ***Hippolyte obliquimanus***
Virbius brevirostris; See *Virbius gracilis* var. *brevirostris*
Virbius Brullei var. *elongata* Czerniavsky, 1884:18, pl.2: fig. 3A–N
Black Sea
= ***Hippolyte inermis***
Virbius Brullei forma *fortior* Czerniavsky, 1884:19, pl. 2: fig. 3A–N
Black Sea
= ***Hippolyte inermis***
Virbius capensis; See *Hippolyte capensis*

Virbius gracilis Heller, 1862a:399, pl. 1: figs. 19, 20 [not *Hippolyte gracilis* Lilljeborg, 1850]
 = *Hippolyte longirostris*
Virbius gracilis var. *articulirostris* Czerniavsky, 1884:15
 Black Sea
 = *Hippolyte longirostris*
Virbius gracilis var. *brasiliensis* Czerniavsky, 1884:14
 = *Hippolyte obliquimanus*
Virbius gracilis var. *brevirostris* Czerniavsky, 1868:68, pl. 5: figs. 2-7
 = *Hippolyte longirostris*
Virbius gracilis var. *longirostris*; See *Hippolyte longirostris*
Virbius gracilis forma *typica* Czerniavsky, 1884
 = *Hippolyte longirostris*
 [*Virbius jactans* Nobili, 1904 = *Chlorocurtis jactans*]

Virbius Kraussianus; See *Hippolyte kraussiana*
Virbius leptocerus; See *Hippolyte leptocerus*
Virbius longirostris; See *Hippolyte longirostris*
Virbius Mossambicus Hilgendorf, 1879:836, pl. 4: fig. 1
 Zambeze
 = *Hippolyte ventricosa*
Virbius pleuracanthus; See *Hippolyte pleuracantha*
Virbius proteus; See *Hippolyte proteus*
Virbius rectifrons Czerniavsky, 1884:21, pl. 1: fig. 2
 Black Sea
 ?= *Hippolyte longirostris*
Virbius tenuirostris Czerniavsky, 1884:20, pl. 2: fig. 4A,G
 Black Sea
 ?= *Hippolyte longirostris*
 [*Virbius variegatus* (Risso, 1826) Carus, 1885 = *Alpheus dentipes*]

Key to Genera of Hippolytidae

1. Carapace bearing 1 or more distinct supraorbital teeth 2
 Carapace without distinct supraorbital tooth 12
2. Third maxilliped with exopod 3
 Third maxilliped without exopod 9
3. Telson bearing 2 pairs of dorsolateral spines 4
 Telson bearing 3-6 pairs of dorsolateral spines 6
4. Carapace abruptly depressed on each side of supraorbital tooth. Antennal peduncle overreaching antennular peduncle. Mandible with 3-jointed palp. Second pereopod with 7-10 carpal articles *Alope*
 (South Africa, Burma, Japan, Australia, Caroline Islands, and New Zealand; littoral)
 Carapace not abruptly depressed on frontal or orbital regions. Antennal peduncle not overreaching antennular peduncle. Mandible without palp. Second pereopod with 2 or 3 carpal articles 5
5. Fifth abdominal pleuron with posteroventral margin rounded. First pereopod with fingers shorter than palm. Second pereopod with 3 carpal articles. Third pereopod with dactyl and distal part of propodus prehensile in functional males
 **Hippolyte*
 Fifth abdominal pleuron with posteroventral margin pointed. First pereopod with fingers longer than palm. Second pereopod with 2 carpal articles. Third pereopod with dactyl and propodus not prehensile in functional males *Phycocaris*
 (Andam[an] Islands; littoral)
6. Mandible without palp 7
 Mandible with 2-jointed palp 8
7. Rostrum unarmed dorsally and ventrally. Antennule with 3rd peduncular segment without movable plate dorsodistally, dorsal flagellum slender. Mandible without incisor process. First maxilliped with epipod simple, not bilobate. Third maxilliped with terminal segment flattened. Second pereopod with 8-11 carpal articles. Uropod with lateral branch armed only with distolateral tooth terminating in minute movable subdistalspine *Bythocaris*
 (Arctic Ocean, North Atlantic, western Africa; 50-3803 meters)

- Rostrum dentate dorsally, unarmed ventrally. Antennule with 3rd peduncular segment bearing subtriangular movable plate dorsodistally, dorsal flagellum short, stout, brush-like. Mandible with incisor process. Third maxilliped with terminal segment elongate, not flattened. Second pereopod with 6 (rarely 7) carpal articles. Uropod with lateral branch bearing prominent movable spine mesial to and overreaching stout fixed distolateral tooth *Thor*
8. Rostrum without tongue-like lobe extending ventrally from lateral carina, ventral blade not projecting posteroventrally between bases of antennules. Carapace with 2 or 3 supraorbital teeth, single pterygostomian tooth, not covered with appressed teeth on lateral surface. Fifth abdominal pleuron with posteroventral margin pointed. Sixth abdominal somite not armed with 7 strong spines, pleuron not curving around base of uropod. Antennule with stylocerite simple, not bifid. Mandible with incisor process. At least 1st pereopod with epipod. Second pereopod with 7 carpal articles. Four posterior pleopods normal
 *Spirontocaris*
 (Arctic Ocean, North Pacific, North Atlantic; littoral to 1380 meters)
- Rostrum with tongue-like lobe extending ventrally from lateral carina immediately anterior to supraorbital tooth, ventral blade projecting posteroventrally between bases of antennules. Carapace with single supraorbital tooth, 2 or 3 pterygostomian teeth, numerous appressed teeth on lateral surface. Fifth abdominal pleuron with posteroventral margin rounded. Sixth abdominal somite armed with 7 strong spines (3 dorsal, 4 on posterior margin), large acute pleuron curving around base of uropod. Antennule with stylocerite distally bifid. Mandible without incisor process. Pereopods without epipods. Second pereopod with 2 carpal articles. Four posterior pleopods of female with endopod fully 3 times as wide as exopod
 *Trachycaris*
 (Eastern Pacific and Central Atlantic; sublittoral to 713 meters)
9. Antennule with sharp dorsodistal tooth on 3rd peduncular segment 10
 Antennule without sharp dorsodistal tooth on 3rd peduncular segment 11
10. Integument rigid. Carapace without antennal tooth. Abdomen dorsally carinate. First pereopod with exopod lacking terminal hook. Uropod with lateral branch armed only with strong distolateral tooth bearing minute subterminal tooth
 *Birulia*
 (Okhotsk Sea and Sea of Japan; 15–118 meters)
- Integument usually not especially rigid. Carapace with antennal and usually pterygostomian tooth. Abdomen not dorsally carinate. Third maxilliped with terminal segment not noticeably flattened. First pereopod with terminal hook on epipod. Uropod with lateral branch bearing movable spine mesial to stout fixed distolateral tooth *Lebbeus*
11. Rostrum not overreaching antennular peduncle, unarmed, ventral blade absent. Carapace inflated in female. Telson broadly rounded posteriorly. Antennule with sharp curved lateral tooth on 2nd peduncular segment. Mandible with 2-jointed palp and incisor process. First maxilliped with bilobate epipod. Second maxilliped with terminal segment applied as lateral strip to preceding segment, without podobranch. Third maxilliped with terminal segment elongate, not distinctly flattened, with epipod, without arthrobranch. Pereopods with epipods on 3 anterior pairs. Second pereopod with 7 carpal articles **Paralebbeus*
- Rostrum overreaching antennular peduncle, dentate at least ventrally, ventral blade strong. Carapace not inflated. Telson with 2 or 3 dorsolateral spines, posteriorly narrowly acute or bifid. Antennule with 2nd peduncular segment unarmed. Mandible without palp or incisor process. First maxilliped with epipod simple, not bilobate. Second maxilliped with terminal segment nearly semicircular and applied nearly transversely to preceding segment, with podobranch. Third

- maxilliped with terminal segment short and broadly flattened, without epipod, with arthrobranch. Pereopods without epipods. Second pereopod with 3 carpal articles **Tozeuma*
12. Carapace with suborbital tooth posterodorsal to orbital angle 13
 Carapace without suborbital tooth posterodorsal to orbital angle 16
13. Rostrum overreaching antennular peduncle, ventral blade strong, projecting posteroventrally between bases of antennules. Carapace with branchiostegal margin usually denticulate. Fifth abdominal pleuron with posteroventral margin usually rounded. Antennule with stylocerite not oriented in vertical plane, dorsal flagellum usually short, stout, brush-like. Mandible without palp. Second maxilliped with terminal segment ovoid, applied obliquely to preceding segment **Latreutes*
 Rostrum not nearly overreaching antennular peduncle, ventral blade not strong, not projecting posteroventrally between bases of antennules. Carapace with branchiostegal margin not denticulate. Fifth abdominal pleuron with posteroventral margin pointed. Antennule with stylocerite oriented in vertical plane, dorsal flagellum slender, not brush-like. Mandible with 3-jointed palp. Second maxilliped with terminal segment applied as somewhat lateral strip to preceding segment 14
14. Pereopods with arthrobranches on 4 anterior pairs *Parhippolyte*
 Pereopods without arthrobranches 15
15. Eye with cornea narrower than stalk. Three posterior pairs of pereopods with propodus entire, not subdivided. Appendix masculina shorter than appendix interna on 2nd male pleopod *Barbouria*
 (Western Atlantic; anchialine)
 Eye with cornea broader than stalk. Three posterior pairs of pereopods with propodus subdivided. Appendix masculina longer than appendix interna on 2nd male pleopod *Janicea*
 (Western Atlantic; littoral and anchialine)
16. Sixth abdominal somite with movable plate articulated near posteroventral angle 17
 Sixth abdominal somite without articulated plate near posteroventral angle 18
17. Carapace without branchiostegal tooth, without pterygostomial tooth. Telson with posterolateral angles sharp, produced. Antennule with stylocerite oriented in somewhat vertical plane. Mandible without incisor process *Nauticaris*
 (Southern Indian Ocean, eastern South Pacific, South Atlantic, South Africa; 20–256 meters)
 Carapace with both branchiostegal and pterygostomial teeth. Telson without posterolateral angles. Antennule with stylocerite oriented in somewhat vertical plane. Mandible with incisor process **Saron*
18. Carapace without antennal tooth 19
 Carapace with antennal tooth 21
19. Rostrum unarmed. Carapace inflated. Eye immovable, cornea deficient. Antennal scale not overreaching antennular peduncle *Calliasmata*
 (Sinai Peninsula, Ellice Islands, Hawaii, Dominican Republic; anchialine)
 Rostrum dentate dorsally. Carapace not inflated. Eye movable, cornea well developed. Antennal scale overreaching antennular peduncle 20
20. Carapace without hepatic tooth, branchiostegal margin with submarginal tooth, not denticulate. Antennular flagella slender, at least as long as animal. Mandible with 3-jointed palp, without incisor process. Second maxilliped with terminal segment narrow strip attached laterally to preceding segment. Third maxilliped with arthrobranch. Second pereopod with carpus multiarticulate *Ligur*
 (Western and eastern Atlantic, Mediterranean; 300–772+ meters)

- Carapace with hepatic tooth, branchiostegal margin denticulate. Antennular flagella very short. Mandible with incisor process, without palp. Second maxilliped with terminal segment subtriangular, attached transversely to preceding segment. Third maxilliped without arthrobranch. Second pereopod with carpus subdivided into 4 articles *Thorella*
(Northern Territory, Australia; littoral)
21. Antennal scale with lateral tooth near midlength 22
Antennal scale with lateral tooth distal or subdistal 23
22. Telson with 10–12 lateral spines. Eyestalk concealed by carapace. Antennule without sharp dorsodistal tooth on 3rd segment. Antennal peduncle overreaching antennular peduncle. Mandible without incisor process. Third maxilliped with distal segment curved, not especially flattened. Second pereopod with 10 carpal articles. Third pereopod with dactyl elongate, unarmed on flexor margin. Uropod with lateral branch armed with lateral lateral tooth near base
. *Bathyhippolyte*
(Chatham Rise, New Zealand; 995–1110 meters)
- Telson with 16–20 lateral spines. Eyestalk not concealed by carapace. Antennule with sharp dorsodistal tooth on 3rd segment. Antennal peduncle not overreaching antennular peduncle. Mandible with incisor process. Third maxilliped with distal segment flattened. Second pereopod with 7 carpal articles. Third pereopod with dactyl not very elongate, 8–10 denticles on flexor margin. Uropod with lateral branch armed with lateral tooth near midlength *Cryptocheles*
(Norway; 165–275 meters)
23. Carapace with 1 or more longitudinal ridges extending onto posterior 1/2 of lateral surface 24
Carapace without longitudinal ridges extending onto posterior 1/2 of lateral surface 25
24. Rostrum with strong ventral blade, unarmed ventrally. Carapace with postrostral crest unarmed. Abdominal terga unarmed. First abdominal pleuron entire, not bifurcate. Fifth pleuron denticulate on ventral margin. Antennal scale with lateral margin spinose. Second pereopod with 3 carpal articles *Gelastocaris*
(Zanzibar and Sri Lanka; littoral)
- Rostrum without ventral lobe, ventrally dentate. Carapace with postrostral crest dentate. Second to 5th abdominal terga with posteromedian tooth. First abdominal pleuron bifurcate. Fifth pleuron denticulate on ventral margin. Antennal scale without lateral spines. Second pereopod with 20 carpal articles *Mimocaris*
25. Third maxilliped with exopod 26
Third maxilliped without exopod 34
26. Third maxilliped with arthrobranch 27
Third maxilliped without arthrobranch 31
27. Uropod with distal movable spine on lateral branch flanked both laterally and mesially by sharp tooth 28
Uropod with distal movable spine on lateral branch not flanked both laterally and mesially by sharp tooth 30
28. Dentate crest in midline at base of rostrum. Telson tapering rather regularly to sharp posterior point *Exhippolyasmata*
Without dentate crest in midline at base of rostrum. Telson not tapering regularly to sharp posterior point 29
29. Prominent epipods on 4 anterior pairs of pereopods **Lysmata*
Pereopods without epipods **Lysmatella*
30. Rostrum with strong ventral blade. First maxilliped with caridean lobe clearly discrete from exopodal lash. Third maxilliped without coxal exite. Pereopods

- without arthrobranches. Second pereopod with 11 or 12 carpal articles
 *Chorismus*
 (Southern Ocean; 15–900 meters)
- Rostrum without ventral blade. First maxilliped with caridean lobe merging gradually into exopodal lash. Third maxilliped with coxal exite. Pereopods with arthrobranches on 4 anterior pairs. Second pereopod with 13–16 carpal articles
 *Merhippolyte*
 (South Africa, India, western Australia, Hawaii, and western Atlantic; 70–650 meters)
31. Mandible with palp 32
 Mandible without palp 33
32. Mandibular palp 3-jointed. Second maxilliped without podobranch. Pereopodal epipods without terminal hook. First pereopod with chela 5 times as long as carpus. Second pereopod with fingers longer than palm, 2 carpal articles
 *Caridion*
 (North Atlantic; littoral to 400 meters)
- Mandibular palp 2-jointed. Second maxilliped with podobranch. Pereopodal epipods with terminal hook. First pereopod with chela less than twice as long as carpus. Second pereopod with fingers shorter than palm, 7 carpal articles
 *Eualus*
 (Arctic Ocean, Sea of Okhotsk, China, Japan, South Africa, North Atlantic, Mediterranean; littoral to 1800 meters)
33. Antennule with stylocerite oriented in nearly vertical plane, acute movable plate articulated dorsodistally on distal segment. Pereopods without epipods
 *Thor*
- Antennule with stylocerite oriented in nearly horizontal plane, acute dorsodistal plate on distal segment partially articulated, not movable. Three anterior pairs of pereopods with epipod *Thoralus*
 (Northeastern Atlantic and Mediterranean; littoral to 130 meters)
34. Third maxilliped with distal segment flattened 35
 Third maxilliped elongate, not distinctly flattened 37
35. Rostrum dentate ventrally. Carapace unarmed in dorsal midline, pterygostomial margin not denticulate. Eyestalk not produced mesially. Pereopods without epipods *Tozeuma*
- Rostrum unarmed ventrally. Carapace with dentate crest in midline of anterior ¹/₂, pterygostomial margin denticulate. Eyestalk with slender mesial process overreaching cornea. Four anterior pairs of pereopods with epipod 36
36. Carapace with antennal tooth minute, marginal, not basally articulated, branchiostegal tooth very large, strongly buttressed. First pereopod with movable finger terminating in 4, fixed finger in 3, strong interlocking spines *Gelastreutes*
 (New Caledonia; 65–120 meters)
- Carapace with antennal tooth submarginal, basally articulated, branchiostegal tooth absent. First pereopod with fewer than 4 and 3 distal spines on movable and fixed fingers, respectively *Paralatreutes*
 (Andaman Islands; 5–7 meters)
37. Third maxilliped without arthrobranch. Second pereopod with 7 carpal articles 38
 Third maxilliped with arthrobranch. Second pereopod with fewer or more than 7 carpal articles 39
38. Rostrum armed dorsally. Carapace not inflated. Eye with ocellus
 *Heptacarpus*
 (Western, northern, and eastern North Pacific; littoral to 1125 meters)

- Rostrum unarmed dorsally. Carapace inflated, especially in females. Eye without ocellus **Paralebbeus*
39. Rostrum with ventral teeth. Telson with 4–7 pairs of lateral spines. Antennal scale with movable spines on lateral margin. Mandible with 1-jointed palp and incisor process. Second maxilliped with terminal segment ovoid, attached nearly transversely to preceding segment. Second pereopods remarkably asymmetrical, with 4 carpal articles. Third pereopod with flexor margin of dactyl unarmed. Uropod with lateral branch spinose on lateral margin *Leontocaris*
(South Africa, Victoria, Australia, and Chile; 240–1368 meters)
- Rostrum unarmed ventrally. Telson with 2 pairs of lateral spines. Antennal scale without lateral spines on lateral branch. Mandible without palp or incisor process. Second maxilliped with terminal segment elongate, applied somewhat laterally to preceding segment. Second pereopods symmetrical, with 20–27 carpal articles. Third pereopod with 2 obscure spines on flexor margin of dactyl. Uropod without spines on lateral margin of lateral branch *Merguia*

***Exhippolysmata* Stebbing, 1915**

Exhippolysmata Stebbing, 1915:94 [type species, selected by Holthuis, 1955: 115, 116: *Hippolysmata ensirostris* Kemp, 1914:118; gender: feminine].

DIAGNOSIS.—Integument not rigid. Rostrum overreaching antennular peduncle, armed dorsally and ventrally, without ventral blade or tongue-like lobe extending ventrally from lateral carina. Carapace with dentate crest in midline at base of rostrum, with marginal, unarticulated antennal and pterygostomian teeth but without supraorbital tooth, depressed frontal or orbital regions, or branchiostegal tooth or denticles. Abdomen with 1st pleuron entire, not bifurcate; 5th pleuron posteroventrally acute, not denticulate; 6th somite without prominent spines, without articulated plate at posteroventral angle and pleuron not curving around base of uropod. Telson tapering to sharp posterior end, bearing 2 pairs of dorsolateral spines. Eye with eyestalk movable, not concealed by carapace, cornea not noticeably narrower than stalk, without ocellus. Antennule with stylocerite not in vertical plane, not bifid; 2nd segment without sharp, curved lateral tooth; 3rd segment without dorsodistal tooth or movable plate, dorsal flagellum slender, not short or brush-like. Antennal peduncle not overreaching antennular peduncle, without 3 strong ventral spines; antennal scale overreaching antennular peduncle, lateral tooth not near midlength, lateral margin not spinose. Mandible without palp or incisor process. First maxilliped with caridean lobe clearly discrete from exopodal lash, epipod bilobate. Second maxilli-

ped with terminal segment narrow and applied somewhat laterally to preceding segment, exopod not unusually wide, with nonbilobate epipod and podobranch. Third maxilliped with distal segment not flattened, with exopod, epipod, arthrobranch, and reduced coxal exite. Pereopods without exopods, with terminally hooked epipods on 4 anterior pairs, without arthrobranchs. First pereopod with fingers shorter than palm, not terminating in distal spines, chela 1 1/3 times as long as carpus, latter not excavated to receive propodus, ischium not produced into unusually long saber-shaped process. Second pereopods symmetrical, fingers no longer than palm, carpus subdivided into 12–22 articles. Third pereopod with dactyl tapering gradually to acute apex, flexor margin armed with about 4 spines, dactyl and propodus not prehensile in functional males, propodus not subdivided, carpus not conspicuously spinose. Uropod with lateral branch bearing distolateral movable spine flanked laterally and mesially by sharp tooth.

RANGE.—South Africa, India to Indonesia, western Atlantic from North Carolina to São Paulo, Brazil, and western Africa from Cameroon to northern Angola; 1–48 meters, occasionally in fresh water.

REMARKS.—The four species and a subspecies recognized herein are covered in the following key. Except for the western Atlantic *E. oplophoroides*, which is easily recognized by the prominent dorsal tooth on the third abdominal somite, the species of *Exhippolysmata* differ from each other in few, rather minor characters.

Key to Species and Subspecies of *Exhippolysmata*

1. Rostrum bearing 2–6 teeth on dorsal margin anterior to basal crest. Telson without even obscure lateral teeth near tip 2
- Rostrum with dorsal margin unarmed anterior to basal crest except for single tooth near crest. Telson with pair of inconspicuous lateral teeth near tip 4

- 2. Third abdominal somite surmounted by sharp dorsal tooth near posterior margin *E. oplophoroides* (Holthuis, 1948:1106, figs. 2, 3)
(Western Atlantic Ocean from North Carolina to Estado de São Paulo, Brazil; 7–27 meters)
Third abdominal somite unarmed 3
- 3. Rostrum armed with 7–16 ventral teeth. Carapace not noticeably uneven or coarsely pitted 67. *E. ensirostris ensirostris*
Rostrum armed with 17–23 ventral teeth. Carapace with longitudinal furrows on anterior portion of branchiostegite and dorsal to branchiostegite, causing dorsal flattening of posterior 1/3 of carapace, and coarse, dense pitting on branchiostegite 68. *E. ensirostris punctata*
- 4. Rostral crest composed of 12–14 teeth *E. tugelae* (Stebbing, 1915:94, pl. 89)
(South Africa; 22–48 meters)
Rostral crest composed of 17–19 teeth *E. hastatoides* (Balss, 1914a:596)
(Western Africa from Cameroon to northern Angola; 12–48 meters)

67. *Exhippolysmata ensirostris ensirostris* (Kemp, 1914)

Hippolysmata ensirostris Kemp, 1914:113, 118, pl. 7: figs. 1–4 [type locality: Colombo, Sri Lanka].
Hippolysmata (Exhippolysmata) ensirostris.—Holthuis, 1947:74.

DIAGNOSIS.—Rostral crest composed of 7–12 teeth, followed by 2–6 teeth on remaining dorsal margin of rostrum; ventral margin armed with 7–16 teeth. Carapace not noticeably uneven or coarsely pitted. Abdomen without any dorsal teeth. Telson without trace of lateral teeth near tip. Maximum postorbital carapace length at least 15 mm.

RANGE.—India, Sri Lanka, Burma, and Sumatra and Java, Indonesia; shallow water.

68. *Exhippolysmata ensirostris punctata* (Kemp, 1914)

Hippolysmata ensirostris var. *punctata* Kemp, 1914:113, 120, pl. 7: figs. 5–7 [type locality: “Sandheads,” Ganges delta, India; “Green Island,” Amherst, Burma; or Thongwa, Burma].
Hippolysmata (Exhippolysmata) ensirostris var. *punctata*.—Holthuis, 1947:75.

DIAGNOSIS.—Rostral crest composed of 6–8 teeth, followed by about 12 teeth on remaining dorsal margin of rostrum; ventral margin armed with 17–23 teeth. Carapace with longitudinal furrows on anterior part of branchiostegite and dorsal to branchiostegite causing dorsal flattening of posterior 1/3 of carapace, and coarse pitting on branchiostegite. Abdomen without any dorsal teeth. Telson without traces of lateral teeth near tip. Maximum postorbital carapace length at least 16 mm.

RANGE.—India, Burma, and Sumatra, Indonesia; littoral.

****Gelastocaris* Kemp, 1914**

Gelastocaris Kemp, 1914:106 [type species, by monotypy: *Latreutes Paronae* Nobili, 1905b:2; gender: feminine].

DIAGNOSIS.—Integument not rigid. Rostrum overreaching antennular peduncle, armed dorsally with single, movable,

subdistal spine, unarmed ventrally, with strong ventral blade projecting posteroventrally between bases of antennules, without tongue-like lobe extending ventrally from lateral carina. Carapace with blunt median, unarmed, sinuous crest, especially prominent on frontal and cardiac regions; surface without appressed teeth; without supraorbital tooth, depressed frontal or orbital regions, subocular tooth posterodorsal to orbital angle, hepatic tooth or pterygostomian tooth; antennal tooth immediately below acute orbital angle small, sharp, marginal, outstanding, not basally articulated; branchiostegal tooth unusually large, supported by strong buttress extending at least halfway to posterior margin of carapace, branchiostegal margin not denticulate. Abdomen smoothly rounded dorsally except for suggestion of median low ridge on 3rd somite, pleura undivided with variably dentate margins, each with posteroventral tooth becoming more prominent on posterior somites, 6th somite armed only with paired posterolateral teeth, without articulated plate or pleuron curving around base of uropod. Telson not tapering regularly to sharp posterior end, with 2 pairs of small dorsolateral spines and 2 larger posterior spines on either side of strong median projection, posterolateral angle not produced. Eye with eyestalk movable, partially concealed by carapace, cornea nearly as wide as eyestalk, without ocellus. Antennule with stylocerite not in vertical plane, not bifid but somewhat semicircular; 2nd segment without sharp, curved lateral tooth; 3rd segment without dorsodistal tooth or movable plate; dorsal flagellum stouter but not noticeably shorter than ventral one.

Antennal peduncle overreaching antennular peduncle but without 3 strong ventral spines; antennal scale overreaching antennular peduncle, distolateral tooth distinctly overreaching blade, lateral margin bearing series of small, movable spines. Mandible without palp or incisor process. Second maxilliped with terminal segment nearly semicircular and applied nearly transversely to preceding segment, exopod somewhat broad-

ened in basal $\frac{1}{3}$. Third maxilliped with distal segment rather broad and somewhat flattened, without exopod but with epipod. Pereopods without exopods or arthrobranchs but with simple epipods without terminal hooks on 4 anterior pairs. First pereopod with fingers less than $\frac{1}{2}$ as long as palm, movable finger ending in 2, fixed finger in 3, strong interlocking spines, chela $1\frac{1}{3}$ times as long as carapace, latter not excavated to receive propodus, ischium not produced into saber-shaped process. Second pereopods symmetrical, fingers shorter than palm, carpus subdivided into 3 articles. Third pereopod with dactyl armed with 4 strong spines, largest near proximal end of flexor surface in line with terminal spines, flanked by paired lateral spines, dactyl and propodus not prehensile in functional males, propodus not subdivided, carpus not spinose. Uropod armed with strong, fixed distolateral tooth with movable spine mesial to it.

RANGE.—Mozambique, Zanzibar, Persian Gulf (USNM), Sri Lanka, Andaman Islands, Western Australia, and Timor and Moluccas, Indonesia, Sulu Archipelago, Philippines, Palau Islands (USNM), New Caledonia; possibly associated with sponges.

REMARKS.—Only one species is recognized.

***69. *Gelastocaris paronae* (Nobili, 1905)**

Latreutes Paronae Nobili, 1905b:2, 1 fig. [type locality: Zanzibar].
Gelastocaris paronae.—Kemp, 1914:107, pl. 5.—Monod, 1969:212, figs. 55–68.

DIAGNOSIS.—See generic "Diagnosis" above.

MATERIAL.—PHILIPPINES. Near Siasi, Sulu Archipelago: sta 5146, 5°46'40"N, 120°48'50"E, 44 m, coral sand, shells, 16 Feb 1908 (1011–1031), 12' Agassiz beam trawl, mud bag: 1 ovig. female [6.1]; sta 5147, 5°41'40"N, 120°47'10"E, 38 m, coral sand, shells, 16 Feb 1908 (1127–1147), 12' Agassiz beam trawl, mud bag: 2 ovig. females [4.1, 4.3].—Off Jolo Island, Sulu Archipelago: sta 5139, 6°06'N, 121°30'E, 37 m, coral sand, 14 Feb 1908 (1313–1317), 12' Agassiz beam trawl, mud bag: 1 male [3.8]; sta 5145, 6°04'30"N, 120°59' 30"E, 42 m, coral sand, shells, 15 Feb 1908 (1344–1359), 12' Agassiz beam trawl, mud bag: 3 females [4.0–5.3], 2 ovig. [4.0, 5.3].

RANGE.—See generic "Range," above. It may be significant that all of the *Albatross* specimens were found on bottoms of coral sand, usually with shells; in depths of 37 to 44 meters.

****Hippolyte* Leach, 1814**

Hippolyte Leach, 1814:431 [type species, by monotypy: *Hippolyte Varians* Leach, 1814:431; gender: feminine].

DIAGNOSIS.—Integument not rigid. Rostrum with ventral blade not conspicuously developed, not projecting posteroventrally between bases of antennules, without tongue-like lobe extending ventrally from lateral carina. Carapace without dentate crest in midline at base of rostrum, without longitudinal lateral carinae, without appressed teeth on lateral surface, with supraorbital tooth but without abrupt depressions on frontal or orbital regions on either side of supraorbital tooth, without

subocular tooth posterodorsal to orbital angle, usually with marginal and not basally articulated antennal tooth, usually with hepatic and branchiostegal teeth but branchiostegal margin not denticulate, usually without pterygostomial tooth. Abdominal somites usually not dorsally carinate or posteriorly dentate, 1st pleuron not ventrally bifurcate, 5th pleuron rounded, not denticulate, 6th somite not armed with 7 strong spines, without articulated plate or pleuron curving around base of uropod. Telson not tapering to sharp point, armed with 2 pairs of dorsolateral spines, posterior margin often rounded, posterolateral angle not sharply produced. Eystalk movable, not concealed by carapace, cornea without ocellus. Antennule with stylocerite not lying in vertical plane, not bifid or semicircular; 2nd peduncular segment without sharp, curved lateral tooth; 3rd segment without sharp dorsodistal tooth or movable dorsodistal plate; dorsal flagellum not unusually short, stout, or brush-like. Antennal peduncle not overreaching antennular peduncle, not armed with 3 strong ventral spines; antennal scale overreaching antennular peduncle, without lateral tooth near midlength or small movable lateral spines. Mandible without palp but with incisor process. First maxilliped with caridean lobe usually quite distinct from exopodal lash, epipod not distinctly bilobate. Second maxilliped with terminal segment subquadrate or semicircular and applied obliquely or nearly transversely to preceding segment, exopod not exceptionally wide, with simple epipod but usually without podobranch. Third maxilliped with distal segment flattened, with exopod but without epipod or arthrobranch, without distinct coxal exite. Pereopods without exopods, epipods, or arthrobranchs. First pereopod with fingers shorter than palm, not terminating in interlocking spines, chela $1-2\frac{1}{2}$ times as long as carpus, carpus not very deeply excavate for reception of chela. Second pereopods symmetrical, fingers not longer than palm, carpus subdivided into 3 articles. Third pereopod with dactyl not gradually tapering to acute apex, dactyl and propodus prehensile in functional males, propodus not subdivided, carpus not conspicuously spinose. Uropod with lateral branch armed only with strong, fixed distolateral tooth with movable spine mesial to it.

RANGE.—Temperate and tropical shores worldwide; littoral to at least 240 meters.

REMARKS.—Thus far, only one of the 28 recognized species of *Hippolyte* has been recorded from the Philippine-Indonesian region.

***70. *Hippolyte ventricosa* H. Milne Edwards, 1837**

Hippolyte ventricosus H. Milne Edwards, 1837:371 [type locality: seas of Asia].

Hippolyte ventricosa.—Holthuis, 1947:55, figs. 7–1.—Hayashi, 1982:192, fig. 6.

DIAGNOSIS.—Variable. Rostrum overreaching antennular peduncle, armed with 1 or 2 dorsal teeth in proximal $\frac{1}{3}$ of length, and usually 2–6 ventral teeth. Suborbital angle knob-like. Abdomen with 6th somite less than twice as long as

maximum depth. Antennal scale 3–3½ times as long as wide. Third pereopod with dactyl bearing 13–16 spines on flexor margin. Maximum postorbital carapace length about 4 mm.

MATERIAL.—PHILIPPINES. Mindoro Strait, west of Mindoro: 12°47'15"N, 120°41'E, on driftwood at surface over depth of 1362 m, 12 Dec 1908 (1150–1210), 4 females [2.8–4.3], 2 ovig. [4.1, 4.3].

RANGE.—Red Sea to South Africa to Japan, Philippines, Indonesia, and Australia, eastward to Hawaii; littoral and slightly sublittoral.

****Latreutes* Stimpson, 1860**

Cyclorhynchus De Haan, 1849:173–175 [type species, by monotypy: *Hippolyte planirostris* De Haan, 1844, pl. 45: fig. 7; gender: neuter; invalid junior homonym of *Cyclorhynchus* Kaup, 1829 (Aves), *Cyclorhynchus* Sundevall, 1836 (Aves), and *Cyclorhynchus* Macquart, 1841 (Diptera)].

Latreutes Stimpson, 1860:27 [type species, selected by Kingsley, 1880: *Hippolyte ensiferus* H. Milne Edwards, 1837:374; gender: masculine].

DIAGNOSIS.—Integument not rigid. Rostrum overreaching antennular peduncle, with ventral blade conspicuously developed and projecting posteroventrally between bases of antennules, without tongue-like lobe extending ventrally from lateral carina. Carapace without dentate crest in midline at base of rostrum, without longitudinal lateral carinae, without numerous appressed teeth on lateral surface, without supraorbital tooth or abrupt depressions on frontal or orbital regions, without hepatic tooth, usually with branchiostegal tooth and denticles on branchiostegal margin but without pterygostomial tooth. Abdomen with somites not dorsally carinate or posteriorly dentate, 1st pleuron not ventrally bifurcate, 5th pleuron rounded, not denticulate, 6th somite not armed with 7 strong spines, without articulated plate or pleuron curving around base of uropod. Telson not tapering to sharp point, armed with 1–3 pairs of dorsolateral spines, posterior margin not rounded, posterolateral angles not sharply produced. Eyestalk movable, not concealed by carapace, cornea without ocellus. Antennule with stylocerite not lying in vertical plane, not bifid; 2nd peduncular segment without sharp, curved lateral tooth; 3rd segment without sharp dorsodistal tooth or movable plate, dorsal flagellum often short, stout, and brush-like. Antennal peduncle usually not overreaching antennular peduncle, not armed with 3 strong ventral spines; antennal scale overreaching

antennular peduncle, without lateral tooth near midlength or small movable lateral spines. Mandible without palp or incisor process. First maxilliped not discrete from exopodal lash, epipod usually bilobate. Second maxilliped with terminal segment semicircular or subtriangular and applied obliquely to preceding segment, exopod rather broad in proximal ½ with nonbilobate epipod but without podobranch. Third maxilliped with exopod and epipod but without arthrobranch and coxal exite. Pereopods with epipods with terminal hooks on at least anterior 3 pairs, without exopods or arthrobranches. First pereopod with fingers shorter than palm, movable finger terminating in 4, fixed finger in 3, strong and interlocking spines, chela 1–2 times as long as carpus, ischium not produced distally into saber-shaped process. Second pereopods symmetrical, fingers shorter than palm, carpus subdivided into 3 articles. Third pereopod with dactyl and propodus not prehensile in functional males, propodus not subdivided, carpus not conspicuously spinose.

RANGE.—Red Sea and South Africa to Kurile Islands and Philippines, Indonesia, Australia, Chile, and western and eastern Atlantic; littoral to 110 meters and on the high seas in floating weeds.

REMARKS.—The difficulties encountered in identifying specimens of *Latreutes*, especially those occurring in the Philippine-Indonesian region, have diminished but little since attention was called to them by Holthuis (1947:59). To be sure, Hayashi and Miyake (1968b:149) effectively demonstrated that *Latreutes dorsalis* refers to males of the species illustrated by De Haan (1844, pl. 44: fig. 7) under the name *Hippolyte planirostris*, and it is highly probable that *Latreutes planus* is based on an aberrant specimen of *L. unidentatus*, which was collected at the same *Challenger* station, but it is still uncertain how the latter species differs from *L. foliistrois*, *L. natalensis*, and finally *L. mucronatus*. The following key is offered as a possible aid to the eventual solution of some of these problems.

It would be of interest, also, to determine whether the peculiar strong spine (frequently referred to as an “antennal spine”) that is articulated onto the suborbital lobe of a majority of the species of the genus is characteristic of all of the species and whether that spine is homologous or merely analogous with a somewhat similarly positioned spine in the anchialine genera *Barbouria*, *Janicea*, and *Parhippolyte*.

Key to Females of Species of **Latreutes*

1. Three or more teeth of dorsal rostral series arising from carapace posterior to orbital margin 2
 No more than 1 tooth of dorsal rostral series arising from carapace posterior to orbital margin 4
2. Antennal scale more than 3 times as long as wide, blade narrowing regularly to termination at base of distal tooth *L. porcinus* (Kemp, 1916:397)
 (Andaman Islands, Singapore, Ryukyus, and Australia)
 Antennal scale little more than twice as long as wide, blade produced anteromesially to level of tip of distolateral tooth 3

3. Anteriormost tooth of dorsal rostral series separated from rounded anterior margin of rostrum by distinct emargination. Third maxilliped with terminal segment narrowly truncate distally *L. antiborealis* (Holthuis, 1952:62)
(Gulf of California to Chile,
Galapagos Islands; 4–46 meters)
- Anteriormost tooth of dorsal rostral series not separated from anterior margin of rostrum by distinct emargination. Third maxilliped with distal margin of terminal segment curving into mesial margin, not narrowly truncate
. *L. parvulus* (Stimpson, 1866:48)
(Western Atlantic from North Carolina to Rio de Janeiro,
Brazil, and Sierra Leone, western Africa; 0–44 meters)
4. Rostrum anteriorly truncate 5
Rostrum not anteriorly truncate 8
5. Anterior margin of rostrum armed, at most, with up to 9 denticles
. *L. compressus* (Stimpson, 1860:28)
(New South Wales and South Australia; littoral)
- Anterior margin of rostrum armed with 5–7 teeth 6
6. Dorsal rostral series consisting of about 25 teeth . . . *L. pristin* (Nobili, 1899:233)
(Papua New Guinea)
- Dorsal dentition limited to 1 spine-like tooth on carapace or rostrum 7
7. Second pereopod with 2nd article of carpus distinctly longer than 1st or 3rd article
. *L. fucorum* (Fabricius, 1798:404)
(North Atlantic; in shallow weed beds and
floating *Sargassum* on the high seas)
- Second pereopod with 1st article of carpus longer than 2nd or 3rd article
. *L. phycologus* (Nobili, 1905d, fig.)
(Arabian coast)
8. One (or more) fixed teeth on gastric region of carapace followed anteriorly by usually pronounced unarmed dorsal concavity above eyes 9
Concavity at base of rostrum, if present, usually limited to shallow, faintly sinuous recession in dorsal margin 11
9. Carapace with blunt median elevation on cardiac region
. *L. planirostris* (De Haan, 1844, pl. 45: fig. 7)
(Hong Kong and Japan; 5–110 meters)
- Carapace without discrete elevation on cardiac region 10
10. Rostrum with 10 or more serrations on anterior part of dorsal margin, more than 6 on ventral margin *L. foliiostris* (Kobjakova, 1935:91)
(East coast of Siberia)
*72. *L. mucronatus*
- Rostrum with no more than 8 serrations on anterior part of dorsal margin, 5 or 6 on ventral margin
. *L. natalensis* (Lenz and Strunck, 1914:320, pl. 21: figs. 1–11)
(South Africa; littoral)
74. *L. unidentatus*
11. Without dorsal marginal tooth or spine in line with or posterior to orbital margin
. 73. *L. planus*
- With dorsal marginal tooth or spine in line with or posterior to orbital margin 12
12. Rostrum with 0–3 dorsal teeth 13
Rostrum with 7 or more dorsal teeth 15
13. Pereopods with epipods on only 3 anterior pairs; 3rd with dactyl unarmed on flexor margin *L. inermis* (Chace, 1972:122, figs. 51, 52)
(Western Atlantic from Puerto Rico
and Virgin Islands to Tobago; probably
associated with gorgonacean octocorals)

- Pereopods with epipods on 4 anterior pairs; 3rd with dactyl armed with 5-7 teeth on flexor margin 14
14. Rostrum more than 1 1/2 times as long as carapace
 *L. acicularis* (Ortmann, 1890:506, pl. 37: fig. 6)
 (Japan; littoral)
- Rostrum less than 1 1/4 times as long as carapace
 *L. pymoeus* (Nobili, 1904:230)
 (Red Sea to southern India
 and New Caledonia; littoral)
15. Third pereopod with dactyl not distally biunguiculate, bearing only 3 or 4 feeble spines on flexor margin *71. *L. anoplonyx*
 Third pereopod with dactyl distally biunguiculate, because of enlarged distalmost spine of series on flexor margin
 *L. laminirostris* (Ortmann, 1890:506, pl. 37: fig. 5)
 (China, Japan; 0-9 meters)

***71. *Latreutes anoplonyx* Kemp, 1914**

Latreutes anoplonyx Kemp, 1914:104, pl. 4: figs. 3-5 [type locality: Bombay, India].—Hayashi and Miyake, 1968a:14, figs. 2, 4b.

DIAGNOSIS.—Rostrum terminally acute, about 3/4 as long as postorbital carapace, rostral formula 1 + 9-20/5-15, none of teeth basally articulated. Carapace with shallow, faintly sinuous recession in dorsal margin, without cardiac elevation, with suborbital lobe directed anteroventrally and armed with strong spine directed only slightly ventrad of antieriad, branchiostegal lobe bearing 8-13 marginal denticles. Sixth abdominal somite more than 1 1/2 times as long as 5th somite. Telson bearing 2 pairs of dorsolateral spines. Antennular stylocerite with somewhat semicircular outline. Antennal scale about 4 times as long as wide, blade tapering to base of distal tooth with barest suggestion of terminal lobe. Third maxilliped with terminal segment dorsally flattened but not particularly wide. Epipods on 4 anterior pairs of pereopods. First pereopod with chela nearly twice as long as carpus, carpus slightly excavate for reception of propodus. Second pereopod with 2nd carpal article more than twice as long as each of subequal 1st and 3rd articles. Third pereopod with dactyl distally simple, not biunguiculate, bearing 2 or 3 small spines on flexor margin. Uropod with lateral branch bearing small, socketed distolateral spine flanked laterally by nearly completely obsolescent blunt lobe. Maximum postorbital carapace length perhaps about 7 mm.

MATERIAL.—PHILIPPINES. Cavite, Luzon [14°29'N, 120°55'E], with medusa, 11 Jan 1909: 6 males [2.7-4.7] 4 females [3.5-5.5], 1 ovig. [5.2].

MALAYSIA. Tawau, Sabah [4°15'N, 117°54'E], from jellyfish, 5 Nov 1909: 2 males [3.8, 4.2] 6 females [4.4-6.0], 1 ovig. [5.5].

RANGE.—India, Burma, China, Japan, Philippines, Indonesia; often associated with medusae.

***72. *Latreutes mucronatus* (Stimpson, 1860)**

Rhynchocyclus mucronatus Stimpson, 1860:27 [type locality: Lei Yue Mun Pass, Hong Kong; 46 meters].

Latreutes mucronatus.—Hayashi and Miyake, 1968a:16, figs. 3, 4c.

DIAGNOSIS.—Rostrum anteriorly rounded, often with acute distal tooth, more than 1/2 as long as postorbital carapace, rostral formula 1 + 7-16/6-15, none of teeth clearly basally articulated. Carapace with distinct concave sinus in dorsal margin, without cardiac elevation, with short suborbital lobe directed anteroventrally and armed with strong spine directed antieriad, branchiostegal lobe bearing 8-14 marginal denticles. Sixth abdominal somite more than 1 2/3 times as long as 5th somite. Telson bearing 2 pairs of dorsolateral spines. Antennular stylocerite somewhat semicircular. Antennal scale about 3 times as long as wide, blade tapering toward distal tooth, with narrowly convex distal end. Third maxilliped with terminal segment somewhat flattened dorsally but not very wide. Epipods on 4 anterior pairs of pereopods. First pereopod with chela about 1 3/4 times as long as carpus, carpus slightly excavate for reception of propodus. Second pereopod with 2nd carpal article about twice as long as subequal 1st or 3rd articles. Third pereopod with dactyl distally biunguiculate with 3 or 4 smaller spines on flexor margin proximal thereto. Uropod with lateral branch bearing small, socketed distolateral spine flanked laterally by nearly completely obsolescent blunt lobe. Maximum postorbital carapace length perhaps about 5 mm.

MATERIAL.—MALAYSIA. Tawau, Sabah [4°15'N, 117°54'E], from jellyfish, 5 Nov 1909: 2 ovig. females [3.9, 4.6].

RANGE.—Red Sea and South Africa to China, Korea, Japan, Sabah, Indonesia, and northern Australia; often associated with medusae.

73. *Latreutes planus* Bate, 1888

Latreutes planus Bate, 1888:584, pl. 89: fig. 5 [type locality: off Sibago Island, Moro Gulf, east of Basilan Strait, Philippines].

DIAGNOSIS.—Rostrum terminally acute, about 3/4 as long as postorbital carapace, rostral formula 0 + 10/5, none of teeth basally articulated. Carapace with shallow recession in dorsal margin, without cardiac elevation or gastric tooth. Sixth abdominal somite about 1 2/3 times as long as 5th somite. Postorbital carapace length less than 2 mm.

RANGE.—Known only from the Philippine type locality.

REMARKS.—As suggested in the generic "Remarks," it seems probable that *L. planus* is an aberrant specimen of the following species that was collected at the same station.

74. *Latreutes unidentatus* Bate, 1888

Latreutes unidentatus Bate, 1888:586, pl. 89: fig. 6 [type locality: off Sibago Island, Moro Gulf, east of Basilan Strait, Philippines].

DIAGNOSIS.—Rostrum terminally acute, more than $1\frac{1}{4}$ times as long as carapace, rostral formula $1 + 8/5$, none of teeth basally articulated. Carapace with distinct sinus in dorsal margin, without cardiac elevation but with strong, fixed gastric tooth. Sixth abdominal somite about $1\frac{2}{3}$ times as long as 5th somite. Postorbital carapace length less than 2 mm.

RANGE.—Known only from the Philippine type locality.

Lebbeus White, 1847

Lebbeus White, 1847:76, 135 [type species, by monotypy: *Lebbeus orthorhynchus* (Leach manuscript) White, 1847:76 (= *Alpheus Polaris* Sabine, 1824: cxxxviii); gender: masculine].

DIAGNOSIS.—Integument not very rigid. Rostrum with ventral blade not unusually strong, not projecting posteroventrally between bases of antennules, without tongue-like lobe extending ventrally from lateral carina. Carapace usually without dentate crest in midline at base of rostrum, without longitudinal lateral carina, without numerous appressed teeth on lateral surface, with supraorbital tooth, without abrupt depression on frontal or orbital regions, without subocular tooth posterodorsal to orbital angle, orbital angle not large or obtuse, with marginal antennal tooth, without hepatic tooth, usually without branchiostegal tooth or denticles on branchiostegal margin, often with pterygostomial tooth. Abdomen with somites not dorsally carinate or posteromesially dentate, 5th pleuron often pointed, margin not denticulate, 6th somite not armed with 7 strong spines, without articulated plate or pleuron curving around base of uropod.

Telson not tapering to sharp point, armed with 2–9 pairs of dorsolateral spines, posterior margin not rounded, posterolateral angles not sharply produced. Eyestalk movable, not concealed by carapace, cornea without ocellus. Antennule with stylocerite not lying in vertical plane, not bifid; 2nd antennular segment often with sharp, curved lateral tooth; 3rd segment with sharp dorsodistal tooth, without movable plate; dorsal flagellum often short, not brush-like, not biramous. Antennal peduncle not armed with 3 strong ventral spines; antennal scale overreaching antennular peduncle, without lateral tooth near midlength or small movable lateral spines. Mandible with 2-segmented palp and incisor process. First maxilliped with bilobate epipod. Second maxilliped with terminal segment elongate and applied somewhat laterally to preceding segment, exopod not unusually broad, usually with epipod and podobranch. Third maxilliped with epipod but without exopod, arthrobranch, or coxal exite. Pereopods with epipods provided

with terminal hooks on anterior 1st, 2nd, or 3rd pairs, without exopods or arthrobranches. First pereopod with fingers shorter than palm, movable finger not terminating in 4, fixed finger in 3 strong, interlocking spines, chela more or less than twice as long as carpus, ischium not produced distally into saber-shaped process. Second pereopods symmetrical, fingers shorter than palm, carpus composed of 7 articles. Third pereopod with dactyl and propodus not prehensile in functional males, propodus not subdivided, carpus not usually very spinose.

RANGE.—Of the 32 species of *Lebbeus* herein recognized, more than 21 are confined to a circumpolar faunal region with southward extensions in the western Indo-Pacific area starting in the Chuckchi Sea and proceeding through the Bering Sea and Ostrov Okhotsk to the Sea of Japan; in the eastern Pacific, proceeding from the Bering Sea along the coasts of Alaska, British Columbia, and Washington, Oregon, and California to Baja California; in the western North Atlantic from the Northwest Territories and Baffin Bay, through Davis Strait, Labrador Sea, and Gulf of St. Lawrence and Gulf of Maine to the latitude of Chesapeake Bay; and in the eastern North Atlantic only to Shetland, although there are early records from the Hebrides. The only other region where more than one species is known is Peru and northern Chile, from where five species have been described, all since 1975. Single species are known from the Bali Sea (the westernmost Indo-Pacific record); off Sydney, New South Wales; Hawaii; the Albatross Plateau southwest of Acapulco, Mexico; Saldanha, South Africa, just north of the Cape of Good Hope; and the Adeline Coast of Wilkes Land, Antarctica, south of Australia. The depth range of the genus is from tide pools to 2620 meters.

REMARKS.—The single species known from the Philippine-Indonesian region is treated below.

75. *Lebbeus indicus* Holthuis, 1947

Lebbeus indicus Holthuis, 1947:40, figs. 1–3 [type locality: Bali Sea, Indonesia, 7°28.2'S, 115°24.6'E; 1018 meters].

REMARKS.—Rostrum overreaching antennal scale, dorsal margin distinctly concave. Carapace with strong, marginal antennal tooth immediately below suborbital angle. Abdominal pleura rounded on 4 anterior somites, pointed on 5th. Antennal peduncle not overreaching antennular peduncle; antennal scale with blade overreaching distolateral tooth. Pereopods with epipods on 3 anterior pairs.

RANGE.—Known only from the type locality in the Bali Sea, Indonesia; in 1018 meters.

**Lysmata* Risso, 1816

Aglaope Rafinesque, 1814:24 [type species, by monotypy: *Aglaope striata* Rafinesque, 1814:24; gender: feminine].

Niphea Rafinesque, 1815:98 [replacement name for *Aglaope*, type species therefore: *Aglaope striata* Rafinesque, 1814:24; gender: feminine].

Melicerta Risso, 1816:109 [type species, selected by H. Milne Edwards in Cuvier, 1837, pl. 54: fig. 3: *Melicerta Seti Caudata* Risso, 1816:110; gender: feminine].

Lysmata Risso, 1816:175 [footnote; replacement name for *Melicerta* Risso,

1816:109; type species, selected by H. Milne Edwards in Cuvier, 1837:18: *Melicerta Seti Caudata* Risso, 1816:110; gender: feminine].
Ophiocheirus Leach, 1830:172 [type species, by monotypy: *Ophiocheirus chrysophthalmus* Leach, 1830:172; gender: masculine].
Usterocheirus Leach, 1830:173 [type species, selected by Holthuis, 1993: *Usterocheirus macropocoilium* Leach, 1830:172; gender: masculine].
 Arno Roux, 1831:18, 19 [replacement name for *Aglaope*, type species therefore: *Aglaope striata* Rafinesque, 1814:24; gender: feminine].
Eretmocariss Bate, 1888:894 [type species, selected by Holthuis, 1955:114: *Eretmocariss stylorostriis* Bate, 1888:898; gender: feminine].

DIAGNOSIS.—Integument not rigid. Rostrum armed dorsally and usually ventrally, without ventral blade or tongue-like lobe extending ventrally from lateral carina. Carapace not inflated, not abruptly depressed on frontal region, without dentate crest in midline at base of rostrum, without numerous appressed teeth on lateral surface, without supraorbital or subocular tooth posterodorsal to orbital angle, latter not large or obtuse, without hepatic tooth or branchiostegal tooth or denticles, but with marginal, unarticulated antennal tooth and, occasionally, pterygostomial tooth. Abdomen with 1st pleuron entire, not bifurcate; 6th somite without prominent spines, without articulated plate at posteroventral angle and pleuron not curving around base of uropod. Telson not tapering to sharp posterior end, posterolateral angles not sharply produced, bearing 2 pairs of dorsolateral spines. Eyestalk not concealed by carapace, cornea not narrower than stalk. Antennule with stylocerite not in vertical plane, not bifid; 2nd segment without sharp, curved lateral tooth; 3rd segment without dorsodistal tooth on movable plate, dorsal flagellum slender, not short or brush-like. Antennal peduncle not overreaching antennular peduncle, without 3 strong ventral spines; antennal scale not overreaching antennular peduncle, lateral tooth not near midlength, lateral margin not spinose. Mandible without palp or incisor process. First maxilliped with caridean lobe clearly discrete from exopodal lash, epipod bilobate. Second maxilliped with terminal segment narrow and applied somewhat laterally to preceding segment, exopod not unusually wide, with nonbilobate epipod and podobranch. Third maxilliped with distal segment not flattened, with exopod, epipod, arthrobranch, and reduced coxal exite. Pereopods without exopods, with terminally hooked epipods on 4 anterior pairs, without arthrobranches. First pereopod with fingers shorter than palm, not terminating in distal spines, chela $3/4-2^{3/4}$ as long as

carpus, latter not excavate to receive propodus, ischium often produced into long saber-shaped process. Second pereopods symmetrical, fingers no longer than palm, carpus subdivided into 13–36 articles. Third pereopod with dactyl and propodus not prehensile in functional males.

RANGE.—Pantropical and subtropical, occasionally temperate; commonly littoral and sublittoral to an unverified depth of 267 meters in *L. philippinensis*, new species.

REMARKS.—When Holthuis (1953) revised the publication dates of De Hann's *Fauna Japonica*, I was pleased to believe the clear evidence thereby engendered that *Palaemon dentatus* became a junior primary homonym and therefore "permanently invalid" (ICZN, Article 52b), hence surely validating *Hippolysmata dentata* Kemp, 1914. I was surprised, therefore, to read the following in Holthuis' characteristically splendid review of this manuscript:

It is true that *Palaemon dentatus* De Haan, 1844, and *Hippolysmata dentata* Kemp, 1914, are secondary homonyms, but according to Art. 59a "a species-group name that is a junior secondary homonym must be treated as invalid by anyone who considers that the two species-group taxa are congeneric." As long as *Palaemon dentatus* and *Hippolysmata dentata* are both brought to the genus *Lysmata*, the junior of the two names has to be replaced, even if the senior name is invalid (but available). . . . The unpleasant consequence of this situation is that zoologists who consider *Lysmata* and *Hippolysmata* synonymous have to use the name *Lysmata kemp* Chace, while those who think the two genera distinct must employ the name *Hippolysmata dentata* Kemp, 1914, for the same species, which then has a different generic, specific, and author's name. But that is nomenclature for you.

This judgment was subsequently concurred with by Curtis W. Sabrosky, the Chairman of the Editorial Committee during six of the ten years devoted to the preparation of the Third Edition of the International Code of Zoological Nomenclature, with the proviso that the case be submitted to the International Commission for final decision. As I am unable to produce an effective response to this argument and as my age would seem to dictate against delaying publication long enough to await a verdict from the Commission, it seems best for the purpose of this report to follow the advice of two of the most highly respected exponents of the ICZN.

As indicated in the following key, seven of the 24 species of *Lysmata* recognized herein are known from the Philippines and/or Indonesia.

Key to Species of *Lysmata*

1. Dorsal antennular flagellum with distinct accessory branch of 3–16 articles . . . 2
 Dorsal antennular flagellum with accessory branch lacking or vestigial, consisting of no more than 2 articles 9
2. Antennular peduncle with stylocerite not overreaching proximal 1/2 of basal segment *L. zaca* (Armstrong, 1941:10, fig. 4)
 (Matautu Bay, Savai'i, Western Samoa; "from broken up masses of coral, depth 8 feet")
 Antennular peduncle with stylocerite nearly or quite overreaching basal segment 3

3. Antennal scale with lateral margin straight 4
 Antennal scale with lateral margin concave 6
4. Antennal scale less than 3 times as long as wide. First pereopod with chela more than $1\frac{1}{2}$ times as long as carpus *L. moorei* (Rathbun, 1901:115, fig. 23)
 (Western Atlantic from Bermuda to Paraiba, Brazil; Ascension Island, South Atlantic; and Gabon, West Africa)
 Antennal scale nearly or quite 4 times as long as wide. First pereopod with chela little longer than carpus 5
5. Antennal scale with distolateral tooth overreaching blade *80. *L. ternatensis*
 Antennal scale with distolateral tooth not overreaching blade
 *L. seticaudata* (Risso, 1816:110, pl. 2: fig. 1)
 (English Channel to Portugal, Mediterranean, Black Sea; littoral)
6. Carapace bearing small pterygostomian tooth. Second pereopod with 29–35 carpal articles 7
 Carapace without pterygostomian tooth. Second pereopod with 17–24 carpal articles 8
7. Rostrum $\frac{3}{5}$ as long as carapace, not overreaching 2nd antennular segment *L. intermedia* (Kingsley, 1878b:90)
 (Galapagos Islands; Bermuda and Florida Keys to Tobago and Curacao; to a depth of 22 meters)
 Rostrum $\frac{2}{5}$ as long as carapace, overreaching 2nd antennular segment
 *L. nilita* (Dohrn and Holthuis, 1950:339, fig. 1, pl. 9)
 (Mediterranean Sea and Canary Islands; littoral)
8. Third maxilliped with exopod barely reaching midlength of antepenultimate segment *L. galapagensis* (Schmitt, 1924b:165)
 (Galapagos Islands; sublittoral)
 Third maxilliped with exopod distinctly overreaching midlength of antepenultimate segment 81. *L. trisetacea*
9. Antennular peduncle with stylocerite not or barely reaching midlength of basal segment 10
 Antennular peduncle with stylocerite overreaching midlength of basal segment 14
10. Second pereopod with fewer than 25 carpal articles 11
 Second pereopod with 30 or more carpal articles 13
11. Color semitransparent with numerous fine red longitudinal lines 82. *L. vittata*
 Color opaque, not translucent, with paired, broad, continuous, dorsolateral, longitudinal red bands on carapace and abdomen 12
12. Median white stripe on abdomen abruptly expanded laterally into broad white band near posterior end of 6th somite and interrupted on anterior $\frac{1}{3}$ of telson, lateral branch of uropod with 2 prominent white spots arranged proximally and distally 76. *L. amboinensis*
 Median white stripe varying little in width from rostrum to end of telson, lateral branch of uropod marked laterally by continuous white marginal line
 *L. grabhami* (Gordon, 1935:319, figs. 10, 11a,b)
 (Western Atlantic from Bermuda and northeastern Gulf of Mexico to northern South America and Ascension Island, South Atlantic)
13. Two or 3 teeth of dorsal rostral series arising from carapace posterior to orbit; carapace usually with distinct pterygostomian tooth
 *L. multiscissa* (Nobili, 1904:231, pl. 2: fig. 5)
 (Djibouti)

- Usually only 1 tooth of dorsal rostral series situated on carapace posterior to orbit; carapace usually without pterygostomian tooth
 *L. rathbunae* (Chace, 1970:59, figs. 1-4)
 (Western Atlantic from eastern Florida to Yucatan; 13-119 meters)
14. Antennular peduncle with stylocerite reaching nearly to or beyond distal end of basal segment 15
 Antennular peduncle with stylocerite not nearly reaching distal end of basal segment 19
15. Antennal scale 3 times as long as wide. Second pereopod with 13-28 carpal articles 16
 Antennal scale 3¹/₂ to 4¹/₂ times as long as wide. Second pereopod with 32-40 carpal articles 18
16. Only posteriormost tooth of dorsal rostral series situated on carapace posterior to orbital margin. Second pereopod with 13-15 carpal articles
 *L. anchisteus* (Chace, 1972:125, figs. 53, 54)
 (West Indies; littoral)
- Two teeth of dorsal rostral series situated on carapace posterior to orbital margin. Second pereopod with 19-28 carpal articles 17
17. Dorsal antennular flagellum without trace of accessory branch 78. *L. kuekenthali*
 Dorsal antennular flagellum with accessory branch consisting of single segment
 *L. unicornis* (Holthuis and Maurin, 1952:198, figs. 1, 2)
 (Morocco; 4-5 meters)
18. Carapace without pterygostomian tooth *L. morelandi* (Yaldwyn, 1971:90)
 (New Zealand; littoral and sublittoral rocky bottoms)
 Carapace with pterygostomian tooth *L. olavo* (Fransen, 1991:63, figs. 1-34)
 (Azores and Salvage Islands; 135-360 meters)
19. Rostrum with only 1 ventral tooth. Antennal scale 6 times as long as wide
 *L. stenolepis* (Crosnier and Forest, 1973:177, figs. 55, 56a-e)
 (Cape Verde Islands; 275-150 meters)
- Rostrum with 2-6 ventral teeth. Antennal scale 3-4 times as long as wide . . 20
20. Rostrum as long as carapace, overreaching antennular peduncle. Third pereopod with dactyl simple, not biunguiculate *L. kemp*, new name
 (Burma; 37 meters)
- Rostrum no more than ²/₃ as long as carapace, not overreaching antennular peduncle. Third pereopod with dactyl biunguiculate 21
21. Second pereopod with merus subdivided by single articulation near proximal end, ischium with single articulation near distal end. Color scarlet with four white spots on each side of carapace, white antennular and antennal flagella, and white ambulatory pereopods 77. *L. debelius*
 Second pereopod segmentation and color not as indicated above 22
22. Orbital angle fused with antennal tooth, not visible in dorsolateral view as distinct tooth in nearly horizontal plane. First pereopod with chela more than 1¹/₂ times as long as carpus 23
 Orbital angle visible in dorsolateral view as distinct tooth in nearly horizontal plane. First pereopod with chela little longer than carpus 24
23. Carapace with pterygostomian tooth. Antennal scale slightly more than 3 times as long as wide. Second pereopod with 28-32 carpal articles
 *L. californica* (Stimpson, 1866:48)
 (Southern California, Baja California; tidepools to 61 meters)

Carapace without pterygostomian tooth. Antennal scale 4 times as long as wide.

Second pereopod with 21 or 22 carpal articles
 *L. porteri* (Rathbun, 1907:49, pl. 3: fig. 4)
 (Chile)

24. Antennal scale slightly more than 3 times as long as wide, extending forward about as far as end of antennular peduncle. Second pereopod with 22–26 carpal articles *79. *L. philippinensis*, new species
 Antennal scale 4 times as long as wide, overreaching antennular peduncle. Second pereopod with 30–33 carpal articles *L. wurdemanni* (Gibbes, 1850:197)
 (Western Atlantic from Virginia to Estado de São Paulo, Brazil; sublittoral to 30 meters)

76. *Lysmata amboinensis* (De Man, 1888)

Hippolysmata vittata var. *amboinensis* De Man, 1888:495 [type locality: Ambon, Indonesia].

Hippolysmata (*Hippolysmata*) *amboinensis*.—Holthuis, 1947:70, figs. 12–14.

Lysmata grabhami.—Bruce, 1974:107, pl. 1 [not *Hippolysmata grabhami* Gordon, 1935].

Lysmata amboinensis.—Hayashi, 1975b:286, figs. 1–4, pl. 5 [part].—Debelius, 1984:112 [fig.].—Manning and Chace, 1990:112.

DIAGNOSIS.—Rostrum not overreaching antennular peduncle; rostral formula 1–2 + 4–5/3–4. Carapace with pterygostomian tooth. Antennule with stylocerite very short, not nearly reaching midlength of basal segment, dorsal flagellum without accessory branch. Antennal scale reaching as far as or slightly beyond end of antennular peduncle, $4\frac{1}{2}$ to $5\frac{1}{3}$ times as long as wide, distolateral tooth barely to distinctly overreaching blade. Third maxilliped with exopod not overreaching midlength of antepenultimate segment. First pereopod with chela slightly longer than carpus. Second pereopod with carpus composed of 19–21 articles. Third pereopod with dactyl biunguiculate. In life, median white stripe abruptly broadened into transverse band near posterior margin of 6th abdominal somite, interrupted on anterior $\frac{1}{3}$ of telson. Maximum postorbital carapace length more than 13 mm.

RANGE.—Red Sea, Mombasa, Gulf of Tonkin, Okinawa, Japan, Philippines, and Indonesia to Hawaii and Society Islands.

REMARKS.—Minor but apparently constant differences in color pattern between Indo-Pacific and Atlantic examples of what Hayashi (1975b) and others believed to be a nearly pantropical species suggest the desirability of retaining the name *L. grabhami* (Gordon, 1935) for the Atlantic form for the time being (see Manning and Chace, 1990:23). The differences in color are clearly depicted in the delightful book by Debelius (1984:112).

In an attempt to find morphological characters to support the apparent differences in color pattern, I discovered that the suborbital angle is quite distinct in Smithsonian material of *L. grabhami*, suggesting a possible variance from the probably immature holotype of *L. amboinensis*, as illustrated by Holthuis (1947, fig. 13). As the Indo-Pacific form is not yet represented in our collections, I sought advice in the matter from Holthuis. In response, Charles Fransen, with his usual kind cooperation,

prepared excellent drawings of the anterior regions in dorsal aspect of two topotypic specimens of *L. amboinensis* that he had collected at Ambon, with postorbital carapace lengths of 9.6 and 6.6 mm. The orbital angle in the larger specimen is identical with that in Atlantic specimens of similar size. It is much less prominent but still present in the smaller specimen, which is subequal in size to the holotype of *L. amboinensis*. It is apparent, therefore, that there is no significant difference in this regard between *L. amboinensis* and *L. grabhami*, and that this character should be used with caution in identifying immature specimens of *Lysmata*.

77. *Lysmata debelius* Bruce, 1983

Lysmata debelius Bruce, 1983a:115, figs. 1–9 [type locality: Polillo Island, east of Luzon, Philippines; 28 meters].

DIAGNOSIS.—Rostrum not overreaching antennular peduncle, rostral formula 1 + 4/2. Carapace with antennal tooth discrete from orbital angle, without pterygostomian tooth. Antennule with stylocerite reaching beyond midlength of basal segment but not to distal end of that segment, dorsal flagellum without accessory branch. Antennal scale 4 times as long as wide, distolateral tooth barely overreaching subtruncate distal margin of blade. Third maxilliped with exopod reaching beyond midlength of antepenultimate segment. First pereopod with chela twice as long as carpus. Second pereopod with carpus composed of 16 articles. Third pereopod with dactyl biunguiculate. In life, deep scarlet, except for brilliant white distal part of merus, propodus, and dactyl of ambulatory pereopods, large, circular spot on epistome, submedian and dorsal carapace, anterior, central, and posterior branchiostegite, and small central spot between 4 large spots on lateral surface of carapace. Maximum postorbital carapace length mm.

RANGE.—Sri Lanka; Ryukyus; Polillo Island, Philippines; and Bali, Indonesia; 10–28 meters.

78. *Lysmata kuekenthali* (De Man, 1902)

Merhippolyte orientalis?—De Man, 1902:849, pl. 26: fig. 56 [not *M. orientalis* Bate, 1888].

Hippolyte kuekenthali De Man, 1902:850 [type locality: Ternate, Indonesia].

Hippolysmata kuekenthali.—Kemp, 1914:115, pl. 6: fig. 11.

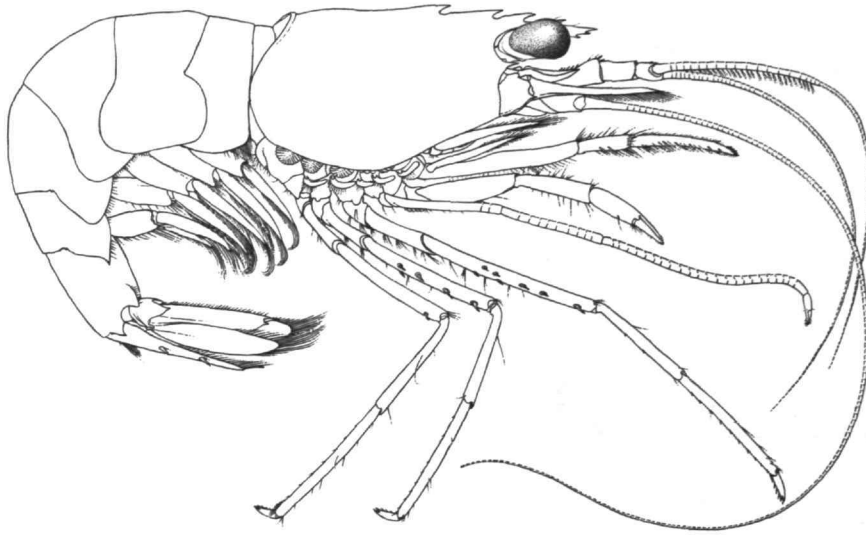


FIGURE 19.—*Lysmata philippinensis*, new species, male holotype from Albay Gulf, carapace length 5.1 mm.

Hippolysmata marleyi Stebbing, 1919:120 [type locality: Sezela, Natal, South Africa].

Hippolysmata (*Hippolysmata*) *kukenthali*.—Holthuis, 1947:69.

DIAGNOSIS.—Rostrum not overreaching antennular peduncle, rostral formula $2 + 2-5/1-3$. Carapace with antennal tooth not fused with orbital angle, without pterygostomian tooth. Antennule with stylocerite slightly overreaching or falling short of distal margin of basal segment of peduncle, dorsal flagellum without accessory branch. Antennal scale barely overreaching antennular peduncle, about 3 times as long as wide, distolateral tooth reaching about to distal margin of blade. First pereopod with chela $1\frac{1}{2}$ times as long as carpus. Second pereopod with carpus composed of 19–21 articles. Third pereopod with dactyl biunguiculate. Maximum postorbital carapace length about 10 mm.

RANGE.—South Africa, Seychelles, Sri Lanka, Japan, and Indonesia; littoral and sublittoral.

REMARKS.—Through the cooperation of William J. Cooke in Kailua, Hawaii, I have been able to compare material of the species referred to *Hippolysmata kukenthali* by Edmondson (1946:252) with six syntypes of De Man's species received through the kind offices of L.B. Holthuis. The Hawaiian species is quite distinct from *L. kuekenthali*, especially in the number of carpal articles of the second pereopod and of lateral spines on the merus of the third pereopod. As suspected by Mr. Cooke, that form seems to be indistinguishable from *L. anchisteus* Chace, 1972, from the tropical western Atlantic.

***79. *Lysmata philippinensis*, new species**

FIGURES 19, 20

DIAGNOSIS.—Rostrum (Figures 19, 20a–c) not overreaching antennular peduncle, rostral formula $2 + 2-3/2$. Carapace

with prominent antennal tooth not fused with orbital angle, latter clearly visible in dorsolateral view as distinct, blunt tooth in nearly horizontal plane (Figure 20c), occasionally with pterygostomian tooth on usually rounded anterolateral margin of carapace (Figure 20a). Fifth abdominal somite with pleuron sharply pointed posteroventrally, 4th somite with pleuron rounded (Figure 19). Antennular peduncle with sharply pointed stylocerite not nearly reaching distal margin of basal segment (Figure 20f, dorsolateral flagellum with 1-segmented accessory branch (Figure 20g,h). Antennal scale barely, if at all overreaching antennular peduncle (Figure 20i), slightly more than 3 times as long as wide, distolateral tooth slightly overreaching distal margin of blade. Third maxilliped with exopod overreaching midlength of antepenultimate segment (Figure 19). First pereopod (Figure 19) with chela very slightly longer than carpus. Second pereopod (Figure 19) with carpus composed of 22–26 articles. Third pereopod with dactyl biunguiculate (Figure 20r), with 2–4 (usually 3) movable spines on flexor margin proximal to terminal pair (Figure 19). Maximum postorbital carapace length 8 mm.

MATERIAL.—PHILIPPINES. Albay Gulf, east of southern Luzon, sta 5453, $13^{\circ}12'N$, $123^{\circ}49'18''E$ [267 m], 7 June 1909 (944–1004), 12' Agassiz beam trawl: 3 males [4.7–5.5], 1 [5.1] is holotype (USNM 264048) 3 ovig. females [7.4–8.0]. The depth from which the single lot was taken was estimated from the Coast Survey chart for the area; no sounding and therefore no bottom sample were obtained at this station.

RANGE.—Known only from the type locality in Albay Gulf, Luzon, Philippines.

REMARKS.—This species seems to be closely related to *L. kuekenthali*, which is known from Indonesia westward to South Africa in depths of no more than 11 meters. The Philippine material had not come to my attention when the type specimens



FIGURE 20.—*Lysmata philippinensis*, new species, male holotype from Albay Gulf, carapace length 5.1 mm: *a*, anterior carapace, right aspect; *b*, same, left aspect; *c*, anterior carapace and appendages, dorsal aspect; *d*, thoracic sternum, denuded except projections; *e*, tail fan, dorsal aspect; *f*, right antennular peduncle, dorsomesial aspect; *g*, dorsolateral antennular flagellum, junction of setiferous and nonsetiferous portions, dorsal aspect; *h*, same, ventral aspect; *i*, right antennal peduncle and scale, ventral aspect; *j*, right mandible, anterior aspect; *k*, right 1st maxilla; *l*, right 2nd maxilla; *m*, right 1st maxilliped; *n*, right 2nd maxilliped; *o*, right 3rd maxilliped, denuded distal end; *p*, right 1st pereopod, denuded chela; *q*, right 2nd pereopod, denuded chela and distal carpal articulation; *r*, right 3rd pereopod, denuded dactyl; *s*, right 1st pleopod, posterior aspect; *t*, same, endopod; *u*, right 2nd pleopod, anterior aspect; *v*, same, appendix masculina and tip of appendix interna.

of *L. kuekenhali* mentioned above were available to me for direct comparison, but the species described here seems to differ from *L. kuekenhali* in the shorter stylocerite on the antennular peduncle, longer pereopods, 22–26 rather than 19–22 articles in the carpus of the second pereopod, and usually three rather than two movable spines on the flexor margin of the dactyl and five to seven instead of three spines on the lateral and flexor surface of the merus of the third pereopod.

The disconcerting presence of a small but distinct pterygostomian tooth on one side of each of two of the six specimens of the species engenders some doubt about the diagnostic significance of that character in other species of the genus, but it is probably reasonable to assume that the indicated eight per cent chance of the occurrence of this aberration is a specific, not a generic attribute.

ETYMOLOGY.—The specific name obviously reflects the region from which the species is currently known.

*80. *Lysmata ternatensis* De Man, 1902

Palaemon dentatus De Haan, 1844, pl. 45: fig. 13 [type locality: Japan; not *Palaemon dentatus* Roemer, 1841:106, pl. 16: fig. 24].

Lysmata seticaudata.—De Haan, 1849:176 [not *L. seticaudata* (Risso, 1816)].

Lysmata seticaudata var. *ternatensis* De Man, 1902:846 [type locality: Ternate, Indonesia, possibly also Ambon and, less likely, Japan].

Hippolysmata acicula Rathbun, 1906:912, pl. 24: fig. 6 [type locality: Puolo Point, Kauai, Hawaii; S.51°30' E4.9°].

Lysmata affinis Borradaile, 1915:209 [type locality: recorded from four localities in the Laccadive Islands, Chagos Archipelago, and the Seychelles].

Lysmata dentata Holthuis, 1947:64.

DIAGNOSIS.—Rostrum not overreaching antennular peduncle, rostral formula 2 + 3–4/2–5. Carapace with antennal tooth fused with orbital angle and with pterygostomian tooth. Fifth abdominal somite with pleuron pointed, 4th somite with pleuron rounded. Antennular peduncle with stylocerite nearly reaching distal margin of basal segment, dorsolateral flagellum with accessory branch long, composed of 10 articles. Antennal scale distinctly overreaching antennular peduncle, about 4 times as long as wide, distolateral tooth overreaching distal margin of blade. Third maxilliped with exopod not quite reaching midlength of antepenultimate segment. First pereopod with chela very slightly longer than carpus. Second pereopod with carpus composed of up to 29 articles. Third pereopod with dactyl biunguiculate. Maximum postorbital carapace length at least 6 mm.

MATERIAL.—PHILIPPINES. Off Jolo Island, Sulu Archipelago, sta 5555, 5°51'15"N, 120°58'35"E, 62 m, coarse sand, 18 Sep 1909 (1109–1113), 6' McCormick trawl: 1 ovig. female [5.2].

RANGE.—Seychelles, Laccadives, Chagos Archipelago, Japan, and Indonesia; to a depth of 62 meters.

REMARKS.—This species was apparently first called *Palaemon dentatus* by De Haan on plate 45 in the crustacean volume of Von Siebold's *Fauna Japonica*. On the assumption that this

plate was issued in 1841, there was no clear challenge to the priority of the name. When Holthuis (1953) corrected the date of that plate to 1844, however, De Haan's species became a junior homonym of *Palaemon dentatus* Roemer, 1841, a fossil lobster now known as *Hoploparia dentata* (Roemer, 1841) (see generic "Remarks").

At Holthuis's suggestion, I compared the ovigerous female holotype of *Hippolysmata acicula* Rathbun, 1906, with the ovigerous female of similar size from *Albatross* station 5555 that I had originally identified as *Lysmata dentata* (De Haan). The only apparent differences are that (1) the Hawaiian specimen has only two postorbital teeth in the midline of the carapace, compared with three in the Philippine example, (2) the similarly long accessory antennular flagellum is composed of ten articles in *L. acicula* and only eight in the other, and (3) the second pereopod has 29 articles in *L. acicula*, 21 and 26 in the other. I am convinced from the current state of knowledge of the species of *Lysmata* that these two specimens represent a single species, especially as the anterodorsal region of the carapace appears slightly deformed in the Hawaiian specimen, as if it might have borne three postorbital teeth originally.

The probable synonymy of *L. acicula* with *L. affinis* Borradaile, 1915, denies the latter priority over the other synonyms of *L. dentata* (De Haan), but the earliest replacement name is obviously *Lysmata seticaudata* var. *ternatensis* De Man, 1902, if we accept the Holthuis (1947:64) synonymy. I am tempted to do so on the assumption that the subspecies type series is limited to the single, probably juvenile specimen cited at the opening of De Man's discussion (1902:846). That assumption would possibly defer the certainty of final determination of the identity of *L. ternatensis* until more of the growth stages of the species are known. Holthuis (in litt.), however, notes that the examination of De Man's type material might be desirable. He defines that material, in addition to "the juvenile male from Ternate" as "the four specimens that De Man mentioned in 1888 (*Archiv für Naturgeschichte*, 53:492) as *L. seticaudata*, and which in 1902 he placed in his new subspecies *Ternatensis*." He eliminates from the type series the "Japanese specimens of *L. seticaudata* of De Haan and Ortmann ... mentioned by De Man (1902)" because "he only thought them probably identical with his new subspecies and did not definitely identify them."

81. *Lysmata trisetacea* (Heller, 1861)

Hippolyte trisetacea Heller, 1861:29 [type locality: Red Sea].

Lysmata pusilla Heller, 1862b:287, pl. 3: fig. 26 [type locality: Red Sea].

Hippolysmata paucidens Rathbun, 1906:913, pl. 24: fig. 4 [type locality: Waikiki Beach, Oahu, Hawaii].

Lysmata chiltoni Kemp, 1914:110, pl. 6: figs. 1–4 [type locality: Meyer Island, Kermadec Islands, New Zealand].

Lysmata trisetacea.—Holthuis, 1947:19, 65.—Chace, 1962:614.

DIAGNOSIS.—Rostrum not overreaching antennular peduncle, rostral formula 1–2 + 2–3/1–2. Carapace with antennal

tooth fused with orbital angle, obliterating latter, without pterygostomian tooth. Antennule with stylocerite reaching as far as or slightly beyond distal margin of basal segment, dorsal flagellum with accessory flagellum as long as or longer than fused portion, composed of 8 articles. Antennal scale distinctly overreaching stout antennular peduncle, more than 3 times as long as wide, distolateral tooth falling slightly short of or slightly beyond distal margin of blade. Third maxilliped with exopod reaching nearly or quite to distal end of antepenultimate segment. First pereopod with chela $1\frac{1}{2}$ times as long as carpus. Second pereopod with carpus composed of 19–24 articles. Third pereopod with biunguiculate dactyl. Maximum postorbital carapace length fully 6 mm.

RANGE.—Red Sea and Kermadec Islands, New Zealand, to Micronesia, Hawaii, and Clipperton Island; littoral.

82. *Lysmata vittata* (Stimpson, 1860)

Hippolysmata vittata Stimpson, 1860:26 [type locality: Hong Kong].

Nauticaris unirecedens Bate, 1888:608, pl. 110: fig. 1 [type locality: Hong Kong].

Hippolysmata durbanensis Stebbing, 1921a:20, pl. 5 [type locality: Durban Bay, South Africa].

Hippolysmata (Hippolysmata) vittata.—Hayashi and Miyake, 1968b:156, fig. 17.—Bruce, 1990c:601, figs. 23–28.

DIAGNOSIS.—Rostrum not overreaching antennular peduncle, rostral formula 2–3 + 2–5/1–5. Carapace with antennal tooth not fused with orbital angle, with pterygostomian tooth. Antennule with stylocerite reaching about to midlength of basal segment, dorsal flagellum without accessory branch. Antennal scale reaching about as far as end of antennular peduncle, about 3 times as long as wide, distolateral tooth reaching about as far as distal margin of blade. Third maxilliped with exopod reaching fully as far as midlength of antepenultimate segment. First pereopod with chela about $1\frac{2}{5}$ times as long as carpus. Second pereopod with carpus composed of 15–31 articles. Third pereopod with biunguiculate dactyl. Maximum postorbital carapace length more than 7 mm.

RANGE.—Eastern Africa to Hong Kong, Japan, Philippines, Indonesia, and Australia; littoral to 54 meters.

REMARKS.—As currently conceived, *L. vittata* seems to be quite variable, especially in regard to the rostral formula and the number of articles in the carpus of the second pereopod.

**Lysmatella* Borradaile, 1915

Lysmatella Borradaile, 1915:206 [type species, by monotypy: *Lysmatella prima* Borradaile, 1915:209; gender: feminine].

DIAGNOSIS.—Integument not rigid. Rostrum (Figure 21a,b) armed dorsally and ventrally, without ventral blade or tongue-like lobe extending ventrally from lateral carina. Carapace (Figure 21a,b) not inflated, not abruptly depressed on frontal region, without dentate crest in midline at base of rostrum, without numerous appressed teeth on lateral surface, without supraorbital or subocular tooth posterodorsal to orbital angle, latter not large or obtuse, without hepatic tooth or branchiostegal tooth or denticles, but with marginal, unarticu-

lated antennal tooth and pterygostomian tooth. Abdomen (Figure 21c) with 1st pleuron entire, not bifurcate; 6th somite without prominent spines, without articulated plate at posteroventral angle and pleuron not curving around base of uropod. Telson (Figure 21d,e) not tapering to sharp posterior end, posterolateral angles not sharply produced, bearing 2 pairs of dorsolateral spines. Eyestalk (Figure 21f) not concealed by carapace, cornea not narrower than stalk. Antennule (Figure 21g,h) with stylocerite not in vertical plane, not bifid; 2nd segment without sharp, curved lateral tooth; 3rd segment without dorsodistal tooth on movable plate, dorsal flagellum slender, not short or brush-like, bearing minute, 2-segmented accessory "flagellum." Antennal peduncle not overreaching antennular peduncle, without 3 strong ventral spines; antennal scale (Figure 21i) barely overreaching antennular peduncle, lateral tooth not near midlength, lateral margin not spinose. Mandible (Figure 21j) without palp or incisor process. First maxilliped (Figure 21m) with caridean lobe clearly discrete from exopodal lash, epipod bilobate. Second maxilliped (Figure 21n) with terminal segment narrow and applied laterally to preceding segment, exopod not unusually wide with nonbilobate epipod and vestigial podobranch. Third maxilliped (Figure 21o,p) with distal segment not flattened, with epipod and coxal exite. Pereopods without exopods, epipods, or arthrobranchs. First pereopod (Figures 21q,r) with fingers shorter than palm, chela $1\frac{1}{3}$ times as long as carpus, latter not excavate to receive propodus, ischium distally produced. Second pereopods (Figure 21s) symmetrical, fingers shorter than palm, carpus subdivided into 20–24 articles. Third pereopod (Figure 21t,u) with dactyl and propodus not prehensile in functional males.

RANGE.—Maldives and Andaman islands, Japan, Philippines, and Indonesia; to a depth of 62 meters.

REMARKS.—*Lysmatella* differs from *Lysmata* only in the complete absence of epipods on any of the pereopods, compared with their strong development on the four anterior pairs in the latter genus.

Only one species of *Lysmatella* is known.

*83. *Lysmatella prima* Borradaile, 1915

FIGURE 21

Lysmatella prima Borradaile, 1915:209; 1917:404, pl. 58: fig. 7.

Hippolysmata (Lysmatella) prima.—Kemp, 1916:404.—Holthuis, 1947:72.

DIAGNOSIS.—See generic "Diagnosis" above.

MATERIAL.—PHILIPPINES. Off Jolo Island, Sulu Archipelago, sta 5139, 6°06'N, 121°02'30"E, 37 m, coral sand, 14 Feb (1313–1317), 12' Agassiz beam trawl, mud bag: 1 female [2.7]; sta 5142, 6°06'10"N, 121°02'40"E, 38 m, coral sand and shells, 15 Feb (1033–1044), 12' Agassiz beam trawl, mud bag: 3 females [2.6–3.2].—Near Siasi, Sulu Archipelago, sta 5146, 5°46'40"N, 120°48'50"E, 44 m, coral sand, shells, 16 Feb 1908 (1011–1031), 12' Agassiz beam trawl, mud bag: 7 females [3.3–4.9], 3 ovig. [4.8–4.9], 1 juv [2.0].—Off Tawitawi, Sulu Archipelago, sta 5152, 5°22'55"N, 120°15'45"E, 62 m, white sand, 18 Feb 1908 (1528–1543), 12' Agassiz beam trawl, mud

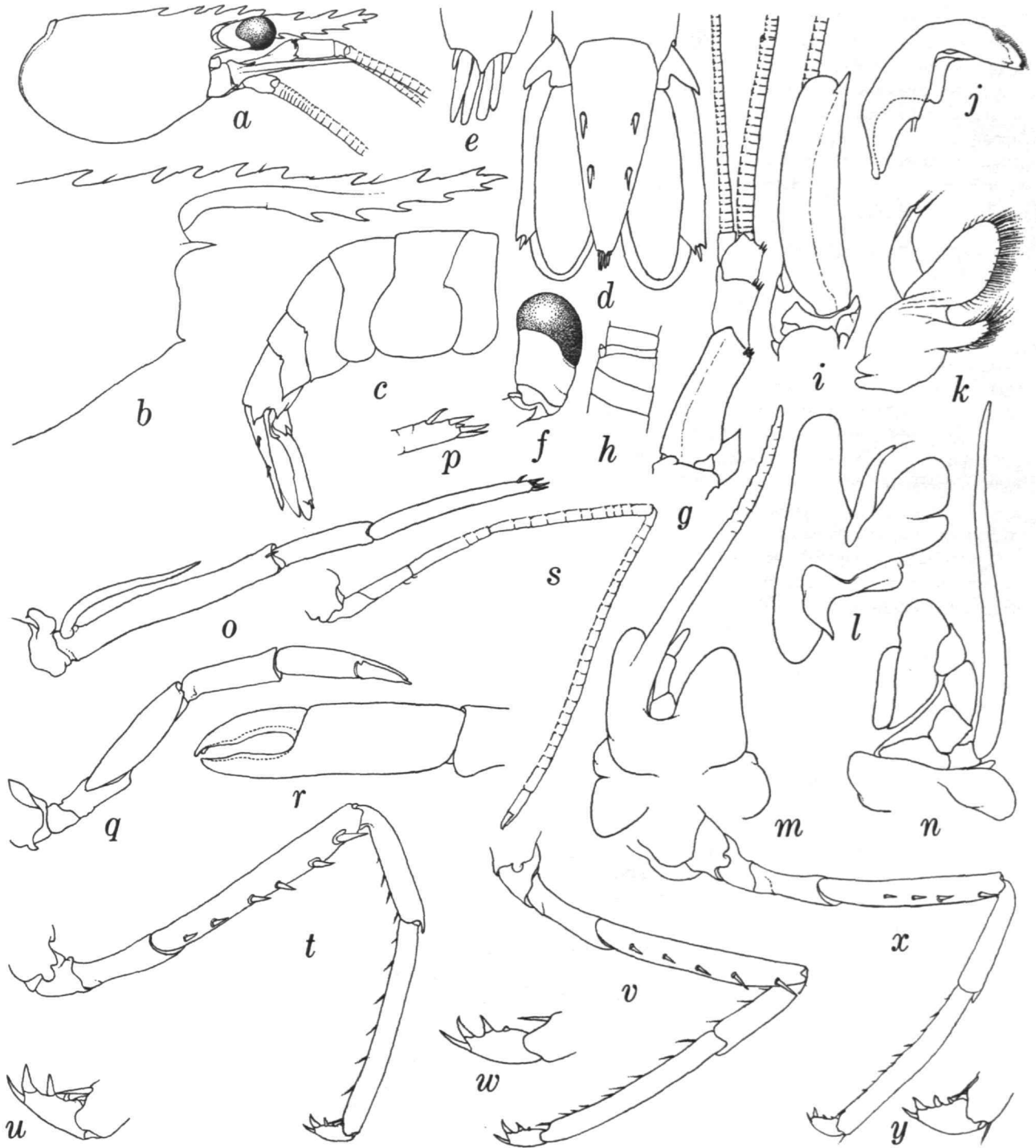


FIGURE 21.—*Lysmatella prima*, ovigerous female with carapace length of 4.9 mm from Albatross sta 5146: a, carapace and anterior appendages; b, anterior carapace; c, abdomen; d, telson and uropods; e, posterior end of telson; f, right eye; g, right antennule, dorsomesial aspect; h, same, accessory branch of dorsal flagellum; i, right antenna, dorsal aspect; j, right mandible; k, right 1st maxilla; l, right 2nd maxilla; m, right 1st maxilliped; n, left 2nd maxilliped; o, right 3rd maxilliped; p, same, distal end; q, right 1st pereopod; r, same, chela; s, right 2nd pereopod; t, right 3rd pereopod; u, same, dactyl; v, right 4th pereopod; w, same, dactyl; x, right 5th pereopod; y, same, dactyl.

bag: 1 ovig. female [4.5]; sta 5157, 5°12'30"N, 119°55'50"E, 33 m, fine sand, 21 Feb 1908 (0904–0909), 9' Johnston oyster dredge: 8 females (2.4–4.5), 1 ovig. [3.9].

RANGE.—See generic "Range" above. It may be significant, or merely coincidental, that two rather uncommon, monotypic hippolytid genera, *Gelastocaris* and *Lysmatella*, were taken during the *Albatross* Philippine Expedition only from a single identical area of the Sulu Archipelago.

Merguia Kemp, 1914

FIGURE 22

Merguia Kemp, 1914:121 [type species, by monotypy: *Hippolyte oligodon* De Man, 1888:277; gender: feminine].

DIAGNOSIS.—Integument not rigid. Rostrum armed dorsally, unarmed ventrally, without ventral blade or tongue-like lobe extending ventrally from lateral carina. Carapace not inflated, not abruptly depressed on frontal region, without dentate crest in midline at base of rostrum, without numerous appressed teeth on lateral surface, without supraorbital tooth or subocular tooth posterodorsal to orbital angle, latter not large or obtuse, without hepatic, branchiostegal or pterygostomial teeth, but with marginal, unarticulated antennal tooth. Abdomen with 1st pleuron entire, not bifurcate; 6th somite without prominent spines, without articulated plate at posteroventral angle and pleuron not curving around base of uropod. Telson not tapering to sharp posterior end, posterolateral angles not sharply produced, bearing 2 pairs of dorsolateral spines. Eyestalk not concealed by carapace, cornea not narrower than stalk. Antennule with stylocerite not in vertical plane, not bifid; 2nd segment without sharp lateral tooth; 3rd segment without dorsodistal tooth on movable plate, dorsal flagellum slender, not short or brush-like. Antennular peduncle not overreaching antennular peduncle, without 3 strong ventral spines; antennal scale not overreaching antennular peduncle, lateral tooth not near midlength, lateral margin not spinose. Mandible without palp or incisor process. First maxilliped with caridean lobe not very discrete from exopodal lash, epipod bilobate. Second maxilliped with terminal segment somewhat obliquely applied to preceding segment, exopod not unusually wide, with nonbilobate epipod but without podobranch. Third maxilliped with distal segment not flattened, with epipod and arthrobranch, but without exopod. Pereopods without exopods, epipods, or arthrobranchs. First pereopod with fingers shorter than palm, not terminating in distal spines, chela slightly longer than carpus, latter not excavate to receive propodus, ischium not much produced distally.

Second pereopods equal, fingers no longer than palm, carpus subdivided into 20–27 articles. Third pereopod with dactyl and propodus not prehensile in functional males.

RANGE.—Mergui Archipelago, Indonesia, and western Atlantic from Panama and Surinam to Estado de Paraiba, Brazil;

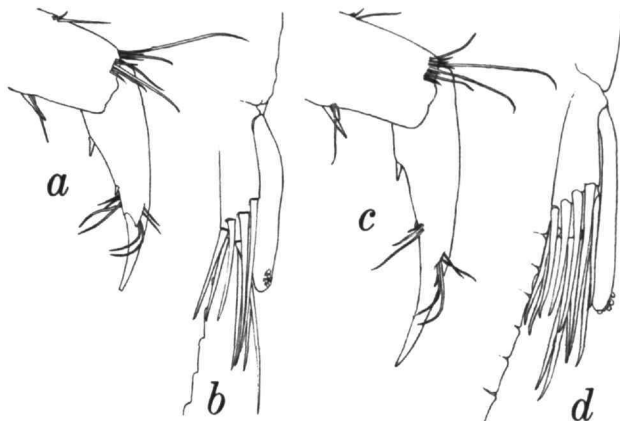


FIGURE 22.—Dactyl of right 3rd pereopod and right appendix masculina of *Merguia*, a,b, *M. oligodon*; c,d, *M. rhizophorae*: a,b, male with carapace length of 4.1 mm from Boera, Papua New Guinea (USNM 169678); c,d, male with carapace length of 4.0 mm from Galeta Island, Caribbean coast of Panama (USNM 127510).

from semiterrestrial habitats. In a personal communication, accompanied by the suggestion that I publish the information herein, C.B. Powell of the Department of Zoology, University of Port Harcourt, Port-Parcourt, Nigeria, has informed me that he found specimens of *Merguia* in high-salinity mangrove creeks in the eastern Niger Delta. Powell also made the pertinent comment that the Nigerian specimens might possibly be exotic rather than truly West African, because of their ability to survive semiterrestrial conditions (see Abele, 1970).

REMARKS.—Two nominal species of *Merguia* have been described: *M. oligodon* from the Mergui Archipelago and Indonesia and *M. rhizophorae* from Panama and Estado da Paraiba, Brazil, and possibly Surinam. In recording specimens of the latter species from Surinam, Holthuis (1959:109) noted that, in male specimens, "the dactylus of the last three pairs of pereopods is slender and unarmed" rather than bearing "two posterior spines" and being "less slender" as in the Brazilian holotype of *M. rhizophorae*. Comparison of these appendages in males of *Merguia* of similar size from New Guinea and Panama failed to reveal any significant differences (Figure 22a,c). The only structure that seems to disagree in these two specimens is the appendix masculina (Figure 22b,d), which bears eight long spines in the specimen from New Guinea and 12 in the Panamanian example, but Holthuis (1959, fig. 15n) shows only eight spines in the Surinam material. Obviously, further study will be required to determine whether these interesting shrimps that behave like insects belong to one, two, or three species.

84. *Merguia oligodon* (De Man, 1888)

Hippolyte oligodon De Man, 1888:277, pl. 18: figs. 1–6 [type locality: Elphinstone Island, Mergui Archipelago].

Merguia oligodon.—Kemp, 1914:121, pl. 7: figs. 8, 9.—Holthuis, 1947:75, fig. 15; 1958:231, figs. 1, 2.

DIAGNOSIS.—See generic "Diagnosis" above.

RANGE.—Mergui Archipelago and Indonesia; in semiterrestrial habitats.

REMARKS.—See generic "Remarks" above.

Mimocaris Nobili, 1903

Mimocaris Nobili, 1903:6 [type species, by monotypy: *Mimocaris heterocarpoides* Nobili, 1903:6; gender: feminine].

DIAGNOSIS.—Rostrum armed dorsally and ventrally, without ventral blade or tongue-like lobe extending ventrally from lateral carina. Carapace not inflated, not abruptly depressed on frontal region, with semblance of dentate crest in midline at base of rostrum, without numerous appressed teeth on lateral surface, without supraorbital tooth or subocular tooth postero-dorsal to orbital angle, latter not large or obtuse, without hepatic tooth or branchiostegal tooth or denticles, but with prominent, marginal, unarticulated antennal tooth and even larger pterygostomial tooth. Abdomen with 1st pleuron bifurcate; 6th somite with single paired distolateral spine, without articulated plate at posteroventral angle and pleuron not curving around base of uropod. Telson tapering to sharp posterior end, posterolateral angles not sharply produced. Eyestalk not concealed by carapace, cornea not narrower than stalk. Antennule with dorsal flagellum not short or brush-like. Antennal scale overreaching antennular peduncle, lateral tooth not near midlength, lateral margin not spinose. Mandible without palp or incisor process. Second pereopods symmetrical.

RANGE.—Sarawak, Malaysia, and east coast of Sumatra, Indonesia.

REMARKS.—Only one species is known.

85. *Mimocaris heterocarpoides* Nobili, 1903

Mimocaris heterocarpoides Nobili, 1903:6, fig. 2 [type locality: Pulau Burong, Sarawak, Malaysia, 1°44'N, 110°48'E or 1°44'N, 109°52'E].—Balss, 1933:86.

DIAGNOSIS.—See generic "Diagnosis" above.

RANGE.—Northwestern Borneo and eastern Sumatra; littoral.

**Paralebbeus* Bruce and Chace, 1986

Paralebbeus Bruce and Chace, 1986:237 [type species, by monotypy: *Paralebbeus zothecculatus* Bruce and Chace, 1986:238; gender: masculine].

DIAGNOSIS.—Integument not rigid. Rostrum unarmed on dorsal and ventral midline, without ventral blade or tongue-like lobe extending ventrally from lateral carina. Carapace inflated, especially in female, not abruptly depressed on frontal region, without dentate crest in midline at base of rostrum, without numerous appressed teeth on lateral surface, with or without

supraorbital tooth, without subocular tooth postero-dorsal to orbital angle, latter distinct but not large or obtuse, without hepatic tooth or branchiostegal tooth or denticles, but with marginal, unarticulated antennal tooth and, sometimes, small pterygostomial tooth. Abdomen with 1st pleuron entire, not bifurcate; 6th somite without prominent spines, without articulated plate at posteroventral angle and pleuron not curving around base of uropod. Telson not tapering to sharp posterior end, posterolateral angles not sharply produced, bearing 1–6 pairs of dorsolateral spines. Eyestalk not concealed by carapace, cornea not narrower than stalk, without ocellus. Antennule with stylocerite not in vertical plane, not bifid; 2nd segment without dorsodistal tooth on movable plate, dorsal flagellum not short or brush-like. Antennal peduncle not overreaching antennular peduncle, without 3 strong ventral spines; antennal scale overreaching antennular peduncle, lateral tooth not near midlength, lateral margin not spinose. Mandible with incisor process and 2-segmented palp. First maxilliped with caridean lobe clearly discrete from exopodal lash, epipod slightly bilobate. Second maxilliped with terminal segment narrow and applied somewhat diagonally to preceding segment, exopod not unusually wide, with nonbilobate epipod and podobranch. Third maxilliped with distal segment not noticeably flattened, with epipod but without exopod, arthrobranch, or prominent coxal exite. Pereopods without exopods, with terminally hooked epipods on three anterior pairs, without arthrobranchs. First pereopod with fingers shorter than palm, movable finger terminating in 2 blunt teeth, chela $2\frac{1}{2}$ – $3\frac{1}{2}$ times as long as carpus, latter shallowly excavate to receive propodus, ischium not produced into long saber-shaped process. Second pereopods symmetrical, fingers shorter than palm, carpus subdivided into 7 articles, 3rd and 7th longest. Third pereopod prehensile with dactyl and propodus not prehensile in male.

RANGE.—Philippines, Indonesia, and off northern Western Australia; fully documented specimen extracted from small chambers in hexactinellid sponges; 452–1023 meters.

REMARKS.—The justification for recognizing two distinct species among the seven admittedly variable specimens of *Paralebbeus* now known may be lost when additional material becomes available. Some of the characters offered in the following key will almost certainly prove to be fallacious in due time, but some of them, such as the arrangement of the stout spines on the distal segment of the third maxilliped and of the two terminal teeth on the movable finger of the first pereopod, seem to indicate that the Philippine female taken by the *Albatross* in 720 meters represents a new depth record for *P. zothecculatus* from the *Soela* cruises off northern Western Australia, whereas the Indonesian male and female trawled by the *Albatross* in 763 and 1023 meters may belong to a different species. It is to call attention to that possibility that I have decided to recognize a second species of the genus.

Key to Species of *Paralebbeus*

- Paired supraorbital teeth conspicuous [Figure 24c]; telson with 4–6 dorsolateral teeth on each side [Figure 24d]; mandible with distalmost tooth of incisor process not much longer than other teeth on distal margin [Figure 24g]; 3rd maxilliped with 10–12 stout spines arranged nearly in circle on distal segment [Figure 24n]; 1st pereopod with movable finger bearing 2 blunt distal teeth arising from nearly same level and reaching about same distance distally [Figure 24p,q]; merus of anteriorly extended 2nd pereopod distinctly overreaching merus of anteriorly extended 3rd pereopod [Figure 23] *86. *P. zotheculatus*
- Supraorbital teeth vestigial or absent [Figures 26c, 28c]; telson with 1–3 dorsolateral teeth on each side [Figures 26d, 28d]; mandible with distalmost tooth of incisor process distinctly longer than other teeth on distal margin [Figures 26g, 28h]; 3rd maxilliped with about 18 stout spines arranged in compressed oval pattern on distal segment [Figures 26n, 28n]; 1st pereopod with movable finger bearing 2 blunt distal teeth arising from different levels and reaching unequal distances distally [Figures 27b, 28g]; merus of anteriorly extended 2nd pereopod not distinctly overreaching merus of anteriorly extended 3rd pereopod [Figure 25a,b] *87. *P. zygius*, new species

*86. *Paralebbeus zotheculatus* Bruce and Chace, 1986

FIGURES 23, 24

Paralebbeus zotheculatus Bruce and Chace, 1986:238, figs. 3–6 [type locality: west of Imperieuse Reef, Western Australia, 17°30.1'S, 118°28.9'E; in hexactinellid sponge from 505–506 meters].

DIAGNOSIS.—See “Key to Species of *Paralebbeus*” above.

MATERIAL.—PHILIPPINES. Western end of Verde Island Passage, east of Lubang Islands, sta 5119, 13°45'05"N, 120°30'30"E, 720 m, green mud, sand, 6.5°C, 21 Jan 1908 (1324–1356), 12' Tanner beam trawl: 1 female [9.7].

RANGE.—Philippines and off Western Australia; 452–720 meters.

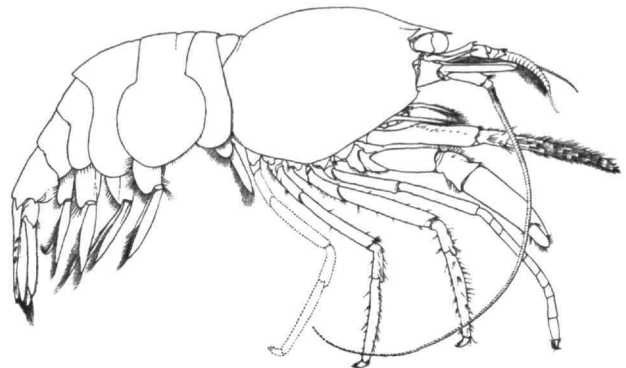


FIGURE 23.—*Paralebbeus zotheculatus*, female with carapace length of 9.7 mm from Albatross sta 5119.

*87. *Paralebbeus zygius*, new species

FIGURES 25–28

DIAGNOSIS.—See “Key to Species of *Paralebbeus*” above.

MATERIAL.—INDONESIA. West of Halmahera; sta 5618, 0°37'00"N, 127°15'00"E, 763 m, gray mud, 27 Nov 1909 (1444–1504), 12' Agassiz beam trawl: 1 male paratype [6.9].—Selat Butung, Sulawesi (Celebes), sta 5648, 5°35'00"S, 122°20'00"E, 1023 m, green mud, 4.0°C, 16 Dec 1909 (1629–1652), 12' Agassiz beam trawl: female holotype [11.7] (USNM 264050).

TYPE LOCALITY.—Selat Butung, Sulawesi (Celebes), Indonesia; 5°35'00"S, 122°20'00"E; 1023 meters.

RANGE.—Known only from the two Indonesian localities mentioned above.

ETYMOLOGY.—From the Greek *zygius*, *-a*, *-um*, “belonging to the yoke,” in reference to the pair of very similar species herein recognized in the genus *Paralebbeus*.

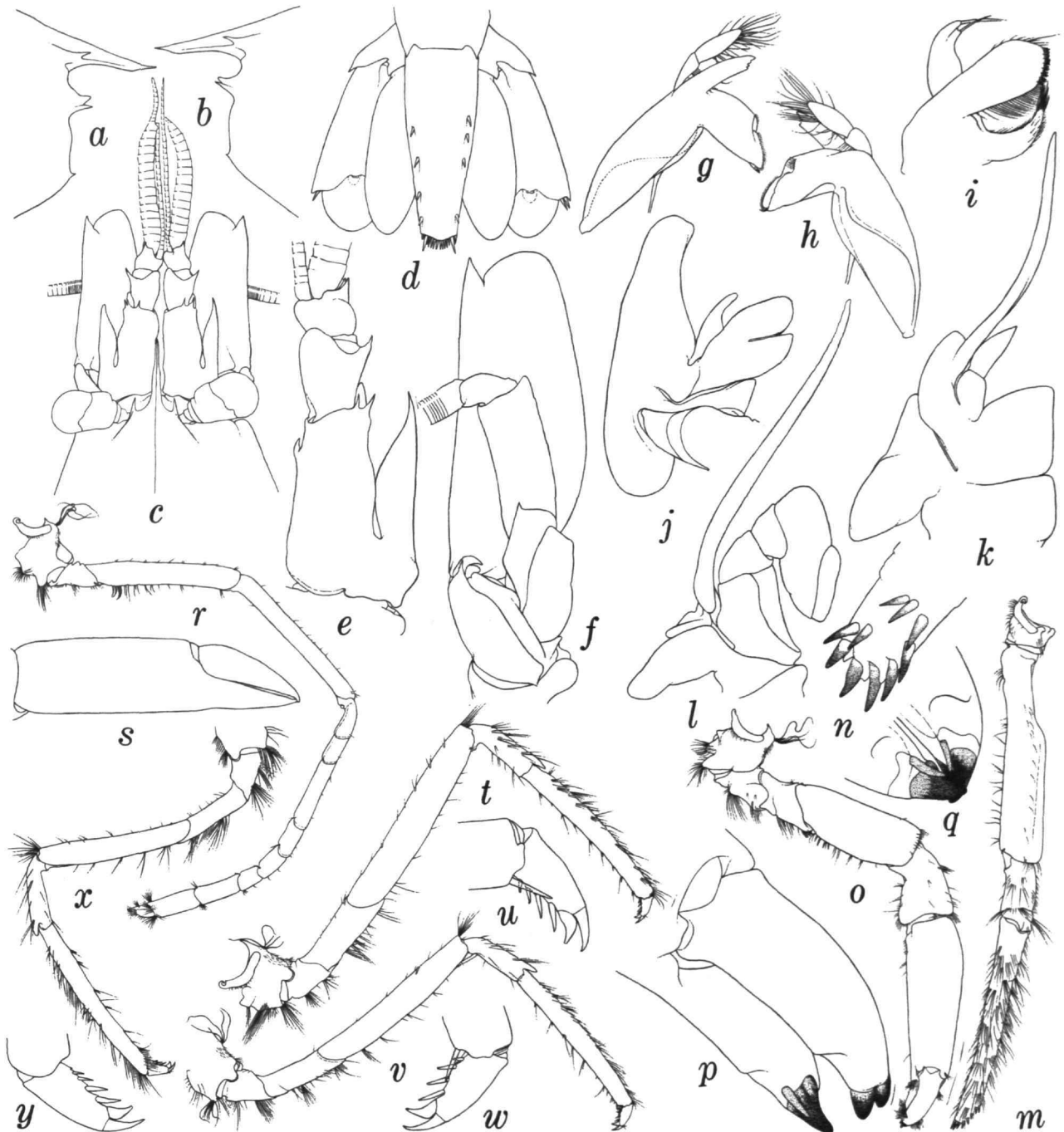


FIGURE 24.—*Paralebbeus zothecculatus*, female with carapace length of 9.7 mm from *Albatross* sta 5119: a, anterior carapace, right aspect; b, same, left aspect; c, anterior carapace and appendages, dorsal aspect; d, telson and uropods; e, right antennular peduncle, dorsomesial aspect; f, right antennal peduncle, ventral aspect; g, right mandible, aboral aspect; h, same, oral aspect; i, right 1st maxilla; j, right 2nd maxilla; k, right 1st maxilliped; l, right 2nd maxilliped; m, right 3rd maxilliped, lateral aspect; n, same, distal end, dorsal aspect; o, right 1st pereopod; p, same, fingers; q, same, tips; r, right 2nd pereopod; s, same, chela; t, right 3rd pereopod; u, same, dactyl; v, right 4th pereopod; w, same, dactyl; x, left 5th pereopod; y, same, dactyl.

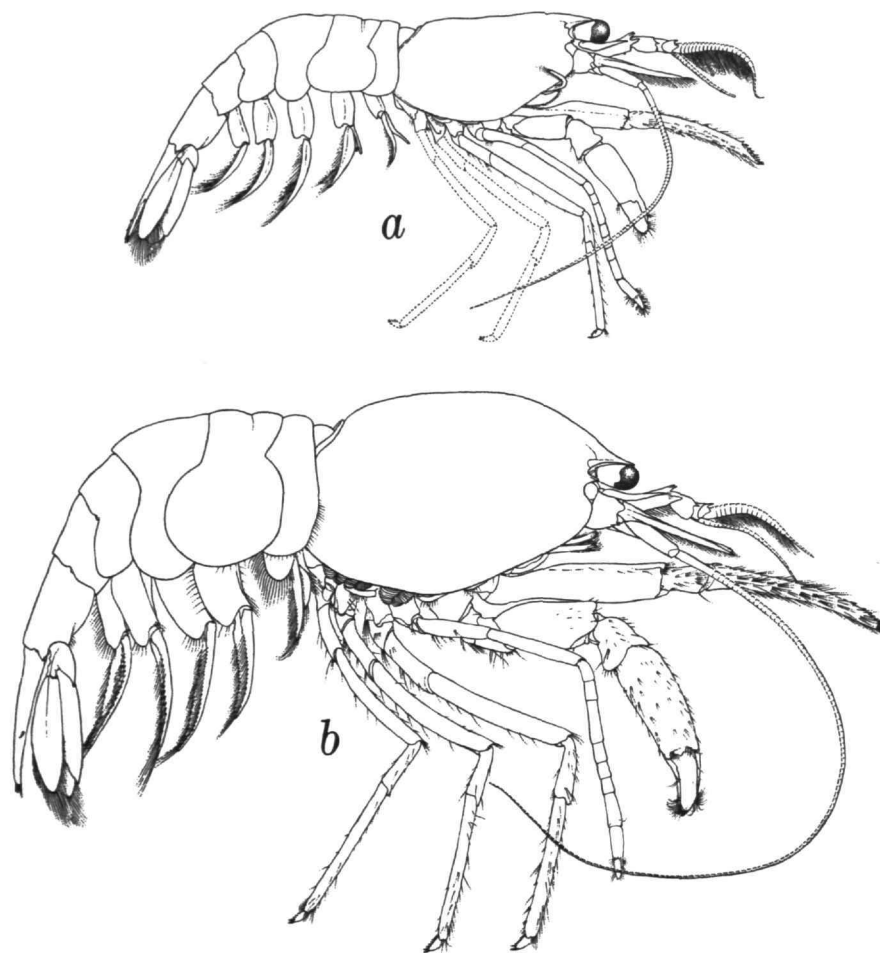


FIGURE 25.—*Paralebbeus zygius*, new species: *a*, male paratype from Molucca Passage, Indonesia, *Albatross* sta 5618, carapace length 6.9 mm; *b*, female holotype from Selat Butung, Celebes, Indonesia, *Albatross* sta 5648, carapace length 11.7 mm.

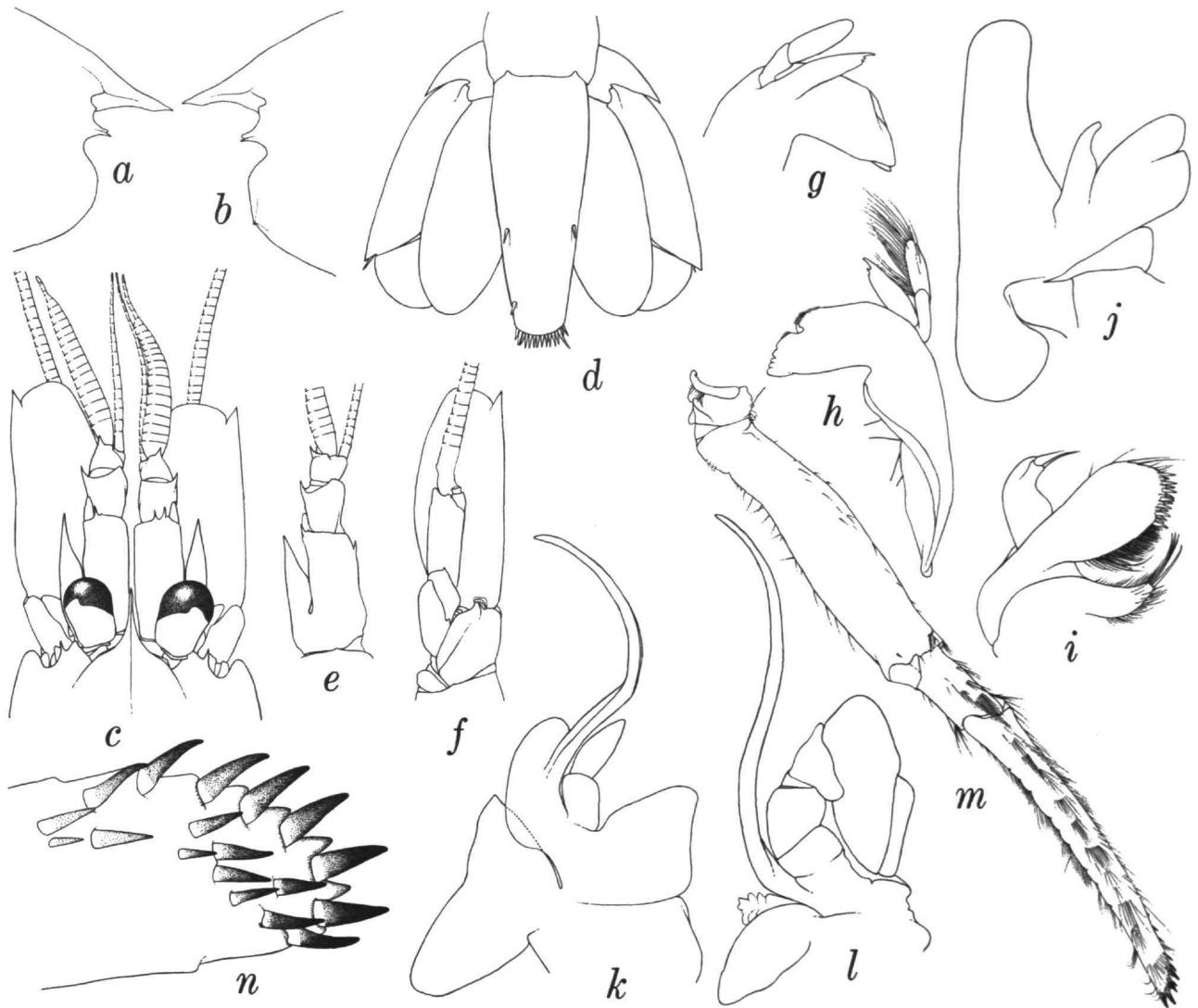


FIGURE 26.—*Paralebbeus zygius*, new species, female holotype with carapace length of 11.7 mm from *Albatross* sta 5648: *a*, anterior carapace, right aspect; *b*, same, left aspect; *c*, anterior carapace and appendages, dorsal aspect; *d*, telson and uropods; *e*, left antennular peduncle, dorsomesial aspect; *f*, left antennular peduncle, ventral aspect; *g*, right mandible, aboral aspect; *h*, same, oral aspect; *i*, right 1st maxilla; *j*, right 2nd maxilla; *k*, right 1st maxilliped; *l*, right 2nd maxilliped; *m*, right 3rd maxilliped, lateral aspect; *n*, same, distal end, dorsal aspect.

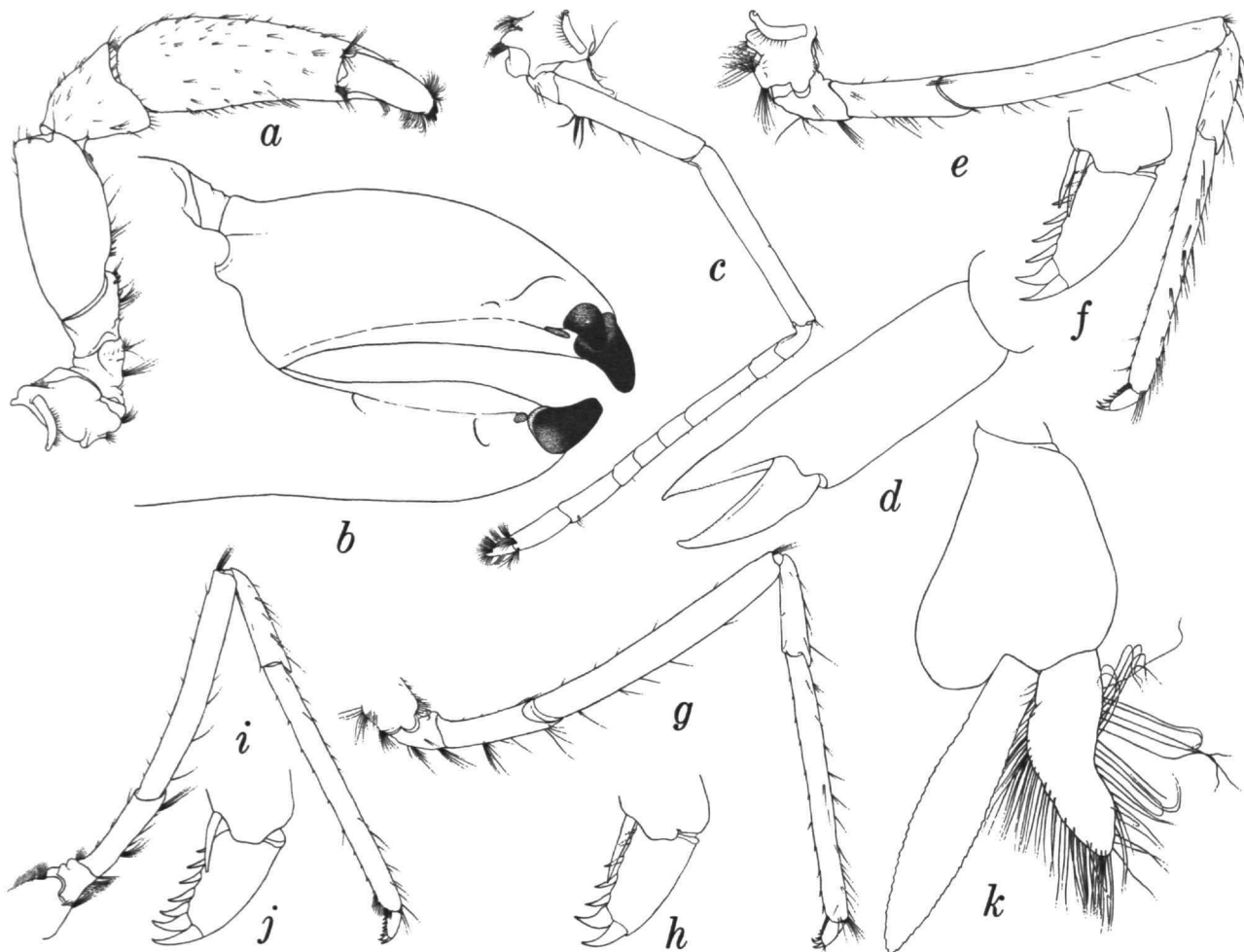


FIGURE 27.—*Paralebbeus zygius*, new species, female holotype with carapace length of 11.7 mm from *Albatross* 5648: *a*, right 1st pereopod; *b*, same, fingers; *c*, right 2nd pereopod; *d*, same, chela; *e*, right 3rd pereopod; *f*, same, dactyl; *g*, right 4th pereopod; *h*, same, dactyl; *i*, right 5th pereopod; *j*, same, dactyl; *k*, right 1st pleopod.

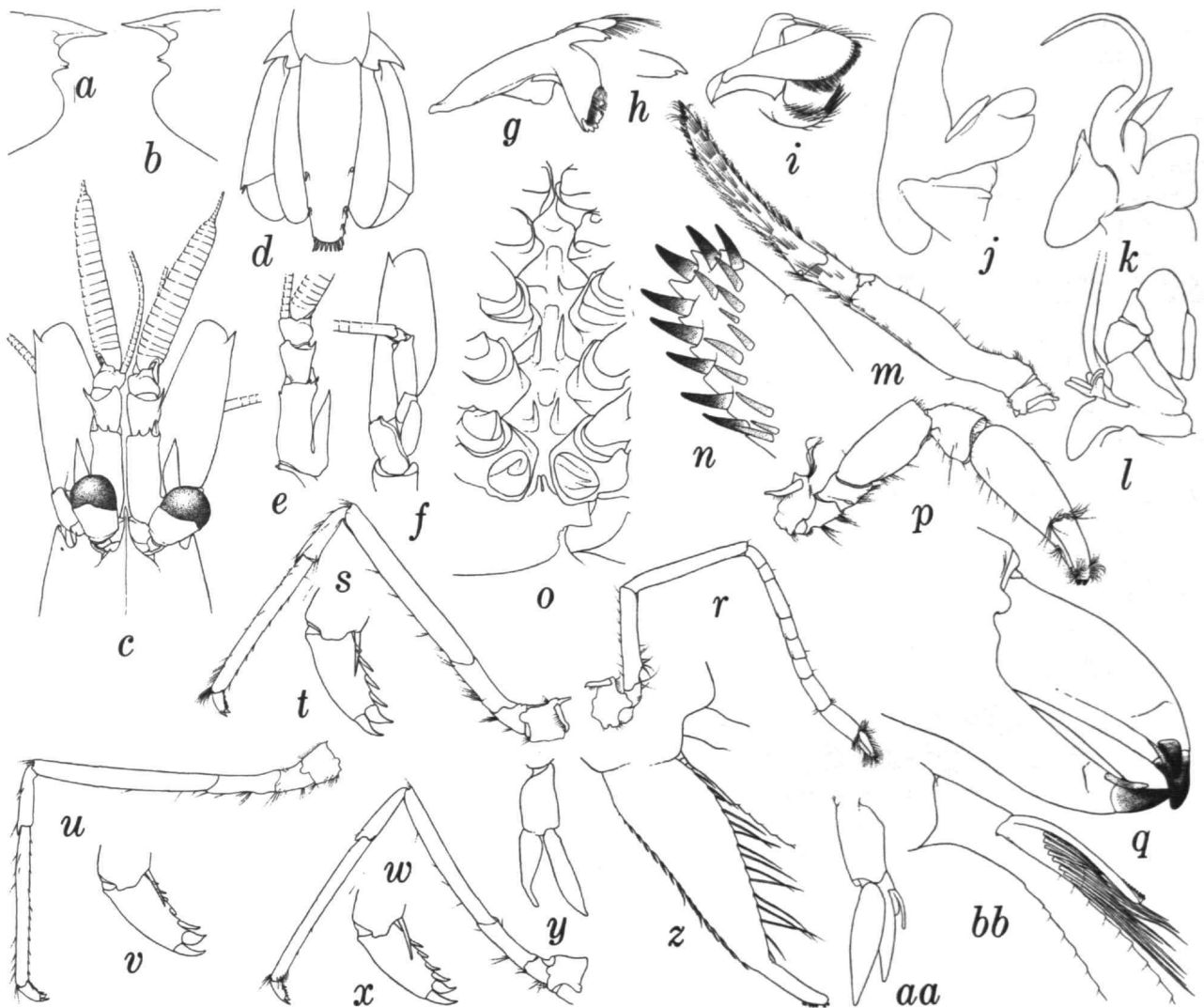


FIGURE 28.—*Paralebbeus zygius*, new species, male paratype with carapace length of 6.9 mm from *Albatross* sta 5618: a, anterior carapace, right aspect; b, same, left aspect; c, anterior carapace and appendages, dorsal aspect; d, telson and uropods; e, right antennular peduncle, dorsomesial aspect; f, right antennal peduncle, ventral aspect; g, right mandible, aboral aspect; h, same, end of incisor process; i, right 1st maxilla; j, right 2nd maxilla; k, right 1st maxilliped; l, right 2nd maxilliped; m, right 3rd maxilliped, lateral aspect; n, same, distal end, dorsal aspect; o, thoracic sternum; p, right 1st pereopod; q, same, fingers; r, right 2nd pereopod; s, left 3rd pereopod; t, same, dactyl; u, left 4th pereopod; v, same, dactyl; w, left 5th pereopod; x, same, dactyl; y, right 1st pleopod, posterior aspect; z, same, endopod; aa, right 2nd pleopod; bb, same, appendix masculina and appendix interna.

Parhippolyte Borradaile, 1900

Parhippolyte Borradaile, 1900:414 [type species, by monotypy: *Parhippolyte uveae* Borradaile, 1900:414; gender: feminine].

DIAGNOSIS.—Integument not rigid. Rostrum armed dorsally and ventrally, without strong ventral blade or tongue-like lobe extending ventrally from lateral carina. Carapace not inflated, not abruptly depressed on frontal region, without dentate crest

in midline at base of rostrum, without appressed teeth on lateral surface, without supraorbital tooth, with subocular tooth posterodorsal to orbital angle, latter distinct, rather large and obtuse or rounded, without antennal or hepatic tooth, with marginal branchiostegal tooth, branchiostegal margin not denticulate, without pterygostomial tooth. Abdomen with somites not dorsally carinate or posteromesially dentate, 1st pleuron entire, not bifurcate; 6th somite without proximal

spines, without articulated plate at posteroventral angle and pleuron not curving around base of uropod. Telson not tapering regularly to sharp posterior end, posterolateral angles not sharply produced, bearing 2 pairs of dorsolateral spines. Eystalk movable, not concealed by carapace. Stylocerite in vertical plane, not bifid; 3rd segment of antennular peduncle without movable plate; dorsal flagellum not short or brush-like. Antennal scale overreaching antennular peduncle, lateral tooth not near midlength, lateral margin not spinose. Mandible without incisor process, with 3-jointed palp. Second maxilliped with terminal segment elongate and applied somewhat laterally to preceding segment, exopod not unusually wide, with nonbilobate epipod and podobranch. Third maxilliped with terminal segment not flattened, with epipod, exopod, and arthrobranch. Pereopods without exopods, with epipods and arthrobranches on 4 anterior pairs; 1st pereopod with fingers shorter than palm, movable finger not terminating in more than 2 blunt teeth; 2nd pereopods fairly symmetrical, fingers shorter than palm, carpus subdivided into more than 30 articles; 3rd

pereopod with dactyl and propodus not prehensile in males, propodus subdivided, carpus not very spinose.

RANGE.—Anchialine pools from western Indian Ocean to Hawaii in the tropical Pacific, and Bermuda in the western Atlantic.

REMARKS.—As suggested by the following key, the genus *Parhippolyte* is currently believed to comprise only three species. Although a thorough comparative study of *P. uveae* from populations in different parts of its extensive range would be desirable as collections accumulate, it is very possible that no change in that conclusion is likely. The variability noted by Wear and Holthuis (1977:128) in eight Philippine specimens from a single pool, as regards the number of ventral rostral teeth, the presence or absence and the disposition of the spine on the antennal lobe (which is assumed to be of prime generic or even potentially familial importance), and the intensity and extent of the red coloration of the animal would seem to allude to a variable species that could adapt readily to environmental inconstancy over a broad range.

Key to Species of *Parhippolyte*

1. Suborbital lobe bluntly triangular; appendix masculina on male 2nd pleopod distinctly longer than appendix interna *P. misticia* (Clark, 1989:446, figs. 1–4)
(Palau, Caroline Islands; cave)
- Suborbital lobe rounded; appendix masculina on male 2nd pleopod not overreaching appendix interna, except by length of distal spines 2
2. Suborbital lobe broader than long; appendix masculina on male 2nd pleopod reaching as far as distal end of appendix interna, distal spines not included *P. sterreri* (C.W. Hart and Manning, 1981:442, figs. 1–28)
(Bermuda; anchialine cave)
- Suborbital lobe longer than broad; appendix masculina on male 2nd pleopod not reaching as far as distal end of appendix interna, distal spines not included 88. *P. uveae*

88. *Parhippolyte uveae* Borradaile, 1900

Parhippolyte uveae Borradaile, 1900:414, pl. 38 [type locality: Uvea, Loyalty Islands].—Manning and Hart, 1984:657, fig. 4.

Ligur uveae.—Gordon, 1936b:102, fig. 1.—Monod, 1968:772, figs. 1–8.—Wear and Holthuis, 1977:125, fig. 1, pls. 1, 2.—Maciolek, 1983:607, 609, 612, 616, figs. 1, 2.

DIAGNOSIS.—Suborbital lobe rounded, longer than broad, sometimes with marginal denticle in addition to suborbital tooth. Appendix masculina shorter than appendix interna, distal spines not included. Maximum postorbital carapace length at least 27 mm.

RANGE.—Aldabra (western Indian Ocean), Tiniguiban Island (between Panay Gulf and Guimaras Strait, Philippines), Halmahera (Indonesia), Palau (Caroline Islands), Loyalty Islands, Fiji Archipelago, Bikini (Marshall Islands), Funafuti

(Ellice Islands), and Hawaii; in anchialine pools.

REMARKS.—See generic "Remarks." It also should be noted that *P. uveae* is very closely related to *P. sterreri* from Bermuda.

**Saron Thallwitz*, 1891

Saron Thallwitz, 1891a:99 [type species, by monotypy: *Hippolyte gibberosus* H. Milne Edwards, 1837:378 (= *Palaemon marmoratus* Olivier, 1811:663); gender: masculine].

DIAGNOSIS.—Integument not especially rigid. Rostrum overreaching antennular peduncle, armed dorsally and ventrally, with strong ventral blade, not projecting between bases of antennules, or series of strong ventral teeth, without tongue-like lobe extending ventrally from lateral carina. Carapace without discrete dentate crest in midline at base of rostrum, without longitudinal lateral carinae, without appressed

teeth on lateral surface, without supraorbital tooth, without abrupt depressions on frontal or orbital regions, without subocular tooth posterodorsal to orbital angle, latter not large, with antennal tooth, latter neither submarginal nor basally articulated, without hepatic tooth, with branchiostegal tooth, branchiostegal margin not denticulate, with pterygostomial tooth. Abdominal somites not dorsally carinate or posteromedially dentate, 1st pleuron not bifurcate, 4th and 5th pleura pointed, not denticulate, 6th somite not armed with 7 strong spines, with plate articulated at posteroventral angle, pleuron not curving around base of uropod. Telson not tapering to sharp point, posterior margin subtruncate or slightly concave, posterolateral angles not sharply produced. Eyestalk movable, not concealed by carapace, cornea with ocellus. Antennule with stylocerite not lying in vertical plane, not bifid or semicircular; 2nd peduncular segment without sharp, curved lateral tooth; 3rd segment without sharp dorsodistal tooth or movable dorsodistal plate; dorsolateral flagellum proximally stout but not unusually short or brush-like. Antennal peduncle sometimes overreaching antennular peduncle, not armed with 3 strong ventral spines; antennal scale overreaching antennular peduncle, without lateral tooth near midlength or small movable lateral spines. Mandible with both palp and incisor process. First maxilliped with caridean lobe quite distinct from

exopodal lash, epipod bilobate. Second maxilliped with terminal segment elongate and applied somewhat laterally to preceding segment, exopod not unusually wide, with somewhat bilobate epipod and with podobranch. Third maxilliped with distal segment not flattened, with exopod, epipod, small arthrobranch, and coxal exite. Pereopods without exopods, with epipods and arthrobranches on 1st to 4th pairs, epipods with terminal hook. First pereopod with fingers shorter than palm, not terminating in interlocking spines, chela 1 1/2 to 2 1/3 times as long as carpus, carpus not deeply excavate for reception of chela. Second pereopods symmetrical, fingers shorter than palm, carpus subdivided into 10-17 articles. Third pereopod with dactyl not gradually tapering to acute apex, armed with teeth on flexor margin, dactyl and propodus not prehensile in functional males, propodus not subdivided, carpus not conspicuously spinose. Uropod with lateral margin of lateral branch terminating in small fixed tooth with larger movable spine mesial to it.

RANGE.—Red Sea and eastern Africa to Hawaii, Marquesas Islands, and Tuamotu Archipelago; littoral.

REMARKS.—All four of the known species of *Saron* have been recorded from the Philippine-Indonesian region. They may be distinguished in the following key adapted from the lists of characters provided by Hayashi (1989:29, 30).

Key to Species of *Saron*

1. Rostrum usually longer than carapace; antennal peduncle with inconspicuous distoventral tooth on basicerite; 2nd pereopod with 9-13 carpal articles; 5th pereopod with 1 or 2 subdistal meral spines 2
- Rostrum usually shorter than carapace; antennal peduncle with prominent distoventral tooth on basicerite; 2nd pereopod with 14-17 carpal articles; 5th pereopod without subdistal meral spine 3
2. Orbital margin single; antennular peduncle without erect spine on 3rd segment; 2nd pereopod with movable finger not finely serrate on opposable margin *90. *S. marmoratus*
- Orbital margin double; antennular peduncle with erect spine on 3rd segment; 2nd pereopod with movable finger finely serrate on opposable margin 91. *S. neglectus*
3. Rostrum dorsally concave, curving upward in distal 1/2, 2/5 to 3/5 as deep as long, ventral teeth decreasing in size anteriorly 89. *S. inermis*
- Rostrum dorsally convex, curving downward in distal 1/2, 4/5 as deep as long, ventral teeth subequal in size 92. *S. rectirostris*

89. *Saron inermis* Hayashi, 1983

Saron sp. Grosskopf, 1982:381, 1 figure.
Saron inermis Hayashi, 1983:117 [type locality: Indonesia]; 1989:27, figs. 5-8, photos 2, 3.

DIAGNOSIS.—Rostrum shorter than carapace, curved upward in distal 1/2. Carapace with double orbital margin. Antennular peduncle without erect spine on 3rd segment. Antennal peduncle with prominent distoventral tooth. Second pereopod with movable finger smooth, not finely serrate, on opposable

margin, carpus composed of 14-17 articles. Fifth pereopod without subdistal spine on merus. Maximum postorbital carapace length about 12 mm.

RANGE.—Okinawa and Indonesia.

***90. *Saron marmoratus* (Olivier, 1811)**

Palaemon marmoratus Olivier, 1811:663 [type locality: Australia].
Hippolyte gibberosus H. Milne Edwards, 1837:378 [type locality: Australia].
Hippolyte Leachii Guérin-Méneville, 1838:37 [type locality: Kusaie, Caroline Islands].

Hippolyte Hemprichii Heller, 1861:29 [type locality: Red Sea].

Hypolite Kraussii Bianconi, 1869:200, pl. 10: fig. 2a [type locality: Mozambique].

Saron marmoratus.—Ortmann, 1894:15.—Holthuis, 1947:25.—Healy and Yaldwyn, 1970:5 [color photo].—Debelius, 1984:60 [color photo].

Nauticaris grandirostris Pearson, 1905:79, pl. 1: fig. 6 [type locality: Galle, Sri Lanka].

DIAGNOSIS.—Rostrum usually longer than carapace, curved upward. Carapace with single orbital margin. Antennular peduncle without erect spine on 3rd segment. Antennal peduncle with basicerite lacking prominent distoventral tooth. Second pereopod with movable finger smooth, not finely serrate, on opposable margin, carpus composed of 9–13 articles. Fifth pereopod with 2 subdistal spines on merus. Fourth pleopod with appendix interna attached to endopod over much of length. Maximum postorbital carapace length about 13 mm.

MATERIAL.—SOUTH CHINA SEA. Southeast of Hong Kong, near sta 5300, 20°31'N, 115°49'E, from seaweed: 1 male [4.7].

PHILIPPINES. Maculabu Island [14°24'N, 122°49'E], 14 Jun 1909: 2 ovig. females [6.0, 9.1].—Canimo Island [14°07'N, 123°04' E], tide pool, 15 Jun 1909: 2 males [8.8, 8.8] 1 ovig. female [7.9].—Batan Island [13°15'N, 124°00'E], tide pool, 5 Jun 1909: 1 ovig. female [7.0].

INDONESIA. Tomahu Island, Buru [3°14'S, 126°04'E], tide pools: 2 males [6.1, 6.5].

RANGE.—Red Sea and eastern Africa to Hawaii, Marquesas Islands, and Tuamotu Archipelago (the type locality of Australia cited for *Palaemon marmoratus* and *Hippolyte gibberosus* is uncertain); littoral.

91. *Saron neglectus* De Man, 1902

Saron neglectus De Man, 1902:854, pl. 26: fig. 58 [type locality: Ternate, Indonesia].—Holthuis, 1947:30.—Miyake and Hayashi, 1966:146, figs. 2, 3d-f.

DIAGNOSIS.—Rostrum usually longer than carapace, curved upward. Carapace with double orbital margin. Antennular peduncle with erect spine on 3rd segment. Antennal peduncle with basicerite lacking prominent distoventral tooth. Second pereopod with movable finger finely serrate on opposable margin, carpus composed of 9–13 articles. Fifth pereopod with 1 subdistal spine on merus. Fourth pleopod with appendix interna attached to endopod over much of length. Maximum postorbital carapace length more than 7 mm.

RANGE.—Red Sea and eastern Africa to Johnstone Island; littoral.

92. *Saron rectirostris* Hayashi, 1984

Saron rectirostris Hayashi, 1984:116 [type locality: Indonesia]; 1989:23, figs. 1–4, photo 1].

DIAGNOSIS.—Rostrum shorter than carapace, dorsal margin curved downward. Carapace with double orbital margin.

Antennular peduncle without erect spine on 3rd segment. Antennal peduncle with prominent distoventral tooth. Second pereopod with movable finger smooth, not finely serrate, on opposable margin, carpus composed of 14–17 articles. Fifth pereopod without subdistal spine on merus. Fourth pleopod with appendix interna attached to endopod only at base. Maximum postorbital carapace length fully 12 mm.

RANGE.—Indonesia.

Thor Kingsley, 1878

Thor Kingsley, 1878b:94 [type species, by monotypy: *Thor floridanus* Kingsley, 1878b:95; gender: masculine].

DIAGNOSIS.—Integument not rigid. Rostrum not overreaching antennular peduncle, armed dorsally with 28 teeth, ventrally with 0–2, without ventral blade, without tongue-like lobe extending ventrally from lateral carina. Carapace without discrete dentate crest in midline at base of rostrum, without longitudinal lateral carinae, without appressed teeth on lateral surface, without abrupt depressions on frontal or orbital regions, without subocular tooth posterodorsal to orbital angle, latter not large, with antennal tooth, latter not basally articulated, without hepatic tooth, without branchiostegal tooth or denticles, usually without pterygostomial tooth. Abdominal somites not dorsally carinate or posteromesially dentate, 1st pleuron not bifurcate, 4th and 5th pleura pointed, not denticulate; 6th somite not armed with 7 strong spines, without plate articulated at posteroventral angle, pleuron not curving around base of uropod. Telson not tapering gradually to sharp point, posterolateral angles not sharply produced. Eyestalk movable, not concealed by carapace, cornea with ocellus. Antennule with stylocerite often lying in vertical plane, not bifid or semicircular; 3rd peduncular segment with movable dorsodistal plate; dorsolateral flagellum stout, brush-like. Antennal peduncle seldom overreaching antennular peduncle, not armed with 3 strong ventral spines; antennal scale overreaching antennular peduncle, without lateral tooth near midlength or small movable lateral spines. Mandible without palp, with incisor process. First maxilliped with caridean lobe usually discrete from exopodal lash, epipod bilobate. Second maxilliped with terminal segment elongate triangular and applied somewhat diagonally to preceding segment, exopod not unusually wide. Third maxilliped with distal segment not flattened, with exopod, usually with epipod and coxal endite, without arthrobranch. Pereopods without exopods, epipods, or arthrobranches. First pereopod with fingers shorter than palm, not terminating in interlocking spines, chela $1^{2/5}$ to $1^{9/10}$ as long as carpus, carpus not deeply excavate for reception of chela. Second pereopods symmetrical, fingers shorter than palm, carpus subdivided into 6 (or 7) articles. Third pereopod with dactyl and propodus prehensile in functional males. Fourth and

5th pereopods with dactyl not gradually tapering to acute apex, biunguiculate, armed with spines proximally on flexor margin, propodus not subdivided. Uropod with lateral margin of lateral branch terminating in fixed tooth with longer, movable spine mesial to it.

RANGE.—Panropical from Red Sea and South Africa to Ascension Island, South Atlantic; to a depth of 58 meters. Thus far, the genus is unreported from the eastern Atlantic.

REMARKS.—There seems to be little doubt that the species described by Borradaile (1915:208) as *Thor maldivensis* and subsequently consistently recognized by that name cannot be accommodated in this genus. It differs from the type species

and the other species assigned to the genus by (1) the presence of only a single tooth on the dorsal margin of the rostrum and none on the concave ventral margin, (2) six, rather than two to four, posterior spines on the telson, (3) grossly “sexually” dimorphic first pereopods, (4) two, rather than commonly three to six spines (proximal to the terminal pair) on the flexor margins of the dactyls of the fourth and fifth pereopods, and (5) most significantly, no vestige of an appendix masculina on the otherwise somewhat modified endopod of the second pleopod, rather than the prominent, densely setose appendix characteristic of *Thor*. The ten species remaining in that genus after this deduction may be distinguished by the following key.

Key to Species of *Thor*

1. Supraorbital tooth distinct 2
 Supraorbital tooth typically reduced to indistinct protuberance or absent 3
2. Telson with posterior margin mesially acute and armed with 2 pairs of spines and 1 mesial pair of plumose spines or setae; 4th and 5th pereopods with dactyl fully 3 times as long as wide *T. spinipes* (Bruce, 1983b:1, figs. 1–6)
 (Cobourg Peninsula, Northern Australia; littoral)
 Telson with posterior margin convex, not mesially acute, armed with 2 pairs of spines and 2 mesial pairs of plumose setae; 4th and 5th pereopods with dactyl twice as long as wide 96. *T. spinosus*
3. Carapace with anterolateral margin obscurely angulate 4
 Carapace with anterolateral margin rounded 5
4. Carapace with minute pterygostomian tooth; telson bearing 4 pairs of posterior spines; antennal scale with distolateral tooth not nearly overreaching blade; 1st pereopod with chela not tapered or strongly compressed 93. *T. amboinensis*
 Carapace without pterygostomian tooth; telson bearing 3 pairs of posterior spines; antennal scale with distolateral tooth slightly overreaching blade; 1st pereopod with chela tapered and clearly compressed
 *T. marguitae* (Bruce, 1978:159, figs. 1–6)
 (Heron Island, Capricorn Islands, Australia)
5. Telson with 1 pair of barely visible lateral spines in distal 1/4 of length
 94. *T. intermedius*
 Telson with 2–5 pairs of distinct dorsolateral spines 6
6. Antennular peduncle without lateral projection near proximal end of stylocerite 95. *T. paschalis*
 Antennular peduncle with lateral protuberance near proximal end of stylocerite 7
7. First pereopod with 1 or 2 small spines in distal 1/2 of flexor margin of merus *T. dobkini* (Chace, 1972:133, fig. 57)
 (Western Atlantic from North Carolina to Yucatan and north coast of Cuba; to a depth of 14 meters)
 First pereopod with distal 1/2 of flexor margin of merus unarmed 8

8. Telson usually bearing 5 pairs of dorsolateral spines; 2nd pereopod with 6th carpal article longest; 4th and 5th pereopods with flexor member of 2 terminal spines on dactyl wider than extensor member
 *T. algicola* (Wicksten, 1987:27, figs. 1-3)
 (Eastern Pacific from Gulf of California
 to Panama; to a depth of 20 meters)
- Telson usually bearing 3 or 4 pairs of dorsolateral spines; 2nd pereopod with 3rd carpal article longest; 4th and 5th pereopods with 2 terminal spines on dactyl subequal 9
9. Fourth and 5th pereopods with dactyl usually armed with 4 or 5 spinules on flexor margin proximal to distal pair of strong spines; eggs large and few, increasing in major diameter during development from 0.66 to 1.40 mm
 *T. floridanus* (Kingsley, 1878b:95)
 (Western Atlantic from North Carolina
 to Yucatan; to a depth of 58 meters)
- Fourth and 5th pereopods with dactyls usually armed with 3 spinules on flexor margin proximal to distal pair of strong spines; eggs numerous and not very large, increasing in major diameter during development from 0.36 to 0.73 mm
 *T. manningi* (Chace, 1972:137, figs. 59-61)
 (Western Atlantic from Bermuda and North
 Carolina to Alagoas, Brazil, and Ascension
 Island; to a depth of 44 meters)

93. *Thor amboinensis* (De Man, 1888)

Hippolyte amboinensis De Man, 1888:535 [type locality: Ambon, Indonesia].
Thor discosomatis Kemp, 1916:388, fig. 1, pl. 36: fig. 1 [type locality: Port Blair, Andaman Islands].
Thor amboinensis.—Holthuis, 1947:50.—Chace, 1972:130, figs. 55, 56.

DIAGNOSIS.—Rostral formula: 0-1 + 1-3/0-1. Carapace without supraorbital tooth, with anterolateral margin obscurely angulate, with minute pterygostomial tooth. Telson with inconspicuous mesial tooth on posterior margin, with 3 or 4 pairs of dorsolateral and 4 pairs of posterior spines. Antennular peduncle with blunt lateral projection near proximal end of stylocerite. Antennal scale with distolateral tooth not reaching level of distal margin of blade. First pereopod with chela not distinctly more slender than carpus, not tapered or strongly compressed, merus unarmed on flexor margin. Second pereopod with 3rd article of carpus longest. Fourth and 5th pereopods with dactyl 3 times as long as high, armed with 3 or 4 spines proximal to terminal pair, flexor member of that pair not clearly stouter than extensor member. Appendix masculina not overreaching endopod of 2nd pleopod. Egg size increasing in major diameter from 0.48 in newly laid egg to 0.70 at maturity. Maximum postorbital carapace length more than 2.3 mm.

RANGE.—Kenya, Madagascar, Bay of Bengal, Japan, Indonesia, and Caroline Islands, and the western Atlantic from Bermuda, Florida Keys, and Yucatan to Tobago; associated with sea anemones and corals. It is possible that direct comparison of Indo-Pacific and western Atlantic populations will eventually reveal characters by which the component

specimens may be distinguished, especially if *T. amboinensis* should become popular in the aquarium trade.

94. *Thor intermedius* Holthuis, 1947

Thor intermedius Holthuis, 1947:14, 51, figs. 4-6 [type locality: "Sissie" near Misool, Indonesia; shore and reef].—Bruce, 1976, fig. 22D [rostrum].

DIAGNOSIS.—Rostral formula: 1 + 2/0. Carapace without supraorbital tooth, with anterolateral margin rounded, without pterygostomial tooth. Telson rounded posteriorly, apparently without median tooth on posterior margin, with 1 pair of barely visible lateral spines on posterior 1/4 of length, with 4 pairs of posterior spines. Antennular peduncle with lateral spinule near proximal end of stylocerite. Antennal scale with distolateral tooth not quite reaching level of distal margin of blade. First pereopod with chela distinctly more slender than carpus, with chela not tapered or strongly compressed, merus unarmed on flexor margin. Fourth and 5th pereopods with dactyl about 3 times as long as high, flexor member of terminal pair of spines not clearly stouter than extensor member. Postorbital carapace length about 2 mm.

RANGE.—Known only from the holotype from Indonesia.

95. *Thor paschalis* (Heller, 1862)

Hippolyte paschalis Heller, 1862b:276, pl. 3: fig. 24 [type locality: Red Sea].
Thor paschalis.—Kemp, 1914:94, pl. 1: figs. 6-10.—Holthuis, 1947:49.—Bruce, 1976: fig. 22B [rostrum].

DIAGNOSIS.—Rostral formula: 0 + 3-4/1. Carapace without supraorbital tooth, with anterolateral margin rounded. Telson

with inconspicuous mesial tooth on posterior margin, with 3 pairs of posterior spines. Antennular peduncle without lateral projection near proximal end of stylocerite. Antennal scale with distolateral tooth slightly overreaching blade. First pereopod with chela not distinctly more slender than carpus, not tapered or strongly compressed, merus unarmed on flexor margin. Second pereopod with 3rd article of carpus longest. Fourth and 5th pereopods with dactyl about 3 times as long as high, armed with 3 spines proximal to terminal pair, flexor member of that pair not clearly stouter than extensor member. Maximum postorbital carapace length more than 1.5 mm.

RANGE.—Because the older records of *T. paschalis* were made before the absence of a lateral projection on the stylocerite was adopted as a diagnostic character, the true distribution of the species is not yet fixed. It almost certainly occurs at least from the Red Sea to Japan, the Philippines, Indonesia, and the Mariana Islands.

96. *Thor spinosus* Boone, 1935

Thor spinosus Boone, 1935:192, pl. 52 [type locality: Bali, Indonesia].—Bruce, 1976:51, figs. 16–21, 23.

DIAGNOSIS.—Rostral formula: 0–1 + 2–5/0. Carapace with distinct supraorbital tooth, with anterolateral margin rounded, without pterygostomial tooth. Telson with mesial tooth on posterior margin, with 3 pairs of dorsolateral and 2 pairs of posterior spines and 2 mesial pairs of plumose setae. Antennular peduncle with small erect lateral tooth near proximal end of stylocerite. Antennal scale with distolateral tooth not reaching level of distal margin of blade. First pereopod with chela not distinctly more slender than carpus, not tapered or strongly compressed, merus unarmed on flexor margin. Second pereopod with 3rd article of carpus longest. Fourth and 5th pereopods with dactyl stout, only twice as long as high, armed with 2–3 spines proximal to terminal pair, flexor member of that pair much stouter than extensor member. Appendix masculina not overreaching endopod of 2nd pleopod. Maximum postorbital carapace length nearly 3 mm.

RANGE.—Kenya, Seychelle Islands, Ryukyu Islands, and Indonesia; associated with corals.

**Tozeuma* Stimpson, 1860

Tozeuma Stimpson, 1860:26 [type species, by monotypy: *Tozeuma lanceolatum* Stimpson, 1860:27; gender: neuter].

DIAGNOSIS.—Integument not rigid. Rostrum overreaching antennular peduncle, armed ventrally, rarely dorsally, with ventral blade, latter not projecting far posteroventrally between bases of antennulas, without tongue-like lobe extending ventrally from lateral carina. Carapace without dentate crest in midline at base of rostrum, without longitudinal lateral carinae, without appressed teeth on lateral surface, without abrupt depressions on frontal or orbital regions, without subocular tooth posterodorsal to orbital angle, latter not especially large, usually with antennal tooth, latter not basally articulated,

without distinct hepatic tooth, branchiostegal margin not denticulate, with or without branchiostegal tooth, with or without pterygostomial tooth. Abdomen with 6th somite not armed with 7 strong spines, without plate articulated at posteroventral angle, pleuron not curving around base of uropod. Telson not tapering gradually to sharp point. Eyestalk movable, not concealed by carapace, cornea without ocellus. Antennular peduncle with stylocerite not usually lying in vertical plane, not bifid or semicircular; 2nd peduncular segment without sharp curved lateral tooth; 3rd peduncular segment without sharp tooth or movable dorsodistal plate; dorsolateral flagellum stout, brush-like. Antennal peduncle seldom overreaching antennular peduncle, not armed with 3 strong ventral spines; antennal scale overreaching antennular peduncle, without lateral tooth near midlength or small movable lateral spines. Mandible without palp or incisor process. First maxilliped with caridean lobe usually discrete from exopodal lash, epipod not bilobate. Second maxilliped with terminal segment broadly rounded, applied obliquely to preceding segment, exopod not unusually wide. Third maxilliped with distal segment flattened, without exopod, with arthrobranch but without epipod or coxal endite. Pereopods without exopods, epipods, or arthrobranchs. First pereopod with fingers shorter than palm, not terminating in interlocking spines, chela nearly 1½ times as long as carpus, carpus not deeply excavate to receive chela. Second pereopods symmetrical, fingers shorter than palm, carpus subdivided into 3 articles. Third pereopod with dactyl and propodus not prehensile in functional males, dactyl usually tapering gradually to acute apex, armed with spines on flexor margin, propodus not subdivided. Uropod with lateral margin of lateral branch terminating in fixed tooth with movable spine mesial to it.

RANGE.—Red Sea and South Africa to Hong Kong, Japan, Philippines, Indonesia, Australia, New Zealand, and western Atlantic from Massachusetts to Bahia, Brazil; to a depth of 135 meters.

REMARKS.—The apparently substantial eastern Pacific and eastern Atlantic gaps in the otherwise pantropical distribution of *Tozeuma*, coupled with suggestive morphological variances, may one day be reflected in the generic classification. It is not beyond the realm of possibility that the genus *Angasia* may yet be resurrected for the aberrant species of *Tozeuma*. The type species of the latter genus, *T. lanceolatum*, and the probably closely related *T. armatus* have the telson tip deeply cleft, whereas *T. pavoninum* (the type species of *Angasia*) together with *T. carolinense*, *T. elongatum*, *T. erythraeum*, *T. novaezealandiae*, *T. serratum*, and *T. tomentosum*, seem to have the posterior margin of the telson transverse or slightly convex for insertion of the series of posterior spines; the configuration of the telson in the other two species (*T. cornutum* and *T. kimberi*) is unknown (the specimen of the former species from Saint John, Virgin Islands, mentioned by Chace (1972:141) is no longer immediately available for examination). The 11 species currently recognized in the genus may be identified from the following key.

Key to Species of *Tozeuma*

1. Carapace with supraocular tooth 2
Carapace without supraocular tooth 4
2. Without median dorsal spine or teeth on carapace or rostrum
. *T. carolinense* (Kingsley, 1878b:90)
(Western Atlantic from Massachusetts to
Bahia, Brazil; to a depth of 75 meters)
With median dorsal spine or teeth on carapace or rostrum 3
3. Median dorsal spine on carapace at base of rostrum; 3 or 4 teeth on ventral margin
of rostrum; abdomen with 4th and 5th somites dentate posteromesially; 2nd
pereopod with 1st carpal article about as long as 2nd and 3rd articles together
. *T. erythraeum* (Nobili, 1904:231)
(Red Sea)
About 5 teeth on dorsal margin of rostrum; 10–14 teeth on ventral margin; abdomen
not posteromesially dentate on any somites; 2nd pereopod with 1st carpal article
about $\frac{3}{4}$ as long as 2nd and 3rd articles together
. *T. serratum* (A. Milne-Edwards, 1881:16)
(Western Atlantic from Massachusetts to Gulf of
Mexico, Barbados, and Colombia; 4–128 meters)
4. Integument hirsute 5
Integument smooth and bare 6
5. Rostrum with 9 teeth on ventral margin; ambulatory pereopods with dactyls simple,
not biunguiculate *T. novaezealandiae* (Borradaile, 1916:86, fig. 3)
(New Zealand)
Rostrum with 5 teeth on ventral margin; ambulatory pereopods with dactyls
biunguiculate *T. tomentosum* (Baker, 1904:152, pl. 29)
(Japan and South Australia; 37–50 meters)
6. Less than 10 teeth on ventral margin of rostrum; 5th abdominal somite without teeth
on posterior margin of pleuron 7
More than 10 teeth on ventral margin of rostrum; 5th abdominal somite with 1 or 2
teeth on posterior margin of pleuron 8
7. Abdomen in adults with 3rd somite bearing long rod-like dorsal projection recurved
posteriorly and bidentate terminally; 2nd pereopod with proximal carpal article
subequal in length to 2 distal articles together
. *T. cornutum* (A. Milne-Edwards, 1881:16)
(Western Atlantic: Florida Keys, Saint John (Virgin
Islands), and off Barbados; 73 meters)
Abdomen with 3rd somite without dorsal projection of any kind; 2nd pereopod with
proximal carpal article subequal in length to distalmost segment alone
. *T. pavoninum* (Bate, 1863:498, pl. 40: fig. 1)
(Saint Vincent Gulf, South Australia; 8–22 meters)
8. Abdomen with 3rd to 5th somites dentate posteromesially 9
Abdomen without posteromesial teeth on any somites 10
9. Rostrum less than twice as long as remainder of carapace; abdomen with 3rd somite
with sharp dorsal carina terminating posteriorly in single large curved tooth
. 97. *T. armatum*
Rostrum 2 or 3 times as long as remainder of carapace; abdomen with 3rd somite
with dorsal carina flattened, typically terminating posteriorly in 3 teeth
. *98. *T. lanceolatum*
10. Carapace not markedly depressed anteriorly
. *T. elongatum* (Baker, 1904:147, pl. 27: figs. 1–4)
(South Australia; 27 meters)
Carapace dorsally depressed anteriorly
. *T. kimberi* (Baker, 1904:149, pl. 27: fig. 5)
(South Australia; 7 meters)

97. *Tozeuma armatum* Paulson, 1875

Tozeuma armatum Paulson, 1875:99, pl. 15: figs. 2–20 [type locality: Red Sea].

Angasia armata.—Holthuis, 1947:61, figs. 10, 11.

DIAGNOSIS.—Integument smooth, not hirsute. Rostrum less than twice as long as remainder of carapace, unarmed dorsally, armed ventrally with 10–30 teeth. Carapace without median tooth at base of rostrum, without supraocular tooth. Abdomen with somites 3–5 dentate posteromesially, 3rd somite with dorsal carina sharp, not flattened, without rod-like projection; 5th somite with 1 or 2 teeth on posterior margin of pleuron. Telson posteriorly bifid. Maximum postorbital carapace length 8.5 mm.

RANGE.—Red Sea, South Africa, Indian Ocean, Japan, Indonesia, and New Caledonia.

REMARKS.—See generic “Remarks.”

***98. *Tozeuma lanceolatum* Stimpson, 1860**

FIGURE 29

Tozeuma lanceolatum Stimpson, 1860:27 [type locality: Hong Kong].—Bruce, 1990c:594, figs. 18–22.

DIAGNOSIS.—Integument smooth, not hirsute. Rostrum fully twice as long as remainder of carapace, unarmed dorsally, armed ventrally with 20–40 teeth. Carapace without dorsomesial tooth at base of rostrum, without supraocular tooth. Abdomen with somites 3–5 dentate posteriorly, 3rd somite with flattened dorsal “carina,” typically tridentate posteriorly, without rod-like projection, 5th somite with 2 teeth on posterior margin of pleuron. Telson posteriorly bifid. Ambulatory pereopods with dactyl simple, not biunguiculate, with series of spines on flexor margin. Maximum postorbital carapace length 11.0 mm.

MATERIAL.—PHILIPPINES. Malampaya Sound, northwestern Palawan, sta 5342, 10°56'55"N, 119°17'24"E, 26–46 m, gray mud, 23 Dec 1908 (1435–1454), 9' Tanner beam trawl: 1 ovig. female [10.0].—Surigao Strait, east of Leyte, sta 5483,

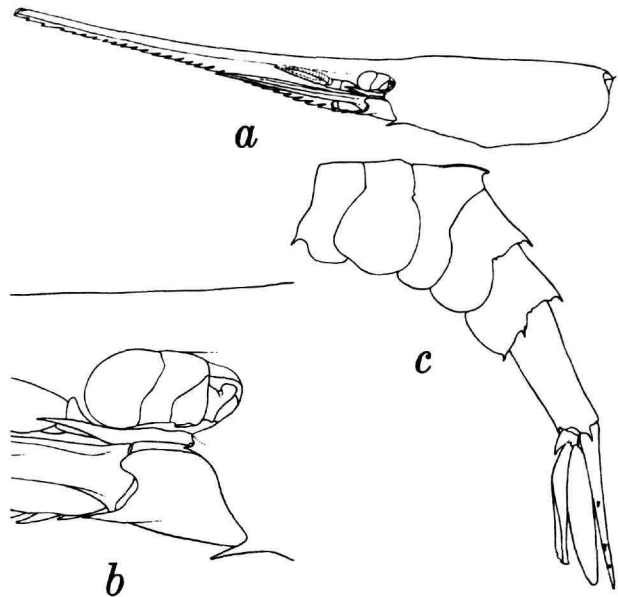


FIGURE 29.—*Tozeuma lanceolatum*, ovigerous female with carapace length of 10.0 mm from *Albatross* sta 5342: a, carapace and anterior appendages, left aspect; b, anterior carapace, left aspect; c, abdomen, left aspect.

10°27'30"N, 125°19'15"E, 135 m, sand, broken shells, 30 Jul 1909 (1000–1021), 12' Agassiz beam trawl: 1 female [9.3].

RANGE.—Singapore, Hong Kong, Philippines; to 135 meters.

REMARKS.—See generic “Remarks.”

Both Philippine specimens lack the lateral teeth at the posterior end of the flattened dorsal carina of the third abdominal somite, but both of them show evidence of injury in that area resulting in damage to the median posterior tooth and that circumstance may be responsible for the loss of the lateral teeth as well.

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Manuscripts intended for series publication receive substantive review (conducted by their originating Smithsonian museums or offices) and are submitted to the Smithsonian Institution Press with Form SI-36, which must show the approval of the appropriate authority designated by the sponsoring organizational unit. Requests for special treatment—use of color, foldouts, case-bound covers, etc.—require, on the same form, the added approval of the sponsoring authority.

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Copy must be prepared on typewriter or word processor, double-spaced, on one side of standard white bond paper (not erasable), with 1¹/₄" margins, submitted as ribbon copy (not carbon or xerox), in loose sheets (not stapled or bound), and accompanied by original art. Minimum acceptable length is 30 pages.

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Taxonomic keys in natural history papers should use the aligned-couplet form for zoology and may use the multi-level indent form for botany. If cross referencing is required between key and text, do not include page references within the key, but number the keyed-out taxa, using the same numbers with their corresponding heads in the text.

Synonymy in zoology must use the short form (taxon, author, year:page), with full reference at the end of the paper under "Literature Cited." For botany, the long form (taxon, author, abbreviated journal or book title, volume, page, year, with no reference in "Literature Cited") is optional.

Text-reference system (author, year:page used within the text, with full citation in "Literature Cited" at the end of the text) must be used in place of bibliographic footnotes in all Contributions Series and is strongly recommended in the Studies Series: "(Jones, 1910:122)" or "...Jones (1910:122)." If bibliographic footnotes are

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Footnotes, when few in number, whether annotative or bibliographic, should be typed on separate sheets and inserted immediately after the text pages on which the references occur. Extensive notes must be gathered together and placed at the end of the text in a notes section.

Bibliography, depending upon use, is termed "Literature Cited," "References," or "Bibliography." Spell out titles of books, articles, journals, and monographic series. For book and article titles use sentence-style capitalization according to the rules of the language employed (exception: capitalize all major words in English). For journal and series titles, capitalize the initial word and all subsequent words except articles, conjunctions, and prepositions. Transliterate languages that use a non-Roman alphabet according to the Library of Congress system. Underline (for italics) titles of journals and series and titles of books that are not part of a series. Use the parentheses/colon system for volume (number):pagination: "10(2):5-9." For alignment and arrangement of elements, follow the format of recent publications in the series for which the manuscript is intended. Guidelines for preparing bibliography may be secured from Series Section, SI Press.

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Some points of style: Do not use periods after such abbreviations as "mm, ft, USNM, NNE." Spell out numbers "one" through "nine" in expository text, but use digits in all other cases if possible. Use of the metric system of measurement is preferable; where use of the English system is unavoidable, supply metric equivalents in parentheses. Use the decimal system for precise measurements and relationships, common fractions for approximations. Use day/month/year sequence for dates: "9 April 1976." For months in tabular listings or data sections, use three-letter abbreviations with no periods: "Jan, Mar, Jun," etc. Omit space between initials of a personal name: "J.B. Jones."

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