

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/247509501>

A new genus of poecilostome copepod of the family Myicolidae parasitic in a commercial clam from Malaysia

Article in *Journal of Natural History* · April 1992

DOI: 10.1080/00222939200770151

CITATIONS

8

READS

88

2 authors, including:



Il-Hoi Kim

Gangneung-Wonju National University

128 PUBLICATIONS 996 CITATIONS

SEE PROFILE

A new genus of poecilostome copepod of the family Myicolidae parasitic in a commercial clam from Malaysia

J. S. HO† and I. H. KIM‡

† *Department of Biology, California State University,
Long Beach, California 90840, USA*

‡ *Department of Biology, Kangreung National University,
Kangreung, Kangwon-do, 210, Korea*

(Accepted 17 July 1991)

A new genus and species of the family Myicolidae (Poecilostomatoida), *Pengna bicornuta*, is described based on the material recovered from the mantle cavity of the razor clam *Pharella acuminata* (Hanley) purchased from the market in Penang, Malaysia. Another new genus, *Exostrincola*, is proposed to accommodate *Ostrincola simplex* Humes, 1959 which differs from the species of *Ostrincola* in the structure of egg sac and the armature on the endopod of legs 2 and 3. A key is provided for identification of the six genera in the Myicolidae.

KEYWORDS: Copepoda, Myicolidae, *Pengna*, *Pharella*, *Exostrincola*, Malaysia.

Introduction

In the summer of 1988, while one of us (J.S.H.) was visiting the School of Biological Sciences, Universiti Sains Malaysia in Penang, Malaysia, two species of myicolid copepods were found in bivalve molluscs that were sold in the local markets. One of them, *Ostrincola breviseti*, recovered from the rock oyster, *Saccostrea cucullata* (Born), has been reported recently by us (Ho and Kim, 1990) and in this report we shall deal with the other species, which is a new genus and species of the Myicolidae.

Thirteen species of poecilostomatoid copepods are currently recognized in four genera of the family Myicolidae. They live in the mantle cavity of bivalve molluscs, except for *Parostrincola lingulae* which was recovered from a brachiopod at Hong Kong (Humes and Boxshall, 1988). The new myicolid reported below bears a close resemblance to the species of *Ostrincola*. In the process of making a close comparison between these two genera we discovered that *Ostrincola simplex* Humes, 1959 is different from its congeners in several key features. Therefore, a new genus is proposed to accommodate *O. simplex*.

Pengna gen. nov.

Female

Body elongate, cephalosome with posterolateral angles of dorsal cephalic shield protruding laterally. Place of fusion between cephalosome and first pedigerous somite marked by furrow. Urosome 5-segmented. Caudal ramus with 6 setae. Antennule 7-segmented, with aesthetes on terminal 3 segments. Antenna 3-segmented, with single terminal claw. Labrum with posterolateral corners drawn out into a long, sharp spine. Mandible with 1 inner and 2 outer setae at base of terminal lash. Paragnath a minute

lobe. Maxillule with 4 setae. Maxilla with enlarged proximal segment and much smaller distal segment extended to form a bilaterally spinulated process bearing 2 setae. Maxilliped reduced to a tiny lobe. Legs 1–4 biramous, with 3-segmented rami. Third segment of exopods: III,1,4; III,1,5; II,1,5; and II,1,5. Third segment of endopods: I,5; III,3; IV,2; and IV,1. Leg 5 2-segmented, second segment tipped with 2 setae and 2 spines. Egg sac elongate with uniseriate eggs.

Male

Body elongate, cephalosome with a pair of sharp posterolateral protrusions as in female. Urosome 6-segmented. Antennule with 1 aesthete on segments 2, 5, 6 and 7, and 2 aesthetes on segment 4. Antenna, labrum, mandible, paragnath, maxillule, and maxilla as in female. Maxilliped 4-segmented, terminal segment a long claw. Legs 1–5 armed as in female.

Etymology

The generic name is an anagram of *Penang*, the island where the new form was discovered. Gender feminine.

Pengna bicornuta sp. nov.

(Figs 1–3)

In the following description a complete account is given of the female, and for the male only those features showing sexual dimorphism are mentioned.

Material examined. Thirty-one females and four males recovered from washings of 33 razor clams, *Pharella acuminata* (Hanley), purchased at Batulanchang market in Georgetown, Penang, on 16 July 1988; and 73 females and 12 males recovered from washings of 75 *P. acuminata* purchased at Cecil Street market in Georgetown, Penang, on 17 July 1988. HOLOTYPE female (USNM 254505), ALLOTYPE male (USNM 254506), and 30 PARATYPES (20 females, 10 males) (USNM 254507) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, DC; the remaining paratypes in the collection of the senior author.

Female

Body (Fig. 1A) elongate, with posterolateral angles of dorsal cephalic shield protruding (Fig. 1B). Length 1.27 mm (1.12–1.34 mm) and greatest width (across cuticular plates in cephalothorax) 0.36 mm (0.32–0.38 mm). Prosoma with constriction behind posterolateral projections marking plane of fusion of cephalosome and first pedigerous somite (Fig. 1B). Urosome (Fig. 1A) apparently 5-segmented, but segmentation indistinct, indicated mostly by lateral constrictions. Ventral surface of urosome with rows of spinules as shown in Fig. 1C. Genital area (Fig. 1D) on dorsolateral surface of genital complex. Caudal ramus (Fig. 1C) elongate, about 5.6 times longer than wide, and armed with 1 dorsal seta, 2 lateral setae, and 3 terminal setae; all setae naked. Egg sac (Fig. 1A) elongate, uniseriate, containing 5–10 eggs.

Rostral area a prominent plate, but without posteroventral protrusion (Fig. 1B). Antennule (Fig. 1E) 7-segmented, with formula of armature: 4, 14, 5, 3, 4 + 1 aesthete, 2 + 1 aesthete, and 7 + 1 aesthete. Antenna (Fig. 1F) 3-segmented; first segment largest, with oblique row of spinules on anterior surface; second segment smallest; third segment elongate, with row of short spinules on outer margin and knob-like protrusion on medial surface close to base. Formula of armature: 1, 1, 1 + 3 + claw.

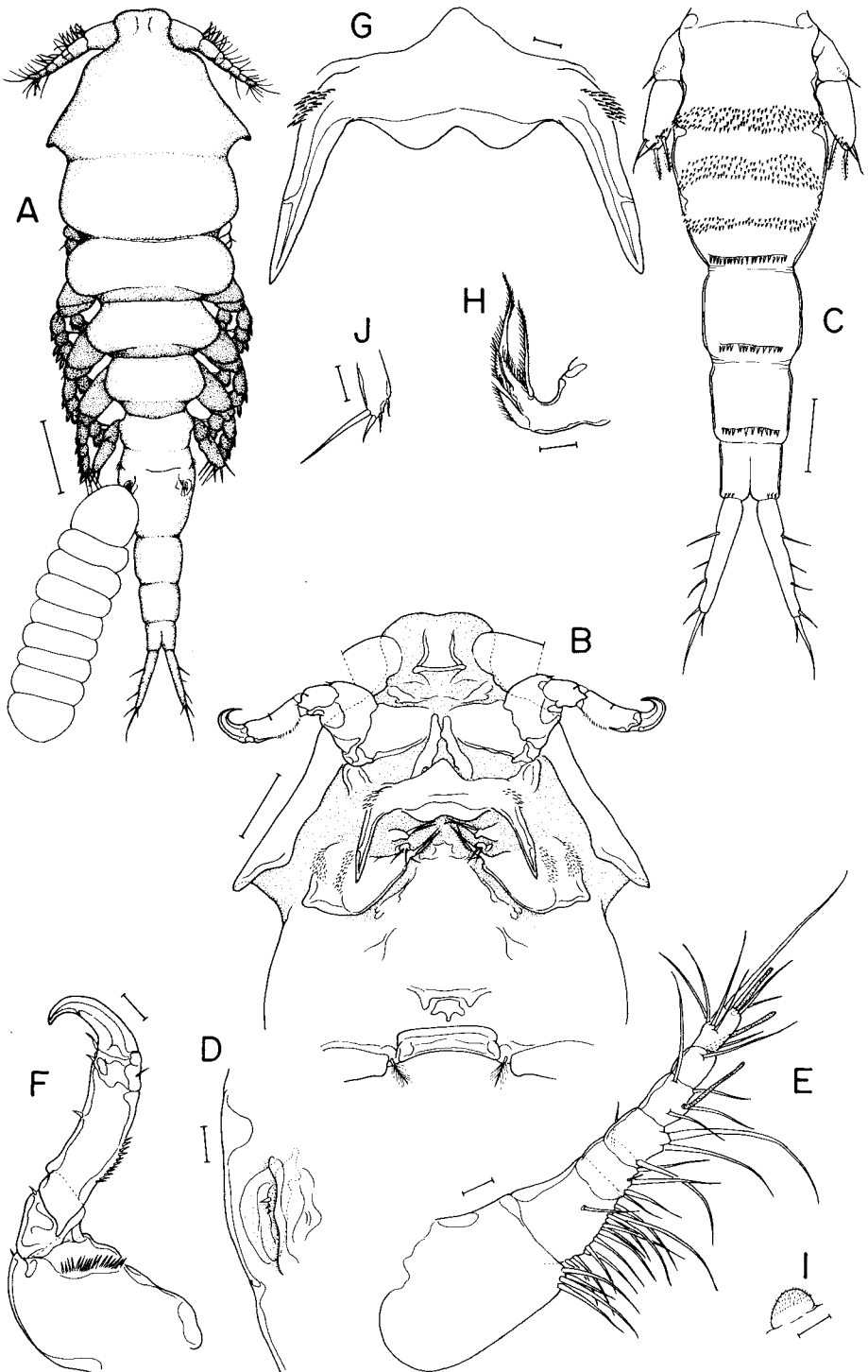


FIG. 1. *Pengna bicornuta* gen. et sp. nov. Female: A, habitus, dorsal; B, cephalothorax (with antennules cut off), ventral; C, urosome, ventral; D, area of egg sac attachment, dorsal; E, antennule, ventral; F, antenna, dorsal; G, labrum, ventral; H, mandible; I, paragnath; J, maxillule. Scale bars: 0.1 mm in A; 0.05 mm in B, C; 0.01 mm in D-J.

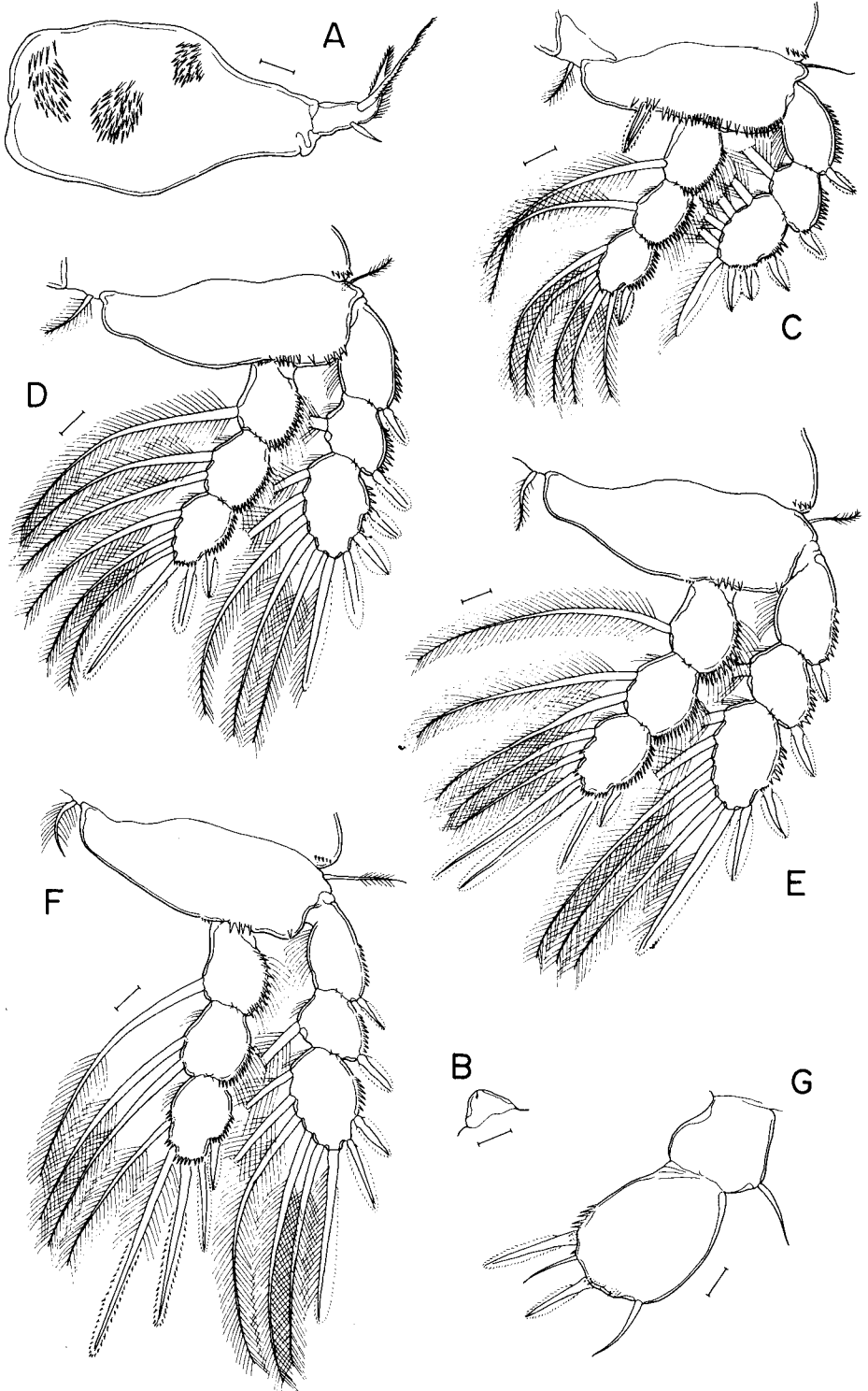


FIG. 2. *Pengna bicornuta* gen. et sp. nov. Female: A, maxilla; B, reduced maxilliped; C, leg 1; D, leg 2; E, leg 3; F, leg 4; G, leg 5. Scale bars: 0.01 mm in all drawings.

Labrum (Fig. 1G) with posterolateral corners greatly protruded into a long, sharp spine and bearing a patch of spinules on its outer, basal surface. Mandible (Fig. 1H) of *Ostrincola*-type, with 1 inner and 2 outer spinulose setae at base of terminal lash. Paragnath (Fig. 1I) a small spinulose lobe. Maxillule (Fig. 1J) a rectangular sac tipped with four setae. Maxilla (Fig. 2A) 2-segmented; first segment very large, with 3 patches of spinules; process-like second segment strongly bent forward and carrying 1 short, smooth seta and 1 long, spinulose seta at base. Maxilliped (Fig. 2B) reduced to tiny lobe.

Legs 1-4 (Figs 2C-F) biramous, with 3-segmented rami. Armature of legs as follows (Roman numerals indicating spines, Arabic numerals representing setae):

P1	coxa 0-1	basis 1-I	exp I-0; I-1; III,I,4 enp 0-1; 0-1; I,5
P2	coxa 0-1	basis 1-0	exp I-0; I-1; III,I,5 enp 0-1; 0-2; III,3
P3	coxa 0-1	basis 1-0	exp I-0; I-1; II,I,5 enp 0-1; 0-2; IV,2
P4	coxa 0-1	basis 1-0	exp I-0; I-1; II,I,5 enp 0-1; 0-2; IV,1

Coxae of all legs with short row of spinules on disto-outer surface. Distal row of spinules on anterior surface of basis long on leg 1, short on leg 2, and much shorter on legs 3 and 4. Outer surface of first 2 segments of all endopods with a row of spinules and another row of setae. Leg 5 (Fig. 2G) 2-segmented, with 1 outer seta on first segment and 2 setae and 2 spines on distal margin of second segment. Distal segment about 1.42 times longer than wide. Leg 6 represented by 3 minute setae in genital area (Fig. 1D).

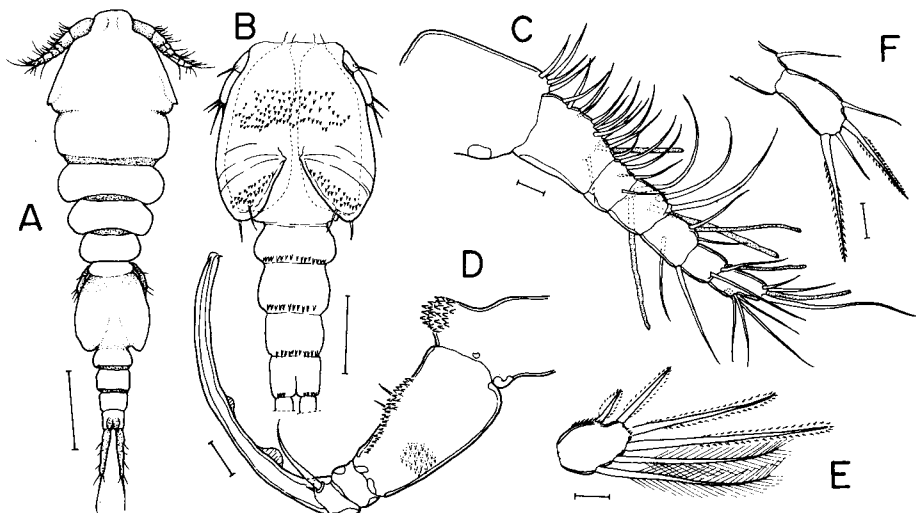


FIG. 3. *Pengna bicornuta* gen. et sp. nov. Male: A, habitus, dorsal; B, urosome, ventral; C, antennule; D, maxilliped; E, terminal segment of leg 3 endopod; F, leg 5. Scale bars: 0.1 mm in A, 0.05 mm in B, 0.01 mm in C-F.

Male

Body (Fig. 3A) elongate, 0.758 mm (0.741–0.774 mm) long and 0.217 mm (0.215–0.220 mm) wide. Urosome 6-segmented, with indistinct segmentation; distribution of spinules on ventral surface of genital somite and abdomen as shown in Fig. 3B. Antennule (Fig. 3C) with 13 + 1 aesthete on second segment and 2 aesthetes on fourth segment. Maxilliped (Fig. 3D) large, 4-segmented; first segment with protruded disto-inner surface covered with denticles; second segment bearing rows of denticles and 2 setae on medial surface, and patch of denticles on posterior surface; third segment smallest and unarmed; and fourth segment a long claw carrying 2 extremely unequal, basal setae on anterior surface. Some specimens with 2 obtuse lobes on medial margin of terminal claw as shown in Fig. 3D. Terminal segment of third endopod (Fig. 3E) with fewer spinules. Leg 5 (Fig. 3F) with terminal spines longer than distal segment which is about twice as long as wide.

Etymology

The species name is a combination of *bi* (= two in Latin) and *cornuta* (= horned in Latin). It refers to the posterolateral spines on the corners of the labrum.

Discussion

With a pair of posterolaterally protruded cuticular plates on the cephalosome (Figs 1A, 3A) and a pair of large, posteriorly directed spines on the labrum (Fig. 1B), the new genus is readily distinguishable from the other four genera of the Myicolidae. As far as the armature of the appendages are concerned, *Pengna* seems to be closer to *Myicola* Wright, 1885 and *Ostrincola* Wilson, 1944 than to either *Pseudomyicola* Yamaguti, 1936 or *Parostrincola* Humes and Boxshall, 1988. However, having a pair of uniseriate egg sacs, the new genus is easily differentiated from *Myicola*, which has a pair of multiseriate egg sacs. A uniseriate egg sac is also a key feature of *Ostrincola*.

Ostrincola simplex reported by Humes (1959) from *Ostrea* sp. in Madagascar differs from its congeners (eight species) in several points. In addition to having a pair of multiseriate egg sacs, the third segment of the endopod of its leg 2 has II,4 armature (III,3 in congeners) and the same segment on leg 3 has III,3 armature (IV,2 in congeners). Since these features are considered to be constant for the genera of Myicolidae, *O. simplex* can no longer be attributed to its originally assigned genus. Therefore, we propose a new genus, *Exostrincola*, to accommodate the oyster-parasitizing myicolid from Madagascar. As reflected in its name, *Exostrincola* is closest to *Ostrincola*. It differs from *Ostrincola* in having a pair of multiseriate egg sacs and II,4 and III,3 armatures, respectively, on the terminal segment of the endopod of leg 2 and leg 3.

With the above addition, there are now six genera in the Myicolidae. Below is a key to the females of the six genera (modified from Humes, 1986).

- 1 Antennule 7-segmented, without spine on first segment; mandible with a terminal lash and 3 additional elements; third segment of exopod of legs 3 and 4 with III,5; caudal ramus tipped with 3 setae 2
- Antennule 6-segmented, with spine on first segment; mandible with a terminal lash and 2 additional elements; third segment of exopod of legs 3 and 4 with IV,5; caudal ramus tipped with 4 setae. *Pseudomyicola*
- 2 Additional elements on mandible setiferous; third segment of endopod of leg 1 either I,5 or II,4; third segment of endopod of leg 2 III,3 or II,4 3
- Two inner additional elements on mandible broad, digitate spines; third segment of endopod of both legs 1 and 2 with IV,2. *Parostrincola*

- 3 Lateral surface of cephalothorax without protruded cuticular plate; posterolateral corners of labrum round 4
 – Lateral surface of cephalothorax with a protruded cuticular plate; posterolateral corners of labrum drawn out into a long spine *Pengna*
- 4 Third segment of endopod of leg 2 III,3; third segment of endopod of leg 3 IV,2 5
 – Third segment of endopod of leg 2 II,4; third segment of endopod of leg 3 III,3
Exostrincola
- 5 Prosome of ovigerous individual cylindrical, swollen; egg sac with multiseriate eggs
Mycicola
 – Prosome of ovigerous individual not greatly swollen; egg sac with uniseriate eggs
Ostrinocola

Acknowledgements

The senior author would like to thank Dr Tak Seng Leong of the School of Biological Sciences, Universiti Sains Malaysia in Penang, for his generous assistance in many ways in the collection of copepod parasites. The junior author's participation in the subsequent study of the specimens at the Department of Biology, California State University in Long Beach was supported by a fellowship from the Korea Science and Engineering Foundation. The completion of this work was partially funded by California State University, Long Beach.

References

- HO, J. S. and KIM, I. H., 1990, *Ostrincola breviseti* n. sp., a copepod parasite of an oyster from Penang, Malaysia, *Beaufortia*, **41**, 91–95.
- HUMES, A. G., 1959, Copepodes parasites de mollusques a Madagascar, *Memoires de l'Institut Scientifique de Madagascar serie F*, **2**, 285–342.
- HUMES, A. G., 1986, *Mycicola metisiensis* (Copepoda: Poecilostomatoida), a parasite of the bivalve *Mya arenaria* in eastern Canada, redefinition of the Mycolidae, and diagnosis of the Anthessiidae n. fam., *Canadian Journal of Zoology*, **64**, 1021–1033.
- HUMES, A. G. and BOXSHALL, G. A., 1988, Poecilostome copepods associated with bivalve molluscs and a brachiopod at Hong Kong, *Journal of Natural History*, **22**, 537–544.