

**Description of *Neobathymysis japonica*, a new genus and species, and
revision of the genus *Bathymysis* with a new
species from Japan (Crustacea: Mysidacea: Mysidae)**

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Abstract.—A new genus *Neobathymysis* is established for *N. japonica*, collected from Japanese waters. *Neobathymysis* is closely related to the genera *Bathymysis* and *Australomysis* but distinguished from *Bathymysis* by the eye with well-pigmented cornea and definite stalk, the presence of the triangular rostrum and the slender antennal scale, and from *Australomysis* by the expanded second endopod segment of the maxilla and the shape and armature of the telson. *Bathymysis renocolata* Tattersall, 1951, known from the east coast of the United States, is transferred to the present new genus. Differences between *Neobathymysis japonica* and *N. renocolata* are discussed. A new species, *Bathymysis distincta*, and an undecided species, *Bathymysis* sp. are described from specimens from Japanese deep waters. Differences among three species, *Bathymysis helgae* Tattersall, 1907, *B. distincta* new species and *Bathymysis* sp. are discussed. The generic diagnosis of *Bathymysis* is amended.

The genus *Bathymysis* was established by Tattersall in 1907 for a species, *B. helgae*, from North Atlantic waters, based on: (1) the form of the small eyes, set close together apparently without definite eyestalks; (2) the 2nd thoracopod, like ones in *Leptomysis* but more robust; (3) the form of the telson, with deeply serrated cleft, lateral margins and apical lobes armed throughout with spines (Tattersall & Tattersall 1951). It was not until 1951 when another species, *Bathymysis renocolata* Tattersall, from the east coast of the United States was described. For the large and developed eyes with definite eyestalks of *Bathymysis renocolata*, the diagnosis of the genus was amended (Tattersall 1951). Pillai (1963) revised the definition of the genus, and described *Bathymysis varunae* based on a single badly damaged male; later Pillai (1964) described the female of the same species. Subsequently (Pillai 1973) *Bathymysis varunae* was synonymized with *Doxomysis quadrispinosa*.

A comparative study of the two known species of *Bathymysis* with the material in the present work, permits a revised diagnosis of the genus *Bathymysis*, the description of a new species, *B. distincta*, the description of an undecided species, *Bathymysis* sp., and the establishment of a new genus, new species, *Neobathymysis japonica*.

The type specimens are deposited in the National Science Museum, Tokyo (NSMT).

Neobathymysis, new genus

Diagnosis.—Body robust. Carapace short, with rostral projection. Eyes well developed, with reniform cornea and distinct eyestalk. Antenna with scale setose all round and distal suture present, with 2 spines on sympod. Maxilla with distal segment of endopod expanded and armed with barbed spines and plumose setae. Endopod of 1st thoracopod with well-developed lobes on basis, preischium and ischium;

Table 1.—Morphological differences between *Neobathymysis renoculata* (Tattersall, 1951) and *N. japonica*, new species.

	<i>N. renoculata</i> (Tattersall, 1951)	<i>N. japonica</i> , new species
Antennal scale	7.5 times as long as broad	6.4 times as long as broad
Maxilla	Distal margin of terminal segment of endopod with about 12 strong barbed setae	Distal margin of terminal segment of endopod with about 10 strong setae, the bigger 4 setae are barbed
Thoracopods	Endopod of 3rd–8th thoracopods with carpopropodus 3-subsegmented	Endopod of 3rd thoracopod with carpopropodus 3-subsegmented Endopod of 4th–8th thoracopods with carpopropodus 4-subsegmented
Endopod of 4th male pleopod	7th segment longer than 6th, 8th very short and armed with 1 long and 1 short setae at apex	6th segment somewhat longer than 7th, 8th very short and armed with 2 long apical setae of almost same length
Endopod of uropod	About 37 spines on inner margin	About 42 spines on inner margin

dactylus with nail. Endopod of 2nd thoracopod slender, with short dactylus. Endopod of 3rd–8th thoracopods with carpopropodus divided to 3 or 4 subsegments; dactylus with slender nail. Male pleopods biramous, exopod of 4th pleopod much longer than endopod, with modified seta on antepenultimate and penultimate segments. Telson cleft, without plumose setae, with spines covering all lateral margins and cleft.

Type species.—*Neobathymysis japonica*, new genus, new species.

Remarks.—*Neobathymysis* resembles *Bathymysis* Tattersall, 1907, in many morphological characters except for the eyes. In *Neobathymysis* the eyes are provided with large and well-pigmented corneas and definite eyestalks, while in *Bathymysis* the visual elements are imperfectly developed and the eyestalk is indistinct. In addition to the eyes, *Neobathymysis* differs from *Bathymysis* in the presence of the rostral projection, the elongated antennal scale, and the presence of two spines on the antennal sym- pod, vs. one in *Bathymysis*.

In agreement of generic characters *Bathymysis renoculata* Tattersall, 1951, should be transferred to *Neobathymysis*.

Neobathymysis also resembles *Australomysis* Tattersall, 1927, but distinguished from the latter genus as follows: (1) in *Neobathymysis* the lateral margins of telson lobes are parallel and have several similar-

sized spines on rounded apical margin; while in *Australomysis* the lobes narrow distally and have a long spine on each apex; (2) in *Neobathymysis* the distal endopod segment of the maxilla is expanded distally, while it is elongated in *Australomysis*. *Neobathymysis* is easily distinguished from *Iimysis*, *Nouvelia*, *Tenagomysis*, *Doxomysis*, and *Afromysis*, by the lack of a pair of plumose setae in the telson cleft.

Neobathymysis japonica, new species
Figs. 1, 2. Table 1

Bathymysis sp.—Murano, 1970:146, figs. 27–30.

Type specimens.—Holotype (NSMT-Cr 11723), male 9.7 mm; allotype (NSMT-Cr 11724), female with well-developed oostegites 9.6 mm; paratypes (NSMT-Cr 11725), 16 males (6.5–8.8 mm), 11 females (6.6–9.4); 22 May 1968, East China Sea (28°40.6'N, 126°48.6'E), 185 m, sledge net.

Other material.—1 immature female (13.5 mm), 23 Apr 1967, Tateyama Bay (about 35°N, 139°50'E), 370–380 m, sledge net. 1 adult male, 13 Apr 1968, Tateyama Bay (35°00.2'N, 139°48.0'E), 220–330 m, sledge net. 1 adult female, 3 Nov 1968, Suruga Bay (34°55.5'N, 138°37.5'E), 0–1150 m oblique tow, ORI-100 net (conical net with 1.6 m mouth diameter).

Body length.—Adult females, 7.7–10 mm; adult males, 7.3–13 mm.

Etymology.—Derived from the locality where the species was collected.

Description.—Body robust. Carapace covering laterally all thoracic somites, and in dorsal view all but 8th and part of 7th thoracic somites; produced in front into well developed, broadly triangular apex (Fig. 1A); eyes and antennular peduncles uncovered; anterolateral corner rounded.

Eyes very large, reniform, reaching distal segment of antennular peduncle, visual area very expanded. Stalk short but distinct (Fig. 1A).

Antennular peduncle of male (Fig. 1B) more robust than in female (Fig. 1C), 1st segment longer than combined length of 2nd and 3rd; a large spine placed dorsally on distal end of 3rd segment, male appendage well developed (Fig. 1B).

Antennal scale narrowly lanceolate, 6.4 times as long as broad, extending beyond distal end of antennular peduncle for almost one-third of its length, setose all round, with well-marked distal suture. Peduncle half as long as scale, with 2nd and 3rd segments about same length, 1st segment short; 2 spines on sympod, 1 at base of scale and another at base of peduncle (Fig. 1D).

Mandible like that described for *Bathymysis renoculata*. Maxillule outer lobe with 14 spines and 5 spine-like setae, inner lobe with 16 setae, 4 of which are at top end of lobe and very large (Fig. 1E). Maxilla with distal segment of endopod expanded, wider than long and bearing about 10 strong setae, of which 4 larger and stronger ones are barbed; exopod large, with 17 setae on margin (3 of them are missing) (Fig. 1F).

First thoracopod with lobes bearing strong barbed setae on basis, preischium, ischium and merus; dactylus with long and slender nail, which is about same length as carpopropodus (Fig. 1G); exopod with flagellum 9-segmented (Fig. 1H). Endopod of 2nd thoracopod slender with long distal nail; basis expanded inwards, ischium twice as long as preischium; merus elongate and

longer than carpopropodus; dactylus very short (Fig. 1I); exopod with flagellum 10-segmented (Fig. 1J). Endopod of 3rd thoracopod with carpopropodus divided into 3 subsegments by transverse sutures, 1st subsegment slightly longer than combined length of 2nd and 3rd, 3rd longer than 2nd; distal nail long and well developed; preischium short; ischium and merus about same length; dactylus shortest segment (Fig. 2A). Endopod of 4th–8th thoracopods as in that of 3rd but carpopropodus 4-subsegmented, 1st and 4th subsegments subequal in length and longer than 2nd and 3rd being also about same length (Fig. 2B). Exopod and basis of endopod of 3rd–8th thoracopods like that of 2nd. All exopods with a small blunt process on outer distal corner of basal plates (Fig. 1J).

In both sexes, 6th pleonite about 1.5 times as long as 5th pleonite.

Pleopods in male biramous; 1st with exopod 7-segmented, unsegmented endopod about equal to 1st segment of exopod in length, with well-developed quadrangular pseudobranchial lobe; basal plate bearing about 9 setae arranged longitudinally (Fig. 2C); 4th pleopod with 7-segmented endopod and 8-segmented exopod; endopod not modified, exopod nearly twice as long as endopod (Fig. 2F); 6th segment somewhat longer than 7th, with short seta and very long strong and sigmoidally-curved plumose seta on outer distal corner, 7th segment with plumose seta twice longer than its segment on distal margin, 8th segment very short, armed distally with 2 long setae of almost same length (Fig. 2G); 2nd, 3rd and 5th pleopods with endopod 7-segmented, shorter than 7-segmented exopod (Figs. 2D, E, H); 5th pleopod armed on 1st segment of endopod with process tipped with seta (Fig. 2H). Pleopods in female uniramous and unsegmented.

Endopod of uropod longer than telson, with inner margin armed with continuous row of about 40 spines from proximal side of statocyst to near apex and gradually increasing in size distally (Fig. 2I). Exopod

of uropod narrow, setose all round, slightly curved outwards, about 1.3 times as long as endopod, with blunt-end (Fig. 2J).

Telson 1.25 times as long as 6th pleonite and nearly twice as long as broad at base; cleft for 0.25 of its length, sides of cleft with about 25 short spines continuing to spines arming apex; lateral margin and apex with about 40–43 sharp spines throughout entire margin (Fig. 2K).

Remarks.—Murano (1970) described briefly this species as *Bathymysis* sp. from specimens from Tateyama Bay, central Japan. Table 1 shows the morphological differences between *Neobathymysis japonica* new genus, new species, and *N. renoculata* (Tattersall, 1951).

Bathymysis Tattersall, 1907

Bathymysis.—Tattersall, 1907:116; 1911: 53.—Tattersall & Tattersall, 1951:300–301.

Diagnosis.—Carapace short without distinct rostral projection. Eye small and subquadrangular, visual elements imperfectly developed, without definite eyestalk. Antennal scale lanceolate, short, setose all round, distal suture present. Maxilla with distal segment of endopod expanded but longer than broad. Endopod of 1st thoracopod with well-developed gnathobasic lobes on basis, preischium and ischium. Endopod of 2nd thoracopod slender, with short dactylus. Endopod of 3rd–8th thoracopods with carpopropodus 3-segmented, dactylus with spine. Male pleopods biramous and multi-segmented except unsegmented endopod of 1st; exopod of 4th pleopod with modified setae on antepenultimate and penultimate segments. Telson cleft, without plumose setae at apex of cleft, spines covering all or part of lateral margins and cleft.

Remarks.—With the establishment of a new genus, *Neobathymysis*, the original diagnosis (Tattersall 1907) is revised with addition of the present new species.

Bathymysis distincta, new species

Figs. 3, 4. Table 2

Type specimens.—Holotype (NSMT-Cr 11720), adult female 8.9 mm; allotype (NSMT-Cr 11721), adult male in ecdysis of about 7.9 mm; paratype (NSMT-Cr 11722), adult female in ecdysis about 9.1 mm; 1 Mar 1965, Sagami Bay (35°04.1'N, 139°16.9'E), about 1000 m, ORI-net in oblique tow accidentally touched sea bottom.

Other material.—1 mature male (8.8 mm), 15 Oct 1994, off Boso Peninsula (34°49.6'N, 140°39.8'E), 1762 m, sledge net.

Etymology.—From the Latin “distinct”, referring to the morphological difference from *Bathymysis helgae*.

Description.—General form robust. Carapace very short, almost 0.25 length of whole body, anterior margin rounded without rostral projection; anterolateral corner pointed; posterior margin leaving last 2 thoracic somites and part of 6th exposed in dorsal view, and laterally covering all thoracic somites and part of 1st pleonite. Abdomen about 1.5 times as long as carapace (Fig. 3A).

Eyes united to form single plate, eyeplate small and subquadrangular with median notch, without definite stalk, not reaching 2nd segment of antennular peduncle, without any kind of armature or ocular process, not pigmented at least in preserved specimens (Fig. 3B).

Antennular peduncle with 1st and 3rd segments subequal in length, 2nd segment about 0.33 length of 1st; 1st segment with outer distal corner produced anteriorly, and with several setae (Fig. 3C).

Antennal scale short, barely 3 times as long as broad, slightly extending beyond antennular peduncle, setose all round, with small terminal joint marked off by distinct suture. Antennal peduncle about same length as antennular peduncle, 3rd segment shorter than 2nd, 1st segment very short.

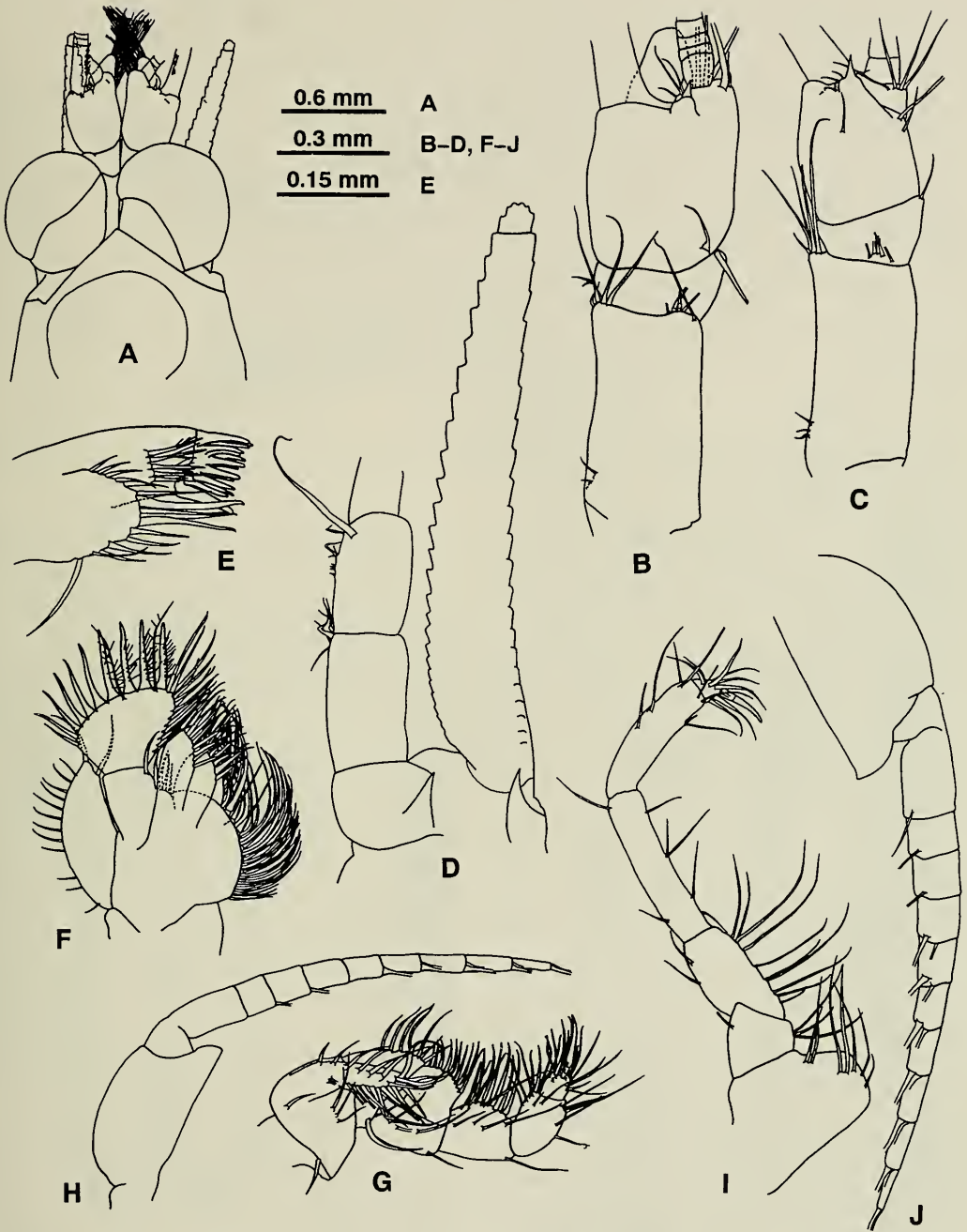


Fig. 1. *Neobathymysis japonica*, new genus, new species. F, allotype; A-E, G-H, I-J, paratypes. A. Anterior part of male in dorsal view. B. Antennular peduncle of male. C. Antennular peduncle of female. D. Antenna. E. Maxillule. F. Maxilla. G. Endopod of 1st thoracopod. H. Exopod of 1st thoracopod. I. Endopod of 2nd thoracopod. J. Exopod of 2nd thoracopod.

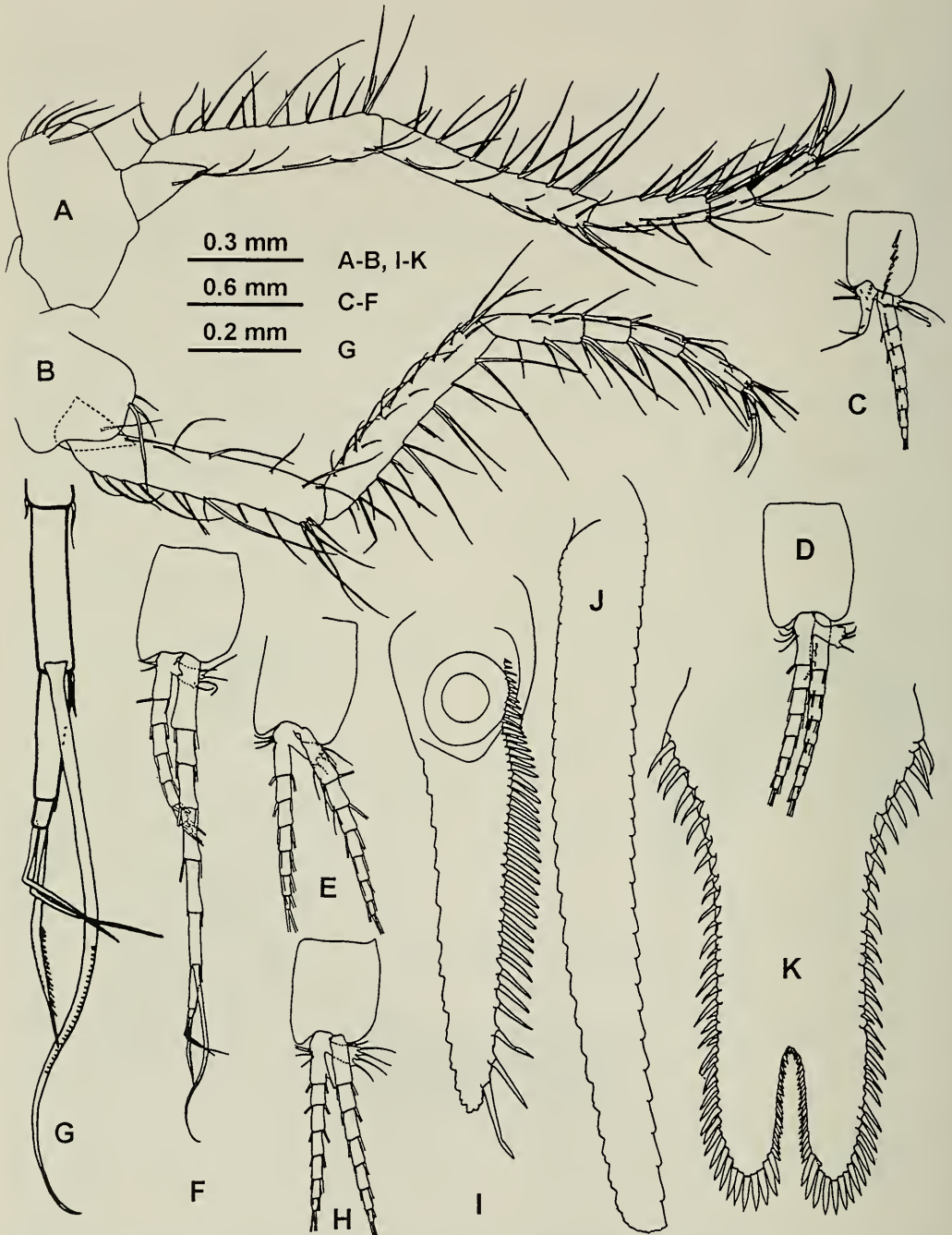


Fig. 2. *Neobathymysis japonica*, new genus, new species. A-C, I-K, paratypes; D-H, holotype. A. Endopod of 3rd thoracopod. B. Endopod of 4th thoracopod. C. 1st male pleopod. D. 2nd male pleopod. E. 3rd male pleopod. F. 4th male pleopod. G. Distal part of 4th male pleopod. H. 5th male pleopod. I. Endopod of uropod. J. Exopod of uropod. K. Telson.

Table 2.—Morphological differences among species in the revised genus *Bathymysis* Tattersall, 1907.

	<i>B. helgae</i> Tattersall, 1907	<i>B. distincta</i> , new species	<i>B. sp.</i>
Eyes	Not united	United	As in <i>B. helgae</i>
Antennal scale	About 4 times as long as broad	Almost 3 times as long as broad	As in <i>B. helgae</i>
Endopod of uropod	About 37 unbarbed spines on inner margin	About 15 unbarbed spines on inner margin	Spines barbed, number unknown due to damage
Telson	Equal in length to 6th pleonite. About twice as long as broad at base. Apical cleft 0.33 of telson length. Spines covering all lateral margins. Cleft completely covered with spines	1.3 times as long as 6th pleonite. Slightly less than twice as long as broad at base. Apical cleft 0.25 of telson length. Spines covering distal 0.6 of lateral margins. Cleft spines covering all except small distal portion	As in <i>B. helgae</i> except apical cleft which is 0.25 of telson length

Blunt process on distal inner corner of sympod (Fig. 3D).

Maxillule as in *Bathymysis helgae* (Fig. 3E). Maxilla damaged but resembling that of *Bathymysis helgae*, distal segment of endopod expanded and large exopod (Fig. 3F).

Most thoracopods missing except male 1st endopod and 4th–7th exopods, and female 6th–8th exopods. Endopod of 1st thoracopod as in *Bathymysis helgae*, merus expanded and bearing strong barbed setae (Fig. 4A). Eighth thoracopod with flagellum of exopod 8-segmented, endopod damaged, penis tubular and very long, slightly shorter than exopod, bearing slender seta on its distal end (Fig. 4B).

Sixth abdominal somite about twice as long as 5th (Fig. 3A).

Male pleopods missing except for unsegmented endopod of 1st (Fig. 4C).

Endopod of uropod reaching slightly beyond apical spines of telson; inner margin armed with about 15 spines from statocyst region to near apex, spines become progressively longer distally, intervals between them gradually growing also distally (Fig. 4D). Exopod of uropod almost 1.3 times as long as telson, inner and outer margins straight (Fig. 4E).

Telson about 1.3 times longer than 6th

pleonite, less than twice as long as broadest basal part, with 10–13 spines on distal 0.6 of lateral margin; spines moderately increasing in length from proximal to distal part. Apical cleft occupying 0.25 of total length of telson, with both sides nearly parallel, without plumose setae and bearing about 14 small spines on each side covering all except small distal portion. Apical lobes with slightly truncate distal margin with 4 large spines each (Fig. 4F).

Remarks.—The telson of one male specimen (Fig. 4G) collected from deep-sea floor at one longitude degree east from the type locality, differs slightly from that of holotype (Fig. 4F) in: (1) small spines covering completely the apical cleft in this specimen, while a small distal portion of apical cleft uncovered in the holotype and (2) sides of cleft divergent distally in this male, but nearly parallel in the holotype. This specimen is in rather bad condition, so we tentatively identify it with *Bathymysis distincta*. Morphological dissimilarities between *Bathymysis distincta* and *B. helgae* are shown in Table 2.

Bathymysis sp.

Fig. 5. Table 2

Material.—1 badly damaged adult male of about 12.2 mm; 25 Oct 1964, Sagami

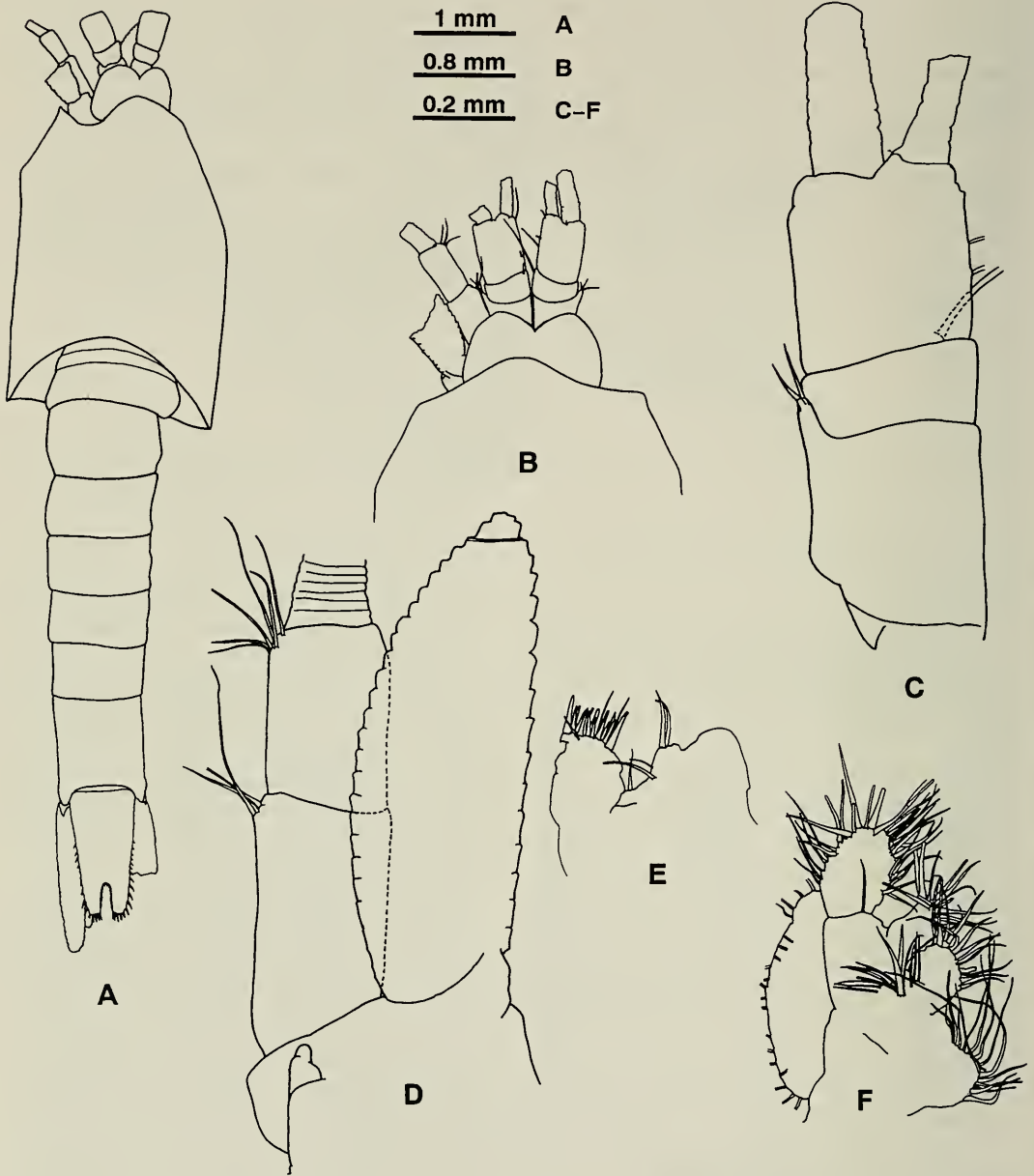


Fig. 3. *Bathymysis distincta*, new species. A-C, holotype; D-F, allotype. A. Female in dorsal view. B. Anterior part of female in dorsal view. C. Antennular peduncle. D. Antenna. E. Maxillule. F. Maxilla.

Bay ($35^{\circ}05.4'N$, $139^{\circ}17.1'E$), about 1000 m, ORI-net in oblique tow accidentally touched sea bottom.

Description.—Carapace, eye and antennular peduncle as in *Bathymysis helgae*.

Antennal scale short, narrowly lanceolate, about 4 times as long as broad, setose

all round, with small terminal joint marked off by distinct suture, peduncle broken. Bluntly process on distal inner corner of sympod (Fig. 5A).

Maxillule and maxilla as in *Bathymysis helgae*.

First and 2nd thoracopods as in *Bathy-*

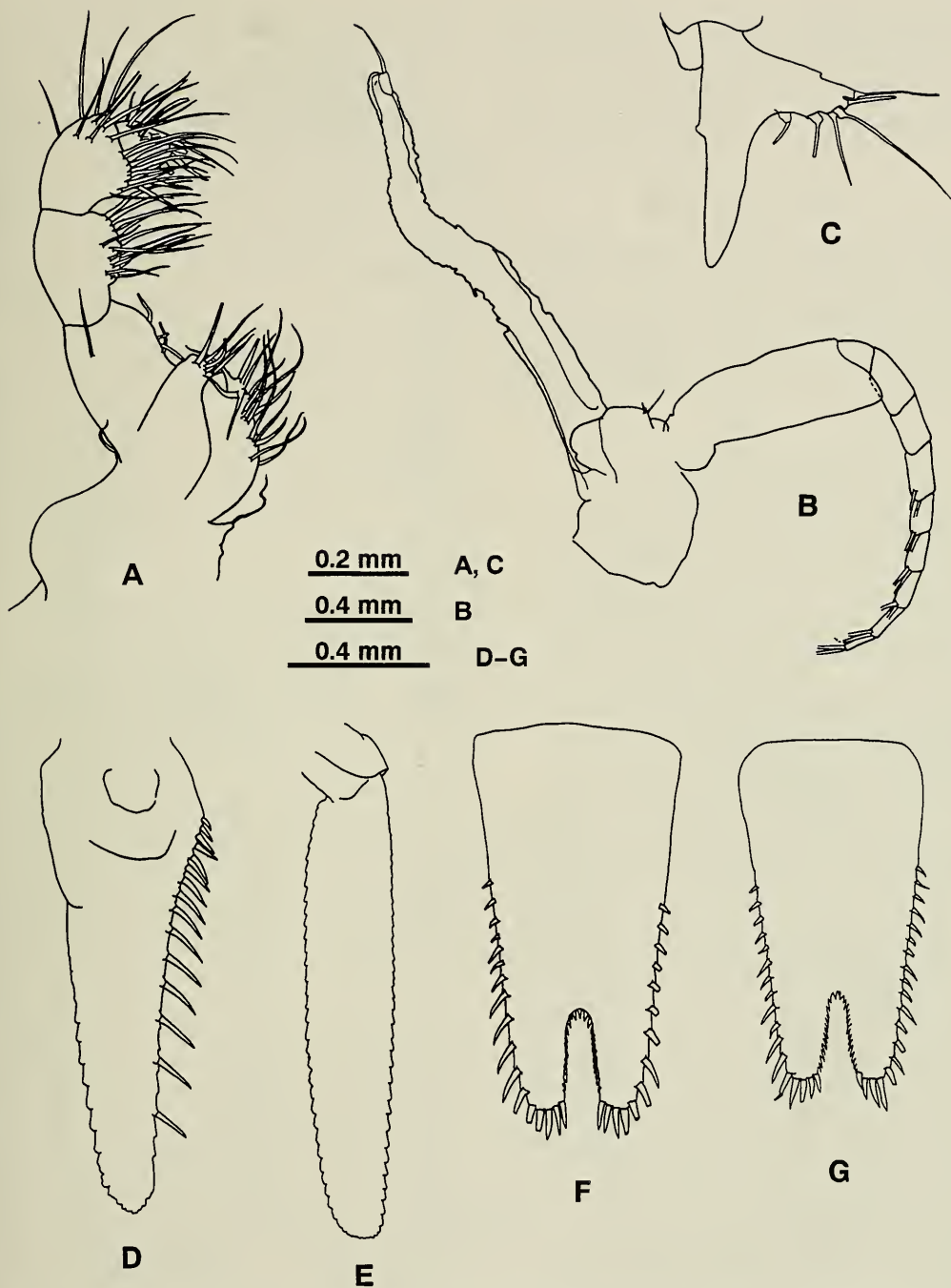


Fig. 4. *Bathymysis distincta*, new species. A-C, allotype; D-F, holotype. A. Endopod of 1st thoracopod. B. 8th thoracopod with penis and exopod, endopod absent. C. 1st male pleopod, exopod absent. D. Endopod of uropod. E. Exopod of uropod. F-G, Telson.

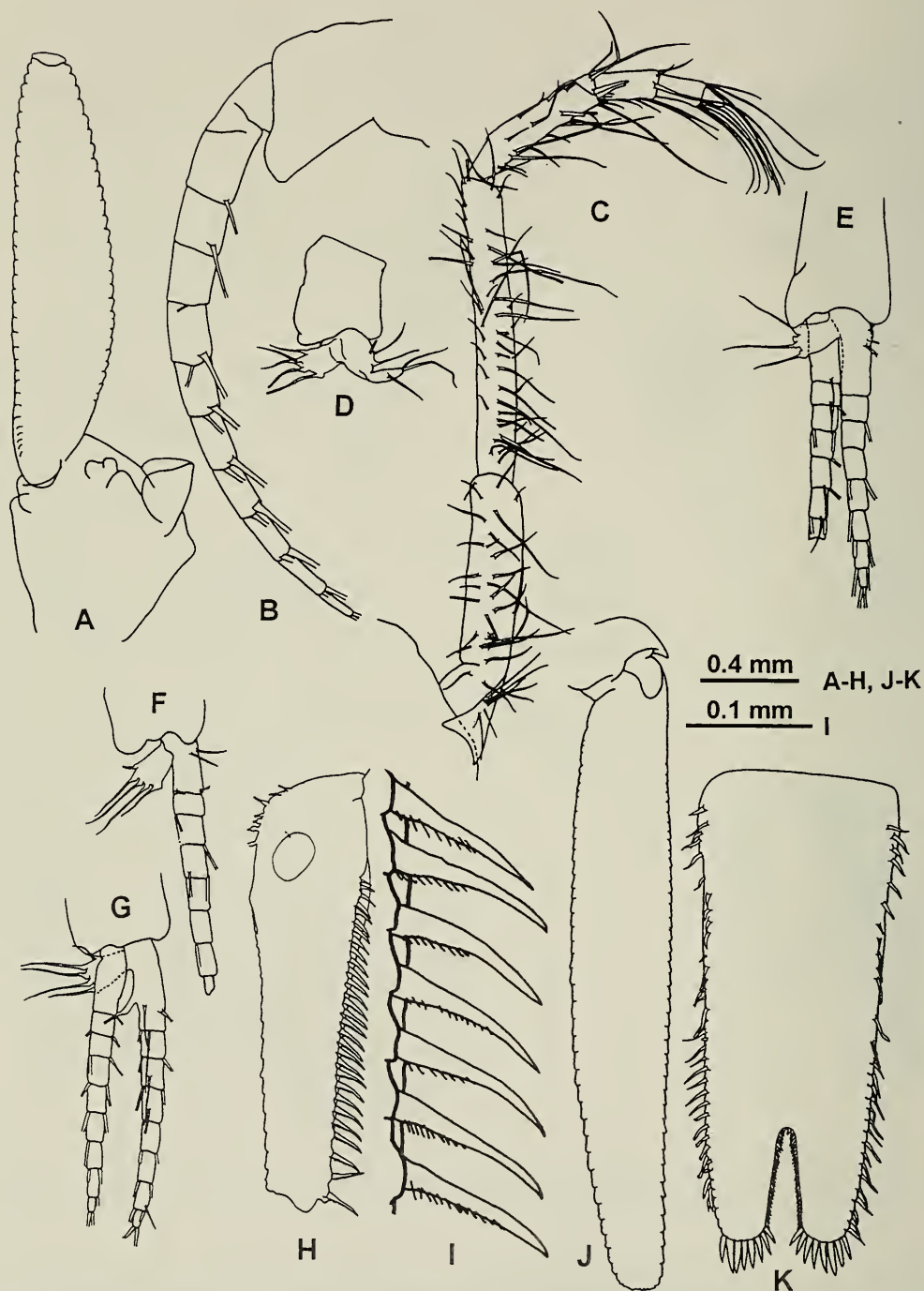


Fig. 5. *Bathymysis* sp. A. Antenna, apex folded just on the distinct suture. B. Exopod of 4th thoracopod. C. Endopod of 4th thoracopod. D. 1st male pleopod, exopod absent. E. 2nd male pleopod, broken exopod. F. 4th male pleopod, exopod absent and broken endopod. G. 5th male pleopod. H. Endopod of uropod, broken distal part. I. Spines on endopod of uropod. J. Exopod of uropod. K. Telson.

mysis helgae. Fourth and 5th thoracopods slender and long, exopod well developed (Fig. 5B), endopod with carpopropodus divided into 3 subsegments by transverse sutures; 1st subsegment longer than combined length of remaining subsegments, 2nd longer than 3rd; distal nail long and slender, preischium short, merus longer than ischium, dactylus shortest (Fig. 5C). Other thoracopods damaged.

Male pleopods biramous. First with unsegmented endopod, exopod missing (Fig. 5D); 2nd with endopod 8-segmented, distal part of exopod broken (Fig. 5E); 4th with broken endopod and exopod missing (Fig. 5F); 5th with 8-segmented endopod slightly longer than 9-segmented exopod and bearing digitiform process on 1st segment (Fig. 5G).

Endopod of uropod damaged distally, inner margin armed with continuous row of barbed spines (Figs. 5H, I). Exopod of uropod with convex inner margin and straight outer margin (Fig. 5J) about 1.3 times longer than telson.

Telson as long as 6th pleonite, about twice as long as broad at base, with about 40–46 spines throughout each lateral margin and apex. Cleft occupying 0.25 of telson length, without plumose setae and bearing about 30 small spines covering all of each side. Sides of cleft somewhat divergent distally (Fig. 5K).

Remarks.—The present specimen, although damaged, closely resembles *Bathymysis helgae* in the carapace, peculiar eyes, antennal scale, maxilla, thoracopods, pleopods and exopod of uropod. Nevertheless, two differences are present between *Bathymysis helgae*: (1) the endopod of uropod has unbarbed spines in *B. helgae* whereas in *Bathymysis* sp. the spines are barbed; (2) the telson of *B. helgae* has an apical cleft 0.33 of telson length instead of 0.25 in

Bathymysis sp., which suggests that the present male is specifically distinct from *B. helgae*. Morphological differences among *Bathymysis helgae*, *B. distincta*, and *Bathymysis* sp. are shown in Table 2.

Acknowledgments

MRB wishes to extend his most sincere thanks to the Ministry of Education, Science, Sports and Culture of Japan for granting to him the opportunity, by means of a fellowship, of carrying out the present study.

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