

***Herrmannella hoonsooi*, a New Species of Copepoda
(Poecilostomatoida, Sabelliphilidae) Associated with a
Bivalve from Korea**

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한국산 이매패류에 기생하는 요각류 1신종, *Herrmannella hoonsooi*

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요 약

이매패류 *Saxidomus purpuratus*에 공생하는 *Herrmannella*속의 속하는 요각류 1신종을 *H. hoonsooi*라고 명명하여 기재한다. 이 종은 두흉부가 주걱 모양이고 몸통의 전반부 및 일부 부속지에 투명질을 가지는 것이 특징이다. 극동에 서 발견된 동일 속의 6종에 대한 검색표도 기록했다.

Key words: *Herrmannella hoonsooi*, n. sp., Poecilostomatoida, Sabelliphilidae, bivalve symbiont, Korea.

The copepod species associated with the molluscs numbered 202 in 1985 (Humes, 1985). Nineteen species (9.4%) of them were assigned to the genus *Herrmannella* at that time. Therefore, in terms of the number among copepod species, *Herrmannella* are an important copepod associates of the molluscs. Some of these copepods associates are being considered harmful to their bivalve hosts (Ho and Kim, 1991, etc.), and recently, Holmes and Minchin (1991) recorded that *H. duggani* could affect adversely the oyster, *Ostrea edulis* L.

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Two species of *Herrmannella* were recorded from Korea. These are *H. soleni* Kim and Ho, 1991 and *H. longicaudata* Avdeev (Ho and Kim, 1991). In this paper a new species of *Herrmannella* is described. This species has been found from the mantle cavity of a commercial bivalve, *Saxidomus purpuratus* (Sowerby). The bivalve hosts were bought from the fish market in Pusan. The copepod specimens were dissected and measured in lactic acid.

Family Sabelliphilidae

Herrmannella hoonsooi, n. sp.

(Figs. 1-3)

TYPE SPECIMENS. Holotype female, allotype, and paratypes (8 females and 3 males, including dissected 2 females and 2 males), from the mantle cavity of 7 *Saxidomus purpuratus* (Sowerby) which were bought at a fish market in Pusan, on 1 December 1989, by I.-H. Kim. Holotype, allotype, and undissected paratypes (6 females and 1 male) have been deposited in the U.S. National Museum of Natural History, Smithsonian Institution. Dissected paratypes are retained in the collections of the author.

OTHER MATERIAL EXAMINED. Seven females, 6 males, and 8 copepodids (2 female and 2 male adults were dissected), from the mantle cavity of 6 *Saxidomus purpuratus*, at a fish market in Pusan, on 2 November 1986, by I.-H. Kim.

FEMALE. Body (Fig. 1A) with broadened prosome. Length 1.90 mm (1.54 - 1.90 mm) and greatest width 0.72 mm (0.60 - 0.74 mm), based on 10 specimens. Prosome 1.13 mm long, occupying about 0.6 of body length. Greatest width measured across second pediger. Ratio of length to width of prosome 1.57. Cephalosome spatulate, both sides nearly parallel. First pediger divided from cephalosome by transverse dorsal line. Ventrolateral areas of prosomal somites covered with hyaline material. Urosome (Fig. 1B) 5-segmented. Fifth pediger slightly wider than genital complex. Genital complex $239 \times 266 \mu\text{m}$ in size, about 1.1 times wider than long, with widest area at anterior third; dorsal surface of genital complex with dense area between lower side of genital areas; genital area located dorsolaterally near middle of complex. First to third postgenital somites with hyaline material laterally, each 108×128 , 97×103 , and $100 \times 83 \mu\text{m}$ in size.

Caudal ramus elongate, $149 \times 31 \mu\text{m}$, or about 4.8 times longer than wide. Outer lateral seta $69 \mu\text{m}$ long, disterodorsal seta $42 \mu\text{m}$, outer terminal seta $94 \mu\text{m}$, inner terminal seta $86 \mu\text{m}$, and two median terminal setae $216 \mu\text{m}$ (outer one) and $403 \mu\text{m}$ (inner one). All setae naked.

Rostrum sharply pointed, $181 \mu\text{m}$ long, reaching middle of first segment of antenna, with hyaline material covered on anterior margin (Fig. 1C).

Antennule (Fig. 1D) $365 \mu\text{m}$ long, with formula for armature 4, 13, 6, 3, 4 + 1 aesthete, 2 + 1 aesthete, and 7 + 1 aesthete. Segments except for terminal one with hyaline material on anterior margin. All setae naked except for 1 on each fifth and sixth and 4 on terminal segment.

Antenna (Fig. 1E) 4-segmented. First segment armed with 1 seta. Second segment about 3 times longer than wide, armed with 1 inner seta and fine spinules along outer margin. Third segment short, much wider than long, with 3 inner distal setae. Fourth segment about 1.6 times longer than wide, armed with 3 minute outer terminal setae, and distally 1 claw, 2 claw-like setae and 1 seta.

Labrum (Fig. 1F) with 2, widely divergent, posteroventral lobes. Mandible (Fig. 1G) slender and bipedinate. Maxillule (Fig. 1H) with 2 terminal and 1 lateral elements. Maxilla (Fig. 1I) with minute spinules on first segment; second segment with 1 seta and 1 barbed spine, and terminating a lash. Maxilliped (Fig.

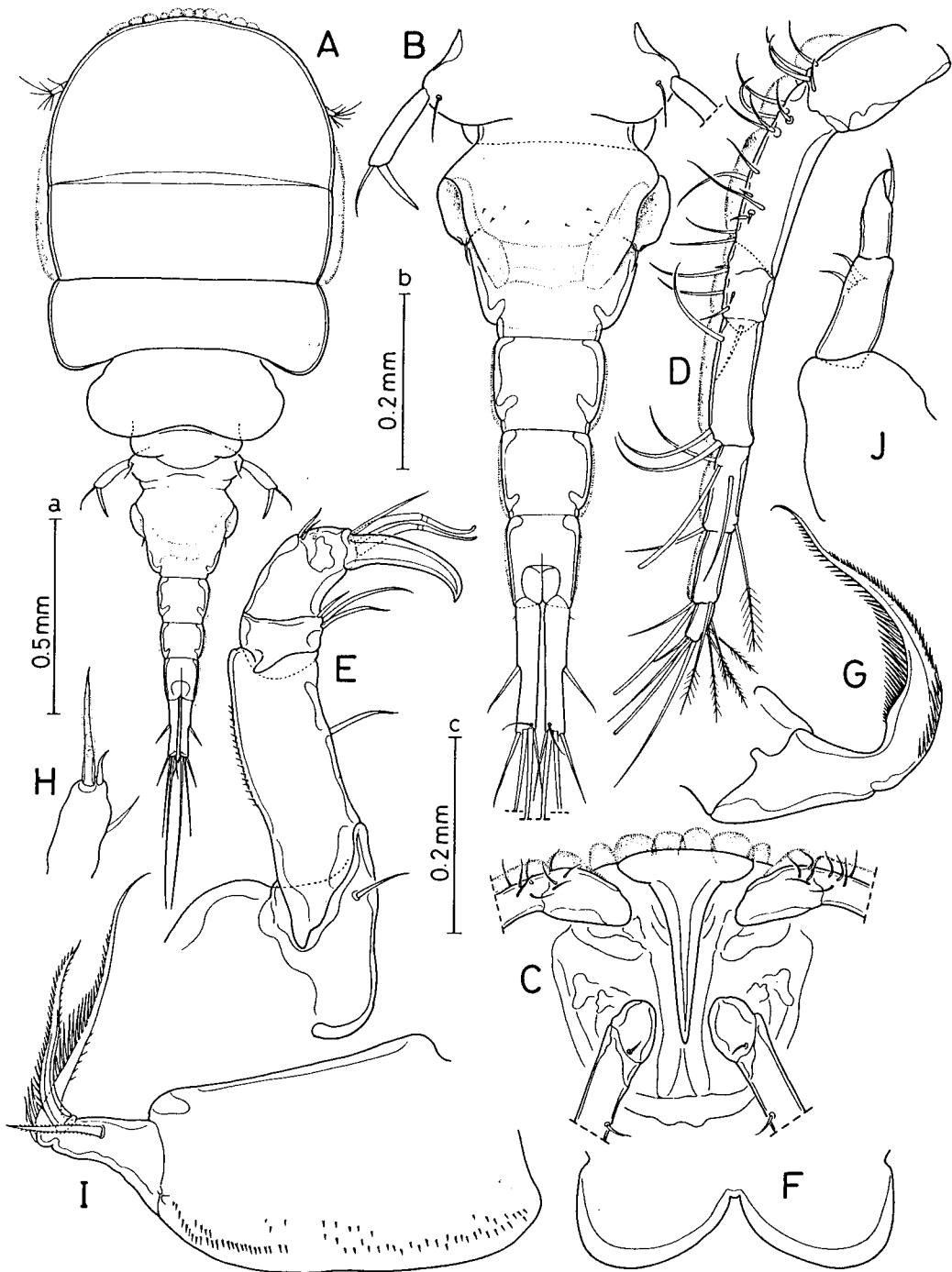


Fig. 1. *Herrmannella hoonsooi*, n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, rostral area, ventral; D, antennule; E, antenna; F, labrum; G, mandible; H, maxillule; I, maxilla; J, maxilliped. Scales: A = a; B = b; C = c; D = e; E = h; F = g; G, I, J = j; H = k.

1J) small, 3-segmented; first segment thick and unornamented; second segment with 2 equal setae sub-distally; terminal segment distally pointed and bent, with 1, relatively long, subterminal seta.

Leg 1 (Fig. 2A), leg 2 (Fig. 2B), and leg 3 with base fringed on distal margin by a row of slender spinules, but leg 4 (Fig. 2D) with hairs on inner distal margin. In all four legs second endopodal segment armed with spinules on outer distal corner. Terminal segment of leg 4 exopod distally with spinules and 2 spines, inner one of latter about 2.2 times longer than outer. Legs 1-4 with following formula for armature:

P1: Prp 0-1; 1-0 Exp I-0; I-1; III, I, 4 Enp 0-1; 0-1; I, 5
 P2: Prp 0-1; 1-0 Exp I-0; I-1; III, I, 5 Enp 0-1; 0-2; III, 3
 P3: Prp 0-1; 1-0 Exp I-0; I-1; III, I, 5 Enp 0-1; 0-2; III, 2
 P4: Prp 0-1; 1-0 Exp I-0; I-1; II, I, 5 Enp 0-1; 0-1; II

Leg 5 (Fig. 2E) 115 μm long, about 5.5 times longer than wide, fringed on both anterior and posterior sides by hyaline material, distally with 1 spine (79 μm long) and 1 naked seta (74 μm long).

Leg 6 represented by 1 seta in genital area.

MALE. Body (Fig. 2F) more slender, 1.63 mm long (1.61-1.68 mm, based on 3 specimens). Greatest width 0.48 mm, measured across first pediger. Prosome not broadend, without hyaline material. Anterior part of rostrum usually seen dorsally. Genital somite $237 \times 223 \mu\text{m}$, or 1.06 times longer than wide, with 2 rows of spinules on each genital area (Fig. 3A). First to fourth abdominal somites unornamented, 113×138 , 125×120 , 98×102 , and $90 \times 93 \mu\text{m}$ in size, respectively. Caudal ramus $128 \times 34 \mu\text{m}$, or 3.76 times longer than wide.

Antennule as in female. Antenna (Fig. 3B) as in female, but second segment with thick spinules on inner margin; third segment with 4 setae, instead of 3 of female.

Labrum, mandible, maxillule and maxilla as in female. Maxilliped (Fig. 3C) 4-segmented; first segment thick, armed distally with pointed tubercle; second segment with 2 rows of spinules (one of them rather irregular in arrangement) and setae, distal one of latter modified as in Fig. 3C; third segment short and unarmed; fourth segment with 2 unequal proximal setae, terminating in long claw.

Leg armature as in female. First exopodal segment of legs 1-4 fringed with spinules on outer margin. Leg 1 (Fig. D) endopodal first segment with spinules on outer distal corner, but not on second segment; spine on terminal segment pointed and not pectinate. Leg 4 with spinules on margin between rami and on outer distal corner of first segment (Fig. 3E). Leg 5 (Fig. 3F) gradually broadened distally, $52 \times 20 \text{ m}$, 2,60 times longer than wide; terminal segments 60 μm and 84 μm , respectively. Leg 6 represented by 2 setae on posterolateral corners of genital somite.

ETYMOLOGY. The specific name *hoonsooi*, is named after Dr. Hoon Soo Kim, the former professor of the Department of Zoology, Seoul National University.

REMARKS. In their revision of the superfamily Lichomolgoidea, Humes and Stock (1973) recognized sixteen species of the genus *Herrmannella* as valid. Since then six more species have been recorded so far. These are *H. hiatellai*, *H. longicaudata*, *H. longichaeta* (all three named by Avdeev, 1975), *H. dentata* by Avdeev (1987), *H. soleni* by Kim and Ho (1991), and *H. duggani* by Holmes and Minchin (1991). The former five species all have been found from the Far Eastern seas, and the latter from an Irish sea.

H. hoonsooi, n. sp. is quite characteristic in having the hyaline material on the lateral margins of prosome and abdominal somites, and on the anterior side of rostrum and antennules. Such feature is not recorded in the congeneric or confamilial species. *H. hoonsooi* has the spatulate cephalothorax, the character shared

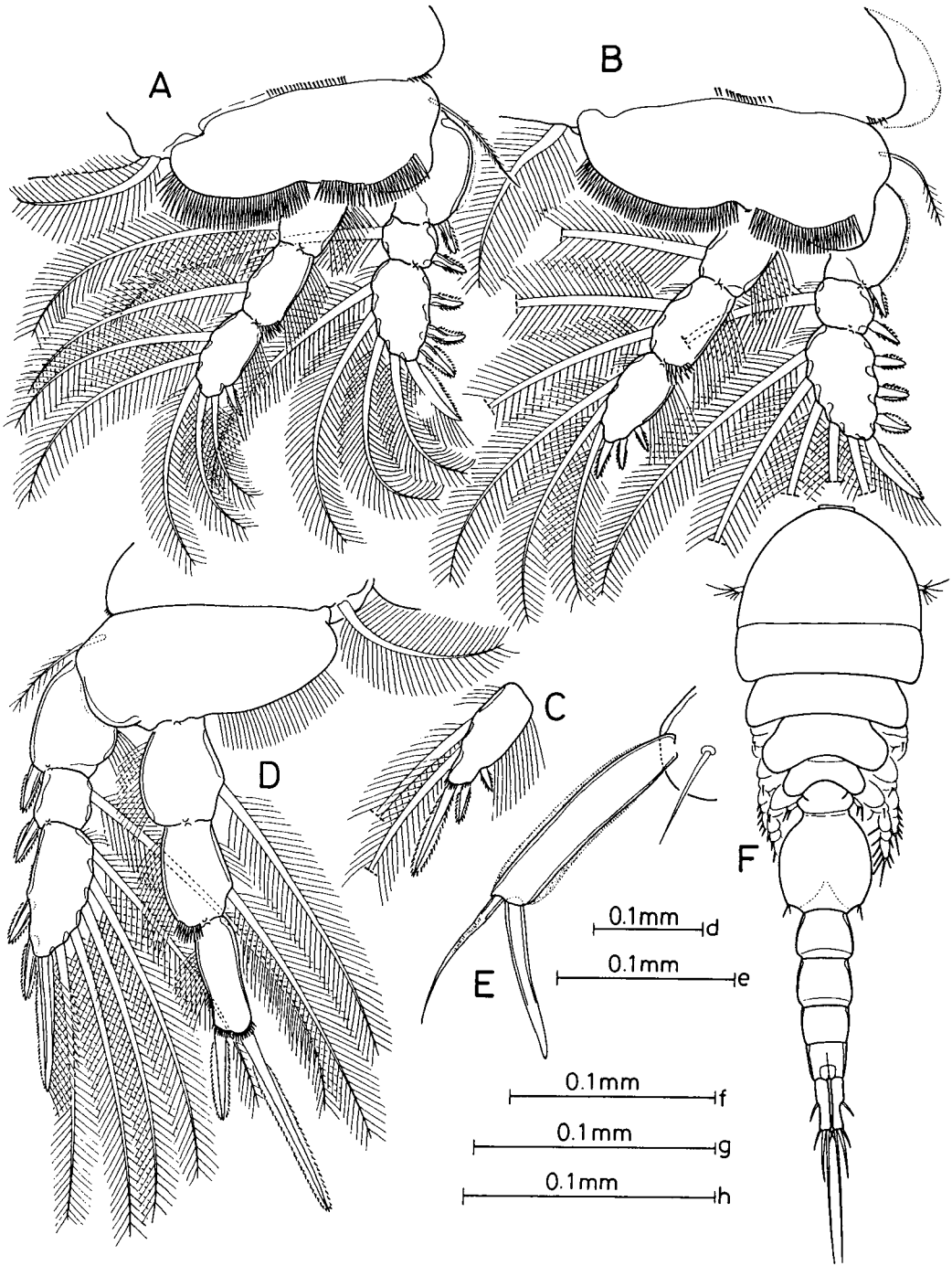


Fig. 2. *Herrmannella hoonsooi*, n. sp. Female: A, leg 1; B, leg 2; C, terminal segment of leg 3 endopod; D, leg 4; E, leg 5. Male: F, habitus, dorsal. Scales: A-E = f; F = a.

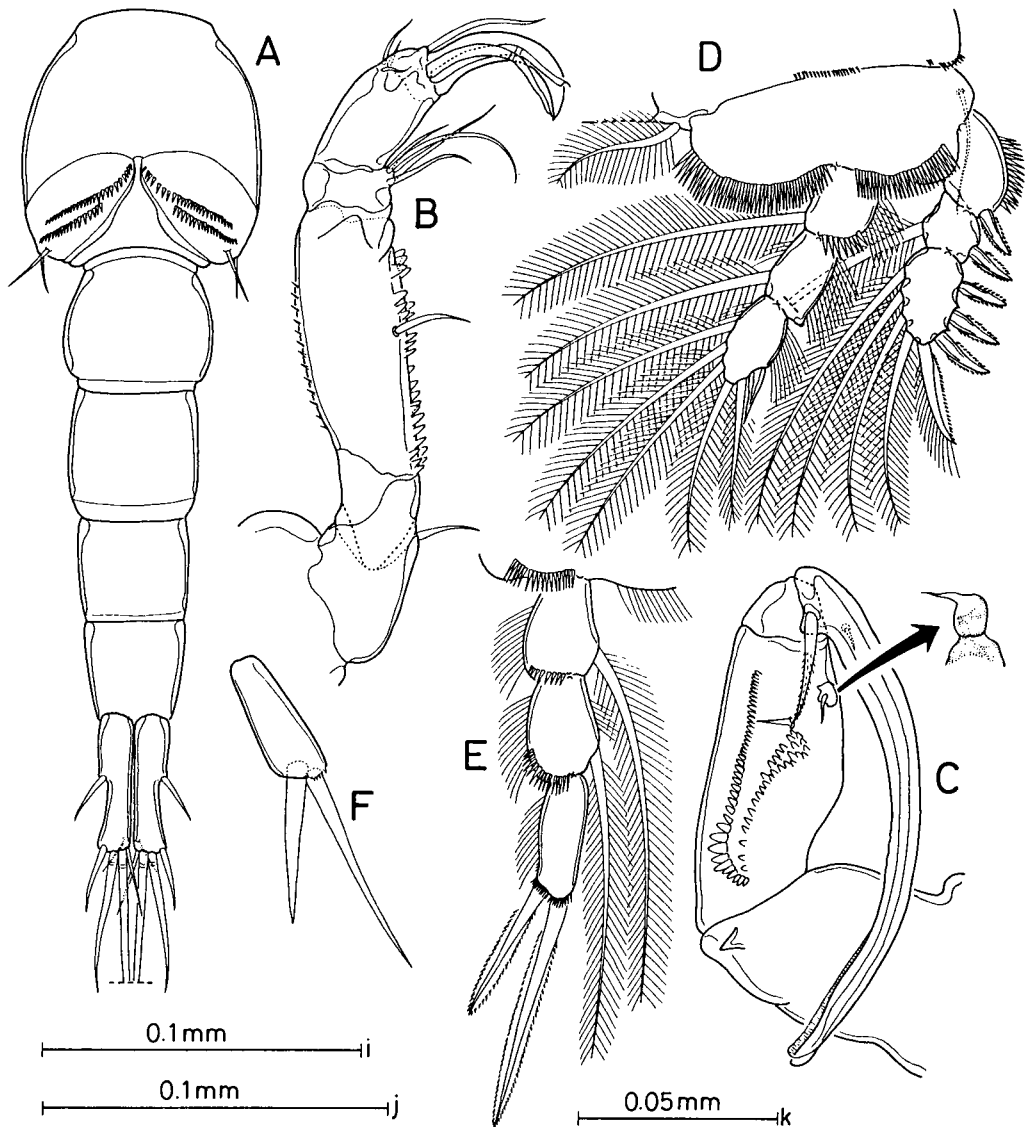


Fig. 3. *Herrmannella hoonsooi*, n. sp., male. A, genital somite and abdomen, ventral; B, antenna; C, maxilliped; D, leg 1; E, endopod of leg 4; F, leg 5. Scales: A = c, B = i; C, F = g; D, E = f.

with *H. saxidomi* recorded from the Californian waters. Interestingly, both species are associated with the congeneric bivalves of *Saxidomus*. *H. dissidens* (Humes, 1970) also has more or less spatulate cephalothorax. This West Indian species shows unusual formula of leg armature (III, I, 4 on third exopodal segment of leg 4), and thus easily separable from all known species of *Herrmannella*. *H. hoonsooi* differs from *H. saxidomi* in several morphological details. The most significant difference, in addition to the presence of the hyaline material of the new species, is found in the shape of leg 5. This appendage of *H. hoonsooi* is long (115 μm) with parallel margins, whereas in *H. saxidomi* it is shorter (47 μm , according to Humes

and Stock, 1973) and bullate proximally.

Of the five species of *Herrmannella* recorded formerly from the Far Eastern seas, *H. longicaudata* was redescribed by Ho and Kim (1991) on the basis of Korean specimens which were taken from *Patinopecten yessoensis* and *Chlamys swifti*, the same host bivalves recorded by Avdeev (1975). *H. hiatellai* and *H. dentata* also have been found from the Korean coast of the Sea of Japan, and these species will be redescribed elsewhere. However, in continuous examinations of the Korean materials of bivalve species *Mactra chinensis* and *Spisula sachalinensis* recorded in the original description as the hosts of *H. longichaeta*, the author has been unsuccessful to collect this copepod. Therefore, for the time being, *H. longichaeta* is thought to be restricted in its distribution to the northern part of the Sea of Japan. A key to identify the Far Eastern species of *Herrmannella* seems worthwhile and is provided below:

1. Third segment of leg 4 exopod with formula for armature III, I, 5 *H. dentata*
Third segment of leg 4 exopod with formula for armature II, I, 5 2
2. Antennule with foliaceous, serrate setae on first two segments *H. longicaudata*
Antennule with usual setae on all segments 3
3. Antenna massive, with second segment less than 2 times as long as wide *H. hiatellai*
Antenna longer, with second segment more than 2 times as long as wide 4
4. Leg 5 expanded proximally *H. soleni*
Leg 5 linear, not expanded proximally 5
6. Cephalothorax spatulate; leg 4 endopod without spiniform process on outer margin of third segment *H. hoonsooi*
Cephalothorax as usual; leg 4 endopod with 2 spiniform processes on outer margin of third segment *H. longichaeta*

ABSTRACT

A new species of the genus *Herrmannella* is described under the name of *H. hoonsooi* from the bivalve host, *Saxidomus purpuratus*. This species is characteristic in that the cephalothorax is spatulate, and the prosome and some parts of body have a hyaline material. A key to six Far Eastern species of the genus is provided.

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