ASED http://e-ASED.org
Animal Systematics, Evolution and Diversity

Anim. Syst. Evol. Divers. Vol. 28, No. 1: 59-67, January 2012
http://dx.doi.org/10.5635/ASED.2012.28.1.059

Short communication

New Record of Two Opossum Shrimps (Crustacea: Mysida: Mysidae) from Korea

Mijin Kim, Sang-kyu Lee, Won Kim*

School of Biological Sciences, Seoul National University, Seoul 151-747, Korea

ABSTRACT

The order Mysida Haworth, 1825 consists of four families. Of these, only family Mysidae Dana, 1850 has been reported in Korea. Two opossum shrimps, *Nipponomysis calcarata* Takahashi and Murano, 1986 and *Exacanthomysis japonica* Murano, 1991 belonging to the tribe Mysini of Mysidae, are reported for the first time from Korean waters. The present study is the second report of these two species in the world. The illustrations and descriptions of these species are provided herein. As a result of this study, 47 species of opossum shrimps including *N. calcarata* and *E. japonica* are now recorded on the mysids in Korean fauna.

Keywords: Mysida, Mysidae, *Nipponomysis*, *Exacanthomysis*, *Nipponomysis calcarata*, *Exacanthomysis japonica*, Korea

INTRODUCTION

Mysids are one of the zooplanktons found in marine and freshwater ecosystems (Jo et al., 1998). They are served as an important food source for higher trophic levels (Mees et al., 1994). They are often called opossum shrimp because pregnant female carries their young in a brood pouch.

In the family Mysidae Dana, 1850, 45 species belonging to 19 genera have been reported in Korea. Continuous systematic study on the mysids in Korea revealed that two species, *Nipponomysis calcarata* Takahashi and Murano, 1986 and *Exacanthomysis japonica* Murano, 1991, are new to Korean fauna. The genus *Exacanthomysis* Holmquist, 1981 is also first reported in Korean waters.

The present two species were collected from a tidal pool by light trap and hand-net. Specimens were preserved in 70% ethyl alcohol, and illustrations were drawn with the aid of compound microscope (Model BX-60; Olympus, Tokyo, Japan) fitted with a drawing tube. Images were recorded using a digital camera (Model D7000; Nikon, Tokyo, Japan), and produced with Helicon Focus software (Model Helicon Focus; Helicon Soft Ltd., Kharkov, Ukraine). Body length was measured from the tip of the rostrum to distal apex of the telson excluding the spine. The simple setae and plumage of the plumose setae on the margin of antennae, antennules, mouthparts, and uropods are omitted from the figures. Terminology for the dissection and measurement is after Tattersall and Tattersall (1951). All specimens have been deposited in the Marine Arthropod Depository Bank of Korea (MADBK), Seoul National University.

SYSTEMATIC ACCOUNTS

Order Mysida Haworth, 1825
Family Mysidae Dana, 1850
Subfamily Mysinae Haworth, 1825
Tribe Mysini Hansen, 1910
Genus *Nipponomysis* Takahashi and Murano, 1986

[1*]*Nipponomysis calcarata* Takahashi and Murano, 1986 (Figs. 1-3)

Nipponomysis calcarata Takahashi and Murano, 1986: 140, fig. 18; Müller, 1993: 201.

Material examined. 1♀, Korea: Isl. Jejudo, Jeju-si, Jeju Port, 2 Nov 2010, in light trap; 1♀, Gyeongsangnam-do: Tongyeong-si, Isl. Yokjido, 8 Dec 2010, by hand-net; 1 juv.,

*To whom correspondence should be addressed
Tel: 82-2-880-6695, Fax: 82-2-872-1993
E-mail: wonkim@plaza.snu.ac.kr

pISSN 2234-6953

Korean name: [1*]며느리발톱곤쟁이 (신칭)

Fig. 1. *Nipponomysis calcarata* Takahashi and Murano, 1986, female. Whole animal, 5.2 mm.

Gyeongsangbuk-do: Uljin-gun, Gol-jang Port, 37° 1′54″N, 129° 24′32″E, 14 Jul 2011, in light trap; 1 ♀, Uljin-gun, 36° 59′51″N, 129° 24′18″E, 24 Aug 2011, in light trap.

Description. Carapace (Fig. 2A) with anterior margin produced into triangular rostral plate with bluntly pointed tip, reaching near base of first segment of antennular peduncle; posterior margin emarginated and covering abdominal somites dorsally except for last two.

Eye (Figs. 1, 2A) large, slightly flattened; cornea reniform in dorsal view and occupying 2/5 of whole eye; eyestalk without denticles.

Antennal scale (Fig. 2B) lanceolate with round apex, about 4 times as long as broad, extending anteriorly beyond first segment of antennal peduncle; obscure suture occupying 1/13 of whole length of antennal scale; outer margin straight, inner margin concave and entire margin with setose. Antennal peduncle 3-segmented; second segment with 4 simple setae on distal margin, twice as long as first; third segment with 3 simple setae on distal margin.

Antennular peduncle (Fig. 2C) 3-segmented; first segment longest and second shortest.

Mandibular palp (Fig. 2D, E) 3-segmented; first segment inconspicuous, second 3 times as long as third; third segment with 5 plumose setae on inner margin and 6 simple setae on medial margin.

Labrum (Fig. 2F) with pointed apex on anterior margin.

Maxillule (Fig. 2G) with outer lobe bearing 11 robust setae on distal margin; inner lobe with 12 plumose setae.

Maxilla (Fig. 2H) armed with plumose setae along margin; endopod 2-segmented, second segment 1.7 times as long as broad; exopod with 15 plumose setae.

Endopod of first and second thoracopods (Fig. 2I, J) robust with long and tough claw terminally.

Endopod of third to eighth thoracopods (Fig. 3A-E) with 3-subsegmented carpopropodus, proximal segment of carpopropodus armed with two long and two short strong spines on inner margin of basal half region.

Marsupium composed of 2 pairs of oostegites.

Pleopod of female uniramous, rudimentary with well-developed endite.

Inner uropod (Fig. 3F) with 9 spines in ventral statocyst region; outer uropod 1.3 times longer than inner uropod.

Telson (Fig. 3G) slightly short, linguiform, about 1.6 times as long as broad; lateral margin bearing 3-4 spines one-by-one on proximal half, remaining distal region armed with 3-4 groups of spines composed of large and small spines alternatively, 1-3 smaller spines and 1 larger spine gradually increased in length to distal part; apex truncated, armed with 2 pairs of spines, outer spines especially robust and 3 times as long as inner ones, 1/3 shorter than lateral distalmost spines.

Distribution. Korea (present study) and Japan (Otsuchi Bay, Iwate Prefecture).

Remarks. *Nipponomysis calcarata* Takahashi and Murano, 1986 has been only known from Japan up to date. The present record in Korean waters is the second in the world.

According to the original description of Takahashi and Murano (1986), the number of spines on ventral margin of the inner uropod varies from 7 to 9. In the present specimens, however, the number of spines varies 6 to 9 as for adult and 4 in case of immature specimens.

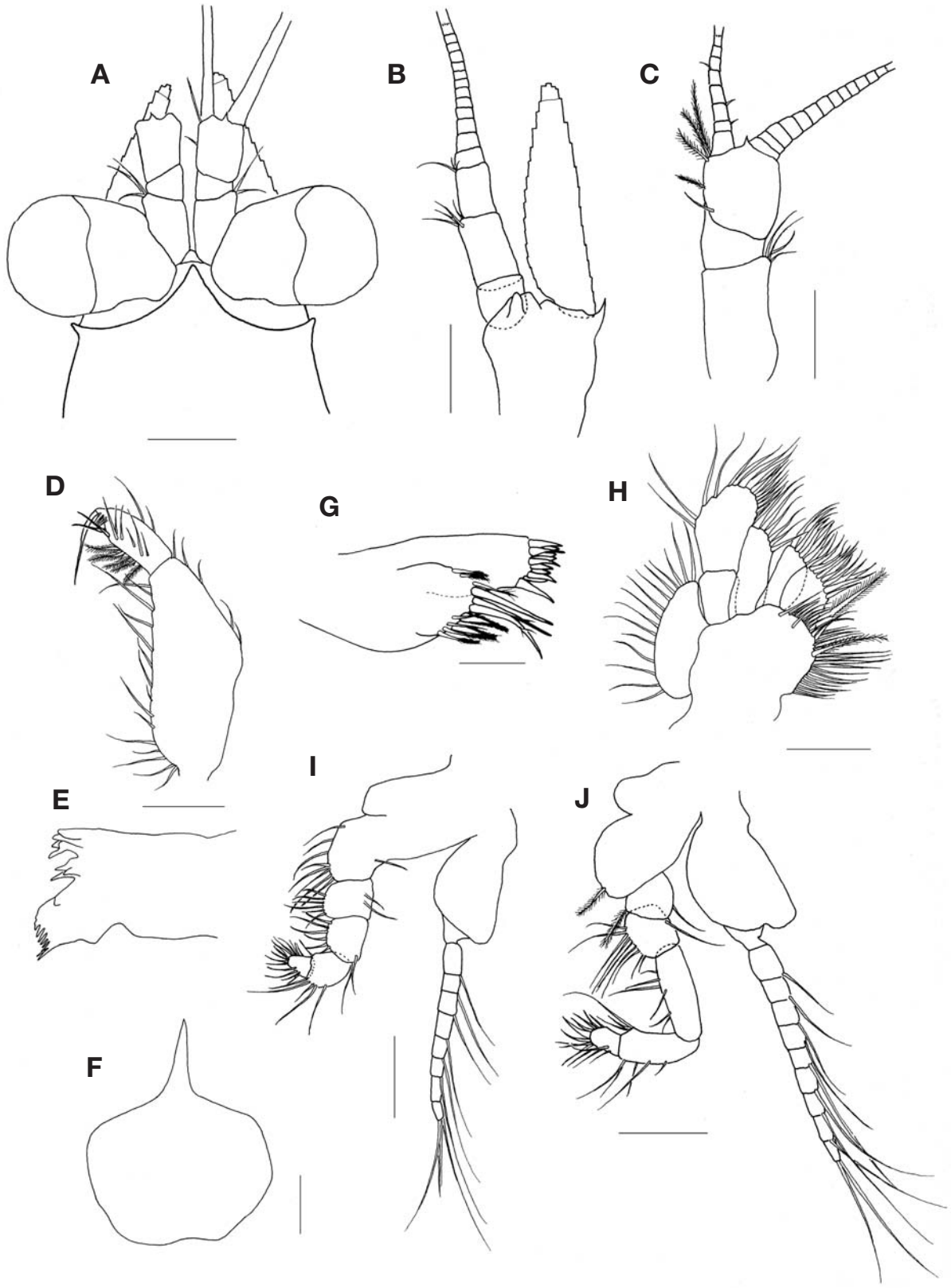

Fig. 2. *Nipponomysis calcarata* Takahashi and Murano, 1986, female. A, Anterior part; B, Antenna; C, Antennule; D, E, Mandible; F, Labrum; G, Maxillule; H, Maxilla; I, First thoracopod; J, Second thoracopod. Scale bars: A-C, I, J=0.25 mm, D-H=0.1 mm.

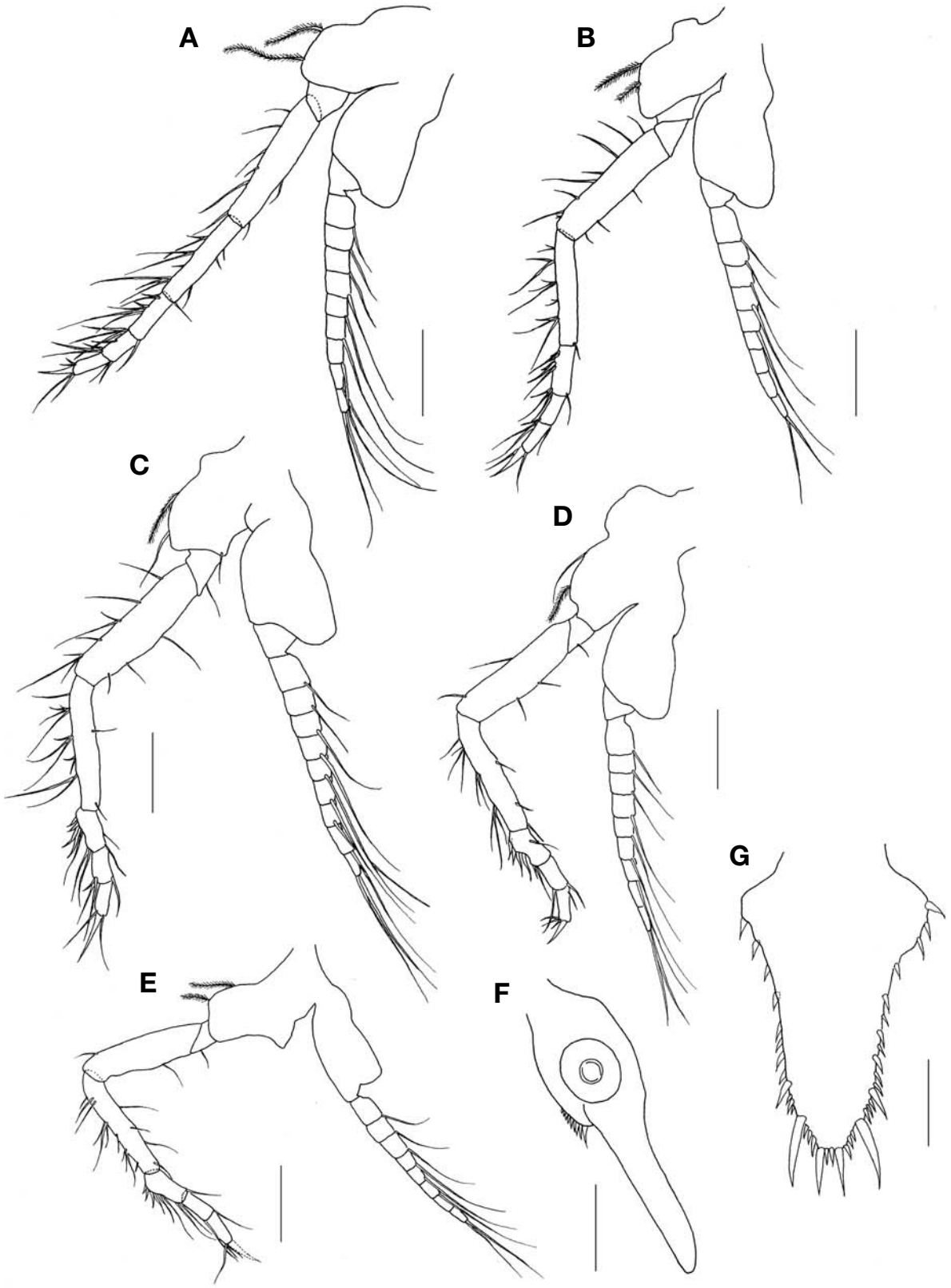

Fig. 3. *Nipponomysis calcarata* Takahashi and Murano, 1986, female. A, Third thoracopod; B, Fourth thoracopod; C, Sixth thoracopod; D, Seventh thoracopod; E, Eighth thoracopod; F, Inner uropod; G, Telson. Scale bars: A-G=0.25 mm.

Fig. 4. *Exacanthomysis japonica* Murano, 1991, female. Whole animal, 8.1 mm.

[1*]Genus *Exacanthomysis* Holmquist, 1981

[2*]***Exacanthomysis japonica*** **Murano, 1991 (Figs. 4-7)**

Exacanthomysis japonica Murano, 1991: 81, figs. 1-2; Müller, 1993: 181.

Material examined. 10♀♀, Korea: Gangwon-do, Goseong-gun, Geojin Port, 38° 26′53.14″N, 128° 27′46.37″E, 4 Apr 2011, in light trap.

Description. Carapace (Fig. 5A) with anterior margin produced into triangular rostral plate with pointed tip bearing ventral median keel, not reaching near base of first segment of antennular peduncle; posterior margin emarginated, anterolateral corners rounded form.

Eye (Figs. 4, 5A) well developed; cornea reniform in dorsal view and occupying half of whole eye; eyestalk without denticles, bearing hairs on surfaces.

Antennal scale (Fig. 5B) lanceolate with round apex, about 4.3 times as long as broad; distal suture occupying 1/17 of whole length of antennal scale; outer margin straight, inner margin concave and entire margin with setose. Antennal peduncle 3-segmented; second segment with 2 simple setae on distal margin, 1.3 times as long as first; third segment with several setae on distal margin, subequal to first.

Antennular peduncle (Fig. 5C) 3-segmented; first longest, second shortest and 1/2 as long as third.

Mandibular palp (Fig. 5D) 3-segmented; second segment almost 2 times as long as third, slightly swollen; third segment bearing 12-13 plumose setae on inner margin.

Maxilla (Fig. 5E) armed with plumose setae along margin; endopod 2-segmented, second segment 1.7 times as long as first.

Maxillule (Fig. 5F) with hump-shaped process on medial margin of outer lobe.

Endopod of first and second thoracopods (Fig. 5G, H) with short claw terminally, basal plate of exopod bearing 1 or 2 spinules.

Endopod of third to eighth thoracopods (Figs. 6A-E, 7A) with 4-subsegmented carpopropodus, all segments of carpopropodus subequal in length or proximal segment longest and with dactylus short; basal plate of exopod bearing 1-3 spinules except in eighth thoracopod.

Pleopod of female (Fig. 7B) uniramous, short and rudimentary; all pleopods almost same length.

Inner uropod (Fig. 7C) bearing 4-5 spines in ventral statocyst region; outer uropod 1.3 times longer than inner uropod.

Telson (Fig. 7D) elongated triangular in shape, about 2.3 times as long as broad; lateral margin bearing 10-12 spines on proximal half and remaining part armed with 7 or 8 groups of spines composed of large and small spines alternatively, 1-5 smaller spines and 1 larger spine gradually increased in

Korean name: [1*]네마디안다리곤쟁이속(신칭); [2*]네마디안다리곤쟁이

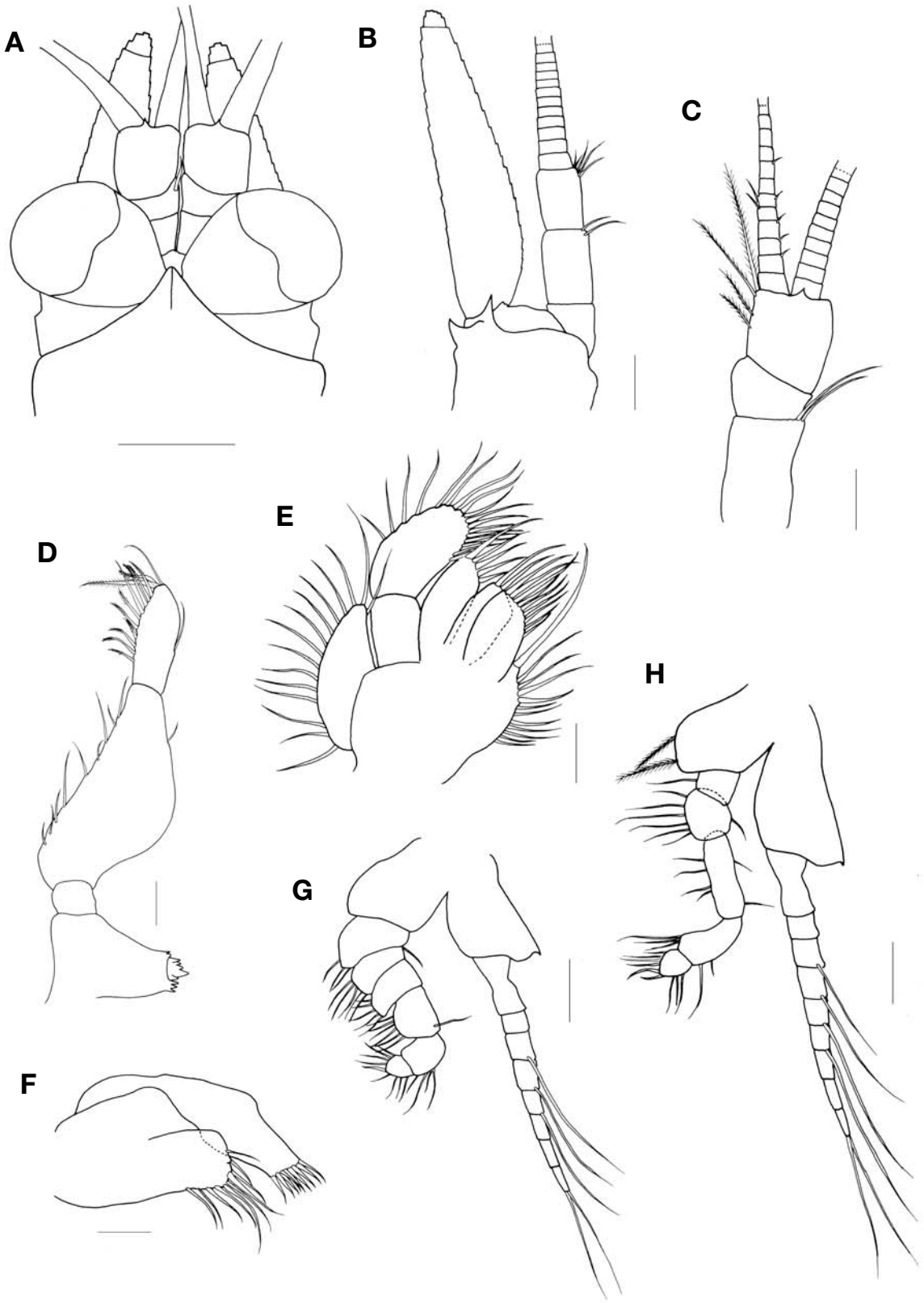

Fig. 5. *Exacanthomysis japonica* Murano, 1991, female. A, Anterior part; B, Antenna; C, Antennule; D, Mandible; E, Maxilla; F, Maxillule; G, First thoracopod; H, Second thoracopod. Scale bars: A=0.4 mm, B, C, G, H=0.2 mm, D-F=0.1 mm.

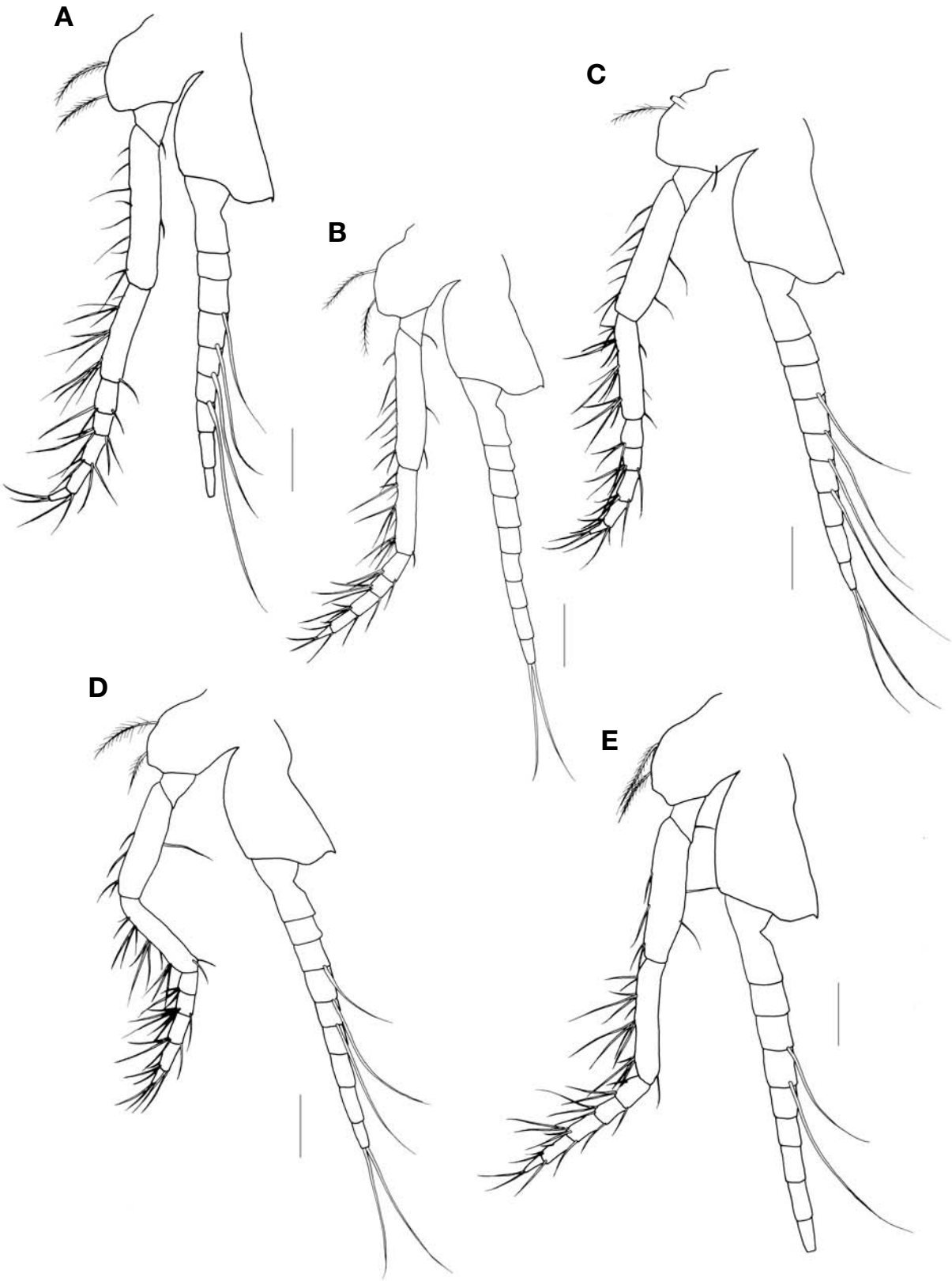

Fig. 6. *Exacanthomysis japonica* Murano, 1991, female. A, Third thoracopod; B, Fourth thoracopod; C, Fifth thoracopod; D, Sixth thoracopod; E, Seventh thoracopod. Scale bars: A-E=0.2 mm.

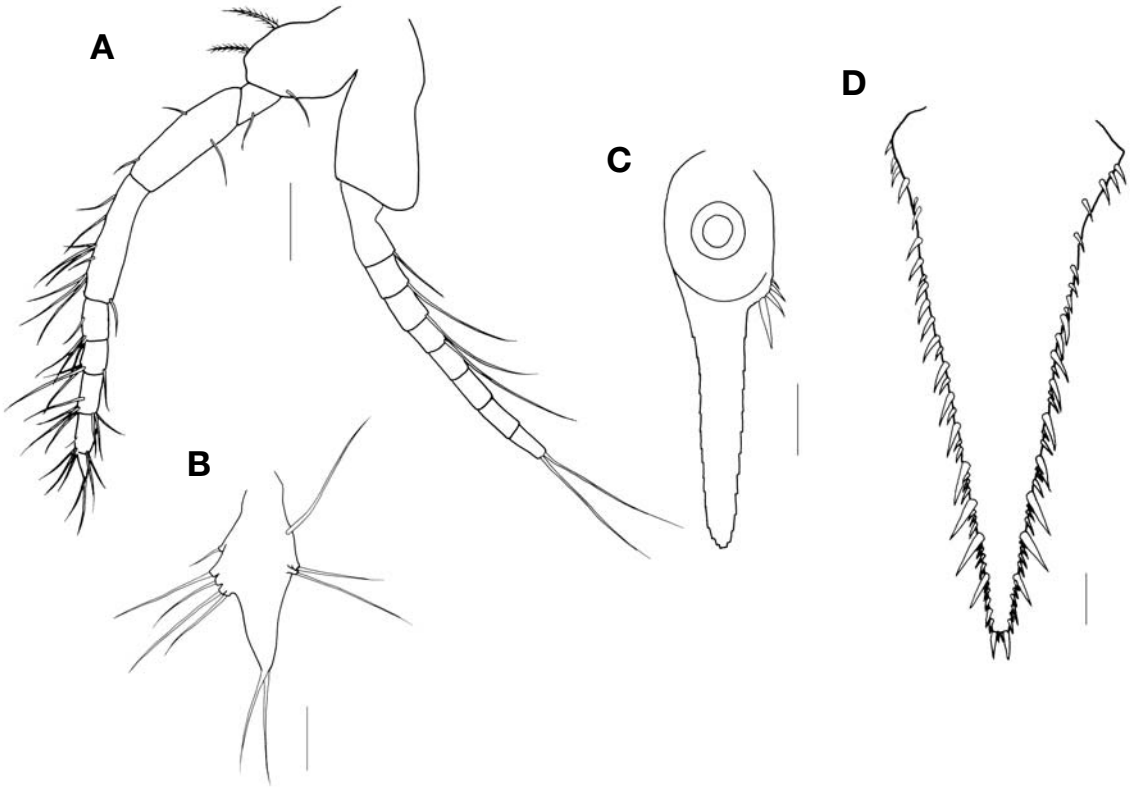

Fig. 7. *Exacanthomysis japonica* Murano, 1991, female. A, Eighth thoracopod; B, Fourth pleopod; C, Inner uropod; D, Telson. Scale bars: A, D=0.2 mm, B, C=0.1 mm.

length to distal part, except last group composed of 6-8 smaller spines; apex narrow and truncated, 13 times as long as broad, bearing 2 pairs of spines, outer spines twice as long as inner ones.

Distrubution. Korea (present study) and Japan (Ishikari Bay, Hokkaido).

Remarks. Three species of the genus *Exacanthomysis* Holmquist, 1981 were reported from the coastal waters in the northeastern Pacific (Murano, 1991): *E. davisi* (Banner, 1948) ranging from California to Alaska, *E. alaskensis* (Banner, 1954) ranging from Washington to Alaska, and *E. arctopacifica* Holmquist, 1981 from Alaska. Since then, *E. japonica* Murano, 1991 was reported as a new species from Japan located in the northwestern Pacific. The present study is the second report in the world.

According to the original description of Murano (1991), *E. japonica* is characterized by its 4 subsegments of carpopropodus of endopod in third to eighth thoracopods. The specimens in the present study agree well with the original description in this respect. Most of our specimens, however, showed that 4 subsegments of carpopropodus were subequal in length, while the original description mentioned proximal first subsegment longer than the others.

ACKNOWLEDGMENTS

We thank Dr. S. J. Song for assistance and comments to present paper. The present study was supported by a grant from Marine Biotechnology Programme funded by Ministry of Land, Transport and Maritime affairs of the Korean Government.

REFERENCES

Holmquist C, 1981. *Exacanthomysis* gen. nov., another detachment from the genus *Acanthomysis* Czerniavsky (Crustacea, Mysidacea). Zoologische Jahrbücher, Abteilung für Systematik, Ökologie und Geographie der Tiere, 108:386-415.

Jo SG, Ma CW, Suh HL, Hong SY, 1998. Mysidacea (Crustacea) from the Korea Strait and its adjacent waters. Korean Journal of Biological Sciences, 2:33-47.

Mees J, Abdulkerim Z, Hamerlynck O, 1994. Life history, growth and production of *Neomysis integer* in the Westerschelde estuary (SW Netherlands). Marine Ecology Progress Series, 109:43-57.

Müller HG, 1993. World catalogue and bibliography of the recent Mysidacea. Wissenchaftlicher Verlag, Tropical Products

Trading Center, Wetzlar, pp. 1-238.
Murano M, 1991. Two new species of the tribe Mysini (Crustacea, Mysidacea) and a new record of *Acanthomysis quadrispinosa* from Japan. Bulletin of the National Science Museum, Series A, Zoology, 17:81-91.
Takahashi K, Murano M, 1986. Establishment of a new genus *Nipponomysis* (Crustacea, Mysidacea) with special reference to its relationship to the genus *Proneomysis*, with descriptions of its two new species. Journal of the Tokyo University of Fisheries, 73:115-144.
Tattersall WM, Tattersall OS, 1951. The British Mysidacea. Ray Society, London, pp. 13-28.

Received November 15, 2011
Revised January 2, 2012
Accepted January 5, 2012