Title	Taxonomic Studies on the Shallow Water Gammaridean Amphipoda of West Kyushu, Japan. VIII. Pleustidae, Podoceridae, Priscomilitaridae, Stenothoidae, Synopiidae, and Urothoidae
Author(s)	Hirayama, Akira
Citation	PUBLICATIONS OF THE SETO MARINE BIOLOGICAL LABORATORY (1988), 33(1-3): 39-77
Issue Date	1988-08-20
URL	http://hdl.handle.net/2433/176149
Right	
Type	Departmental Bulletin Paper
Textversion	publisher

Taxonomic Studies on the Shallow Water Gammaridean Amphipoda of West Kyushu, Japan. VIII. Pleustidae, Podoceridae, Priscomilitaridae, Stenothoidae, Synopiidae, and Urothoidae[1)]

By

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With Text-figures 264–298

Pleustidae

Key to the genera of Pleustidae

1 Rostrum developed, extending to the apex of peduncle of antenna 1; carpus of gnathopods 1–2 furnished with a strong posterior lobe.....*Pleustes*
Rostrum short; carpus of gnathopods 1–2 lacking a strong posterior lobe 2
2 Dactyl of pereopods not notched .....*Parapleustes*
Dactyl of pereopods notched .....*Dactylopleustes*

Pleustes

Pleustes panoplus Kryφer, 1838

(Fig. 264)

Pleustes panoplus Krφyer, 1838: Smith 1883, p. 228; Sars 1895, p. 344–346; Stebbing 1906, p. 810; Shoemaker 1930, p. 91; Chevreux 1935, p. 101; Stephensen 1938b, p. 253–255; Stephensen 1940a, p. 43–44; Stephensen 1944b, p. 4; Gurjanova 1951, p. 633–637; Dunbar 1954, p. 750; Oldevig 1959, p. 71; Nagata 1960, p. 170; J.L. Barnard 1972c, p. 146.
Pleustes panopla: Nagata 1965b, p. 174–175.

Material examined: Tomioka Bay, Shijiki Bay.

Parapleustes

Key to the species of *Parapleustes*

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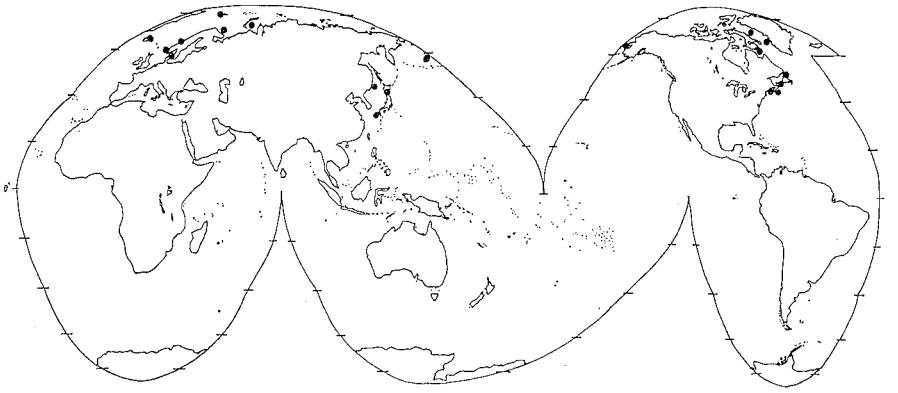

Fig. 264. Distribution of *Pleustes panoplus* Krøyer (●) in the world.

1 Pleonites 1–2 armed with a dorsal acute tooth; pleonal epimeron 3 furnished with a tooth posteroventrally ..... *P. bicuspoides*
Pleonites 1–2 lacking dorsal teeth; pleonal epimeron 3 lacking a posteroventral tooth ..... *P. filialis*

Parapleustes bicuspoides Nagata, 1965

Parapleustes bicuspoides Nagata, 1965b, p. 176–177.

Material examined: Ariake Sea, Shijiki Bay.

Parapleustes filialis sp. nov.

(Figs 265–268)

Body. Rostrum extending to proximal third of peduncular segment 1 of antenna 1. Eyes circular, large. Pleonites lacking dorsal teeth; epimeron 1 continuously

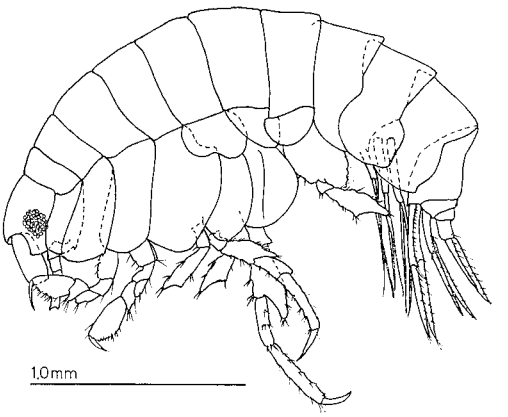

Fig. 265. *Parapleustes filialis* sp. nov. Holotype, male (?), 3.5 mm.

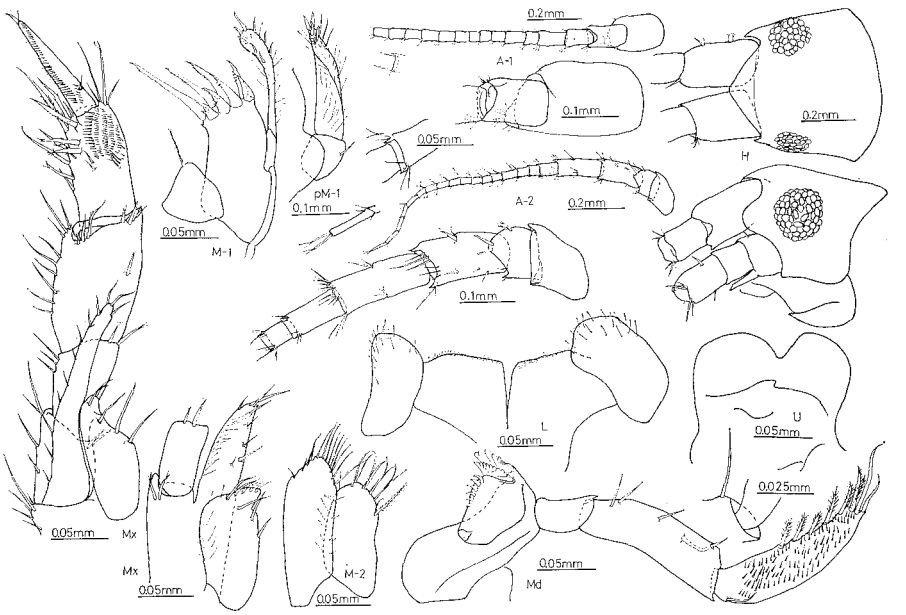

Fig. 266. *Parapleustes filialis* sp. nov. Holotype, male (?), 3.5 mm.

rounded anteriorly and posteriorly, furnished with 3 spines anteromedially; epimeron 2 subrectangular, provided with 2 spines ventrally; epimeron 3 provided with 6 small spines on anterior half of its ventral margin, not protruding posteroventrally.

Antennae. Antenna 1: peduncular segment 1 shorter than head, protruding laterodistally; peduncular segment 2 almost a half as long as peduncular segment 1; accessory flagellum absent; flagellum segment 1 a little longer than peduncular segment 3, each segment slightly protruding distally. Antenna 2 shorter than antenna 1; peduncular segment 2 furnished with an acute conical tooth, which extends along peduncular segment 3; peduncular segment 5 longer than peduncular segment 4, surrounded by stiff setae distally; proximal segment of flagellum longer than a half as long as peduncular segment 5; terminal segment of flagellum provided with 2 spines.

Mouthparts. Upper lip symmetrically bilobed. Lower lip: outer plates obliquely astride inner plates, which nearly coalesce to each other. Maxilla 1: inner plate triangular, provided with a plumose seta apically; outer plate provided with an inner-distal tooth and 4 pairs of tooth-like spines, outer ones of which are pectinate on distal half of each inner edge, and inner ones of which are armed with 0 to 3 teeth unilaterally; palp consisting of 2 segments, the proximal one of which is small and is provided with a slender spine outer-laterally, and the distal one of which is scoop-formed and bristly, and is provided with 4 pairs of spines on about distal third of its length. Maxilla 2: inner plate furnished with 4 pairs of unpinnate setae and an inner set of a pinnate and a small unpinnate setae distally; outer plate furnished with 13 single setae apically. Mandible: incisor and lacinia mobilis broad, bluntly serrate;

accessory spines 6 in number, gradually decreasing in size; molar process vestigial, probably armed with 5 grooves; palp developed very well, attached on the outer-distal end of mandible, consisting of 3 segments, the proximal one of which is armed with a small tooth anterodistally; the middle segment of palp provided with 4 setae anteriorly; the distal segment of palp as long as the preceding one, truncate, slightly falcate, bristly in rows except for its proximal part, provided with 6 pectinate spines

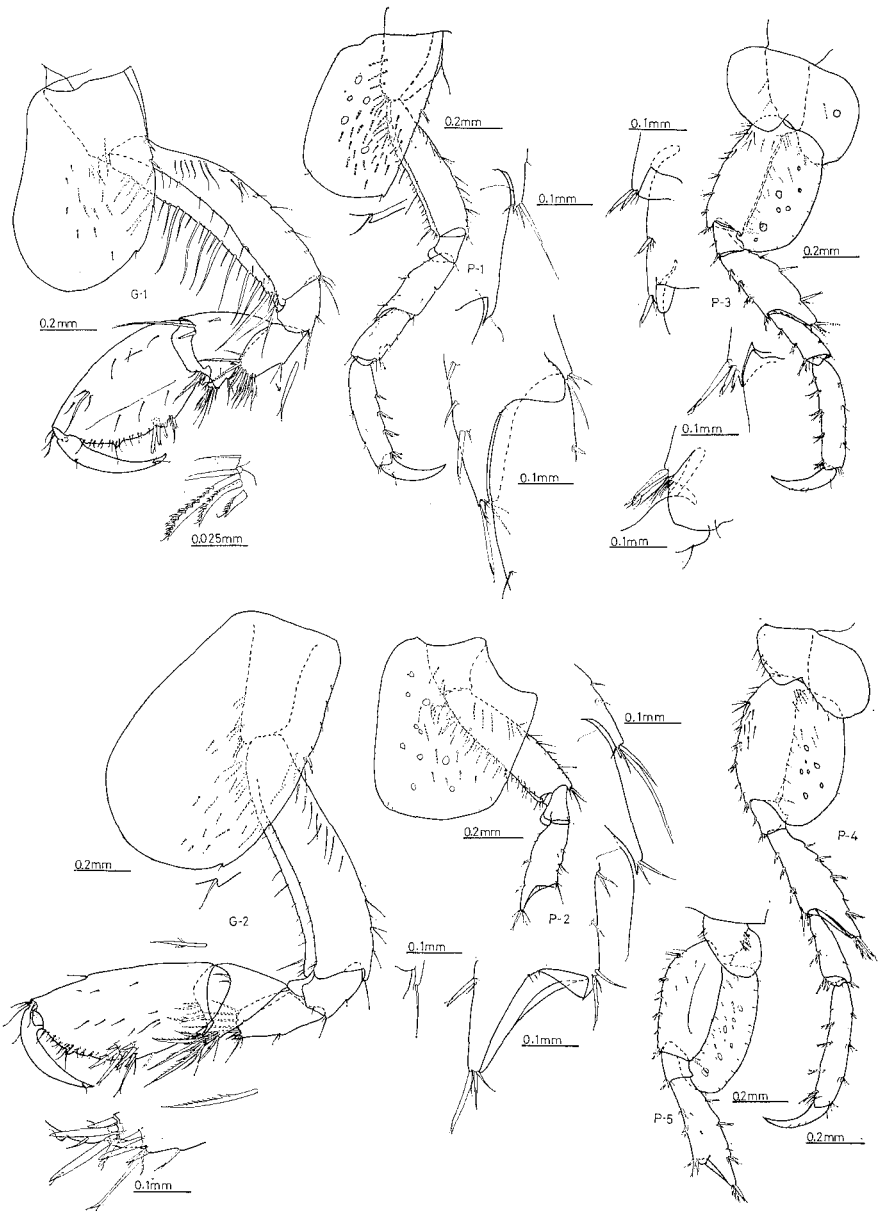

Fig. 267. *Parapleustes filialis* sp. nov. Holotype, male (?), 3.5 mm.

on distal two-thirds of its anterior margin and 3 unpectinate thick setae distally. Maxilliped: inner plate curved inward, medium, provided with 5 apical and 3 facial setae; outer plate rather slender, not extending to the middle of palpar segment 2, furnished with 9 facial and 3 apical setae; palp consisting of 4 segments, the distal one of which is longer than the preceding one, attenuates and is provided with a longitudinal row of small setae along the inner margin throughout, and with a nail and a small seta apically.

Gnathopods 1–2. Homopodous except for gnathopod 1 a little smaller than gnathopod 2. Coxae 1–2 rounded ventrally, provided with a set of a minute seta and a small notch; coxa 2 distinctly larger than coxa 1. Basis in gnathopod 1 more setaceous on the anterior margin of inner side than that of gnathopod 2; in gnathopod 2 provided with a tooth posterodistally, which is obliquely truncate and is provided with a seta distally. Carpus in gnathopod 1 triangular, not extending along propod; in gnathopod 2, extending along propod. Propod oblong; palm oblique, rounded, defined by 3 pectinate spines and a set of a spine and 2 small setae in gnathopod 1, in gnathopod 2 defined by 2 sets of 4 simple spines and furnished with a small triangular cusp medially. Dactyl falcate, reaching the palmar defining spines when closed.

Pereopod 1. Coxa 3 rectangular, provided with a set of a small notch and a minute seta, together with a spine on a point at proximal one-third of the posterior margin. Basis, ischium and merus a little protruding posterodistally. Merus extending to proximal third of carpus anteriorly. Propod: posterior spine formula 1–2–2–2. Dactyl about a half as long as propod, falcate.

Pereopod 2. Coxa 4 curved inward on upper third of the posterior margin. Basis, ischium and merus similar to those of pereopod 1; other segments unknown.

Pereopods 3–4. Homopodous. Coxae 5–6 bilobate. Basis oblong, posterior lobe not extending beyond ischium. Merus protruding to the middle of carpus along it. Propod: anterior spine formula 1–3–3–3–2. Dactyl falcate, shorter than a half of the propod length.

Pereopod 5. Coxa 7 unilobate, small. Basis similar to that of pereopod 4,

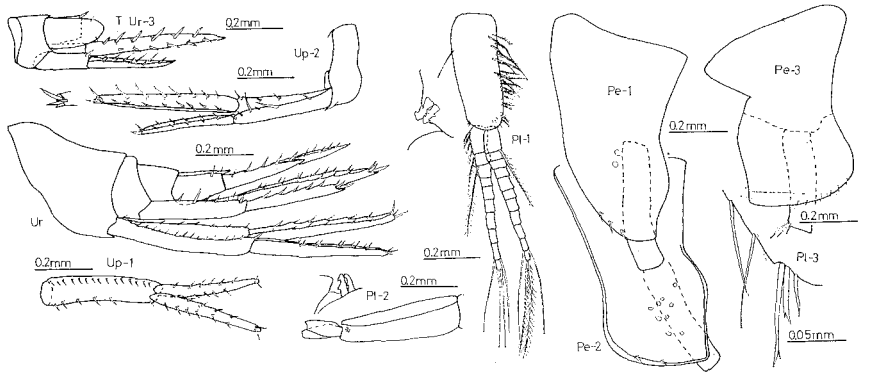

Fig. 268. *Parapleustes filialis* sp. nov. Holotype, male (?) 3.5 mm.

though the posterior thin plate more extending beyond the ischium than that of pereopod 4 doing.

Pleopods. Pleopod 1: peduncle provided with many pinnate setae inner-marginally and with a pair of coupling spines; proximal segment of rami not well developed; terminal swimming setae about two-thirds as long as rami. Pleopod 3: peduncle provided with 2 normal spines instead of coupling spines.

Uropods 1–3. Uropod 1 a little extending beyond uropod 2; peduncle provided with many small spines inner-marginally; outer ramus a little shorter than inner ramus; both rami rounded apically, with many spines bilaterally. Uropod 2: peduncle as long as outer ramus; outer ramus two-thirds as long as inner ramus; rami truncate, spinose bilaterally, provided with 2 apical spines. Uropod 3: peduncle about five-twelves as long as inner ramus, provided with a spine outer-distally; outer ramus two-thirds as long as inner ramus; both rami acuminate apically, spinose bilaterally.

Telson. Entire, oblong.

Material examined. Holotype: male (?), 3.5 mm. Type locality: Ariake Sea. Date: June 11, 1976. Paratypes: 4 specimens. Collection No.: AMBL-Amph. 18.

Remarks. The new species is similar to *Parapleustes derzhavini* (Gurjanova, 1938) (Gurjanova 1951) but is distinguished from the latter as follows: in *P. derzhavini*, 1) the palm of gnathopod 2 defined by 3 or 4 spines, though the counterpart in the new species is defined by 2 sets of 4 spines; 2) the basis of pereopods 3–5 pectinate posteriorly, though the counterpart in the new species is not pectinate; 3) the postero-distal angle of pleonal epimeron 3 protruding backward and downward, provided with an acute tooth posteroventrally, though the epimeron 3 of the new species is not protruded and is rounded posteroventrally; 4) the peduncle of uropod 3 a half as long as the inner ramus, though longer than the latter in the new species.

The specific name, *filialis*, is designated to mean a son of *Parapleustes*.

Dactylopleustes

Dactylopleustes obsolescens sp. nov.

(Figs 269–271)

Body. Small, rounded. Head as long as pereonites 1–2 combined; rostrum triangular, extending almost to the level at proximal third of peduncular segment of antenna 1, curved downward; anterior head lobe extending forward to the tip of rostrum. Eyes orange in alchohol, oval, large. Coxae serially enlarging, especially coxae 3–4 much developed. Pleopods and pleonites well developed in comparison to body. Pleonal epimera: epimeron 1 extending backward, continuously rounded anteriorly and ventrally; epimera 2–3 protruding backward ventrodistally, provided with 2 spines ventromedially. Urosome: urosomite 1 as long as pleonite 3; urosomites 2–3 equal in dorsal length; urosomite 3 prominently extending backward

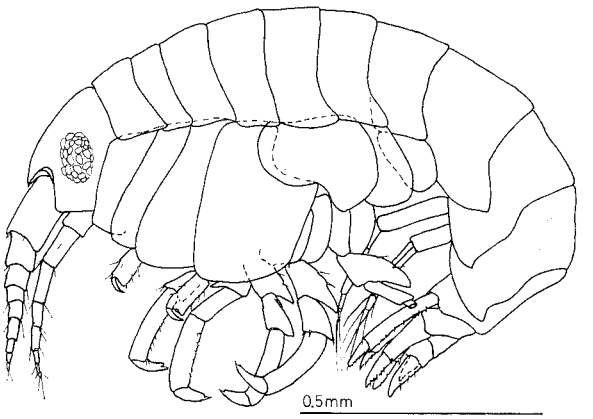

Fig. 269. *Dactylopleustes obsolescens* sp. nov. Holotype, male (?), 2.0 mm.

ventrally to the distal end of peduncle of uropod 3.

Antennae. Subequal to each other in length, about a fifth of the body length. Antenna 1: relative lengths of peduncular segments 1–3 10:5:3; accessory flagellum absent; flagellum 6-articulate; flagellum segments 1–3 provided with a distal protrusion, which is provided with 1 or 2 aesthetascs and several short setae. Antenna 2: peduncular segment 2 lacking a gland cone, broader than long; peduncular segment 3 trapezoid; peduncular segments 4–5 equal in length; flagellum 5-articulate.

Mouthparts. Upper lip unknown. Lower lip: outer lobes oblong, almost longitudinally astride inner lobes, which are nearly coalescent to each other. Maxilla 1: inner plate provided with an apical seta; outer plate provided with 11 tooth-like spines, three of which are pectinate, the others armed with several minute teeth medially; palp consisting of 2 segments, the distal one of which is truncate and is furnished with 5 stout spines. Maxilla 2: both plates subequal in size; inner plate provided with 4 apical setae; outer plate provided with 6 spines and a seta. Mandibles protruding forward at the upper part; molar process absent; lacinia mobilis and incisor similar to each other, serrate distally; accessory setae 5 in number; palp triarticulate; terminal segment of palp as long as subterminal one, uniform in thickness, pubescent, provided with 4 setae apically. Maxilliped: inner plate medium, scoop-like, poorly setaceous; outer plate medium, provided with 2 setae apically; palp slender, consisting of 4 segments, the relative lengths of which are 3:3:4:4; segments 3–4 of palp pubescent.

Gnathopods 1–2. Similar to each other, rather small. Coxae 1–2 provided with 2 notches posteroventrally. Merus, carpus and propod 5:7:7 in relative lengths. Propod rectangular; palm transverse, short. Dactyl stout, extending beyond the palm when closed, nail-like distally.

Pereopods 1–2. Homopodous except for coxae. Coxa 3 provided with 3 blunt notches ventroposteriorly; coxa 4 1.5 times as broad as coxa 3, slightly upturned posteromedially. Relative posterior lengths of segments from basis to dactyl almost 16:4:8:6:10:3. Propod provided with a pair of locking spines, together with 8 to 10

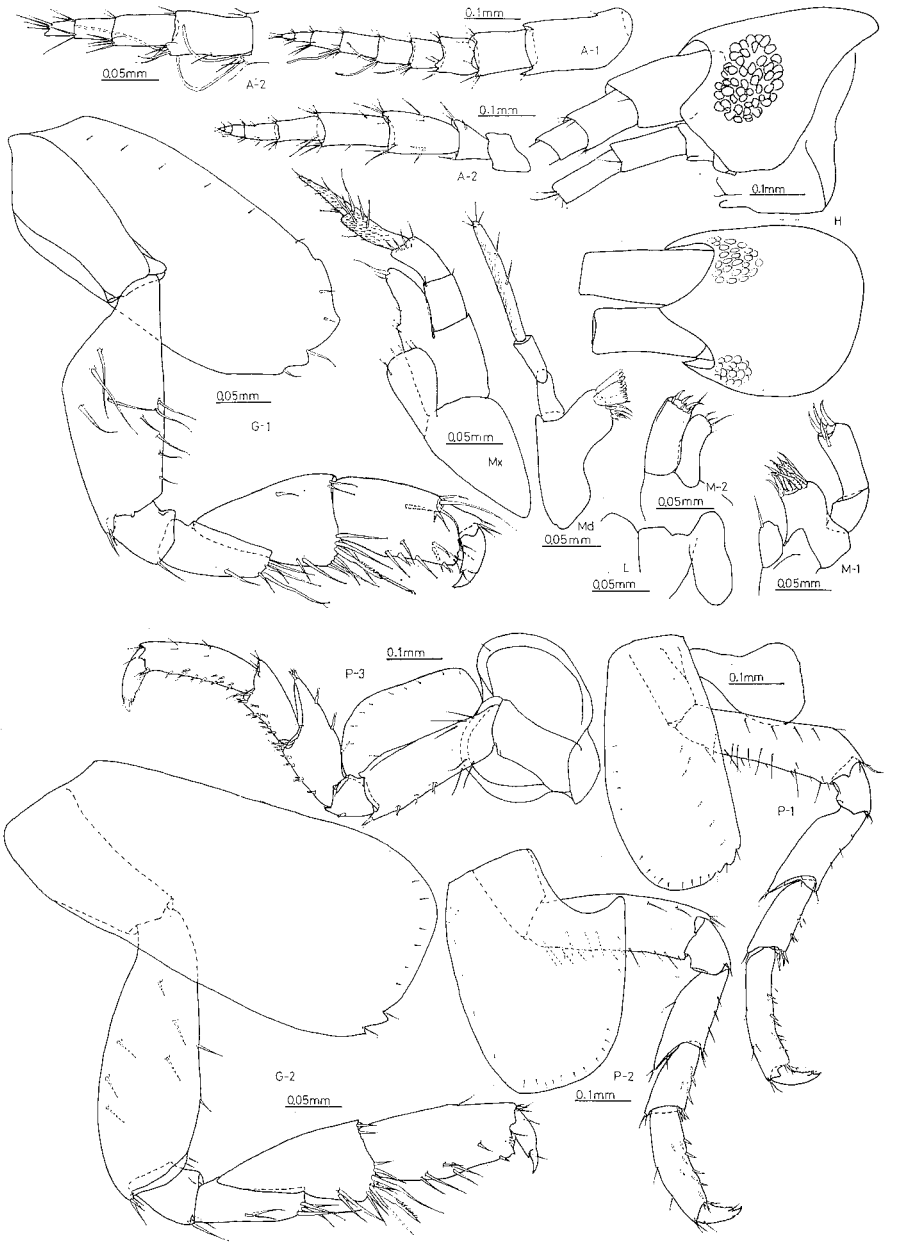

Fig. 270. *Dactylopleustes obsolescens* sp. nov. Holotype, male (?), 2.0 mm.

spines posteriorly. Dactyl stout, with a nail, finely pectinate posteriorly.

Pereopods 3–4. Homopodous except for coxae. Coxae 5–6 bilobate; coxa 5. larger than coxa 6. Relative posterior lengths of segments from basis to dactyl 13:4:6:6:9:3. Basis: posterior thin plate a little broader than muscular part, almost uniform in width. Merus extending beyond the middle of carpus posteriorly.

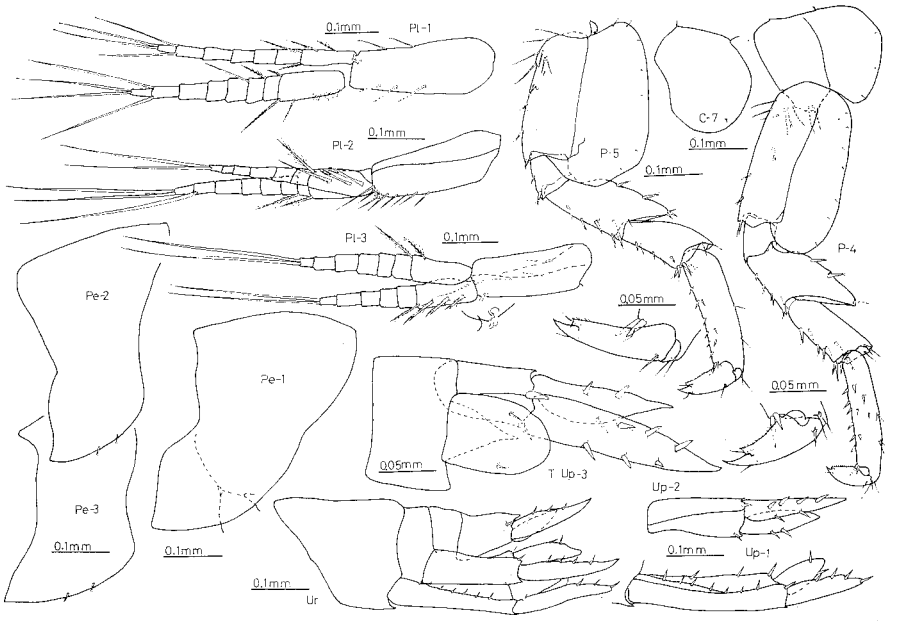

Fig. 271. *Dactylopleustes obsolescens* sp. nov. Holotype, male (?), 2.0 mm.

Propod and dactyl similar to those of pereopod 2.

Pereopod 5. Coxa 7 unilobe. Relative posterior lengths of segments from basis to dactyl almost 12:3:8:12:9:4. Basis: posterior thin plate almost 1.5 times as broad as that of pereopod 4. Merus not extending to the middle of carpus posteriorly. Propod and dactyl similar to those of pereopod 2.

Pleopods. Similar to each other. Pleopods 1–2: outer ramus 8-articulate; inner ramus 7-articulate; terminal swimming setae shorter than rami. Pleopod 3: outer ramus 7-articulate, inner ramus 6-articulate.

Uropods. Uropod 1 not extending beyond uropod 2; peduncle provided with 8 outer and 3 inner spines upper-marginally; both rami foliaceous; outer ramus about a half as long as peduncle, provided with only 4 outer spines; inner ramus two-thirds times as long as outer ramus; provided with a pair of marginal spines. Uropod 2: peduncle provided with a pair of bilateral spines upper-distally; rami foliaceous; outer ramus longer than peduncle, provided with 4 outer and 2 inner spines; inner ramus furnished with 2 inner-medial spines. Uropod 3: peduncle provided with a pair of bilateral spines upper-distally; rami foliaceous; outer ramus 2.5 times as long as peduncle, provided with 3 pairs of bilateral spines; inner ramus two-thirds as long as outer ramus, provided with 2 pairs of bilateral spines.

Telson. Entire, obtuse distally, provided with a pair of bilateral setae.

Material examined. Holotype: male (?), 2.0 mm. Type locality: Ariake Sea. Date: June 11, 1976. Collection No.: AMBL-Amph. 19.

Remarks. Only one species, *Dactylopleustes echinoicus* (Tzvetokova, 1975) (Tzveto-

kova 1975, Karaman & J.L. Barnard 1979) has hitherto been known in the genus *Dactylopleustes*. The new species plainly differs from *D. echinoicus* as follows: in *D. echinoicus*, 1) the mandibular palp robuster and more setaceous than that of the new species; 2) the outer plates of lower lip extending obliquely, though the counterpart in the new species extending longitudinally; 3) the palpar dactyl of maxilliped shortening and stubby, though the counterpart in the new species not shortening and slender.

The specific name, *obsolescens*, referes to the less setation on the both plates of maxilliped.

Podoceridae

Podocerus

Podocerus inconspicuus (Stebbing, 1888)

(Fig. 272)

Podocerus inconspicuus (Stebbing, 1888): Stebbing 1906, p. 702; Pirlot 1938, p. 356–358; K.H. Barnard 1940, p. 438; Nagata 1965c, p. 322; Griffiths 1973, p. 298; Griffiths 1974c, p. 323; Griffiths 1975, p. 163.

No *Podocerus cristatus* (Thomson, 1879): K.H. Barnard 1916, p. 276–277; Griffiths 1973, p. 298; Griffiths 1974a, p. 202; Griffiths 1974b, p. 251; Griffiths 1974c, p. 322.

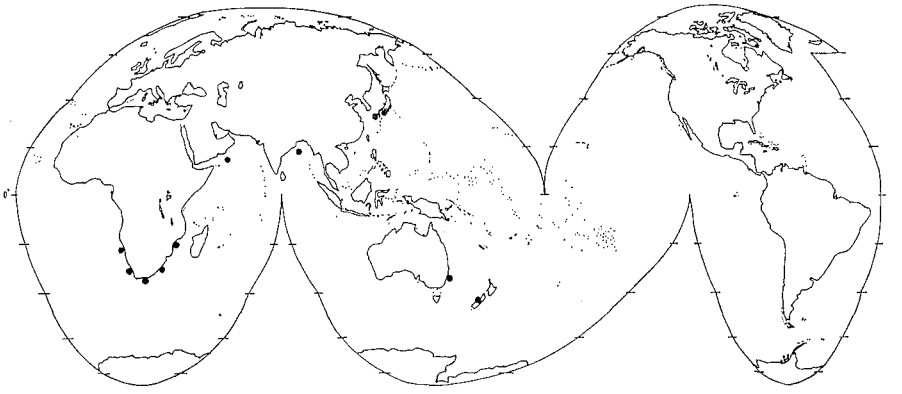

Fig. 272. Distribution of *Podocerus inconspicuus* (Stebbing) (●) in the world.

Priscomilitaridae fam. nov.

Diagnosis. Body cylindrical, slender; urosome segmented. Head truncate anteriorly; rostrum absent. Antennae subequal in length, slender. Pereonite 1 very small; pereonites 2–7 almost equal in size. Coxae 1 very reduced; coxa 2 prominently developed, extending forward beyond the middle of head; coxae 3–5 gradually decreasing in size, serially overlapping; coxae 5–7 small, separated from each other. Labrum of upper lip slightly emarginate apically; inner lobe of lower lip

developed; mandible molar medium; palp of mandible triarticulate, normal; inner lobe of maxilla 1 small, unarmed; maxilla 2 and maxilliped not well developed. Gnathopod 1 feeble, subchelate; gnathopod 2 prominently elongate, nearly simple. Rami of uropods 1–2 lacking spines; uropod 3 uniramus, ramus elongate. Telson entire, small, fleshy.

Remarks. The new family is related to the family Isaeidae revived by Myers (1981) from the family Corophiidae (J.L. Barnard 1973) in morphological characteristics as follows: head strongly recessed, lacking rostrum; gnathopods subchelate, gnathopod 1 prominently smaller than gnathopod 2; antennae subequal in length, slender; mandibular palp tri-articulate, normal; uropod 3 extending beyond uropods 1–2, lacking inner ramus. However, the anomalous coxae and the reduced pereonite 1 in the new family have not observed in the corophioidean amphipods including Isaeidae (J.L. Barnard 1973, Myers 1981); in all of the corophioidean amphipods, the coxae are either reduced or well developed; if reduced, the coxae are serially separated, or, if well developed, they are serially overlapped; the pereonite 1 is never reduced. A morphological plan of the coxae and pereon is of important in a familial level and the above differences suggest it valid to establish the new family. Further, the new family is discriminated from Isaeidae, especially from such the closely related genera as *Cheiriphotis* (J.L. Barnard 1973, Ledoyer 1973c), *Microprotopus* (Chevreux & Fage 1925, J.L. Barnard 1974, Ledoyer 1979) and *Microphotis* (J.L. Barnard 1973), by the morphological characteristics as follows: in the latter three genera, the ramus of uropod 3 not elongate (elongate in the new family); the inner plate of maxilla 1 setaceous (naked in the new family); the accessory flagellum present, though absent in the new family and *Microphotis*.

Type genus: *Priscomilitaris* gen. nov.

Priscomilitaris gen. nov.

Diagnosis. With the diagnosis of the new family. The gender is musculine. The genus *Priscomilitaris*, Prisco: ancient; militaris: soldier; referring to the large coxa 2 as an ancient solder with a sield.

Type species: *Priscomilitaris tenuis* sp. nov.

Priscomilitaris tenuis sp. nov.

(Figs 273–274)

Body. Slender, cylindrical. Head subequal to pereonites 1–2 combined in length, truncate anteriorly, largely recessed; anterior head lobe slightly protruding. Pereonite 1 strongly reduced; pereonites 2–7 and pleonites 1–3 subequal in length. Pleonal epimera shallow; epimeron 1 a little extending backward, slightly sinuous posteriorly; epimeron 2 rectangular; epimeron 3 rectangular, gradually going up ventrally. Urosome depressed; urosomite 1 a half as long as urosome; urosomites

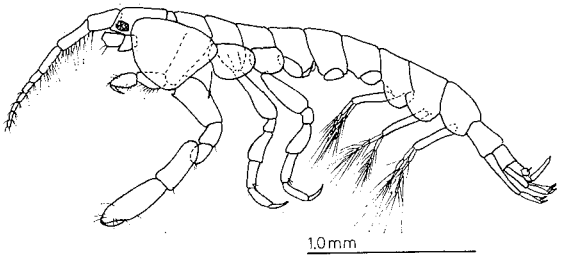

Fig. 273. *Priscomilitaris tenuis* fam. nov., gen. nov. and sp. nov. Holotype, male, 2.8 mm.

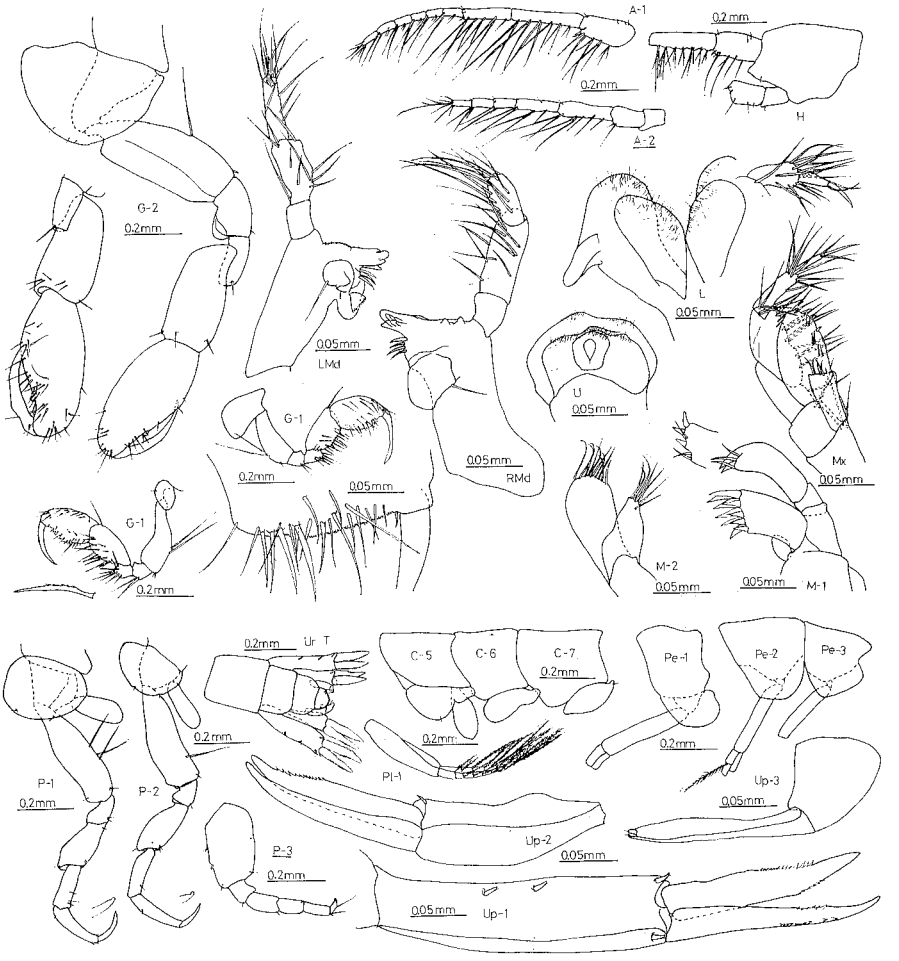

Fig. 274. *Priscomilitaris tenuis* fam. nov., gen. nov. and sp. nov. Holotype, male, 2.8 mm.

2–3 subequal in length.

Antennae. Antenna 1 longer than a third of the body length, setaceous ventrally; relative lengths of peduncular segments 1–3 4:6:5; peduncular segment 1 a half as long as head length; accessory flagellum absent; flagellum consisting of 6

segments, which are subequal in length. Antenna 2 shorter than antenna 1; peduncular segment 2 rectangular, a little protruding ventrodistally; relative lengths of peduncular segments 3–5 13:24:19; flagellum consisting of 3 segments, which are equal in length.

Mouthparts. Upper lip semicircular, slightly concave apicomedially. Lower lip: inner plate developed, oblong; shoulders rounded; mandibular process medium. Maxilla 1: inner plate small, oval, naked; outer plate provided with 12 tooth-like and unarmed spines; palp extending beyond outer plate, consisting of 2 segments, the distal one of which slightly curved at a point of distal third of its length and is armed with 3 spines and 3 setae distally. Maxilla 2: inner plate truncate, provided with 7 setae apically; outer plate larger than inner plate, provided with 11 setae apically. Mandible: incisor and lacinia mobilis armed with 4 blunt teeth, broad; accessory blades simple, 4 in number; molar process medium, provided with a short seta; accessory trapezoid process bearing near the base of molar process, rugose; palp consisting of 3 segments, distal two segments of which are subequal in length and are provided with 2 longitudinal rows of setae; terminal palpar segment truncate. Maxilliped: inner plate rectangular, provided with 3 pairs of small setae; outer plate not extending beyond palpar segment 2, oblong, provided with 2 long and 3 short conical teeth, together with 3 pairs of small setae on the facial margin; palp consisting of 4 segments, the 2nd of which is subequal to the succeeding two segments combined; relative lengths of palpar segments 3–4 5:3; terminal segment of palp provided with a long and slender spine and 2 long stiff setae apically.

Gnathopod 1. Small, subchelate, conical behind coxa 2. Coxa 1 very small, oval, provided with a minute seta ventrally. Carpus and propod subequal in length, setaceous posteriorly; palm straight, finely pectinate. Dactyl falcate, extending beyond palm when closed.

Gnathopod 2. Well developed, subchelate or nearly simple. Coxa 2 semicircular, the largest of coxae, moderately developed, prominently extending forward beyond the middle of head length. Relative lengths of segments from basis to propod 30:13:11:24:30. Basis prominently compressed proximally. Merus truncate, provided with a seta posterodistally; three-fourths of the anterior margin concealed behind carpus. Propod: palm almost parallel to the axis of propod, slightly concave, setaceous. Dactyl falcate, completely covering palm when closed.

Pereopods 1–2. Homopodous. Coxae 3–4 oval or semioval. Relative lengths of segments from basis to dactyl 49:11:21:19:19:14. Merus a little protruding anterodistally. Propod lacking locking spines. Dactyl falcate, blunt apically.

Pereopod 3. Coxa 5 bilobate; anterior lobe twice as deep as posterior lobe. Relative lengths of segments from basis to dactyl 50:10:15:11:12:5. Basis rectangular, 2.5 times as long as broad, provided with 3 spines posteriorly. Propod lacking locking spines. Dactyl nail-like, stout.

Pereopods 4–5. Coxae 6–7 separated from each other; coxa 6 bilobate; coxa 7 oblong. Other segments unknown.

Pleopods. Rather feeble. Peduncle longer than rami, lacking coupling spines

and setae; rami 6- or 7-articulate; terminal swimming setae shorter than rami.

Uropods. Uropod 1 slightly extending beyond uropod 2; peduncle provided with 2 outer-medial spines and a pair of apico-bilateral spines on the dorsal side; both rami subequal in length, about three-fourths as long as peduncle, lanceolate, lacking spines, serrate in a part both marginally. Uropod 2: peduncle provided with a spine outer-distally; rami equal in length, a little longer than peduncle, lanceolate; outer ramus serrate in a part outer-marginally. Uropod 3 uniramous, two-thirds as long as uropod 2; peduncle stout; rami provided only with an apical pair of spines.

Telson. Semioval, fleshy, provided with 2 bilateral pairs of small setae.

Material examined. Holotype: male, 2.8 mm. Type locality: Ariake Sea. Date: June 10, 1976. Paratypes: 2 specimens. Collection No.: AMBL-Amph. 11.

Etymology. The specific name, *tenuis*, refers to the slender body of the new species.

Stenothoidae

Stenothoe

Stenothoe valida Dana, 1853

(Figs 275–278)

Stenothoe valida Dana, 1853: Stebbing 1906, p. 194; Chevreux & Fage 1925, p. 137–138; Schellenberg 1928, p. 647; Chevreux 1935, p. 81–84; Reid 1951, p. 230; J.L. Barnard 1964a, p. 105; Ledoyer 1967, p. 11; J.L. Barnard 1970b, p. 250–251; J.L. Barnard 1971a, p. 122; J.L. Barnard 1972c, p. 158; Griffiths 1973, p. 299; J.L. Barnard 1974, p. 129; Griffiths 1974a, p. 202; Griffiths 1974b, p. 252; Griffiths 1974c, p. 327; Griffiths 1975, p. 168; Fox & Bynum 1975, p. 228; Ledoyer 1977, p. 409.

Stenothoe ornata K.H. Barnard, 1930, p. 341.

Probolium megacheles Heller, 1866, p. 13–14; Krapp-Schichel 1974, p. 336.

Material examined. Male, 2.5 mm; female, 2.5 mm: dissected and figured. Tomioka Bay and Shijiki Bay. Collection No.: AMBL-Amph. 25 (2 specimens).

Body, antennae and mouthparts. Antenna 1: slightly longer than antenna 2;

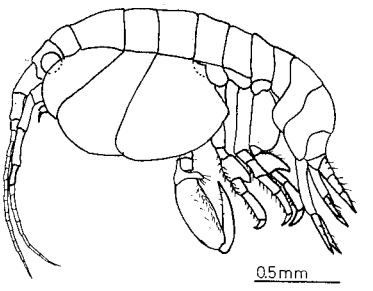

Fig. 275. *Stenothoe valida* Dana. Male, 2.5 mm.

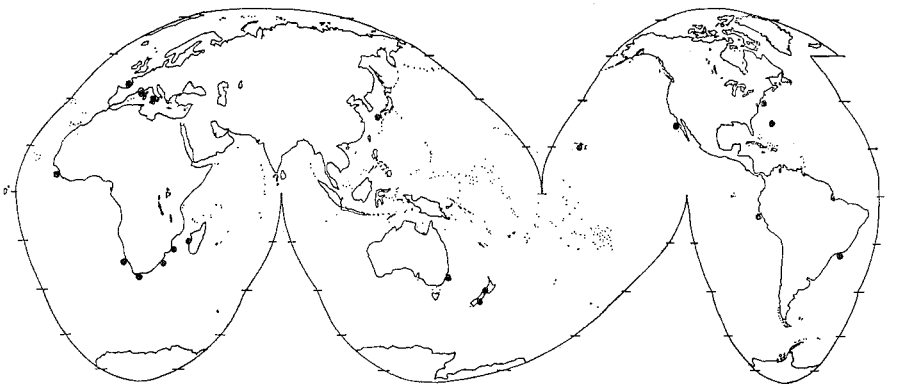

Fig. 276. Distribution of *Stenothoe valida* Dana (●) in the world.

flagellum 12-articulate. Pleonal epimeron 3 a little protruding backward posteroventrally. Upper lip asymmetrically bilobate. Maxilla 1: inner plate provided only with a seta; outer plate furnished with 5 tooth-like spines. Maxilla 2: inner plate provided only with 2 setae. Mandibles lacking molar process. Maxilliped: inner plates very small, separated from each other, provided with 2 setae; outer plate absent.

Gnathopods 1–2 of male. Gnathopod 1: merus prolonged to the end of carpus, provided with several spines posterodistally; palm strongly oblique, defined by 4 spines, finely pectinate; grasping margin of dactyl finely pectinate. Gnathopod 2: posterior lobe of carpus not extending to the posterodistal end of merus; palm longitudinal to the axis of propod, occupying the whole posterior margin of propod, provided with a blunt tooth and a flat projection distally; dactyl reaching the base of propod when closed.

Gnathopods 1–2 of female. Gnathopod 1 similar to that of male. Gnathopod 2: normally subchelate; palm defined by a pair of spines, oblique.

Pereopods. Pereopods 1–3 homopodous except for coxae; relative lengths of segments from basis to dactyl almost 8:2:5:3:5:3; merus protruding to the middle of carpus. Pereopods 5–6 homopodous except for coxae; relative lengths of segments from basis to dactyl almost 7:3:4:3:6:3; basis prominently expanding backward; merus extending to near the end of carpus.

Pleopods. Pleopod 1: peduncle slender, provided with a pair of coupling spines; both rami 9-articulate; terminal swimming setae shorter than rami.

Uropods. Uropod 1 extending beyond uropod 2; rami equal in length, finely pectinate marginally, about three-fourths as long as peduncle. Uropod 2: peduncle finely pectinate outer-marginally; both rami finely pectinate bilaterally; inner ramus slightly longer than peduncle; outer ramus shorter than peduncle. Uropod 3: peduncle shorter than ramus, provided with 3 spines outer-marginally; ramus consisting of 2 segments, proximal one of which is provided with a pair of spines distally.

Telson. Oval, provided with 2 pairs of bilateral spines.

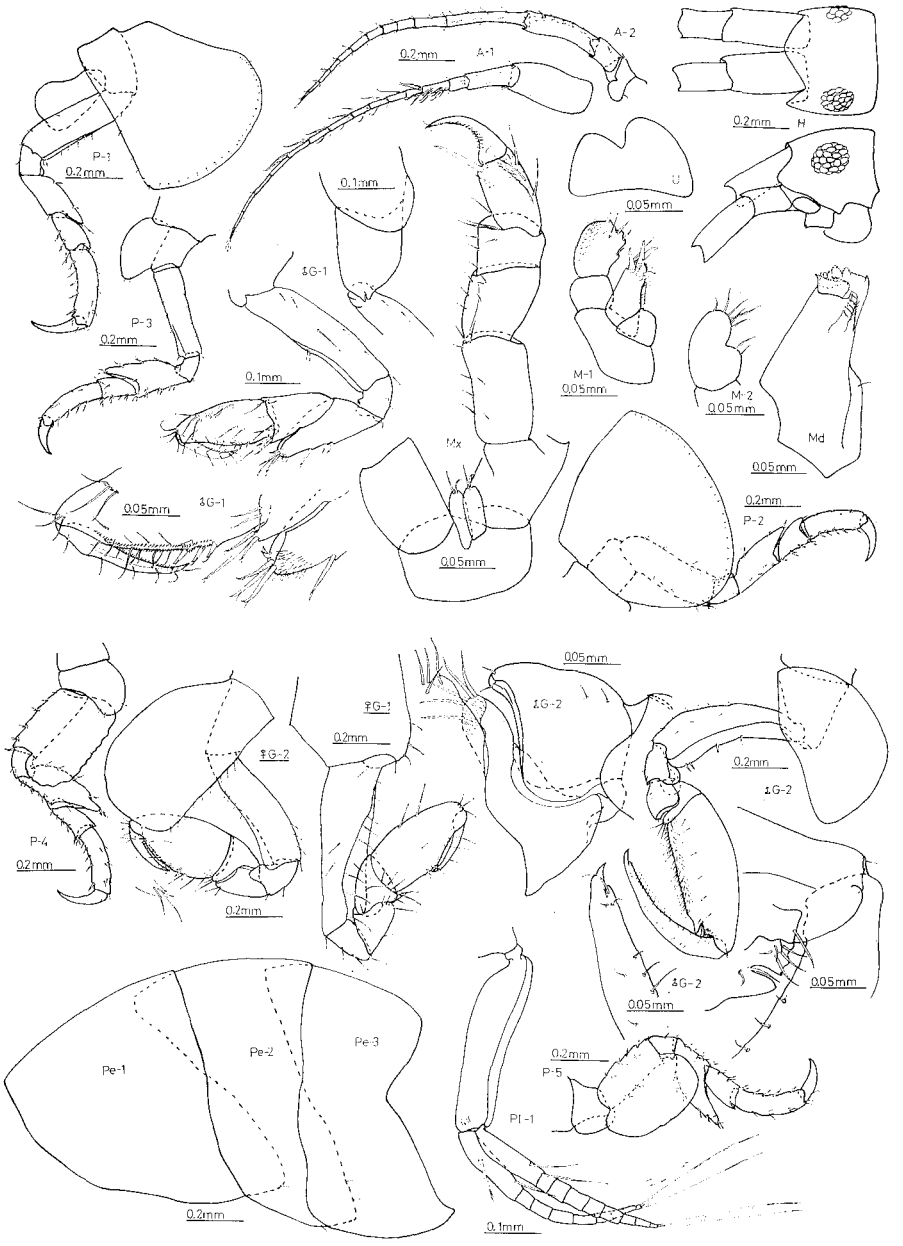

Fig. 277. *Stenothoe valida* Dana. Male, 2.5 mm. ♀G–1, ♀G–2: female, 2.5 mm.

Remarks. The present specimens agree with Ledoyer's description and figures (1967) except for the following characteristics: in Ledoyer's, 1) the uropods 1–2 not finely pectinate marginally; 2) the peduncle of uropod 3 subequal to ramus in length and provided with 4 or 5 spines outer-marginally. Additionally, though the telson described to date is furnished with 3 or 4 pairs of spines (Chevreux & Fage 1925,

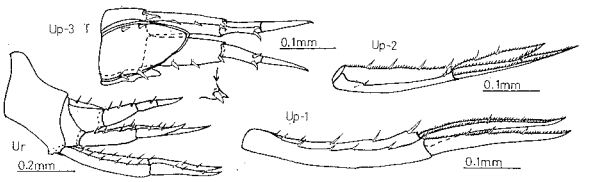

Fig. 278. *Stenothoe valida* Dana. Male, 2.5 mm.

Chevreux 1930, Ledoyer 1967, Krapp-Schickel 1976, Lincoln 1979), the counterpart in the present specimens is furnished with 2 pairs of spines. These differences are triffle in specific and subspecific levels. The author thinks that it is unvalid to propose a new species or a new subspecies for these Japanese population of *Stenothoe*.

Synopiidae

Key to the genera of Synopiidae

1 Urosomites 1–3 lacking dorsal extensions ..... *Synopia*
Urosomites 1–3 distinctly extending backward dorsally ..... *Tiron*

Synopia

Synopia ultramarina Dana, 1853

(Figs 279–282)

Synopia ultramarina Dana, 1853: Stebbing 1906, p. 271–272; Schellenberg 1926, p. 341–343; K.H. Barnard 1930, p. 367; Pirlot 1936, p. 301–302; Nagata 1965b, p. 171; J.L. Barnard 1972b, p. 51–52.

Synopia scheeloana Bovallius, 1886: Stebbing 1906, p. 272.

Synopia orientalis Kossman, 1880: Stebbing 1906, p. 273.

Material examined. Male (?), 4.25 mm. Tomioka Bay. Date: May, 1978. Collection No.: AMBL-Amph. 73 (1 specimen).

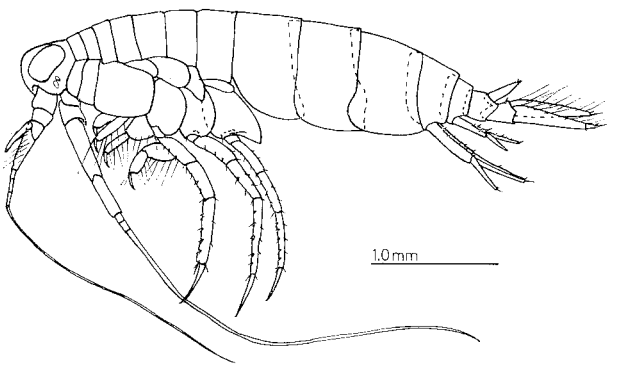

Fig. 279. *Synopia ultramarina* Dana. Male (?), 4.25 mm.

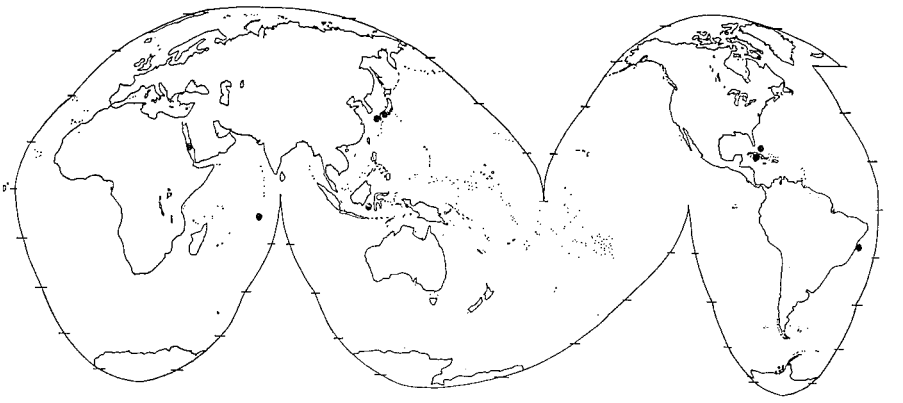

Fig. 280. Distribution of *Synopia ultramarina* Dana (●) in the world.

Body and antennae. Head galeate; eyes large; two separate facets present on the bilateral sides of head. Pleon longer than pereon; pleonites 1–3 equal in length; epimera not protruding backward. Antenna 1 shorter than body length; accessory flagellum consisting of 2 segments, the proximal one of which is well developed, and the terminal one of which is very small; proximal segment of flagellum prolonged, a little shorter than accessory flagellum, densely setaceous in transverse rows ventrally. Antenna 2 longer than body length; peduncular segment 2 prominently protruding ventrodistally; relative lengths of peduncular segments 3–5 6:17:11; peduncular segment 4 prominently protruding both anterodorsally and anteroventrally.

Mouthparts. Upper lip bilobate apically. Lower lip: inner plate and mandibular process medium. Maxilla 1: inner plate furnished with 5 stout and 2 minute setae facio-marginally; outer plate provided with 9 tooth-like spines; palp extending far beyond outer plate, cosisting of 2 segments, distal one of which is provided with 5 tooth-like spines apically. Maxilla 2: inner plate provided with a facial oblique row of unpinnate setae, together with various apical setae. Mandibles similar to each other except for structures of lacinia mobilis; molar process medium, rugose; molar rasp developed; accessory blades about 7 in number, various in size; lacinia mobilis in left mandible larger than that of right mandible, armed with 4 teeth; incisor armed with 4 teeth; palp consisting of 3 segments, middle one of which is prolonged, and terminal one of which is prominently reduced and is provided with 2 pinnate setae apically. Maxilliped: outer plate provided with many pinnate setae instead of tooth-like spines; palp elongate, linear, consisting of 4 segments, terminal one of which is reduced and is provided with a long and falcate spine.

Gnathopods 1–2. Gnathopod 1 simple; carpus and propod oblong, almost 2:1 in relative length, provided with many pinnate setae posteriorly; a little shorter than propod, slender, falcate. Gnathopod 2 simple, linear; carpus and propod 16:9 in relative length; dactyl very small, nail-like.

Pereopods. Pereopods 1–2 homopodous; merus and carpus swollen; dactyl a little swollen, nail-like apically. Pereopods 3–4 homopodous, though pereopod 4 longer than pereopod 3; basis oval; dactyl styliform. Pereopod 5: basis gradually

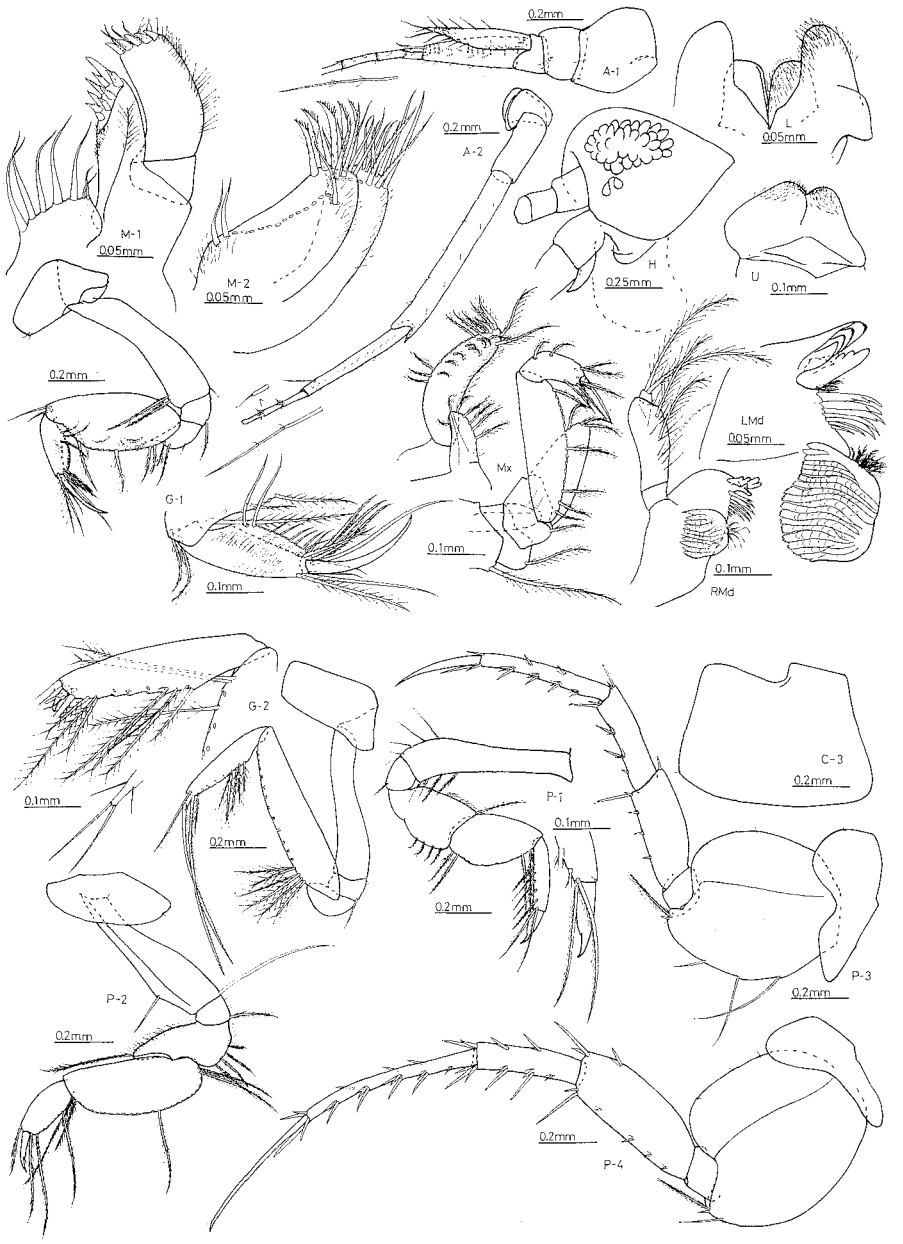

Fig. 281. *Synopia ultramarina* Dana. Male (?), 4.25 mm.

expanding backward, extending to near the middle of merus; dactyl stiliform.

Pleopods. Peduncle stout, provided with a pair of coupling spines, which are armed with 2 teeth; rami multiarticulate; terminal setae very short.

Uropods. Uropod 1 extending beyond uropod 2, reaching almost to the middle of uropod 3; rami provided with a pair of spines, one of which is stouter than the

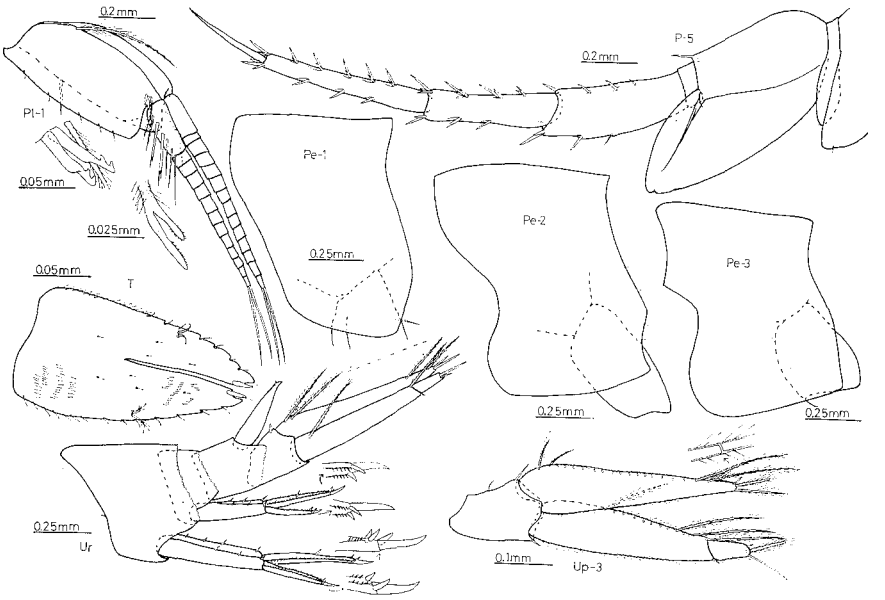

Fig. 282. *Synopia ultramarina* Dana. Male (?), 4.25 mm.

other; outer ramus about two-thirds as long as inner ramus. Uropod 2 similar to uropod 1, though shorter than the latter. Uropod 3 prominently extending backward; rami well developed; outer ramus a little longer than inner ramus, consisting of 2 segments, distal one of which is about a fifth as long as the proximal one.

Telson. Cleft beyond the middle of its length, crenulate on distal half of outer margin; both lobes provided with a spine inner-distally.

Remarks. The lobes of telson in *Synopia ultramarina* Dana, 1853 are various as follows: in Stebbing's (Stebbing 1888 and 1906, Schellenberg 1926), the lobes of telson are serrate, notched and furnished with a spine; in Bovallius's (Schellenberg 1926), the counterparts are either serrate or not, and are furnished with a spine or without spines; in Spandle's (Schellenberg 1926), the counterparts are serrate and are furnished with 2 spines. In the present specimens, the counterparts are of a new type, in which those are serrate, not notched and furnished with a spine.

Tiron

Key to the species of *Tiron*

1 Basis of pereopod 3 broadly expanding, oval ..... *T. ovatibasis*
Basis of pereopod 3 not expanding, rectangular ..... *T. galeatus*

Tiron ovatibasis sp. nov.

(Figs 283–284)

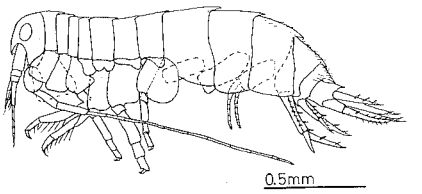

Fig. 283. *Tiron ovatibasis* sp. nov. Holotype, male, 2.25 mm.

Body. Pubescent. Head: galeate, deep laterally. Eyes medium, oblong; accessory facets absent. Pereon shorter than pleon; especially pereonites 1–4 shortened. Pleonites serrate posterodistally; pleonal epimera 1–3 almost perpendicular posteriorly, a little protruding ventrodistally. Urosomites 1–3 distinctly extending backward dorsally; the dorsal extension of urosomite 2 reaching near the distal end of urosomite 3, bifid distally; urosomite 3 provided with a pair of spines posterodorsally.

Antennae. Antenna 1 short; peduncular segment 1 provided with a spine upperdistally; accessory flagellum consisting of 2 plus a rudimentary segments, the 1st one of which is longer than a half of accessory flagellum; main flagellum consisting of 6 segments, of which the 1st one is a little shorter than accessory flagellum and segments 2–5 are provided with an aesthetasc distally. Antenna 2 shorter than body length; gland cone of peduncular segment 2 distinct; peduncular segments 4–5 prolonged, setaceous on the upper side.

Mouthparts. Massive, prominently protruding downward. Upper lip emarginate apicomedially. Lower lip winged outward; mandibular process developed. Maxilla 1: inner plate bristly, a little folded, provided with 3 thick pinnate setae apically, together with 2 slender setae medially; outer plate bristly proximally, provided with 9 slender tooth-like spines, of which three are simple and falcate, one is bifid, two are trifurcate and the rest two are rounded apically and armed with a tooth near apex. Maxilla 1: inner plate provided with a longitudinal row of 11 slender setae and 3 stout setae facially, together with 4 dispersively pinnate and 3 unpinnate setae apically; outer plate provided with a dispersively pinnate and 8 unpinnate setae, two of unpinnate setae stouter than the others. Mandibles: molar process prominently protruding; accessory blades 8 in number; lacinia mobilis in one mandible serrate distally, in the other mandible bifid; incisor armed with 4 teeth. Maxilliped: inner plate rectangular, provided with a longitudinal row of 11 pinnate setae; outer plate normal, lacking tooth-like spines, provided with 5 thick setae instead of spines, together with 2 pinnate setae outerdistally; palm rather slender, consisting of 4 segments, distal one of which is small and provided with a nail.

Gnathopods 1–2. Homopodous except for coxae, simple, linear. Coxa 1 most protruding forward at a point of the ventral third of its depth; coxa 2 almost uniform in width, rounded ventrally. Relative posterior lengths of segments from merus to dactyl 5:11:5:2. Propod provided with 5 single pectinate spines, lacking

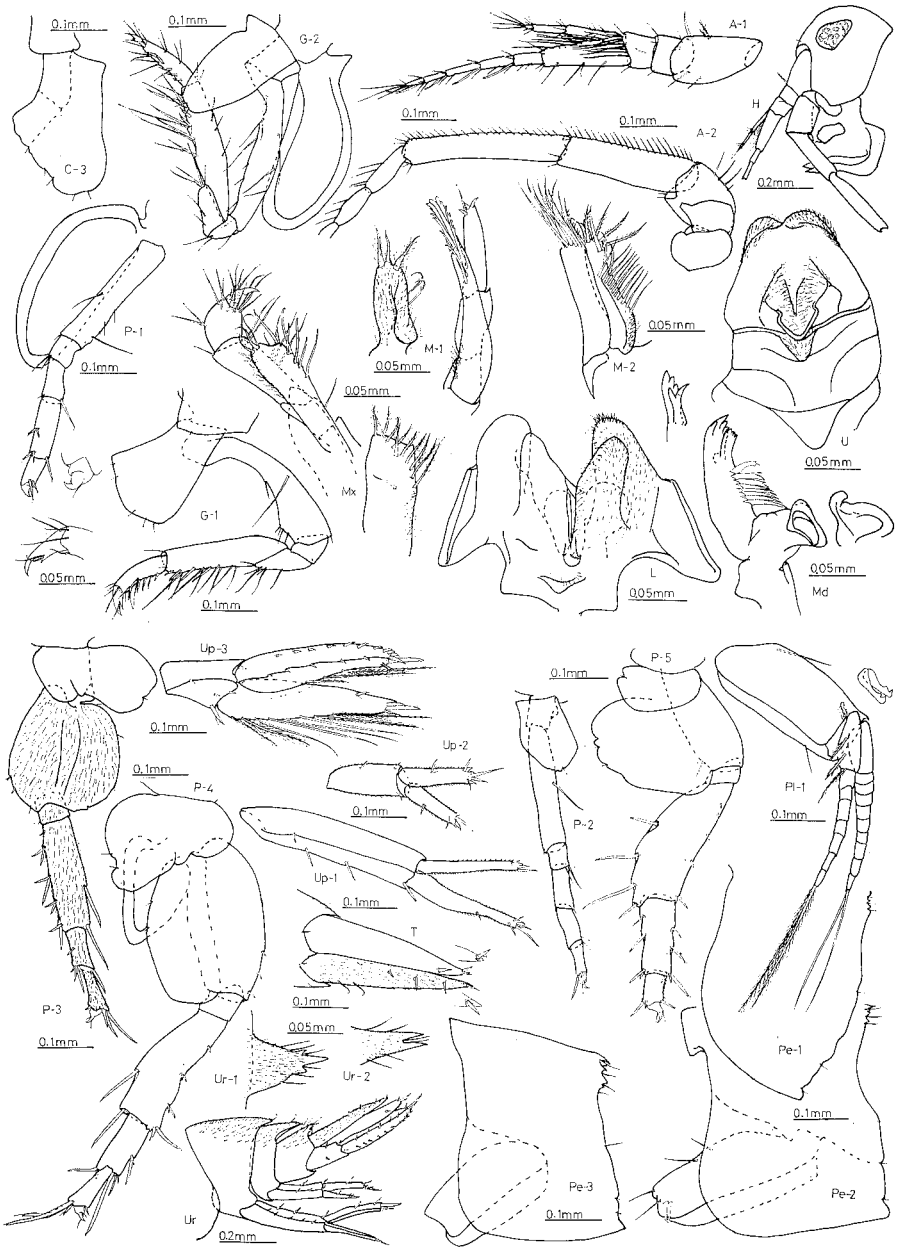

Fig. 284. *Tiron ovatibasis* sp. nov. Holotype, male, 2.25 mm.

palm. Dactyl bifid.

Pereopods 1–2. Homopodous except for coxae, uniform in width. Coxa 3 expanding backward at the middle point; coxa 4 about a half as large as coxa 3. Relative lengths of segments from basis to propod almost 11:2:4:4:3. Propod provided with a pair of locking spines. Dactyl stubby, provided with a nail.

Pereopods 3–4. Similar to each other in form except for coxae and bases; pereopod 3 smaller than pereopod 4. Coxae bilobate. Basis in pereopod 3 ovate, in pereopod 4 subrectangular. Relative lengths of segments from merus to propod almost 11:5:5; propod a little expanding and extending posterodistally, provided with a locking and 3 posterodistal spines. Dactyl stubby, armed with a nail.

Pereopod 5. Coxa 7 unilobate, notched posteroventrally. Basis prominently winged backward, most expanded basally. Relative lengths of segments from ischium to propod almost 2:12:7:3; merus gently expanding backward, a little protruding posterodistally; the posterodistal extension of merus truncate, provided with a spine distally; propod uniform in width, provided with a pair of locking spines and a posterodistal spine. Dactyl similar to that of pereopod 4.

Pleopod 1. Peduncle stout, provided with a pair of coupling spines; rami longer than peduncle, 8- or 10-articulate; terminal swimming setae shorter than rami.

Uropods. Uropod 1 extending beyond the middle of uropod 3; peduncle provided with 3 outer and an inner spines; rami equal in length, five-eighths of the peduncular length, truncate, armed with a tooth inner-apically, together with a pair of spines. Uropod 2: peduncle as long as rami, provided with 2 outer and an inner spines; rami equal in length, truncate, armed with 2 bilateral teeth distally, provided with an apical pair of unequal spines, together with 2 or 3 latero-marginal spines. Uropod 3 developed; peduncle provided with a stout inner-distal spine; rami equal in length, uniarticulate, truncate; inner ramus provided with many outer-marginal pinnate setae, an inner-apical tooth and 3 apical spines, one of which is stout and long; outer ramus provided with 2 unequal apical spines, a longitudinal row of spines outer-ventrally, 6 marginal spines outer-dorsally and 3 pinnate setae on medial third of the inner margin.

Telson. Divided into two parts, cleft to the about distal fifth of itself; both lobes taper, provided with 1 or 2 spines apically and a longitudinal row of 1 or 3 spines.

Material examined. Holotype: male, 2.25 mm. Type locality: Shijiki Bay. Date: June, 1977. Collection No.: AMBL-Amph. 34.

Remarks. The new species lacks a mandibular palp. This characteristic has been observed in only two species within the genus *Tiron, Tiron brevidactylus* (Pillai, 1957) and *T. tropackis* J.L. Barnard, 1972 (J.L. Barnard 1972b). Further, the following characteristics show a close relationship between the new species and the above two species: 1) the dactyl of pereopods 1–5 stubby; 2) the inner ramus of uropod 2 shorter than the outer ramus; 3) both rami of uropod 1 equal in length. However, the new species has morphological characteristics distinct from the other two species: 1) the inner plate of maxilla 1 in *T. brevidactylus* small and naked (the counterpart in the new species large and furnished with 3 pinnate setae apically); 2) the inner plate of maxilla 2 in *T. brevidactylus* lacking medial setae (the counterpart in the new species furnished with a medial row of setae); 3) two accessory facets in *T. tropackis* present (in the new species absent); 4) the basis of pereopod 3 in *T. tropackis* not oval

(in the new species oval); 5) the posterior lobe of coxa 5 in *T. tropackis* very large (in the new species medium).

The specific name refers to the oval basis of pereopod 3.

Tiron galeatus sp. nov.

(Figs 285–288)

Body. Head galeate; rostrum not decurved downward; anterior head lobe protruding to near the apex of rostrum. Eyes oval, large; accessory facets absent. Pereonites 1–4 prominently shortened. Pleon equal to pereon in length; pleonites 1–3 subequal in length, serrate dorsoposteriorly; pleonal epimera 1–3 perpendicular to each longitudinal axis posteriorly. Urosome: dorsal extension of urosomites 1–2 not beyond the following segment, slender, bifid; urosomite 3 a little protruding dorsodistally, provided with a pair of spines dorsodistally.

Antennae. Shortened. Antenna 1: relative lengths of peduncular segments 1–3 8:5:5; accessory flagellum consisting of 3 segments, two proximal ones of which are equal in length; main flagellum consisting of 6 segments, which are subequal in length except for the terminal segment. Antenna 2: gland cone of peduncular segment 2 prominent; peduncular segment 4 shorter than peduncular segment 5; flagellum consisting of 8 segments, which are furnished with a hooked spine distally except for the proximal and terminal segments.

Mouthparts. Massive. Upper lip emarginate apicomedially. Lower lip largely winged downward; mandibular process obliquely extending. Maxilla 1: inner plate oblong, provided with 3 pinnate setae apically; outer plate provided with 8 tooth-like spines, two of them needle, three of them bifid and stout, the rest three spines stout and blunt apically; palp consisting of 2 segments, terminal one of which is provided with 4 spines. Maxilla 2: inner plate furnished with an oblique row of unpinnate setae mid-facially and 6 pinnate and several unpinnate setae on distal fourth of inner margin and on its apex; outer plate provided with a pinnate, 5 unpinnate stout and 8 unpinnate slender setae apically. Mandible: molar process prominently protruded, large; accessory blades 9 in number, proximal four blades pinnate, the rest five ones obliquely truncate or bifid and pectinate apically; lacinia mobilis of one mandible armed with 4 blunt teeth, in the other mandible bifid; incisor armed with 4 blunt teeth. Maxilliped: inner plate rectangular, provided with

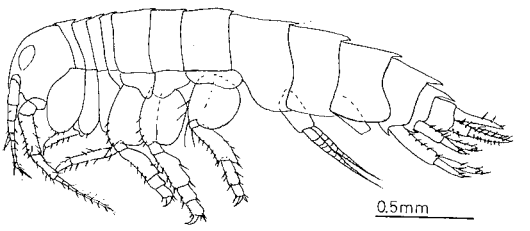

Fig. 285. *Tiron galeatus* sp. nov. Holotype, female, 2.75 mm.

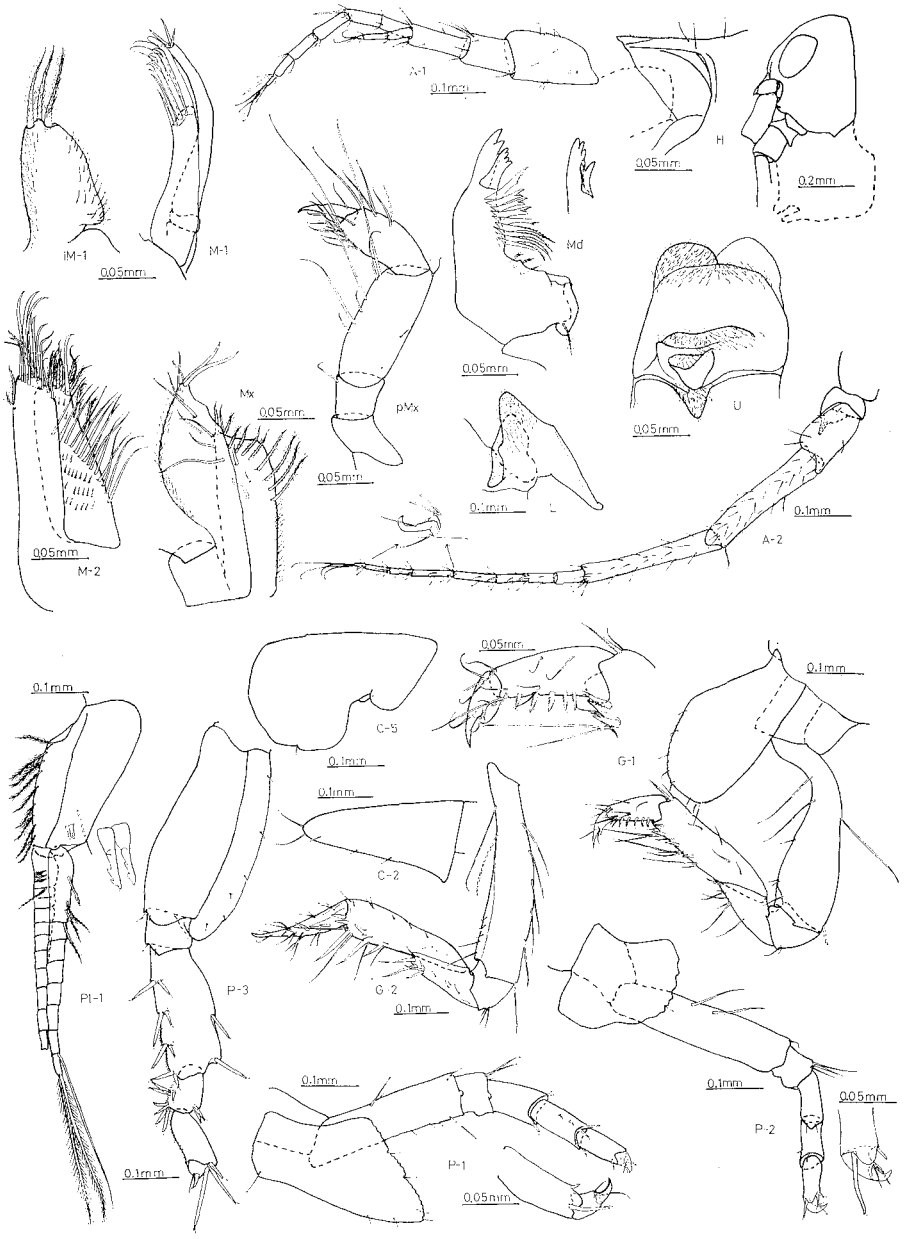

Fig. 286. *Tiron galeatus* sp. nov. Holotype, female, 2.75 mm.

an oblique row of pinnate setae; outer plate not ovate, slightly concave inner-distally, provided with 10 thick setae instead of spines; palm consisting of 4 segments, terminal one of which is stout and nail-like.

Gnathopods 1–2. Homopodous except for coxae, simple, normal. Coxa 1 oblong, protruding forward anteromedially; coxa 2 triangular. Basis of gnathopod 1

twisted basally. Relative lengths of segments from merus to dactyl 8:12:5:3; propod provided with 5 spines in gnathopod 1, in gnathopod 2 with 3 spines; dactyl falcate, provided with a tooth posteromedially.

Pereopods 1–2. Homopodous except for coxae. Coxa 3 gradually decreasing in depth; coxa 4 quater-circular. Relative lengths of segments from basis to propod 12:3:6:5:4; propod furnished with a locking and an anterodistal spines. Dactyl stubby, furnished with a nail apically.

Pereopod 3. Coxa 5 bilobate. Relative lengths of segments from basis to propod 18:3:12:4:6; posterior thin plate of basis narrow, uniform in width; propod lacking spines. Dactyl similar to that of pereopod 1.

Pereopod 4. Coxa 6 bilobate; posterior lobe 3 times as deep as anterior one. Relative lengths of segments from basis to propod 20:3:15:6:5; basis ovate, truncate posterodistally; propod protruding and truncate posterodistally, provided with a locking and 3 posterodistal spines. Dactyl similar to that of pereopod 3.

Pereopod 5. Coxa 7 unilobate, notched posteromedially. Relative lengths of segments from basis to propod 15:3:14:10:4; posterior thin plate of basis roundly winged; propod provided with 2 locking and 3 posterodistal spines. Dactyl similar to that of pereopod 3.

Pleopods. Pleopod 1: peduncle provided with many pinnate setae outer-marginally and a pair of coupling spines inner-distally; inner ramus longer than outer ramus, provided with a bifid pinnate seta on the first segment; terminal swimming setae two-thirds as long as rami. Pleopods 2–3 similar to pleopod 1, though peduncle lacking pinnate setae outer-marginally and the proximal segment of inner

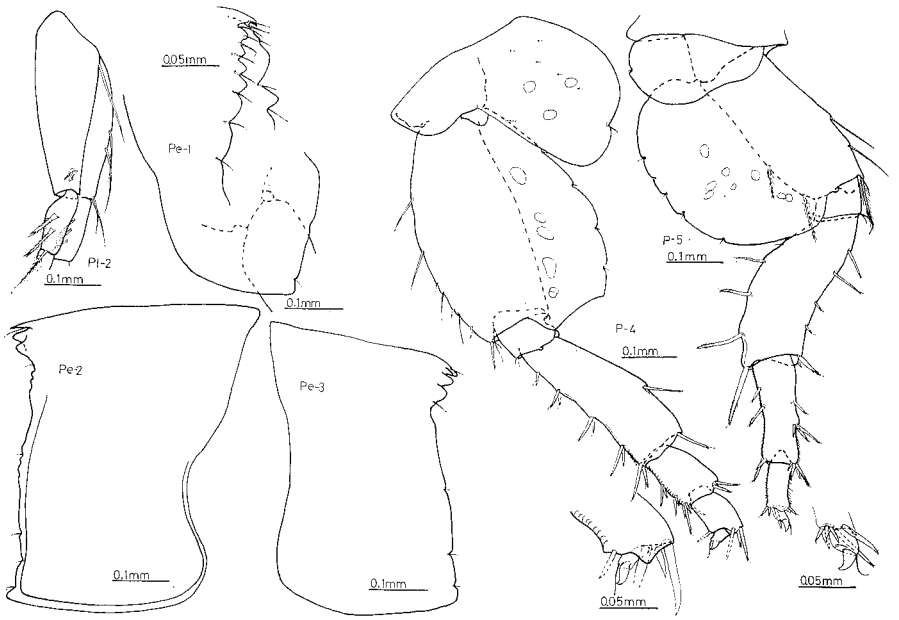

Fig. 287. *Tiron galeatus* sp. nov. Holotype, female, 2.75 mm.

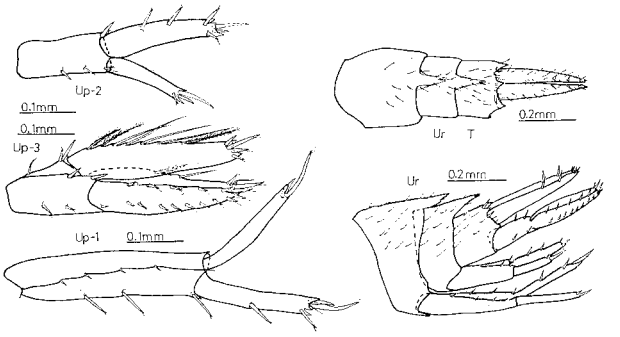

Fig. 288. *Tiron galeatus* sp. nov. Holotype, female, 2.75 mm.

ramus provided with 2 bifid pinnate setae.

Uropods. Uropod 1 extending beyond uropod 2 and the middle of uropod 3; peduncle provided with 3 long spines outer-marginally; rami equal in length, about two-thirds as long as peduncle, armed with a tooth inner-distally and 2 unequal spines apically; in addition to these armatures, outer ramus provided with a small outer-distal tooth and 2 outer spines medially and distally; inner ramus provided with an inner-distal spine. Uropod 2: peduncle intermediate between both rami in length; outer ramus shorter than inner ramus, provided with 2 bilateral teeth and 2 unequal spines apically, together with an outer-distal spine; inner ramus provided with an outer tooth and 2 unequal spines apically, together with an outer-distal and 3 longer inner spines. Uropod 3: rami subequal in length, truncate, armed with 2 bilateral teeth apically; inner ramus provided with many pinnate setae inner-marginally and 4 unequal spines apically; outer ramus provided with 2 unequal spines apically, a distal spine and 2 medial pinnate setae inner-marginally, and 2 longitudinal rows of spines on the outer side.

Telson. Divided into two lobes, cleft to the middle of itself; both lobes taper, provided with a pair of spines apically and a longitudinal row of 2 spines.

Material examined. Holotype: female, 2.75 mm. Type locality: Shijiki Bay. Date: June 1977. Paratypes: 5 specimens. Collection No.: AMBL-Amph. 30.

Remarks. The present new species accords with *Tiron brevidactylus* (Pillai, 1957) (J.L. Barnard 1972b), *T. tropackis* J.L. Barnard, 1972 (J.L. Barnard 1972b) and *T. ovatibasis* sp. nov. (the present paper) in the morphological characteristics that the mandibular palp is absent and the dactyl of pereopods 1–5 is stubby. Further, the inner plate of maxillae in the present new species suggests that it is related more closely to the latter two than to the former (see the remarks of *T. ovatibasis* sp. nov. (the present paper)). However, the present new species is distinguishable from the latter two species by the shape of its rostrum not extending straight.

The specific name, *galeatus*, refers to the helmet-like head.

Urothoidae

Urothoe

Key to the species of *Urothoe*

1 Carpus of pereopod 3 broadly expanding.....*U. grimaldii japonica*
Carpus of pereopod 3 not expanding, uniform in width .....*U. gelasina ambigua*

Urothoe grimaldii Chevreux, 1895 ***japonica*** subsp. nov.

(Figs 289–293)

Body. Broad fusiform, depressed. Head as long as pereonites 1–3 combined; rostrum short; anterior head lobe much extending downward. Eyes large, circular, slightly continuously contacting with each other dorsally. Pleon: pleonites 1–2 equal in length, narrower than pleonite 3; epimeron 1 extending backward, protrud-

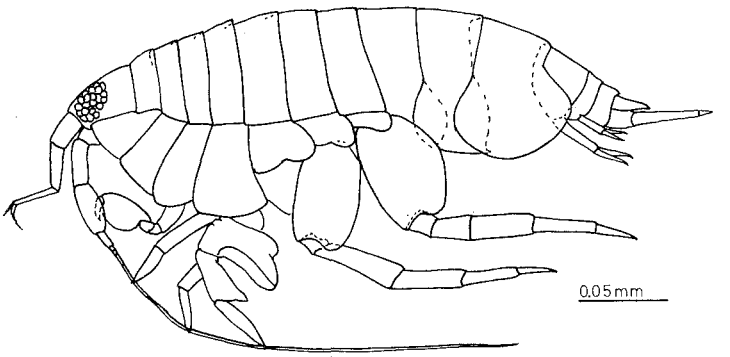

Fig. 289. *Urothoe grimaldii japonica* subsp. nov. Holotype, male, 3.5 mm.

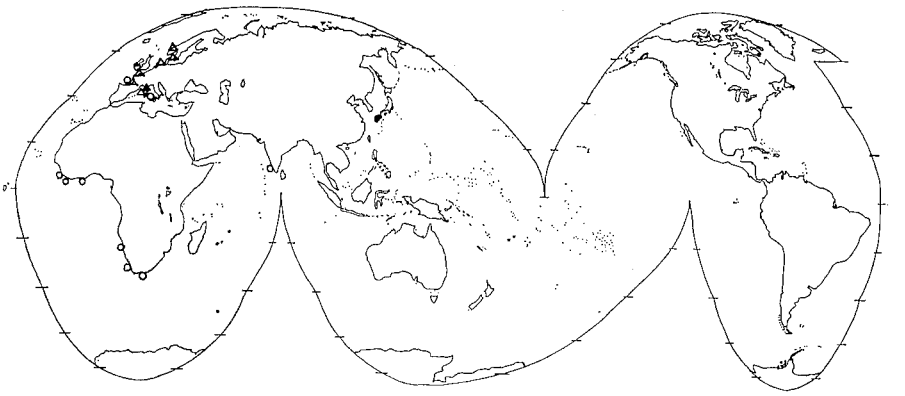

Fig. 290. Distributions of *Urothoe grimaldii japonica* subsp. nov. (●), *U. grimaldii grimaldii* Chevreux (○), *U. grimaldii inermis* Chevreux et Fage (▲) and *U. grimaldii poseidonis* Reibisch (△) in the world.

ing almost anteroventrally, rounded; epimeron 2 prominently protruding forward anteromedially, armed with an acute tooth posteroventrally, provided with 2 transverse rows of pinnate setae on the other side; epimeron 3 protruding forward anteromedially, lacking pinnate setae. Urosome depressed.

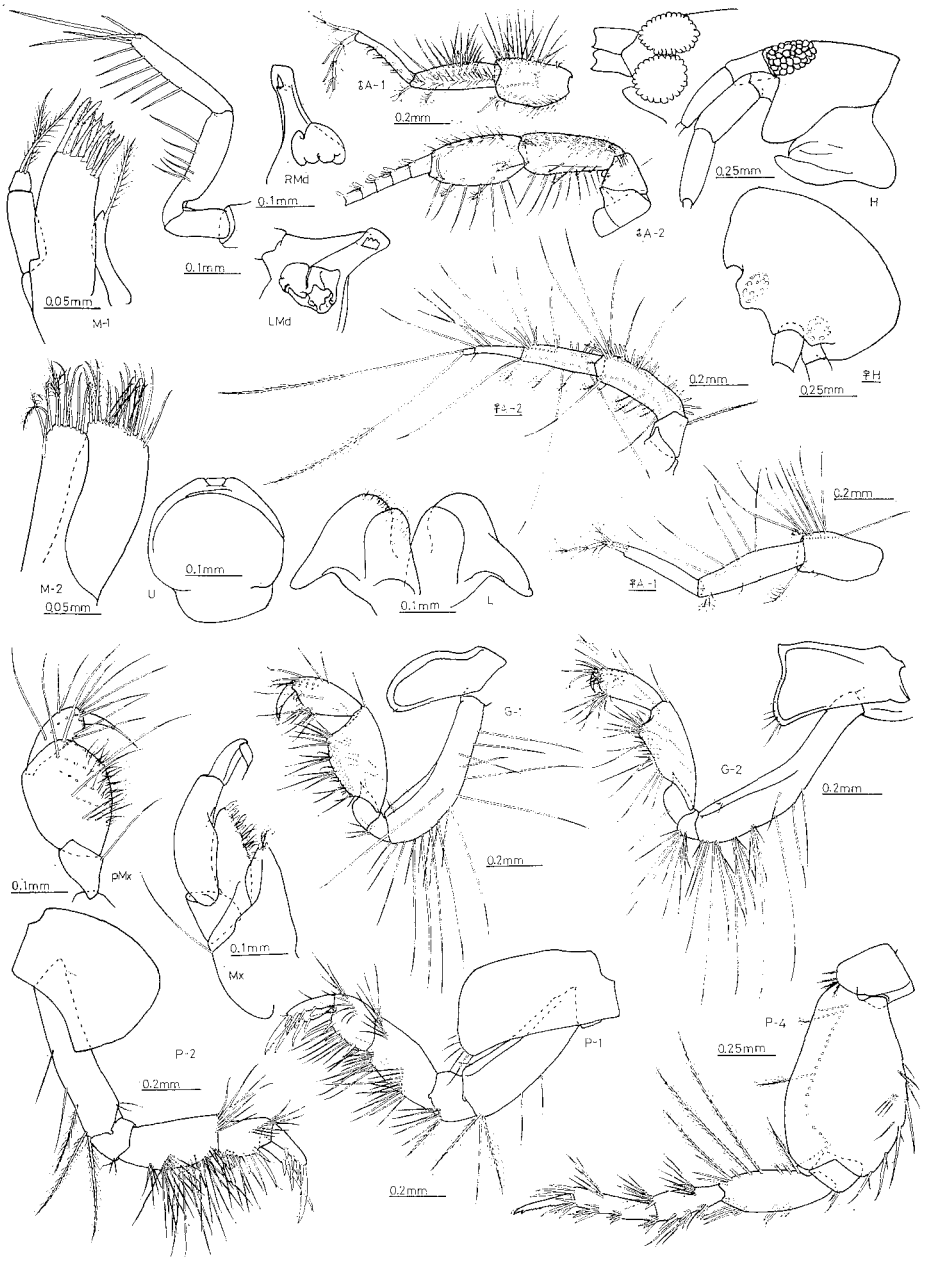

Fig. 291. *Urothoe grimaldii japonica* subsp. nov. Holotype, male, 3.5 mm. ♀A–1, ♀A–2, ♀H: paratype no. 1, female, 3.5 mm.

Antennae. Antenna 1: relative lengths of peduncular segments 1–3 7:8:6; peduncular segments 1–2 setaceous in rows inner-marginally; accessory flagellum consisting of 2 segments, which are equal in length; main flagellum shorter than peduncular segment 3, consisting of 4 segments, proximal three of which are furnished with an aesthetasc apically. Antenna 2 subequal to body length; gland cone of peduncular segment 2 triangular, medium in size; peduncular segment 4 as long as peduncular segment 5, almost uniform in thickness, bristly on the upper submargin of inner side throughout, provided with a proximal pair of spines, 3 oblique rows of 4 spines and a distal row of 3 spines and a long seta on the upper-outer side, together with 9 setae ventrally throughout and a ventrodistal spine; peduncular segment 5 provided with 7 transverse rows of small setae dorsally and 7 thick setae ventrally; each flagellum segment provided with a caliceolus.

Mouthparts. Upper lip large, circular. Lower lip: inner plate developed, densely pubescent; shoulders broad, densely pubescent; mandibular process prominently winged outward. Maxilla 1: inner plate provided with a pinnate seta apically; outer plate provided with 4 bifid and 7 serrate tooth-like spines; palp not reaching to the distal end of outer plate, consisting of 2 segments, distal one of which is shortened and is provided with 2 pinnate setae apically. Maxilla 2: inner plate narrower than outer plate, provided with 5 pinnate setae almost inner-distally and 5 unpinnate setae apically; outer plate provided with 6 thick unpinnate, 4 thick pinnate and 9 slender unpinnate setae apically. Mandibles similar to each other except for lacinia mobilis; molar process medium, prominently protruding; accessory spines absent; lacinia mobilis in right mandible tooth-like, in left mandible broad and serrate apically; incisor rather narrow, chisel-like; palp well developed, slender, consisting of 3 segments, terminal one of which is provided with 5 unequal thick setae apically and a longitudinal row of 6 stiff setae on distal two-thirds of inner margin. Maxilliped not enlarged; inner plate provided with 2 conical teeth and 2 penicilate setae apically; outer plate provided with 6 tooth-like spines; palp consisting of 4 segments, 2nd one of which is prominently expanding, is ovate and is provided with 5 transverse rows of long setae, and terminal one of which is stiliform and is provided with a needle-like spine apically.

Gnathopod 1. Weakly subchelate. Coxa 1 narrow, rounded ventrally. Relative posterior lengths of segments from basis to propod 7:1:1:3:3. Basis setaceous posteriorly. Carpus broadly expanding backward, setaceous in rows on the ventral submargin of inner side. Propod a third as broad as the distal width of carpus; palm oblique, defined by a spine. Dactyl falcate, extending beyond palm when closed.

Gnathopod 2. Weakly subchelate. Coxa 2 rectangular. Relative posterior lengths of segments from basis to propod 18:2:3:6:4. Basis, ischium and carpus setaceous posteriorly. Carpus not prominently expanding backward. Propod about a half as broad as the distal width of carpus, uniform in width; palm almost transverse, defined by many thick setae. Dactyl falcate, not extending beyond palm when closed.

Pereopods 1–2. Homopodous except for coxae. Coxa 3 rectangular; coxa 4 expanding backward almost posteroventrally, rounded ventrally. Relative lengths of segments from basis to dactyl 12:3:8:5:4:4. Merus setaceous in several rows posteriorly. Carpus provided with 2 spines and a distal pair of spines posteriorly. Propod provided with 2 medial rows of 3 or 4 spines and a medial spine posteriorly. Dactyl falcate, serrate posteriorly.

Pereopod 3. Stout. Relative anterior lengths of segments from basis to dactyl almost 11:3:4:6:11:12. Basis rectangular, broader than long. Carpus prominently expanding backward to three times as broad as long; outer side of the expansion provided with 2 transverse rows of spines proximally and distally, and with a distal marginal row of pinnate setae. Propod gradually increasing in width, provided with 2 spines posteriorly. Dactyl sword-formed, tapered, provided with 6 slender spines anteriorly.

Pereopod 4. Relative anterior lengths of segments from basis to dactyl 16:3:9:6:7:6. Basis oblong; posterior thin plate narrow, uniform in width. Merus provided with 7 pinnate setae and 3 distal spines posteriorly; anterior spine formula 3–2–2–4; 3 of 4 anterior spines slender. Carpus provided with 2 medial and distal transverse rows of 1 or 2 spines and stiff setae posteriorly; anterior spine formula 3–3–2–6. Propod provided with a transverse row of 5 stiff setae on a point at distal third of posterior margin and 3 unequal spines posterodistally; anterior spine formula 5–5–4. Dactyl serrate anteriorly.

Pereopod 5. Relative anterior lengths of segments from basis to dactyl 14:2:5:

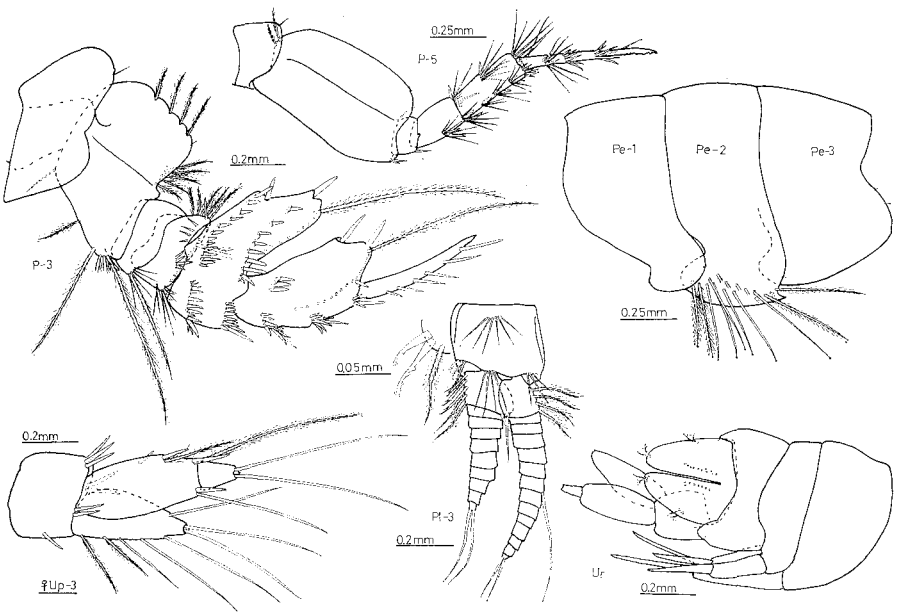

Fig. 292. *Urothoe grimaldii japonica* subsp. nov. Holotype, male, 3.5 mm. ♀Up–3: paratype no. 1, female, 3.5 mm.

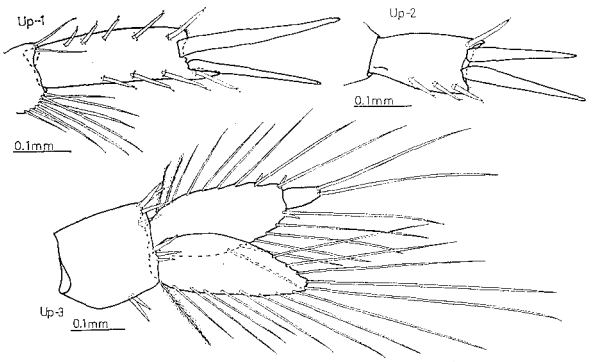

Fig. 293. *Urothoe grimaldii japonica* subsp. nov. Holotype, male, 3.5 mm.

7:7:5. Basis subrectangular, not prominently expanding backward. Merus lacking pinnate setae posteriorly, provided with a set of a spine and stiff setae posterodistally, and 2 sets of 2 spines and stiff setae anteromedially and anterodistally. Carpus provided with a transverse row of a spine and stiff setae posteromedially, 2 anterior sets of 2 spines and several stiff setae and an anterodistal set of 6 spines. Propod provided with a set of 2 spines and several stiff setae, a transverse row of 6 spines on medial third of anterior margin and 5 anterodistal spines. Dactyl serrate anteriorly.

Pleopod 3. Stout. Peduncle distinctly broader than long, provided with 2 coupling spines and a pinnate seta inner-distally; outer ramus longer than inner ramus; unbifid setae on rami biarticulate; terminal swimming setae shortened.

Uropods. Uropod 1: peduncle protruding inner-distally, provided with 4 inner and 5 outer spines; rami stiliform, naked; outer ramus as long as peduncle, longer than inner ramus. Uropod 2: peduncle provided with an inner-distal and 3 outer spines; rami similar to those of uropod 1. Uropod 3 well developed; peduncle subsquare; rami foliaceous; inner ramus setaceous on inner margin and distal quarter of outer margin; apical setae on inner ramus 2 in number; outer ramus biarticulate; proximal segment of outer ramus provided with 7 pinnate setae and 2 distal sets of a spine and a pinnate seta outer-marginally, together with 5 pinnate setae and a distal set of a spine and a pinnate seta on distal half of inner margin; terminal segment of outer ramus reduced, quarter as long as the preceding one, provided only with 2 pinnate setae apically.

Telson. Deeply cleft, semiovate; both lobes provided with an apical pair of simple and penicilate setae, and an outer-medial pair of penicilate setae.

Female (Paratype no. 1, 3.5 mm). Eyes small, circular, not contacting with each other dorsally, consisting of sparse ommatidia. Antenna 1: relative lengths of peduncular segments 1–3 7:10:7; peduncular segment 1 provided with long setae on distal half of ventral side; peduncular segment 2 provided with 2 longitudinal rows of 6 or 7 long setae ventrally; accessory flagellum biarticulate; main flagellum triarticulate. Antenna 2 shortened, slender; peduncular segments 4–5 subequal in

length, spinose inner-dorsally, provided with longitudinal rows of long setae on inner side; flagellum consisting of 2 segments, proximal one of which is elongate, about two-thirds as long as peduncular segment 5; terminal segment of flagellum shortened, provided with 2 very long setae, which are pinnate on the half. Uropod 3 less setaceous than that of male; apices of inner ramus and terminal segment of outer ramus provided only with 2 pinnate setae. Other parts similar to those of male.

Material examined. Holotype: male, 3.5 mm. Type locality: Tomioka Bay. Date: May 1987. Paratypes: 12 specimens (no. 1, female, 3.5 mm, dissected and figured in a part). Collection No.: AMBL-Amph. 93.

Remarks. *Urothoe grimaldii* Chevreux, 1895 is broadly distributed in the coasts of Eurasia and Africa (Fig. 290) (Stebbing 1906, Chevreux & Fage 1925, Chevreux 1935, Reid 1951, Rabindranath 1971, Griffiths 1974a, 1974c and 1975, Ledoyer 1968, Fage 1933, Hamond 1967, Schellenberg 1942) and contains three subspecies, *U. g. grimaldii* Chevreux, 1895, *U. g. poseidonis* Reibisch, 1905 and *U. g. inermis* Chevreux et Fage, 1925: the latter two subspecies have been combined into a single species named *U. poseidonis* Reibsch, 1905 by Lincoln (1979) without remarks; the author doubts his idea because of the small morphological differences between *U. grimaldii* and *U. poseidonis*, and the author maintains them as the three subspecies of *U. grimaldii* as before in this paper. The new subspecies closely resembles *U. grimaldii grimaldii* reported from India by Rabindranath (1971) in the morphological characteristics of the gnathopods 1–2, pereopods 1–5, antennae and pleonal epimera. However, the new subspecies has the discriminable morphological characteristics from the Indian specimens of *U. g. grimaldii* as follows: in the Indian specimens of *U. g. grimaldii*, 1) the telson completely cleft, broadly undulated distally, provided with 5 setae distally (not completely cleft, smooth distally and provided with only two setae in the new subspecies); 2) the inner ramus of uropod 1 carrying spines (naked in the present new species); 3) the peduncular segment 1 of antenna 1 protruding inner-distally (not protruding inner-distally in the new species); 4) the peduncular segment 5 of antenna 2 provided with many barrel-shaped caliceoli (without caliceoli in the new subspecies); 5) the propod of gnathopod 1 prominently compressed basally (not prominently compressed in the new subspecies). On the basis of the above differences, it is probably valid that the Japanese *U. grimaldii* are nominated to the new subspecies, *U. grimaldii japonica*.

The subspecific name, *japonica*, refers to the locality of the new subspecies.

Urothoe gelasina Imbach, 1967 ***ambigua*** subsp. nov.

(Figs 294–298)

Body. Comparatively slender in a lateral view, depressed. Head subequal to pereonites 1–3 combined in dorsal length, triangular and deep in lateral view; rostrum short, triangular, broad basally. Eyes large, circular, not contacting with. Pleon: epimera 1–3 protruding forward; epimera 1–2 armed with a minute tooth

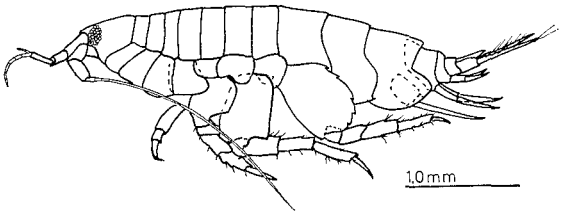

Fig. 294. *Urothoe gelasina ambigua* subsp. nov. Holotype, male, 3.5 mm.

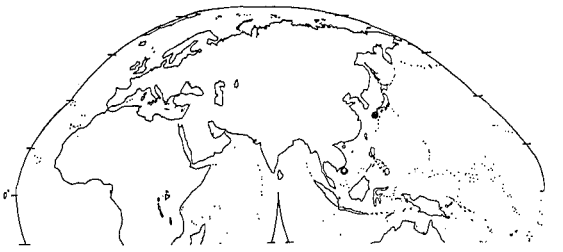

Fig. 295. Distributions of *Urothoe gelasina ambigua* subsp. nov. (●) and *U. gelasina gelasina* Imbach (○) in the world.

posteroventrally.

Antennae. Antenna 1: relative lengths of peduncular segments 1–3 6:6:5; peduncular segments 1–2 provided with a longitudinal band of bristles dorsally; accessory flagellum biarticulate; main flagellum distinctly shorter than peduncle, 7-articulate. Antenna 2 subequal to body in length; peduncular segment 1 twice as broad as long; gland cone of peduncular segment 2 short; peduncular segment 3 densely bristly anterodistally; peduncular segment 4 spinose dorsally, provided with a longitudinal band of bristles in the inner side; peduncular segment 5 as long as peduncular segment 4, provided with a longitudinal row of 5 caliceli; flagellum segments except for proximal and terminal segments provided with a caliceolus; terminal segment of flagellum provided with a pair of short and very long setae apically.

Mouthparts. Upper lip large, semicircular. Lower lip: inner plate large; shoulders broad; mandibular processes prominently winged outward. Maxilla 1: inner plate provided with a pinnate seta apically; outer plate provided with 9 tooth-like spines; palm not extending beyond outer plate, consisting of 2 segments, terminal one of which is almost as long as proximal one and is furnished with 2 pinnate setae apically. Maxilla 2: inner plate furnished with 7 facial pinnate, 5 apical unpinnate and an apical pinnate setae; outer plate provided with 6 thick unpinnate, 8 slender unpinnate and 2 pinnate setae apically. Mandibles: molar process large; accessory teeth absent; lacinia mobilis in the left mandible tooth-like, in the right mandible serrate apically; incisor chisel-like, smooth marginally; palp slender, almost uniform in width, consisting of 3 segments, middle one of which is provided with a longitudinal row of 5 setae on middle of third of its length, and terminal one of which is provided with 4 setae on distal two-thirds of its length and 4 apical unpinnate setae. Maxil-

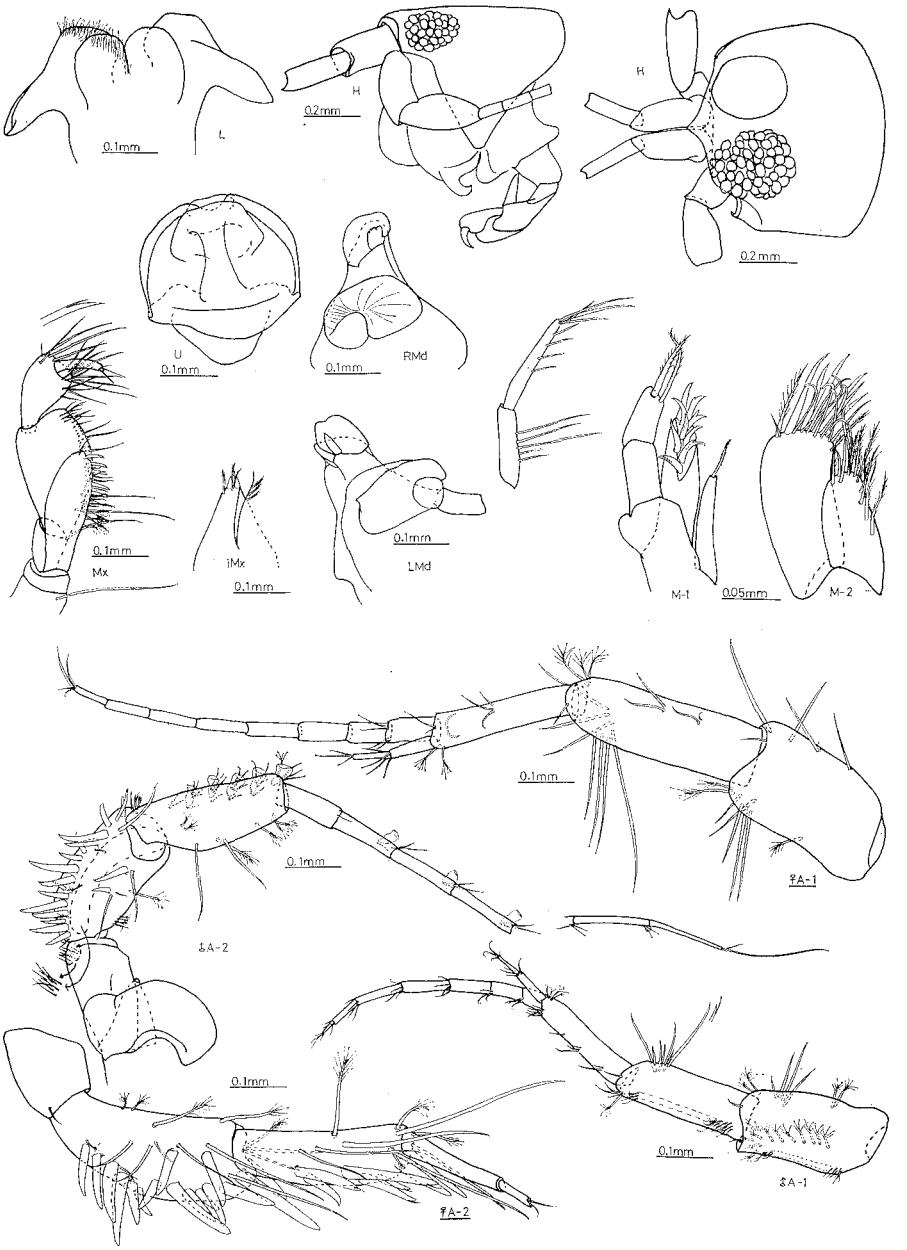

Fig. 296. *Urothoe gelasina ambigua* subsp. nov. Holotype, male, 3.5 mm. ♀A–1, ♀A–2: paratype no. 2, female, 5.0 mm.

liped: inner plate provided with 2 conical spines and 3 pinnate setae; outer plate furnished with 5 tooth-like spines; palp consisting of 4 segments, 2nd one of which is swollen and is setaceous; terminal segment of palp clavate, without apical spines.

Gnathopods 1–2. Similar to each other except for coxae and dactyl. Coxa 1

Fig. 297. *Urothoe gelasina ambigua* subsp. nov. Holotype, male, 3.5 mm.

narrower than coxa 2. Relative lengths of segments from basis to dactyl in gnathopod 1 26:4:7:19:11:6, in gnathopod 2 31:5:8:18:11:4. Basis: setae pinnate on almost distal half of its length. Propod oblong; palm and posterior margin of propod continuously rounded; palm defined by a spine. Dactyl in gnathopod 2 stouter than

that of gnathopod 1.

Pereopods 1–2. Homopodous though pereopod 1 smaller than pereopod 2, stout. Relative lengths of segments from basis to dactyl in pereopod 1 18:6:14:7:8:5, in pereopod 2 26:7:16:8:8:6. Carpus obliquely truncate, provided with 4 stout

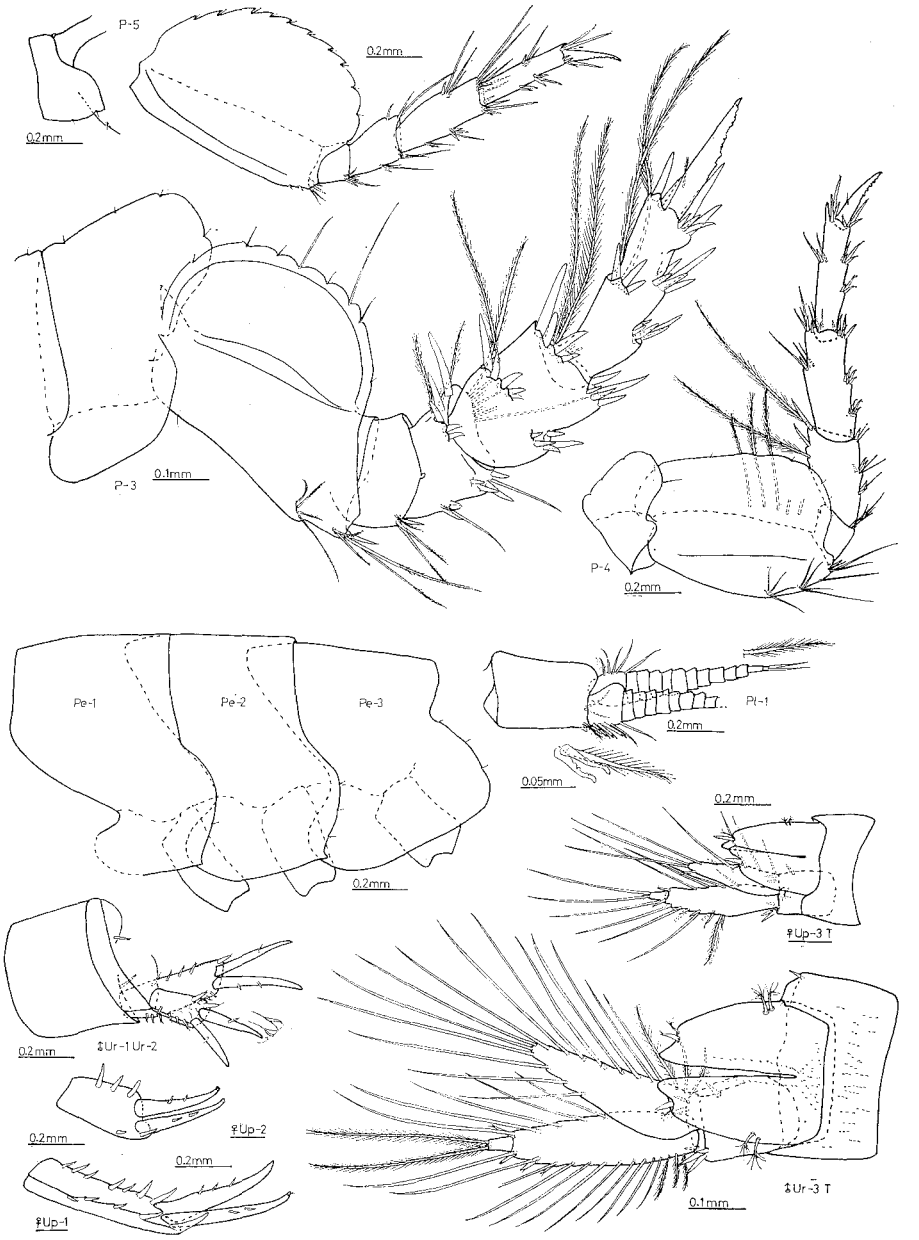

Fig. 298. *Urothoe gelasina ambigua* subsp. nov. Holotype, male, 3.5 mm. ♀Up–3, T: paratype no. 2, female, 5.0 mm.

spines posteriorly. Propod about a half as thick as carpus, obliquely cut posteriorly, provided with 7 or 8 stout spines. Dactyl spine-like, bluntly serrate posteriorly.

Pereopod 3. Relative lengths of segments from basis to dactyl 22:5:9:12:16:12. Basis roundly expanding backward. Carpus not expanding backward, provided with 2 anterior transverse rows of 5 spines medially and distally, together with 2 posterior transverse rows of 5 or 6 spines medially and distally. Propod about a half as thick as carpus, provided with 3 sets of 5 spines anteriorly, a medial set of 3 spines and a distal pair of spines posteriorly. Dactyl straight, gradually getting narrower, serrate anteriorly.

Pereopods 4–5. Similar to each other in segments from ischium to dactyl. Relative lengths of segments from basis to dactyl 8:2:4:5:5:3. Basis winged backward; posterior margin in pereopod 4 smooth, in pereopod 5 serrate. Propod protruding posterodistally. Dactyl bluntly serrate on distal half of its posterior margin.

Pleopod 1. Peduncle stout, provided with a set of 2 coupling spines and a pinnate seta inner-distally; terminal swimming setae very short.

Uropods. Almost the same in male and female. Uropod 1: peduncle furnished with many spines upper-marginally; rami equal in length, subeuqal to peduncle in length, awl-shaped, provided with a few spines. Uropod 2: peduncle provided with 3 outer and 2 inner spines; rami equal in length, longer than peduncle, awl-shaped, provided with 1 or 2 spines medially. Uropod 3 well developed; rami more setaceous in male than in female; outer ramus consisting of 2 segments, proximal one of which is setaceous, and terminal one of which is provided only with 2 long pinnate setae apically; inner ramus shorter than proximal segment of outer ramus, setaceous marginally.

Telson. Not completely cleft; both lobes provided with a pair of penicilate setae at a point of the middle of outer margin and an apical set of a spine and a penicilate seta.

Female antennae (Paratype no. 2, 5.0 mm). Antenna 1 similar to that of male except for peduncular segments 1–2 without longitudinal bristly band. Antenna 2: peduncular segments 4–5 subequal in length; peduncular segment 4 spinose dorsally; spine formula on peduncular segment 5 2–2–1–2; flagellum shorter than peduncular segment 5, consisting of 2 segments, terminal one of which is a third as long as proximal one and is provided with a pair of small setae apically.

Material examined. Holotype: male, 3.5 mm. Type locality: Ariake Sea. Date: June 1976. Paratypes: 7 specimens, (no. 2, female, 5.0 mm, dissected and figured in a part). Collection No.: AMBL-Amph. 52.

Remarks. The present specimens agree with *Urothoe gelasina* Imbach, 1967 from South China Sea with respects to the diagnostic characters given by Imbach (1967). However, several morphological differences are noticed as follows: in Imbach's, 1) the cephalic lobe rectangular (triangular in the present specimens); 2) the carpus of gnathopods 1–2 more expanding backward than that of the present specimens; 3) the pleonal epimeron 2 provided with many pinnate setae (without pinnate setae in

the present specimens); 4) the palpar segment 3 of mandible lacking lateral setae (with 4 stiff setae in the present specimens); 5) the uropod 3 less setaceous than that of the present specimens; 6) the palm of gnathopod 2 defined by 4 spines (by only one spine in the present specimens). The author can not decide whether the above-mentioned differences show locality or specific differences. At the present, the author believes that it is reasonable to treat these two forms from South China Sea and Japanese waters as two subspecies.

The subspecific name, *ambigua*, implies that the author hesitates to state the present material to be a new subspecies of *U. gelasina*.

(To be continued)