

A Systematic Study on the Genus *Anisomysis* (Crustacea: Mysida: Mysidae), with Descriptions of Six New Species

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Abstract Systematic study on the genus *Anisomysis* is dealt with on the basis of 21 species in our possession. A new subgenus and six new species are established. The new subgenus *Pseudanisomysis* is distinctly different from the other two subgenera, *Paranisomysis* and *Anisomysis*, in the eye cornea divided into two portions, the second antennular peduncle segment provided with a finger-like process, and the distal spines of the telson armed with a pair of small blunt processes at the base. Six new species are distinguished from allied species as follows: *Anisomysis* (*Paranisomysis*) *omorii* n. sp. by the telson with a U-shaped posterior cleft without spines in the anterior half, *A.* (*Paranisomysis*) *parvisinuosa* n. sp. by the telson having both a shallow lateral constriction and a shallow posterior sinus, *A.* (*Paranisomysis*) *modestiangusta* n. sp. by the rostrum with broadly rounded frontal margin and the telson armed with six pairs of spines on the posterior margin, *A.* (*Anisomysis*) *rotunda* n. sp. by the rostrum with broadly rounded frontal margin and the shape and armature of the telson, *A.* (*Anisomysis*) *maldivensis* n. sp. by the triangular rostrum and the exopod of the fourth pleopod of the male with the second segment less than half as long as the third segment, and *A.* (*Anisomysis*) *parvispina* n. sp. by the length ratio of three exopod segments of the fourth male pleopod and the minute marginal spines of the telson. Keys to the subgenus and to the species are given.

Key words: Mysidae, *Anisomysis*, taxonomy, new species

Introduction

The genus *Anisomysis* was established by Hansen (1910) for *Anisomysis laticauda* collected from Laiwui, Obi Island, Indonesia, during the Siboga Expedition. Nakazawa (1910) added two Japanese species, *A. ijimai* and *A. mixta*, to this genus by reason of the close resemblance in the fourth male pleopod, in spite of a noticeable difference in the telson. Tattersall (1912) also placed his new species, *A. bifurcata*, collected from Chagos Islands and Farquhar Island, in this genus by agreement in main features exclusive of the carpopropodus of thoracic limbs and the telson.

On the other hand, Hansen (1912) instituted *Cryptomysis lamellicauda* for a single adult female collected from Fiji, but this genus was can-

celed by Zimmer (1915a, b) as a synonym of *Anisomysis*, because of the close resemblance in the telson to *A. ijimai*. The genus *Kreagromysis*, which was created by Illig (1913) for *K. megalops* obtained near the north tip of Sumatra, was also synonymized to *Anisomysis* by Tattersall (1921), although Illig (1930) used still the genus *Kreagromysis* as a member of the tribe Leptomysini in his “Tiefsee-Expedition”. These changes of generic names have been accepted by later scientists. Recently, Murano (1995a) transferred *Carnegieomysis xenops* Tattersall, 1943, to this genus because his specimens collected from neighbouring waters of the type locality of *C. xenops* have been provided with characters of the genus *Anisomysis*, especially in the fourth pleopod of the male. Nowadays, mysidacean taxonomists seem to have a common understanding that

the genus *Anisomysis* is primarily characterized by the feature of the male pleopod.

For recent 40 years, the genus *Anisomysis* was largely expanded due to studies by Ii (1964), Nouvel (1967, 1973), Băcescu (1973a, b, 1975), Pillai (1973), Ledoyer (1974), Panampunnayil (1981, 1984, 1993), Liu & Wang (1983), Murano (1983, 1987, 1990, 1994, 1995a, b), Wang (1989), Wang & Liu (1994) and Fukuoka & Murano (1997). Currently, the genus contains as many species as 45, all of them are known from tropical and subtropical regions of the Indian Ocean and the western and central Pacific Ocean.

Băcescu (1973b) divided *Anisomysis* into two subgenera by main reason of the difference in the mandibular palp, the subgenus *Paranisomysis* having the mandibular palp armed with prominent triangular processes on the mesial margin of the second segment, and the subgenus *Anisomysis* not having such triangular processes. Furthermore, he (1992) proposed the establishment of the subgenus *Javanisomysis* which was characterized by the exopod of the fourth male pleopod being not divided into segments. His proposal, however, cannot be accepted because it does not agree with the existing diagnosis of *Anisomysis* that the exopod is divided into three segments. *Javanisomysis* should be recognized as a valid genus.

Müller (1993) listed *Anisomysis bacescui* Pillai, 1976, in his catalogue. However, we failed to get the reference that this species has been described, in spite of our devotion of efforts. In the present paper, *A. bacescui* is excluded from discussions.

In this paper, the systematic study on *Anisomysis*, including the establishment of one new subgenus and six new species, are given on the basis of 21 species in our possession.

Materials and Methods

Specimens examined in this study consist of those collected by the present authors, those donated for our study, and those stored in laboratories. Major parts of these specimens were cap-

tured visually with hand nets during SCUBA diving in rocky shores and coral reefs in addition to those collected by tows of various types of plankton nets in coasts and open sea areas. Details are inscribed in the material paragraph of each species.

Body length was measured from the anterior end of the rostrum to the posterior end of the telson under the stretched condition of the body. Illustrations were drawn with the aid of a camera lucida. In illustrations of some appendages, especially in the antennal scale and uropod, marginal setae were omitted.

All the specimens examined are lodged in the National Science Museum, Tokyo (NSMT).

Systematics

Order Mysida Boas, 1883

Family Mysidae Dana, 1850

Subfamily Mysinae Hansen, 1910

Tribe Mysini Hansen, 1910

Genus *Anisomysis* Hansen, 1910

Anisomysis Hansen, 1910: 74; Nakazawa, 1910: 252; Ii, 1964: 548–550; Liu & Wang, 1986: 198; Liu & Wang, 2000: 265.

Cryptomysis Hansen, 1912: 203–204.

Kreagromysis Illig, 1913: 271.

Carnegieomysis Tattersall, 1943: 68.

Type species. — *Anisomysis laticauda* Hansen, 1910.

Diagnosis. — Eye large, cornea globular or divided into two portions.

Antennular peduncle rather small, more robust in male than in female.

Antennal scale narrowly lanceolate with rounded apex, setose all round.

Labrum obtuse in front.

Mandibular palp with second segment furnished along mesial margin with normal setae or with peculiar triangular processes with tiny sub-terminal seta.

Endopods of third to eighth thoracic limbs with carpopropodus undivided or divided into 2 subsegments.

Female with 2 pairs of oostegites.

First, second, third and fifth pleopods of male and all pleopods of female reduced to small unsegmented lobe. Fourth pleopod of male biramous, endopod rudimentary, exopod usually extremely elongated, 3-segmented, terminating in 2 setae of different form, outer seta slender and naked, inner seta stout and barbed.

Uropod slender; exopod more than twice as long as telson, endopod tapering, nearly equal to or shorter than exopod, usually unarmed with spines in statocyst region.

Telson variable, without apical plumose setae.

Remarks. — The genus *Anisomysis* is primarily characterized by the fourth pleopod of the male and is distinguished distinctly by it from other genera of the family Mysidae.

Băcescu (1973b) divided the genus *Anisomysis* into two subgenera, *Paranisomysis* and *Anisomysis*. The former subgenus is composed of species having the cylindrical second segment of the mandibular palp armed with triangular processes, and the latter subgenus contains the remaining species of the genus *Anisomysis*. The subgenus *Anisomysis*, however, is still heterogeneous, and should be divided into two groups by the general form of the body and by the structure of the eye and antennular peduncle. We propose the establishment of a new subgenus, *Pseudanisomysis*. As a result, the genus *Anisomysis* is classified into three subgenera, *Anisomysis*, *Paranisomysis* and *Pseudanisomysis*.

Key to the subgenus of the genus *Anisomysis*

- 1a. Body rather strongly built, gibbous; abdomen flexed ventrally; eye large, with cornea divided into two parts by groove.
.....*Pseudanisomysis* new subgenus
- 1b. Body slender, straight; eye globular, expanded.2
- 2a. Mandibular palp with second segment armed with triangular processes on mesial margin.*Paranisomysis* Băcescu, 1973
- 2b. Mandibular palp with second segment armed with normal setae on both margins. ...

.....*Anisomysis* Băcescu 1973

Subgenus *Pseudanisomysis* new subgenus

Type species. — *Anisomysis bipartoculata* Ii, 1964.

Diagnosis. — Body rather strongly built, gibbous, hispid or not; abdomen flexed ventrally.

Eye very large, cornea separated into two portions by groove.

Second segment of antennular peduncle expanded dorsally and posteriorly, furnished on dorsal surface with finger-like process tipped with several setae.

Second segment of mandibular palp without triangular processes on mesial margin.

Telson compressed laterally or not; posterior margin rounded or truncate, armed with spines with pair of small blunt processes at base.

Remarks. — The subgenus *Pseudanisomysis* is distinguished at once from the subgenera *Paranisomysis* and *Anisomysis* by the flexed body and the eye cornea divided into two parts. It comprises four species, *A. bipartoculata* Ii, 1964, *A. tattersallae* Pillai, 1973, *A. hispida* Pillai, 1973 and *A. xenops* (Tattersall, 1943).

Ecologically, these species seem to be different from those of the other two subgenera. Collection records indicate that these species are oceanic forms. In open sea they are collected from the water column including the surface and on or just above the sea floor at certain depths, while those of the other two subgenera are coastal forms.

Key to the species of the subgenus

Pseudanisomysis

- 1a. Body not hispid; telson without or with slight lateral compression.2
- 1b. Body hispid; telson with deep lateral compression.3
- 2a. Posterior margin of telson arched, with 4-8 spines.*A. bipartoculata* Ii, 1964
- 2b. Posterior margin of telson not arched, with 2 spines.*A. tattersallae* Pillai, 1973
- 3a. Posterior margin of telson arched, with 8 spines.*A. hispida* Pillai, 1973

- 3b. Posterior margin of telson transverse, with 4–6 spines.*A. xenops* (Tattersall, 1943)

Anisomysis (Pseudanisomysis)

bipartocolata Li, 1964

Anisomysis bipartocolata Li, 1964: 554–558, figs. 146, 147; Mauchline & Murano, 1977: 47 (catalogue); Băcescu, 1973b: 178 (key); Panampunnayil, 1984, 949–952, figs. 40–46; Müller, 1993: 202 (catalogue); Wang & Liu, 1994: 106–108, fig. 19; 1997: 219; Liu & Wang, 2000: 266–268, fig. 101.

Material. — [South China Sea] One adult male (4.5 mm) (NSMT-Cr 14316); 04°03.2'N 106°09.4'E, 85–88 m, plankton net installed in mouth of 3-m beam trawl, 9 July 1972, collected by M. Murano. Nine adult males (4.1–4.8 mm) (NSMT-Cr 14317); 06°51.6'N 108°48.1'E, 132–137 m, plankton net installed in mouth of 3-m beam trawl, 11 July 1972, collected by M. Murano. One adult female (3.6 mm) (NSMT-Cr 14319); 04°59.3'N 107°28.9'E, 0–50 m oblique tow with ORI net, 27 February 1977, collected by M. Murano. One adult male (3.6 mm) (NSMT-Cr 14318); 09°02.3'N 110°27.7'E, 0–750 m oblique tow with ORI net, 1 March 1977, collected by M. Murano.

[Timor Sea] One adult male (4.3 mm), 4 adult females (4.0–4.7 mm) and 2 immature males (3.4, 2.5 mm) (NSMT-Cr 14315); 12°36.7'S 124°35.2'E, 74–78 m, plankton net installed in mouth of 3-m beam trawl, 25–26 June 1972, collected by M. Murano.

Body length. — Adult male, 3.6–4.8 mm; adult female, 3.6–4.7 mm.

Remarks. — *Anisomysis (Pseudanisomysis) bipartocolata* is distinguished from the other species of the subgenus by the smooth body and the shape and armature of the telson.

Hitherto, this species has been captured with plankton nets towed in water column (Li, 1964; Panampunnayil, 1984). In the present collections, the majority of the specimens from the South China Sea and the Timor Sea were obtained with a small-sized plankton net (mouth opening, about 0.1 m²) installed in the mouth of a 3-m beam trawl. This net was not provided with a closing

device, so that exact depths at which the specimens were collected could not be known. It is supposed, however, that they were collected from on or just above the sea floor, because only a few specimens were collected by oblique hauls with the ORI-net (a conical net with mouth opening of 2 m² and filtering part of 6 m long) practiced in neighboring waters of trawling spots.

Distribution. — Known from the South China Sea, the Yellow Sea (Li, 1964), SW of Australia (Panampunnayil, 1984) and the Timor Sea. The present occurrences fall within the known distribution range of this species.

Anisomysis (Pseudanisomysis) hispida

Pillai, 1973

(Fig. 1)

Anisomysis hispida Pillai, 1973: 110–115, figs. 62, 63; Mauchline & Murano, 1977: 47 (catalogue); Müller, 1993: 203 (catalogue); Panampunnayil, 2002: 383–384, fig. 3A–G.

Material. — [Philippine Sea] One adult female (3.7 mm) (NSMT-Cr 14332); 09°03.0'N 129°53.3'E, 0–1,550 m oblique tow with ORI net at night, 28 October 1981, collected by M. Murano.

Remarks. — The present specimen agrees morphologically with the original description of Pillai (1973) in main characteristics such as the eye with the cornea divided into two parts, the telson (Fig. 1) suddenly broadened behind the lateral constriction and the posterior margin of the telson furnished with 8 spines. Slight differences, however, are found in the body surface and the telson. Microscopic scales like spines cover almost the whole body surface in Pillai's specimens, whereas these are only found on the surface of the abdomen in the present specimen. It is supposed that these microscopic scales have fallen off through the collecting process. The telson in the present specimen is armed on the lateral margin with 4 spines as against 5 in Pillai's specimens. The difference may fall within a range of variation.

Distribution. — Hitherto, this species has been

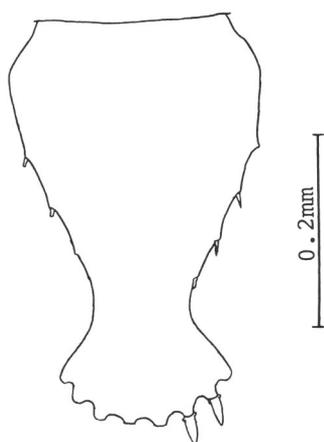


Fig. 1. *Anisomysis* (*Pseudanisomysis*) *hispida* Pillai, 1973. Telson.

known from the Andaman Sea (Pillai, 1973; Panampunnayil, 2002), the Bay of Bengal and the central and eastern regions of the Indian Ocean (Pillai, 1973). The present occurrence, therefore, is the first record from the Pacific Ocean, and largely extends the distribution range of this species eastward.

Subgenus *Paranisomysis* Băcescu, 1973

Paranisomysis Băcescu, 1973b: 178 (key).

Type species. — *Anisomysis ijimai* Nakazawa, 1910.

Diagnosis. — Body straight, slender, not hispid.

Cornea of eye large, globular, not divided into two portions.

Antennular peduncle having neither expanded lobe nor finger-like process on second segment.

Second segment of mandibular palp cylindrical, armed on mesial margin with prominent triangular processes with subterminal seta.

Telson variable.

Remarks. — Morphological differences between the subgenus *Anisomysis* are hardly observed except for the mandibular palp.

Murano (1983) classified *Anisomysis enewetakensis* into the subgenus *Paranisomysis*, because the second segment of the mandibular palp was armed with tiny processes on the mesial

margin. However, these are not so prominent and do not seem to be identical with those of *Paranisomysis* species. Accordingly, *A. enewetakensis* should be transferred to the subgenus *Anisomysis*.

Paranisomysis comprises 14 species and 1 subspecies, including three new species described below.

Key to the species of the subgenus

Paranisomysis

- 1a. Telson with lateral constriction, posterior part behind constriction more or less rounded or triangular. 2
- 1b. Telson with both lateral constriction and posterior cleft or sinus. 9
- 2a. Constricted part of telson about 1/3 as broad as distal lobe of telson.
.....*A. constricta* Murano, 1983
- 2b. Constricted part of telson more than half as broad as distal lobe of telson. 3
- 3a. Lateral constriction of telson shallow, ratio of narrowest part to maximum width of distal lobe being about 0.8.
.....*A. ryukyuensis* Murano, 1990
- 3b. Lateral constriction of telson deep, ratio of narrowest part to maximum width of distal lobe being 0.5 to 0.7.4
- 4a. Distal lobe of telson as long as broad.
.....*A. ijimai estafriana* Băcescu, 1973
- 4b. Distal lobe of telson wider than long.5
- 5a. Posterior margin of telson rounded.6
- 5b. Posterior margin of telson truncate or slightly concave.7
- 6a. Rostrum prolonged with pointed apex; antennal scale about 10 times as long as broad.*A. acuminata* Murano, 1990
- 6b. Rostrum low triangular with rounded apex; antennal scale 7 times as long as broad.*A. ijimai* Nakazawa, 1910
- 7a. Second segment of mandibular palp with about 13 denticles along mesial margin; posterior margin of telson nearly straight. .
.....*A. lamellicauda* (Hansen, 1912)
- 7b. Second segment of mandibular palp with

- 7–9 denticles along mesial margin; posterior margin of telson rather concave.8
- 8a. Proximal part anterior to constriction of telson longer than broad, with 7 spines on each lateral margin.
.....*A. marisrubri* Băcescu, 1973
- 8b. Proximal part anterior to constriction of telson as long as broad, with 4 spines on each lateral margin.
.....*A. ohtsukai* Murano, 1994
- 9a. Posterior cleft of telson U-shaped with anterior half unarmed.
.....*A. omorii* new species
- 9b. Posterior cleft or sinus of telson without such unarmed part.10
- 10a. Constricted part of telson more than half as broad as maximum width at base.11
- 10b. Constricted part of telson less than half as broad as maximum width at base.13
- 11a. Posterior sinus of telson very shallow, less than 1/10 of telson length.
.....*A. modestiangusta* new species
- 11b. Posterior cleft of telson deep, 1/4 to 1/5 of telson length.12
- 12a. Spines arming telson cleft pointed distally.
.....*A. laccadivei* Panampunnayil, 1981
- 12b. Spines arming telson cleft rounded and flattened distally.
.....*A. hosakai* Murano, 1990
- 13a. Antennal scale about 10 times as long as broad; fourth pleopod of male with second segment longer than third segment; lateral constriction of telson very deep, narrowest part 1/4 as broad as at base.
.....*A. gracilis* Panampunnayil, 1984
- 13b. Antennal scale about 7 times as long as broad; fourth pleopod of male with second segment shorter than third segment; lateral constriction of telson not so deep, narrowest part about half as broad as at base.14
- 14a. Rostrum triangular with narrowly rounded apex; telson cleft deep, 0.25 of telson length; spines arming telson cleft flattened and rounded apically.
.....*A. spatulispina* Murano, 1995
- 14b. Rostrum low triangular with broadly rounded apex; telson cleft shallow, 0.12 of telson length; spines arming telson cleft not flattened and rounded apically.
.....*A. parvisinuosa* new species

Anisomysis (Paranisomysis) ryukuensis

Murano, 1990

Anisomysis ryukuensis Murano, 1990: 205–207, fig. 14; Müller, 1993: 206 (catalogue); Fukuoka *et al.*, 2002: 42–43.

Material. — [Okinawa, Japan] One juvenile (NSMT-Cr 14721); Port Aka, Akajima Is., hand net under electric light, 23 June 1990, collected by M. Murano. One adult male (5.1 mm), 3 adult females (5.1–5.3 mm), 2 immature males (4.7 mm) and 6 immature females (up to 5.2 mm) (NSMT-Cr 14722); Port Aka, Akajima Is., hand net under electric light, 15 March 1991, collected by M. Murano. One adult male (5.8 mm), 3 gravid females (5.9–6.5 mm), 4 adult females (5.9–7.1 mm) and 1 immature male (5.3 mm) (NSMT-Cr 14723); Maenohama, Akajima Is., hand net during SCUBA diving, surface, 3 December 1990.

Body length. — Adult male, 4.9–7.2 mm; adult female, 4.6–8.6 mm.

Remarks. — This species is distinguished from the other species of the subgenus by the telson having the shallow lateral constriction and the rounded posterior margin. In the shape of the telson, this species rather resembles *Anisomysis (Anisomysis) enewetakensis* Murano, 1983, but clearly differs from the latter by the mandibular palp with prominent denticles on the mesial margin of the second segment.

Distribution. — Hitherto, this species has been known from Okinawa (Murano, 1990), Manazuru and Hachijo Is., Japan (Fukuoka *et al.*, 2002).

Anisomysis (Paranisomysis) acuminata

Murano, 1990

Anisomysis acuminata Murano, 1990: 202–205, fig. 13; Müller, 1993: 201 (catalogue).

Material. — [Okinawa, Japan] One male

(damaged), 3 gravid females (4.3–5.4 mm) and 2 adult females (5.0, 5.4 mm) (NSMT-Cr 14724); Agonohama, Akajima Is., 2 August 1990, collected by M. Murano.

Body length. — Adult male, 5.3–6.0 mm; adult female, 4.3–7.2 mm.

Remarks. — *Anisomysis* (*Paranisomysis*) *acuminata* is easily distinguished from the other species of the subgenus by a combination of the prolonged rostrum, the slender antennal scale, and the telson with a deep lateral constriction and a rounded distal lobe.

Distribution. — Only known from Okinawa, southwestern Japan (Murano, 1990).

Anisomysis (*Paranisomysis*) *ijimai*

Nakazawa, 1910

(Fig. 2)

Anisomysis ijimai Nakazawa, 1910: 252–253, pl. 8, figs. 5, 14, 27, 33; Tattersall, 1921: 413–414; Illig, 1930: 598 (key); Gordan, 1957: 340 (catalogue); Ii, 1964: 551–554; fig. 145; Mauchlin & Murano, 1977: 47 (catalogue); Valbonesi & Murano, 1980: 223, fig. 7; Müller, 1993: 203 (catalogue); Yoo, 1995: 287–288; Liu & Wang, 2000: 268–269, fig. 102.

Material. — [Mainland of Japan] Abundant males (4.9–6.1 mm) and females (5.8–7.1 mm) (NSMT-Cr 14707); Heda Inlet, Shizuoka, surface tow at night, 23 June 1973, donated by T. Ishimaru. One immature male (3.7 mm) and 1 immature female (4.6 mm) (NSMT-Cr 14708); Mera, Shizuoka, hand net under electric light, 25 July 1973, collected by M. Murano. Five juveniles (NSMT-Cr 14709); Nomo, Nagasaki, 15 m, 30 May 1975, collected by S. Inoue and T. Takita. Eight adult males (3.7–5.4 mm), 1 adult female (damaged) and 3 immature males (NSMT-Cr 14710); Omura Bay, Nagasaki, date unknown, collected by M. Azuma. One adult male (6.1 mm) and 1 immature female (4.6 mm) (NSMT-Cr 14711); Shijiki Bay, Nagasaki, date unknown, collected by M. Azuma. One immature male (4.5 mm) and 2 immature females (4.2, 4.7 mm) (NSMT-Cr 14712); Kozu Is., Izu Islands, 20 August 1974, collected by T. Muto. One male

(5.5 mm) and 1 female (6.6 mm) (NSMT-Cr 14544); Manazuru, Kanagawa, 0.3 m, sledge net, 16 April 1991, collected by K. Fukuoka. Thirteen males (5.1–6.0 mm) and 11 females (4.8–5.7 mm) (NSMT-Cr 14545); Banda, Chiba, 8 m, sledge net, 13 July 1994, collected by K. Fukuoka. Ten males (5.3–6.0 mm) and 5 females (5.0–6.0 mm) (NSMT-Cr 14546); Shimane, keta net (a kind of small-sized trawl net), 12 September 1996, collected by K. Sota.

Body length. — Male and female, up to 8.6 mm.

Remarks. — This species is distinguished from allied species and subspecies of the subgenus by the low triangular rostrum with an obtuse apex (Fig. 2A), the relatively short antennal scale (Fig. 2A, B), and the telson with a relatively deep lateral constriction and a rounded distal lobe (Fig. 2E).

Distribution. — *Anisomysis* (*Paranisomysis*) *ijimai* is mainly known from warm-water coastal regions around the mainland of Japan (Nakazawa, 1910; Tattersall, 1921; Ii, 1964; Valbonesi & Murano, 1980). In these regions this species is one of the most abundant mysid species. In the outside of Japan, it has been recorded from Korea (Yoo, 1995) and Daya Bay, South China (about 22°40'N 114°40'E) (Liu & Wang, 2000).

Anisomysis (*Paranisomysis*) *omorii* new species

(Fig. 3)

Type series. — Holotype (NSMT-Cr 14718), adult female (4.3 mm); allotype (NSMT-Cr 14719), adult male (damaged); paratypes (NSMT-Cr 14720), 1 adult male (damaged) and 2 adult females (4.5, 5.0 mm); Ribbon Is., Great Barrier Reef, 15°00'S, 146°42'E, hand net during SCUBA diving, 24 August 1986, collected by M. Omori.

Description. — Carapace (Fig. 3A) produced anteriorly in low triangular rostral plate with obtusely pointed apex and convex lateral margins, not extending to base of antennular peduncles; anterolateral corner rounded; posterior margin emarginate, leaving last thoracic somite exposed

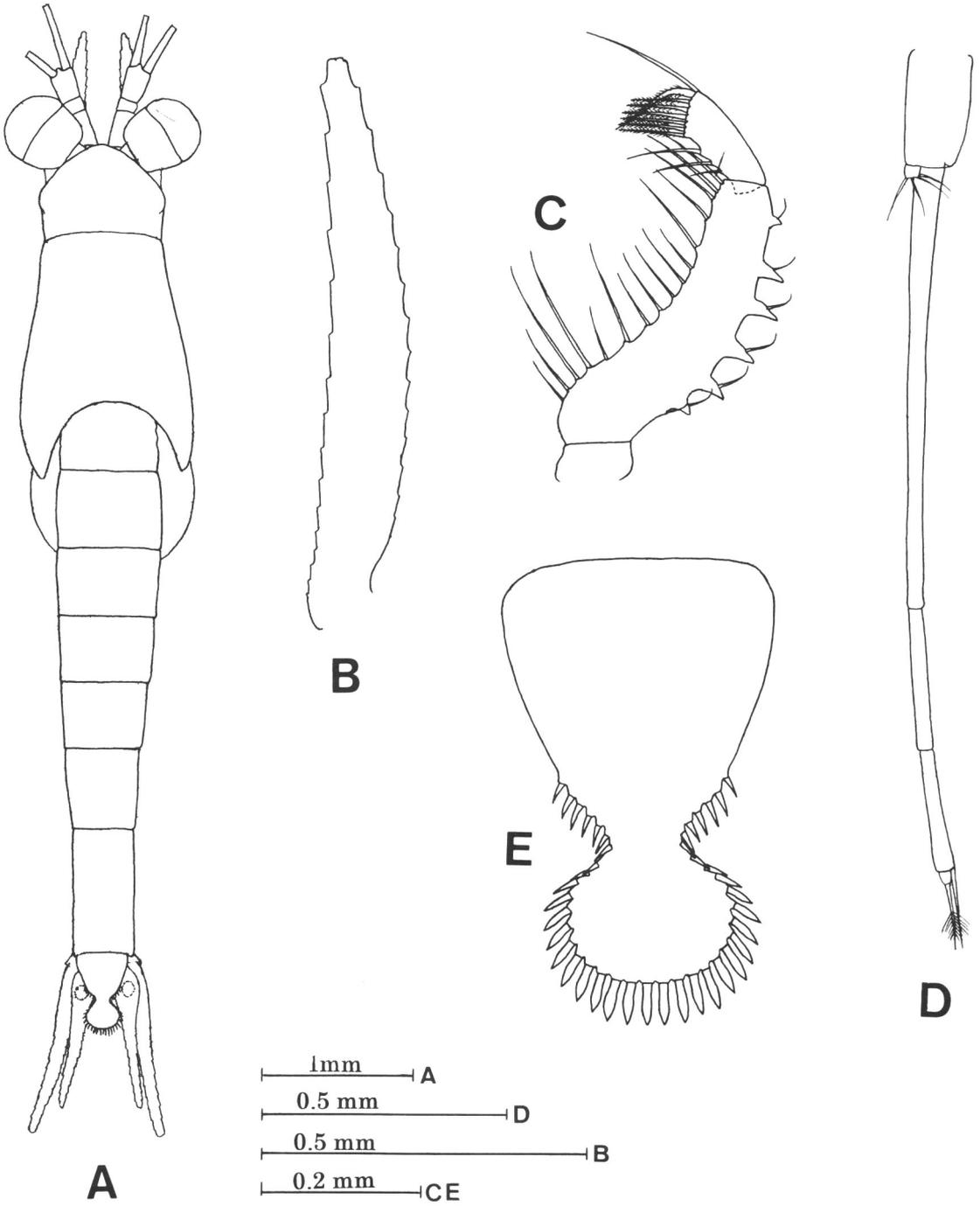


Fig. 2. *Anisomysis (Paranisomysis) ijimai* Nakazawa, 1910, from Heda, A–C, E: adult female; D: adult male. A, whole body in dorsal view; B, antennal scale; C, mandibular palp; D, fourth pleopod; E, telson.

dorsally.

Eye (Fig. 3A) large; cornea expanded, wider than eyestalk; eyestalk without papilliform process on dorsal surface.

Antennular peduncle of female (Fig. 3A) slender; first segment longer than second and third segments together, outer distal corner produced, armed with several setae, one seta long, thick and curved anteriorly at its middle; third segment armed with 2 long and 1 short setae at inner distal corner. Antennular peduncle of male missing in all male specimens.

Antennal scale (Fig. 3A, B) long and slender, extending beyond distal end of antennular peduncle by 1/4 of its length, slightly curved outwardly, about 9 times as long as broad, setose all round, distal suture absent. Antennal peduncle (Fig. 3B) short, not extending to proximal fourth of antennal scale.

Mandibular palp (Fig. 3C) with second segment armed on mesial margin with 8 prominent denticles provided with short subterminal seta, 4 median denticles bigger than others, outer margin armed with 13 variable setae arranged at rather regular intervals; third segment 1/3 as long as second.

Endopods of third to eighth thoracic limbs (Fig. 3D, E) with carpopropodus not divided into subsegments. Thoracic exopods (Fig. 3E) with flagelliform part 7-segmented in first and eighth limbs and 8-segmented in second to seventh limbs; basal plate with outer distal corner rounded.

Abdomen with fifth somite 1.2 times longer than fourth, sixth somite 1.3 times longer than fifth.

Fourth pleopod of male (Fig. 3F, G) biramous; endopod reduced to small, unsegmented lobe; exopod extremely elongated, extending to distal end of telson, 3-segmented, first segment slightly more than 3 times as long as second, third segment slightly shorter than second (1.2: 1), with 2 terminal setae, inner seta barbed, thick, outer seta slender, shorter than inner.

Uropod (Fig. 3H) slender, setose; endopod straight, overreaching distal end of telson for

0.63 of its length, no spines in statocyst region; exopod slightly curved outwards, extending beyond endopod by 1/7 of its length.

Telson (Fig. 3H, I) less than half as long as last abdominal somite, slightly more than 1.5 times as long as broad at base, constricted laterally, narrowest part at distal fourth 2/5 of maximum width near base; lateral margin unarmed in proximal half, armed on distal half with 7 spines, of which 4 spines arise on margin anterior to narrowest part; apical cleft deep, about 1/6 of telson length, without spines in anterior half; each distal lobe with 5 rather long spines on rounded margin.

Etymology. — Named in honor of the collector, Dr. Makoto Omori, Emeritus Professor of the Tokyo University of Fisheries.

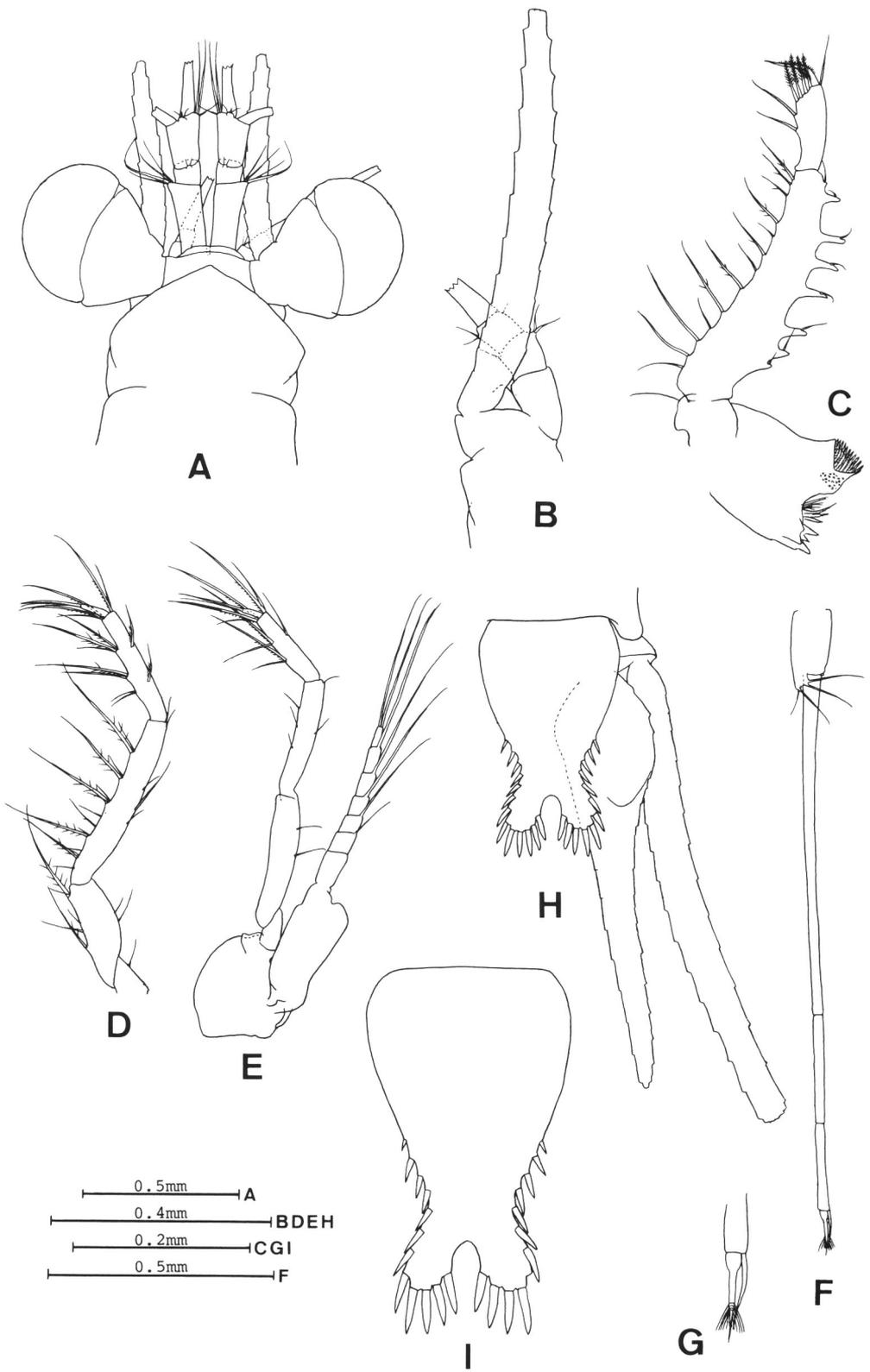
Remarks. — The new species is unique in the subgenus *Paranisomysis* in having the telson with a U-shaped posterior median cleft being not armed with spines in the anterior half. By this character, this species is easily distinguished from the other species of the subgenus.

Distribution. — Only known from the Great Barrier Reef, Australia.

Anisomysis (Paranisomysis) parvisinuosa
new species
(Fig. 4)

Type series. — Holotype (NSMT-Cr 14725), adult male (5.0 mm); allotype (NSMT-Cr 14726), gravid female (4.2 mm); paratypes (NSMT-Cr 14727), 11 adult males (4.6–5.5 mm) and 10 adult females (4.4–5.3 mm), 1 male paratype (4.9 mm) and 1 female paratype (5.2 mm) dissected for drawings; Agonohama, Akajima Is., Okinawa, Japan, hand net during SCUBA diving, 30 December 1989, collected by K. Shimoike.

Other material. — [Okinawa, Japan] Abundant males (up to 5.0 mm) and females (up to 5.2 mm) (NSMT-Cr 14728), collection data same as type series. Two gravid females (5.7, 6.2 mm) (NSMT-Cr 14729); Nishihama, Akajima Is., hand net during SCUBA diving, 8 May 1989, collected by K. Shimoike.



0.5mm — A
0.4mm — BDEH
0.2mm — CGI
0.5mm — F

Description. — Carapace (Fig. 4A, B) produced anteriorly in low triangular rostral plate with broadly rounded apex and convex lateral margins, extending to base of antennular peduncles, leaving eyestalks exposed completely; anterolateral corner rounded; posterior margin emarginate, leaving last thoracic somite exposed.

Eye (Fig. 4A, B) large; cornea expanded, wider than eyestalk; eyestalk without papilliform process on dorsal surface.

Antennular peduncle of male (Fig. 4A) more robust than that of female, first segment shorter than third segment, anterolateral corner produced laterally and tipped with several setae, second segment shortest, third segment slightly broadened anteriorly, with processus masculinus developed. Antennular peduncle of female (Fig. 4B) with first segment slightly shorter than second and third segments combined, third segment armed with 3 setae at anteromesial corner. Outer flagellum with sensory setae in proximal part.

Antennal scale (Fig. 4A–C) slender, extending slightly beyond distal end of antennular peduncle, slightly curved outwardly, about 9 times as long as broad, setose all round, distal suture absent. Antennal peduncle (Fig. 4C) short, with first segment longest.

Mandibular palp (Fig. 4D) with second segment armed on mesial margin with 6 prominent denticles with short subterminal seta, proximal and distal denticles smaller than median ones, outer margin armed with about 20 bristles along whole length; third segment 2/5 as long as second.

Endopods of third to eighth thoracic limbs (Fig. 4E–H) with carpopropodus not divided into subsegments. Thoracic exopods (Fig. 4G, H) with flagelliform part 7-segmented in first and eighth limbs and 8-segmented in second to seventh limbs; basal plate with outer distal corner rounded.

Fourth abdominal somite shortest, fifth ab-

dominal somite subequal to first in length, 1.2 times longer than fourth somite, sixth somite 1.6 times longer than fifth.

Fourth pleopod of male (Fig. 4I, J) biramous; endopod small, unsegmented; exopod elongated, extending to posterior end of last abdominal somite, first segment 3 times as long as second, third segment slightly shorter than second (1.2:1), with 2 terminal setae of equal length, inner seta barbed, thick, outer seta slender, slightly curved inwardly.

Uropod (Fig. 4K) slender, setose all round; endopod straight, tapering, overreaching distal end of telson for 0.58 of its length, no spines in statocyst region; exopod slightly curved outwards, extending beyond endopod by 1/6 of its length.

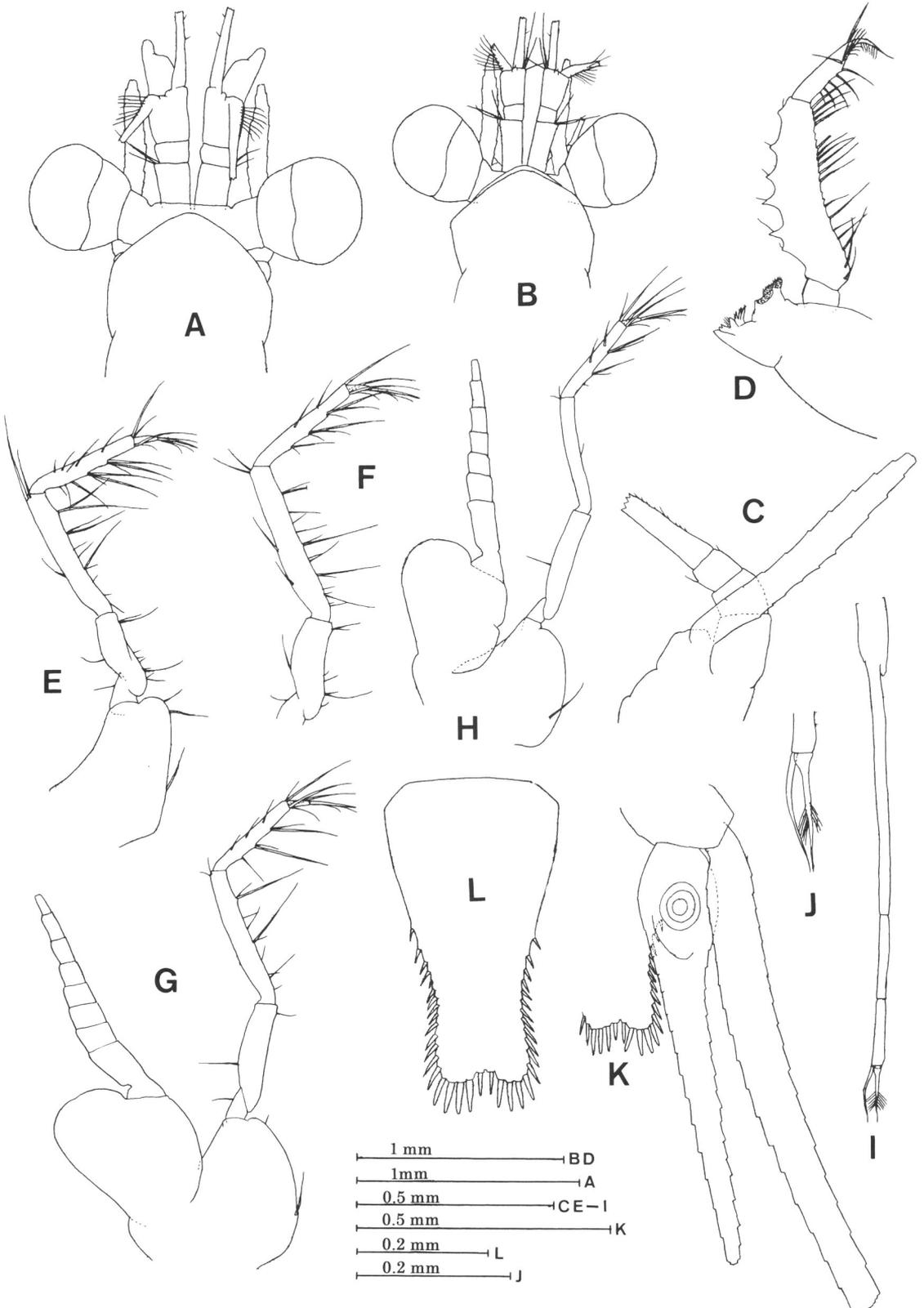
Telson (Fig. 4L) more than 2/3 of last abdominal somite in length, slightly less than 1.8 times as long as broad at base, slightly constricted laterally, narrowest part at posterior third half as broad as maximum width at base; lateral margin slightly convex in anterior half and concave in posterior half, armed on posterior 3/5 with 13–15 spines increasing in length posteriorly; posterior margin shallowly depressed, armed with pair of rather short spines on depression and with 3 long, robust spines on rounded margin of each distal lobe, these spines on posterior margin somewhat rounded distally.

Etymology. — The specific name is derived from Latin *parvus*, slight, and *sinuosus*, sinuous, referring to the shape of the telson.

Remarks. — *Anisomysis (Paranisomysis) parvisinuosa* is easily distinguished from known species of this subgenus by the shape of the telson having both shallow lateral constriction and shallow posterior sinus. In such a telson the new species rather resembles *Anisomysis (Anisomysis) akajimaensis*, but it is distinctly different from that species by the mandibular palp with denticles on the mesial margin of the second segment.

Distribution. — Only known from Okinawa,

Fig. 3. *Anisomysis (Paranisomysis) omorii* n. sp., A–E, H, I, holotype; F, G, allotype. A, anterior part of body; B, antenna; C, mandible and mandibular palp; D, one of middle endopods of thoracic limbs; E, eighth thoracic limb; F, fourth pleopod; G, extremity of the same; H, uropod and telson; I, telson.



1 mm ———— BD
1 mm ———— A
0.5 mm ———— CE-I
0.5 mm ———— K
0.2 mm ———— L
0.2 mm ———— J

southwestern Japan.

Anisomysis (Paranisomysis) hosakai

Murano, 1990

Anisomysis hosakai Murano, 1990: 200–202, fig. 12;
Müller, 1993: 203 (catalogue).

Material. — [Okinawa, Japan] Two adult males (3.8 mm), 8 gravid females (4.1–4.3 mm), 8 adult females (4.1–4.9 mm) and 1 immature male (3.5 mm) (NSMT-Cr 14717), Agonohama, Akajima Is., hand net during SCUBA diving, 30 December 1989, collected by K. Shimoike. Abundant males (up to 4.0 mm) and females (up to 4.4 mm) (NSMT-Cr 14716), Agonohama, Akajima Is., hand net during SCUBA diving, 2 August 1990, collected by S. Hosaka. Fifty-seven adult and immature males (up to 4.6 mm) and 86 adult and immature females (up to 4.4 mm) (NSMT-Cr 14713); Port Aka, Akajima Is., hand net under electric light, 13 November 1990, collected by M. Murano. Twenty-nine adult and immature males (up to 4.3 mm) and 109 adult and immature females (up to 4.2 mm) (NSMT-Cr 14714); Agonohama, hand net during SCUBA diving, 15 November 1990, collected by M. Murano. Forty-nine adult and immature males (up to 5.0 mm) and 45 adult and immature females (up to 5.4 mm) (NSMT-Cr 14715); Port Aka, Akajima Is., hand net under electric light, 15 March 1991, collected by M. Murano.

Body length. — Male, up to 5.0 mm; female, up to 5.4 mm.

Remarks. — This species closely resembles *Anisomysis laccadivei* Panampunnayil, 1981, but is distinguished from the latter species by the following aspects. The antennal scale is 8 times as long as broad in *A. hosakai* compared with about 6 times as long in *A. laccadivei*. In *A. hosakai* the second segment of the mandibular palp is armed with 5 denticles of which proximal 2 are bigger,

while in *A. laccadivei* the second segment is armed with 6 or 7 denticles of which distal 4 are bigger. Spines arming the distal cleft of the telson are flattened and rounded distally in *A. hosakai*, whereas these spines are pointed and not flattened in *A. laccadivei*.

Distribution. — Only known from Okinawa, southwestern Japan (Murano, 1990).

Anisomysis (Paranisomysis) modestiangusta

new species

(Fig. 5)

?*Anisomysis gracilis*, Murano, 1990: 199–200, fig. 11.

Type series. — Holotype (NSMT-Cr 14734), adult male (4.1 mm); allotype (NSMT-Cr 14735), gravid female (3.8 mm); paratypes (NSMT-Cr 14736), 8 adult males (3.6–3.9 mm), 11 adult females (3.8–4.0 mm), 1 immature male (3.5 mm) and 1 immature female (3.6 mm); W. of Geruma Is., Kerama Islands, Okinawa, Japan, hand net during SCUBA diving, 10 m, 5 May 1989, collected by K. Shimoike.

Description. — Carapace (Fig. 5A, B) produced anteriorly in low triangular rostral plate with broadly rounded apex, extending to base of antennular peduncles; anterolateral corner rounded; posterior margin emarginate, leaving posterior 2 thoracic somites exposed.

Eye (Fig. 5A, B) very large; cornea expanded, not depressed dorsoventrally, wider than eyestalk; eyestalk without papilliform process on dorsal surface.

Antennular peduncle of male (Fig. 5A) more robust than that of female, first segment shorter than third segment, anterolateral corner produced laterally and tipped with several setae, second segment shortest, third segment with processus masculinus developed. Antennular peduncle of female (Fig. 5B) with first segment slightly

Fig. 4. *Anisomysis (Paranisomysis) parvisinuosa* n. sp., A, K, holotype; B, allotype; C–J, L, one of male paratypes. A, anterior part of body; B, anterior part of body; C, antenna; D, mandible and mandibular palp; E, endopod of third thoracic limb; F, endopod of fourth thoracic limb; G, seventh thoracic limb; H, eighth thoracic limb; I, fourth pleopods of male; J, extremity of fourth pleopod of male; K, uropod and telson (ventral view); L, telson.

shorter than second and third segments combined, third segment slightly broadened anteriorly, armed with 3 setae at anteromesial corner. Outer flagellum with sensory setae in proximal part.

Antennal scale (Fig. 5A–C) slender, extending slightly beyond distal end of antennular peduncle, slightly curved outwardly, about 7.5 times as long as broad, setose all round, distal suture absent. Antennal peduncle (Fig. 5C) short, with first segment longest. Antennal sympod (Fig. 5C) with distolateral corner being not pointed.

Second segment of mandibular palp (Fig. 5D) 3.5 times as long as broad, armed on mesial margin with 6 prominent denticles provided with short subterminal seta, proximal 2 denticles smaller than others, outer margin armed with about 17 bristles along whole length; third segment about 2/5 as long as second, lateral margin with 4 setae.

Endopods of middle pairs of thoracic limbs (Fig. 5E–G) with carpopropodus not or incompletely divided into subsegments. Thoracic exopods (Fig. 5G) with flagelliform part 7-segmented in first and eighth limbs and 8-segmented in second to seventh limbs; basal plate with outer distal corner rounded.

Abdomen with first 4 somites subequal, fifth somite 1.2 times longer than fourth, sixth somite 1.6 times longer than fifth.

Fourth pleopod of male (Fig. 5H, I) biramous; endopod small, unsegmented; exopod elongated, extending to proximal third of telson, first segment 3.4 times as long as second, third segment 1.2 times as long as second, with 2 terminal setae of subequal length, inner seta barbed, thick, outer seta slender, naked, straight.

Uropod (Fig. 5J) slender, setose all round; endopod tapering, overreaching distal end of telson for 0.58 of its length, no spines in statocyst re-

gion; exopod slightly curved outwards, extending beyond endopod by 0.14 of its length.

Telson (Fig. 5J, K) slightly more than half as long as last abdominal somite, about 1.5 times as long as broad at base, constricted laterally, narrowest part at about posterior 0.3 about 0.4 as wide as at base, posterior part behind constriction again becoming broader and bilobed; distal sinus moderately deep, 0.12 of telson length; lateral margin of telson armed on more than distal half with 8–10 spines, of which 4 or 5 spines are located before constriction; posterior margin (apices and sinus) with 5–6 pairs of long spines, innermost pairs of spines shortest, about half as long as other apical spines.

Etymology. — The species name is derived from Latin *modestus*, moderate, and *angustus*, narrow, referring to the shape of the telson.

Remarks. — An immature male specimen, which was reported under the name of *?Anisomysis gracilis* by Murano (1990), belongs to the present new species.

The new species resembles *A. gracilis* and *A. spatulispina* Murano, 1995, in the telson having both the lateral constriction and the posterior sinus. Morphological differences among these three species are summarized in Table 1.

Distribution. — Only known from Okinawa, southwestern Japan.

Subgenus *Anisomysis* Băcescu, 1973

Anisomysis (Anisomysis) Băcescu, 1973b: 178 (key)

Type species. — *Anisomysis laticauda* Hansen, 1910.

Diagnosis. — Body straight, slender, not hispid.

Cornea of eye large, globular, not divided into two portions.

Antennular peduncle having neither expanded

Fig. 5. *Anisomysis (Paranisomysis) modestiangusta* n. sp., A, J, holotype; B, allotype; C–G, one of female paratypes; H, I, K, one of male paratypes. A, anterior part of body; B, anterior part of body; C, antenna; D, mandible and mandibular palp; E, endopod of third thoracic limb; F, endopod of fourth thoracic limb; G, fifth thoracic limb; H, pair of fourth pleopods of male; I, extremity of fourth pleopod of male; J, uropod and telson; K, telson.

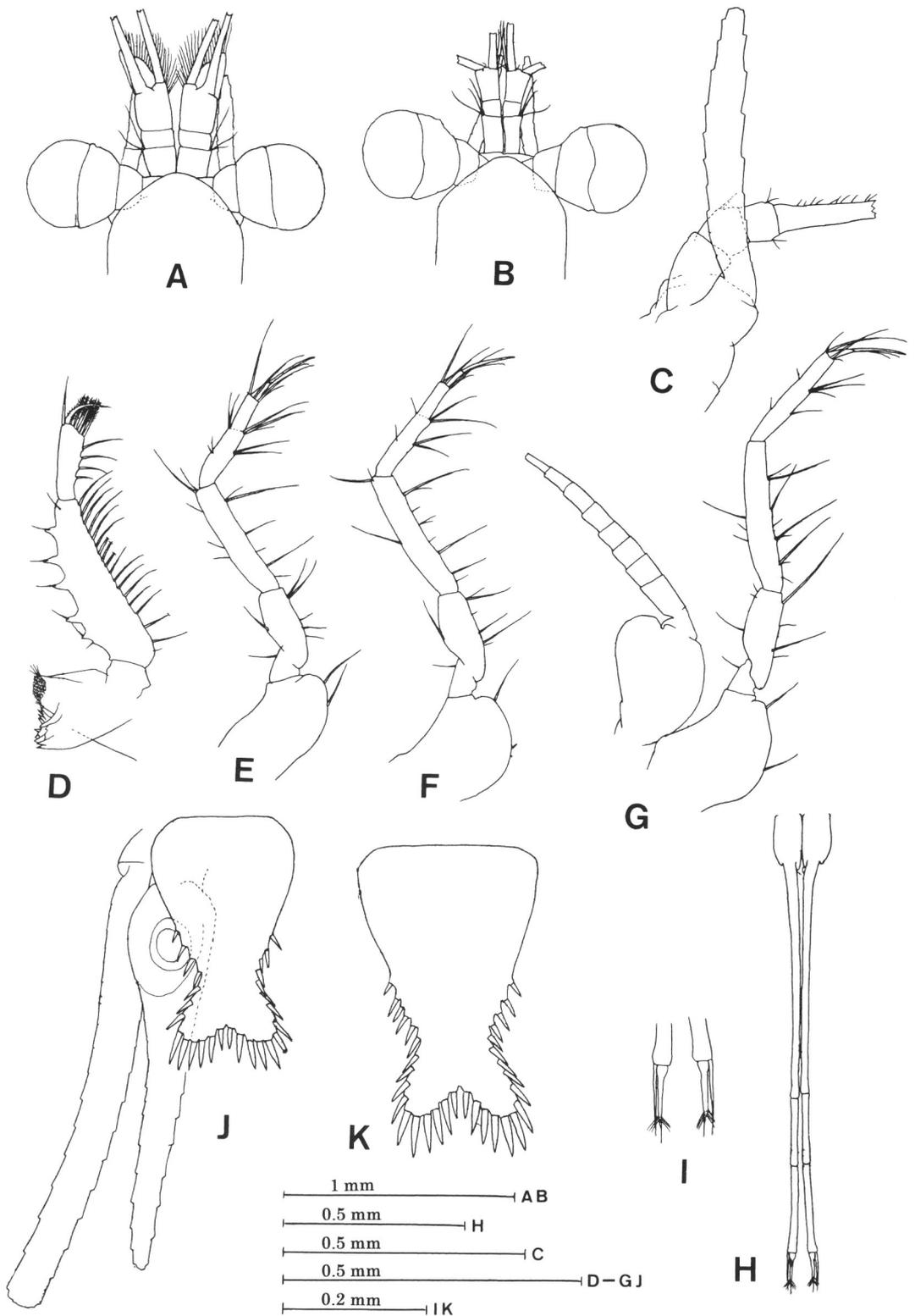


Table 1. Morphological differences among *Anisomysis gracilis* Panampunnayil, 1984, *A. spatulispina* Murano, 1995, and *A. modestiangusta* n. sp.

	<i>Anisomysis gracilis</i> Panampunnayil	<i>Anisomysis spatulispina</i> Murano	<i>Anisomysis modestiangusta</i> n. sp.
Rostrum	Low triangular with blunt apex	Triangular with narrowly rounded apex	Low triangular with broadly rounded apex
Antennal scale	About 10 times as long as broad	7 times as long as broad	7 times as long as broad
Second segment of mandibular palp	6 times as long as broad, with 7 flagellated denticles	About 4 times as long as broad, with 4 flagellated denticles	About 4 times as long as broad, with 7 flagellated denticles
Fourth pleopod of male	Second segment longer than third	Second segment shorter than third	Second segment shorter than third
Posterior sinus of telson	Shallow (less than 0.1 of telson length)	Deep (0.25 of telson length)	shallow (0.12 of telson length)
Posterior margin of telson	With 5 pairs of spines	With 9 pairs of spines	With 6 pairs of spines
Lateral margin anterior to constriction of telson	With shoulder at base of proximalmost lateral spine	Without shoulder	Without shoulder

lobe nor finger-like process on second segment.

Second segment of mandibular palp foliate, without triangular denticles on mesial margin.

Telson variable.

Key to the species of the subgenus *Anisomysis*

- 1a. Telson 3 times as long as broad, with 24–26 spines on distal 3/4 of lateral margin.*A. sirielloides* Băcescu, 1975
- 1b. Telson less than 2.5 times as long as broad.2
- 2a. Telson without distal cleft.3
- 2b. Telson with distal cleft.10
- 3a. Telson triangular with narrow apex armed with pair of spines. 4
- 3b. Distal margin of telson rounded or truncate. 6
- 4a. Anterolateral margins of rostrum serrated; marginal spines of telson not or indistinctly articulated at base; exopod of fourth male pleopod with first segment as long as third.*A. thurneyseni* Nouvel, 1973
- 4b. Anterior margin of rostrum smooth; marginal spines of telson distinctly articulated at base; exopod of fourth male pleopod with first segment more than 1.5 times as long as third. 5
- 5a. Rostrum triangular with narrowly rounded apex; exopod of fourth male pleopod with second segment about 1/3 as long as third; marginal spines of telson normally developed.*A. mixta* Nakazawa, 1910
- 5b. Rostrum broadly rounded or triangular with broadly rounded apex; exopod of fourth male pleopod with second segment about 4/5 as long as third; marginal spines of telson reduced in size.*A. australis* Zimmer, 1918
- 6a. Telson 1.2 times as long as broad, with 4 spines on truncate distal margin and 5 spines on each lateral margin.*A. levi* Băcescu, 1973
- 6b. Telson more than 1.5 times as long as broad.7
- 7a. Distal margin of telson more than half as broad as at base; outer spines on posterior margin of telson long and stout, more than 1/3 of telson length.....*A. truncata* Panampunnayil, 1993
- 7b. Distal margin of telson less than 1/3 as broad as at base. Marginal spines of telson subequal in size. 8
- 8a. Telson with 8 spines on posterior margin.*A. enewetakensis* Murano, 1983
- 8b. Telson with 4 spines on posterior margin. 9
- 9a. Telson 1.5 times as long as broad, with 10–12 spines on posterior half of each lateral margin.*A. chessi* Murano, 1983

- 9b. Telson nearly twice as long as broad, with 7–8 spines on posterior 2/3 of each lateral margin.*A. quadrispinosa* Wang, 1989
- 10a. Telson cleft deep, without spines or with spines in posterior 1/3 to 1/2.11
- 10b. Telson cleft shallow, armed with spines. ...
.....19
- 11a. Uropodal endopod with process on mesial margin of statocyst region.12
- 11b. Uropodal endopod without process on mesial margin of statocyst region13
- 12a. Process on uropodal endopod blunt, without articulation at base.
.....*A. bifurcata* Tattersall, 1912
- 12b. Process on uropodal endopod acutely pointed, with articulation at base.....
.....*A. spinata* Panampunnayil, 1993
- 13a. Each posterior lobe of telson with single spine at apex.14
- 13b. Each posterior lobe of telson with 2 or 3 spines on apical end.17
- 14a. Posterior cleft of telson less than 1/3 of telson length.15
- 14b. Posterior cleft of telson about half of telson length.16
- 15a. Lateral margin of telson with 11–20 spines.*A. minuta* Liu & Wang, 1983
- 15b. Lateral margin of telson with less than 10 spines.*A. pelewensis* Li, 1964
- 16a. Rostrum pointed; eyestalk with papilliform process; telson with 2 or 3 spines on lateral margin of each posterior lobe.....
.....*A. megalops* (Illig, 1913)
- 16b. Rostrum rounded; eyestalk without papilliform process; telson with 5 or 6 spines on lateral margin of each posterior lobe.....
.....*A. nana* Murano, 1995
- 17a. Telson narrowing abruptly at distal 1/3, provided with 2 spines there; each apex of distal lobes of telson with 2 short spines.
.....*A. kunduchiana* Băcescu, 1975
- 17b. Telson not narrowing abruptly; lateral margin of telson with more than 5 spines. ...18
- 18a. Telson cleft U-shaped, 1/4 as long as telson, with spines on posterior half; each apex of distal lobes of telson with 3 spines.*A. incisa* Tattersall, 1936
- 18b. Telson cleft V-shaped, 2/7 as long as telson, with spines on posterior 2/3; each apex of distal lobes of telson with 2 spines.*A. hawaiiensis* Murano, 1995
- 19a. Posterior margin of telson narrow, with small median sinus armed with pair of spines; each apex of telson lobes with one spine.*A. extranea* Murano, 1995
- 19b. Posterior margin of telson broad, with median depression armed with more than 2 pairs of spines; each apex of telson lobes with more than 3 spines.20
- 20a. Distal spines of telson much bigger than lateral ones; lateral margin of telson with 3–6 spines.21
- 20b. Distal spines of telson slightly bigger than lateral ones; lateral margin of telson with 5–12 spines.24
- 21a. Posterior margin of telson broader than basal width, with 3 pairs of long and robust spines, these spines about 1/3 of telson length.
.....*A. robustispina* Panampunnayil, 1984
- 21b. Posterior margin of telson equal to or narrower than basal width; distal spines of telson about 1/7 as long as telson.22
- 22a. Exopod of fourth pleopod of male extending to posterior end of fifth abdominal somite.*A. aikawai* Li, 1964
- 22b. Exopod of fourth pleopod of male extending to or beyond posterior margin of last abdominal somite.23
- 23a. Exopod of fourth pleopod of male extending to middle of telson, second segment 1.6 times longer than third; sixth abdominal somite 1.6 times longer than telson.
.....*A. hashizumei* Fukuoka & Murano, 1997
- 23b. Exopod of fourth pleopod of male extending slightly beyond posterior margin of last abdominal somite, second segment slightly longer than third; sixth abdominal somite as long as telson.
.....*A. laticauda* Hansen, 1910
- 24a. Telson 1.3–1.4 times as long as broad....25
- 24b. Telson 1.5–1.8 times as long as broad....28

- 25a. Posterior 2/3 of telson gradually narrowing distally; lateral spines of telson considerably reduced in size.
.....*A. vasseuri* Ledoyer, 1974
- 25b. Posterior 1/4 to 1/3 of telson becoming parallel-sided; lateral spines of telson normally developed.26
- 26a. Uropodal endopod subequal to exopod in length; second segment of fourth male pleopod 1/3 as long as first segment and half as long as third segment.
.....*A. rotunda* new species
- 26b. Uropodal endopod clearly shorter than exopod; second segment of fourth male pleopod 1/4 as long as first segment and less than half as long as third segment.
.....27
- 27a. Exopod of fourth male pleopod not extending posteriorly beyond posterior margin of last abdominal somite; length ratios of 3 exopod segments of fourth male pleopod 4.2:1:2.3. Ratio of widest part at base to distal margin in telson width, 2.3.
.....*A. hanseni* Nouvel, 1967
- 27b. Exopod of fourth male pleopod extending posteriorly beyond posterior margin of last abdominal somite; length ratios of 3 exopod segments of fourth male pleopod 5.5:1:2.6. Ratio of widest part at base to distal margin in telson width, 2.8.
.....*A. maldivensis* new species
- 28a. Lateral spines of telson considerably reduced in size.29
- 28b. Lateral spines of telson normally developed.30
- 29a. Antennal scale not extending to distal end of antennular peduncle in male, slightly beyond in female, 6 times as long as broad; telson 1.5 times as long as broad, with 7 spines on lateral margin.
.....*A. boraboraensis* Murano, 1995
- 29b. Antennal scale extending beyond distal end of antennular peduncle, 7 times as long as broad; telson 1.7 times as long as broad, with 8–9 spines on lateral margin.
.....*A. parvispina* new species
- 30a. Telson clearly depressed laterally at distal fourth; distal margin of telson broad, with 4–5 pairs of long spines.
.....*A. brevicauda* Wang, 1989
- 30b. Lateral depression of telson very slight if present; distal margin of telson narrow, with 3 pairs of long spines.31
- 31a. Long spines on distal margin of telson as long as those on lateral margin; exopod of fourth male pleopod with second segment 1/3 as long as third segment.
.....*A. mullini* Murano, 1987
- 31b. Long spines on distal margin of telson longer than those on lateral margin; exopod of fourth male pleopod with second segment about half as long as third segment.
.....*A. akajimaensis* Murano, 1990

Anisomysis (Anisomysis) mixta

Nakazawa, 1910

(Figs. 6, 7)

Anisomysis mixta Nakazawa, 1910: 253, pl. 8, figs. 28, 34; Illig, 1930: 599 (key); Gordan, 1957: 340 (catalogue); Ii, 1964: 558–559; Mauchline & Murano, 1977: 47 (catalogue); Müller, 1993: 205–206 (catalogue).

Material. — [Mainland of Japan] Twenty-one males (3.8–4.5 mm) and 32 females (3.7–5.2 mm) (NSMT-Cr 14335); Kozu Is., Izu Islands, 20 August 1974, collected by T. Muto. Five males (4.3–4.5 mm) and 5 females (3.6–4.3 mm) (NSMT-Cr 14336); Nomo, Nagasaki, rocky shore, 3 m, 19 December 1975, collected by S. Inoue and T. Takita. Abundant males (up to 4.0 mm) and females (up to 3.9 mm) (NSMT-Cr 14339); turtle exhibition tank in Aquarium of the Kusimoto Marine Park Center, Wakayama, 23 October 1996, collected by K. Nomura. Forty males (up to 4.4 mm) and 56 females (up to 4.0 mm) (NSMT-Cr 14827); Sabiura, Kushimoto, Wakayama, 3 m, 4 October 2002, collected by K. Nomura.

[Okinawa, Japan] Three adult males (4.1–4.3 mm), 4 gravid females (3.1–4.3 mm) and 2 immature males (3.2, 3.6 mm) (NSMT-Cr 14338); Akajima Is., 1 m, 23.9°C, 29 April 1990, collect-

ed by S. Hosaka.

[North of Hawaii] One juvenile (1.7 mm) (NSMT-Cr 14337), 24°59.7'N 154°56.6'W, 0–1,250 m oblique haul with ORI net, 10 September 1969, collected by M. Murano.

Body length. — Adult male, 3.8–4.5 mm; adult female, 3.1–5.2 mm.

Description. — Carapace (Fig. 6B, C) produced frontally into low triangular rostrum with bluntly pointed or narrowly rounded apex and almost straight lateral margins, leaving eyestalks exposed almost completely. Anterolateral corner of carapace rounded; posterior margin (Fig. 6A) deeply emarginate, leaving last 2 thoracic somites exposed.

Eye (Fig. 6B, C) large, laterally extending far beyond lateral margin of carapace; cornea globular, expanded, wider than eyestalk.

Antennular peduncle of male (Fig. 6B) more robust than that of female, first segment shorter than third, anterolateral corner produced and armed with several setae, processus masculinus large; in female (Fig. 6C), third segment shorter than first, armed at anteromesian corner with 1 long and 2 short setae.

Antennal scale (Fig. 6B–D) extending beyond distal margin of third segment of antennular peduncle, straight, 6 times longer than broad; distal suture wanting. Antennal peduncle (Fig. 6D) reaching proximal third of antennal scale, 3-segmented with first segment longest. Antennal sympod (Fig. 6D) with distolateral corner rounded.

Mandibular palp (Fig. 6E) with mesial margin convex, armed with setae but without denticles, third segment half as long as second, rectangular, armed on outer margin with 5 setae becoming longer distally and on distal margin with 5 barbed setae. Maxillule and maxilla as shown in Fig. 6F and G, respectively.

Endopod of first thoracic limb (Fig. 6H) robust, terminal claw strong. Endopod of second thoracic limb (Fig. 6I) short, merus as long as carpopropodus and dactylus combined, dactylus slightly longer than broad, with terminal claw strong. Endopods of third to seventh thoracic

limbs (Fig. 6A–C) with carpopropodus divided into 2 subsegments by obscure articulation. Endopod of eighth thoracic limb (Fig. 7D) considerably slender compared with those of anterior limbs, carpopropodus not divided into subsegments. Flagelliform part of thoracic exopods (Fig. 7C) 7-segmented in first and eighth limbs and 8-segmented in second to seventh limbs.

Abdomen (Fig. 6A) composed of 6 somites, fifth somite 1.26 times longer than fourth, sixth somite 1.5 times longer than fifth.

First, second, third and fifth pleopods of male and all pleopods of female rudimentary. Fourth pleopod of male (Fig. 7E) biramous; endopod rudimentary; exopod extremely elongated, slightly overreaching posterior end of telson, terminating into 2 setae of usual type of the genus; length ratio of three segments as 4.5 : 1 : 2.8 from first to third.

Uropod (Fig. 7F) slender, setose all round; endopod straight, overreaching apex of telson for 0.57 of its length, without any process in statocyst region; exopod slightly curved outwardly, overreaching apex of endopod for 0.15 of its length.

Telson (Fig. 7G) triangular in shape, half as long as last abdominal somite, 1.5 times as long as broad at base; lateral margin convex and naked in proximal half, slightly concave and armed with 10 short spines on distal half, these spines increasing in length distally; distal margin narrow with 2 spines, which are slightly smaller than distalmost lateral spine.

Remarks. — Since *Anisomysis mixta* was established by Nakazawa in 1910, there were no records of collection. His original description is brief with only two illustrations of the fourth pleopod of the male and the telson, so that the redescription is given above.

Anisomysis (Anisomysis) mixta resembles *A. (A.) australis* Zimmer, 1918, and *A. (A.) thurneyseni* Nouvel, 1973, in the triangular telson. Differences from *A. (A.) australis* are discussed in the "Remarks" of that species. From *A. (A.) thurneyseni* this species is distinguished by the smooth posterolateral margin of the rostrum, the

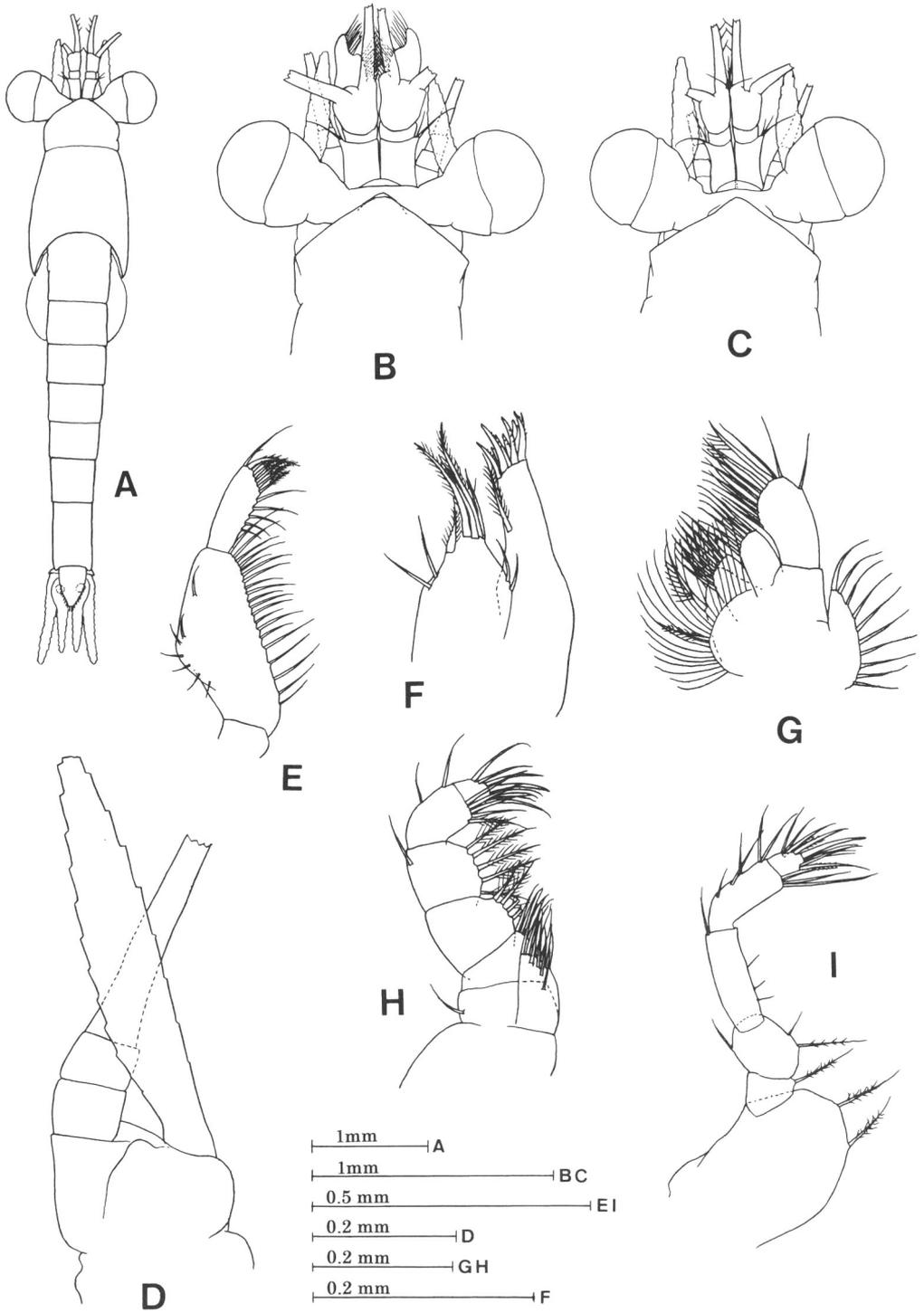


Fig. 6. *Anisomysis (Anisomysis) mixta* Nakazawa, 1910, from Nomo, A, C, F–I: adult female; B, D, E: adult male. A, whole body in dorsal view; B, anterior part of body; C, anterior part of body; D, antenna; E, mandibular palp; F, maxillule; G, maxilla; H, endopod of first thoracic limb; I, endopod of second thoracic limb.

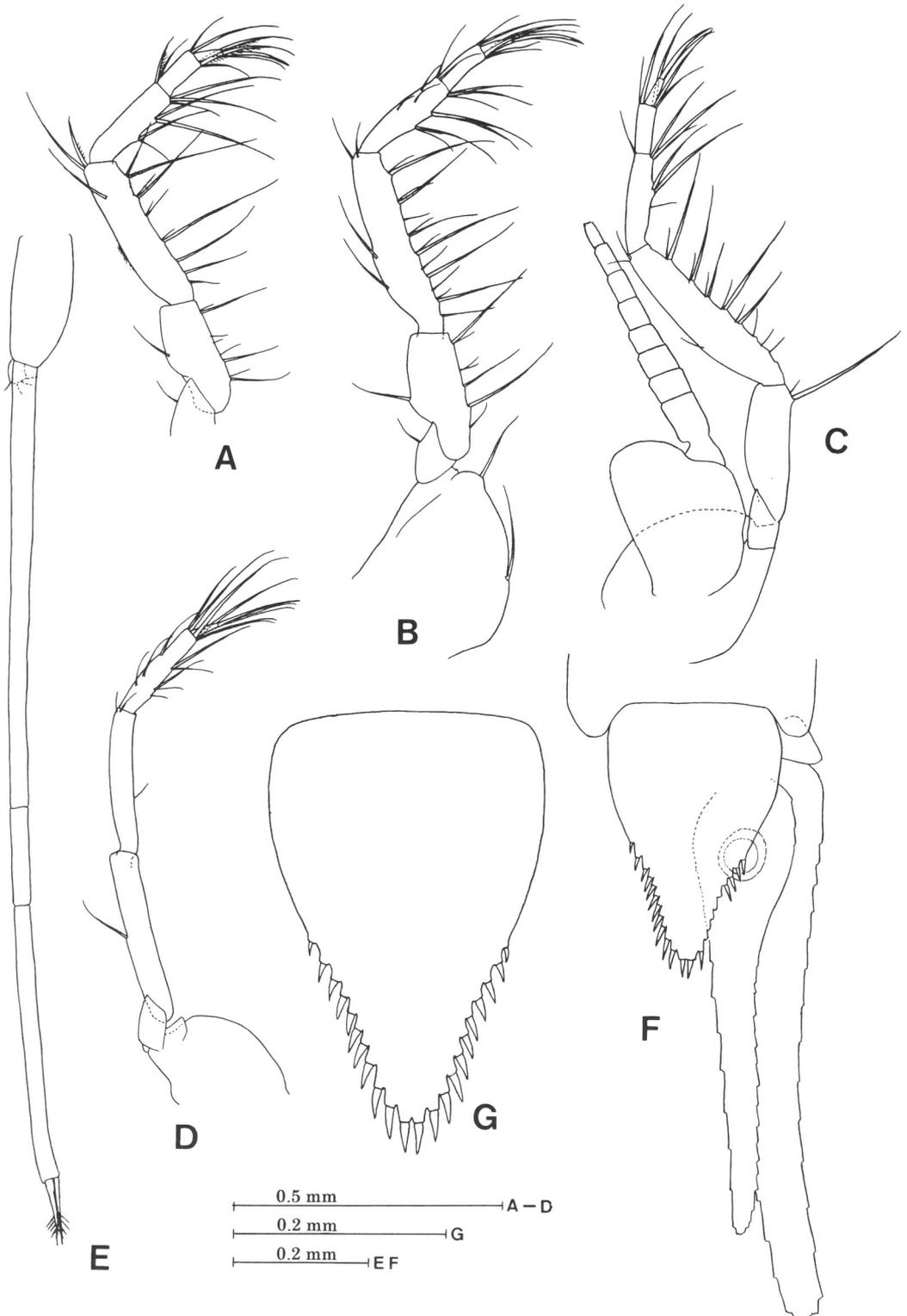


Fig. 7. *Anisomysis (Anisomysis) mixta* Nakazawa, 1910, from Nomo, A–D: adult female; E–G: adult male. A, endopod of third thoracic limb; B, endopod of fifth thoracic limb; C, sixth thoracic limb; D, endopod of eighth thoracic limb; E, fourth pleopod of male; F, uropod and telson; G, telson.

armature of the telson and the length of the fourth pleopod of the male.

One juvenile collected from a northern area of Hawaii in the present collections is identified tentatively with this species due to the infancy. Considering that almost all the species belonging to the subgenus *Anisomysis* are coastal forms, it should be sure that this specimen came from coastal waters of an island including the Hawaiian Islands. From the Hawaiian Islands, however, only two species, *Anisomysis (Anisomysis) hawaiiensis* Murano, 1995, and *A. (A.) extranea* Murano, 1995, are known and the both species are considerably different in external morphology from *A. (A.) mixta*. *Anisomysis (A.) mixta* or its related species having a triangular telson may be discovered from coastal waters of Hawaii or neighbouring islands in future.

Distribution. — Known from Japanese waters and northern area of Hawaii.

Anisomysis (Anisomysis) australis

Zimmer, 1918

(Fig. 8)

Anisomysis australis Zimmer, 1918: 22, 23, figs. 27–32; Tattersall, 1927: 252; Illig, 1930: 599 (key); Gordan, 1957: 340 (catalogue).

Anisomysis mixta australis, Băcescu, 1973b: 176.

Material. — [South Australia] Two gravid females (4.5, 5.1 mm), 50 immature females (up to 4.6 mm), 21 males (up to 4.4 mm), 21 juveniles (NSMT-Cr 14312); Rosetta Head, Victor Harbour, 6–10 m, hand net during SCUBA diving, collected by Y. Ishihara and N. Takamura.

Remarks. — The present specimens agree morphologically with the original description of *Anisomysis australis* Zimmer, 1918, except for the length of the fourth pleopod of the male. The exopod of the fourth pleopod in the present largest male (4.4 mm) extends to the anterior end of the telson, while in the type specimens it reaches the posterior end of the telson. This male specimen is somewhat smaller compared with females collected at the same time, 4.5 and 5.2 mm long in gravid females and 4.6 mm long in an im-

mature female with half-grown marsupium, so that this difference is probably derived from the immaturity in the present male specimen.

Anisomysis (A.) australis is closely allied to *A. (A.) mixta* Nakazawa, 1910. Ii (1964) noted that differences between the two species lie only in the two points, the shape of the rostrum (Fig. 8A) and the length ratios in the three exopod segments of the fourth male pleopod (Fig. 8C). The third difference is recognized in the armature of the telson through the present examination. The telson of *A. (A.) australis* (Fig. 7E) is armed with spines distinctly smaller than those of *A. (A.) mixta* (Fig. 6G), e. g., apical spines of the telson are 1.5 times as long as broad at the base in *A. (A.) australis* while those of *A. (A.) mixta* are 3 times as long.

Băcescu (1973b) degraded *A. australis* to a subspecies of *A. mixta*, without direct observation on the both species. As mentioned above, however, obvious differences exist between the both species. It seems that there is no necessity of degradation to subspecies level.

Distribution. — Known from southern part of Australia (Zimmer, 1918; Tattersall, 1927).

***Anisomysis (Anisomysis) pelewensis* Ii, 1964**

Anisomysis pelewensis Ii, 1964: 565–567, fig. 150; Mauchline & Murano, 1977: 47 (catalogue); Valbonesi & Murano, 1980: 224–225, fig. 8; Murano, 1990: 197–199, fig. 10; Müller, 1993: 206 (catalogue); Fukuoka *et al.*, 2002: 42, fig. 11-N.

Material. — [Mainland of Japan] Four males (2.6–2.9 mm) and 6 females (2.4–3.0 mm) (NSMT-Cr 14340); Nomo, Nagasaki, 2 m, sandy bottom, 9 September 1975, collected by S. Inoue and T. Takita. Four males (2.8–3.1 mm), 3 females (2.8–3.2 mm), 2 immature males (1.7, 2.1 mm), 1 immature female (2.3 mm) and 7 juveniles (1.1–1.7 mm) (NSMT-Cr 14547); Banda, Chiba, 10 m, sledge net, 15 November 1993, collected by K. Fukuoka. Two females (2.5, 2.7 mm) (NSMT-Cr 14548); Banda, 10 m, sledge net, 13 July 1994, collected by K. Fukuoka. One male (2.3 mm) (NSMT-Cr 14549); Banda, 4 m, 20

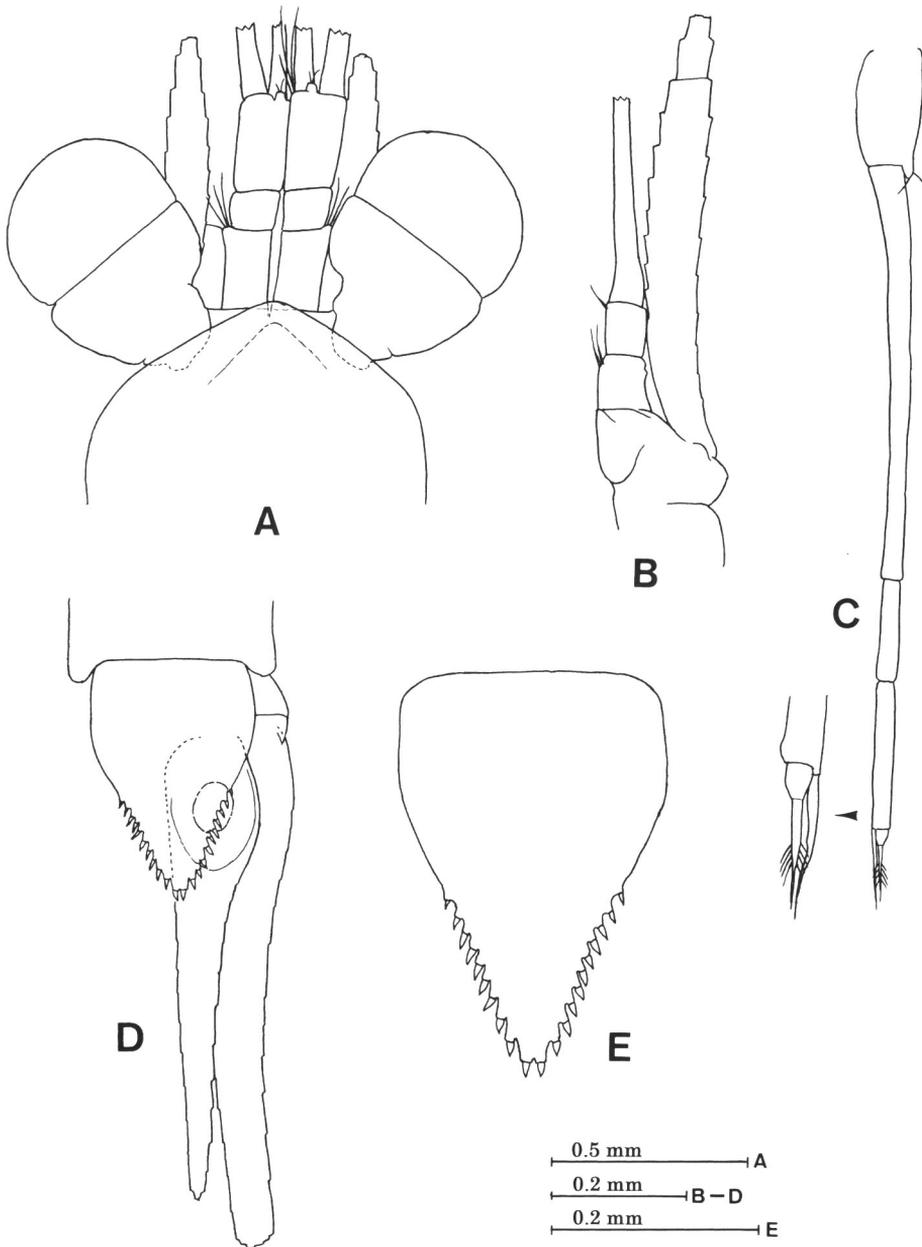


Fig. 8. *Anisomysis (Anisomysis) australis* Zimmer, 1918, A, B, E: gravid female (5.1 mm); C, D: male (4.4 mm). A, anterior part of body; B, antenna; C, fourth pleopod; D, uropod and telson; E, telson.

September 1994, collected by K. Fukuoka.

[Okinawa, Japan] Six males (2.4–2.9 mm), 18 females (2.3–3.0 mm) and abundant immature males and females (NSMT-Cr 14341); Iriomote Is., 4 m, 17 June 1986, collected by M. Murano. One male (NSMT-Cr 14348); Port Aka, Akajima

Is., surface tow at night, 23 June 1990, collected by M. Murano. One male (NSMT-Cr 14349); Port Aka, light trap, 24 June 1990, collected by M. Murano. Twenty-two adult and immature males (up to 3.2 mm) and 32 adult and immature females (up to 3.0 mm) (NSMT-Cr 14350);

Agonohama, Akajima Is., 10 m, 16 March 1991, collected by M. Murano. One hundred adult and immature males (up to 3.5 mm) and 187 adult and immature females (up to 3.1 mm) (NSMT-Cr 14351); Agonohama, hand net, 15 m, 17 March 1991, collected by M. Murano. Fifty-two adult and immature males (up to 3.3 mm) and 125 adult and immature females (up to 3.2 mm) (NSMT-Cr 14352); Maenohama, Akajima Is., sledge net, 18 March 1991, collected by M. Murano.

Body length. — Male, up to 4.4 mm; female, up to 4.9 mm.

Distribution. — Known from Palau (Pelew) Islands, Micronesia (Ii, 1964), Japan (Valbonesi & Murano, 1980; Murano, 1990; Ohtsuka *et al.*, 1995; Fukuoka *et al.*, 2002) and the Great Barrier Reef (Carleton & Hamner, 1989). In coral reef lagoon surrounding Okinawa Islands, this species is one of the most abundant zooplankton organisms.

Anisomysis (Anisomysis) aikawai Ii, 1964

(Fig. 9)

Anisomysis aikawai Ii, 1964: 559–562, fig. 148; Mauchline & Murano, 1977: 47 (catalogue); Valbonesi and Murano, 1980: 223–224; Müller, 1993: 201 (catalogue).

Material. — [Mainland of Japan] Four adult males (3.2–4.0 mm), 4 adult females (3.2–3.6 mm) and 1 immature female (NSMT-Cr 14311); Nomo, Nagasaki, 3 m, sandy bottom, 2 October 1975, collected by S. Inoue and T. Takita.

Remarks. — The present specimens agree with the original description of *Anisomysis aikawai* Ii, 1964, in main characteristics. Slight differences, however, are present in the rostrum, the fourth pleopod of the male and the telson. The anterior margin of the rostrum of Ii's specimens is broadly and evenly rounded and leaves the eyes and antennular peduncles completely uncovered, while that of the present specimens is produced into the angular rostrum with a rounded apex and covers a proximal part of the antennular peduncles (Fig. 9A). The endopod of the

fourth pleopod of the male in the present specimens bears much longer setae than illustrated by Ii (Fig. 9D). Spine number on the telson margin is 11 or 12 in Ii's specimens compared with 9 or 10 in the present specimens, and these spines are much longer in the present specimens than drawn by Ii (Fig. 9E).

Distribution. — Only known from the mainland of Japan (Ii, 1964; Valbonesi & Murano, 1980).

Anisomysis (Anisomysis) laticauda

Hansen, 1910

(Fig. 10)

Anisomysis laticauda Hansen, 1910: 74–75, pl. 12, fig. 1a–s; Tattersall, 1936: 161; Gordan, 1957: 340 (catalogue); Mauchline & Murano, 1977: 47 (catalogue); Müller, 1993: 204 (catalogue).

Material. — [Philippines] One adult female (4.0 mm) (NSMT-Cr 14333), off Panay Is., 17 May 1979, collected by Southeast Asia Fisheries Development Center.

Remarks. — The present adult female is judged to belong to *Anisomysis laticauda* Hansen, 1910, by the similarity in the telson. However, some differences from the type specimen, probably depending upon localities, are observed in the rostrum, the eye, and the telson. The rostrum is triangular with a broadly rounded apex in the type specimen while rather evenly rounded in the present specimen (Fig. 10A). In dorsal view, the eye in the present specimen is more expanded than that of the type specimen, half as wide as the anterior portion of the cephalothorax in the type specimen while 3/4 as wide in the present specimen (Fig. 10A). The distal incision of the telson is deeper in the type specimen (1/4 of telson length) than in the present specimen (1/6 of telson length) (Fig. 10B). The lateral margin of the telson is provided with three pairs of spines in the constricted part in the type specimen instead of only one spine in the present specimen (Fig. 10B).

Distribution. — Known from Laiwui, Obi Island, Indonesia (Hansen, 1910), the Great Barrier

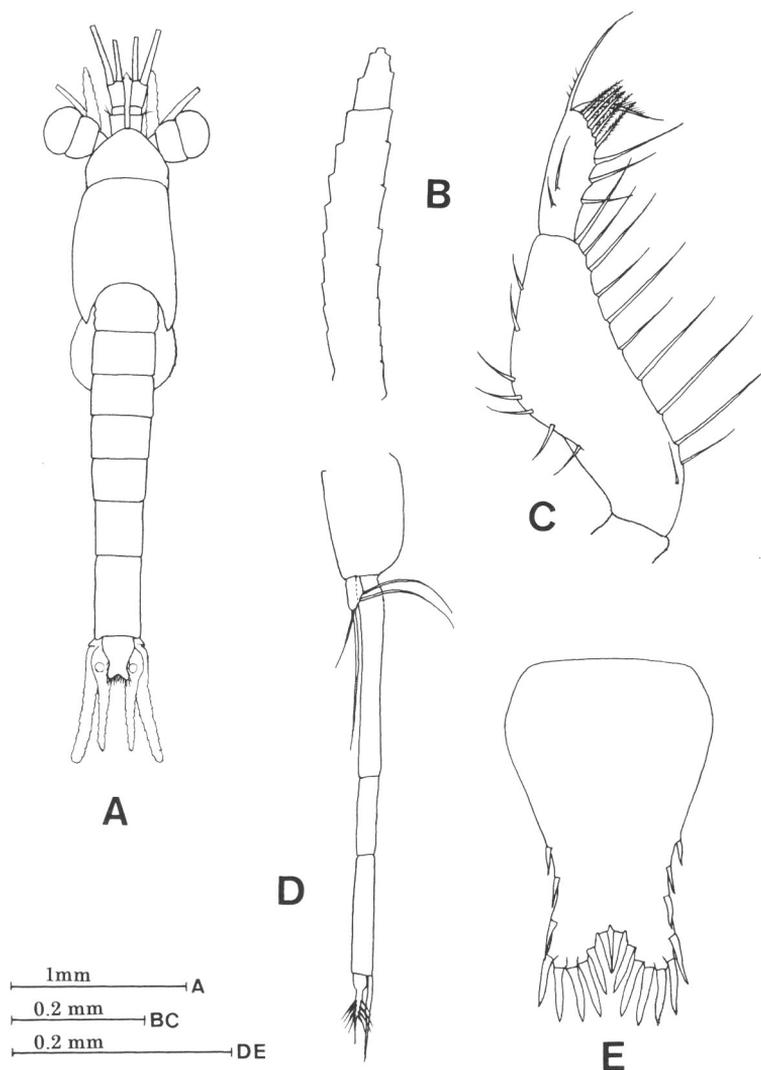


Fig. 9. *Anisomysis (Anisomysis) aikawai* Ii, 1964, from Nomo. A–C, E: adult female; D: adult male. A, adult female in dorsal view; B, antennal scale; C, mandibular palp; D, fourth pleopod of male; E, telson.

Reef (Tattersall, 1936) and the Philippines. The present occurrence from the Philippines extends the geographical distribution of this species northwards.

Anisomysis (Anisomysis) hashizumei

Fukuoka & Murano, 1997

(Fig. 11)

Anisomysis hashizumei Fukuoka & Murano, 1997: 534–536, fig. 9a–l.

Material. — [Okinawa, Japan] Three adult males (3.7–4.1 mm), 2 gravid females (3.9, 4.2 mm), 2 adult females (3.8, 3.9 mm), 1 immature female (3.1 mm) (NSMT-Cr 14331); Port Aka, Akajima Is., hand net under electric light, 15 March 1991, collected by M. Murano.

Remarks. — The present specimens agree morphologically with the original description by Fukuoka & Murano (1997), except for marginal spines of the telson, which are somewhat longer than those of the type specimens (Fig. 11B).

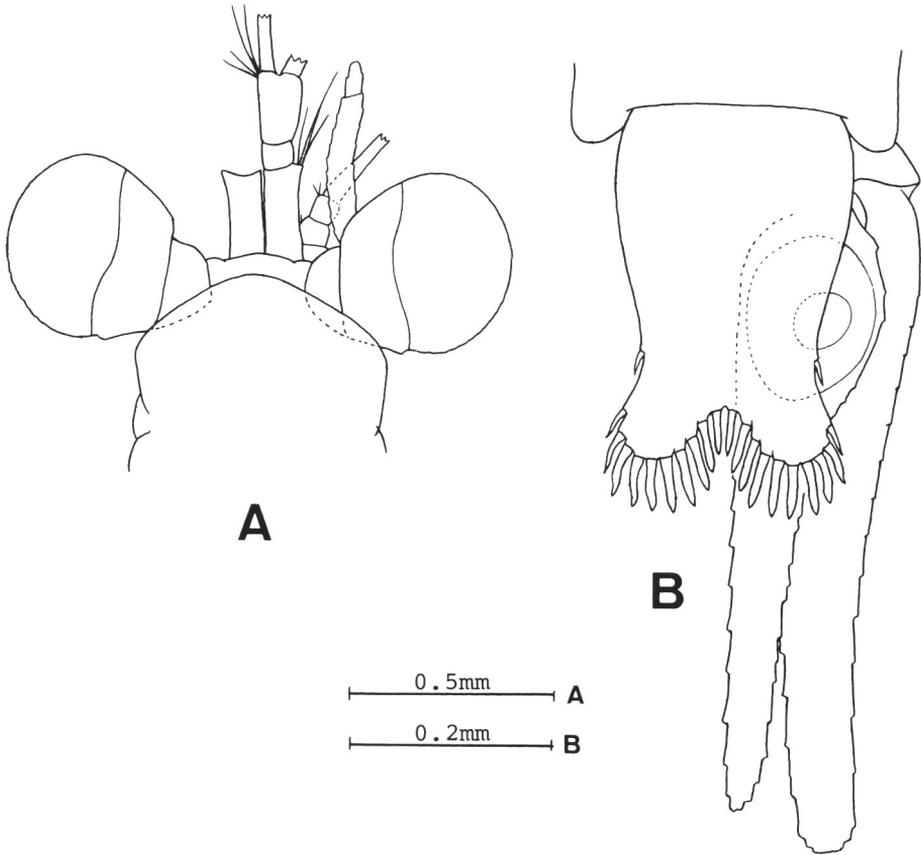


Fig. 10. *Anisomysis (Anisomysis) laticauda* Hansen, 1910, adult female. A. anterior part of body; B, uropod and telson.

The present specimens were collected together with abundant specimens of *Anisomysis hosakai* under an electric light.

Distribution. — Only known from Okinawa, southwestern Japan (Fukuoka & Murano, 1997).

Anisomysis (Anisomysis) rotunda new species
(Fig. 12)

Type series. — Holotype (NSMT-Cr 14700), adult male (3.3 mm); allotype (NSMT-Cr 14701), gravid female (3.4 mm); paratypes (NSMT-Cr 14702), 34 males (up to 3.4 mm) and 37 females (up to 3.7 mm); Ribbon Is., Great Barrier Reef, 15°00'S 146°42'E, Australia, hand net during SCUBA diving, 24 August 1986, collected by M. Omori.

Other material. — [Great Barrier Reef] Three adult males (2.7–3.0 mm), 8 adult females (2.7–3.2 mm) and 113 immature males and females (NSMT-Cr 14703); Cod Hole, Ribbon Is., 10 m, on sand beneath coral reef, hand net during SCUBA diving, 23 August 1986, collected by M. Omori. Abundant males and females (in poor condition) (NSMT-Cr 14704); Ribbon Is., hand net during SCUBA diving, 24 August 1986, collected by M. Omori, (M-32-2). Sixty-six juveniles (ca 1.7 mm) (NSMT-Cr 14705); Ribbon Is., 12 m, hand net during SCUBA diving, 24 August 1986, collected by M. Omori. One adult male (3.2 mm) (NSMT-Cr 14706); Ribbon Is., hand net during SCUBA diving, found among *Anisomysis (A.) parvispina* swarm, 24 August 1986, collected by M. Omori.

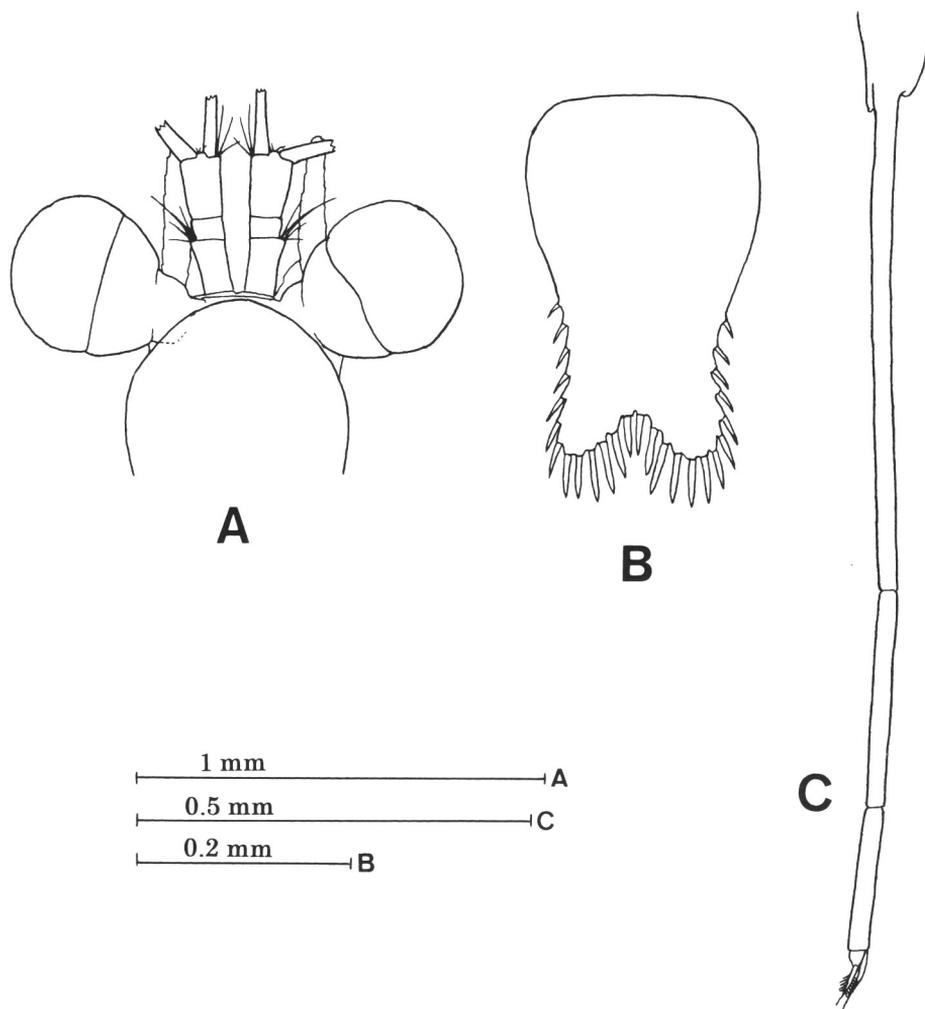


Fig. 11. *Anisomysis (Anisomysis) hashizumei* Fukuoka and Murano, 1997. A, anterior portion of gravid female (3.9 mm); B, telson (adult male, 3.8 mm); C, fourth pleopod of adult male (4.1 mm).

Description. — Rostrum (Fig. 12A, B) produced frontally with broadly rounded anterior margin, leaving eyestalks exposed almost completely. Anterolateral corner of carapace rounded; posterior margin emarginate, leaving last thoracic somite uncovered.

Eye (Fig. 12A, B) large, laterally extending beyond lateral margin of carapace; cornea globular, expanded, much wider than eyestalk.

Antennular peduncle of male (Fig. 11A) more robust than that of female, first segment shorter than third, armed with several setae at anterolateral corner; in female (Fig. 12B) third segment

shorter than first, armed with 1 long and 2 short setae at anteromesial corner.

Antennal scale (Fig. 12A–C) extending to distal margin of third segment of antennular peduncle in male and slightly beyond it in female, 6.5 times longer than broad, slightly curved outwardly, distal suture indistinct. Antennal peduncle (Fig. 12C) extending beyond middle of antennal scale, 3-segmented with first segment longest. Antennal sympod (Fig. 12C) with outer distal corner rounded.

Second segment of mandibular palp (Fig. 12D) foliate, inner margin evenly convex, armed with

setae, third segment rectangular, with 4 setae on outer margin, 4 barbed setae on distal margin and 2 long setae at distomesial corner.

Endopod of third thoracic limb (Fig. 12E) with carpopropodus divided into 2 subsegments, fourth to eighth thoracic endopods (Fig. 12F, G, H) with carpopropodus not or obscurely divided into 2 subsegments. Flagelliform part of exopods 7-segmented in first and eighth limbs and 8-segmented in second to seventh limbs.

Abdomen composed of 6 somites, fifth somite 1.2 times longer than fourth, sixth somite 1.4 times longer than fifth.

First, second, third and fifth pleopods of male and all pleopods of female rudimentary. Fourth pleopod of male (Fig. 12I) biramous; endopod rudimentary; exopod extremely elongated, extending posteriorly beyond apex of telson, 3-segmented, first segment long, 3 times longer than second, third segment 1.5 times longer than second, terminating in 2 setae of usual type of the genus.

Uropod (Fig. 12J) slender, setose all round; exopod slightly curved outwardly, more than twice as long as telson; endopod almost equal to exopod in length, straight, without spines in statocyst region.

Telson (Fig. 12J) 2/3 length of last abdominal somite, 1.3 times as long as maximum width at proximal fourth, rounded in proximal 2/3, then parallel-sided, parallel-sided part 2/5 of maximum width; lateral margin naked in proximal 2/3, armed on distal 1/3 with 5 short spines increasing in length distally; posterior margin with slight median depression provided with pair of spines, each apex of small distal lobes with 3 spines, middle (apical) one longest among marginal spines of telson.

Etymology. — The specific name is derived from Latin *rotundus*, round, referring to the rounded anterior margin of the rostrum.

Remarks. — This species is closely allied to *Anisomysis (Anisomysis) hanseni* Nouvel, 1967, from Madagascar, and *A. (A.) maldivensis* n. sp. which is described in the next, in general feature of the telson. However, some differences are recognized among these species as summarized in Table 2.

This new species is distinguished from other species of the genus by the shape and armature of the telson.

Distribution. — Only known from the Great Barrier Reef, Australia.

Anisomysis (Anisomysis) maldivensis

new species

(Fig. 13)

Type series. — Holotype (NSMT-Cr 14694), adult male (3.9 mm); allotype (NSMT-Cr 14695), adult female (4.2 mm); paratypes (NSMT-Cr 14696), 5 adult males (3.4–4.0 mm); Addu Atoll, off Willingiri Island, Maldives, 9 m, hand net during SCUBA diving, 28 December 1984, collected by M. Omori.

Description. — Rostrum (Fig. 13A, B) low triangular with narrowly rounded apex and almost straight lateral margins, leaving anteriorly eyestalks exposed completely. Anterolateral corner of carapace rounded, posterior margin deeply emarginate, leaving seventh and eighth thoracic somites exposed.

Eye (Fig. 13A, B) large, extending laterally beyond lateral margin of carapace; cornea globular, expanded, much wider than eyestalk.

Antennular peduncle of male (Fig. 13A) more robust than that of female, first segment shorter than third, anterolateral corner produced anteriorly and armed with several setae, second segment shortest, third segment becoming broader distally, with processus masculinus developed. In female (Fig. 13B) first segment longer than third,

Fig. 12. *Anisomysis (Anisomysis) rotunda* n. sp., A, C–J, holotype; B, allotype. A, anterior end of body; B, anterior end of body; C, antenna; D, mandible and mandibular palp; E, endopod of third thoracic limb; F, endopod of fifth thoracic limb; G, endopod of seventh thoracic limb; H, endopod of eighth thoracic limb; I, fourth pleopod of male; J, uropod and telson.

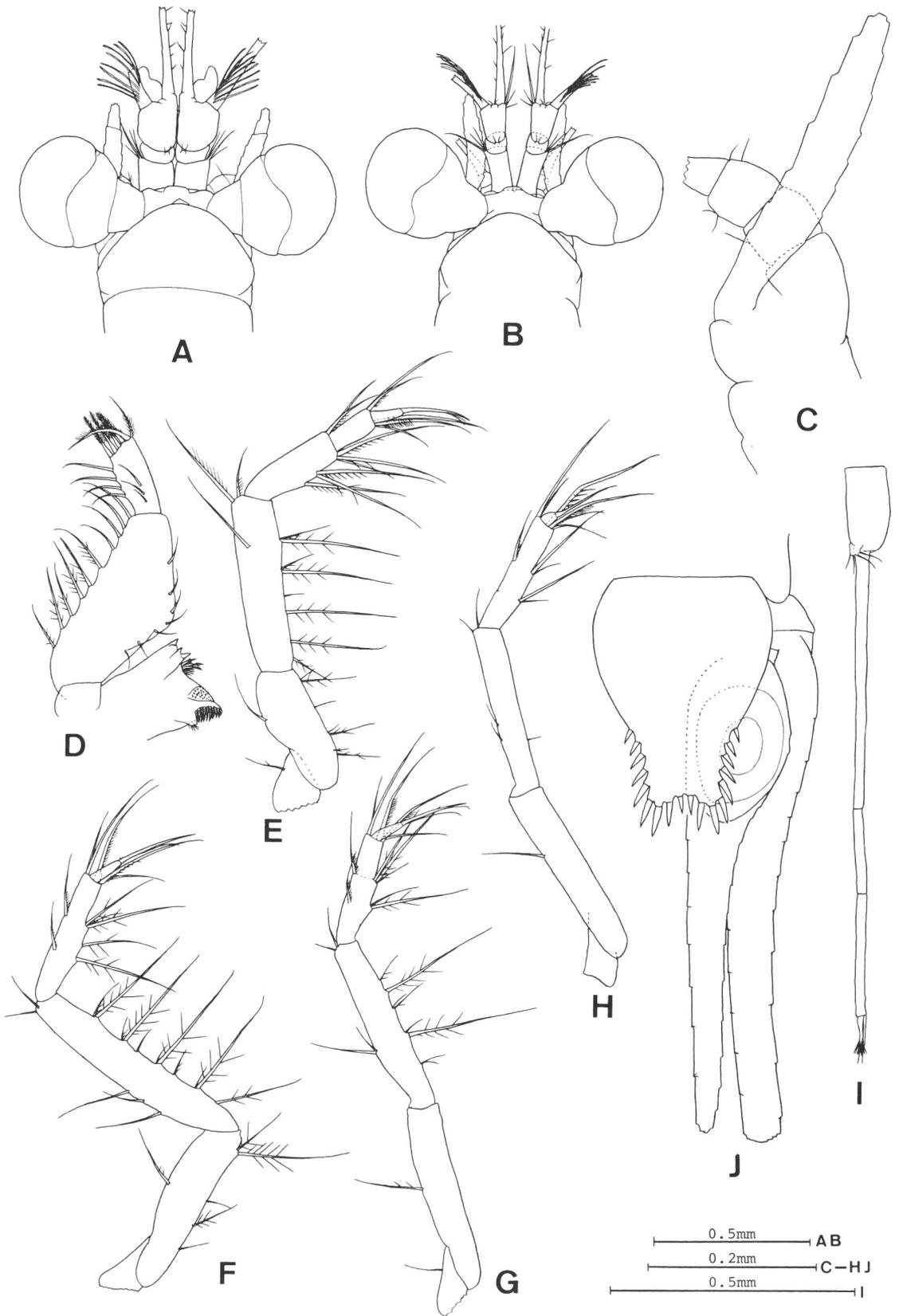


Table 2. Morphological differences among *Anisomysis hanseni* Nouvel, 1967, *A. rotunda* n. sp. and *A. maldivensis* n. sp.

	<i>Anisomysis hanseni</i> Nouvel	<i>Anisomysis rotunda</i> n. sp.	<i>Anisomysis maldivensis</i> n. sp.
Rostrum	Low triangular with blunt apex	Broadly rounded	Low triangular with blunt apex
Exopod of 4th pleopod of male:			
Length	Not extending beyond posterior margin of 6th abdominal somite	Extending beyond distal end of telson	Extending posteriorly beyond middle of telson
Length ratios of 3 segments	4.2 : 1 : 2.3	3.1 : 1 : 1.5	5.5 : 1 : 2.6
Endopod of uropod	Shorter than exopod	Subequal to exopod in length	Shorter than exopod
Telson:			
Ratio of maximum width to distal width	2.3	2.4	2.6
Number of marginal spines	28 spines on distal 1/2	18 spines on distal 2/5	22 spines on distal 2/5

anterolateral corner produced anteriorly and armed with several setae, third segment with 2 long and 1 short setae at inner distal corner.

Antennal scale (Fig. 13A–C) slightly overreaching distal margin of third antennular peduncle segment, 7 times as long as broad, slightly curved outwardly. Antennal peduncle (Fig. 13C) short, not reaching middle of antennal scale, first segment longest. Antennal sympod (Fig. 13C) with outer distal corner rounded.

Second segment of mandibular palp (Fig. 13D) foliate, mesial margin arched, with short setae, outer margin straight, with about 10 long setae arranged regularly; third segment with 3 setae on outer margin.

Endopods of third to sixth thoracic limbs (Fig. 13E) with carpopropodus not divided into subsegments; endopod of eighth thoracic limb more slender than those of preceding ones. Flagelliform part of thoracic exopods 7-segmented in first and eighth limbs and 8-segmented in second to seventh limbs.

Third and fourth abdominal somites shorter than others, fifth somite 1.25 times longer than fourth, sixth somite 1.5 times longer than fifth.

First, second, third and fifth pleopods of male and all pleopods of female rudimentary. Fourth pleopod of male (Fig. 13F) biramous; endopod rudimentary; exopod extending to middle of tel-

son, 3-segmented, first segment longest, occupying more than 0.6 of exopod in length, 5.5 times as long as second segment, third segment half as long as first and 2.6 times as long as second, with 2 terminal setae of usual type of the genus.

Uropod (Fig. 13H) slender, setose all round; endopod straight, tapered, twice as long as telson; exopod slightly curved outwardly, overreaching distal end of endopod for 1/7 of its length.

Telson (Fig. 13G) reversed bottle-shaped with shallow median sinus on posterior margin, half as long as last abdominal somite, 1.3 to 1.4 times as long as maximum breadth near base; lateral margin convex and naked in proximal 2/3, armed with 6–7 spines on distal 1/3; posterior margin 1/3 of maximum width, with 3 spines on each apical lobe and pair of spines on sinus.

Etymology. — The specific name, *maldivensis*, refers to the locality in which the present specimens were collected.

Remarks. — The present new species from Maldives closely resembles *Anisomysis* (*Anisomysis*) *hanseni* Nouvel, 1967, collected from Madagascar, and *A. (A.) rotunda* n. sp. Differences among these three species are summarized in Table 2.

According to the collector, M. Omori, this species forms global swarms with the diameter

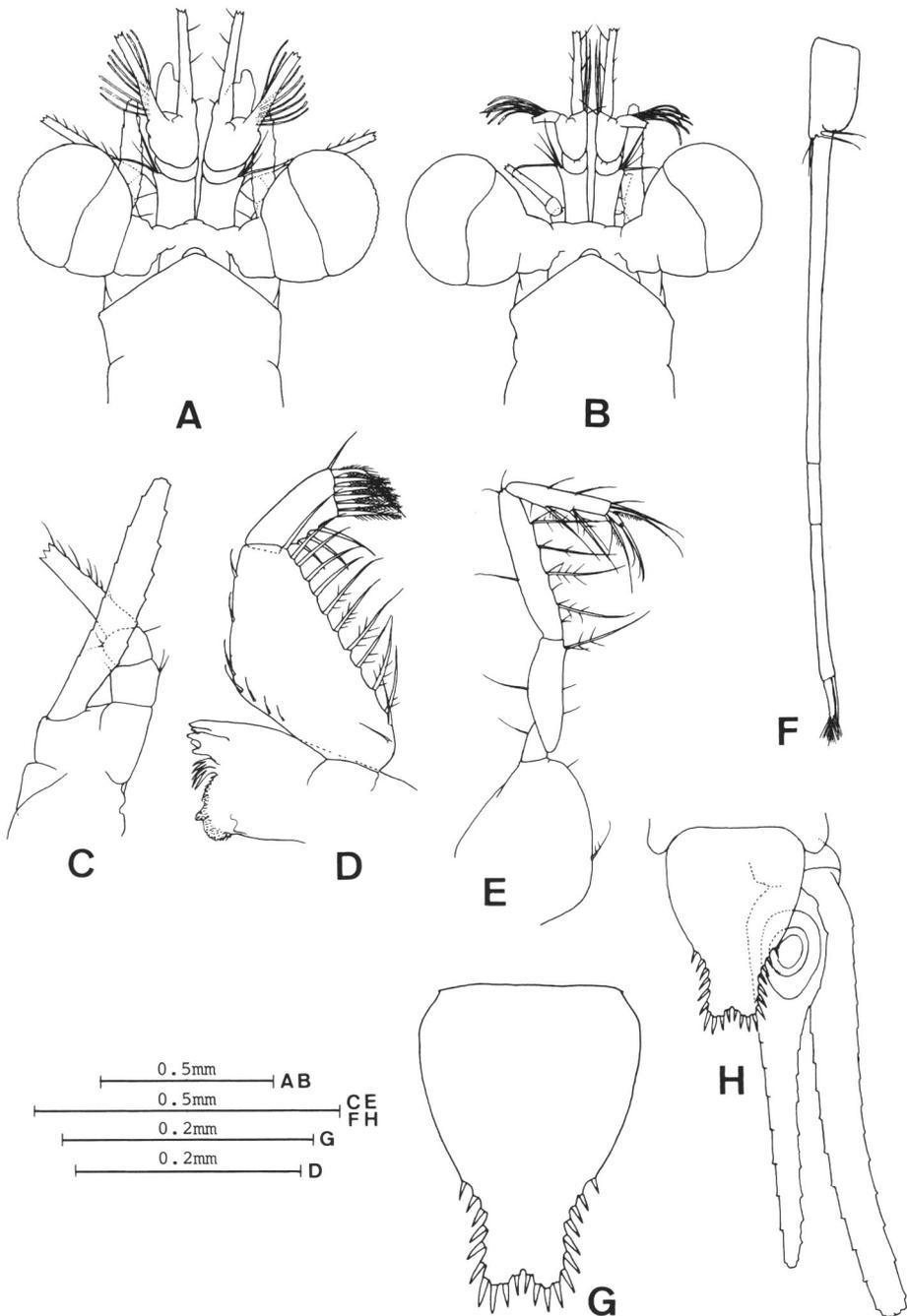


Fig. 13. *Anisomysis (Anisomysis) maldivensis* n. sp., A, C, F–H, holotype; B, allotype; D, E, one of female paratypes (3.5 mm). A, anterior part of body; B, anterior part of body; C, antenna; D, mandible and mandibular palp; E, endopod of sixth thoracic limb; F, fourth pleopod; G, telson; H, uropod and telson.

of 0.5 to 1 m.

Distribution. — Only known from Maldives.

Anisomysis (Anisomysis) parvispina

new species

(Figs. 14, 15)

Type series. — Holotype (NSMT-Cr 14697), adult male (3.8 mm); allotype (NSMT-Cr 14698), adult female (3.7 mm); paratypes (NSMT-Cr 14699), 16 males (up to 3.9 mm) and 18 females (up to 4.0 mm, one specimen of 3.3 mm dissected for drawings); Ribbon Is., Great Barrier Reef, 15°00'S 146°42'E, hand net during SCUBA diving, 24 August 1986, collected by M. Omori.

Description. — Carapace (Fig. 14A, B) produced anteriorly into low triangular rostral plate with rounded apex not extending to base of antennular peduncles, leaving almost whole eyes uncovered. Anterolateral corner of carapace rounded; posterior margin emarginate, leaving last thoracic somite exposed dorsally.

Eye (Fig. 14A, B) well developed, extending laterally beyond lateral margin of carapace; cornea globular, expanded, occupying more than half of whole organ. Eyestalk (Fig. 14A, B) without papilliform process on dorsal surface.

Antennular peduncle of male (Fig. 14A) more robust than that of female, first segment armed with several setae on anterolateral corner, second segment shortest, about twice as wide as long, third segment slightly shorter than combined length of preceding 2 segments, somewhat longer than wide, processus masculinus developed, hirsute. In female (Fig. 14B), first peduncular segment slightly shorter than following 2 segments combined, more than twice as long as broad, armed with several setae at anterolateral corner, third segment 1.5 times longer than broad, armed at anteromesial corner with 1 long and 2 short setae.

Antennal scale (Fig. 14A–C) extending slightly beyond distal margin of third segment of antennular peduncle in male and beyond distal margin by 1/4 of its length in female, 7 times longer than broad, somewhat curved outwardly, setose

all round, distal suture absent. Antennal peduncle (Fig. 14C) short, not reaching middle of scale, proximal segment longest.

Second segment of mandibular palp (Fig. 14D) foliate, more than twice as long as broad, mesial margin armed with setae, third segment half as long as second, armed with 5 setae on inner margin, 5 barbed setae on distal margin and 2 long setae at distomesial corner.

Endopods of thoracic limbs (Figs. 14E, 15A–D) allied to those of *Anisomysis mullini* Murano, 1987, but built more robustly. Exopods of thoracic limbs with flagelliform part (Figs. 14E, 15D) 7-segmented in first and eighth limbs and 8-segmented in second to seventh limbs.

First 4 abdominal somites subequal, fifth somite 1.2 times longer than fourth, sixth somite 1.5 times longer than fifth, nearly twice as long as broad.

First to third and fifth pleopods of male and all pleopods of female reduced into unsegmented single lobe. Fourth pleopod of male (Fig. 14F) biramous; endopod rudimentary; exopod extremely elongated, reaching posterior end of telson, 3-segmented, first segment 5 times as long as second, longer than succeeding 2 segments together, third segment more than 3 times as long as second, with 2 terminal setae of usual type of the genus.

Uropod (Fig. 14G) slender, setose all round; endopod narrow, tapering, straight, about twice as long as telson, without spines in statocyst region; exopod overreaching distal end of endopod by 1/10 of its length, slightly curved outwardly.

Telson (Fig. 14G) 2/3 length of sixth abdominal somite, 1.7 times as long as maximum width near base, gradually narrowing towards distal fourth, then becoming parallel-sided; lateral margin naked in proximal half, armed on distal half with 8–9 small spines, which are so short that they never reach base of next one. Posterior margin 1/3 of maximum width, with shallow median depression armed with pair of minute spines, apex of each distal lobe with 3 minute spines.

Etymology. — The specific name is derived from Latin *parvus*, small, and *spina*, spine, refer-

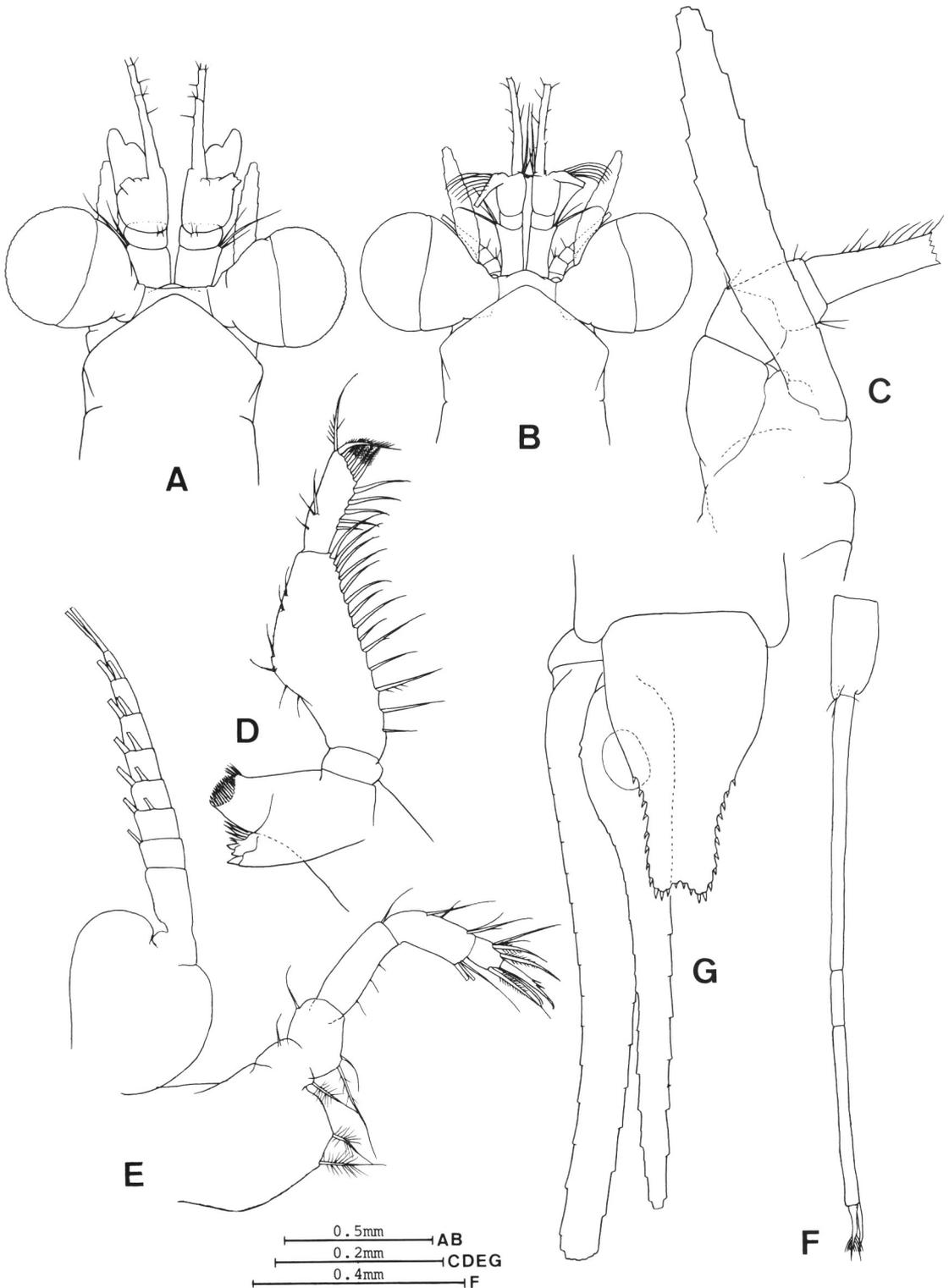


Fig. 14. *Anisomysis (Anisomysis) parvispina* n. sp., A, F, G, holotype; B, allotype; C–E, one of female paratypes (3.3 mm). A, anterior part of body; B, anterior part of body; C, antenna; D, mandible and mandibular palp; E, second thoracic limb; F, fourth pleopod of male; G, uropod and telson.

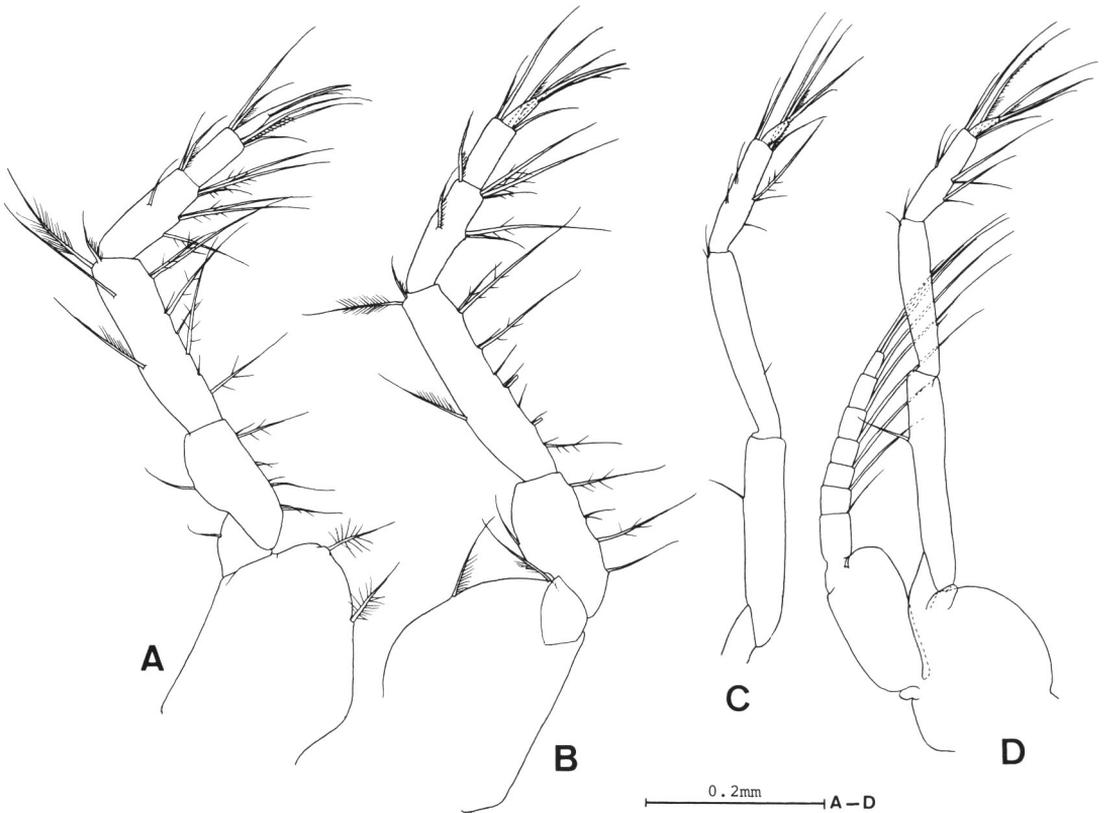


Fig. 15. *Anisomysis (Anisomysis) parvispina* n. sp., one of female paratypes (3.3 mm). A, endopod of third thoracic limb; B, endopod of fourth thoracic limb; C, endopod of seventh thoracic limb; D, eighth thoracic limb.

ring to the small spines on the telson margin.

Remarks. — The most noticeable character of this new species is in the marginal spines of the telson, which are so small that these spines are shorter than the intervals between the next ones. In this aspect of the telson, the new species resembles *Anisomysis (Anisomysis) vasseuri* Ledoyer, 1974, from Madagascar, and *A. (A.) boraboraensis* Murano, 1995, from the Society Islands. The new species, however, is distinguished from *A. (A.) boraboraensis* by the shape of the telson and from *A. (A.) vasseuri* by the length ratios of three exopod segments of the fourth pleopod of the male.

Distribution. — Only known from the Great Barrier Reef, Australia.

Anisomysis (Anisomysis) akajimaensis

Murano, 1990

Anisomysis akajimaensis Murano, 1990: 207–209, fig. 15; Müller, 1993: 201 (catalogue); Fukuoka *et al.*, 2002: 38.

Material. — [Okinawa, Japan] One male (4.0 mm) and 2 females (3.8, 3.9 mm) (NSMT-Cr 14550); Agonohama, Akajima Is., 2 August 1990, collected by M. Murano.

Remarks. — This species closely resembles *Anisomysis (Anisomysis) brevicauda* Wang, 1989, from the South China Sea, but differs from latter species in the shape of the telson and the length of the exopod of the fourth male pleopod (Murano, 1990).

Distribution. — Known from Okinawa (Murano, 1990) and Ogasawara (Fukuoka *et al.*, 2002), Japan.

Anisomysis (Anisomysis) sp. I

(Fig. 16)

Material. — [East China Sea] One adult female (2.7 mm) (NSMT-Cr 14334); 28°10.3'N 129°13.8'E, 67–68 m, bottom-net, 24 April 1970, collected by M. Murano.

Remarks. — This species resembles *Anisomysis (Anisomysis) minuta* Liu & Wang, 1983 and *Anisomysis (A.) sp.* (Wang & Liu, 1994) by having the triangular rostrum (Fig. 16A), the relatively short antennal scale (Fig. 16A), the shape and armature of the telson (Fig. 16B). This specimen, however, is somewhat different from the two latter species in the shape and armature of the telson, and represents an intermediate form between them; the telson in this specimen is 2.3 times as long as maximum breadth and furnished with 9 or 10 spines on the lateral margin (Fig. 16B), while in *A. minuta* and *A. sp.* the telson is 3 times as long and armed with 11–20 spines and

1.75–2 times as long and with 7 or 8 spines, respectively. Further studies, including intraspecific variations, based on more material may allow clarification of the true identity of these species.

Anisomysis (Anisomysis) sp. II

(Fig. 17)

Material. — [Mainland of Japan] One adult male (ca. 3.3 mm) (NSMT-Cr 14360); turtle exhibition tank in Aquarium of the Kushimoto Marine Park, 23 October 1996, collected by K. Nomura.

Remarks. — This single specimen was found from a turtle exhibition tank in Aquarium of the Kushimoto Marine Park Center, together with abundant specimens of *Anisomysis (Anisomysis) mixta*. This species clearly belongs to the subgenus *Anisomysis* by having the mandibular palp without dentate processes on the mesial margin of the second segment, and is closely allied to

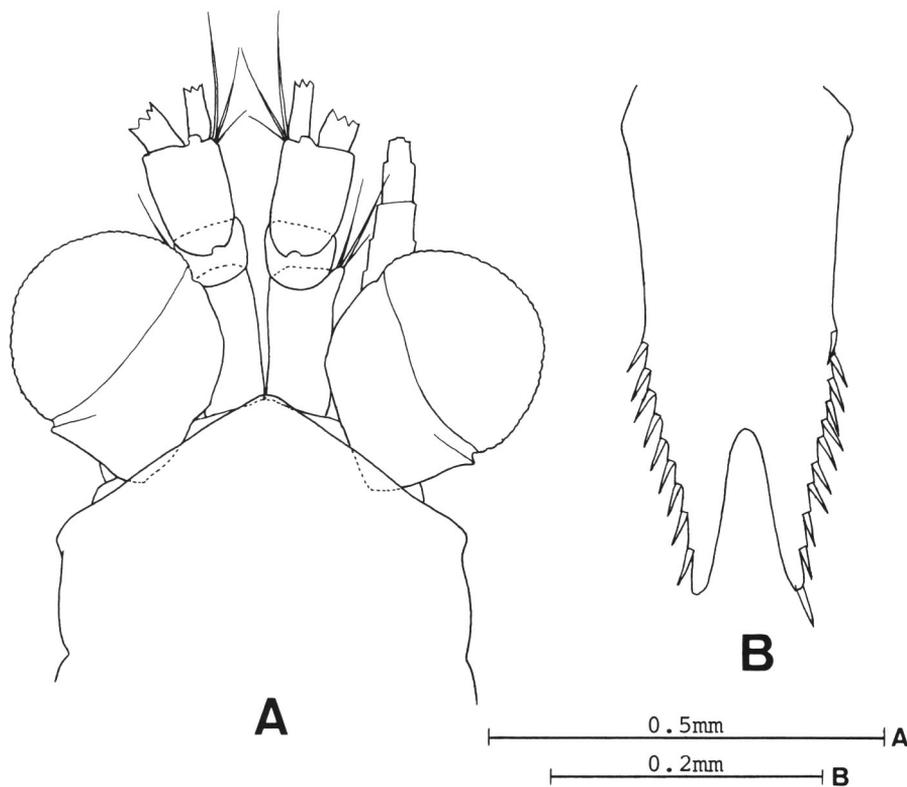


Fig. 16. *Anisomysis (Anisomysis) sp. I*, adult female. A, anterior part of body; B, telson.

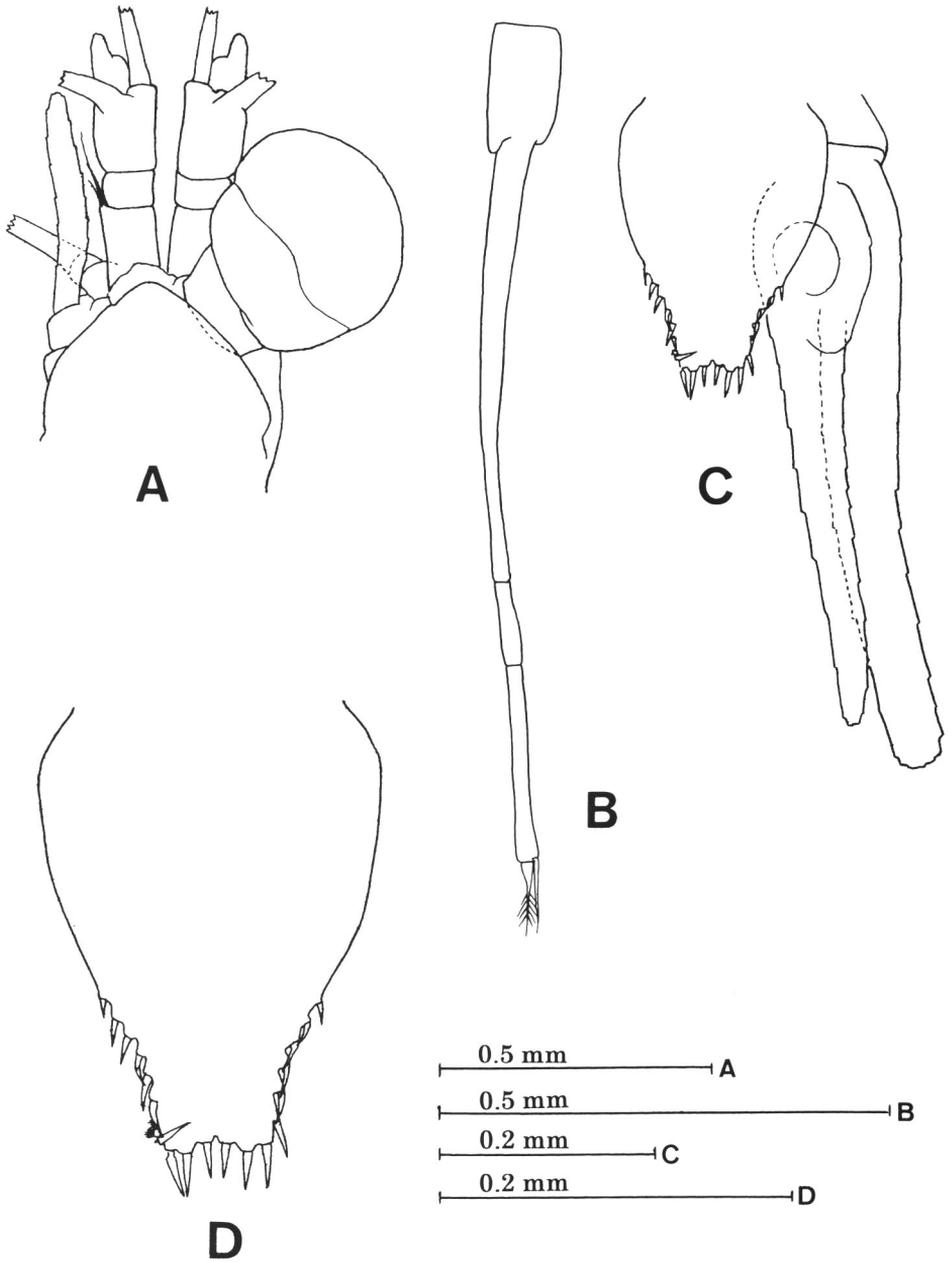


Fig. 17. *Anisomysis (Anisomysis)* sp. II, adult male. A, anterior part of body; B, fourth pleopod of male; C, uropod and telson; D, telson.

Anisomysis (Anisomysis) hanseni Nouvel, 1967, and *A. (A.) maldivensis* n. sp. in the telson with a slight posterior depression (Fig. 17D) and the exopod of the fourth male pleopod with the third segment more than twice as long as the second segment (Fig. 17B). Differences from the two lat-

ter species are found in the shape and armature of the telson. The telson becomes gradually narrower towards posterior end in this species (Fig. 17D), while that of the two latter species becomes abruptly narrower at distal third and then parallel-sided towards posterior end. Distal lobes

of the telson (Fig. 17D) is furnished with two pairs of spines in this species instead of three pairs in the two latter species.

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