

Nippoleucon projectus, a New Species of Leuconid Cumaceans (Cumacea, Leuconidae) from Korea

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Abstract: A new species of leuconid cumaceans, *Nippoleucon projectus* n. sp. is described on the basis of the specimens collected from western shallow coast of the South Korea. This new species is easily distinguished from two previously recorded species (*N. hinumensis* and *N. enoshimensis*) in having the fifth abdominal segment prominently projected to rear at dorsal posterior portion and the carapace of the female with three spines on the frontal lobe.

Keywords: Cumacea, Leuconidae, *Nippoleucon*, new species, South Korea

Cumaceans are small peracaridean crustaceans and currently comprises more than 1200 species in eight families worldwide (Watling and McCann, 1997). Among them, the family Leuconidae is one of the old cumacean families and has been reported 99 species of 12 genera over the world to date (Băcescu, 1988; Watling, 1991). Watling (1991) established *Nippoleucon* as a new genus for two species, *Nippoleucon hinumensis* (Gamô, 1967) and *N. enoshimensis* (Gamô, 1967), which were described originally from Japanese waters. They were transferred from *Hemileucon* to *Nippoleucon* by the following diagnostic characters: 1) eyelobe without lens or pigment; 2) antennule not geniculate; 3) uropodal endopod biarticulated; 4) the length of the third article of second pereopod much shorter than wide; 5) with exopods on first pereopod to third in female and first to fourth in male; 6) in male antenna, the fourth article of peduncle without the brush of setae and the several proximal articles of flagellum modified into grasping-like structures; 7) in male, pleopod absence and antenna not extending beyond carapace. Recently, *N. hinumensis* was

also reported in Korea by Lee and Lee (2003).

Through this examination of the cumacean specimens collected from western coast of the South Korea, a species belonging to the genus *Nippoleucon* turned out to be new to science. As a result, this genus comprises three species over the world, of which two species (*N. hinumensis* and *N. projectus*) are reported from Korean waters.

MATERIALS AND METHODS

The specimens were collected mainly using a light-trap and a fine mesh hand-net from the shallow coast of the Yellow Sea in Korea. The specimens were fixed in 70-80% ethanol. The specimens were dissected in glycerol on cobb's aluminium hole slide. Drawings and measurements were performed with the aid of a drawing tube. Measurements for the body length were made from the anterior tip of carapace to the last abdominal segment and for each appendages were made along the mid-line of article, exclusive of the inflated outer angle. Type specimens will be deposited in the National Institute of Biological Resources, Incheon, Korea.

DESCRIPTION

Order Cumacea Kröyer, 1846
Family Leuconidae Sars, 1878
Genus *Nippoleucon* Watling, 1991

Nippoleucon projectus n. sp.
(Figs. 1-7)

Material examined

3 ♀ ♀, Yeocha-ri, Ganghwa I. (37° 35' 32"N, 126° 22' 50"E), 14 Apr. 1998, collected by Y. H. Kim. Holotype (♀, KB-111) and paratype (1 ♀, KB-112) will be deposited in the

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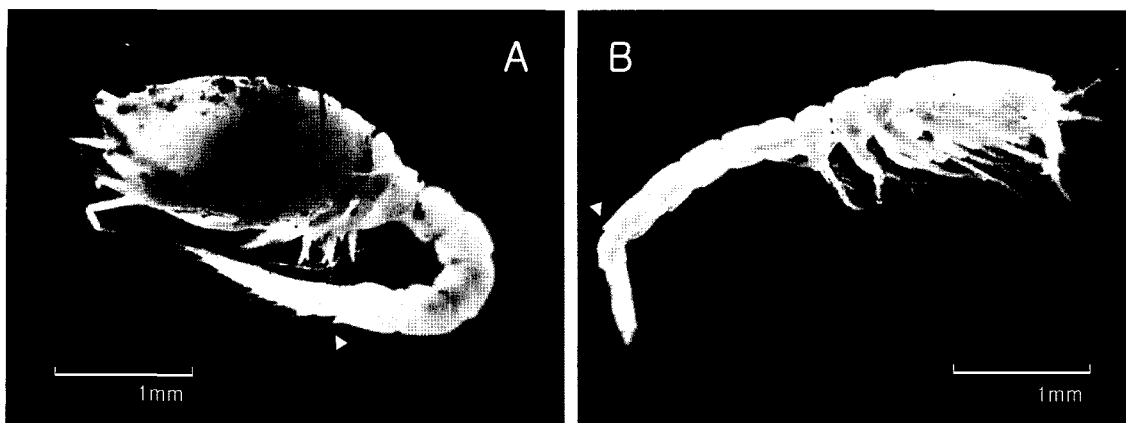


Fig. 1. *Nippoleucon projectus* n. sp., Specimens preserved in alcohol. A, Habitus of female. B, Habitus of male.

National Institute of Biological Resources. Dissected paratype (1 ♀) is retained in the collection of the authors. Allotype: ♂ (right appendages dissected out), Boleum I. (37° 40' 17"N, 126° 12' 16"E), 26 Apr. 2001, collected by Y. H. Kim. Dissected allotype is kept in the collection of the authors.

Female

Body (Figs. 1A, 2A) length about 4.5 mm, excluding uropods. Carapace (Fig. 2A, B) slightly shorter than 1/5 of body length, about 1.3 times as long as its depth, and about 1.15 times as long as its width; shape nearly triangular in dorsal view, with 3 spines on frontal lobe. Antennal notch and antero-lateral corner prominent. Antero-lateral margin serrated. Pseudorostral lobes (Fig. 2A, B) obliquely directed upward. Ocular lobe (Fig. 2B) absent.

Thorax (Fig. 2A, B) about 1.85 times as long as carapace, slightly longer than 1/3 of body length. Second segment largest, about 1.5 times as long as first; third about 0.75 times as long as second; fourth and fifth subequal in length. Abdomen (Figs. 1A, 2A) about 0.85 times as long as cephalothorax. Fifth segment longest, about 0.6 times as long as third and fourth combined, and prominently projected to rear at dorsal posterior portion. Last segment about 0.75 times as long as fifth, with 4 pectinated setae near distal margin.

Antennule (Fig. 2C): Peduncle composed of 3 articles; first article about 0.8 times as long as second, with 1 plumose and 3 sensory setae on inner corner; second subequal in length to third, with 4 sensory and 4 plumose setae near distal margin; third with 1 simple seta near outer margin, and 1 long simple and 3 sensory setae near inner corner. Main flagellum composed of 3 articles; first article 0.6 times as long as third peduncular article; second slightly shorter than 1/2 of first, with 1 aesthetasc, 2 short and 1 long simple setae on disatal margin; third

article very minute, with 1 aesthetasc, 1 sensory, 1 short and 2 long simple setae. Accessory flagellum not articulated, slightly longer than 1/4 of first article of main flagellum, with 2 simple and 3 sensory setae on distal margin.

Labium (Fig. 2D) with numerous hairs on inner margin; apex faint, with 1 spiniform seta.

Left mandible (Fig. 2E) truncated, triangular, with 1 pectinated seta between lacinia mobilis and pars molaris; pars incisiva with 3 teeth; lacinia mobilis with 3 indistinct teeth; pars molaris large. Right mandible (Fig. 2F) with 2 pectinated setae between pars incisiva and pars molaris; pars incisiva with 3 teeth.

First maxilla (Fig. 2G): Protopod with 8 spiniform setae and 1 pectinated spiniform seta on terminal margin; outer margin with 1 plumose distal seta; palp very long, with 2 filaments. Endite with 4 pectinated spiniform setae.

Second maxilla (Fig. 2H): Protopod with 17 plumose setae; endites extending beyond protopod.

First maxilliped (Fig. 3A): Carpus of protopod with numerous hairs, 7 simple setae. Endite extending beyond merus of protopod, with 1 large plumose seta and 2 hook-like spines near inner margin, and numerous hairs, 1 pectinated spine, 4 simple and 2 plumose setae near distal margin.

Second maxilliped (Fig. 3B): Basis about 0.8 times as long as remaining articles combined, with 1 long plumose and 1 short simple setae on distal margin.

Third maxilliped (Fig. 3C): Basis about 1.4 times as long as remaining articles combined, with 6 plumose setae near median surface, 6 plumose setae on inner margin, and numerous hairs on outer margin; outer corner inflated, with 3 long plumose setae. Exopod well developed, with 3 plumose setae on outer margin.

First pereopod (Fig. 3D): Basis about 0.85 times as long as remaining articles combined, with 1 spiniform distal seta, 3 short and 11 long plumose setae on inner

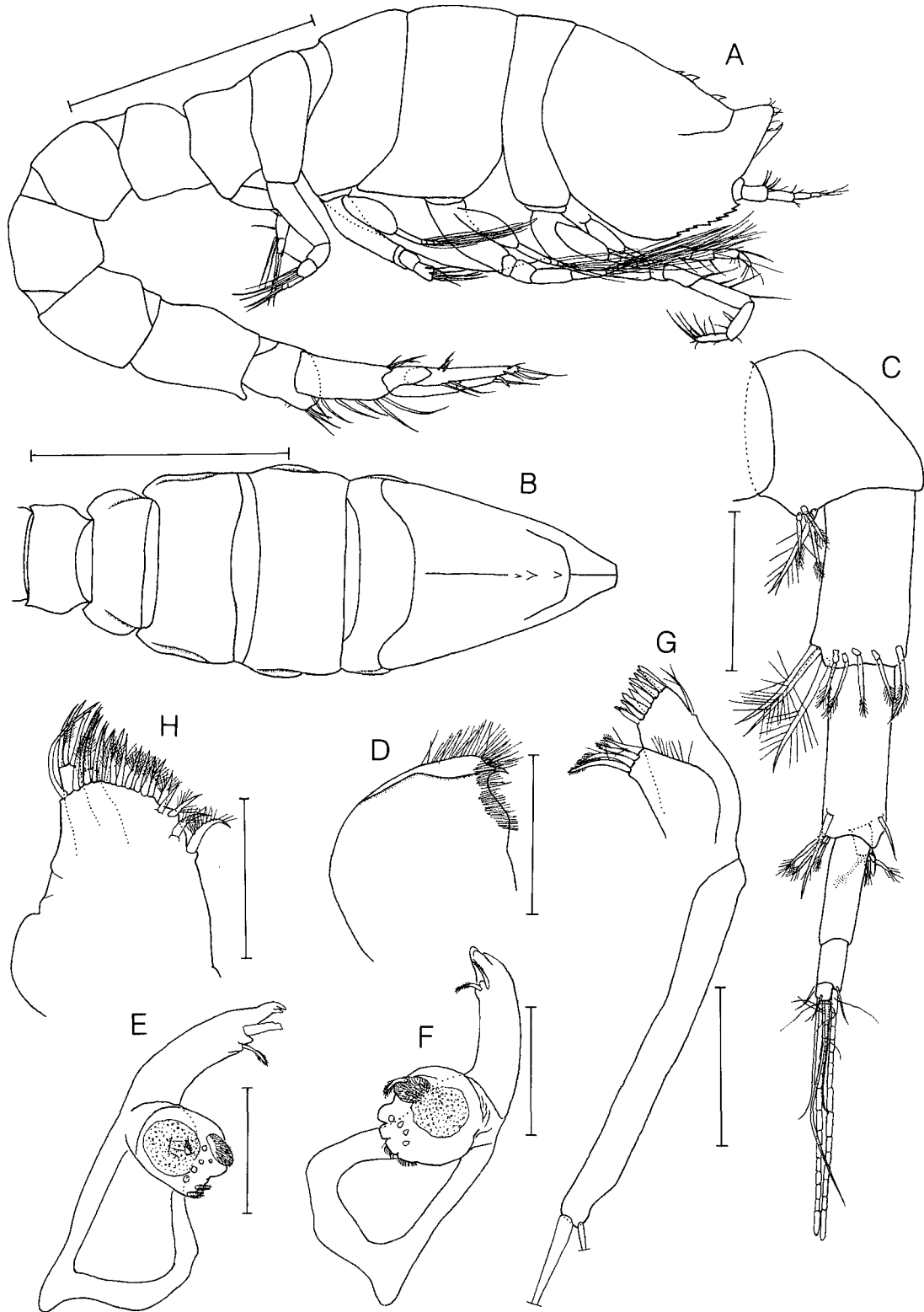


Fig. 2. *Nippoleucon projectus* n. sp., female. A, Habitus, lateral. B, Cephalothorax, dorsal. C, Antennule. D, Labium. E, Left mandible. F, Right mandible. G, First maxilla. H, Second maxilla. Scale bars = 1 mm (A, B) and 0.1 mm (C-H).

margin, and 1 simple and 2 plumose setae near distal margin. Carpus 1.75 times as long as propodus, with 1

short simple seta on inner margin, and 1 short simple and 3 plumose setae on outer margin. Exopod well developed,

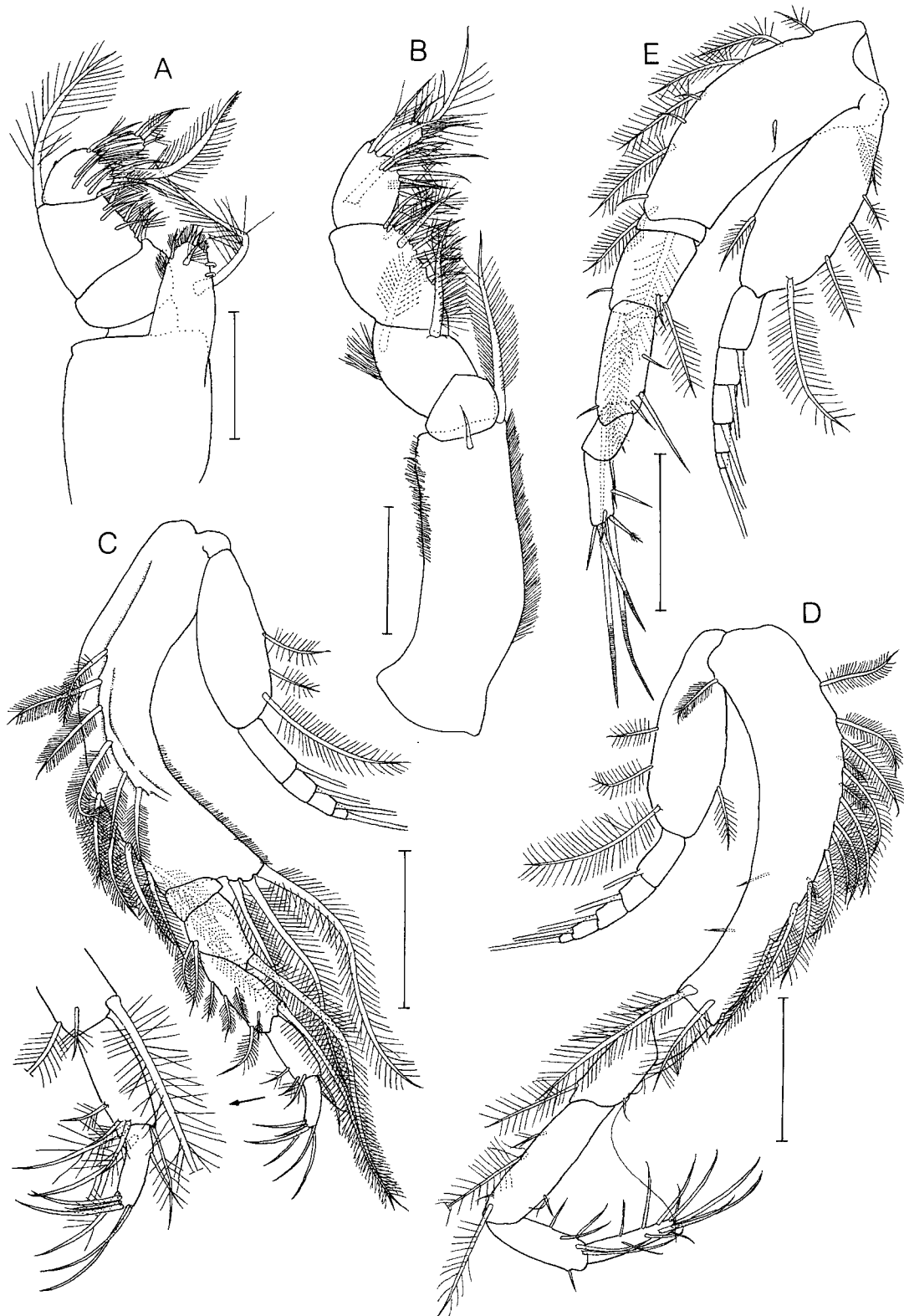


Fig. 3. *Nippoleucon projectus* n. sp., female. A, First maxilliped. B, Second maxilliped. C, Third maxilliped. D, First pereopod. E, Second pereopod. Scale bars = 0.1 mm (A, B) and 0.2 mm (C, D).

with 3 plumose setae on outer margin.

Second pereopod (Fig. 3F): Basis about 0.8 times as

long as remaining articles combined, with 3 short simple and 6 plumose setae near inner margin. Exopod well

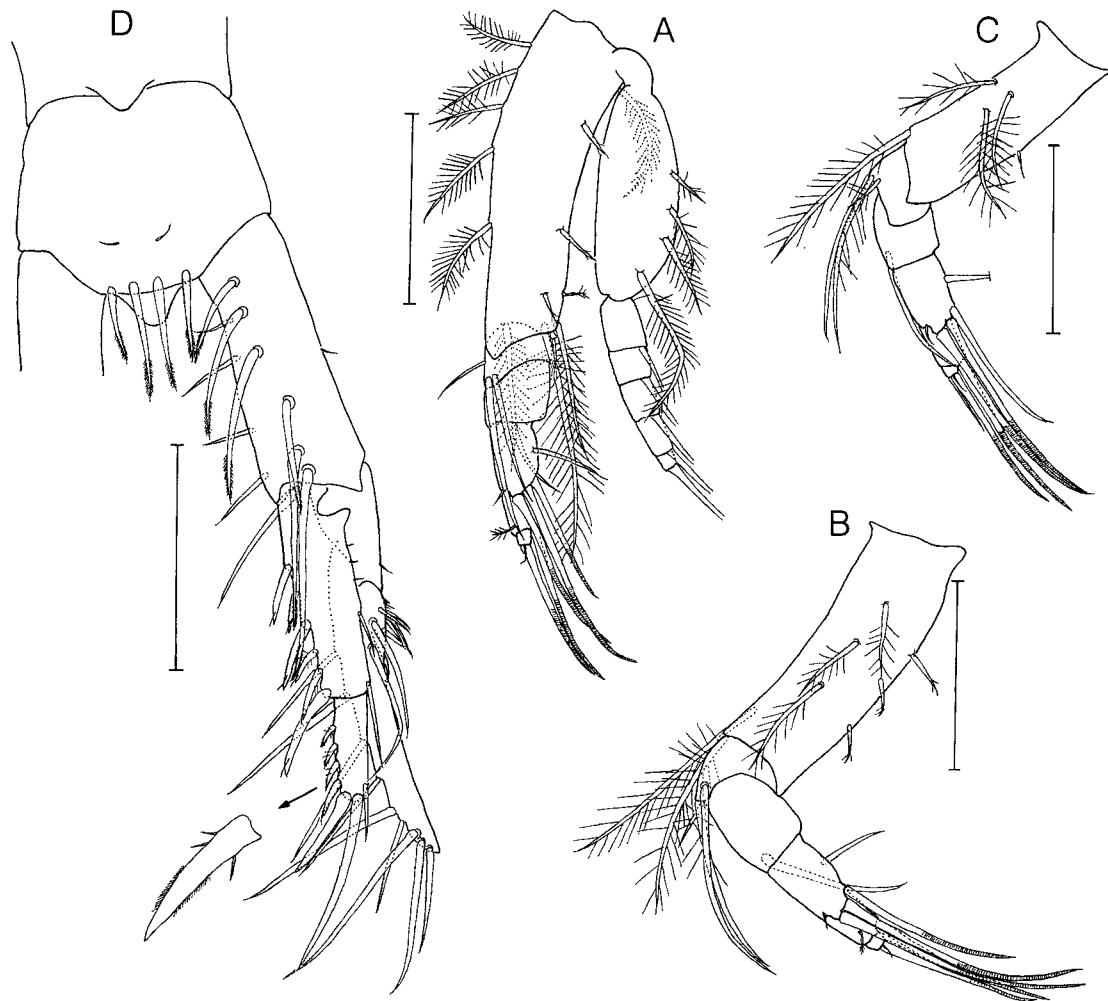


Fig. 4. *Nippoleucon projectus* n. sp., female. A, Third pereopod. B, Fourth pereopod. C, Fifth pereopod. D, Uropods and last abdominal segment, dorsal. Scale bars = 0.2 mm (A-C) and 0.3 mm (D).

developed, with 4 plumose setae on outer margin.

Third pereopod (Fig. 4A): Basis about 1.5 times as long as remaining articles combined, with 1 sensory distal seta, 1 long and 3 short plumose setae near outer margin, and 1 sensory seta and 3 plumose setae on distal margin; inner margin with 5 plumose setae. Exopod well developed, with 4 plumose setae on outer margin.

Fourth pereopod (Fig. 4B): Basis slightly longer than length of remaining articles combined, with 3 short and 5 plumose setae on surface.

Fifth pereopod (Fig. 4C): Basis subequal to length of remaining articles combined, with 1 short simple and 4 plumose setae on surface.

Uropod (Fig. 4D): Peduncle about 1.3 times as long as last abdominal segment, with 5 simple setae on inner margin, and 6 pectinated setae near median surface. Endopod 2-articulated, about 1.2 times as long as peduncle; first article with 6 spines (last spine strong) on inner margin, and 2 simple setae on outer margin. Second

article subequal in length to 1/2 of first, with 5 spines (last spine strong) on inner margin and 1 long terminal spiniform seta; outer margin with 1 distal seta. Exopod 2-articulated, about 1.2 times as long as endopod. Second article with 9 simple setae on inner margin; outer margin with 3 sensory hairs and 1 bundle of setae (about 5 simple setae) near proximal portion.

Male

Body (Fig. 5A) length about 3.75 mm, excluding uropods. Carapace (Fig. 5A, B) subequal to 1/5 of body length, about 1.55 times as long as its depth; shape nearly rectangular in dorsal view, rather smooth. Antennal notch absent and antero-lateral corner obtuse. Antero-lateral margin smooth. Pseudorostral lobes (Fig. 5A, B) shorter than those of female, U-shaped. Ocular lobe (Fig. 5B) small, triangular form. Fifth segment of abdomen same as in female.

Antennule (Fig. 5C): First article of peduncle about



Fig. 5. *Nippoleucon projectus* n. sp., male. A, Habitus, lateral. B, Cephalothorax, dorsal. C, Antennule. D, Antenna. E, Third maxilliped. Scale bars = 1 mm (A, B), 0.15 mm (C), 0.3 mm (D), and 0.2 (E).

1.35 times as long as second, with 3 sensory setae on inner corner, and 5 plumose setae near distal margin;

second slightly shorter than length of third, with 5 sensory and 9 plumose setae near distal margin. Main flagellum

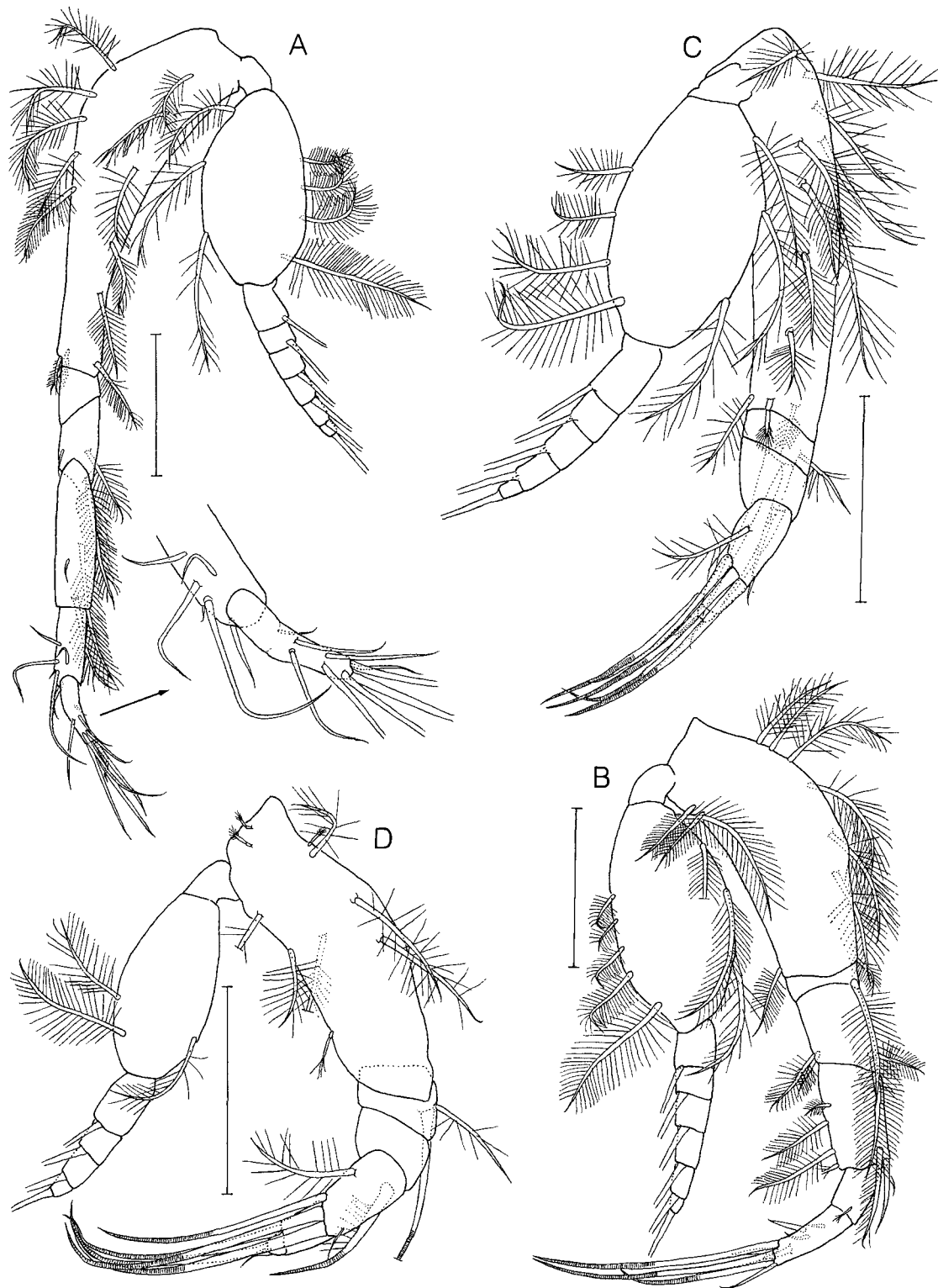


Fig. 6. *Nippoleucon projectus* n. sp., male. A, First pereopod. B, Second pereopod. C, Third pereopod. D, Fourth pereopod. Scale bars = 0.2 mm.

composed of 4 articles; first article about 0.6 times as long as third peduncular article, with 2 aesthetascs; second slightly shorter than 1/3 of first, with 5 long plumose setae on distal margin; third with 1 aesthetasc

and 1 long simple setae on disatal margin; fourth article very minute, with 1 aesthetasc and 2 long simple setae. Accessory flagellum slightly shorter than 1/3 of first article of main flagellum, with 7 simple setae near middle

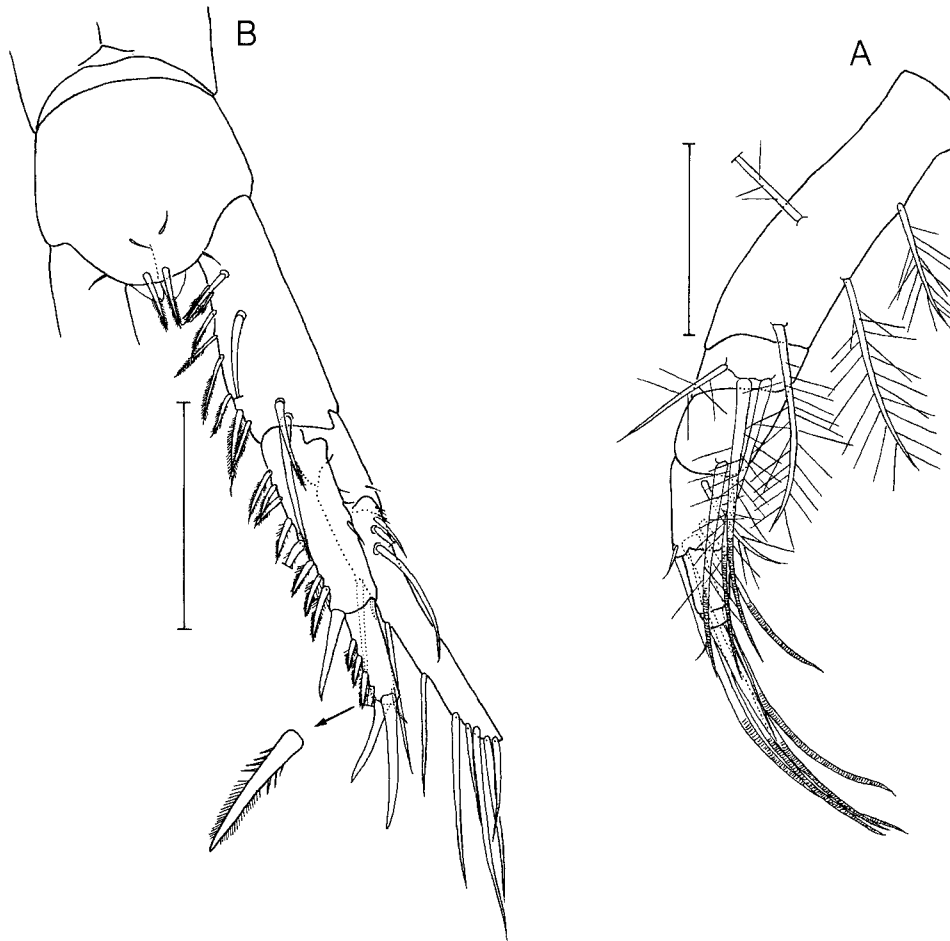


Fig. 7. *Nippoleucon projectus* n. sp., male. A, Fifth pereopod. B, Uropods and last abdominal segment, dorsal. Scale bars = 0.15 mm (A) and 0.3 mm (B).

portion; terminal margin with 1 sensory and 4 simple setae.

Antenna (Fig. 5A, D) short, not extending beyond carapace. Peduncle composed of 4 articles; fourth segment with poorly sensory setae on inner margin. Flagellum 16-articulated; several proximal articles modified into grasping structures.

Third maxilliped (Fig. 5E): Basis about 1.4 times as long as remaining articles combined, with 6 plumose setae near median surface, and numerous hairs, 6 plumose setae on inner margin; outer margin with numerous hairs; outer corner inflated, with 3 long plumose setae.

First pereopod (Fig. 6A): Basis about 0.95 times as long as remaining articles combined, with 6 plumose setae near median surface and 5 plumose setae on inner margin; inner corner with 2 short plumose setae.

Second pereopod (Fig. 6B): Basis about 0.85 times as long as remaining articles combined, with 7 plumose setae on inner and 3 plumose setae on outer margins.

Third (Fig. 6C) and Fourth pereopods (Fig. 6D) with well developed exopod respectively.

Fifth pereopod (Fig. 7A): Basis slightly shorter than length of remaining articles combined, with 4 plumose setae on surface.

Uropod (Fig. 7B): Peduncle about 1.1 times as long as last abdominal segment, with 8 pectinated setae on inner margin, and 4 pectinated setae near median surface. Endopod about 0.9 times as long as peduncle; first article with 8 pectinated and 1 strong spines on inner margin, and 2 sensory hairs and 1 short simple seta on outer margin; second article subequal in length to 1/2 of first, with 4 pectinated, 1 strong spines on inner margin and 1 long terminal spine. Exopodal second article with 8 simple setae on inner margin.

Habitat

Type specimens were collected from intertidal mud flats in the shallow waters of the eastern Yellow Sea. This new species seems to mainly live in the mud bottom.

Etymology

The specific epithet *projectus*, which means “projecting”

Table 1. Character comparison between three known species of *Nippoleucon*

Character and distribution	Species		
	<i>N. hinumensis</i>	<i>N. enoshimensis</i>	<i>N. projectus</i> n. sp.
Body length	3.6 mm (male) 5.3 mm (female)	1.8 mm (male) 2.4 mm (young female)	3.75 mm (male) 4.5 mm (female)
Dorsal posterior portion of fifth abdominal segment	not projected	not projected	projected to rear
Ornamentation on carapace in female	serrated crest	absent	3 spines
Length of uropodal exopod in female	1.2 times as long as endopod	subequal to endopod	1.3 times as long as endopod
Number of inner seta of uropodal exopod in female	6 simple setae	4 plumose and 6 simple setae	5 simple setae
Length of antenna 2 flagellum in male	1.3 times as long as peduncle	shorter than peduncle	1.5 times as long as peduncle
Number of terminal seta of last abdomen in female	4 short setae	2 short setae	4 long setae
Distribution	Japan (Gamô, 1967), South Sea, Korea (Lee & Lee, 2003)	Japan (Gamô, 1967)	Yellow Sea, Korea (in the present study)

in Latin, alludes to the fifth abdominal segment prominently projected to rear at dorsal posterior portion.

Remarks

The new species is easily distinguished from two species, *N. hinumensis* and *N. enoshimensis* described originally in Japanese waters, by the combination of following features (Table 1): 1) the posterior portion of the fifth abdominal segment is projected to rear (while it isn't in both *N. hinumensis* and *N. enoshimensis*); 2) the female carapace has three spines on frontal lobe (while it has a serrated crest in *N. hinumensis* and there is no ornamentation in *N. enoshimensis*); 3) the length of the female uropodal exopod is nearly 1.3 times as long as that of endopod (while it is nearly 1.2 times in *N. hinumensis* and subequal to endopod in *N. enoshimensis*); 4) the female uropodal exopod has five simple setae on inner margin (while it has six simple setae in *N. hinumensis* and in *N. enoshimensis*, it has four plumose and six simple setae). Also, the female last abdominal segment is armed with four terminal setae in both *N. projectus* and *N. hinumensis*, instead of two in *N. enoshimensis*.

The male of the new species resembles closely the male of *N. hinumensis* in having a similar body form. The new species, however, possesses a distinctive feature that the fifth abdominal segment is projected to rear at dorsal posterior portion in both sexes. This seems to be very important character to separate the new species from two congeners. Moreover, the length of flagellum of

antenna 2 is nearly 1.5 times as long as that of peduncle in the male of *N. projectus*, whereas nearly 1.3 times in *N. hinumensis* and shorter than peduncle in *N. enoshimensis*. Among three species mentioned above, only *N. hinumensis* is commonly distributed in Korean and Japanese waters.

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