

The Amphipoda of Bermuda

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The
Amphipoda of Bermuda

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VERGLEICHENDE ANATOMIE

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I.—THE AMPHIPODA OF BERMUDA.

By B. W. KUNKEL, PH.D.

The Amphipoda of the Bermudas and West Indies apparently have been almost entirely neglected by systematists. The only notices which we have of Amphipoda from Bermuda are those of *Caprella danilevskii* (Czerniavski, 1868), recorded by Stebbing in the "Challenger" Report (vol. 39, p. 1364, pl. 145), *Cyamus fascicularis* (Verrill, 1903) from a sperm whale captured off Bermuda and exhibited at St. George's, and *Orchestia agilis* (Smith, 1873) which Verrill notes as being abundant (Trans. Conn. Acad., vol. XI, p. 21-22, 1903).

The greater part of the material for the present study was collected by Prof. Verrill and parties during two expeditions to the islands in the spring of 1898 and 1901, and was turned over to the writer for study in the spring of 1906; besides this material, several vials bore the label of G. Brown Goode, 1876-77, several that of W. M. Rankin, 1898, and one vial was received from Dr. L. J. Cole, dated Bermuda Biological Station, July 15, 1903.

In general, no exact data regarding the localities and surrounding conditions were recorded, but where such are known due reference will be made to them. The collecting by Verrill was done in shallow water along the shore, at most in only a few fathoms, and nearly all the forms are shallow water species.

The most striking peculiarity of the Amphipodous fauna of Bermuda is its close relationship to that of the Mediterranean. Of the 45 species recorded from Bermuda, 19, or possibly 20, of them occur also in the Mediterranean, and nearly all of these are abundant in European waters. Eighteen of these 45 species are peculiar to Bermuda and only 7 species which are not endemic, are not found also in the Mediterranean. Thus nearly $\frac{1}{2}$, or 44%, of the known species of Bermuda Amphipoda are Mediterranean. In contrast to the richness of European forms the 9 species common to South and Central American shores is striking, especially in view of the fact that 93% of the Decapod Crustacea of Bermuda have been recorded from the Florida Keys and the West Indies (Verrill, Trans. Conn. Acad., vol. XIII, p. 452, 1908). This paucity of forms from Central and South America probably has little significance, however,

and is due simply to the small amount of collecting of the smaller Crustacea from these waters.

The distribution of the species of Amphipoda known to occur in the waters of Bermuda is designated in the following list. New species are printed in heavy-faced type and new genera are preceded by an asterisk.

1. *Lysianassa punctata*. Naples.
2. *Amphilocheus brunneus*. Naples.
3. *Leucothoe spinicarpa*. Arctic Ocean, North Atlantic, North Sea and Skagerrak, Greenland; Norway, British Isles, Azores, France, Mediterranean.
4. *Stenothoe marina*. North Atlantic, North Sea, Adriatic Sea.
5. *S. valida*. Rio Janeiro, Mediterranean?
6. ***Pariphinotus tuckeri**.
7. *Colomastix pusilla*. British Isles, France, Mediterranean.
8. **Panoploeopsis porta**.
9. *Eusiroides crassi*. South Atlantic.
10. **Pontogeneia verrilli**.
11. *Melita fresnelii*. Rio Janeiro, Singapore, Port Jackson, N. S. Wales.
12. **M. planaterga**.
13. *Ceradocus orchestiipes*. Mediterranean.
14. **C. parkeri**.
15. **C. colei**.
16. *Maera inaequipis*. Mediterranean, Azores.
17. *M. rathbunae*. Key West, Fla.
18. **M. tinkerensis**.
19. *Elasmopus rapax*. British Isles, Christianiafjord, France, Azores, Mediterranean.
20. **E. magnispinatus**.
21. *E. pocillimanus*. Mediterranean, Atlantic coast of North America (Long Island Sound, Vineyard Sound).
22. **Gammarus breweri**.
23. ***Insula antennulella**.
24. *Orchestia platensis*. Rio de la Plata, Atlantic coast of North America (Bay of Fundy to New Jersey), Mediterranean, Sea of Tiberias.
25. *Hyale prevostii*. Mediterranean, Atlantic Coast of North America, Rio Janeiro, Valparaiso, Peru.
26. *H. pontica*. North Atlantic, North Sea, Mediterranean.
27. **H. trifoliadens**.
28. ***Parhyalella batesoni**.

29. *Microdeutopus anomalus*. Atlantic coast of Norway, Shetland Isles, Black Sea.
30. *Autonoe longipes*. Naples, Scandinavia, British Isles, Port Jackson, N. S. Wales.
31. **Eurystheus lina**.
32. *Podocerosia sophia*. Arctic Ocean, Scandinavia, British Isles, Shetland.
33. **Isaea longipalpus**.
34. *Amphithoe longimana*. New England coast.
35. *A. rubricata*. North Atlantic and adjoining seas of Europe.
36. **A. pollex**.
37. *Grubia crassicornis*. Naples, Black Sea.
38. **G. coei**.
39. *Erichthonius braziliensis*. Atlantic coast of North America, Norway, Adriatic Sea, Rio Janeiro, San Francisco, Cal.
40. *Chelura terebrans*. Atlantic coast of North America, Norway to Black Sea.
41. *Caprella equilibra*. Mediterranean, Norway, Charleston, N. Car., Rio Janeiro, Hong Kong, N. S. Wales.
42. **C. bermudia**.
43. *C. danilevskii*. Mediterranean, Black Sea, Copenhagen, Bay of Biscay, Sea of Japan, Port Jackson, N. S. Wales, Rio Janeiro.
44. *Protellopsis stebbingii*. Gulf of Mexico.
45. *Cyamus fascicularis*.

The specimens were all of relatively small size, the largest specimen measuring less than 20 mm. in length, which is in accord with previous observations that the Amphipoda of Arctic regions are of larger size than those of warm waters.

The classification of the Gammaridea into families is in a rather unsatisfactory condition and no attempt at revision has been made in the following pages. Boeck (1876) divides them into 10 families and 22 subfamilies; Stebbing (1888) in the "Challenger" Report makes 26 families and in his later work on the Gammaridea (1906) he recognizes 41 families; Della Valle (1893) in his monograph recognizes only 10 families which, however, differ from Boeck's; and Sars (1895) divides the Gammaridea of Norway alone into 26 families.

For complete synonymy, reference should be made to the extensive works of Stebbing, Sars, and Della Valle. Acknowledgment is made at this time of the privileges of the laboratory of the U. S. Bureau of Fisheries at Woods Hole, Mass. where part of this work was done in the summer of 1906.

Tribe GAMMARIDEA.

Head rather small, not fused with first thoracic segment; eyes rarely of very large size, usually compound, first antennae consisting of 3-jointed peduncle and flagellum; second antennae with peduncle usually consisting of 5 joints and flagellum; maxillipeds with inner plates free and with 2- to 4-jointed palps.

Body usually compressed; thorax of 7 distinct segments, rarely reduced to 6; 5 or 6 segments bearing gills; 4 segments in female bearing marsupial plates; thoracic legs overlapped at base by epimera, the first 4 being usually larger than the posterior 3.

First 3 abdominal segments always free; posterior 3 usually distinct; uropod 1 always biramous.

Key to the genera of the Gammaridea.

- | | | | |
|---|---|--|----------------------|
| 1 | { | Gnathopod 2 with third joint elongate | Lysianassa |
| | | Gnathopod 2 with third joint short 2 | |
| 2 | { | Gnathopod 2 with fifth joint greatly prolonged;
telson elongate, tapering, entire | Amphilochus |
| | | Not with same combination of characters . . . 3 | |
| 3 | { | Gnathopod 1 with chela formed by fifth and sixth
joints | Leucothoe |
| | | Gnathopod 1 otherwise 4 | |
| 4 | { | Epimeron 4 enormously developed | Stenothoe |
| | | Epimeron 4 not especially large 6 | |
| 5 | { | Gnathopods 1 and 2 simple; body depressed and
ridged dorsally; pleopod 3 with peduncle ex-
panded to form long process | Pariphinotus |
| | | Not with same combination of characters . . . 6 | |
| 6 | { | Gnathopod 2 with second joint rather slender and
greatly enlarged distally, gnathopod 1 very
small | Colomastix |
| | | Gnathopods otherwise 7 | |
| 7 | { | Epimera 1-3 tapering acutely ventrally | Panoploeopsis |
| | | Epimera 1-3 more or less rounded ventrally . 8 | |
| 8 | { | Antennae with calceoli 9 | |
| | | Antennae without calceoli 10 | |

9	{	Antenna 1 with accessory flagellum	Eusiroides
	}	Antenna 1 without accessory flagellum	Pontogeneia
10	{	Antenna 1 with accessory flagellum of more than 2 joints; pereopods 1 and 2 without glands; uropod 3 projecting beyond others, biramous; telson cleft 11	
	}	Not with same combination of characters	15
11	{	Uropod 3 with rami very unequal	Melita
	}	Uropod 3 with rami not very unequal	12
12	{	Maxillae 1 and 2 with outer and inner plates very setose 13	
	}	Maxillae 1 and 2 with outer and inner plates not very setose 14	
13	{	Pleon segments 4-6 with dorsal spinules	Gammarus
	}	Pleon segments 4-6 without dorsal spinules	Ceradocus
14	{	Pereopods 3-5 slender	Maera
	}	Pereopods 3-5 robust	Elasmopus
15	{	Antenna 1 with no accessory flagellum; mandible without palp; pereopods 1 and 2 without spinning glands; uropod 3 small, uniramous 16	
	}	Not with this combination of characters	19
16	{	Maxilliped with 3-jointed palp	Insula
	}	Maxilliped with 4-jointed palp	17
17	{	Antenna 1 shorter than peduncle of 2	Orchestia
	}	Antenna 1 longer than peduncle of 2	18
18	{	Maxilla 1 with palp	Hyale
	}	Maxilla 1 without palp	Parhyalella
19	{	Antenna 1 with accessory flagellum well developed; maxilla 1 with inner plate small; pereopods 1 and 2 with spinning glands; gnathopod 1 larger than gnathopod 2 20	
	}	Not with this combination of characters	21
20	{	Gnathopod 1 in male with fifth joint produced to form a large tooth	Microdeutopus
	}	Gnathopod 1 in male with fifth joint not so produced	Autonoe
21	{	Antenna 1 with accessory flagellum; lower lip with anterior margin of outer plate entire; pereopods 1 and 2 with spinning glands; uro- pod 3 not uncinata 22	
	}	Not with this combination of characters	24
22	{	Telson emarginate	Eurystheus
	}	Telson entire	23

23	{	Pereiopods 1-5 not subchelate	Podoceropsis
		Pereiopods 1-5 subchelate	Isaea
24	{	Lower lip with anterior margin of outer plate incised; pereiopods 1 and 2 with spinning glands; uropod 3 uncinata	25
		Not with these characters	26
25	{	Antenna 1 without accessory flagellum	Amphithoe
		Antenna 1 with accessory flagellum	Grubia
26	{	Antenna 1 without accessory flagellum; antenna 2 with flagellum not spatulate	Ericthonius
		Antenna 1 with accessory flagellum; antenna 2 with spatulate flagellum	Chelura

Lysianassa punctata (O. G. Costa, 1840), Stebbing, 1906.

1840. *Callisoma punctata*. O. G. Costa, Fauna Reg. Napoli, Crost., Cat. p. 5.

1906. *Lysianassa punctata*. Stebbing, Das Tierreich, Lief. 21, p. 40.

Eyes large, compound, reniform, ocelli large and not crowded together, pigmented in specimens preserved in alcohol.

First antennae very short; first joint of peduncle twice as long as second, third joint shorter than second; principal flagellum made up of about 10 joints, about as long as peduncle; accessory flagellum composed of 4 joints, about half as long as principal flagellum. Second antennae shorter than first and more slender; flagellum shorter than peduncle, made up of 5 joints; fourth and fifth joints of peduncle subequal; third joint shorter than fourth.

Mandibles with body rather slender; cutting edge not denticulated; palp long, 3-jointed, third joint slender and not quite as long as second, provided with several spinules apically; molar tubercle wanting. Lower lip with inner plates small and rounded; outer plates triangular, much longer than broad. First maxillae with inner plates very small; outer plates with branched spines on distal margin; palp made up of 2 joints, of which the first is very short and the second has a serrated, blunt distal end. Second maxillae with inner plate much broader than outer and of about same length, broader at distal end which is oblique and provided with spinules. Maxillipeds with 3-jointed palp having terminal dactyl-like spine; second joint rather long and slender, with slender spinules on inner margin; third joint with long spinules apically; inner plates with 3 teeth on round distal margin; fine cilia on inner margin; outer plates moder-

ately broad, unarmed, extending nearly as far as second joint of palp.

In female, first gnathopods with triangular epimeron, with anterior ventral angle rounded; second joint fairly stout, cylindrical; third joint broader than long; fourth triangular with posterior margin convex and provided with setae toward apex; wrist somewhat longer than broad and provided with setae apically; hand slender and

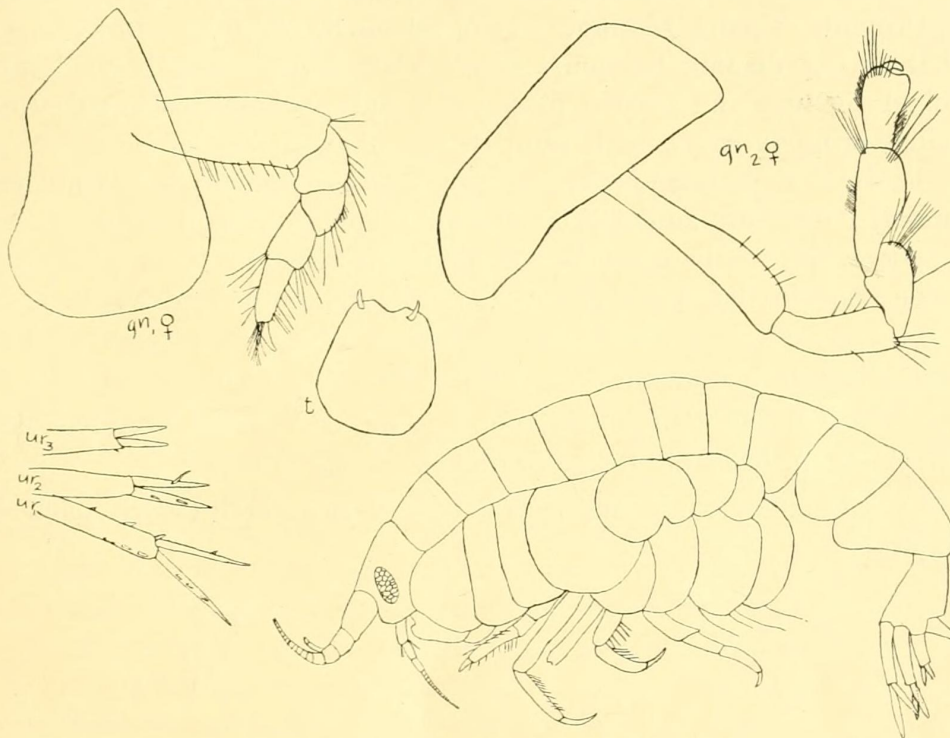


Fig. 1. *Lysianassa punctata* (O. G. Costa).

tapering, not subchelate, posterior margin provided with long setae and sharp tooth-like spines; finger short and curved, unguiform.

Second gnathopods with narrow epimeron more than twice as high as long, rhomboidal; second joint long and very slender, slightly broader distally than proximally; third joint 4 times as long as broad; fourth joint about $\frac{1}{2}$ as long as third, broader at distal end than at proximal, rounded apically, articulating with wrist by distal half of anterior margin; wrist longer than third joint, triangular, broadest at middle, posterior margin convex, anterior margin straight with many fine setae near middle; hand shorter and narrower than wrist, subrectangular, broader at distal margin which is transverse and concave, anterior margin with abundant fine setae toward apical portion, distal portion of posterior margin with many closely set

sharp teeth; finger very short and curved, not as long as width of distal end of hand.

Pereiopods of usual form without spinning glands; epimera rather high, third epimeron rectangular; fourth greatly elongated at inferior margin forming a posterior projection above which the anterior margin of fifth epimeron fits; fifth epimeron with inferior margin incised by deep split.

Postero-inferior margin of third abdominal segment rounded, entire.

Uropods, 3 pairs, biramous; rami subequal, styliform and slender; first pair projecting beyond second; second projecting beyond terminal; in first and second pairs rami and peduncle subequal; terminal uropods short, with rami shorter than peduncle.

Telson small, longer than broad, bearing apically a slight depression medially and a short toothlike spine on each side.

There were only 2 females in the collection.

The species has been recorded previously only from Naples.

Amphilochus brunneus Della Valle, 1893.

1893. Della Valle, Fauna und Flora des Golfes von Neapel, vol. 20, p. 596; pl. 4, fig. 5 and pl. 29, fig. 1-15.

Eyes circular, compound, made up of many ocelli closely packed together.

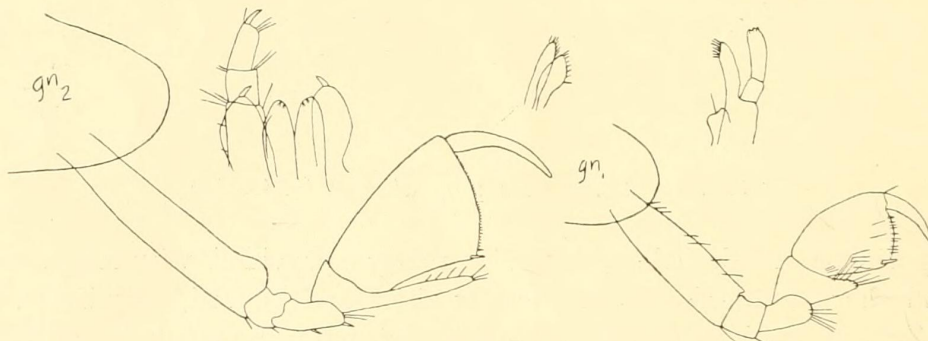


Fig. 2. *Amphilochus brunneus* Della Valle.

First antennae short, first and second joints of peduncle each about as broad as long and about $\frac{2}{3}$ as long as third which is about twice as long as wide; flagellum short and thick, composed of 8 or 9 segments, each of which is provided with a long and a short spine at distal margin. Second antennae slightly longer than first with moderately slender gland cone; fourth and fifth joints of equal length, but fourth much thicker than fifth; flagellum short and thick, about $\frac{2}{3}$ as long as peduncle, composed of 6 segments.

Mandibles with slender 3-jointed palp, the third joint of which is longer than second, cutting edge expanded and divided into 7 teeth; molar tubercle small, with no true triturating surface. First maxillae with inner plate small and broad and bearing a single spine on apex; outer plate narrow, moderately long, sides parallel to near distal end where plate tapers, inner margin of apex armed with about 12 broad, curved spines; palp 2-jointed, first joint as broad as long, second joint twice as long as broad, rounded at apex which is armed with a tooth and several spines. Second maxillae with inner plate narrow at base and inner edge oblique and slightly convex; outer plate narrow, somewhat longer than inner plate, bearing 3 or 4 spines on narrow apex and fine setules on inner margin. Maxillipeds with inner plate long and narrow, having lateral margins parallel and with rounded apex provided with 2 toothlike spines, extending as far as apex of first joint of palp; outer plate rather large, extending to middle of second joint of palp, oval in form, twice as long as wide, outer margin strongly convex, the distal portion of which bears many fine setae, inner margin distally serrate, proximally bearing several submarginal spines, apex bearing large tooth and spine; palp 4-jointed, first joint longer than broad, with a few spines on outer distal corner and outer margin; second joint rather narrower than first, slightly longer than broad, with a few spines on distal margin; third joint about twice as long as wide and not more than half as wide as second joint, provided with spines on apex; fourth joint clawlike, about $\frac{1}{3}$ as long as third joint.

First gnathopods with oval epimeron, which is higher than long; second joint long, more than 3 times as long as broad with a few setae on anterior margin and apex; third joint not as long as broad armed with a few spines apically; fourth joint more slender than third, rounded apically, twice as long as broad, with fascicle of spines at apex; wrist triangular, broader than long, articulating with anterior margin of fourth joint, posterior margin prolonged distally to form a triangular process which extends to the middle of the hand parallel to its posterior margin; hand subtriangular, articulating with wrist by apex, anterior margin slightly convex, palm also slightly convex and passing into posterior margin by obtuse angle, marked by 2 prehensile spines, finely serrate and armed with submarginal spines; finger moderately strong, curved, slightly longer than palm, inner margin with fine teeth.

Second gnathopods with epimeron $1\frac{1}{2}$ times as high as long, ventral margin strongly convex; second joint very long and slender, more than 4 times as long as broad; third and fourth joints as in

first gnathopods; wrist with posterior margin greatly elongated to form slender triangular process which extends as far as apex of posterior margin of hand, which is much larger than that of first gnathopods, more triangular in form with palm at right angles to axis of joint and $\frac{2}{3}$ as long as anterior margin, and finely serrate, and with prehensile angle provided with 2 stout spines; finger long, curved, with fine teeth on inner margin.

Uropods, 3, biramous; terminal uropods extending beyond others, with outer ramus shorter than inner and somewhat shorter than peduncle which is slender.

Telson slender, triangular, entire.

The species was represented by several specimens about 3 mm. long from Flatts Village in sand from low water to 2 fathoms, and also from Castle Harbor in dead coral.

Della Valle recorded the species from the Gulf of Naples at 5 fathoms.

Leucothoe spinicarpa (Abildgaard, 1789), Boeck, 1860.

1789. *Gammarus spinicarpus*. Abildgaard, in O. F. Müller, Zool. Danica, vol. 3, p. 66; pl. 119, fig. 1-4.

1860. *Leucothoe spinicarpa*. Boeck, Bemaerk. norske Amphip. Forhandl. ved de Skand. Naturforsk., p. 654.

Eyes compound, reniform, of medium size.

First antennae scarcely $\frac{1}{3}$ as long as body, slightly longer than second; peduncle about $2\frac{1}{2}$ times as long as flagellum; first joint moderately stout, cylindrical; second of about same length but more slender; third joint hardly more than $\frac{1}{4}$ as long as second and scarcely to be differentiated from first joint of flagellum which is short and composed of 8 or 9 segments; accessory flagellum 1-jointed, rudimentary. Second antennae with short flagellum; third joint of peduncle short, twice as broad as long; fourth joint long and slender; fifth joint about $\frac{2}{3}$ as long as fourth; flagellum about as long as last joint of peduncle and composed of about 7 segments.

Mandibles without molar tubercle but with incisive plate well dentated and with numerous spines on spine row; palp well developed, first joint short, with small process on inner margin; second joint long with spines on inner margin; third joint somewhat longer than first and provided with a few spines on rounded apex. Lower lip with plates broad and rounded. First maxillae with inner plates small, triangular and with single spine on apex; outer plates moderate with usual spines on oblique distal margin; palp 2-jointed, somewhat longer than outer plate, armed apically with a few spines. Second maxillae

with outer plates curved, slender and longer than inner plates which are more or less tapering and provided with rather long spines on inner margin. Maxillipeds with inner plate rudimentary, provided with 4 odontoid spines apically; outer plates likewise rudimentary, represented by small process bearing sharp spine; palp 4-jointed, all of which are provided with slender spines on the inner and distal margins, first and second joints much wider distally than proximally

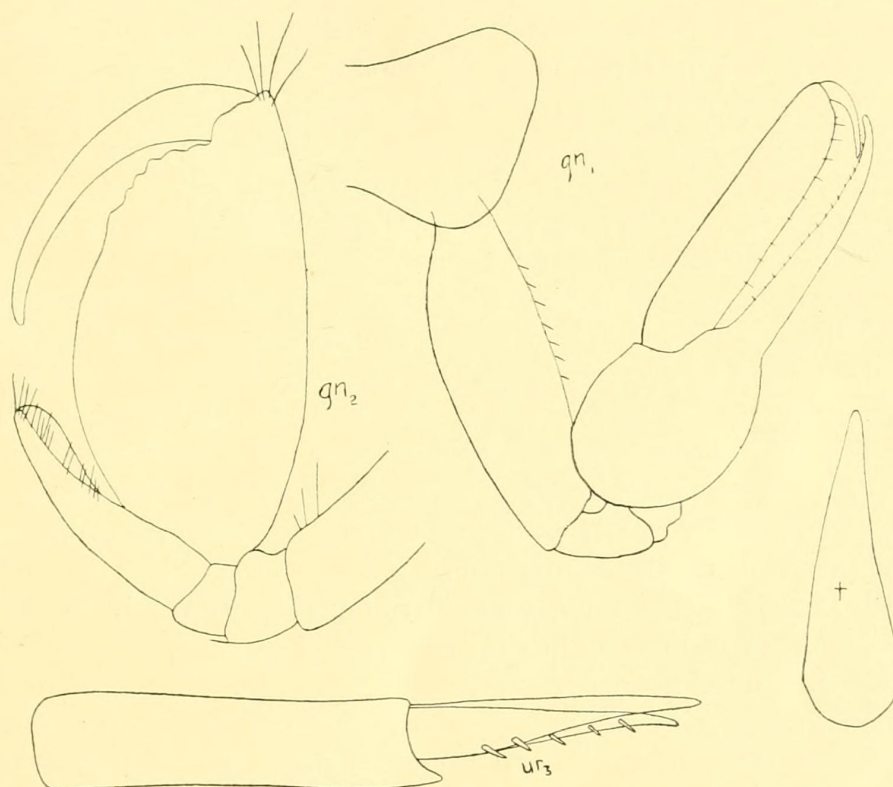


Fig. 3. *Leucothoe spinicarpa* (Abildgaard).

and subequal; third joint somewhat club-shaped, about as long as preceding joint; fourth joint in form of nail bearing single cilium on inner concave margin.

First gnathopods with epimeron small, rhomboidal, having antero-ventral angle prolonged slightly; second joint rather long and stout, and broadest at middle, with short spines on both anterior and posterior margins; third joint moderately long, twice as long as broad and broader distally than proximally; fourth joint somewhat shorter than third and more slender; wrist large, oval, not much longer than broad but bearing by a prolongation of posterior margin a long slender, slightly curved spur which extends as far as distal

end of hand and which forms a true chela with hand, anterior margin of spur provided with a few short cilia; hand long and slender of nearly uniform width throughout, palm not marked off definitely from posterior margin; finger slender and of usual form.

Second gnathopods with oval epimeron longer than high; second joint moderately long with anterior margin straight and provided with a few slender spines; third joint about as broad as long; fourth joint very short, somewhat cup-shaped with distal end broader than proximal; wrist weak, bearing a long shell-like process distally and posteriorly which is provided with many slender setae and into which the proximal portion of the hand fits; hand oval, with posterior margin rather more convex than anterior, palm also convex, not differentiated from posterior margin, bearing distally 3 or 4 tooth-like convexities, hand provided with fascicle of spines apically; finger long and slender, curved and pointed.

Epimera increasing in height to fourth; third being shortest and terminating rather acutely ventrally; pereopods without spinning glands, ending in unguiform dactyls.

Uropods, 3 pairs, biramous, first and third pairs projecting beyond middle pair; rami subequal except in second pair where outer ramus is rather shorter than inner, more or less styliform; peduncles of first and second equal respectively to rami in length; peduncle of third pair rather longer than rami.

Telson long and slender, triangular, tapering uniformly to acute apex, 3 times as long as broad, entire.

Length 8 mm.

Numerous specimens were present in the collection from Harrington Sound, from Flatts Village from low water to 2 fathoms, and from Castle Harbor where they were found in dead coral.

The species is very widely distributed over the North Atlantic, being reported from the Arctic Ocean, Norway, the British Isles, the Azores, France, the Mediterranean. Sometimes it occurs in the branchial sac of Ascidians.

Stenothoe marina (Bate, 1857), Boeck, 1870.

1857. *Montagua marina*. Bate, Ann. & Mag. Nat. Hist., Ser. 2, vol. 19, p. 137.

1870. *Stenothoe marina*. Boeck, Forh. Videnskabs-Selsk. Christiania, 1870, p. 139.

Eyes large, compound, subtriangular.

First antennae $\frac{2}{3}$ as long as body, peduncle short with first joint rather stout, tapering somewhat; second joint slightly shorter than

first, cylindrical; third joint short, hardly to be distinguished from first segment of flagellum, which is made up of about 20 segments which are longer than broad; no accessory flagellum. Second antennae slightly shorter than first; peduncle nearly as long as flagellum; fourth joint somewhat longer than fifth.

Mandibles rather broad, without palp and molar tubercle; principal and secondary cutting edges denticulated; numerous spines in spine row. First maxillae with inner plate small, triangular, furnished with single setule apically; outer plate short, tapering slightly toward apex, with very minute setules on inner margin and 4 or 5 stout

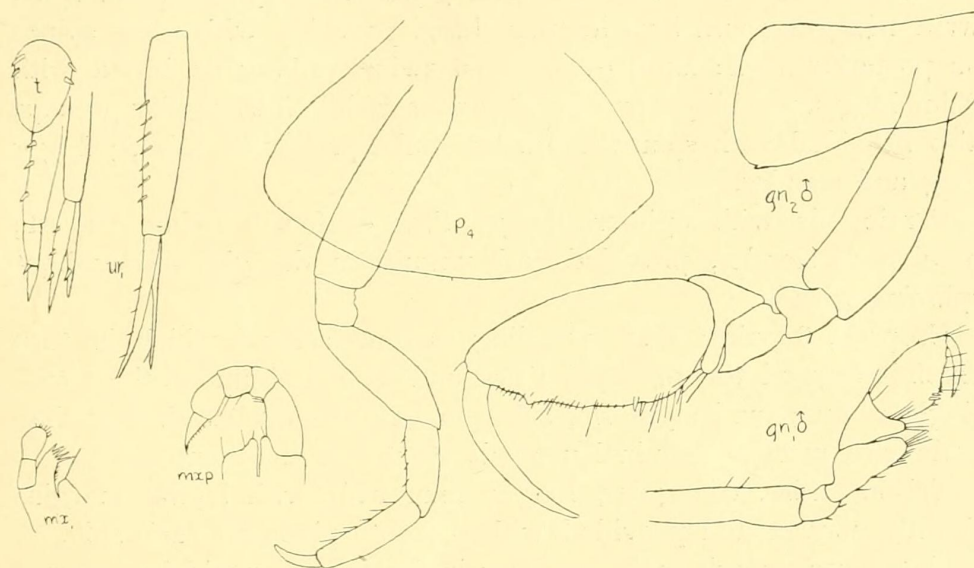


Fig. 4. *Stenothoe marina* (Bate).

spines on apical margin; palp stout, 2-jointed, with second joint rounded and provided with numerous teeth and spines apically, proximal joint only slightly shorter than second. Second maxillae with plates normally developed, but with inner plate having a single setule. Maxillipeds with inner plate reduced to a slight eminence and outer plate entirely absent so that maxilliped appears to be made up of very small inner plate and a 5-jointed palp, of which all the joints are cylindrical except the terminal one which tapers to a slender point and bears fine cilia on the inner margin.

In male, first gnathopods much smaller than second; epimeron moderate in size; second joint long and slender of uniform width throughout; third joint cylindrical, slightly longer than broad; fourth joint large, more or less cup-shaped with distal margin long and oblique and posterior margin, which bears a few spines, much longer

than anterior; wrist triangular, about as broad as long, provided with spines on distal margin and posterior apex; hand oval with distal portion more slender than basal portion and with palm long and oblique, very finely serrate and furnished with long slender spines and 4 prehensile spines, finger moderate with concave margin serrate.

Second gnathopods with moderate epimeron which is higher than long with small tooth on postero-ventral angle; second joint long and slender; third joint cup-shaped and wider distally than proximally; fourth joint much wider distally than proximally with posterior distal angle acute, articulating with wrist by anterior margin; wrist triangular and broader than long, provided with a few spines on posterior apex; hand oval, about twice as long as broad with palm long and oblique and bearing near middle a triangular process, also provided with spines and setae and 2 prehensile spines; finger long and slender.

Pereiopods with epimera large, that of fourth being largest; pereiopods slender, provided with unguiform dactyls and without spinning glands.

Uropods, 3 pairs; first extending beyond second which in turn extends beyond the third pair; first and second biramous, third with single ramus; rami styliform, subequal, and somewhat shorter than peduncle; rami of terminal uropods stouter than others.

Telson entire, triangular, longer than wide with lateral margins slightly convex and provided with 4 stout spines on each side.

There was a single male specimen in the collection which measured about 3 mm. in length.

The species has been recorded from the North Atlantic and North Sea and from the Adriatic at a depth of from 19 to 47 fathoms.

Stenothoe valida Dana, 1853.

1853. Dana, U. S. Expl. Exped. vol. 13 II, p. 924, pl. 63, fig. 1.

Eyes small, compound, reniform, situated between first and second antennae.

First antennae moderately long and slender with flagellum about twice as long as peduncle; first and second joints of peduncle cylindrical and subequal in length and each about as long as head, third joint less than $\frac{1}{2}$ as long as second; flagellum made up of about 20 segments which are short proximally but become longer and more slender distally. Second antennae shorter than first in female (flagellum broken off in single male specimen at hand) with gland cone small and inconspicuous, third joint cylindrical and slightly longer

than broad, fourth joint long and cylindrical, fifth joint somewhat shorter than fourth; flagellum made up of about 17 segments, less than twice as long as peduncle.

Mandibles without palp or molar tubercle, but with incisive plate moderate. First maxillae with very small, triangular inner plate bearing single spine apically; outer plate rather broad and short, having 4 or 5 rather larger spine teeth on distal margin; palp 2-jointed, first joint short, second joint rather large, about 3 times

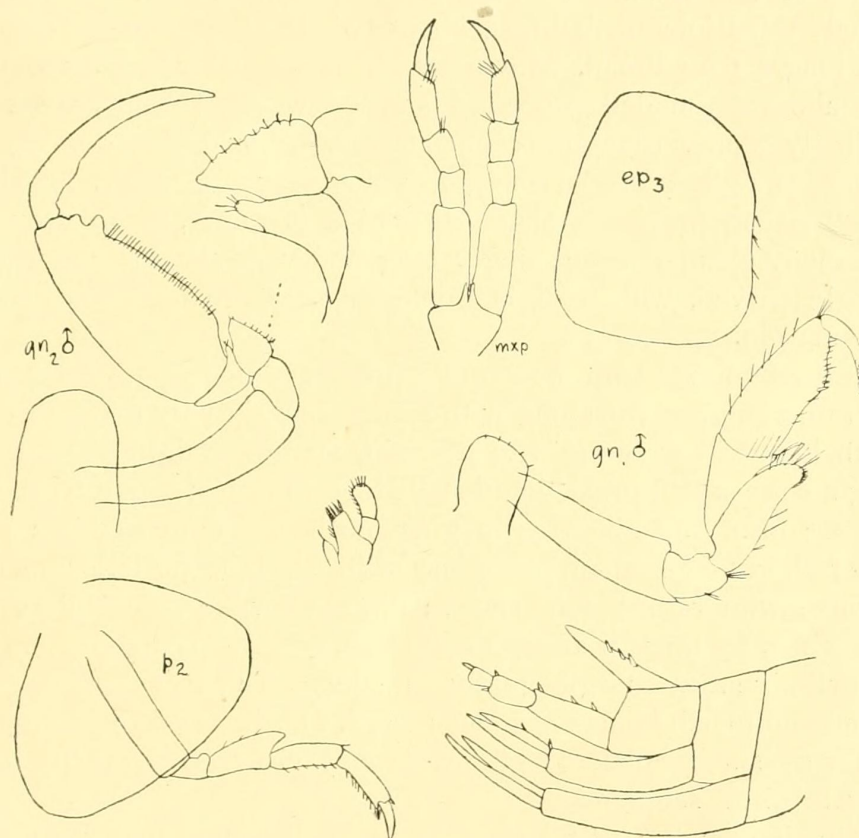


Fig. 5. *Stenothoe valida* Dana.

as long as first, rounded apically and provided with short setae on apex and inner margin. Maxillipeds with inner plates rudimentary and outer plates wanting; palps 4-jointed, rather long and slender, first joint rather short, slightly longer than broad, second joint longer than first, cylindrical, third joint clawlike and slender, as long as third.

In male, first gnathopods rather small, with very small epimeron having a few setae on ventral margin, second joint long and slender; fourth joint oblong with free anterior margin very short and posterior

margin forming an oval lobe which is provided with cilia posteriorly and spines distally, wrist triangular, shorter than fourth joint, with a few long spines on distal apical angle; hand subrectangular rather narrow, with anterior and posterior margins parallel and with moderate palm somewhat oblique, serrated and provided with a few spines, prehensile angle bearing a few stout spines; finger of usual form and moderate size.

Second gnathopods with epimeron higher than long and with ventral margin rounded; second joint moderately long and slightly curved; third joint cylindrical, about twice as long as broad; fourth joint longer than broad, with posterior margin convex and provided with about 6 rounded processes and a few short setae, wrist exceedingly small, triangular; hand large, suboval, anterior margin convex, straight posterior margin, which serves as palm, provided with 2 strong processes near articulation of finger, palm provided with many slender setae; finger long and very slender and rather strongly curved, with 2 slight processes near proximal end of concave margin.

First pereopods with moderate epimeron which is subrectangular and rather higher than long with ventral margin very finely serrate; fourth joint rather broad with posterior margin straight and anterior margin convex and projecting distally to form rather strong triangular process; fifth joint about as long as fourth, and more slender; sixth joint rather longer than preceding with straight posterior margin provided with rather stout spines; finger clawlike. Second pereopods with very large triangular epimeron, greatly expanded ventrally and with ventral margin gently rounded. Third pereopods with second and fourth joints expanded; third, fourth, and fifth pereopods with very small epimera; all pereopods closely resembling each other in distal segments.

Uropods, 3 pairs; first and second pairs biramous with rami styli-form; third pair projecting slightly beyond the other two, with single 2-jointed ramus, not as long as peduncle, the distal one of which bears a blunt projection apically and is longer than the proximal.

Telson triangular, rather prominent, entire, with 3 lateral spines on each side.

Length 5 mm. The species was represented by a male and a female specimen.

The female is much smaller than the male and differs from it principally in that the hand of the second gnathopod is broader and the palm is shorter and devoid of the 2 toothlike processes near the finger.

The species has also been reported from Rio Janeiro and possibly from the Mediterranean.

Pariphinotus gen. nov.

Body depressed and ridged dorsally.

First and second antennae short; first without accessory flagellum; flagella of both short.

Mandibles without molar tubercle or palp, principal cutting edge denticulated. Lower lip without inner plates. First maxillae with obsolete palp and without inner plates. Second maxillae with inner and outer plates coalesced except at apex. Maxillipeds with short, truncated inner plates not reaching as far as second joint of palp, apical margin with 3 spine teeth; outer plates broad and rounded, unarmed, extending nearly to distal end of second joint of palp which is moderate in size and made up of 4 joints, the terminal one of which is unguiform.

Gnathopods simple; epimera low.

Third pleopods with 2 rami and with peduncle expanded to form arm-like process tipped with 3 coupling hooks.

Uropods, 2 pairs, biramous. Telson semicircular, entire, thick.

The genus is closely related to *Iphinotus* (Stebbing) but has only 2 pairs of uropods which are both moderately stout whereas in *Iphinotus* the first is slender and the second stout.

Pariphinotus tuckeri sp. nov.

Head provided with broad, square rostrum with rounded corners and with prominent lateral lobes which bear the large, prominent, compound eyes.

Antennae short; first being slightly longer than second, with flagellum very short; first antennae with first joint of peduncle much broader distally than proximally and about as broad as long; second joint about $\frac{3}{4}$ as long as first and about $\frac{1}{2}$ as wide, with outer margin produced slightly distally; third joint about $\frac{2}{3}$ as long as second, cylindrical in form; flagellum short, about as long as second joint of peduncle, made up of 2 joints of which the terminal one is very short and the proximal one longer than last joint of peduncle, provided with setae distally. Second antennae with flagellum like that of first; third joint of peduncle cylindrical, about as broad as long; fourth joint twice as long as broad; fifth about same length as fourth but narrower.

Mandibles oblong with dentated cutting edges, 3 anterior teeth large, posterior ones small; molar tubercle and palp absent, spine

row with single spine. Lower lip without inner lobes but with very broad outer ones. First maxillae without palp or inner plate; outer plate armed on distal oblique margin with the usual forked, toothlike spines. Second maxillae with outer and inner plates coalesced except distally where a cleft separates the two; apical margin with a few short setae. Maxillipeds with plates well developed and 4-jointed palp; inner plates narrow, subrectangular, reaching scarcely as far as apex of first joint of palp, truncated, armed apically with 3 short spine teeth; outer plates broad, reaching as far as middle of second joint of palp, inner margin straight, outer margin strongly

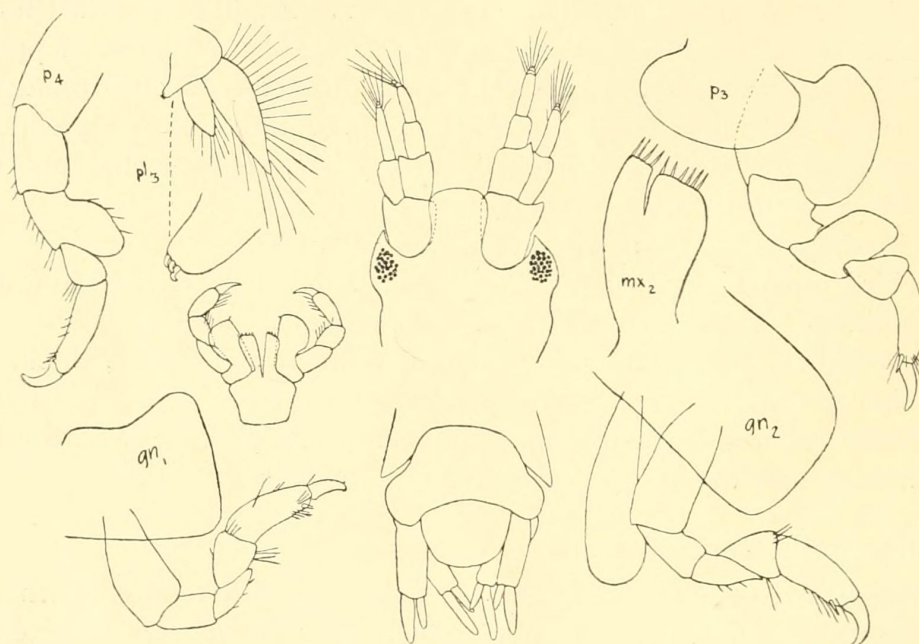


Fig. 6. *Pariphinotus tuckeri* sp. nov.

convex, armed only with single seta on inner apex; palps with first joint twice as long as wide, second joint slightly longer than first with setae on inner margin, third joint cylindrical, as long as second, with a few setae on inner margin toward distal end, terminal joint slender, unguiform.

In male, first gnathopods with large epimeron, produced slightly anteriorly; second joint moderately stout; third slightly longer than broad; fourth slender, somewhat cup-shaped with posterior convex margin provided with several setae; wrist triangular, about as broad as long with short posterior margin bearing a fascicle of setae; hand simple, as long as fourth and fifth joints together, tapering slightly, distal posterior angle provided with stout spine and several setae; finger stout and curved.

Second gnathopods with subrectangular epimeron higher than long, having rounded angles; second joint short and stout becoming uniformly broader distally; third joint slender, twice as long as broad; fourth joint narrower and shorter than third with posterior margin convex and longer than anterior; wrist, hand and finger as in first gnathopod.

Epimera diminishing in height posteriorly, that of first pereopod being slightly lower than that of second gnathopod; fourth joints rather broad, due to formation of lobe on anterior margin in anterior group of appendages and on posterior margin in posterior group; third, fourth, and fifth pereopods with second and fourth joints broad; sixth joints of all pereopods provided with stout spine at apex.

Second and third pleopods with both rami well developed and with peduncle bearing a stout prolongation medially which is provided with 3 coupling hooks at apex.

Uropods, 2 pairs, biramous; peduncle of both pairs cylindrical and extending to same distance posteriorly; rami styliform with somewhat rounded apices, outer one much longer and broader than inner one; outer margin of outer ramus of first with sparse setae, apex with single spine; second uropods with rami slightly longer than those of first, both rami with outer margin very finely serrated and provided with apical spine.

Telson semicircular, not extending as far as peduncles of uropods; margin entire.

Back provided with a rather conspicuous ridge; abdomen rather small.

No sexual dimorphism.

Length 5 mm.

The species was represented by a male and a female collected by Dr. W. G. VanName in 1901.

Colomastix pusilla Grube, 1861.

1861. Grube, Ein Ausflug nach Triest und dem Quarnero, Berlin, 1861.

Eyes small, round.

First antennae short and stout, slightly longer than second; peduncle, stout and nearly twice as long as head; flagellum rudimentary, consisting of 3 very short segments which are provided with rather long setae; first joint of peduncle slightly longer than either second or third, which are subequal in length, cylindrical

and diminishing in thickness from first to third. Second antennae also with rudimentary flagellum; third joint of peduncle rather stout and tapering very slightly; fourth joint longer than third and more slender, slightly wider distally than proximally; fifth joint cylindrical and longer than fourth, with row of setae on lower margin.

Epistome elongated in front, in form of slender cone. Upper lip large and strong with distal margin bilobed. Mandibles with elongated body, principal cutting edge divided into 5 long slender teeth which are serrated distally; molar tubercle large, cylindrical; palp wanting. Lower lip apically broad, center prominent. First maxillae strikingly broad, inner plate wanting; outer plater short with distal

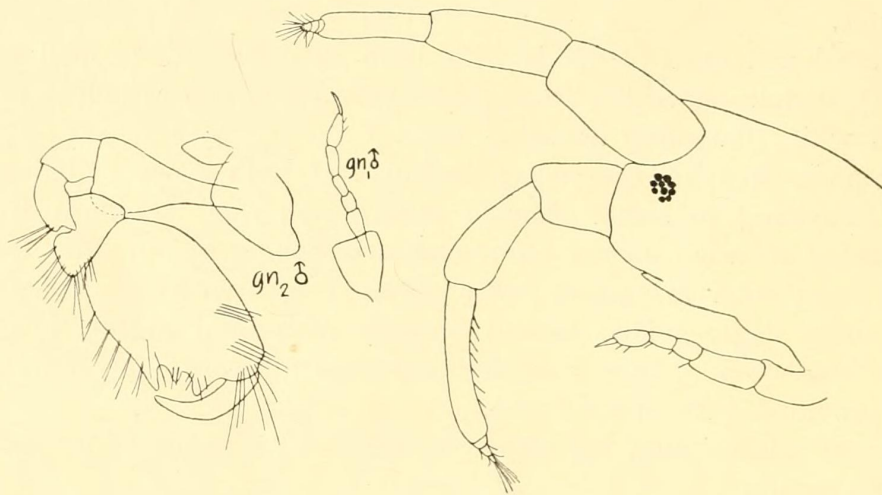


Fig. 7. *Colomastix pusilla* Grube.

margin provided with 3 odontoid spines; palp 1-jointed, curved to apex and terminating acutely so that inner margin of palp strikes against distal margin of outer plate, thus forming a true chela. Second maxillae formed of single plate, the distal margin of which is divided into 2 lobes, a small rounded one externally and a broader one medially, both of which are provided with setae. Maxillipeds very strongly developed; inner plates fused on middle line to form slender triangular plate; outer plates moderately broad but not very long, extending just beyond distal end of first joint of palp, inner margin smooth and unarmed; palp 4-jointed, slender, with first two joints cylindrical and second joint slightly longer than first, third joint a little longer than preceding, rather fusiform with a few setae on inner margin, fourth joint clawlike and about as long as second joint.

In male, first gnathopods strongly atrophied, rudimentary; epimeron triangular; second joint rather broader distally than proximally; third joint rather longer than usual; fourth, fifth, and sixth joints scarcely distinguishable, last joint forming very weak claw.

Second gnathopods with strongly developed hand; epimeron more or less oval, not large; second joint very slender at base but broadening regularly to distal end where anterior margin is produced to form a rather large rounded lobe; third joint small; fourth much narrower than third with a distal triangular process; wrist triangular, cuplike, not as long as broad, with short posterior margin provided with a number of setae; hand suboval, about twice as long as broad, anterior margin convex, posterior margin about half as long as anterior, palm oblique and very irregular, bearing 3 deep rounded indentations and numerous setae of different lengths, anterior submargin and apex with several fascicles of setae; finger rather stout and curved, of usual form.

Pereiopods rather long and slender and subequal with epimera which are longer than high; second joint long and slender; third joint small; succeeding joints elongated and subequal; claws small. Pereiopods of posterior group with second joints slender in proximal half, strongly dilated in distal half; succeeding joints very similar to those of anterior pereiopods.

Uropods, 3 pairs, biramous, all extending to about same distance posteriorly; rami broad, styliform, slightly serrated on margins; rami in all uropods subequal.

Telson entire, suboval, rather longer than broad with apical margin very slightly indented.

The species was represented by a single male specimen 4 mm. long. It has been reported from the Mediterranean and the British and French coasts.

Panoploeopsis gen. nov.

Posterior margins of posterior thoracic and anterior abdominal segments produced to form median dorsal teeth. Rostrum acute; epimera 1-3 more or less acutely tapering, fourth with posterior margin produced to form pointed process.

Mandibles narrowly tapering to cutting edge, accessory plate narrow, no spine row, molar tubercle rudimentary, palp 3-jointed. Lower lip rather elongate, without inner plate and with anterior margins of outer plates entire. First maxillae with inner plate bearing setae on inner margin and apex, outer plate rather long and nar-

row, palp 2-jointed, not reaching apex of outer plate. Maxillipeds with inner and outer plates long and narrow, outer fringed on distal part of outer margin, palp 3-jointed, first joint not as long as second and third together.

First and second gnathopods very slender, hands simple. Pereiopods 3-5 with second joint well expanded.

Third uropods with narrowly lanceolate rami, not extending as far as others. Telson broadly incised at apex.

The genus differs from *Panoploea* (G. M. Thomson) notably in the fact that the outer plates of the lower lip are not incised, in the shape of the second joint of the palp of the maxilliped and in the simple gnathopods.

***Panoploeopsis porta* sp. nov.**

Eyes circular, compound, rather small, ocelli closely crowded together.

Rostrum well developed, extending beyond first joint of peduncle of first antennae; interantennal lobes prominent, triangular.

First antennae shorter than second, with peduncle rather more than half as long as flagellum; first joint cylindrical and longer than second which in turn is longer than third joint; flagellum slender, made up of about a dozen segments which are provided with numerous threadlike setules. Second antennae much stouter than first, second joint with long slender conical process on dorsal side extending nearly as far as distal end of third joint which is slightly longer than broad; fourth and fifth joints subequal, cylindrical; flagellum about as long as last 2 joints of peduncle together.

Upper lip very long and slender. Mandibles elongated and slender toward apex, cutting edge very long, divided into 6 very short teeth, the apical one being the longest; secondary cutting plate very slender; molar tubercle rudimentary; palp 3-jointed, first joint slightly longer than broad and with rounded process apically, second joint long and slender, of uniform breadth throughout, third joint stouter and shorter than second, with a few short setae on inner margin and with outer margin slightly convex. Lower lip very much elongated and very narrow, with no inner plates and with mandibular processes rather short and with inner margin of outer plate entire. First maxillae with very slender 2-jointed palp not extending as far as apex of outer plate which is rather narrow and triangular with distal margin very oblique, provided with the usual toothed spines; inner plate small, triangular, with setae on inner margin. Second maxillae very long and slender, outer plates longer

than inner and with outer and inner margins parallel; inner plate triangular. Maxillipeds with 3-jointed palp of which the first is slightly longer than the second and as long as the third which terminates subacutely; outer plates moderately long with inner margin straight, outer margin convex and apex rather slender; inner plates moderate, terminal margin transverse and armed with plumose spines.

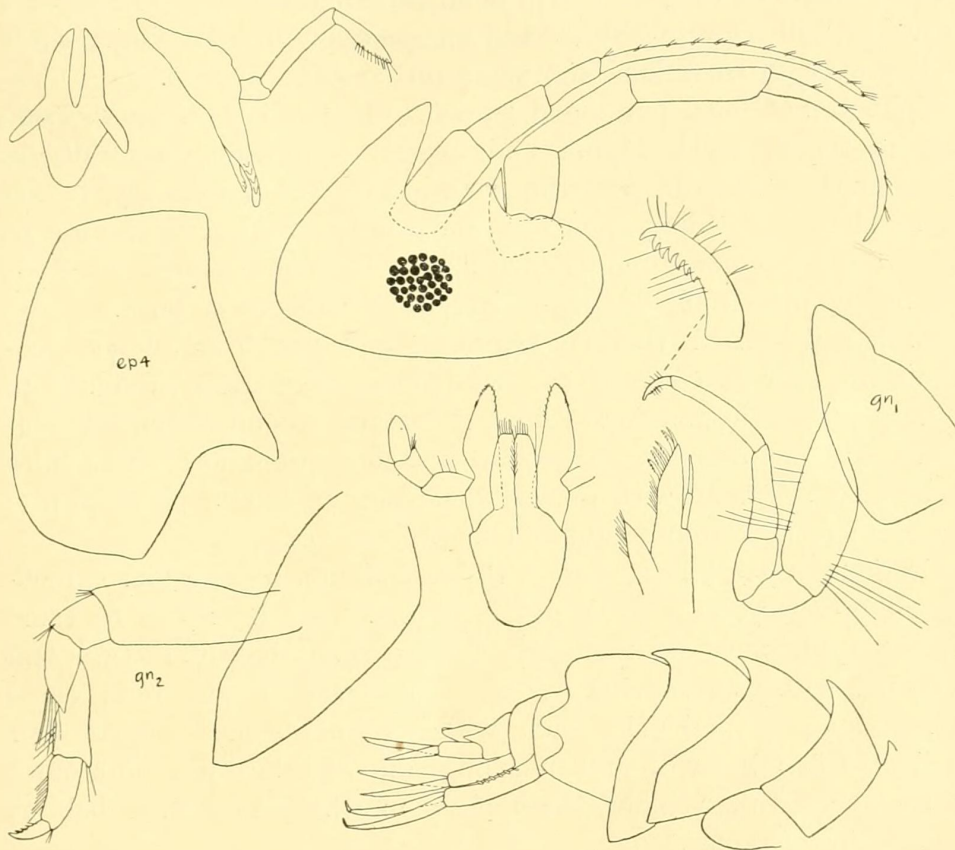


Fig. 8. *Panoploeopsis porta* sp. nov. (*Ep 4* is upside down.)

In female, first gnathopods with rather high epimeron, twice as high as long, triangular, with slight notch on anterior margin; second joint moderately stout with long setae on anterior and on distal third of posterior margin; third joint slightly longer than broad; fourth joint about as long as third and slightly stouter; wrist slender, tapering toward distal end, about 3 times as long as broad; hand more slender than wrist and longer, anterior and posterior margins nearly parallel, simple; finger short, curved, with concave margin divided into about 6 hooked teeth and with numerous setae.

Second gnathopods with epimeron rather higher than that of first and more than twice as high as long, terminating acutely ventrally: second joint moderately stout; third joint about as broad as long; fourth joint about twice as long as broad with apex acutely pointed and with long slender setae on distal portion of posterior margin; wrist longer than hand and triangular with distal margin transverse and with anterior margin produced slightly distally; hand simple, about as long as fourth joint, tapering slightly to distal end, provided with row of short setae on posterior margin; finger short and stout with serrations and setae on concave margin.

Epimeron of third pereopod similar to that of second gnathopod; that of fourth much higher and longer, terminating ventrally in acute angle and with posterior margin concave proximally to accommodate succeeding epimeron, and with acute process ventral to recess; fifth epimeron longer than high with ventral margin bilobed; seventh epimeron smaller than sixth, both suboval in form.

Sixth and seventh thoracic segments and first 3 abdominal segments more or less keeled and with posterior margin produced to a sharp process in mid-dorsal line. First and second abdominal segments with lateral margins produced to form triangular lobes; third abdominal segment with posterior margins of lateral portions produced to form 2 stout, rather blunt projections.

Uropods, 3 pairs, biramous, with rami styliform; first pair extending slightly beyond second and third pairs which extend to same distance; peduncle of first pair longer than that of second and provided with row of sharp spines on dorsal margin, rami equal and as long as peduncle, each with terminal spine; second pair similar to first but without spines on peduncle; third pair with outer ramus shorter than inner, peduncle somewhat more than half as long as inner ramus.

Telson about twice as long as broad, with apex divided into 2 triangular lobes whose apices are rather widely separated from each other.

Length 7 mm.

The species was represented by a single female collected by J. M. Jones.

Eusiroides crassi Stebbing, 1888.

1888. Stebbing, Rep. Challenger, vol. 39, p. 977, pl. 90.

Eyes moderately large, compound, reniform, pigmented.

Antennae with calceoli on flagella; first antennae moderately slender, peduncle very short with first joint slightly longer than broad

second joint slightly shorter and narrower, third joint shorter and narrower than second; flagellum made up of about 15 segments, each of which is provided with setae on distal margin; accessory flagellum made up of 1 joint which is not as long as first joint of principal flagellum. Second antennae somewhat shorter than first; peduncle short, last 2 joints longest and subequal, about twice as long as wide; flagellum scarcely as long as peduncle, composed of about 9 segments which are provided at distal ends with a few spines.

Mandibles with 3-jointed palp and with principal cutting edge not denticulate; secondary cutting edge divided into 4 slight, rounded teeth; 3 spine teeth on spine row; molar tubercle well developed; third joint of palp longest, second joint rather broad. First maxillae with 2-jointed palp. Maxillipeds with plates normally developed;

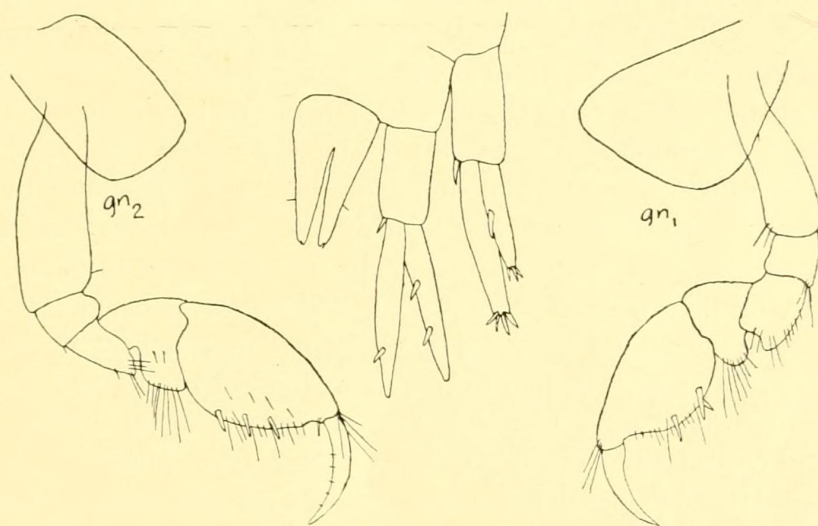


Fig. 9. *Eusiroides crassi* Stebbing.

inner plate rectangular, not as long as first joint of palp, inner margin with spine row with 4 or 5 spines; molar tubercle prominent but not very robust. Lower lip with lobes widely separated; inner plates very small; mandibular processes short and rounded. First maxillae with elongated palp 2-jointed, second joint nearly twice as long as first with 4 or 5 spines on apex and 1 on outer margin at middle; outer plate broad with 10 branched teeth on oblique distal end; inner plate small. Maxillipeds with 4-jointed palp of which the first joint is triangular, second joint articulating by inner margin and bearing 4 setae apically, second joint large, broader at distal end and with row of setae about distal margin and with inner margin densely covered with setae, third joint subrectangular, slightly

longer than broad and bearing 2 diagonal rows of setae on surface and with distal margin thickly set with long setae, not more than half as long as second joint, fourth joint unguiform, bearing 2 short setae on concave margin and nearly as long as third joint.

In male, first gnathopods with epimeron moderate, ventral margin smooth, posterior margin provided with a spiniform tooth ventral to which are 2 submarginal spines; second joint rather long and stout bearing a few long setae at distal end of anterior margin which is slightly concave; third joint about half as long as wide with fascicle of setae on distal posterior angle; fourth joint not as wide as third, about twice as long as wide, more or less rectangular with wrist articulating by anterior margin, the distal part of which bears 4 large spines, and posterior margin elongated to form a distal triangular lobe which bears 4 fascicles of setae; wrist broader than long, with posterior margin strongly convex so that segment is broader than hand, posterior margin much shorter than anterior and bearing several fascicles of setae; hand oval, smaller than that of second gnathopod, about twice as long as wide, with posterior margin continuous with palm and bearing about 9 fascicles of long flexible setae, palm oblique, and bearing 6 triangular processes which are accompanied by submarginal teeth and fascicles of setae, posterior margin very short; finger long and stout, of usual form.

Second gnathopods with epimeron higher than long with anterior and posterior margins parallel and with ventral margin slightly convex and bearing a few short setae; second joint longer than that of first gnathopod; third, fourth, and fifth joints as in first gnathopod; hand and finger more slender, but otherwise similar to first gnathopod.

Pereiopods slender, provided with dactyls; last pereiopods as long as preceding; epimera moderate, regularly convex ventrally.

Postero-lateral margins of third abdominal segment not serrated.

Uropods, 3 pairs, biramous; first pair with long slender peduncle provided with 5 or 6 spines on inner margin and one on apex, rami also slender and styliform with inner one slightly longer than outer one, extending as far as extremities of terminal uropods, rami nearly as long as peduncle; second uropods similar to first but with peduncle much shorter and with rami more tapering than in first, inner ramus rather stouter than outer and somewhat longer; terminal uropods extending well beyond telson, with rami subequal, laminar, $1\frac{1}{2}$ times as long as peduncle, both rami furnished with short setae and plumose spines on inner margin and 1 or 2 on outer margin.

Telson laminar, triangular, slender, cleft $\frac{2}{3}$ to base. In one of

the specimens at hand the right lobe was shorter than left and more rounded at apex. This may have been the result of injury. Each lobe with single spine near apex on outer margin.

Length 8 mm.

The species has been reported from the South Atlantic at a depth of about 500 fathoms.

Pontogeneia verrilli sp. nov.

Eyes compound, reniform, closely approximated dorsally.

Antennae very elongate; first slightly longer than second; and about half as long as body, much more slender than second pair,

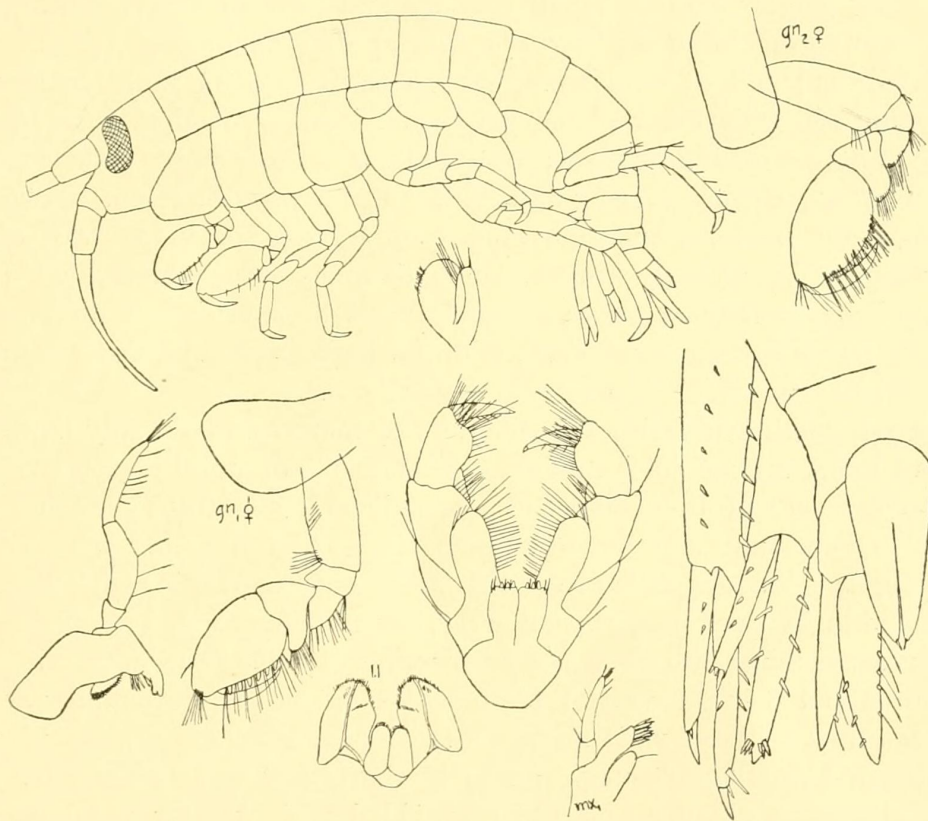


Fig. 10. *Pontogeneia verrilli* sp. nov.

peduncle rather short with joints increasing in length distally; flagellum made up of many joints which are very short toward the base but become longer distally, provided with calceoli. Second antennae with peduncle slightly shorter than flagellum and with second and third joints very short, fourth and fifth joints subequal in length, at least three times as long as second and third together; flagellum with joints very short.

Mandibles with 3-jointed palp of which the first is very short and broadens distally, second and third joints subequal but second much stouter, third joint tapering slightly and terminated by several slender spines; cutting edges denticulated; molar tubercle prominent; several spines on spine row. Lower lip with outer plates large and widely separated, inner plates large and oval; mandibular processes not large. First maxillae with inner plate oval and large, provided with single spine apically; outer plate moderately slender with distal margin very oblique and armed in usual fashion; palp long, 2-jointed, with second joint slender and tapering, with few spines on outer and inner margins and apex. Second maxillae with outer plate bearing single plumose spine apically and several simple ones on inner margin, rather slender and shorter than inner plate which is very broad and of oval form, with a few setae on inner margin. Maxillipeds with inner plates small and bearing 3 odontoid spines on transverse distal margin; outer plates rather large with outer and inner margins parallel and with apical margin rounded, bearing long setae on inner margin; palp 4-jointed and provided with unguiform spine apically; third joint with many setae apically where it is broader than at base; fourth joint with short setae on inner margin; second joint provided with flat laminar process along entire inner margin which bears long slender setae.

First gnathopods with subtriangular epimeron considerably higher than long; second joint moderately long and of uniform thickness, provided with group of spines at antero-distal angle; third joint short; fourth joint subtriangular with setae along posterior margin; wrist triangular, broader than long with setae on posterior margin; hand moderate in size, longer than wrist, oval, palm long and slightly convex, passing into short posterior margin by even curve, provided with about 6 large conical teeth and long setae alternating with them, apex of hand with fascicle of setae; finger long and slender.

Second gnathopods very similar in shape and size to first; hand slightly more slender and palm provided with greater number of teeth.

Epimera moderate; pereopods without spinning glands, with dactyls.

Three anterior abdominal segments with postero-lateral margins serrate.

Uropods, 3 pairs, biramous; first and second with rami styliform and inner longer than outer and with both rami provided with spines, first extending slightly beyond second and third, peduncle of first rather longer than rami, that of second considerably shorter;

third pair with rami rather broader and lamellar, tapering to acute point, inner ramus larger than outer, provided with slender setae.

Telson long and slender, twice as long as broad, cleft for $\frac{2}{3}$ of its length, each lobe provided apically with single spine, extending beyond peduncle of terminal uropod.

Length 7 mm. This species was represented in the collection at hand by several specimens some of which were found in dead coral from Castle Harbor.

Melita fresnelii (Audouin, 1876).

1876. *Gammarus fresnelii*. Audouin, Descr. Égypte, vol. I, iv, p. 93, Crust., pl. 11, fig. 3.

1875. *Melita fresnelii*, Miers, Ann. Nat. Hist., ser. 4, vol. 16, p. 75.

Eyes compound, circular, deeply pigmented in alcoholic specimens.

First antennae almost as long as body, longer than second antennae; peduncle more than half as long as flagellum, with first joint cylindrical, second joint longer and more slender than first; third joint very short; flagellum slender and made up of about 40 elongated segments; accessory flagellum made up of 5 segments. Second antennae extending to about middle of first antennae with peduncle somewhat longer than that of first; gland cone long and slender, reaching nearly as far as end of third joint which is longer than broad; fourth joint very long and slender; fifth subequal to fourth in length; flagellum rather long, made up of more than 14 segments.

Mandibles strong with all parts well developed; principal cutting edge denticulated; numerous spines on spine row; molar tubercle large and prominent; palp made up of 3 joints of which the first joint is short, second one moderately long, but shorter than the third and with setae along outer margin, third joint very slender, provided with many long setae on inner margin and apex. Lower lip with outer plates broad, rounded, and with anterior margin entire, inner plates moderate, mandibular processes short. First maxillae with inner plates slender and tapering, moderate, with 2 plumose spines on apex; outer plates large and curved with usual branched spines on oblique distal margin; palp 2-jointed with second joint broader apically and armed with spinelike teeth, apex of first joint provided with fascicle of setae. Second maxillae with oval plates, moderately broad; outer plates with slender setae on rounded apex; inner plates with slender setae on apex and inner margin and with an oblique row on outer surface. Maxillipeds with inner

plates rectangular, extending beyond first joint of palp and provided with plumose spines on inner and distal margins and also on distal margin with 3 odontoid spines, and submarginally at inner distal angle with 2 conical toothlike spines; outer plates moderate in size, not extending as far as second joint of palp, inner margin straight, outer margin convex, passing over to distal margin by even curve, inner margin provided with toothlike spines which increase in length toward the apex and gradually become long and slender spines on

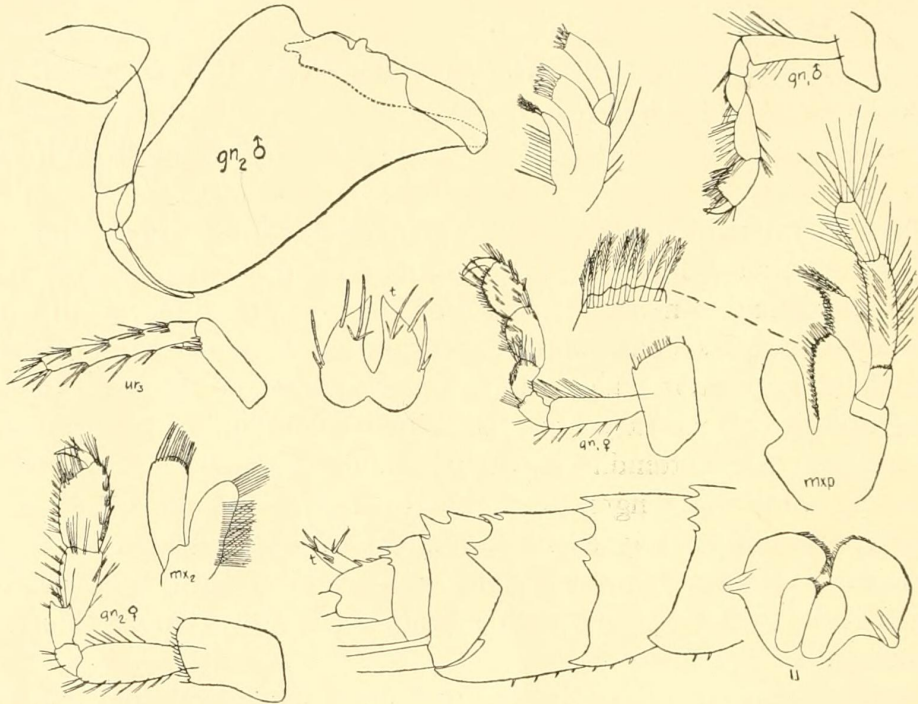


Fig. 11. *Melita fresnelii* Audouin.

distal margin; palp 4-jointed, first joint slightly longer than broad, second joint slender, broadest proximal to middle, 3 times as long as broad, provided with numerous fascicles of slender setae, third joint short and curved, larger at distal end than at proximal, fourth joint curved and tapering, with apical spine and a few large setae on inner margin.

In male, first gnathopods with small, rhomboidal epimeron; second joint long and slender, provided with long setae on anterior and posterior margins; third joint slender, slightly longer than broad; fourth joint small, broader distally and rounded, with fine cilia on posterior margin and with setae apically; wrist long, triangular, $2\frac{1}{2}$ times as long as broad with 5 or 6 fascicles of setae on posterior and distal margins; hand subtriangular, somewhat longer than

broad and broader distally than wrist, palm nearly transverse, provided with setae on posterior and distal portion of anterior margins and palm; finger stout and curved.

Second gnathopods with small rhomboidal epimeron which is higher than long; second joint rather long, extending well beyond epimeron; third joint short; fourth joint rather long with posterior margin convex and distal margin much longer than proximal; wrist rather short with posterior margin prolonged to form cuplike process in which the posterior margin of the hand fits proximally; hand very large and strong, broader distally, posterior margin prolonged apically to form strong fingerlike process which tends to make the hand chelate, palm transverse and bearing 3 strong rounded processes near articulation with finger which is strong and not greatly curved, except at apex where it closes past the fingerlike process of the hand, and which is broadest at middle.

In female, first gnathopods with quadrilateral epimeron having posterior margin forming a small triangular process and with ventral margin provided with setae and cilia; second joint long and slender with 5 fascicles of setae on posterior margin and numerous longer setae on distal $\frac{2}{3}$ of anterior margin; third joint slightly longer than broad; fourth somewhat longer than third with anterior margin very short and posterior margin long and provided near distal end with many very fine cilia and several stout setae; wrist longer than hand and as broad as hand, provided on posterior margin with numerous short setae which form a close set mass, and also with a few longer pectinate spines on posterior margin and numerous fascicles of setae near margin; hand subrectangular, less than twice as long as broad with posterior margin provided with many setae of different lengths, some of which are finely pectinate, palm finely serrate and armed with short submarginal spines, anterior margin with 4 fascicles of setae; finger of usual form having 2 curved spines on outer convex margin and with several short slender ones on concave margin.

Second gnathopods slightly stouter than first, with epimeron very similar to that of first but slightly higher; fourth segment with posterior margin prolonged to form a triangular process and provided with a few long setae; wrist quite similar to that of first gnathopod but larger, posterior margin furnished with fascicles of slender setae among which are a few finely pectinate ones; wrist as long as hand which is subrectangular, palm oblique with rounded prominence near articulation with finger, finely serrate, furnished also with numerous submarginal setae and with 3 prehensile spines,

anterior and posterior margins each with 6 fascicles of setae; finger strongly serrate and provided with 2 fascicles of setae near middle of outer convex margin.

Pereiopods with moderate epimera and with normal dactyls and no spinning glands.

Abdominal segments with ventral margins of anterior 3 prolonged posteriorly, first 2 to form simple triangular processes, third with ventral margin very much longer to form a slender process posteriorly; dorsal portion of posterior margins of abdominal segments deeply serrated to form 5 to 7 acutely pointed teeth.

Uropods, 3 pairs, biramous; first pair extending slightly beyond second, rami styliform, inner one longer than outer, peduncle slender, cylindrical, about as long as inner ramus, rami provided with spines on inner margin and apex; second pair similar in form to first but shorter; terminal uropods extending considerably beyond others, inner ramus rudimentary, outer ramus long and slender, more or less flat, about twice as long as peduncle, provided with fascicles of setae on outer and inner margins and apically.

Telson triangular, slender, lamellar, cleft $\frac{3}{4}$ to base with lobes rather dehiscent, provided with several sharp spines on outer margin and at apex, somewhat longer than broad.

Length 6 mm. Numerous specimens were at hand which were found at Flatts Village, in sand from low water to 12 feet; in Castle Harbor, among dead corals; and in Harrington Sound.

The species has been found on the coast of Brazil, Rio Janeiro, at Singapore at a depth of 9 feet, and according to Haswell it is very common at Port Jackson, New South Wales.

Melita planaterga sp. nov.

Eyes round, small, compound, deeply pigmented, situated well ventrally between first and second antennae.

First antennae long and slender, about $\frac{3}{4}$ as long as body; peduncle as long as flagellum; first joint of peduncle stout, more or less fusiform, second joint cylindrical and somewhat longer and more slender than first; third joint short, not more than $\frac{1}{3}$ as long as second; principal flagellum made up of about 18 slender segments; accessory flagellum short, 2-jointed. Second antennae somewhat shorter than first, but peduncle longer than that of first, with flagellum made up of about 7 segments and about as long as last 2 joints of peduncle, third joint of peduncle about as long as broad, fourth and fifth subequal in length, gland cone rather long and slender.

Upper lip with small median emargination. Mandibles with dentate cutting edges, prominent molar tubercle and slender 3-jointed palp, the second joint of which is the longest and the terminal joint of which tapers slightly and is a little shorter than second. Lower lip with inner plates distinct. First maxillae with numerous setae on inner plate and with outer plate armed in the usual way; palp 2-jointed with terminal joint broadened and rounded distally and armed with toothlike projections and setae. Maxillipeds with plates well developed and with 4-jointed palp; inner plates subrectangular,

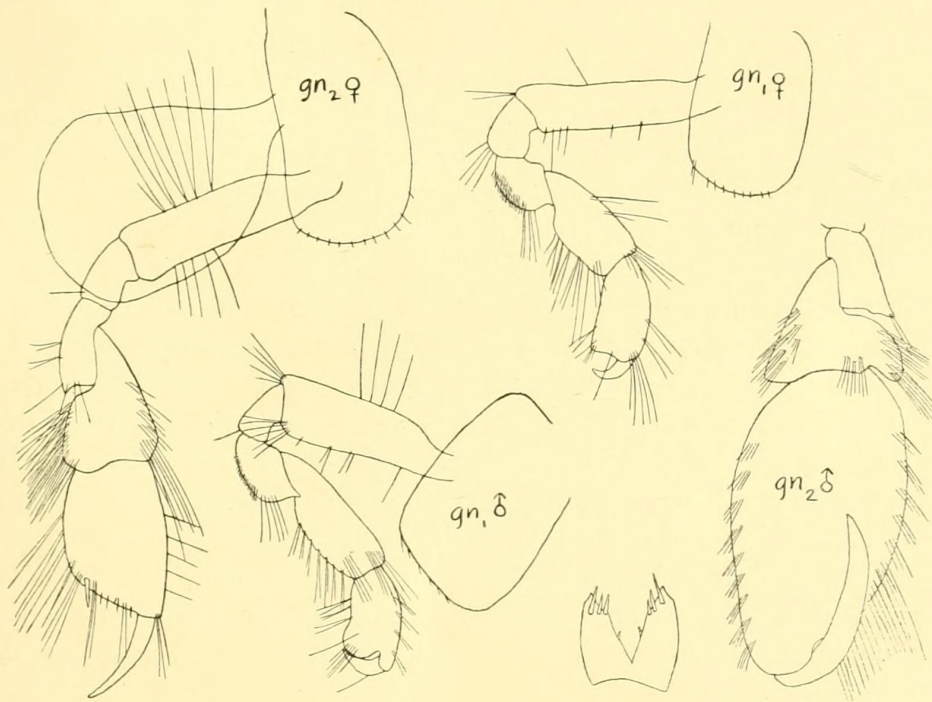


Fig. 12. *Melita planaterga* sp. nov.

long, extending nearly to middle of second joint of palp, distal margin transverse and provided with numerous setae; outer plates large, with outer and distal margins convex, inner margin straight and provided with spine teeth which become long and slender apically; second joint of palp 3 times as long as wide, cylindrical, third joint about $\frac{3}{5}$ as long as second, broader distally than proximally and bearing a rounded triangular process at middle of inner margin, rounded apex ciliated, fourth joint long and slender, unguiform.

In female, first gnathopods with oval epimeron, higher than long with ventral margin somewhat convex and provided with fine setae; second joint very long and slender with setae on both anterior and posterior margins; fourth joint short, posterior margin strongly convex

and provided with fine cilia and a few long setae; wrist triangular, twice as long as wide and longer than hand, anterior margin and distal portion of posterior margin parallel and with a few setae; hand subchelate, subrectangular, with palm transverse, about twice as long as broad; finger short and strongly curved. Second gnathopods with epimeron rather higher than first; second joint long and slender with numerous long setae on posterior margin and smaller number on anterior; fourth joint longer than third with posterodistal angle slightly produced; wrist triangular, nearly as broad as long, with dense setae on posterior margin and very long ones on anterior; hand oval.

In male, first gnathopods like female except that the wrist is much longer and the hand is broader at distal than at proximal end because of rounded lobelike process on posterior margin; palm very convex, bearing a rather marked rounded incision near hinge; finger short, thick, and somewhat curved. Second gnathopods with rounded epimeron which is higher than long; second joint moderately stout and with a few long setae on posterior margin; fourth joint about twice as long as broad with posterior margin somewhat produced to acute point; wrist triangular with posterior margin somewhat rounded and produced distally and provided with a series of transverse rows of setae; anterior submargin also with rows of setae; hand oval, nearly twice as long as broad with anterior and posterior margins of nearly equal convexity and provided with numerous fascicles of setae, palm provided with many long slender setae, rather convex and passing into posterior margin by even curve; finger rather long and stout and not greatly curved, capable of closing past palm.

Epimera of moderate size, fourth one largest, emarginate posteriorly; pereopods slender and increasing in length posteriorly, the last 2 being subequal; second joints of third to fifth pereopods well expanded with posterior margins finely serrate. Abdominal segments with posterior margin smooth, third segment with posterolateral margins entire.

Uropods 3 pairs, biramous; first and second pairs with lanceolate rami provided with a few stout setae on outer margin and fascicle of setae at apex; third uropods with inner ramus small, outer ramus greatly elongated and rather foliaceous, with margins slightly convex and apex blunt, provided with stout setae on both margins and apex.

Telson as broad as long, cleft to base, each lobe bearing triangular process distally and several setae.

Length 9 mm.

The preserved specimens were marked with irregular chocolate brown bands on posterior margin of body segments, the bands on the first 3 abdominal segments being especially broad; the telson, peduncles of uropods, and of antennae were marked with very minute brown spots and the proximal joints of pereopods bore irregular longitudinal brownish lines.

The specimens were collected in a brackish pond near Flatts Village.

Ceradocus orchestipes A. Costa, 1853.

1853. A. Costa, Rendic. della Soc. Reale Borbon., Acc. delle Sci., Napoli, n. ser., vol. 2, p. 177.

Eyes compound, large, round.

First antennae about $\frac{3}{4}$ as long as body; peduncle rather long but shorter than flagellum, first joint moderately stout, cylindrical, second joint slightly longer than first, third joint rather short and slender; flagellum made up of 22 or more segments, the first of which is scarcely to be distinguished from terminal joint of peduncle; secondary flagellum made up of 5 segments. Second antennae shorter than first, flagellum rather short; gland cone rather long and slender, extending beyond distal end of third segment which is about twice as long as broad, fourth segment slightly longer than fifth, rather long and slender; flagellum made up of about 9 joints, about equal in length to last joint of peduncle.

Mandibles with all parts well developed; palp 3-jointed, first joint moderately long, broader at apex and bearing sharp spinelike process at inner distal corner, second joint longest, tapering slightly toward distal end and bearing 4 long setae on inner margin; third joint about $\frac{1}{2}$ as long as second with slender rounded apex which bears several long setae and is also provided with 2 setae on inner margin and 1 on outer; principal cutting edge divided into 2 rounded teeth; secondary cutting edge broad, made up of 4 equal teeth; 7 plumose spines on spine row; molar tubercle moderate. First maxillae with 2-jointed palp, second joint longer than proximal joint and broader at apex which is provided with numerous spines; outer plate large, with 6 or 7 branched and pectinate spines on oblique distal margin; inner plate broad, triangular, with inner margin provided with row of long plumose spines. Second maxillae of usual form, plates oval, subequal; outer plate with apex provided with setae; inner plate with setae on inner margin as well as apex. Maxillipeds with plates well developed; inner plate with apex truncate and outer and inner angles prolonged to form toothlike processes, apical

margin with many plumose spines; outer plate extending almost as far as second joint of palp with inner margin provided with toothlike spines which become longer toward rounded apex; palp with first joint slightly longer than broad, second joint very long and moderately slender having slender setae on inner margin, third joint short, with distal end larger than proximal; fourth joint with slender terminal spine as long as joint itself.

In male, first gnathopods with epimeron triangular, small; second joint moderately stout with short setae on anterior margin and several very long ones on posterior margin; third joint short with group of moderately long setae near distal end of posterior margin;

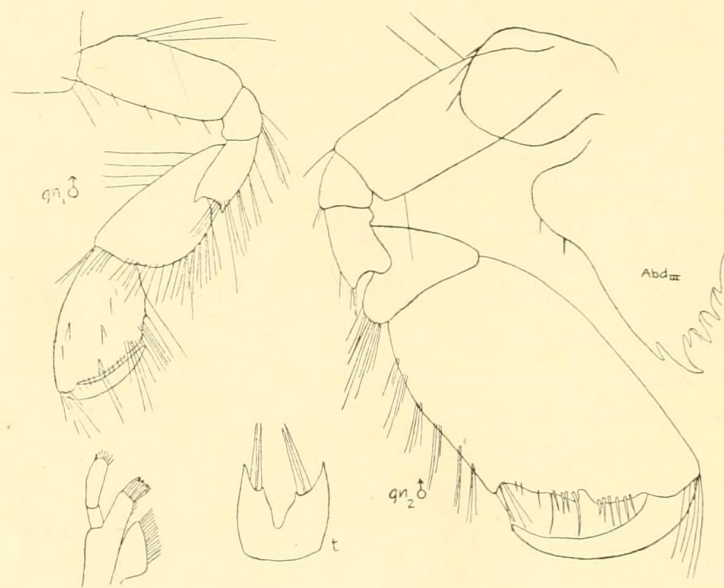


Fig. 13. *Ceradocus orchestipes* A. Costa.

fourth joint more or less rectangular with 4 fascicles of setae on posterior margin and group of setae on distal margin, both anterior and posterior margins produced distally to form small triangular processes; wrist very large, triangular, longer and broader than hand, posterior margin very convex and provided with many long setae which also are present on distal margin, anterior margin with 4 quite long setae; hand more or less oval with palm oblique and about as long as posterior margin which bears many setae, palm provided with numerous setae; finger of usual form moderately stout.

Second gnathopods with rectangular epimeron slightly higher than long; second joint short and stout with 2 long setae near proximal end of posterior margin and 1 at distal end and 1 near distal end

of anterior margin; third joint short; fourth about twice as long as broad, subrectangular; wrist small, triangular, broader than long with many long setae on convex posterior margin; hand very large, subrectangular, twice as long as broad, with palm oblique and having moderately deep notch near middle, prehensile angle with stout spine, palm provided with numerous submarginal setae, posterior margin with 6 fascicles of setae and apex with 5 or 6 long setae; finger curved, stout and of usual form.

Pereiopods with epimera of moderate size, of usual form and provided with dactyls but no spinning glands.

Uropods 3 pairs, biramous; first extending slightly beyond second, rami cylindrical, inner one slightly longer than outer, peduncle $\frac{1}{3}$ longer than rami, provided with sharp spines on inner margin; second uropods of essentially same form as first but with peduncle much shorter so that rami are slightly longer than peduncle; terminal uropods reaching much beyond the others, rami very long, equal, laminar, finger with spinules, apices narrowly truncate.

Telson flat, slightly longer than broad, with lobes widely separated, cleft $\frac{2}{3}$ to base; each lobe terminating in long acute process and bearing 2 long stout spines side by side on inner margin near apex.

Length 6 mm.

The species was represented by a number of specimens some of which were found in sand at Flatts Village from low water to 2 fathoms.

The species has been reported previously only from the Mediterranean.

***Ceradocus parkeri* sp. nov.**

Eyes, small round, compound.

First antennae long and slender, about $\frac{1}{3}$ as long as body, with rather long peduncle, about $1\frac{1}{2}$ times as long as flagellum which is made up of about 20 segments which are provided with long setae; accessory flagellum half as long as principal flagellum, made up of 6 or 7 segments; peduncle with first 2 segments cylindrical and equal in length, third joint less than $\frac{1}{5}$ as long as second and narrower. Second antennae about $\frac{3}{5}$ as long as first, with short flagellum made up of about 8 short segments, slightly shorter than last joint of peduncle, which in turn is about $\frac{1}{3}$ shorter than the fourth and is provided with setae on the lower margin, fourth joint cylindrical, with setae on lower margin, third joint about 3 times as long as broad, gland cone small and applied closely along lower margin of third joint.

Mandibles with principal and secondary cutting edges dentated and with numerous spines on spine row, molar tubercle robust; palp 3-jointed, with first joint rather short, second joint long and slender with row of long stiff setae on inner margin, third joint shorter and more slender than second with several very long setae on inner margin toward apex which is rather acute. Lower lip with inner plates broad and rounded, outer plates broad with entire margins, mandibular processes short and stout. First maxillae with 2-jointed palp, inner plate triangular with many setae on inner margin. Second maxillae with plates having apices rounded, outer plate larger than inner, both provided with setae on distal end. Maxillipeds with 4-jointed palp, the first joint of which is about as long as broad, the second is long and slender, cylindrical with setae on inner margin,

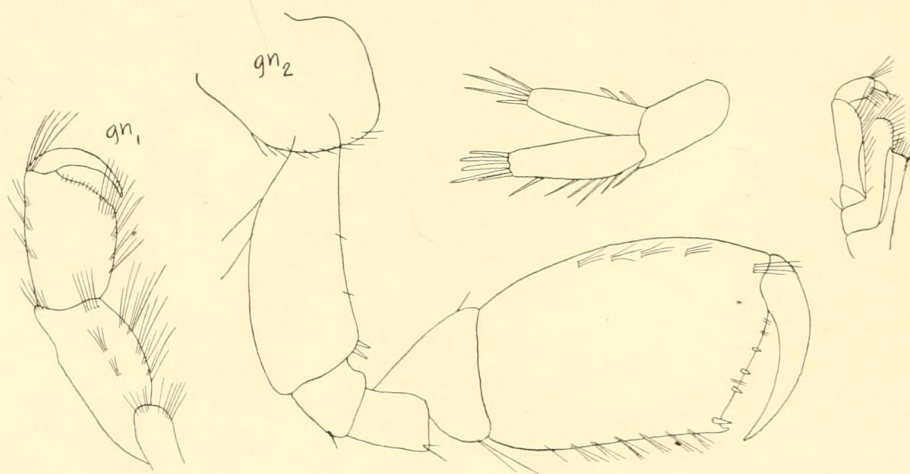


Fig. 14. *Ceradocus parkeri* sp. nov.

the third is less than $\frac{1}{2}$ as long as the second with the distal end rather broader than proximal and provided with setae on rounded apex, and the fourth joint is conical with a stout spine apically; outer plate rather well developed, extending nearly as far as apex of second joint of palp with outer margin rounded and inner margin provided with broad toothlike spines which become longer toward apex; inner plate moderate, rectangular, with distal margin transverse and provided with a few plumose spines and bearing triangular process on outer distal angle.

In male, first gnathopods with moderate epimeron, having antero-ventral angle prolonged slightly and provided with several spinules; second joint rather long, slightly broader distally than proximally and with a few setae on posterior margin; third joint short; fourth joint rather longer than broad, subrectangular, with rounded apex

bearing fascicle of setae; wrist rather large and subtriangular, twice as long as wide, with many fascicles of setae on posterior margin and on lateral surface, and stout spines on apex; hand shorter than wrist but about as wide, subrectangular with distal end wider than proximal and with palm slightly oblique, finely serrate and provided with short setae, posterior margin provided with 4 or 5 fascicles of long stout setae, prehensile spine present, anterior margin slightly convex and provided with 4 or 5 fascicles of setae; finger moderately stout and curved with few fine setules on concave margin.

Second gnathopods with subrectangular epimeron about as broad as long, with ventral margin provided with a few setae; second joint very stout with 2 long spines on proximal third of posterior margin and numerous fine setae on anterior margin and 2 short stout setae on anterior distal apex; third joint broader than long; fourth, subrectangular, twice as long as broad with single seta on postero-distal apex; wrist triangular, about as broad as long; hand stout, subrectangular, slightly broader distally than proximally, palm slightly oblique, provided with setae, prehensile angle produced to form curved toothlike process and provided with prehensile spine, posterior margin with about 8 fascicles of setae, anterior submargin with about 4 fascicles; finger of usual form, stout.

Epimera of moderate size; pereopods of moderate size and provided with clawlike fingers.

First 3 abdominal segments with posterior and lateral margins entire and rounded.

Uropods, 3 pairs, biramous; rami of first 2 pairs styliform and subequal, with large spines apically; third uropods with rami much longer than peduncle and somewhat flattened, outer ramus longer than inner, with rather long spines on outer margin and apex, inner ramus with long spines apically. Telson subrectangular, about as broad as long, divided to base, each lobe with several long stout spines on inner apex.

Length, 6 mm.

The species is represented by a single male specimen.

***Ceradocus colei* sp. nov.**

First antennae slender, longer than second, about half as long as body; peduncle about $\frac{2}{3}$ as long as flagellum which is made up of nearly 20 segments; first joint of peduncle swelling somewhat in thickness at middle, about 3 times as long as broad, provided with a few setae, second joint longer and more slender than first and provided with setae, third joint small, scarcely to be distinguished

from proximal joints of principal flagellum; accessory flagellum short, 2-jointed. Second antennae with flagellum about as long as last 2 joints of peduncle, made up of 8 or 9 elongated segments; gland cone rather stout and prominent, third joint slightly longer than broad, fourth joint cylindrical and about as long as first joint of peduncle of first antennae, fifth joint longer and more slender than fourth, both fourth and fifth joints with slender setae.

Mandibles as in *C. parkeri*. First maxillae with 2-jointed palp, of which the first is short and the second more or less clubshaped with short spines on rounded apex; outer plate slightly tapering in form, with usual spine teeth on distal margin; inner plate somewhat rounded with numerous setae on inner margin. Maxillipeds

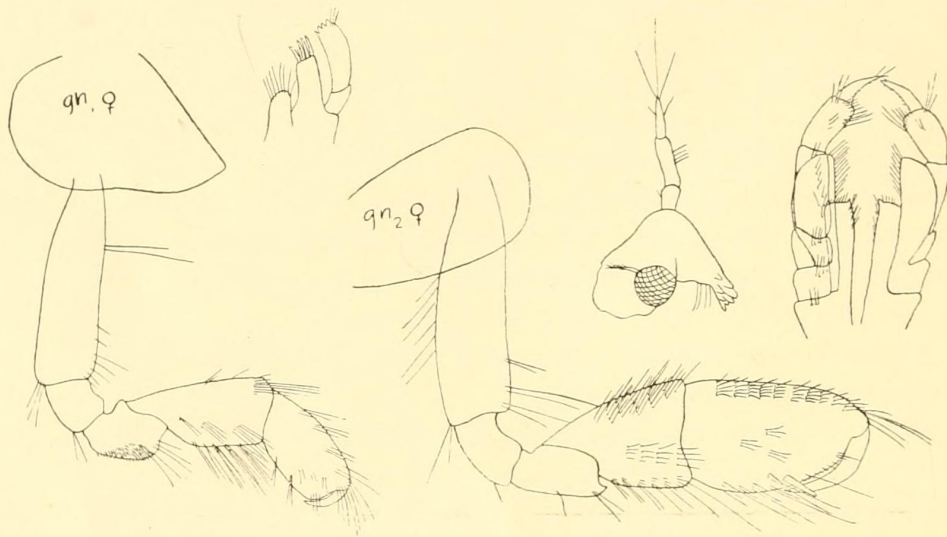


Fig. 15. *Ceradocus colei* sp. nov.

with 4-jointed palp and outer and inner plates well developed; first joint of palp short, cylindrical, second joint cylindrical and about $2\frac{1}{2}$ times as long as broad, third joint slightly thicker distally than proximally, about twice as long as wide and of about the same thickness at widest part as second, provided with spines and cilia at apex, fourth joint clawlike, curved, with short setae on inner margin; outer plate extending as far as apex of second joint of palp with inner margin straight and provided with abundant setae, outer margin and apex convex; inner plates extending scarcely to middle of second joint of palp, apex truncated and provided with short setae which become more slender and extend along distal half of inner margin.

In female, first gnathopods with moderate rhomboidal epimeron

having anterior ventral angle somewhat produced anteriorly; second joint rather long and slender with margins parallel and with anterior margin having several long setae near proximal end and group of shorter ones at distal end, posterior margin with group of setae at distal end; third joint small, with few setae on posterior margin near distal end; fourth joint broader distally than proximally, with posterior margin especially strongly convex toward distal end and provided with a fascicle of rather long setae apically and ciliated for $\frac{3}{4}$ of its length; wrist $\frac{1}{3}$ longer than hand, somewhat over $\frac{1}{3}$ as broad as long, of uniform width throughout except at proximal end where articulation with fourth joint is oblique, anterior margin with fascicle of pectinate spines at anterior apex, posterior margin with 6 or 7 fascicles of setae, some of which are pectinate, surface of wrist with several groups of setae; hand subrectangular, slightly narrower at proximal end than at distal end and narrower than wrist, anterior margin slightly convex and provided with several fascicles of setae, posterior margin with several groups of setae, palm transverse, slightly convex with submarginal setae toward posterior margin; finger of usual form, extending as far as prehensile angle of hand.

Second gnathopods with epimeron twice as high as long with ventral margin evenly rounded; second joint moderate with long setae on posterior margin and a few near distal end of anterior; fourth joint with posterior margin elongated to form triangular projection; wrist triangular, about $1\frac{1}{3}$ times as long as broad, with anterior and posterior margins provided with numerous fascicles of setae; hand suboval, somewhat longer than wrist and of same width, anterior margin twice as long as posterior, with numerous fascicles of setae, posterior margin with long setae, passing into oblique convex palm by even curve, prehensile angle with several stout setae, palm provided with setae of various lengths; finger moderately long and curved with setae on middle of convex margin.

Pereiopods and epimera as in *C. parkeri*. Third abdominal segment with postero-lateral angle prolonged somewhat posteriorly, posterior margin entire.

Uropods, 3 pairs, biramous; rami of first and second styliform, those of first pair extending beyond second; third pair long and rather flattened.

Telson subrectangular, about as long as broad, divided to base, each lobe somewhat acutely pointed and provided with group of several setae of different lengths.

Length 5 mm. There was a single female specimen in the collection.

Maera inaequipes (A. Costa, 1851), Stebbing, 1906.1851. *Amphithoe inaequipes*, A. Costa, Cat. Crost. Ital., p. 45.1906. *Maera inaequipes*, Stebbing, Das Tierreich, Lief. 21, p. 435.

Eyes small, rounded, compound, deeply pigmented in alcoholic specimens. Interantennal lobes rather prominent and rounded.

First antennae about $\frac{1}{2}$ as long as body, slender, peduncle longer than flagellum, second joint rather longer than first which tapers slightly; third joint very short; flagellum made up of about 18 segments gradually increasing in length distally; accessory flagellum long, made up of 7 segments, more than half as long as principal flagellum. Second antennae extending to about middle of flagellum

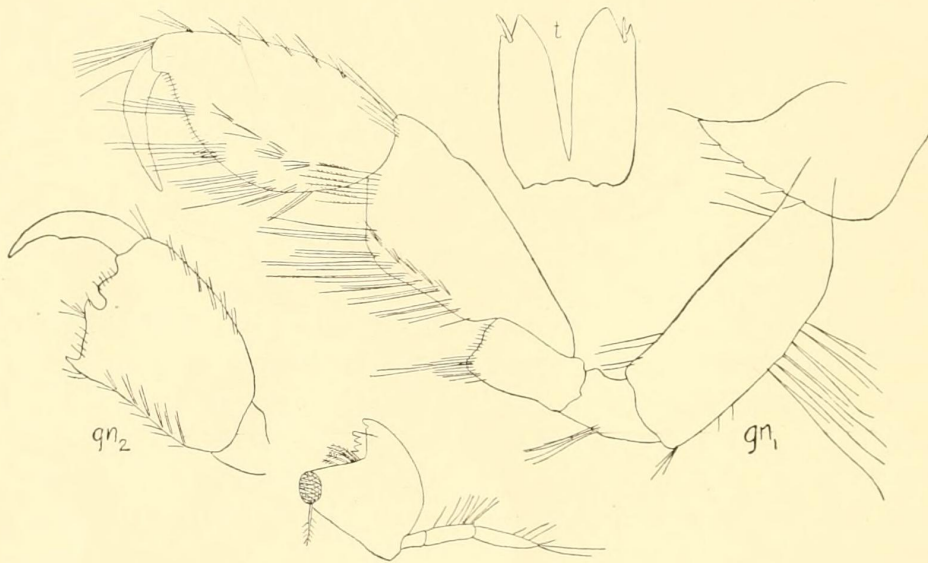


Fig. 16. *Maera inaequipes* (A. Costa).

of first; peduncle about as long as that of first antennae; gland cone rather long and acutely pointed, extending to middle of next segment; third joint more than $\frac{1}{2}$ as long as fourth which is the longest and is very slender; fifth joint about $\frac{3}{4}$ as long as fourth; flagellum about as long as fourth joint of peduncle, consisting of about 10 segments.

Mandibles triangular, with all parts well developed; palp 3-jointed, third joint longest, tapering somewhat in form; second joint slightly shorter than third, about 3 times as long as broad, cylindrical; first joint longer than broad; principal and secondary cutting edges both denticulated, secondary plate rather broad; molar tubercle very large, 5 or 6 spines in spine row. Lower lip broad, having anterior margin of outer plates incised; inner plates large; mandibular

processes elongate. First maxillae with 2-jointed palp having proximal joint broader apically, distal joint about 3 times as long as broad, rounded apically and bearing a number of setae at apex; outer plate not reaching to middle of second joint of palp, with truncated apical margin which bears about 8 branched and furcate spines; inner plate small, triangular, bearing about 4 plumose spines apically. Second maxillae with oval plates having apices rounded; outer plate slightly longer and broader than inner one. Maxillipeds with 4-jointed palp and well developed plates; second joint of palp rather, long about 3 times as long as broad, third joint about twice as broad as long with rounded apex, fourth joint conical, armed with terminal claw nearly as long as segment itself; outer plate oval, extending about $\frac{2}{3}$ to distal end of second joint, provided with odontoid spines along inner margin which become longer toward apex and on the broad distal margin; inner plate rectangular having plumose spines on distal margin which bears a small triangular process at outer corner and a single toothlike spine apically and externally.

In female, first gnathopods with small epimeron produced to form acute angle anteriorly, ventral margin slightly notched and provided with fine setae; second joint of moderate proportions with long setae on posterior margin; third joint longer than broad, bearing group of setae on posterior margin; fourth joint rectangular, bearing rounded process on postero-distal angle, distal end provided with row of short setae and a number of longer ones; wrist very long, as long as hand, triangular, articulating with anterior margin of fourth joint, anterior margin indented slightly near distal end, posterior margin provided with 8 or 9 fascicles of setae and bearing, proximal to articulation of hand, a row of pinnate spines; hand rather small, regularly oval, posterior margin more convex than anterior, palm oblique passing by even curve into posterior margin, with short submarginal setae and several fascicles of longer setae and 3 prehensile spines; finger rather long and curved.

Second gnathopods with small rhomboidal epimeron having setae on antero-ventral margin; second joint of same form as that of first with long slender setae on anterior margin at proximal and distal ends; third joint short; fourth rectangular, as in first; wrist very small, triangular, with lobe on free posterior margin which is rounded and provided with numerous fine setae; hand very large and oval, twice as long as broad and broader than wrist, palm variable in character but moderately long, often with 3 rounded processes near articulation with finger and provided with numerous submarginal setae of various lengths, and with posterior margin produced to

form triangular process behind which the extremity of finger fits; finger very long and strong. (Palm usually transverse and with rounded notch in the middle; in one specimen the hands on the 2 sides were quite different.)

Gnathopods of male quite similar to those of female.

Pereiopods of moderate length, those of posterior group being rather stout and fourth and fifth being subequal, all furnished with tricuspidate dactyls; epimera of moderate size, subrectangular; third to fifth pereiopods with second joints moderately expanded, posterior margin produced slightly distally.

Uropods, 3 pairs, biramous; first pair with moderately long peduncle, bearing stout spines on outer margin, inner ramus slightly longer than outer; second uropods shorter than first, extending posteriorly about as far as first pair; third pair of flattened form, extending scarcely beyond others, peduncle short, rami with truncated apices, provided with fascicles of setae on outer margin and apex of outer ramus which is rather broader and longer than inner.

Telson longer than broad divided nearly to base, lobes widely dehiscent; each lobe terminating in triangular point bearing small toothlike process at base of outer margin, and accompanied by toothlike spine.

Third abdominal segment with postero-lateral corners not serrate. Length 7 to 8 mm.

The species was represented by numerous specimens which were rather variable. Specimens were collected at Flatts Village in sand from low water to 2 fathoms, in dead coral in Castle Harbor, in corallines from Bailey Bay, and in Harrington Sound. It has been previously recorded from the Mediterranean and the Azores.

Maera rathbunae Pearse, 1908.

1908. A. S. Pearse, Proc. U. S. National Mus., vol. 34, p. 29.

Eyes round, small, compound, deeply pigmented.

First antennae longer than second, with peduncle longer than flagellum, first joint rather stout, slightly tapering in form, second joint very slender, longer than first; third joint short, hardly to be distinguished from first joint of principal flagellum, which is made up of about a dozen segments; accessory flagellum as long as first 7 segments of principal flagellum, composed of many joints. Second antennae with rather short flagellum, about as long as fourth joint of peduncle, made up of 8 segments; gland cone prominent, extending nearly to end of third joint of peduncle; fourth joint slightly longer than fifth, and like the fifth provided with long setae.

Mandibles with all parts well developed, palp 3-jointed, the terminal joint of which is bluntly styliform, shorter than second and provided with long setae on inner margin. First maxillae with 2-jointed palp of uniform thickness throughout and with apex rounded and provided with short setae; outer plate of usual form with forked and branching toothlike spines on oblique distal margin; inner plate



Fig. 17. *Maera rathbunae* Pearse.

triangular, of moderate size, with 4 setae on apex. Second maxillae with subequal, oval plates having setae on distal margins. Maxillipeds with 4-jointed palp and well developed plates; inner plate subrectangular, extending somewhat beyond first joint of palp with outer margin slightly convex and with distal margin armed with plumose spines; outer plate rather large, armed with setae on inner and distal margins, oval, extending nearly as far as second joint of palp which is the longest and cylindrical; third joint about $\frac{1}{2}$ as long

as second and slightly longer than first; fourth joint clawlike, about as long as third.

In male, first gnathopods with suboval epimeron and moderately slender second joint which bears several long setae on posterior margin; third joint short; fourth joint slightly longer than broad with numerous setae on rounded apical margin; wrist rather large and triangular, more than twice as long as broad, with posterior margin well rounded and with distal margin provided with numerous setae, anterior margin produced to form a triangular process; hand about as wide as wrist but not so long, suboval in form, posterior margin more convex than anterior margin and passing into oblique palm by an even curve, palm slightly irregular in contour and provided with setae of various lengths; finger moderately long and slender.

Second gnathopods with small, subrectangular epimeron; second joint fairly short and third joint a little longer than broad; fourth smaller than third with anterior margin much longer than posterior; hand very large, subtriangular in form with base of triangle forming palm, posterior margin produced to form a triangular process, palm very irregular in contour, more or less incised in posterior half and with rounded prominence near articulation with finger provided with stout spine; finger very large and strong, of curved form with concave margin bearing a slight eminence toward middle.

Epimera low, suboval in form, third slightly bilobed ventrally, second epimeron highest.

Uropods, 3 pairs, biramous; first pair with peduncle longer than the styliform rami; second pair rather stouter than first, rami provided with numerous stout setae; third pair with short peduncle and rather broad, subrectangular lamelliform rami of which the inner one is shorter than the outer one and provided only at apex with setae, outer ramus also with setae on outer margin, third uropods extending slightly beyond first and second.

Telson rectangular, slightly broader than long, incised for $\frac{2}{3}$ of its length with the lobes widely dehiscent, lobes truncate and distal angles provided with several setae.

Length of single male specimen which was in the collection, 5 mm.

The species has been reported by Pearse from the Gulf Stream, off Key West, Florida, in 98 fathoms, Station 7279, U. S. Bureau of Fisheries, steamer *Fish Hawk*; and 122 fathoms, Station 7296.

Maera tinkerenensis sp. nov.

Eyes rather large, circular, with ocelli very widely separated. Interantennal lobes of head not prominent. Back sparsely setose.

First antennae with long peduncle, somewhat longer than flagellum, more than $\frac{1}{2}$ as long as body; first joint of peduncle tapering slightly, rather longer than head, bearing on proximal half of lower margin 3 setae equidistant from each other and on upper margin, numerous very fine setae, apically a single seta and fascicle of setae; second joint more slender than first and slightly longer, provided with fascicles of setae on upper margin and short setae on lower; third joint less than $\frac{1}{3}$ as long as second; principal flagellum composed of many segments, provided apically with short

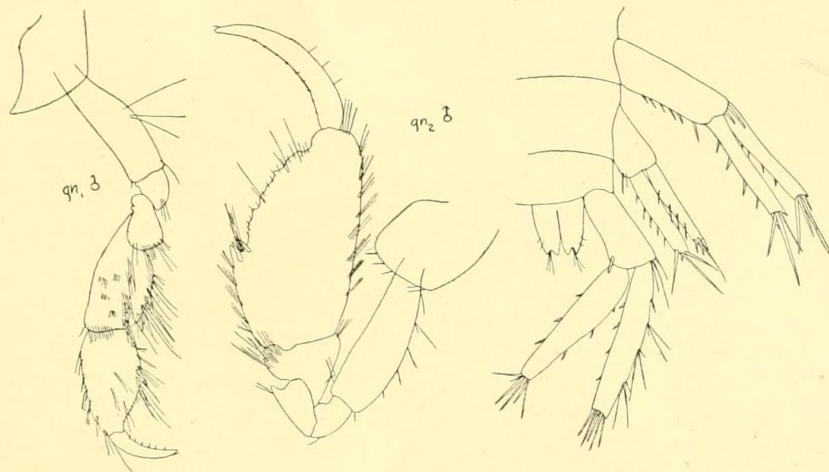


Fig. 18. *Maera tinkerenensis* sp. nov.

setae; accessory flagellum long, made up of 5 segments. Second antennae only slightly longer than peduncle of first, with gland cone long and slender; third joint about 3 times as long as broad; fourth and fifth joints slender, fourth being slightly longer than fifth; flagellum scarcely longer than last joint of peduncle, made up of about 6 segments.

Mandibles with denticulated cutting edge and all parts moderately developed; palp 3-jointed, with second joint longest; third joint of tapering form and provided with long setae on inner margin. Lower lip of ordinary form, rather broad and furnished with strong mandibular processes. First maxillae with 2-jointed palp of uniform width and with square apex and furnished with 7 or 8 plumose spines, proximal joint of palp with numerous very fine setae on outer margin; outer plate extending beyond middle of second joint of palp, some-

what tapering with apex truncate and provided with about 8 branched (antler-like) spines; inner plate small, triangular, with 3 spines apically. Second maxillae of usual form with oval plates, outer plate broader distally, inner one broader proximally. Maxillipeds with 4-jointed palp, second joint long and slender, more than 4 times as long as broad, third joint as long as fourth including terminal spine; outer plate rather narrow and slender, reaching nearly to end of second joint of palp, provided on inner margin with row of closely set toothlike spines which become longer toward distal end of plate where they become plumose; inner plate rectangular, with plumose spines on apical margin and distal portion of inner margin, which bears at distal end a submarginal toothlike spine and external to this a fascicle of simple setae.

In male, first gnathopods with epimeron which is higher than long and which projects strongly anteriorly, with a short seta just behind anterior ventral corner; second joint moderately long with several setae near middle of posterior margin; third joint slightly longer than broad with fascicle of setae near distal end of posterior margin; fourth joint short with posterior margin very convex so that joint is $\frac{2}{3}$ as broad as long, posterior margin with numerous setae on distal portion; wrist subrectangular, widening somewhat toward distal end, as broad as hand and slightly longer, posterior margin with 8 or 9 fascicles of slender setae which increase in length distally, surface of wrist provided with many fascicles of short simple setae and longer pectinate spines; hand oval, with more or less convex palm passing by even curve into posterior margin, provided with 2 prehensile spines, posterior margin with 3 fascicles of setae, palm finely serrated and provided with numerous submarginal setae, surface of hand and anterior margin further furnished with fascicles of setae; finger of usual form with single seta on outer margin near base and 5 or 6 blunt spines on inner margin.

Second gnathopods with epimeron about as broad as long, with ventral margin slightly convex and furnished with 4 or 5 setae; second joint long, with posterior margin convex and furnished with 4 or 5 setae placed at equal distances from each other; third joint somewhat longer than broad; fourth joint twice as long as broad, broadening somewhat distally, with posterior margin elongated to form a sharp projection having 2 setae at base; wrist triangular, not as wide as hand, with posterior margin rounded to fit internal to projection on fourth joint, rounded portion covered with setae of various lengths, the longest being on the margin; hand large,

oval, nearly twice as long as wide, with anterior margin having a number of fascicles of setae, palm oblique, more than $\frac{1}{2}$ as long as hand, posterior margin furnished with 5 or 6 fascicles of setae, prolonged to form a notch behind which the end of the dactyl fits, notch provided with fascicle of long setae and with 2 spines bearing cilia-like appendages, palm serrated and provided with submarginal setae of various lengths; finger of usual form with 3 slender setae on convex margin and 9 submarginal filiform spines on internal margin.

Pereiopods moderately slender, seventh slightly longer than sixth; epimera of moderate size with ventral margin convex and furnished with a few setae.

None of the segments dentate dorsally.

Postero-inferior margin of third abdominal segment entire.

Uropods, 3 pairs which are biramous, first extending as far as second and having rami subequal and longer than peduncle, the inner margin of which is furnished with 6 spines and apex with several rather long spines, rami with 4 spines on inner margin and group of longer ones at apex; second uropods with peduncle shorter than that of first and also relatively much shorter than rami which are subequal and stouter than those of the first; terminal uropods extending far beyond others, with peduncle short and provided with setae on distal margin, outer ramus somewhat longer than inner, of uniform width, furnished externally with 4 notches in which are fascicles of setae, inner margin with 4 short spines and fascicle of long spines apically, inner ramus of slightly tapering form with outer margin furnished with 3 spines and inner with 4 and apex with a fascicle of setae.

Telson longer than broad, deeply cleft, each lobe being incised to form a triangular notch in apex and armed with one spine and fine seta.

Length 4 mm.

The species was represented in the collection by several males from Harrington sound.

***Elasmopus rapax* A. Costa, 1853.**

1853. A. Costa, Rendic. della Soc. Reale Borbon., Acc. delle Sci., Napoli, n. ser., vol. 2, p. 175.

Body moderately compressed and stout, back without carinae or spines but with sparse, very fine setules. Postero-lateral angle of first 2 abdominal segments about 90° , third segment rather rounded

and slightly acute; ventral margins of abdominal segments provided with rather stout spine about in the middle.

Eyes compound, reniform, composed of many ocelli, deeply pigmented in alcoholic specimens.

First antennae longer than second, with flagellum rather shorter than peduncle, second segment of peduncle slightly longer than first and more slender; third segment about $\frac{1}{2}$ as long as second; flagellum made up of many segments; accessory flagellum 2-jointed,

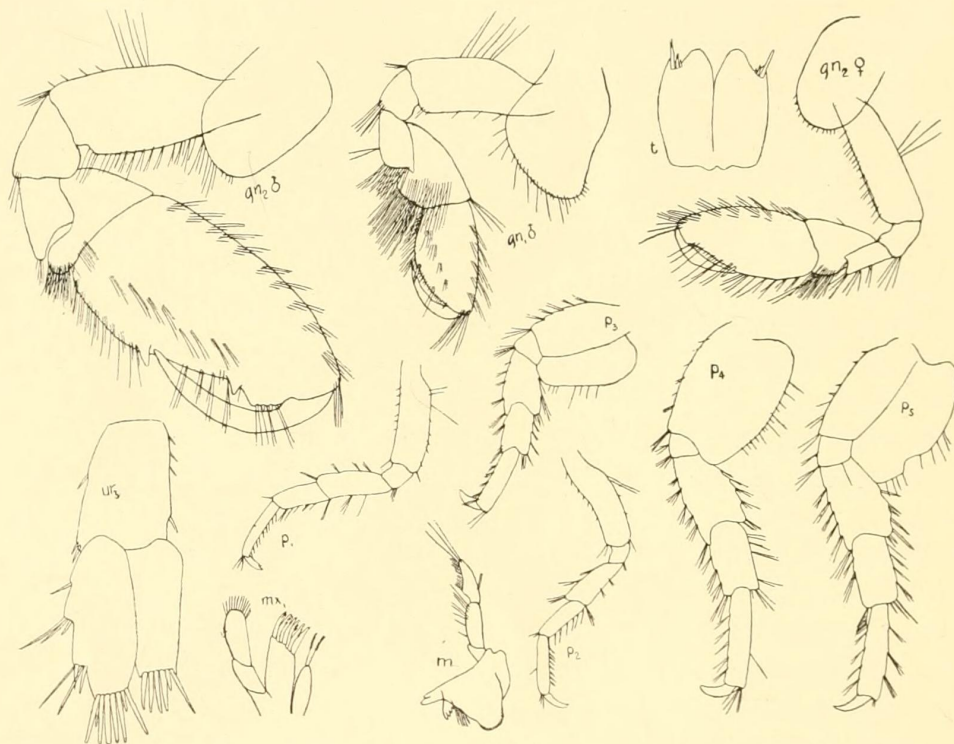


Fig. 19. *Elasmopus rapax* A. Costa.

shorter than first 2 joints of principal flagellum. Second antennae with gland cone long and slender; third joint as broad as long; fourth and fifth joints subequal; flagellum rather short, made up of about a dozen segments.

Upper lip rounded sharply with fine cilia on anterior margin and ventral surface. Mandibles with 3-jointed palp, principal cutting edge denticulated, and large molar tubercle; first joint of palp short, second rather strong with several setae on inner margin, third segment blade-like, slender proximally, broadening abruptly, outer margin convex, inner edge straight and furnished with setae apically; secondary cutting edge also denticulated; spine row with 7 spines.

Lower lip with outer plates rather widely separated, mandibular processes moderately long; inner plates moderate. First maxillae with inner plate triangular with 2 plumose spines apically; outer plate large, provided with pectinate and branched toothlike spines, terminal margin straight and oblique; palp 2-jointed, terminal joint twice as long as first and moderately stout, apex rounded and provided with number of finely serrated spines. Second maxillae with inner plate nearly as long as outer and with margins parallel and apex rounded; outer plate broader than inner, slightly broader distally and with inner margin longer than outer. Maxillipeds with inner plates narrow, twice as long as wide, apex straight and inclined slightly toward middle and provided with 14 or 15 plumose spines; outer plate much larger than inner with median margin provided with numerous toothlike spines and setae and distal margin with about 6 plumose spines; palp 4-jointed with last joint clawlike; second joint twice as long as first and broader at distal end than at proximal, rather broad, provided with setae on distal half; third joint a little longer than first with apex provided with ciliated knob and abundant long setae on distal half.

In male, first gnathopods smaller than second; second joint rather slender with margins parallel and provided with few short setae; third joint about as long as wide provided with a fascicle of setae on distal margin; fourth joint rather more slender than third, with anterior and posterior margins parallel, posterior margin prolonged to form triangular process which is twice as long as broad; wrist triangular, cup-shaped, rather broader than hand, posterior margin thickly beset with setae; hand oval, with palm slightly convex, finely serrated toward apex, provided with numerous setae; dactyl about $\frac{1}{2}$ as long as hand, of usual form with fine cilia on concave margin and a single seta near base of outer margin.

Second gnathopods with moderately developed second joint, provided with short setae on posterior margin and longer ones on straight anterior margin; third joint slightly longer than wide with small convex process at anterior end and furnished with fascicle of setae apically; fourth joint with posterior margin twice as long as anterior and provided with fascicle of setae distally; wrist very short and broad, about as broad as long and about as broad as hand, posterior margin very convex and provided with very many setae of moderate length, articulating with short anterior margin of fourth joint; hand slightly more than twice as long as broad, oval; palm rather oblique, bearing rather broad, flat process near articulation with finger and having several teeth, anterior and posterior

margins with numerous fascicles of setae; finger of usual form, curved and pointed, about $\frac{1}{2}$ as long as hand and provided with number of short cilia on inner concave margin.

First gnathopods of female similar to those of male; second with second joint more slender, furnished with many short setae on anterior margin and several long ones on posterior margin; third joint longer than broad; fourth twice as long as broad, subrectangular with several fascicles of setae on posterior margin; wrist cup-shaped, nearly as broad as long with free portion of posterior margin closely beset with many long setae; hand long, oval, as wide as wrist, with fascicles of setae on anterior and posterior margins, palm oblique, passing by regular curve into posterior margin, provided with setae and with prehensile spine; finger of usual form, long.

Pereiopods with moderate epimera, provided ventrally with a few setae, no spinning glands, appendages gradually increasing in length posteriorly; pereiopods 3 to 5, very robust.

Uropods, 3, biramous; first uropods with inner ramus longer than outer, extending as far as second uropods; terminal uropods having rami lamellar and projecting beyond anterior ones.

Telson deeply cleft but lobes not widely dehiscent, longer than broad, bearing at outer posterior corner a short process and stout spine; inner corners of lobes rounded.

The species was represented by numerous specimens, some of which bore the locality labels of Bailey Bay where they were found in corallines, the "Ship Channel," Flatts Village, in sand, low water to 2 fathoms, Castle Harbor in dead coral, and Harrington Sound. The species has been recorded previously from the British Isles, Christianiafjord, the Atlantic coast of France, the Azores, and the Mediterranean.

***Elasmopus magnispinatus* sp. nov.**

First antennae somewhat more than $\frac{1}{2}$ as long as body, fairly stout, with flagellum having abundant setae, peduncle slightly longer than flagellum, with first joint rather stout and broadest in middle; second joint slightly shorter than first and much more slender, provided with setae; third joint more than $\frac{1}{2}$ as long as first; principal flagellum stout, made up of about 10 rather short segments; accessory flagellum 1-jointed, rudimentary. Second antennae very short, about as long as flagellum of first; gland cone fairly prominent, third joint of peduncle as long as broad; fourth and fifth joints subequal in length, fifth narrower than fourth and tapering slightly;

flagellum about as long as last joint of peduncle, made up of 4 or 5 segments.

Mouth parts as in *E. pocillimanus*.

In male, first gnathopods much smaller than second, with moderately large rhomboidal epimeron; second joint rather stout with proximal end slender; third and fourth joints short, fourth about twice as long as broad with posterior margin convex apically where it is provided with short setae; wrist large, triangular, rather wider than hand and with a number of long setae, some of which are pectinate; hand suboval in form, somewhat more than twice as long as broad, palm rather oblique, passing into posterior margin by even curve, prehensile angle with prehensile spine, posterior

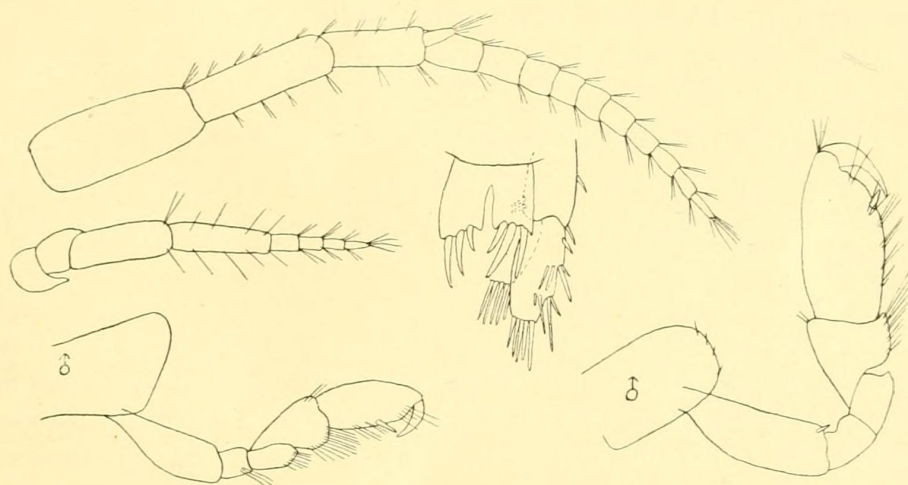


Fig. 20. *Elasmopus magnispinatus* sp. nov.

margin and palm provided with rather long, slender setae; finger curved and of moderate proportions.

Second gnathopods with suboval epimeron, rather higher than long and having ventral margin rounded; second joint strong, bearing single stout spine at anterior apex; third joint short; fourth joint subrectangular with distal margin bearing a small, triangular process; wrist triangular, about as broad as long and broader than hand, with posterior margin provided with long setae; hand and finger similar to those of first gnathopod but larger.

Epimera moderate; pereopods 3 to 5, very stout; third abdominal segment with posterior lateral angle produced slightly to form triangular process. Dorsal region of body segments provided with sparse hairs.

Uropods, 3 pairs, biramous; first and second with styliform rami,

first extending slightly beyond second and as far as third; rami of first subequal, and not as long as peduncle, provided on dorsal margin and apex with stout spines; second uropods with rami similar to those of first but not longer than peduncle; third uropods with lamelliform rami, outer one larger than inner and provided with fascicles of spines on outer margin and truncated apex.

Telson about as broad as long, rectangular, deeply incised, each lobe bearing a process at inner angle and with group of 3 or 4 stout spines on distal margin.

Many individuals occurred in the collection, the largest of which were about 4 mm. in length.

Sexual dimorphism not marked.

Elasmopus pocillimanus (Bate, 1862), Della Valle, 1893.

1862. *Maera pocillimanus*. Bate, Cat. Brit. Mus., p. 191, pl. 34, fig. 7.

1893. *Elasmopus pocillimanus*. Della Valle, Fauna und Flora des Golfes von Neapel, vol. 20, p. 733; pl. 1, fig. 4; pl. 22, fig. 23-25.

Eyes compound and placed well toward anterior surface of face; interantennal lobes not prominent.

First antennae longer than second, not more than $\frac{2}{3}$ the length of body; peduncle moderately long, first 2 segments subequal, third about $\frac{1}{2}$ length of second; flagellum about as long as peduncle, made up of about 21 segments; accessory flagellum 2-jointed. Second antennae only slightly longer than peduncle of first; gland cone slender and pointed, extending beyond apex of third segment which is not as broad as long; last 2 segments of peduncle subequal, long and slender; flagellum short, not as long as last 2 joints of peduncle, made up of 10 joints.

Mandibles with 3-jointed palp, first joint of which is short, second of moderate length and only slightly shorter than third which becomes broader near the middle and tapers toward the apex like a knife blade, inner margin of tapering portion armed with closely set row of short setae of equal size and 2 or 3 longer ones apically; cutting edge dentate, molar tubercle prominent. First maxillae with 2-jointed palp, the terminal joint of which is longer and thinner than first and armed with a number of moderately stout spines at the rounded apex; outer plate of moderate size, with 6 branching and pectinate spines on apical margin; inner plate small, triangular, with 2 plumose spines on apex. Second maxillae of usual form. Maxillipeds with plates well developed; inner plate rectangular with plumose spines and spine teeth on apical margin; outer plate not

extending to distal end of second joint of palp, margin armed with setae which are short and stout on proximal part of inner margin, becoming elongated and toothlike toward the apex and long and slender on apical portion of outer margin; palp 4-jointed, third joint provided with ciliated knoblike process at apex, fourth joint curved and clawlike and armed with a terminal seta.

First gnathopods of male very small; epimeron rather small, rhomboidal, inferior anterior angle projecting forward considerably,

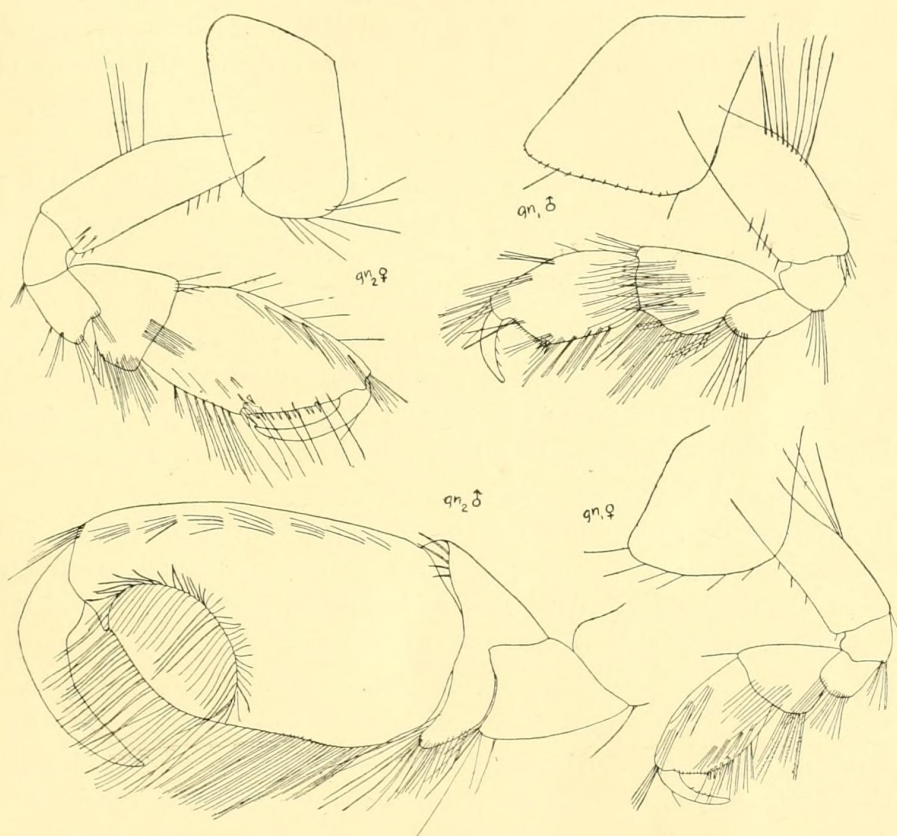


Fig. 21. *Elasmopus pocillimanus* (Bate).

ventral margin armed with many short setae and 2 long setae; second joint moderately stout, projecting considerably beyond epimeron, provided on convex hind margin with about 9 rather long, slender setae and at distal end of posterior margin with several shorter ones, some of which are pectinate; third and fourth joints small, each provided apically with many long setae, front margin of fourth joint straight, forming articulation with wrist which is nearly as long as hand and slightly broader; wrist provided with many long setae on posterior and apical margins and on lateral

surface, posterior margin rather strongly convex, distal margin straight and at right angles to anterior margin; hand subrectangular with 5 or 6 fascicles of setae on posterior margin and 3 or 4 on anterior which is more convex than posterior; palm short, oblique, armed at prehensile angle with 3 or 4 spine teeth, finely serrate and armed with many submarginal setae; finger of usual form with a few setules on inner concave margin.

Second gnathopods very large in the male, with small epimeron which is $\frac{2}{3}$ as long as high, lower margin convex and armed with many short submarginal setae and slender spines; second and third joints very similar to the respective joints of the first gnathopod but larger and stouter; fourth joint relatively short with posterior margin twice as long as anterior; wrist triangular, not as long as broad, with a considerable process on posterior margin which fits into the concave apical margin of preceding joint and is armed with many long, slender setae; hand very large, rectangular, about twice as long as wide; posterior margin, which continues by a regular curve into the palm, armed with many long setae; anterior margin with many fascicles of setae including one at apex; palm oblique and hollowed to form concavity like shallow bowl which is bordered with many slender setae, and into which fits the finger which is strongly curved and stout.

In female, first gnathopods very similar in form and size to those of male, but somewhat more slender; fourth joint shorter than in male and wrist relatively shorter and broader with posterior margin armed with many long pectinate setae, hand and finger similar to male.

Second gnathopods quite similar to first but larger; wrist armed with many setae on posterior margin which is more angular than in the first gnathopod; hand oval, twice as long as broad, armed with numerous long setae and short spine teeth; 3 or 4 longer spine teeth at angle between palm and posterior margin; finger moderately long and slender with a single seta on convex margin.

Pereiopods of usual form, terminating in curved dactyls; epimera of moderate size increasing to fourth; second joints of last 3 pereiopods normally dilated; posterior limbs stout and seventh as long as sixth.

Uropods biramous; third extending beyond others and rami expanded into subequal plates armed with many setae on apex, outer plate with outer margin also provided with setae.

Telson rectangular, not longer than broad, cleft nearly to base, the 2 halves widely dehiscent, each armed with 2 setae at apex

which is rather deeply concave with a median process rather more prominent than the outer.

Length: 12 mm. in one specimen, average about 8 mm.

E. pocillimanus is apparently very common; it was represented in the collection by upwards of 30 specimens, some of which were found in dead coral from Castle Harbor, in corallines from Bailey Bay at low water, and from Harrington Sound. The species has been previously recorded from the Mediterranean, and the coast of New Jersey, Long Island Sound, and Vineyard Sound.

***Gammarus breweri* sp. nov.**

Eyes large, compound, subtriangular, situated well forward on interantennal lobes.

First antennae more than half as long as body with peduncle about as long as flagellum; second joint of peduncle slightly longer than first but more slender; third joint very short and scarcely to be distinguished from first segments of flagellum, which is composed of about 17 segments gradually diminishing in length toward apex; accessory flagellum of moderate size made up of 6 joints. Second antennae shorter than first, gland cone very slender and long, reaching nearly to apex of third segment, which is stout, about twice as long as broad; fourth and fifth segments long and slender, fifth slightly longer than fourth; whole peduncle longer than that of first antennae; flagellum not as long as last 2 joints of peduncle, made up of about 8 gradually diminishing segments.

Mandibles with all parts well developed; palp 3-jointed with first of moderate size, broader apically and produced on inner margin to form triangular process distally, third joint about $\frac{1}{2}$ as long as second, provided apically with several very long setae; principal cutting edge denticulated, secondary cutting edge made up of about 6 slender teeth; 6 spines in spine row; molar tubercle rather large.

First maxillae with 2-jointed palp, of which the proximal one is slightly longer than broad and the distal one is more than twice as long as broad with a blunt apex bearing numerous setae; outer plate rather long and slender and somewhat curved with numerous branched and forked spines on distal margin; inner plate triangular with fine pinnate spines on inner margin and apex. Second maxillae with plates of nearly equal size, inner one slightly broader than outer which is the longer of the 2, plates rounded apically and provided with setae. Maxillipeds with 4-jointed palp, first joint short, second moderately long, extending beyond apex of outer plate, with setae on inner margin; third joint about twice as long as wide and

broader distally than at base, inner margin and apex with many long setae, fourth joint conical, armed apically with single sharp unguiform spine; outer plate moderately broad, rounded at apex and on outer margin, inner margin provided with broad toothlike spines which become longer toward distal end of plate where they gradually become long setae; inner plate extending hardly to middle of second joint of palp, with distal margin transverse and provided with row of pinnate spines.

In female, first gnathopods with epimeron slightly higher than long, produced anteriorly and ventrally to rather acute angle; second

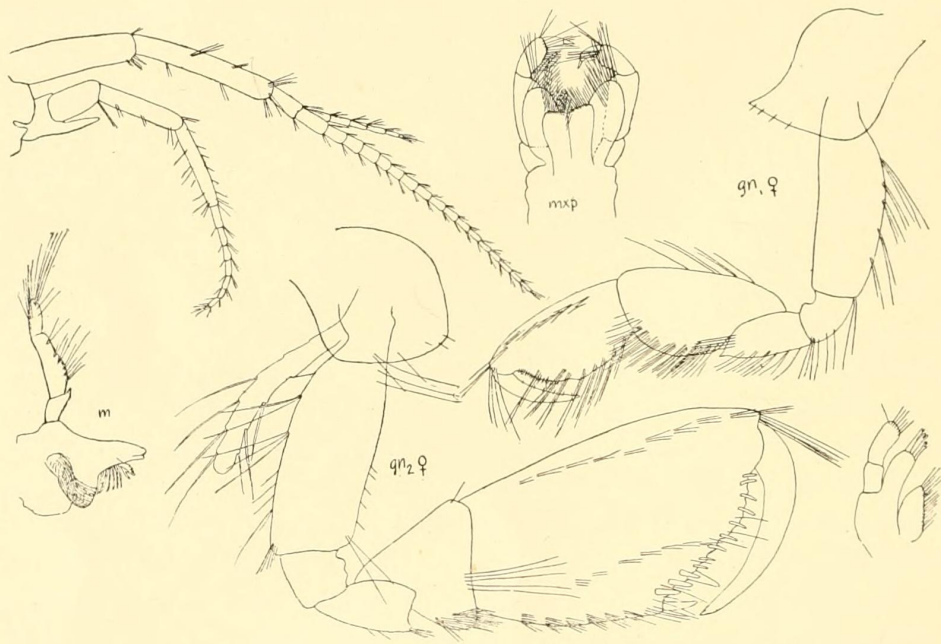


Fig. 22. *Gammarus breweri* sp. nov.

joint moderately long and stout, provided on posterior margin with numerous setae; third and fourth joints of usual form and size; wrist large, with anterior and posterior margins slightly convex and about twice as long as broad, with several long setae on anterior margin and numerous fascicles of setae on posterior margin which forms an even curve with distal margin; hand oval, smaller than wrist, palm rather oblique and provided with short setae and several fascicles of long ones, posterior margin and apex with fascicles of setae; finger rather large, of usual form with several cilia on concave margin.

Second gnathopods much larger and stronger than first; epimeron rhomboidal, about as long as high; second joint fairly stout with long slender setae on posterior margin and short ones on anterior;

third joint broader than long; fourth rectangular, about twice as long as broad with posterior margin prolonged to form slender triangular process; wrist triangular, about as broad as long with several fascicles of setae on posterior margin and several very long setae on distal margin, scarcely as broad as hand which is oval and broader distally than proximally and about twice as long as greatest breadth, palm coarsely dentate, rather oblique and about as long as posterior margin into which it passes by a small triangular process and in which region it is furnished with 5 prehensile spines, rest of palm provided with stout odontoid spines and a few slender setae, posterior margin provided with 7 fascicles of setae, anterior submargin with several more fascicles, apex with fascicle of rather long setae; finger of usual form, rather large.

Pereiopods with epimera of moderate size and with dactyls of usual type, last 3 pairs stouter than first 2, fourth and fifth of nearly equal size.

Posterior margins of first 3 abdominal segments serrated and provided with short setae, posterior margin of third segment with a rounded notch close to postero-lateral angle which thus is rendered very acute.

Third uropods and telson were missing in the single specimen at hand; first and second uropods biramous, with rami subequal, peduncle of first extending as far posteriorly as peduncle of second but rami slightly farther than those of second, peduncle of first slightly longer than rami.

Length of single female exclusive of last abdominal segment and telson 8 mm.

Insula gen. nov.

Body compressed, epimera moderate.

Antennae short, with few segments in flagella, first antennae nearly as long as second and with no accessory flagellum.

Mandibles with denticulate cutting edge and very large molar tubercle, no palp. First maxillae with inner plate provided with 2 terminal setae and with small, one-jointed palp. Second maxillae normal. Maxillipeds with inner plates armed apically with 3 acute processes, outer plate small, palp 3-jointed, stout.

Gnathopods subchelate and equal. Pereiopods normal, no spinning glands; last pair not differing markedly from preceding.

Uropods 3 pairs, terminal pair small and uniramous. Telson small, thick, entire.

This genus resembles *Orchestia* but is markedly different in the greater relative length of the first antennae.

***Insula antennulella* sp. nov.**

Eyes compound, situated close to anterior margin of head, deeply pigmented; lateral lobes of head not developed.

First antennae about $\frac{1}{4}$ as long as body; peduncle short and scarcely to be differentiated from flagellum, first joint broader than long, second about as long as broad and narrower than first, third joint as long as second, about $\frac{2}{3}$ as broad as second and scarcely differing from joints of flagellum which number 4. Second antennae longer than first and stouter, peduncle longer than flagellum, third joint stout and slightly longer than wide, fourth joint more slender

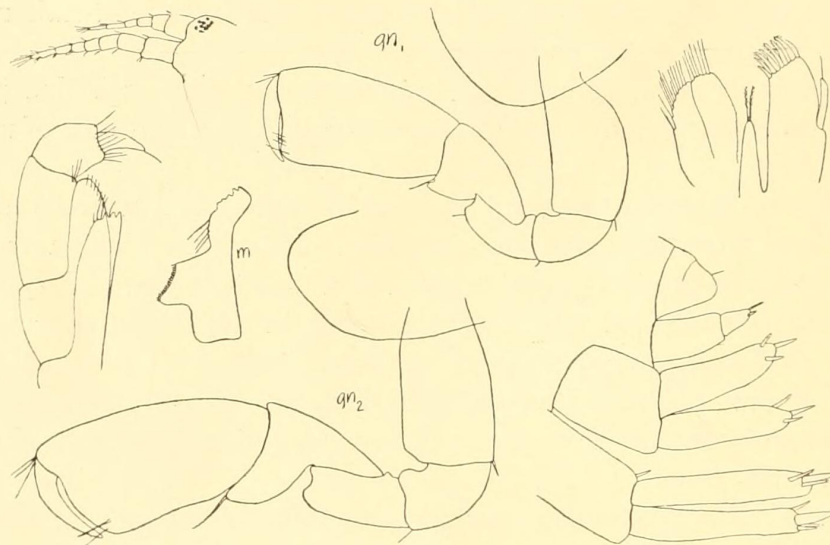


Fig. 22. *Insula antennulella* sp. nov.

than third, fifth joint small, slightly shorter than preceding and very similar to first joint of flagellum which is made up of 5 joints.

Mandibles moderately stout, with principal cutting edge divided into 5 teeth and with secondary cutting edge short, deeply incised, molar tubercle very large and cylindrical, palp absent. Lower lip without inner plates and with outer plates broad, mandibular processes short and not prominent. First maxillae with inner plate slender, triangular, with 2 setae apically, outer plate large, armed with pectinate setae on oblique distal margin; palp weak, 1-jointed, not extending as far as outer plate. Second maxillae of usual form with narrow plates provided with setae on apex. Maxillipeds with inner plates narrow and long, with distal margin produced to form 3 triangular teeth and provided with a few setae; outer plate slightly longer than inner and with rounded apex, provided with setae; palp

strong, 3-jointed, first joint cylindrical, twice as long as wide, with a few setae on distal inner angle, second joint short, about as long as broad, with long setae on apical border, third joint conical, about as long as preceding, provided apically with a single seta.

First gnathopods of male with epimeron rather short, produced anteriorly to form rounded angle; second joint stout, third joint short; fourth joint about twice as long as broad; wrist cup-shaped, articulating with anterior margin of fourth joint, slightly longer than broad, distally expanded to width greater than that of proximal end of hand, posterior margin bearing a single, stout seta distally; hand subchelate, nearly twice as long as wide, subrectangular, slightly broader distally, palm transverse, slightly irregular in form; finger of usual form and as long as palm. Second gnathopods very similar in form to first but slightly larger; wrist with more prominent posterior lobe than that of first; palm convex.

Epimera moderate, with ventral margins rounded; pereopods of normal form, furnished with clawlike fingers and with no spinning glands.

Uropods, 3 pairs, of which the first pair is the longest, with 2 rami of lanceolate form, armed distally with several stout spines; second pair also biramous but much shorter than first; third pair very short, uniramous, with ramus much shorter than peduncle.

Telson small, thick, entire, with few short setae at apex.

Length about 2 mm.

The genus was represented by a single male specimen taken from the surface in the evening, May, 1898.

***Orchestia platensis* Kröyer, 1845.**

1845. Kröyer, *Naturhistorisk Tidsskrift*; ser. 2, vol. 1, p. 304, pl. 2, fig. 2.

Eyes compound, made up of many small ocelli, moderate, circular.

First antennae very short, extending not quite as far as tip of penultimate joint of peduncle of second antennae; segments of peduncle subequal in length; flagellum very short, $\frac{2}{3}$ as long as peduncle, made up of several joints terminating in several short setae. Second antennae of moderate length; first and second fused with head; third joint shorter than broad; fourth joint slightly more than twice as long as broad; fifth joint considerably longer than fourth and more slender; flagellum about as long as peduncle, each segment provided with several setae at distal end.

Mandibles elongated, cutting edges divided into several teeth, spines on spine row well developed; molar tubercle large; palp

wanting. First maxillae with inner plate moderately long and slender, provided apically with 2 plumose spines; outer plates somewhat longer than inner, furnished with forked and branching spines apically; palp very small, being represented by small spine on outer margin of outer plate. Maxillipeds with small inner plate which reaches scarcely as far as distal end of first joint of palp and is provided with 3 toothlike spines alternating with plumose spines on apical margin; outer plate about as wide as inner but reaching

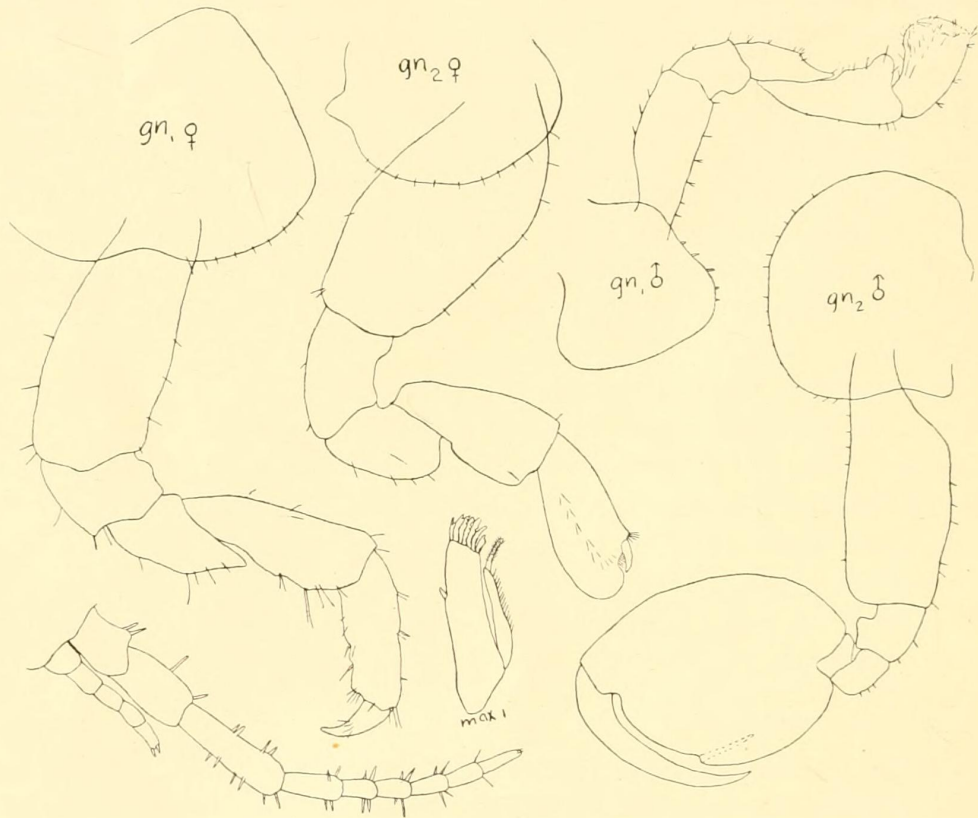


Fig. 24. *Orchestia platensis* Kröyer.

nearly to extremity of second joint of palp, rounded apically and provided with numerous stout setae on inner margin and apex; palp 3-jointed, stout, first joint not as long as wide, becoming broader distally, second joint also broader than long and furnished with a lobe on inner margin which is provided with setae similar to those of outer plate and extending beyond proximal margin of last joint which is rounded apically and slightly longer than wide, bearing apically several short setae.

In female, first gnathopods smaller than second; with subtriangular epimeron having ventral margin slightly indented by broad notch;

second joint moderately stout with a few setae on anterior and posterior margins; third joint shorter than broad; fourth joint triangular, twice as long as broad with articulation with wrist near proximal end of anterior margin, posterior margin provided with a few setae; wrist triangular, nearly three times as long as broad, wider than hand, provided scantily with setae; hand not as long as wrist nor as broad, subrectangular, furnished with fascicles of spines on anterior and posterior margins, palm very short and nearly transverse; finger of usual form and size with cirlet of short setae about $\frac{2}{3}$ distance to apex.

Second gnathopods with rounded epimeron bearing subtriangular process posteriorly; second joint very stout with anterior margin strongly convex and provided with setae; third joint longer than broad with anterior margin slightly concave and posterior margin convex; fourth joint shorter than third but scarcely as broad; wrist articulating with nearly entire anterior margin of fourth joint, triangular, twice as long as broad, distal margin transverse; hand somewhat elongate, oval, with rounded apex, anterior margin notched near apex to receive short finger, posterior margin rounded, longer than anterior margin so that hand is weakly chelate, palm short, slightly concave, provided with setae; finger rather small and curved, not reaching as far distally as hand.

In male, first gnathopods with trapezoidal epimeron in which the ventral margin is nearly twice as long as dorsal, posteriorly elongated to form a semicircular lobe of moderate size, anterior margin provided with many short sharp spines; second joint moderately long; much broader at distal end than at proximal, provided with setae on anterior and posterior margins; third joint about as broad as long; fourth joint similar to that of female, twice as long as broad, having articulation with wrist by means of oblique portion of anterior margin; wrist very long, triangular, having rounded lobe on distal part of posterior margin provided with numerous spines of various sizes; hand more or less rectangular with distal margin considerably longer than proximal and at right angles to anterior margin, posterior margin strongly convex toward distal end, palm moderately long, passing by even curve into posterior margin, which region is minutely spinulose, palm very finely serrate and provided with numerous submarginal setae; finger moderately long, not greatly curved, provided with encircling row of setae near middle.

Second gnathopods with semicircular epimeron slightly longer than high, with numerous short setae on ventral margin; second joint moderately stout, very slender at proximal end; third joint

longer than broad with triangular process on anterior margin; fourth joint subrectangular, articulating with wrist by entire anterior margin; wrist scarcely $\frac{1}{2}$ as long as wide, broader at distal end, articulating by anterior wall of V-shaped notch in posterior margin of hand which is large and oval and nearly twice as long as broad, palm strongly convex, nearly as long as posterior margin and separated from latter by broad shallow notch, provided with numerous stout submarginal spines; finger very long, extending beyond palm, curved and pointed.

Pereiopods with moderate epimera; appendages devoid of spinning glands and provided with dactyls of usual form; second joint of last pereiopods with posterior margin serrate.

Abdominal segments with postero-lateral margins of anterior 3 serrated.

Uropods, 3 pairs, of which the last pair are uniramous; rami of first pair subequal and not as long as peduncle, provided with sharp spines; second uropods not extending as far as first, rami subequal and about as long as peduncle; terminal uropods short, ramus rather slender, not as long as peduncle which is slightly conical and stout.

Telson emarginate, subtriangular, rather thick, not extending as far as peduncle of last uropods, provided with 2 setae on dorsal side of apex and near middle.

Length 11–12 mm.

This is one of the commonest known species of Amphipod, being found on the sea shore of nearly all climates. It has been recorded from the Rio de la Plata, the Atlantic coast of North America from the Bay of Fundy to New Jersey, the Mediterranean, and the Sea of Tiberias. The species occurs in abundance under decaying seaweeds at high water mark on all the shores of Bermuda. Prof. Verrill obtained large numbers by attracting them to a pan of alcohol placed on the beach in the night by means of a lantern.

Hyalé prevostii (Milne-Edwards, 1830) Stebbing, 1888.

1830. *Amphithoe prevostii*. Milne-Edwards, Annales Sc. Nat. (1) vol. 20, p. 378.

1888. *Hyalé prevostii*. Stebbing, Rept. of Challenger, vol. 29, p. 144.

Eyes compound, well separated from each other dorsally, oval in form, deeply pigmented.

First antennae terminating about on level with first third of flagellum of second antennae; peduncle slightly less than $\frac{1}{2}$ as long as flagellum, first joint longest and stoutest, third slightly shorter than second which in turn is about $\frac{1}{2}$ as long as first; flagellum composed of about 12 elongated segments. Second antennae not as long as body, with peduncle less than $\frac{1}{2}$ as long as flagellum; third joint scarcely as broad as long, fourth and fifth joints subequal in length, fourth much thicker than fifth; flagellum composed of about 16 elongated segments.

Mandibles strong, oblong, principal and secondary cutting edges divided into 3 or 4 teeth of different sizes, molar tubercle very

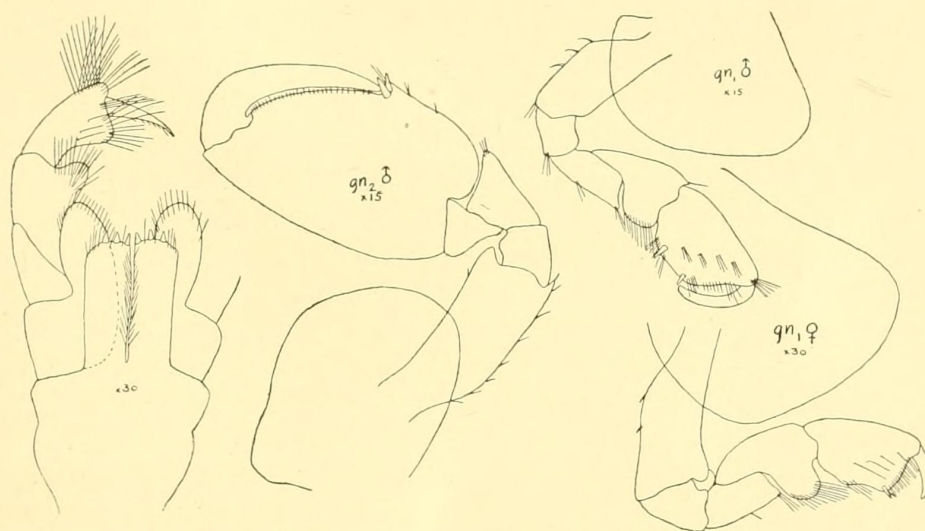


Fig. 25. *Hyale prevostii* (Milne-Edwards).

large and cylindrical with flat grinding surface, palp absent. Lower lip with no inner plates, outer plates stout, rather widely separated from each other, anterior margins rather short and densely ciliated, mandibular processes short but strong. First maxillae with 1-jointed palp which does not extend beyond apex of outer plate, provided with single apical seta; outer plate large, having oblique apical margin with numerous stout, forked and pectinate spine teeth; inner plate slender, triangular, with 2 plumose spines at apex. Second maxillae with inner plate rather shorter than outer and about as wide, both plates provided with setae apically. Maxillipeds with 4-jointed palp; inner plates rectangular extending nearly as far as apex of first joint of palp and provided on distal margin, which is transverse, with 3 triangular odontoid spines and numerous plumose spines which also occur on the straight inner margin; outer plate

extending slightly beyond apex of first joint of palp, outer margin convex and apical margin rounded and provided with numerous submarginal setae; palps strong, first joint with outer margin about 3 times as long as inner, second joint nearly twice as long as first and very broad on account of presence of broad lobe on inner side which is produced distally and bears numerous long, stout setae at apex and distal part of inner margin; third joint about as long as first, provided with broad, rounded lobe on inner side at distal end so that joint is much broader distally than proximally, outer apex also provided with small, rounded lobe, distal margin and lobes armed with many long, stout setae; fourth joint about as long as third, clawlike, with concave margin provided with numerous setae.

In female, first gnathopods somewhat smaller than second; epimeron rather deeper than long with anterior ventral angle rounded and not greatly produced; second joint moderately stout, with anterior margin slightly concave, posterior margin convex and proximal end much thinner than distal, anterior distal angle produced to form rounded lobe, posterior margin with 2 rather stout pectinate spines near middle; third joint short, with posterior distal angle provided with long pectinate spine and several setae; fourth joint subrectangular, more than twice as long as broad, provided with several pectinate spines on distal margin; wrist $\frac{2}{3}$ as broad as long, articulating with fourth joint by entire anterior margin of fourth, posterior margin forming a semicircular lobe which is provided with closely set row of pectinate spines; hand subrectangular, slightly broader at distal end than proximal, posterior margin provided with row of pectinate spines occupying middle third of margin which at this point is slightly convex, outer surface of hand provided with diagonal row of stout, plumose spines, palm slightly oblique and convex, provided with several setae and 2 prehensile spines; finger of usual form, short and stout and provided with several setae on concave margin.

Second gnathopods similar to first but having epimeron subrectangular with ventral margin rounded and palm of hand slightly more oblique than that of first; whole appendage stouter in all respects than first.

In male, first gnathopods with epimeron having anterior ventral angle not greatly produced; second joint stout, with anterior margin straight and posterior margin convex with several sharply pointed spines at nearly equal distances from each other; third joint about as long as wide; fourth subrectangular with anterior margin forming articulation with wrist which is triangular, much longer than wide

and with posterior margin produced to form prominent semicircular lobe which is provided with row of stout, pectinate spines; hand suboval, slightly longer than wrist, posterior margin with single stout toothlike spine situated submarginally; palm rather oblique and slightly convex, provided with a regular row of submarginal setae and a very large prehensile spine; finger of usual form, moderately stout.

Second gnathopods with rounded epimeron, about as high as long; second joint rather short with anterior margin prolonged distally to form triangular process; third joint short; fourth joint quadrilateral, posterior margin much longer than anterior, distal margin rather longer than proximal; wrist articulating with anterior margin of fourth and having form of equilateral triangle; hand oval, with base incised to form 2 equal lobes, the anterior one of which forms articulation with wrist, about twice as long as wide, palm rather longer than posterior margin which is separated from it by several prehensile spines and distinct prehensile angle, provided with double row of rather stout submarginal setae; finger rather long and curved in usual way.

Fourth epimeron much higher than fifth which is suboval. Fifth and sixth pereopods with sixth joint having spine and setae on posterior margin.

Uropods essentially as in *H. pontica*; telson semicircular, broader than long and divided by deep incision nearly to base.

Length 7-9 mm.

The species, which is apparently one of the commonest species in Bermuda, occurs very abundantly among the fronds of *Ulva* in the Mediterranean and is reported from the east coast of North America, Rio Janeiro, and Valparaizo, Peru.

Some of the specimens were collected on Somerset Island by W. M. Rankin in 1898, there were some also collected from dead coral from Castle Harbor.

Hyale pontica Rathke, 1837.

1837. Rathke, Mém. Acad. Impér. des Sci. de St. Pétersbourg, vol. 3, p. 378, pl. 5, fig. 20-28.

Eyes large, compound, subtriangular, ocelli small and arranged close together.

First antennae about $\frac{1}{3}$ as long as body, extending as far as middle of second antennae; peduncle short, more than $\frac{1}{3}$ length of entire appendage; first joint fairly stout, about twice as long as wide with a few setae around distal margin; second joint more

slender and not so long as first; third more slender than second and slightly shorter; flagellum with 13 segments. Second antennae with flagellum much longer than peduncle, fourth segment about $\frac{1}{3}$ shorter than fifth; first, second, and third joints short and provided on distal ends with setae; flagellum made up of about 20 segments provided with setae on distal ends.

Mandibles strong, palp wanting; both cutting edges divided into 5 or 6 teeth; 5 plumose spines on spine row; molar tubercle large;

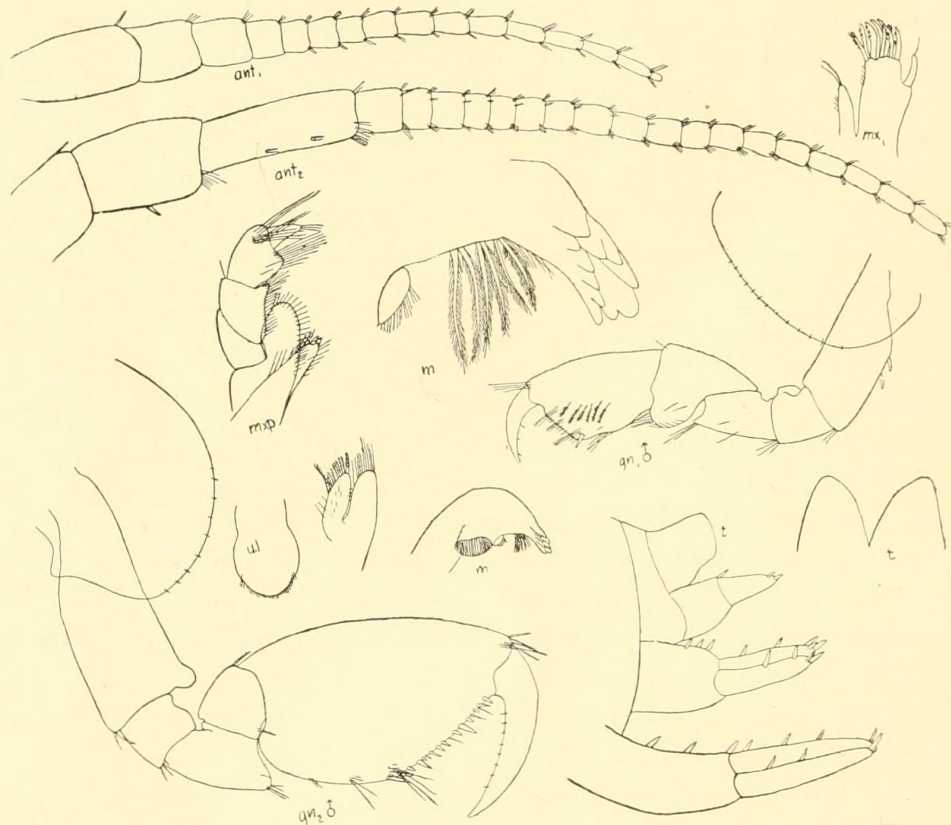


Fig. 26. *Hyale pontica* H. Rathke.

bearing plumose flagellum. Lower lip with no inner plate; outer plate broad, with anterior margin entire and mandibular processes rather small. First maxillae with inner plate slender, triangular and furnished with 2 plumose spines apically; outer plate moderately large with 9 stout pectinate spines in a double row on distal margin which is transverse; palp small and slender, one-jointed, furnished with setae at apex. Second maxillae with inner plate somewhat smaller than outer; both oval in form; inner plate provided with pectinate spines on apex and distal half of inner margin; outer plate with

numerous setae on apex, and several small setae on inner margin. Maxillipeds with 4-jointed palp, the fourth joint of which is conical and provided with a fascicle of fine setae on apex; third joint very broad, narrower at base than at apex, with many long setae near distal margin; second joint about as long as third, with rounded process on distal end of inner margin which is provided with setae; first joint short, with outer margin much longer than inner; outer plate reaching nearly to distal end of second joint of palp, provided with setae on rounded apex and inner margin; inner plate long and narrow, with fine setae on outer and inner margins and several toothlike spines on apex.

In male, first gnathopods smaller than second, with epimeron elongated anteriorly and having ventral margin only slightly convex and provided with many submarginal setae; second joint projecting half its length beyond epimeron, constricted proximally, provided with 2 stout curved spines on posterior margin; third joint as broad as long; fourth joint about twice as long as wide, articulating with wrist by anterior margin; wrist triangular, having rounded lobe on posterior side which is provided with many setae; hand subrectangular, not so broad as wrist and having palm slightly oblique, provided with diagonal row of plumose spines across surface and with group of setae $\frac{2}{3}$ distance to distal end of posterior margin, palm provided with many submarginal setae of various lengths and with prehensile spine; finger strong, curved, and provided with a few setae on inner margin.

Second gnathopods with epimeron rounded ventrally, higher than long and bearing triangular lobe on posterior margin and submarginal setae ventrally; second joint extending considerably beyond epimeron, with rounded lobe at antero-distal angle; third and fourth segments essentially as in first gnathopod; wrist triangular and smaller than in first; hand large, oval, about twice as long as broad, posterior margin continuous with palm by even curve and provided with many teeth and setae of various lengths, prehensile spine present; finger strong and curved, having a few setae on concave margin.

Pereiopods furnished with dactyls, last 2 pairs subequal; epimera moderate with margins entire except for rounded notch on first 3; that of second pereiopod largest of series.

Uropods, 3 pairs; first and second biramous, first longer than second and third, with rami somewhat shorter than peduncle, the inner one of which is slightly longer than the outer, provided with 2 or 3 spines on dorsal margin and several on apex; second with peduncle relatively shorter than that of first, otherwise of similar

form; terminal uropods quite short, uniramous, with ramus shorter than peduncle and bearing several spines on apex, peduncle extending beyond telson.

Telson thick, very deeply cleft, broader than long.

There were present in the collection only a few males having a length of about 15 mm.

The species has been previously recorded from the North Atlantic, the North Sea, and the Mediterranean.

***Hyale trifoliadens* sp. nov.**

Eyes small, compound, deeply pigmented in alcoholic specimens.

First antennae with peduncle half as long as flagellum; first joint slightly longer than second, stout, scarcely twice as long as broad; third joint short and slender, very similar to first joint of flagellum which is made up of about 9 segments. Second antennae much

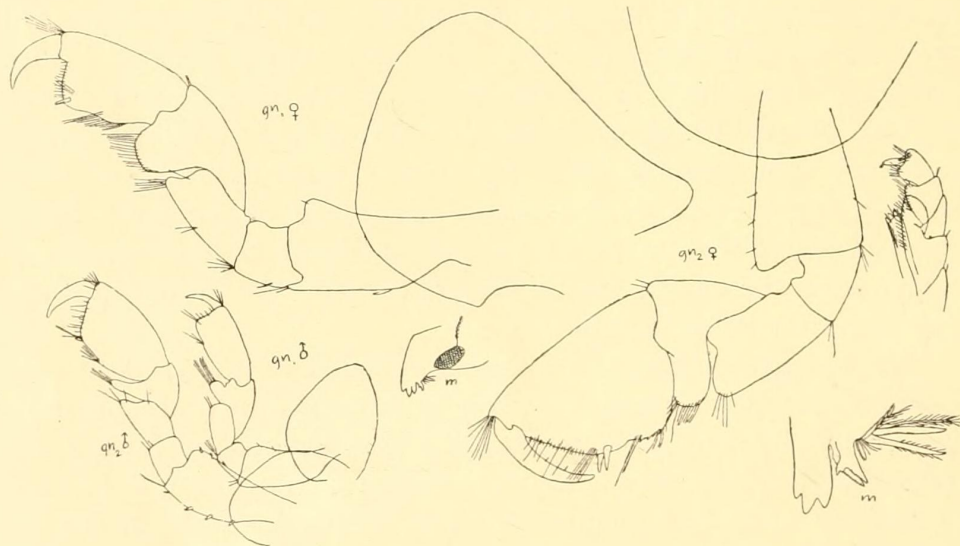


Fig. 27. *Hyale trifoliadens* sp. nov.

longer than first, scarcely $\frac{1}{2}$ as long as body; peduncle nearly as long as entire first antennae; first and second joints short and broad with gland cone slender; third joint not as long as broad; fourth joint twice as long as broad and shorter than fifth which is more slender; flagellum made up of about 15 segments provided with setae on distal margins.

Mandibles strong; palp wanting; principal cutting edge divided into 3 teeth; secondary cutting edge with 2 processes, much smaller than principal; spine row with a number of short plumose spines; molar tubercle large, furnished with a plumose seta.

Lower lip and first and second maxillae as in *H. pontica*. Maxillipeds with inner plates well developed, narrow, extending as far as first joint of palp, provided with plumose spines on inner margin and apex which also bears 3 odontoid spines; outer plate extending well beyond inner and bearing 2 plumose spines apically and many setae on inner margin; palp well developed with second joint subrectangular and bearing a semicircular lobe on inner distal angle and with many setae on inner margin; third joint about as long as first, broader distally than proximally and bearing many setae on distal margin; fourth joint more or less clawlike, not as long as preceding joint.

In male first gnathopods with epimeron longer than high, rounded ventrally but with anterior angle projecting well forward; second joint moderately stout, projecting well beyond epimeron, bearing on anterior margin 2 or 3 short setae and several long setae on distal posterior angle; third joint about as long as broad with a few setae on distal posterior angle; fourth joint about twice as long as wide with a few setae on posterior distal angle; fifth joint articulating with fourth along nearly entire anterior margin, more or less triangular with prominent semicircular lobe bearing long setae on posterior margin, anterior margin moderately convex; hand subrectangular, rather more than twice as long as broad, not as broad as wrist, posterior margin bearing single fascicle of setae near middle, palm transverse and furnished with setae, the longest of which are at the prehensile angle; finger fairly stout, of usual form.

Second gnathopods with epimeron slightly shorter than that of first gnathopods with ventral margin evenly rounded; second joint robust but slender at proximal end, bearing a few setae on anterior and posterior margins; third joint as long as broad, with a few setae on distal posterior angle; fourth joint triangular, articulating with wrist by distal portion of anterior margin, bearing several setae on apex; wrist rather short, bearing long curved process on posterior side which renders wrist broader than hand which bears a fascicle of setae apically; hand oval, rather broader distally than proximally, about twice as long as broad, palm somewhat oblique, straight, provided with numerous setae of various lengths and prehensile spine, posterior margin with fascicle of setae near middle; finger of usual form and size; second gnathopods in every way stronger than first.

In female, first gnathopods with wrist longer than in male and provided with many more setae on posterior margin; hand shorter than in male and furnished with many setae on posterior margin,

provided with prehensile spine. In second gnathopods, wrist shorter than in first and hand more nearly oval with palm quite oblique and posterior margin much shorter than palm and provided with several groups of spines, palm with numerous submarginal spines of various lengths and 2 prehensile spines; finger moderately stout, provided with 2 short cilia on inner concave margin.

Other characters as in *H. pontica*.

The species was represented by several individuals 6–8 mm. in length.

Parhyalella gen. nov.

First antennae longer than peduncle of second; first maxillae with palp wanting; maxillipeds with 4-jointed palp, last joint being unguiform; gnathopods subchelate; telson entire.

This genus is closely related to *Hyalella* but differs from it in the absence of a maxillary palp.

Parhyalella batesoni sp. nov.

Eyes moderately large, compound, situated well toward dorsal side of head.

First antennae nearly as long as second; peduncle longer than flagellum which is composed of about a dozen rather short segments which are markedly broader at the distal than at proximal end; first joint of peduncle very stout, scarcely longer than broad, second joint subequal in length but much narrower, third joint shorter than second and about twice as long as broad. Second antennae with first and second joints of peduncle short and coalesced with head, gland cone absent, third joint about as broad as long, fourth joint rather more than twice as long as broad, fifth joint somewhat longer and more slender than fourth; flagellum very short, scarcely longer than last joint of peduncle, made up of only a few segments which rapidly become shorter and thinner distally.

Mandibles with principal cutting edge divided into 6 teeth of which the second and third from the anterior end are largest, secondary edge divided into 5 nearly equal teeth, molar tubercle very strong, palp wanting. First maxillae with palp wanting, outer plate rather large with pectinate and branched spine-teeth on distal end; inner plate rather short and slender with 2 plumose spines on apex. Second maxillae with outer and inner plates rather narrow and subequal, outer one with setae on distal margin, inner one with setae also on distal half of inner margin. Maxillipeds with inner and outer plates rather small, outer plates extending as far as apex of first

joint of palp and inner one extending not quite so far; distal margin of inner plate provided with 3 odontoid spines and numerous plumose spines, outer plates with inner margin and apex which is rounded, provided with setae; palp 4-jointed with first joint very short and outer apex rather prolonged, second joint not as long as broad with broad lobe extending along inner side provided with row of stout spines, fourth joint clawlike, about as long as third joint.

In male, first gnathopods with moderately high epimeron produced at antero-ventral angle; second joint stout; wrist triangular, about

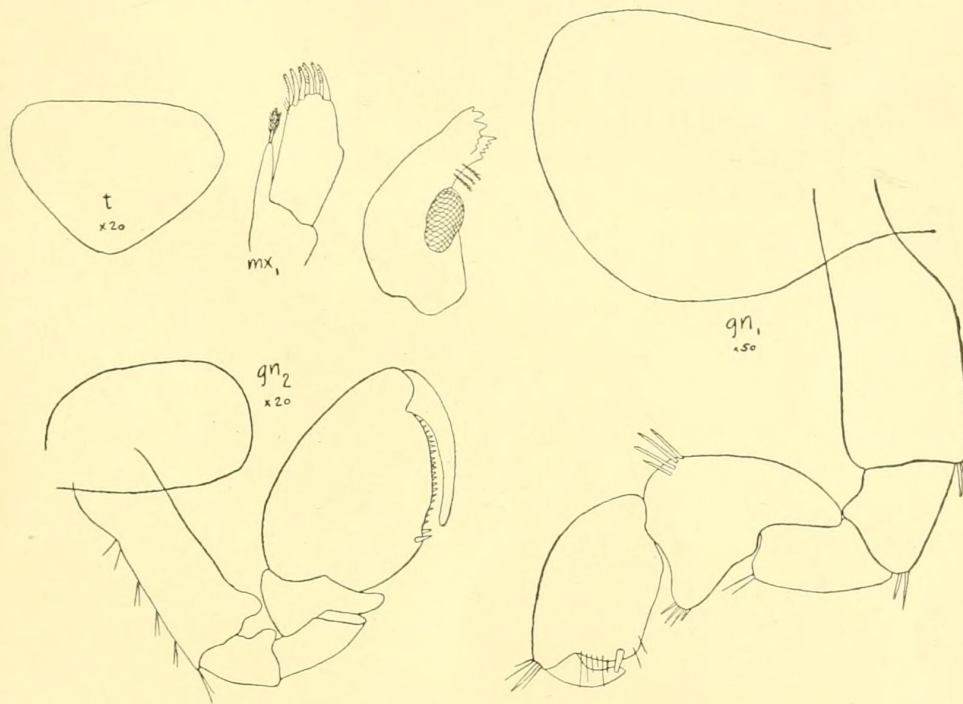


Fig. 28. *Parhyalella batesoni* sp. nov.

as broad as long and bearing prominent rounded lobe on posterior margin; hand subrectangular, not as broad as wrist, nearly twice as long as wide, palm rather short and nearly transverse, provided with setae of various lengths, prehensile angle rounded and furnished with stout spine; finger short and very stout.

Second gnathopods very large with subrectangular epimeron which are higher than long; second joint of moderate proportions with projecting lobe on anterior side; fourth joint with anterior and posterior margins nearly parallel and with posterior apex somewhat produced; wrist triangular, short, with very broad lobe from distal posterior angle which projects as far as posterior margin of fourth joint; hand oval, about twice as long as wide, with base deeply

incised, palm oblique and furnished with submarginal setae, prehensile angle moderately prominent and bearing two stout setae; finger long and curved.

Telson triangular, about as broad as long with apex rounded.

Length 9 mm. There was a single specimen in the collection.

Microdeutopus anomalus (Rathke, 1843) Bate, 1862.

1843. *Gammarus anomalus*. Rathke, Nova Acta Acad. Caesarea Leopold. Carol. German., vol. 30 I, p. 63, pl. 4, fig. 7.

1862. *Microdeutopus anomalus*. Bate, Cat. Brit. Mus., p. 164, pl. 30, fig. 3.

Eyes small, round, compound, widely separated from each other dorsally, and very close to margin of interantennal lobes. Head produced to form short, rather acutely pointed rostrum.

First antennae about one half as long as body and with principal flagellum longer than peduncle, made up of about 25 segments and provided with accessory flagellum of 4 or 5 elongated joints; second joint of peduncle longest, third joint not more than one half as long as first. Second antennae somewhat shorter than first, with very short flagellum of about 8 joints furnished with setae; glandular cone long and slender; third joint less than twice as long as broad, fourth and fifth joints very long and slender, subequal in length.

Mandibles with all parts well developed, palp 3-jointed, with third joint longer than second and with proximal half broad and distal half tapering to a point and provided on inner margin with setae; primary and secondary cutting edges denticulated. Lower lip with outer plates having anterior margin entire and widely separated from each other and with inner plates wide, mandibular processes long and slender. First maxillae with inner plate small, triangular, provided apically with single plumose spine, outer plate of moderate size with oblique distal margin armed in usual way; palp well developed, 2-jointed, second joint curved and moderately long, with apex rounded and furnished with group of setae. Second maxillae with plates moderately broad and rounded apically, furnished with abundant setae on distal end; outer plate slightly longer and broader than inner. Maxillipeds with large rectangular inner plates extending as far as apex of first joint of palp, and furnished with slender spines apically; outer plates broad, extending nearly as far as apex of second joint of palp, outer margin and apex rounded, inner margin straight and furnished with short odontoid spines which become longer at apex; palp 4-jointed and slender, second joint longest, terminal joint provided with clawlike spine.

First gnathopods of female larger than second; epimeron moderate, third and fourth joints small; wrist rather large, nearly oval in form, about twice as long as broad, posterior margin more convex than anterior and provided with slender setae; hand subrectangular, more than twice as long as broad and somewhat longer than wrist, broader at distal end than at proximal, palm slightly oblique, irregular in shape, with stout spine tooth separating it from posterior margin; finger moderate in size, of usual form with concave margin serrated. Second gnathopods with small rounded epimera as long as high; second joint long and slender, of uniform thickness; third and

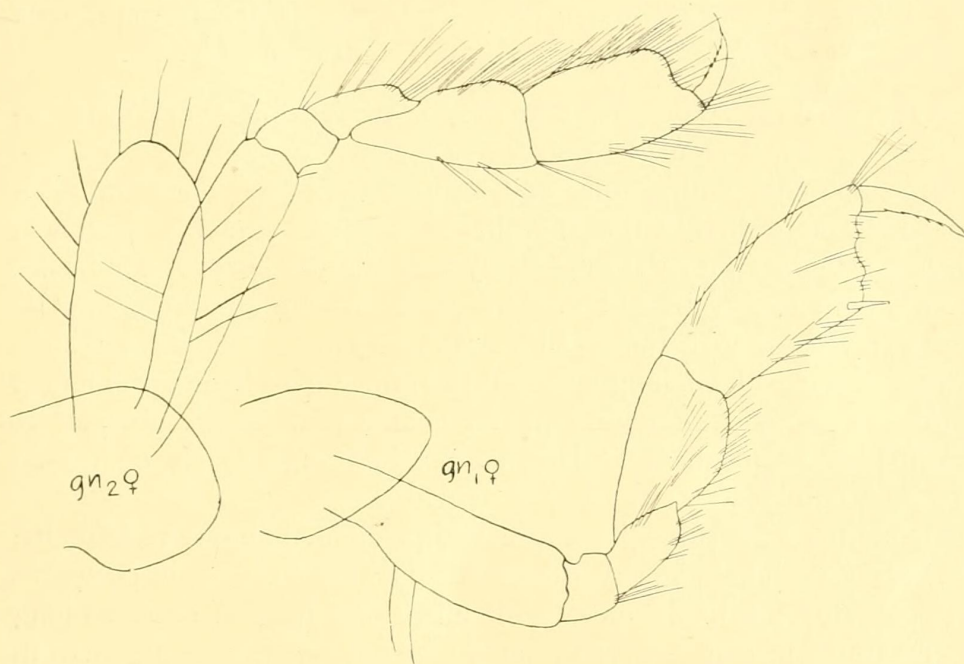


Fig. 29. *Microdeutopus anomalus* (H. Rathke).

fourth joints small; wrist triangular, twice as long as broad, provided with numerous long setae on posterior margin; hand subrectangular, shorter than wrist, palm nearly transverse, posterior margin and palm provided with abundant setae; finger similar to that of first gnathopod. Marsupial plates oval, about two and a half times as long as broad.

Pereiopods of middle group short, with epimera of moderate size, longer than high; posterior pereiopods very long and slender with second joints moderately expanded.

Uropods, 3 pairs, biramous, first pair extending slightly beyond other two; rami styliform with stout spines at apex and along inner margin, inner rami of first and second longer than outer, inner rami of third uropods slightly shorter.

Telson oval, longer than broad, apex truncated, furnished with 2 symmetrical fascicles of moderately stout spines.

Length, 8 mm. A single female represented the species in the collection.

The species has been previously reported from the Atlantic Coast of Norway, the Shetlands, and the Black Sea.

Autonoe longipes (Liljeborg, 1852) Bruzelius, 1859.

1852. *Gammarus longipes*. Liljeborg, Öfversigt af Kongl. Vetens.-Akad. Forhandl. Stockholm, p. 10.

1859. *Autonoe longipes*. Bruzelius, Skandinavian Amphipoda Gammar., Kongl. Sv. Vetens.-Akad. Handl., vol. 3, p. 28.

Eyes moderate, compound, reniform, approaching very close together on dorsal side of head.

First antennae rather long and slender with long flagellum composed of more than a dozen rather elongated segments; peduncle with first joint rather stout, nearly as long as head, second joint slender and longer than first, third joint small, about $\frac{1}{3}$ as long as second; accessory flagellum made up of 5 joints. Second antennae with peduncle much longer than that of first; gland cone prominent, third joint longer than broad, fourth and fifth joints subequal in length; flagellum about as long as last joint of peduncle, composed of about 5 joints.

Mandibles with principal cutting edge divided into several teeth; secondary cutting edge also denticulate and rather narrow; 4 spines on spine row; palp 3-jointed with third joint longest, about as long as first and second together, inner margin straight, outer margin convex, provided with plumose spines on both margins, second joint about twice as long as first and somewhat stouter, with several long setae on inner margin, first joint rather short, broader at distal end than at proximal. Lower lip with outer plates rounded, anterior margins entire, not very broad; mandibular processes long and pointed, diverging considerably; inner plates broad, rounded. First maxillae with inner plates rudimentary and bearing single long plumose spine apically; outer plates broad, with distal margin oblique, inclining toward inner margin, furnished with usual spine teeth; palp 2-jointed, first joint as broad as long and with single seta on outer distal margin, second joint 4 times as long as broad with blunt apex provided with a number of slender teeth and setae. Second maxillae with oval plates which are rather broad; outer plates provided with many long setae distally; inner plates smaller than outer with

plumose spines on inner margin and setae on distal margin and in a row extending obliquely from middle of distal margin to inner margin proximally. Maxillipeds with inner plates short and provided with plumose spines on transverse distal and inner margins; outer plates extending as far as second joint of palp, having outer margin convex and unarmed and inner margin, which is straight, provided with broad toothlike spines which become more slender distally and become plumose spines around distal margin; palps long, 4-jointed, of which the first joint is longer than broad, the second joint 3 times as long as broad with a number of long setae on inner margin;

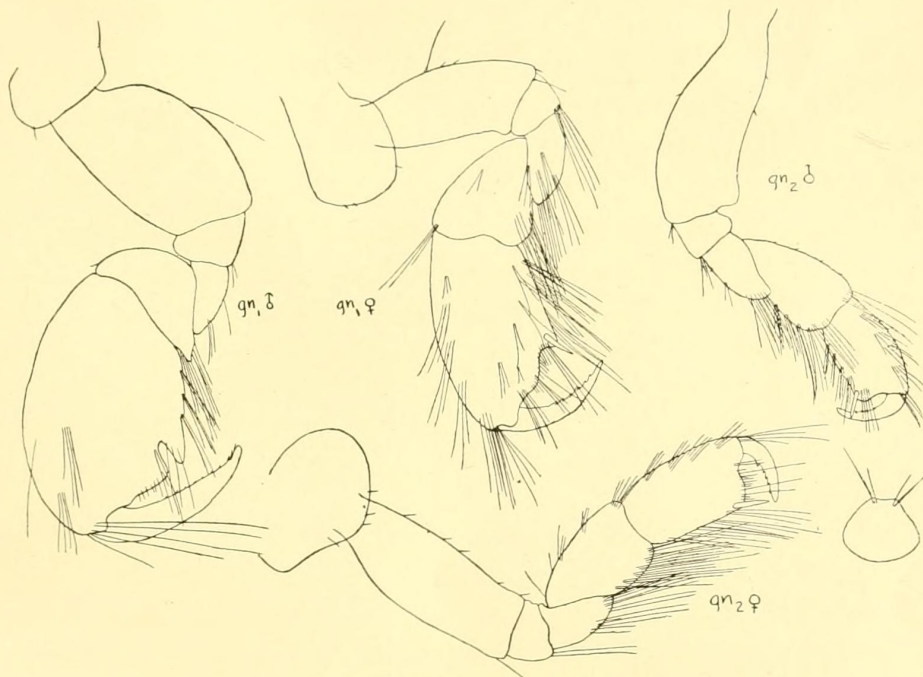


Fig. 30. *Autouoe longipes* Bruzelius.

third joint about $\frac{2}{3}$ as long as second, being broader at distal end and provided with many long setae; fourth joint as long as third and unguiform.

In male, first gnathopods with small subrectangular epimeron; second joint very stout, $\frac{2}{3}$ as broad as long, widest in middle; third joint very short with several setae on postero-distal angle; fourth joint longer than third and more slender with a few setae on posterior margin; wrist triangular, broader than long, having posterior margin provided with long setae; hand large, oval, with anterior margin rather convex and much longer than posterior which bears several fascicles of long setae, palm oblique, not very long, provided with

deep notch near prehensile angle and provided with numerous setae, apex of hand with fascicle of long setae; finger rather large, of usual form with concave margin provided with numerous cilia.

Second gnathopods much smaller than first, with rhomboidal epimeron about as long as high; second joint moderate in width, fairly long, anterior margin curved, posterior margin rather strongly convex; third and fourth joints as in first gnathopods but third rather more slender; wrist triangular, rather large, longer and broader than hand, provided with very short setae on anterior margin and with several fascicles of setae on posterior margin; hand subrectangular, provided with setae on anterior and posterior margins, palm moderate, with long prehensile spine and fascicle of setae; finger very large with concave margin serrated.

In female, first gnathopods with second joint much more slender than in male; third and fourth joints provided with many more setae which are also longer than in male; wrist longer than in male, and hand more slender, being subrectangular, with palm somewhat oblique and sinuous, provided with prehensile spine and setae of various lengths, posterior margin with many long setae and anterior submargin with several fascicles of slender setae; finger slender, with concave margin serrated.

Second gnathopods smaller than first, with second joint more slender and wrist broader than in male; hand subrectangular, not unlike that of male but setae rather longer.

Epimera moderately low, being longer than high in each case, diminishing slightly in height posteriorly, those of fourth and fifth pereopods being not more than half as high as long and suboval in form; fourth not emarginate posteriorly; third, fourth and fifth pereopods with second joints normally expanded; last pereopods longest, with fourth, fifth and sixth joints especially long and slender; first and second pereopods with spinning glands.

Uropods, 3 pairs, biramous; first pair longest with peduncle somewhat longer than rami which are equal in length and provided with stout spines; second pair extending posteriorly as far as first; terminal pair very short, not extending as far as preceding, rami styliform.

Telson slightly broader than long, with distal margin slightly concave, postero-lateral angle provided with a spine and several longer setae.

Length 5.5 mm.

This species has been previously reported from Naples, the coast of Scandinavia, Great Britain, and Port Jackson, Australia.

Eurystheus lina sp. nov.

Eyes compound, suboval, situated well on lateral aspect of head on prominent interantennal lobes and widely separated from each other.

Antennae subequal; first antennae rather stout with peduncle somewhat longer than flagellum; first joint of peduncle cylindrical



Fig. 31. *Eurystheus lina* sp. nov.

and about 3 times as long as broad, second joint nearly twice as long as first and more slender, third joint somewhat shorter than second, all joints provided with abundant setae, especially on lower margin; principal flagellum made up of about 11 joints, also provided with abundant setae; accessory flagellum made up of 4 or 5 joints. Second antennae with gland cone rather prominent and moderately long; third joint hardly twice as long as wide and with

distal end somewhat wider than proximal and provided with rather long setae on ventral margin; fourth joint rather long and slender, cylindrical; fifth joint shorter than fourth; flagellum about as long as fourth joint of peduncle, made up of 4 or 5 short, stout segments which are provided with setae.

Mandibles triangular, with principal and secondary cutting edges denticulated, with 9 or 10 spines on spine row and with prominent molar tubercle; palp 3-jointed, first joint short and cup-shaped with proximal end very narrow, second joint about 3 times as long as broad, slightly broader distally and with rather long setae on inner margin, third joint slightly shorter than second with rounded apex which is provided with abundant setae. Lower lip with outer plates having anterior margin entire. First maxillae having inner plate triangular and with numerous setae on inner margin; outer plate of usual form with stout spines on oblique apex; palp 2-jointed, of which the first is about as long as wide and the second is somewhat curved and club-shaped with setae on rounded apex. Second maxillae of usual form with plates rounded distally. Maxillipeds with plates well developed and with 4-jointed palp; inner plates rectangular with distal margin provided with abundant setae and a few spines; outer plates extending nearly as far as distal end of second joint of palp, with inner margin straight and armed with broad toothlike spines and abundant setae, outer and distal margins convex, distal margin with long setae; palp with first joint short, hardly as long as broad, second joint cylindrical, 3 times as long as broad and with long and abundant setae on inner margin, third joint $\frac{2}{3}$ as long as second with rounded apex having abundant setae, fourth joint less than $\frac{1}{2}$ as long as third with rounded apex as in third joint.

In male, first gnathopods with moderate epimera having anterior ventral angle only slightly produced and with very short setae on ventral margin; second joint moderate in size, third joint rather shorter than broad; fourth joint broader toward distal end than proximal with posterior margin much longer than anterior and with 4 or 5 fascicles of setae; wrist as long as second joint, subtriangular with distal margin somewhat oblique, posterior margin with 5 or 6 fascicles of setae and with similar number of fascicles along axis of joint; hand suboval, slightly broader than wrist, more than $\frac{2}{3}$ as broad as long, anterior and posterior margins slightly convex, posterior margin passing by even curve into palm which is slightly convex and provided with setae of various lengths, prehensile angle with spine, posterior and anterior margins with numerous fascicles of setae; finger long and moderately slender, serrated.

Second gnathopods very much larger in every way than first, epimeron small, rounded and not higher than long; second joint large and stout with fascicles of setae on both anterior and posterior margins; fourth joint hardly longer than third which is provided with rounded lobe on anterior distal apex; wrist short and triangular, articulating with fourth joint by most of posterior margin, distal part of margin in form of lobe extending over distal end of fourth joint and provided with numerous setae; hand very large, subrectangular, twice as long as broad with posterior margin provided with numerous setae, posterior margin prolonged distally so that prehensile angle is acute and palm is more or less concave; finger very stout, tapering and rounded apically, concave margin provided with a triangular process near base.

Epimera rather low, first 2 pereopods with spinning glands, last pereopod slightly longer than preceding.

Uropods 3 pairs, biramous; posterior pair extending slightly beyond second which in turn extend slightly beyond first; inner rami slightly longer than outer, styliiform.

Telson subrectangular, stout, bilobed, with lobes well separated by triangular emargination and armed apically with 2 or 3 stout spines.

Length 6 mm.

The species was represented by 2 specimens which were collected in 1903.

***Podocerosia sophia* Boeck, 1861.**

1861. Boeck, Forh. Skand. Naturf., vol. 8, p. 666.

Eyes compound, reniform, situated very close to front margin of head.

First antennae slightly longer than second, with first 2 joints of peduncle rather stout, cylindrical and equal in length, last joint $\frac{2}{3}$ as long as first; principal flagellum made up of 5 elongated joints, about as long as last 2 joints of peduncle; accessory flagellum short, consisting of 2 unequal joints, the first of which is much longer than the second. Second antennae with second joint rather short but with gland cone rather long and slender; third joint more than twice as long as broad, slightly thicker distally than proximally; fourth and fifth joints subequal, about as long as first joint of first antennae; flagellum made up of 6 joints, somewhat shorter than that of first antennae.

Mandibles with 3-jointed palp and denticulated cutting edge; first joint short; second and third subequal in length, second cylindrical;

third broader at distal end which is rounded and provided with numerous long setae, some of which are plumose; secondary cutting edge long; molar tubercle prominent. Lower lip with outer plates having anterior margin entire. First maxillae with small triangular inner plate and 2-jointed palp, having terminal joint rounded apically and provided with a few setae; outer plate with distal margin obliquely truncate and provided with toothed and branching spines. Second maxillae with inner plate rounded apically with setae on inner margin; outer plate somewhat longer than inner one and provided with long setae apically. Maxillipeds with plates well developed and 4-jointed palp; inner plate rather slender, triangular, provided with fairly stout spines apically; outer plate with rounded apex, furnished with odontoid spines and setae on inner margin and apex; last joint of palp cylindrical, furnished with single stout spine apically.

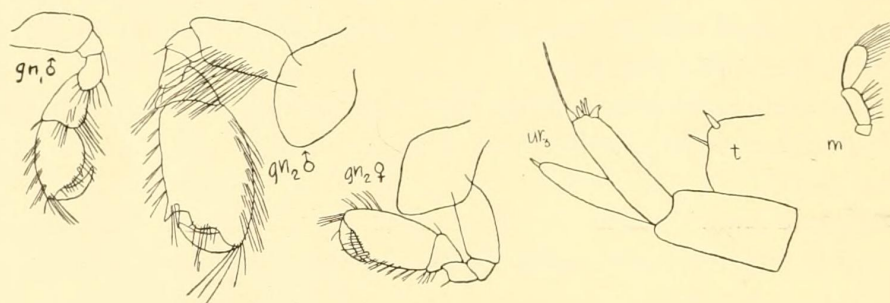


Fig. 32. *Podoceroopsis sophia* Boeck.

In male, first gnathopods with trapezoidal epimeron projecting well forward, ventral margin provided with short setae; second joint very stout and of moderate length, provided with long setae at distal end of posterior margin; third joint short; fourth somewhat longer than broad and broader at distal end, articulating with wrist by anterior margin; posterior margin and apex provided with long setae; wrist triangular, somewhat longer than broad, with setae on posterior and distal margins; hand oval, somewhat longer than wrist and slightly broader, posterior margin passing by even curve into palm which is convex and provided with submarginal setae and a rather large prehensile spine; hand also furnished with fascicles of setae on anterior margin and apex; finger of usual form, rather long and bearing a single cilium near apex on inner concave margin.

Second gnathopods with subrectangular epimeron much higher than long with ventral margin rounded; second joint stout and

moderately long, anterior margin straight and provided with numerous very long setae; third joint very short; fourth joint small, rectangular, about twice as long as broad with group of setae at apex, articulating with wrist by entire anterior margin; wrist small and cup-shaped, broader than long, with a fascicle of setae on very short free portion of posterior margin; hand large, much larger than that of first, subrectangular, palm rather irregular, convex near articulation of finger, bearing decided cavity with broad bottom in region of prehensile spine, posterior margin prolonged to form triangular process behind which the apex of the finger fits, posterior and anterior margins provided with fascicles of setae, palm provided with a few setae of various lengths; finger rather stout, of usual form.

In female, gnathopods smaller than in male; first gnathopods with relatively longer and more slender finger; second gnathopods with palm regularly convex and lacking prolongation of posterior margin of hand to form triangular process.

Pereiopods of usual form, provided with pointed dactyls, first 2 pairs with spinning glands.

Uropods, 3 pairs, biramous; second pair projecting beyond first and third; terminal uropods having rami nearly as long as peduncle and provided with several stout spines apically.

Telson thick, short, entire.

The species was represented in the collection by a male and a female 2.5 mm. in length, collected by W. G. VanName, 1901. It has been recorded from the Arctic Ocean, Scandinavia, the British coast, and Shetland Isles (70-90 fathoms).

***Isaea longipalpus* sp. nov.**

Eyes small, compound, circular.

First antennae long and slender, more than $\frac{1}{2}$ as long as body, with elongated flagellum; first joint of peduncle stout and armed with stout setae; second joint slender, slightly longer than first; third joint short and narrow, about $\frac{1}{3}$ as long as second; principal flagellum considerably longer than peduncle, composed of numerous elongated joints; accessory flagellum long, made up of at least 4 segments. Second antennae shorter than first; gland cone rather prominent but not long; third joint of peduncle slightly longer than broad; fourth and fifth joints long and subequal in length; flagellum about as long as last joint of peduncle, composed of about 6 joints.

Mandibles strong, triangular, with principal cutting edge denticulated and all parts well developed; palp 3-jointed, the first of which is rather long, only half as broad as long, second joint stouter than

first and about 3 times as long as broad, third joint longest, of tapering form with setae on inner margin and plumose spines on terminal portion of outer margin; secondary cutting edge moderately developed; molar tubercle large and prominent. First maxillae with inner plate rudimentary, bearing a single plumose spine apically; outer plate moderately large, with branching toothlike spines on distal margin; palp 2-jointed, with first joint small, second curved, elongated, larger at distal end, which is rounded, than at proximal end and armed with toothlike spines. Second maxillae of moderate size, plates rounded apically and provided with many setae. Maxillipeds with plates well developed and with palp 4-jointed; inner

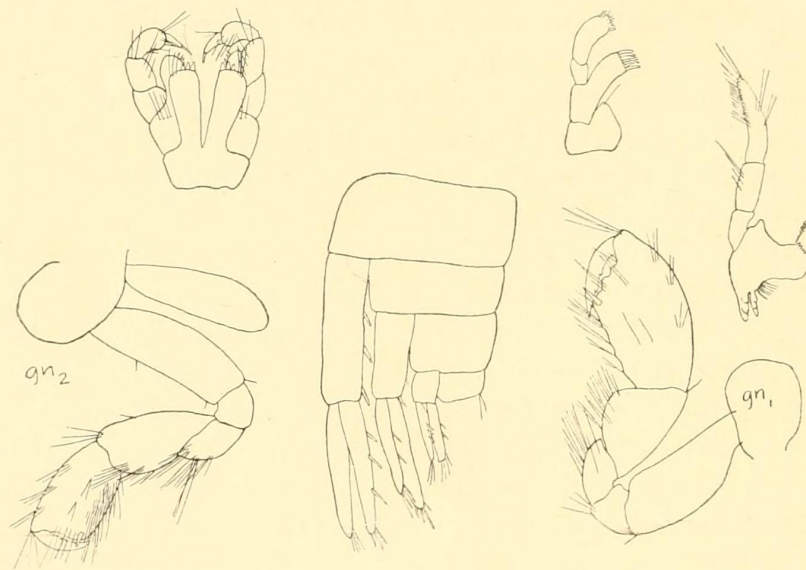


Fig. 33. *Isaea longipalpus* sp. nov.

plates moderately large, rectangular, with 3 spine teeth and plumose spines on terminal margin, inner margin with plumose spines; outer plates large, oval, with dagger-shaped spines on distal portion of inner margin and apex; palp rather slender with numerous setae on inner margin of joints; second joint cylindrical, third with enlarged, rounded apex bearing setae, fourth conical and bearing a terminal spine.

First gnathopods larger than second; epimeron irregularly rectangular; second joint rather long and stout, slightly more than twice as long as broad; third joint short; fourth more or less oval with setae on posterior margin; wrist articulating with anterior margin of preceding joint, triangular, somewhat longer than broad with convex posterior margin provided with long setae; hand sub-

rectangular, as broad as wrist and about $1\frac{1}{2}$ times as long, slightly broader distally than proximally, palm irregularly incised, slightly oblique with numerous setae and large prehensile spine, posterior margin with several fascicles of setae; finger of usual form with concave margin serrate, somewhat longer than palm.

Second gnathopods with rather small subrectangular epimeron which is longer than high and with rounded angles; second joint moderate; third joint short; fourth oblong with wrist articulating by whole anterior margin, provided with setae on distal portion of posterior margin and apex; wrist triangular, twice as long as wide and as wide as hand, with many setae on posterior margin; hand subrectangular, about as long as wrist with palm nearly transverse and provided with numerous submarginal setae and a prehensile spine, posterior margin with numerous setae; finger of usual form, fairly stout, serrated on concave margin.

Epimera rather low; gills oval and broad. In the single specimen at hand all the pereopods were missing.

Uropods, 3 pairs, biramous; rami styliform; first and second projecting slightly beyond terminal pair; all provided apically with groups of several stout spines.

Telson thick, entire, about as broad as long, with 2 setae at each distal angle.

Dorsally and laterally the 5 anterior thoracic segments and the head are marked with irregular masses of pigment in the form of a fine network which, in the alcoholic specimen, is brownish black.

Length 2.5 mm.

The single specimen in the collection was found in Bailey Bay in coralline at low water in 1898.

***Amphithoe longimana* Smith, 1874.**

1874. Smith, Rep. U. S. Fish. Com., vol. 1, p. 563.

Eyes small, compound, somewhat oval, made up of many ocelli crowded together.

First antennae longer than second, and nearly as long as body, with no accessory flagellum; first joint of peduncle stout, cylindrical, about 5 times as long as broad, provided with a few setae; second joint somewhat longer than first and more slender; third joint about $\frac{1}{2}$ as long as first and much thinner, bearing a few setae on distal end; flagellum slender, composed of about 32 segments each with short setae on apical margin. Second antennae long and slender; gland cone small and slender; third joint of peduncle nearly twice as long as wide and with a few setae at apex; fourth and fifth joints

subequal and slightly longer than second joint of first antennae; flagellum about as long as peduncle and made up of 12 to 15 segments.

Mandibles with principal cutting edge divided into 7 teeth diminishing regularly in size from apical one which is largest; secondary

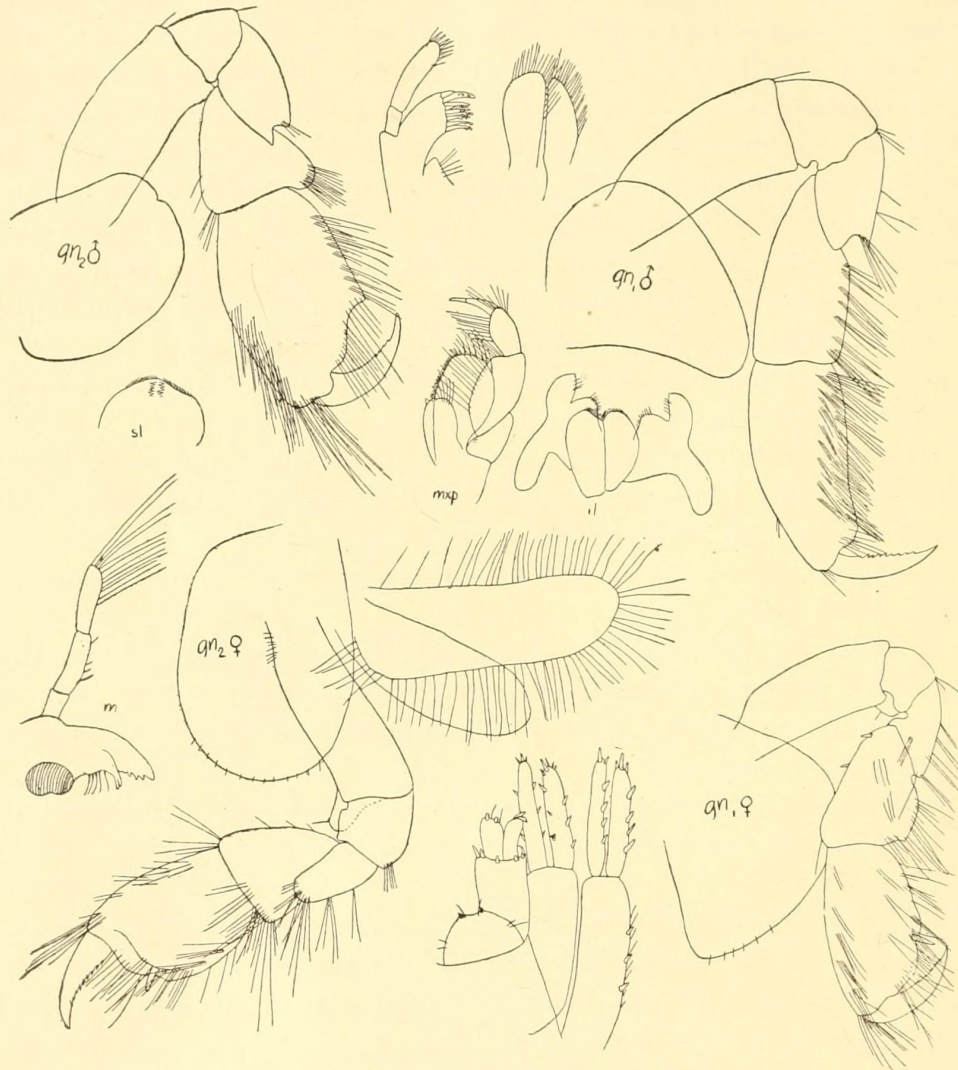


Fig. 34. *Amphithoe longimana* Smith.

cutting edge small and likewise denticulated; spine row with 5 plumose spines; molar tubercle large; palp 3-jointed with first joint short and not much longer than wide, second joint very slightly longer than third and provided with setae on inner margin, third joint rounded apically where joint is thicker than at base, provided with many long setae on apex and distal half of inner margin.

Lower lip with large outer plates incised at apex; mandibular processes large and diverging; inner plates large and oval. First maxillae with small triangular inner plates armed with short setae on inner margin; outer plates large, curved, with distal margin oblique and provided with 8 or 9 branching toothlike spines; palp 2-jointed, first joint $1\frac{1}{2}$ times as long as broad, second joint thicker than proximal and about 4 times as long as broad, rounded at apex which is provided with slender conical spines. Second maxillae with outer plates much broader at distal end than at proximal; inner plate not quite as long as outer, triangular. Maxillipeds with plates well developed; inner plates extending as far as first joint of palp with apex rounded and provided at inner distal angle with 2 stout teeth, external to which are 8 plumose spines; outer plates broad and large, extending as far as second joint of palp, provided on inner margin with teeth which become longer toward apex and pass over into long setae extending around apex to outer side; palp 4-jointed, first joint short, second nearly twice as long as wide with many setae on inner margin; third joint equal to first in length, rounded apically where it is broader than at base, provided with a fascicle of setae on outer distal angle and many setae on inner margin; fourth joint about $\frac{2}{3}$ length of third, slender and curved, bearing a stout spine apically which renders whole segment as long as third.

In female, first gnathopods with epimeron produced anteriorly to acute angle, ventral margin convex and provided with short setae on anterior portion; second joint moderately slender, broader at distal end which bears on anterior margin a semicircular lobe with a short seta; third joint broader than long; fourth joint rather slender, with posterior margin long and convex, bearing several fascicles of setae, anterior margin short, distal end broader than base and cup-shaped; wrist as long as third and fourth joints together, triangular, broader than hand, posterior margin with many long setae, anterior margin with 2 toothlike spines on proximal half, distal margin slightly concave; hand subrectangular, twice as long as broad, somewhat longer than wrist, anterior and posterior submargins with numerous fascicles of setae, palm oblique and convex, provided with many setae and a stout prehensile spine; finger rather long and stout with a few serrations distally on concave margin.

Second gnathopods with oval epimeron having ventral margin armed with setae; second joint with a number of short setae at proximal end of anterior margin; third joint much as in first gnathopod

but with group of setae at posterior distal corner; fourth joint scarcely longer than third, oblong, $\frac{2}{3}$ as broad as long, armed with several fascicles of setae on anterior margin; wrist triangular, not as long as wrist of first gnathopod, provided with numerous setae on distal margin; hand much like that of first gnathopod but broader and shorter, palm less oblique and posterior margin more convex; finger short and stout with concave margin serrate.

First and second pereopods with spinning glands; epimera moderate, gradually increasing in size toward posterior end, with ventral margins in each case rounded and armed with very short setae.

Uropods, 3 pairs, biramous; second pair extending beyond first and third; first pair with outer margin of peduncle armed with 3 conical toothlike spines, inner ramus more than half as long as peduncle and slightly longer and more slender than outer ramus; rami provided with toothlike spines on margins and apically; second pair like first but stouter and with no spines on peduncle; third pair with peduncle extending beyond that of second, armed with several toothlike spines on distal margin; rami very short, about half as long as peduncle and terminating in 2 stout hooked spines and armed with several long setae.

Telson broader than long, semicircular, with apex slightly truncate and with lateral margins slightly produced to form triangular processes which are each armed with a seta, apex also provided with 4 long setae and lateral margins with 4 shorter ones.

Length 12 mm.

The species was represented by a number of specimens. It occurs abundantly on the New England coast.

Amphithoe rubricata (Montagu, 1808) Leach, 1813.

1808. *Cancer rubricatus*. Montagu, Trans. Linn. Soc. London, vol. 9, p. 99; pl. 5, fig. 1.

1813-14. *Amphithoe rubricata*. Leach, Edinb. Encycl., vol. 7, p. 403.

Eyes moderately large, round, compound.

First antennae longer than second. First joint of peduncle fairly stout and shorter than second; third joint short and slender, hardly to be distinguished from proximal joints of flagellum, about $\frac{1}{3}$ as long as second joint; flagellum composed of many segments, long and slender and less than twice as long as peduncle. Second antennae with peduncle longer than that of first; fourth and fifth joints subequal in length; third joint rather broad and shorter than broad; flagellum composed of many segments.

In female, first gnathopods with trapezoidal epimeron projecting anteriorly by acutely rounded angle, ventral margin slightly rounded and armed with numerous short setae; second joint robust, extending well beyond epimeron, anterior margin straight with small flat rounded lobe at distal end; third and fourth joints short, fourth joint triangular, widened distally, provided with setae at apex and on posterior margin; wrist triangular armed with a few rather long stout setae on rounded posterior margin which forms a kind of lobe so that the wrist is broader than the hand, wrist provided with several fascicles of setae on surface; hand rather long, about $\frac{1}{3}$ longer than wrist, subrectangular with anterior and posterior margins nearly parallel, with posterior margin and palm provided with many setae of different lengths, palm oblique and passing evenly into

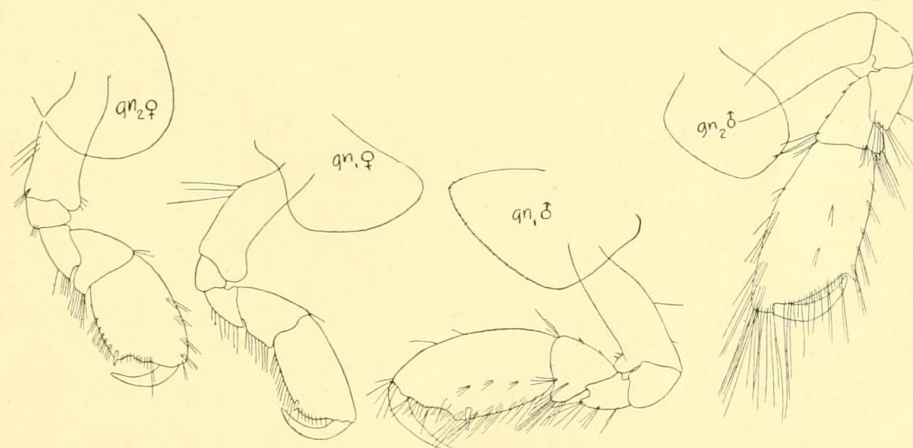


Fig. 35. *Amphithoe rubricata* (Montagu).

posterior margin, prehensile angle with a large submarginal spine; finger very long and slender with inner concave margin serrate.

Second gnathopods with rectangular epimeron nearly as long as high, convex on ventral margin which is armed with many short setae; second joint similar to that of first gnathopod; third joint short; fourth joint twice as long as broad with wrist attached to anterior margin, provided with setae apically and on posterior margin; wrist more or less triangular, posterior margin strongly convex forming a lobe which makes the wrist wider than the hand; hand subrectangular, much shorter and stouter than that of first gnathopod, palm oblique and forming with posterior margin a small process which bears a submarginal prehensile spine, anterior margin provided with 4 fascicles of slender setae, posterior margin and palm

with many setae; finger curved, moderately slender, with concave margin serrated.

In male, first gnathopods with epimeron prolonged anteriorly with antero-ventral angle rounded; second joint fairly stout; fourth joint short with fascicle of setae on acute postero-ventral angle, wrist nearly as long as hand with anterior and posterior margins parallel, the latter of which is provided with numerous fascicles of setae; hand long and slender, almost rectangular, about twice as long as broad and not broader than wrist, anterior margin slightly convex, posterior margin with many setae, palm very short and irregular; finger long and of usual form with concave margin provided with coarse serrations.

Second gnathopods with epimeron slightly higher than long and rounded with moderate notch in ventral margin dividing it into a larger anterior and smaller posterior lobe; second, third, and fourth joints essentially as in first gnathopod; wrist triangular, about as broad as long with postero-ventral angle rounded and provided with a tuft of setae; hand strong, subrectangular, with anterior margin slightly convex and provided with numerous fascicles of setae, posterior margin also with numerous fascicles of setae, palm oblique and convex, prehensile angle very prominent and acute; finger stout and curved with a few serrations on concave margin fitting behind prehensile angle.

Epimera of second gnathopod and first and second pereopods provided with small notch in ventral margin, dividing epimeron into 2 rounded lobes.

Telson triangular, not as long as wide, apex more or less truncated, provided with 2 fascicles of setae along lateral margins.

One of the specimens, a male, was dredged in 3 fathoms in Castle Harbor, in dead coral, April 24, 1901. The species has been previously reported from the North Atlantic and adjoining seas of Europe between tide marks and at small depths.

***Amphithoe pollex* sp. nov.**

Eyes compound, round, moderate in size.

First antennae with second joint of peduncle slightly longer than first which is moderately stout. Rest of antennae wanting in specimens at hand. Second antennae with gland cone absent, third joint of peduncle broader than long; fourth and fifth joints subequal in length but fifth rather more slender than fourth; flagellum made up of about 10 joints, equal in length to last 2 joints of peduncle together.

First gnathopods with rhomboidal epimeron, rather longer than high and provided with short setae on ventral margin; second joint fairly stout with a semicircular process at antero-distal angle; third and fourth joints short, fourth twice as long as broad with setae on apex; wrist triangular, scarcely as broad as long, with short posterior margin rounded and provided with a few long setae; hand oval, rather large, nearly twice as long as wrist and more than twice as long as broad, widest portion very near proximal end, posterior margin and palm forming an even curve, prehensile angle with a stout

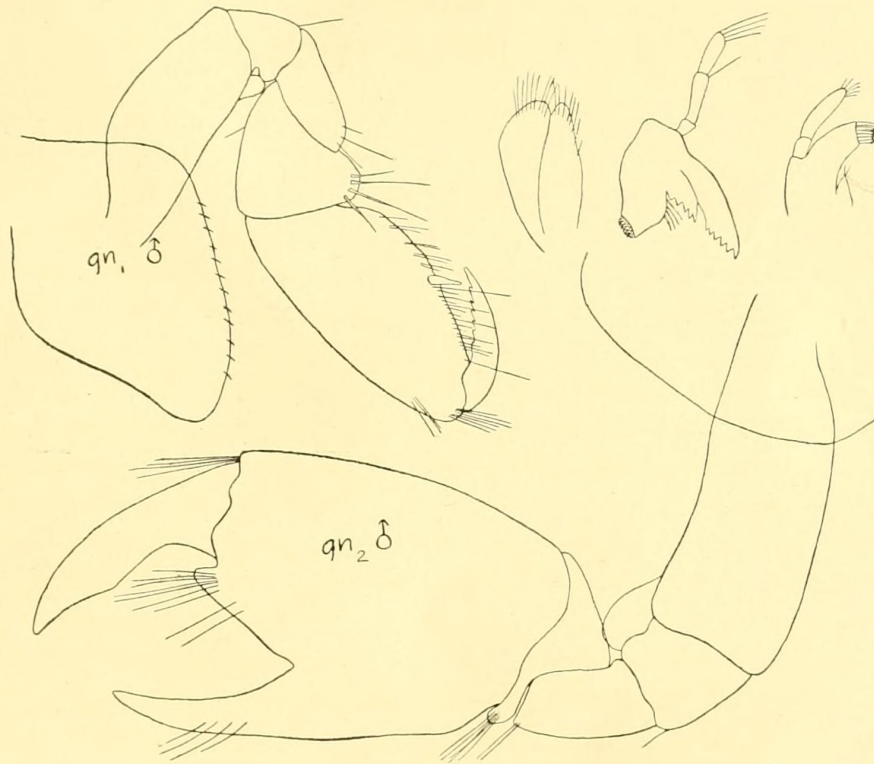


Fig. 36. *Amphithoe pollex* sp. nov.

spine, palm very oblique and provided with numerous setae; finger rather large and stout with concave margin bearing several serrations.

Second gnathopods with rounded epimeron and very stout second joint; fourth joint rectangular, about twice as long as broad; wrist very short, triangular, considerably broader than long, with free posterior margin very short and strongly convex and bearing a fascicle of long setae; hand exceedingly large, broader at distal end than at proximal and somewhat longer than broad at widest part, posterior margin produced to form a long, slightly curved, thumblike process; palm very oblique and shorter than

thumblike process just described, provided with a few long setae near apex, distal margin of hand transverse and rather long; finger stout, with broad base and with concave margin provided with a low broad triangular process.

Epimera rather low, with ventral margins not strongly convex; pereopods fairly stout, first and second provided with spinning glands, fourth and fifth longer than others.

Uropods and telson as in *A. longimana*.

The species was represented in the collection by 2 male specimens, the larger one of which measured 5.5 mm. in length.

Grubia crassicornis (A. Costa, 1853) Della Valle, 1893.

1853. *Amphithoe crassicornis*. A. Costa, Rendic. Soc. Reale Borbon., Accad. Sci. Napoli, vol. 1, p. 306, pl. 3, fig. 1 a-d.

1893. *Grubia crassicornis*. Della Valle, Fauna und Flora des Golfes von Neapel, vol. 20, p. 464, pl. 2, fig. 12; pl. 13, fig. 18-29.

Eyes small, nearly circular, compound and made up of very many ocelli which are yellowish brown in the alcoholic specimens at hand.

First antennae longer than second, with peduncle about $\frac{1}{3}$ length of flagellum; first joint rather stout and about as long as second; third about $\frac{1}{3}$ as long as second; flagellum made up of large number of segments which are furnished with setules distally; accessory flagellum composed of single segment which is about $\frac{1}{2}$ as long as first joint of principal flagellum. Second antennae with gland cone prominent and slender; third joint of peduncle rather long and about as long as fifth which is as long as fourth joint; flagellum made up of many joints, about as long as peduncle.

Mandibles strong, well developed; palp 3-jointed, slender, first joint $\frac{1}{2}$ as long as second, third joint shorter than second and stouter, with apex rounded and provided with numerous long setae; principal cutting edge long with numerous triangular teeth; secondary cutting edge also with numerous teeth; spine row with 6 spines; molar tubercle very large and prominent, provided with 6 or 7 flagella. Lower lip with inner plates large, rounded, with many short hairs on anterior margin; outer plates large, with anterior margin incised with deep, broad notch; mandibular processes long, broad, tapering, and widely divergent. First maxillae with inner plate small, triangular, provided with a single seta on inner margin; outer plate broad, curved, apical margin obliquely truncated and provided with numerous pectinate toothlike spines; palp 2-jointed and slender, first

joint slightly longer than broad, second joint long, tapering, provided with many long setae on distal half of inner margin and apex. Second maxillae with inner plate narrower than outer and tapering slightly, with apex rounded and provided with plumose spines on distal third of inner margin and apex; outer plate slightly longer than inner plate with outer margin rounded, inner margin straight, slightly broader toward distal end than at base and provided with setae. Maxillipeds with inner plates moderately long, provided with many setae distally and on inner margin, apex rounded; outer plate large, inner margin straight, outer strongly convex, provided with many long setae on apex and numerous very short ones on inner

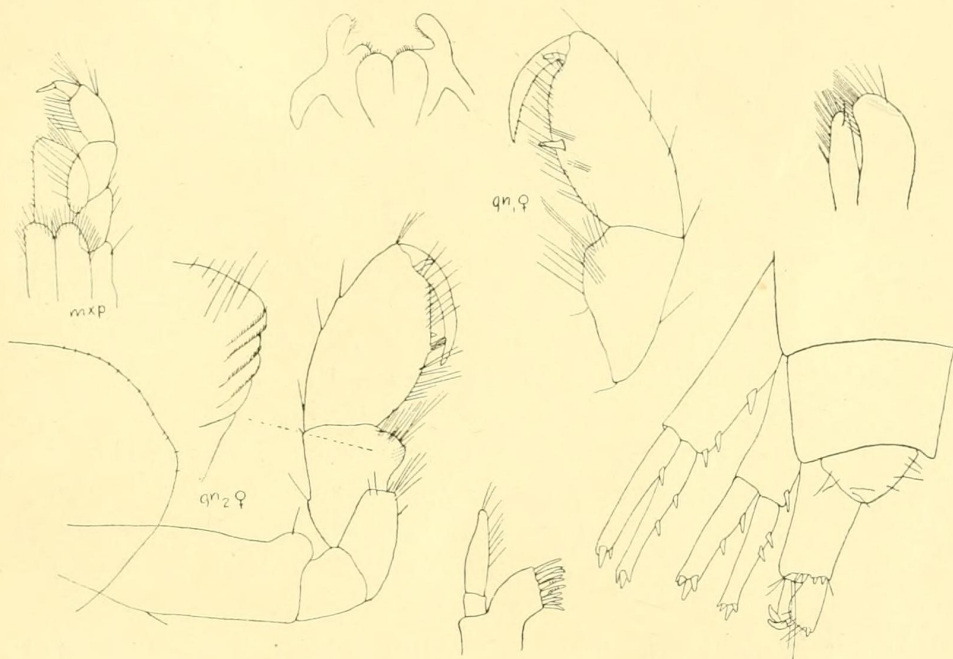


Fig. 37. *Grubia crassicornis* (A. Costa).

margin; palp 4-jointed of which the first joint reaches farther than the inner plate and the second about as far as outer plate and is provided with plumose spines on inner margin, third joint nearly as long as second, more or less oval in form, with many setae on inner margin and a fascicle on outer margin near distal end and a second fascicle at apex, fourth joint conical and provided with a nail apically which equals the joint itself in length.

In female first gnathopods with epimeron about as long as high, with ventral margin much longer than dorsal, convex and furnished with a few very short setae; second joint moderately stout, broader at distal end than at proximal, furnished with 2 long setae on pos-

terior margin, distal anterior corner prolonged into rounded process which bears a single seta; third joint slightly longer than broad, provided with several setae distally; fourth joint broader distally and slightly longer than third and provided with a few setae on distal margin; fifth joint $\frac{3}{4}$ as long as hand, provided with a single seta on middle of posterior margin and another at distal end, and many on anterior margin; hand oval, provided with many setae on anterior margin and several distally and on posterior margin, palm oblique, passing by smooth curve into posterior margin of hand; prehensile spine present, palm provided at articulation of finger with curved spine somewhat smaller than prehensile spine; finger curved and slender, about $\frac{1}{2}$ as long as hand, inner concave margin notched.

Second gnathopods with hand shorter than that of first but about as stout; epimeron subrectangular, slightly higher than long, provided with short setae on convex ventral margin; second and third joints as in first gnathopod; fourth joint longer than broad, with a fascicle of setae terminally, articulating by entire anterior margin with wrist which is subtriangular and nearly as broad as long; posterior margin very strongly convex and provided with several groups of setae toward apex and proximal to these with 5 transverse rows of very short cilia; hand oval, provided with several setae on anterior margin and more closely set setae on posterior, very similar to hand of first gnathopod, palm provided with submarginal setae of various lengths; finger very slender, of usual form.

Pereiopods of anterior group provided with spinning glands; epimera moderate with ventral margins rounded and bearing a few short setae.

Uropods, 3 pairs, biramous; first with long peduncle and with inner ramus, which is the longer, about as long as peduncle, rami terminated by 3 short, stout spines and a single larger one; second uropods extending nearly as far as first, with rami similar to those of first but stouter; third uropods very stout, and extending as far as preceding ones; subequal rami, the inner one of which is provided with 2 curved spines apically and the outer one with a fascicle of setae, rami about $\frac{1}{3}$ as long as peduncle which is moderate in size and provided distally with several short stout spines.

Telson not as long as wide, triangular or semicircular in shape, entire.

Length about 6 mm.

The species is rather common at Naples and has also been recorded from the Black Sea.

Grubia coei sp. nov.

Eyes compound, oval, situated very well forward on interantennal lobes.

First antennae longer than second and nearly $\frac{2}{3}$ as long as body; peduncle more than $\frac{1}{2}$ as long as principal flagellum, first joint stout, cylindrical, nearly as long as head, second nearly as long as first but much more slender; third joint very short, about as long as first joint of flagellum; accessory flagellum one-jointed, not as long as first joint of principal flagellum which is slender and made up of a large number of segments. Second antennae with gland

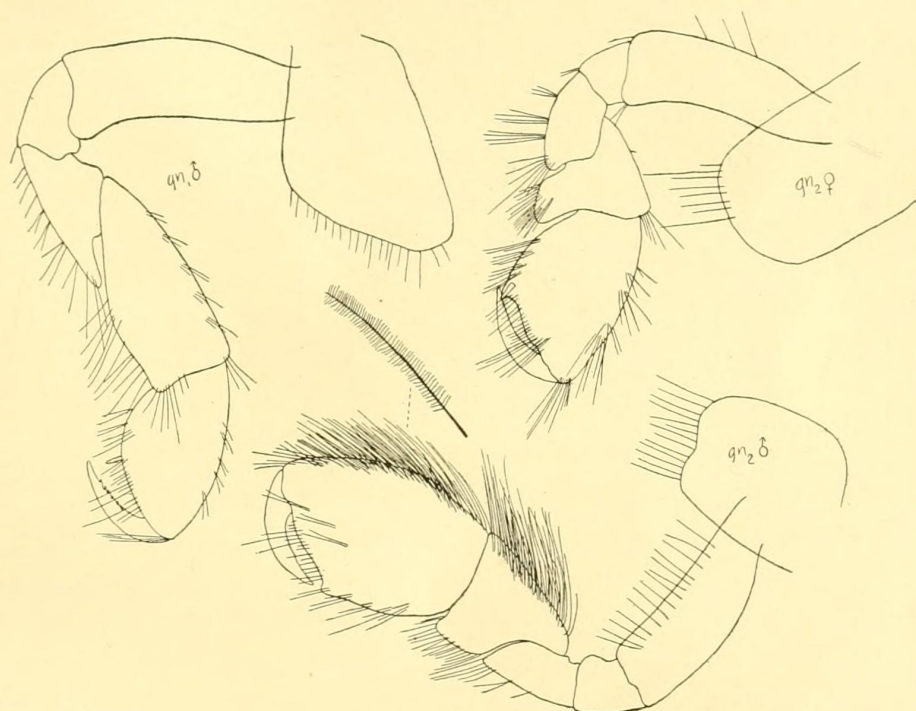


Fig. 38. *Grubia coei* sp. nov.

cone small; third joint of peduncle longer than broad, extending $\frac{3}{4}$ as far as first joint of first antennae; fourth and fifth joints long, subequal, provided with dense plumose spines; flagellum made up of many joints, scarcely as long as peduncle.

Mandibles with all parts well developed; principal cutting edge denticulated, also secondary cutting edge which is long; spine row with 8 spines; molar tubercle large and prominent; palp 3-jointed having the second joint longer than third, which is stouter than second and with rounded apex provided with numerous setae. Lower lip with outer plates large, having anterior margin deeply incised and mandibular processes prominent; inner plates large and

oval. First maxillae with 2-jointed palp, of which the terminal joint is club-shaped with sharp spines on apical margin; outer plate rather large with obliquely truncate apical margin provided with branched spines; inner plate very small, triangular, provided with setae on inner margin. Second maxillae with outer plate longer than inner and much broader apically than proximally, provided with setae apically; inner plate tapering, with rounded apex, which, with inner margin, is provided with plumose spines. Maxillipeds with plates well developed and with 4-jointed palp; inner plate extending about as far as apex of first joint of palp, rounded and provided with plumose spines and with apical odontoid spine; outer plate large, oval, extending beyond apex of second joint of palp; inner margin armed with odontoid spines which increase in length and become slender distally; palp with first joint triangular, short, second joint cylindrical with spines near distal end of inner margin, third joint short, broader distally, with setae on distal half of inner margin and apex, fourth joint curved, conical, armed with clawlike spine apically and several setae on inner margin.

In male, first gnathopods with triangular epimeron bearing setae on ventral margin, about as high as greatest length; second joint rather long and slender with small rounded process at distal end of anterior margin; third joint short, more or less triangular; fourth joint moderately long, with long, rather slender process at distal end of posterior margin, so that posterior margin, which is provided with setae, is much longer than anterior, distal margin oblique, articulation with wrist rather short; wrist very long, as long as second joint and much stouter, articulating with fourth joint by proximal part of posterior margin, distal portions of posterior and anterior margins parallel, distal margin transverse, margins provided with setae; hand oval, stout, palm very oblique, slightly convex, posterior margin very convex, separated from palm by prehensile spine, anterior margin moderately convex, hand broader than wrist but shorter, slender setae on palm, posterior and anterior margins; finger moderately long, with serrated concave margin.

Second gnathopods with epimeron rectangular, slightly higher than long with ventral margin provided with long setae and slightly indented by broad sinus; second joint rather long with anterior margin provided with setae; third joint of usual form, about as long as broad; fourth joint rectangular, with posterior margin provided with setae near distal end and longer than anterior, apex somewhat oblique; wrist triangular, articulating with almost entire anterior margin of fourth segment, posterior margin provided with short

setae and strongly convex to form rounded lobe which extends as far as posterior margin of fourth joint, anterior margin slightly convex and provided with large number of very long plumose spines; hand oval, not much longer than broad, wider than wrist, anterior margin with very large number of long plumose spines, posterior margin with several fascicles of setae, both margins rather convex, palm oblique, marked off from posterior margin by slight triangular process, provided with setae of various lengths; finger short and stout.

In female first gnathopods with epimeron having anterior ventral corner rounded and projecting considerably so that ventral margin is nearly twice as long as dorsal, provided with long setae; second joint moderately long and slender, with setae on posterior margin and rounded lobe at distal end of anterior margin; third joint longer than broad; fourth joint broader distally than proximally, with posterior margin much longer than anterior and provided with numerous setae; wrist somewhat triangular, twice as long as broad, articulating with oblique distal margin of fourth, anterior margin much longer than posterior so that distal margin is transverse, posterior margin provided with numerous long setae; hand scarcely as long as wrist and about as broad, oval, posterior margin short, palm very oblique, separated from posterior margin by prehensile spine, anterior and posterior margins provided with numerous fascicles of setae, palm provided with numerous submarginal setae of various lengths; finger moderately strong with inner margin only slightly concave and serrated.

Second gnathopods with rectangular epimeron higher than long, with rounded ventral margin provided with long setae; second joint similar to that of first gnathopod; third short; fourth rectangular twice as long as wide, with posterior margin longer than anterior and provided with several fascicles of setae; wrist triangular, broader than long and with posterior margin produced to form rounded lobe which is densely covered with setae; hand longer than broad with distal end broader than proximal, palm slightly oblique, provided with numerous submarginal setae, separated from posterior margin by slight process and prehensile spine, anterior and posterior margins provided with numerous fascicles of setae; finger of usual form and size. In both sexes second gnathopods larger than first.

Epimera increasing slightly in height to fifth, all provided with setae on ventral rounded margins.

Uropods biramous; first and second pairs with inner ramus slightly longer than outer, second pair projecting hardly as far as first; rami

provided with short setae on inner margins and apex; third uropods with short conical rami armed apically with hook-like spines, extending beyond other uropods.

Telson small, entire, thick, subtriangular, about as long as broad.

In the alcoholic specimens represented in the collection by 2 males and 2 females, the epimera, terga, and proximal joints of the antennae and uropods were marked with irregular spots of a dark flesh color. Length of males, 10 mm.; of females, 18 mm.

Eriethonius braziliensis (Dana, 1853) Stebbing, 1906.

1853. J. D. Dana, *Pyctilus braziliensis*. U. S. Explor. Exped., vol. 13 II, p. 976; pl. 67, fig 5.

1906. Stebbing, *Eriethonius braziliensis*. Das Tierreich, Lief. 21, p. 671.

Eyes compound, with ocelli very closely crowded together, situated on basal portion of very prominent interantennal lobes.

Antennae subequal and more than half as long as body.

Mandibles with all parts well developed; palp stout, 3-jointed; first joint broader than long, narrower at base than apically; second joint longer and stouter than first, armed with long slender setae on inner margin; third joint nearly 3 times as long as broad, with rounded apex, armed with setae along inner margin, more numerous on distal half and apex, outer margin with fascicles of setae at middle; cutting edge short, divided into 4 or 5 teeth, of which the second is the largest; secondary cutting plate expanded distally and cutting edge very oblique, composed of 4 rather sharply pointed teeth, diminishing in size from the anterior one; 5 plumose spines on spine row; molar tubercle moderately large. Lower lip with outer plates having anterior margin entire, inner plates moderately developed. First maxillae with inner plate small, triangular, with 2 setae on inner margin; outer plate moderately broad, tapering slightly, with 7 forked spine teeth on distal margin; palp 2-jointed, curved; first joint broader than long; second about as long as wide with apex truncate, armed with 4 stout setae and several smaller ones. Second maxillae with broad plates rounded distally; outer plate longer than inner one and with setae on apex; inner plate with spines on apex and diagonally on surface. Maxillipeds with long, 4-jointed palp; fourth joint cylindrical, about twice as long as broad, with 4 apical setae, of which the 2 outer are longer than segment; third joint stout, twice as long as broad with numerous long setae on distal portion; second joint broader and longer than third and armed with long setae on inner margin; first joint slightl

longer than broad; outer plate extending scarcely to middle of second joint of palp, armed with plumose spines on rounded apex, the spines becoming smaller as they pass obliquely over the surface to inner margin proximally, margin with dagger-shaped spines on distal portion of inner margin; inner plate rather rectangular in shape, extending as far as first joint of palp, armed with plumose spines apically and on distal half of inner margin; apex with 3 odontoid spines.

In male first gnathopods with small epimeron; second joint rather

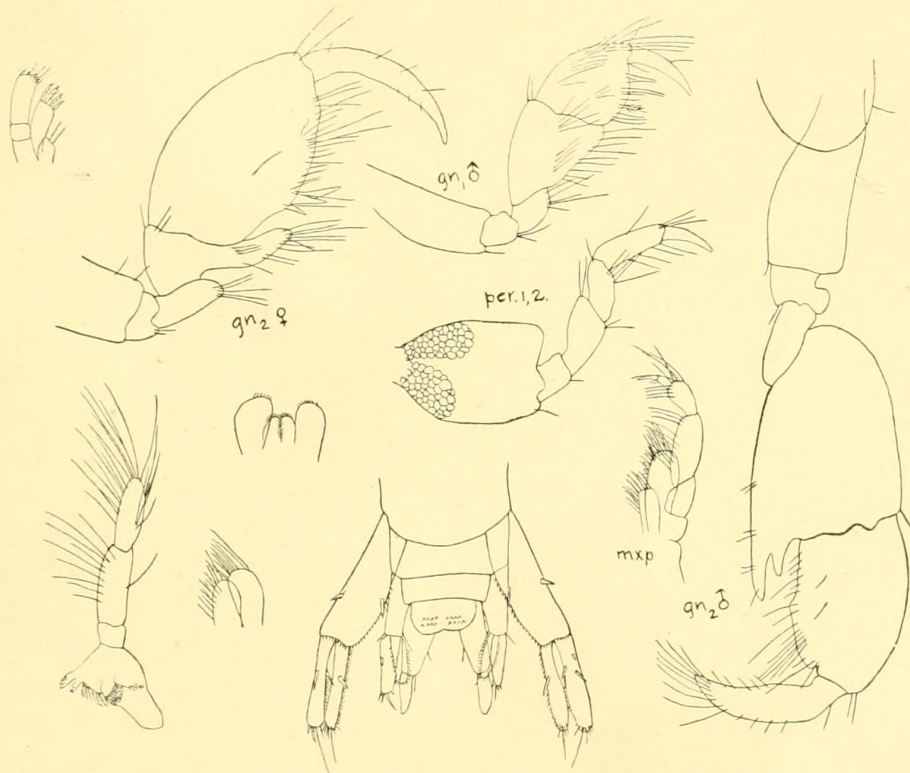


Fig. 39. *Ericthonius braziliensis* (Dana).

short, about 3 times as long as broad; third and fourth joints short, fourth bearing a few setae apically, third bearing fewer and shorter ones; wrist large, triangular, somewhat longer than broad, attached to anterior margin of fourth, posterior margin provided with many long setae; hand, triangular, as broad as wrist but not so long, about as long as broad, with 4 fascicles of setae near anterior margin, posterior one very short and convex with several moderately long setae, passing into palm by even curve; palm finely serrate, provided near proximal end with a single stout plumose spine and numerous setae of various lengths; hand provided apically with

several long setae; finger moderately long and curved, with one seta near middle of outer convex margin and another near proximal end; finely serrate on inner margin.

Second gnathopods with epimeron rounded ventrally, with a single seta anteriorly; second joint rather stout, armed with a very few short setae on anterior and posterior margins; third joint not as long as broad; fourth joint oblong, more slender than third and about 3 times as long as wide; wrist very large and strong, subtriangular in shape, considerably longer than broad; posterior margin prolonged to form a large process extending past base of hand in the form of 2 moderately sharp toothlike projections, of which the outer one is the longer, posterior margin bearing 4 fascicles of short setae toward distal end; hand subrectangular and smaller in all dimensions than wrist, very markedly narrower, anterior margin convex, posterior margin about $\frac{1}{3}$ as long as anterior and parallel to it, palm longer than posterior margin and very oblique, passing into posterior margin by a slightly projecting obtuse prehensile angle, palm provided with setae of various lengths; finger long, curved, stout, nearly equalling the hand in length so that apex fits into notch between process of wrist and hand, provided with short setae which are longer and more crowded together around apex.

In female, second gnathopods simply subchelate; wrist provided with long process on posterior margin which extends nearly as far as proximal end of palm, process provided with setae along posterior margin and at apex where there are also 2 odontoid spines; hand oval with distal portion more slender, transition between posterior margin and palm by an even curve which is provided with 2 or 3 prehensile spines; finger slender, moderately long and curved, armed with a few setae.

Pereiopods with low epimera; first, second, and third pereiopods rather short and stout with moderately long and slender dactyls; first and second appendages with spinning glands; fourth and fifth appendages rather long and slender.

Uropods, 3 pairs; first pair longest, with peduncle serrate on inner margin and slightly longer than rami which are subequal and have margins finely serrate and provided with 2 short stout spines and with one long stout spine and several shorter setae on apex; second pair not extending as far as others, similar to first pair; third pair with stout peduncle and single ramus which is stout and projects as far as first uropods, somewhat curved in form and provided apically with 2 very short, stout, hooked spines.

Telson broad but short, not extending as far as peduncle of second

uropods, apically rounded with broad, shallow depression dividing it into 2 lobes which are armed on the dorsal surface with numerous recurved spines.

There were only 2 or 3 specimens of the species in the collection, about 4 mm. in length. The species has been previously reported from the Atlantic coast of N. America (Vineyard Sound), Norway, the Adriatic, Rio Janeiro, and the North Pacific (San Francisco).

***Chelura terebrans* Philippi, 1839.**

1839. Philippi, Arch. f. Naturgesch., vol. 5, p. 120, pl. 3, fig. 3.

Eyes round, compound, situated close to lateral lobes of head.

First antennae about $\frac{1}{5}$ as long as body, with joints of peduncle successively diminishing in size; principal flagellum about as long as last 2 joints of peduncle, composed of 6 joints rather densely provided with slender setae; accessory flagellum short, made up of 2 joints. Second antennae much longer and stronger than first and somewhat curved; third, fourth, and fifth joints of peduncle nearly equal in length, fifth being longer than either fourth or third; flagellum not segmented, consisting of a large spatulate joint provided with dense setae on both edges and tipped with one or two rudimentary segments.

Upper lip rather elongated with apex broad and entire. Mandibles with strong body but relatively small palp; principal and secondary cutting edges denticulated, molar tubercle strongly developed; palp 3-jointed with terminal joint longest and having acute apex armed with several long setae and inner margin beset with short setae, second joint cylindrical, about twice as long as wide; first joint very short. Lower lip made up of 2 pairs of plates with cilia on anterior margin of outer plates. First maxillae with inner plate moderately developed, provided with several setae on apex; outer plate strong, provided with many strong, branching spines; palp moderate, composed of 2 joints of which the distal one is the longer with rounded apex which is provided with setae of various lengths. Second maxillae with plates rather narrow and provided apically with setae. Maxillipeds with well developed plates and 4-jointed palp; inner plate with rounded apex and extending nearly as far as distal end of first joint of palp, with slender setae on inner and apical margin; outer plate with outer margin rather strongly convex, inner margin straight and apex fairly acute, both provided with setae; palp with second joint long and slender, slightly spindle-shaped with setae on inner margin, third joint about twice as long as broad, with outer apex produced to rounded lobe, fourth joint

slightly curved, cylindrical, much smaller than third joint, provided apically with clawlike spine.

First gnathopods with rectangular epimeron about as long as broad and with angles rounded, and with anterior ventral angle provided with long setae; second joint rather stout, with anterior and posterior margins parallel and provided with long setae; third joint very short; fourth joint about as broad as long with apex rounded and armed with a fascicle of setae; wrist short, subrectangular with anterior margin longer than posterior and with the latter provided with long setae; hand subrectangular, about twice as long as broad and much longer than wrist, with posterior apex produced to form a stout thumb against which the finger closes; finger curved, small.

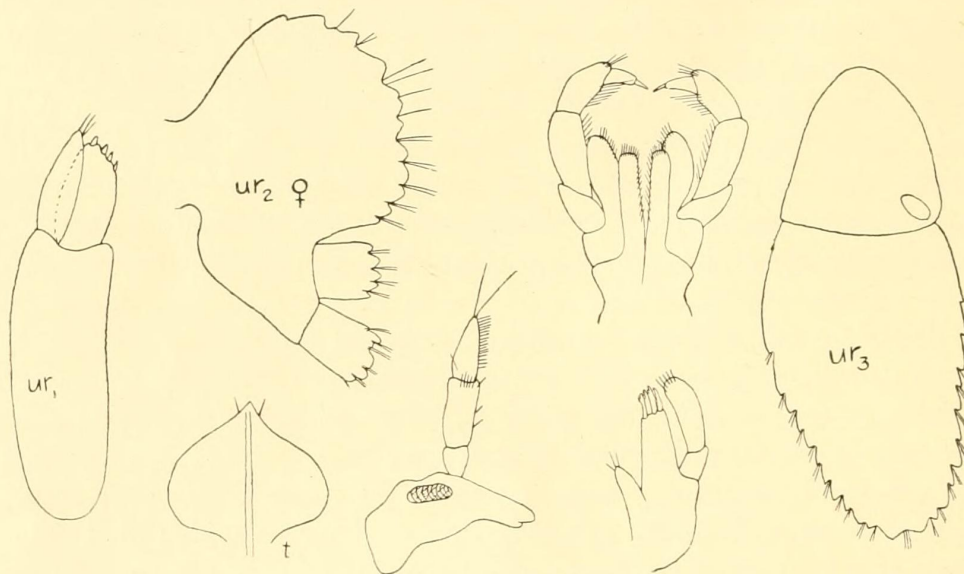


Fig. 40. *Chelura terebrans* Philippi.

Second gnathopods with small triangular epimeron provided with stout spines; second joint rather longer and more slender than that of first gnathopod with anterior margin provided with long setae; third joint shorter than broad; fourth joint triangular, nearly twice as long as broad with anterior and posterior margins slightly convex, anterior margin and apex provided with rather long, plumose spines; wrist subrectangular, as long as but narrower than preceding joint; hand subrectangular, very long and slender, being longer than fourth joint but much narrower, smaller than that of first gnathopod, posterior apex prolonged to form rounded thumb against which the strongly curved but short finger closes to form a chela.

Epimera of pereopods rather small, pereopods subequal in length

and rather short and stout, second joints of posterior pairs scarcely broader than those of anterior pairs; posterior pereopods with posterior margin fringed with strong ciliated setae.

Posterior abdominal segments fused, about $\frac{1}{2}$ as long as body in male, $\frac{1}{3}$ in female; dorsal posterior margin of third segment produced to form long projection, slightly curved, directed posteriorly, which is much longer in male than in female.

Uropods, 3 pairs; first pair biramous with long cylindrical peduncle and rather short styliform rami scarcely half as long as peduncle, inner ramus somewhat broader than outer and armed apically with 3 short spines; second pair rather short, biramous, with lamelli-form rami which have 5 or 6 serrations apically and are scarcely half as long as peduncle which is expanded greatly to form a sub-quadrangle lobe having serrated outer margin; third pair with short peduncle and single rather long, oval ramus which is leaflike and serrated on edge.

Telson small, triangular, subcarinated dorsally, apex acute.

Length of female 5 mm., of male (exclusive of terminal uropods) 6 mm.

Sexual differences rather marked; in male, dorsal projection from third abdominal segment relatively much longer than in female; second pair of uropods with expansion of peduncle broader than long and with serrated margins, whereas in female the expansion is long and provided with many closely set long spines; third uropod with much longer ramus than in female.

A large number of specimens were obtained from the neighborhood of Coney Island in submerged timbers which were thoroughly honey-combed with the tunnels of the animal.

The species has been recorded from the North Atlantic and adjoining seas (Europe from Norway to the Black Sea, North America).

Tribe LAEMODIPODA.

First thoracic segment fused with head; eyes small, compound; mandibles with or without palp; first maxillae without inner plate; maxillipeds normally developed with 1- to 4-jointed palp.

Pereopods, when not rudimentary, ending in prehensile claws. Abdomen short and small with or without appendages.

The tribe is divided into 2 families, the Caprellidae and the Cyamidae, characterized as follows:

Caprellidae.

Body slender, first antennae much longer than second. Gills saclike and confined to the second, third, and fourth, or to only the third and fourth thoracic segments.

Abdomen of 5 joints at most, of which the first 3 are very short and do not bear appendages; uropods rudimentary or obsolete.

Non-parasitic in habit.

Cyamidae.

Body broad and flat; third and fourth thoracic segments without limbs, posterior segments with prehensile limbs.

Both pairs of antennae 4-jointed, first pair much longer and stouter than second.

Gills confined to third and fourth thoracic segments, elongated in form.

Parasitic on Cetacea.

Key to the genera of the Caprellidae.

- | | |
|----------------------------------|---------------------|
| Mandibles without palp | Caprella |
| Mandibles with palp | Protellopsis |

Caprella equilibra Say, 1818.

1818. Say, Journ. Acad. Natur. Sci. Phil., vol. 1, p. 374-401.

Eyes compound, moderate in size. Rostrum absent. Body with smooth dorsum.

First antennae with peduncle stout, having third joint longer than first and second longer than third; flagellum abruptly narrower than peduncle, made up of about 12 joints, less than $\frac{1}{3}$ as long as peduncle. Second antennae fringed with long setae; flagellum made up of 2 joints, nearly as long as fourth joint of peduncle which is as long as fifth, provided with long setae, terminal joint small.

Mandibles without palp; cutting edge divided into about 5 acute teeth; spine row with 2 or 3 stout plumose spines; molar tubercle strong, with a triangular process which gives it an irregular shape in the side view. Lower lip with principal lobes widely dehiscent; inner lobes fairly large; mandibular processes narrow, rather widely dehiscent. First maxillae with no inner plate; outer plate curved, shorter than palp, with distal margin furnished with 7 forked tooth-like spines; first joint of palp short; second widening toward dentated, obliquely rounded apex which is provided with many setae on margin and with row of longer ones on surface near apical

margin. Second maxillae with inner plate shorter than outer, with many slender setae around margin; outer plate oblong with long setae on apex. Maxillipeds with inner plate small, scarcely reaching to base of first joint of palp, distal margin transverse and provided with 2 or 3 spine teeth; outer plate small, extending slightly beyond first joint of palp; with 8 rather long spine teeth on distal part of inner margin and long setae which also arm the oblique distal margin; palp 4-jointed with first joint small and moderately stout, having a few setae on inner margin; second joint stouter and much longer, about twice as long as wide, with inner margin provided with many long setae; third joint shorter and more slender than second and with fringe of long setae on inner margin and apex; fourth joint unguiform, as long as third joint.



Fig. 41. *Caprella equilibra* Say.

First gnathopods with second joint moderately short; third and fourth joints short, fourth with a fascicle of long setae on distal portion of posterior margin; wrist about as broad as long, with setae on rounded posterior margin; hand oval, about twice as long as wide, tapering toward distal end, anterior margin convex, posterior margin very short, palm extending practically to base of hand, and provided with setae of various lengths and a stout prehensile spine, posterior part of palm finely serrate; finger long and strong with inner concave margin toothed.

Second gnathopods rather short and stout, with distal end much broader than proximal and with lamellar process extending along anterior margin; third, fourth, and fifth joints short; hand oval, long, with long palm bearing 2 or 3 rounded processes about middle and several short setae, prehensile angle prominent, terminating in stout spine; finger strong. "Of special importance as a character of the

species is the strong sharp process projecting ventrally in the middle line between the insertions of the second gnathopods of the male, which is developed only slightly in the female." (Mayer.)

Pereiopods, first and second pairs wanting, third pair present. Gills present on third and fourth thoracic segments, long and narrow. Abdomen with single segment. Uropods, one pair present in male, wanting in female.

There were several specimens in the collection, the longest of which was hardly 10 mm. in length.

The species is widely distributed, having been recorded from the Mediterranean; the coast of Norway; Charleston, S. Car.; Hongkong; Rio Janeiro; and New South Wales.

Caprella bermudia sp. nov.

Eyes small, round, situated well posterior to front margin of head.

First antennae stout, more than $\frac{1}{2}$ as long as body; peduncle somewhat longer than flagellum which is composed of 12 or more elongated segments; first joint of peduncle short and thick, second joint nearly twice as long as first and not so thick, and provided with a row of long setae on distal half of lower margin; third joint somewhat longer than first, cylindrical in form and provided on lower margin with many short setae. Second antennae slightly longer than peduncle of first; second joint of peduncle very short with inconspicuous gland cone; third joint about twice as long as wide; fourth and fifth joints subequal in length and provided on lower margin with rather long setae; flagellum made up of 2 joints, about as long as fifth joint of peduncle, first joint 3 or 4 times as long as terminal joint and provided with setae on lower margin.

Mandibles without palp, principal cutting edge divided into 5 unequal teeth, secondary cutting edge divided into 5 equal teeth, molar tubercle large, of irregular form. Lower lip with large rounded inner lobes and principal lobes with anterior margin entire, mandibular processes short and stout. First maxillae with 2-jointed palp, of which the last is long and abundantly provided with spines toward apex where joint is widened; outer plates rather short; inner plates wanting. Second maxillae with inner plate shorter than outer but wider at base than outer plate, both with distal margins rounded and provided with setae. Maxillipeds with outer and inner plates rather small; palp long and 4-jointed; inner plates broader distally than proximally, distal margin straight, oblique, provided with numerous setae; outer plates extending slightly beyond first-joint of palp, outer margin and apex rounded, inner margin with 5

or 6 sharply pointed toothlike spines and numerous setae; first joint of palp short, outer margin rather longer than inner, second joint about twice as long as wide with setae on inner margin, third joint about as long as second but more slender, provided with setae on inner margin toward apex; terminal joint clawlike, nearly as long as third joint.

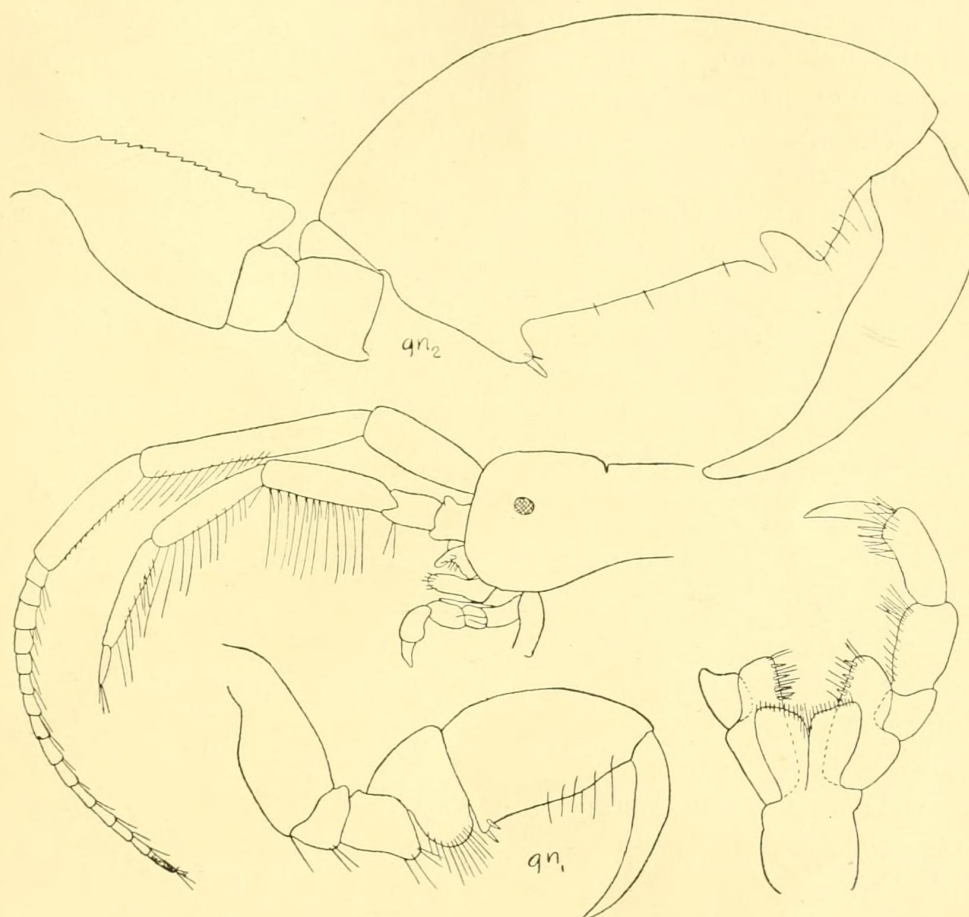


Fig. 42. *Caprella bermudia* sp. nov.

In male, first gnathopods with second joint very short and stout; third joint broader than long; fourth joint subrectangular with group of setae on distal margin; wrist somewhat triangular, posterior margin strongly convex, forming semicircular lobe, provided with about a dozen setae; hand subtriangular, as broad as wrist and about twice as long as broad, anterior margin convex, palm forming posterior margin, very slightly convex, with 2 prehensile spines and a few slender setae; finger long and not greatly curved, moderately slender.

Second gnathopods very large; second joint about twice as long as wide at distal end, proximal end rather narrow, anterior margin notched and slightly convex, anterior apex produced, forming a triangular process, posterior margin rather strongly convex; third joint shorter than long; fourth joint about as long as broad, rectangular with small process extending from distal end of posterior margin; wrist very small, articulating with anterior margin of fourth joint; hand large, suboval, anterior margin slightly convex; palm rather long and very oblique, nearly parallel with anterior margin, separated from posterior margin by rather prominent process bearing prehensile spine, palm provided with a rather deep notch near distal end, behind which is a toothlike process, proximal to which the palm is nearly straight and less prominent than toward the distal end; finger stout and curved, moderately long.

Second thoracic segment provided with long acutely pointed process ventral to articulation of gnathopod which is near posterior end of segment. Pereiopods of third and fourth segments wanting. Branchial vesicles narrow, 3 times as long as broad, present on third and fourth thoracic segments. Fifth, sixth, and seventh pereiopods of usual form.

Abdomen represented by a single segment with a single pair of rudimentary uropods.

Length about 9 mm.

There were 2 specimens collected by Dr. L. J. Cole, July 15, 1903.

Caprella danilevskii Czerniavski, 1868.

1868. *Materialia ad zoograph. pont. campar.*, p. 92; pl. 6, fig. 21-34.

The following description is modified from Haswell's of *C. inermis* which is evidently the same as *C. danilevskii*. (Proc. Linn. Soc. N. S. Wales, vol. 4, p. 348. 1879.)

Cephalon terminating anteriorly in minute mesial tooth. Neck very long; first segment of body longer than head and neck, other segments shorter.

First antennae as long as head and first 2 thoracic segments; flagellum shorter than last 2 segments of peduncle. Second antennae slightly longer than peduncle of first; flagellum shorter than last 2 joints of peduncle.

First gnathopods short with ovate hand having a longitudinal palm which is undefined.

Second gnathopods very large, with hand elongated and narrow with the palm uniformly excavate and occupying $\frac{1}{3}$ entire length of hand.

Gills subcylindrical.

Last pair of pereopods longer than others.

Color, green.

Length $\frac{7}{10}$ in.

The species is of exceedingly wide occurrence, having been already reported from the Mediterranean, Black Sea, Copenhagen, Bay of Biscay, Sea of Japan, Port Jackson (New South Wales), Rio Janeiro, and Bermuda (Stebbing, 1888, Challenger Report, vol. 29, p. 1264).

No specimens of this species were present in the collection studied.

***Protellopsis stebbingii* Pearse, 1908.**

1908. A. S. Pearse, Proc. U. S. Nat. Mus., vol. 34, p. 30.

Head rounded and provided with acutely pointed spinous processes. There may be 2 processes directed forwards and situated above and behind the eye, or there may be a single process in the middorsal line and also one just lateral to the base of the second antennae. Second thoracic segment with spinous process in middorsal line situated at about middle of segment, anterior margin with large process laterally and also several just dorsal to articulation of second gnathopod. These processes are variable in size and occurrence.

Eyes large, circular, situated near anterior margin of head.

First antennae rather slender, more than $\frac{1}{2}$ as long as body; peduncle over $\frac{1}{2}$ as long as flagellum which is made up of numerous elongated segments; first joint of peduncle moderately stout, cylindrical; second joint about twice as long as first and not so broad; third joint less than $\frac{1}{2}$ as long as first, broader at distal than proximal end. Second antennae much shorter than first, extending as far as first third of flagellum of first; flagellum 2-jointed, first joint $1\frac{1}{2}$ times as long as distal one, as long as fourth joint of peduncle; gland cone rather prominent; third joint longer than broad; fourth and fifth joints subequal and slender, with a few setae.

Mandibles with 3-jointed palp, of which the first is short and cylindrical and about twice as long as broad; second joint slender, of about the same width as first but more than twice as long; third joint shorter than second, broader at distal end than at proximal, apex obliquely truncated and provided with setae of various lengths; principal and secondary cutting edges divided into numerous teeth;

molar tubercle large, cylindrical. First maxillae without inner plate; outer plate narrow, provided with serrated toothlike spines on short apical margin; palp 2-jointed, first joint about as broad as long, second twice as broad as long with apex rounded and broader than proximal end and provided with short spines. Second maxillae small, outer plate longer and narrower than inner plate, both plates with fine setae on apex. Lower lip with principal plates broad and oval; inner plates rather large; mandibular processes short. Maxillipeds with outer and inner plates small and with long, 4-jointed palp; inner plates not reaching as far as base of first joint of palp, rather broad and with apical margin rounded and provided with a few stout spines; outer plates extending to about the middle of

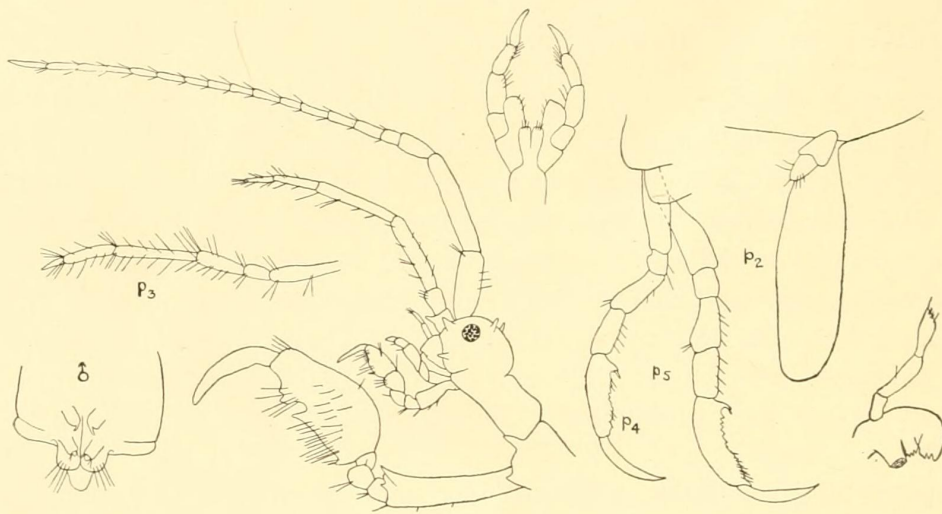


Fig. 43. *Protellopsis stebbingii* Pearse.

second joint of palp, outer margin rather strongly convex, inner margin straight and provided with a few setae; palp with first joint longer than broad, cylindrical, second joint cylindrical, 3 times as long as broad; third joint somewhat shorter than second and narrower, provided at distal end of inner margin with a few setae; fourth joint clawlike and as long as third, provided on inner margin with exceedingly fine setae.

First gnathopods with second joint moderately slender; third joint about as broad as long; fourth joint more or less cuplike and with posterior margin much longer than anterior and provided with a few setae near apex; wrist triangular, rather longer than wide, posterior margin and apex provided with a few short setae; hand triangular, about $1\frac{1}{2}$ times as long as wide and much wider than wrist,

palm oblique, forming nearly entire posterior margin, provided with numerous short setae; finger rather long and curved, concave margin somewhat serrated.

Second gnathopods with second joint long and slender and slightly curved so that posterior margin is slightly convex, anterior apex produced to form acutely pointed process; third joint about as broad as long; fourth joint spheroidal, articulating with third joint by rather slender stalk, provided with a few setae posteriorly; wrist very short, triangular; hand strongly developed, oval in form, broadest about $\frac{1}{3}$ distance from proximal to distal end, palm extending to very near proximal end of posterior margin and somewhat incised, posterior margin separated from palm by rather prominent triangular process which bears apically a stout spine, form of palm variable, but always with deep U-shaped notch toward distal end; finger very long and curved.

First and second pereopods rudimentary and 2-jointed. Branchial vesicles confined to third and fourth thoracic segments, long and oval in form. Third, fourth, and fifth pereopods developed normally.

Abdomen made up of 2 segments. Uropods, only one pair which are very short and 2-jointed, with the terminal joint exceedingly small and rounded, the first joint broader apically than proximally and bearing several setae apically.

Length 9 mm.

The species was represented by numerous specimens received from Dr. L. J. Cole and bearing the date July 15, 1903.

According to Pearse this species was abundant in the Gulf of Mexico, off Northwest Channel, in $10\frac{1}{4}$ fathoms.

Pearse figures the second gnathopod of the male with the proximal end of the hand broadened to form a triangular process and with the palm bearing a very large triangular notch. In the specimens from Bermuda the second gnathopod of the males does not differ from that of the females which corresponds with that figured by Pearse.

Cyamus fascicularis Verrill, 1903.

1903. Trans. Conn. Acad. vol. 11, p. 21; pl. 8, fig. 4.

A slender bodied *Cyamus* from the body of a young sperm whale, taken off Bermuda and exhibited at St. George's in April.

"This species is much more slender than those of the right whales and allied cetaceans. The two branchial segments are about as wide as the following ones, and bear fascicles of small, short, some-

what unequal branchiae, scarcely longer than the segments. There are about 10 to 12 branchial filaments in each of the four groups.

"The first segment is consolidated with the head, which is narrow and rather long with conspicuous eyes. Antennae are about $\frac{2}{3}$ the length of the head. First pair of legs small, beneath the second. The hands of the second pair are not much swollen, and have two strong denticles, besides a similar one at the distal angle of the carpus. The three posterior feet have a recurved denticle on the distal angle of the carpus.

"Color, yellowish white; branchiae have small black spots. The specimens described are females. No males were taken.

"Length of body und head, 9 mm.; greatest breadth of body, 3.5 mm."

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