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*Lichomolgus uncus* n.sp. (Copepoda: Cyclopoida)  
An Associate of the Mussel *Perna canaliculus* Gmelin

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*Abstract*

A new species of cyclopoid copepod belonging to the genus *Lichomolgus* Thorell, 1859, obtained from the gills of the bivalve *Perna canaliculus* (Gmelin, 1791), is described and illustrated.

INTRODUCTION

During a study of animals closely associated with some New Zealand marine molluscs, a new copepod was discovered on the gills of *Perna canaliculus* (Gmelin, 1791), a common edible mussel occurring both intertidally and below low tide level around much of the New Zealand coastline. The copepod, described below, belongs to the genus *Lichomolgus* Thorell, 1859 as redefined by Humes and Stock (1973).

LICHOMOLGIDAE

*Lichomolgus* Thorell, 1859

*Lichomolgus uncus* n.sp. (Fig. 1-3)

*Female* (Figs. 1-3)

Body cyclopoid, length (excluding ramal setae) 1.25 mm (1.0-1.67 mm). Greatest width 0.42 mm (0.30-0.50 mm), based on ten specimens in alcohol. Length to width ratio of prosome 1.45:1. Ratio prosome to urosome 1.14:1. Urosome five-segmented. First segment is  $82 \times 102.5 \mu\text{m}$  and bears the fifth legs. Second segment is the greatly expanded genital segment which is heart shaped, and bears the ovisacs. Width at anterior end of genital segment  $164 \mu\text{m}$ . Three post-genital segments 102, 152, and  $49 \mu\text{m}$  long.

*Rostrum* (Fig. 1b): has parabolic postero-ventral margin.

*Antennule* (Fig. 1c): seven-segmented, segments 32, 56, 18, 40, 60, 28 and  $16 \mu\text{m}$  long, (measured along posterior nonsetiferous margins). Armature formula 4, 13, 3, 3, 4+1, 2+1, 7+1. All setae naked.

*Antenna* (Fig. 1d): four-segmented; first two segments short, second bears a seta. Third segment bears two setae on medial inner surface, and three setae on distal apex. Fourth segment tiny, bears three curved claws, and a claw-like spine at the tip. One claw is  $152 \mu\text{m}$  in length, and other two are about  $64 \mu\text{m}$  long. All setae naked.

*Mandible* (Fig. 1e): has concave margin with row of long slender spinules; convex margin bears a row of fine spinules extending on to the long terminal lash.

*First Maxilla* (Fig. 1f): bears two terminal setae; distal margin distinctly pointed.

*Second Maxilla* (Fig. 1g): has unarmed first segment. Second segment bears two short setae, one on the posterior surface and one inserted beneath the lash. On its convex margin the lash has a row of slender spinules, on the concave side a few barbules.

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*Maxilliped* (Fig. 1h): three-segmented; first segment unarmed. Second segment bears two naked setae, and numerous spinules. Third segment bears a terminal spine and a tiny setule.

*Legs 1-4* (Figs. 2a-d) have the following armature (Roman numerals indicate spines, arabic numerals represent setae):

P1	coxa	0-1	basis	1-0	exp.	I-0	I-1	III, I,	4
					end.	0-1	0-1		5
P2	coxa	0-1	basis	1-0	exp.	I-0	I-1	III, I,	5
					end.	0-1	0-2	III,	3

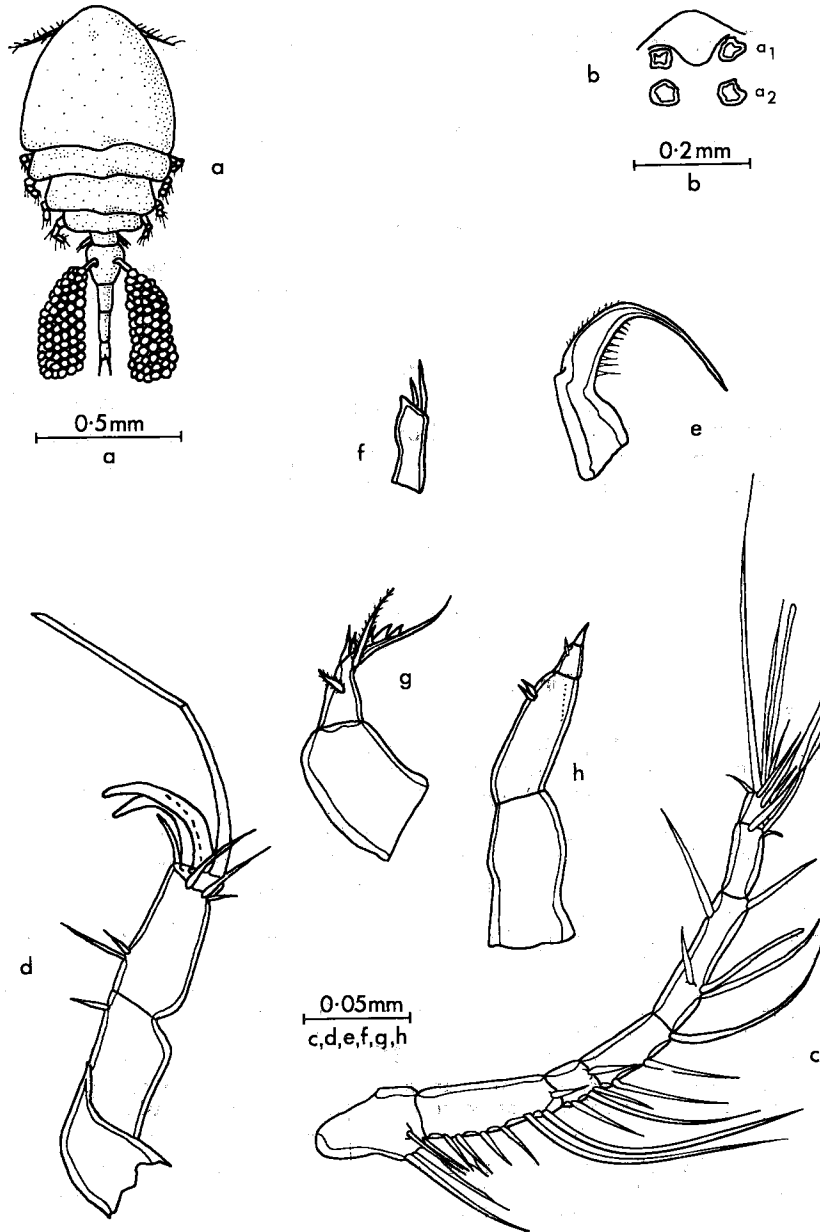


FIG. 1.—*Lichomolgus uncus* n.sp., female: (a) dorsal view, (b) rostral area, (c) antennule, (d) antenna, (e) mandible, (f) first maxilla, (g) second maxilla, (h) maxilliped.

P3	coxa	0-1	basis	1-0	exp.	I-0	I-1	III, I, 5
					end.	0-1	0-2	III, 2
P4	coxa	0-1	basis	1-0	exp.	I-0	I-1	II, I, 5
					end.	0-1	0-II	

*Leg 5* (Fig. 2e) inner margin of free segment expanded so that greatest width is three-quarters of the distance along the axis from the base of the segment. There are two terminal setae, almost equal in length, and a short seta near the base of the free segment.

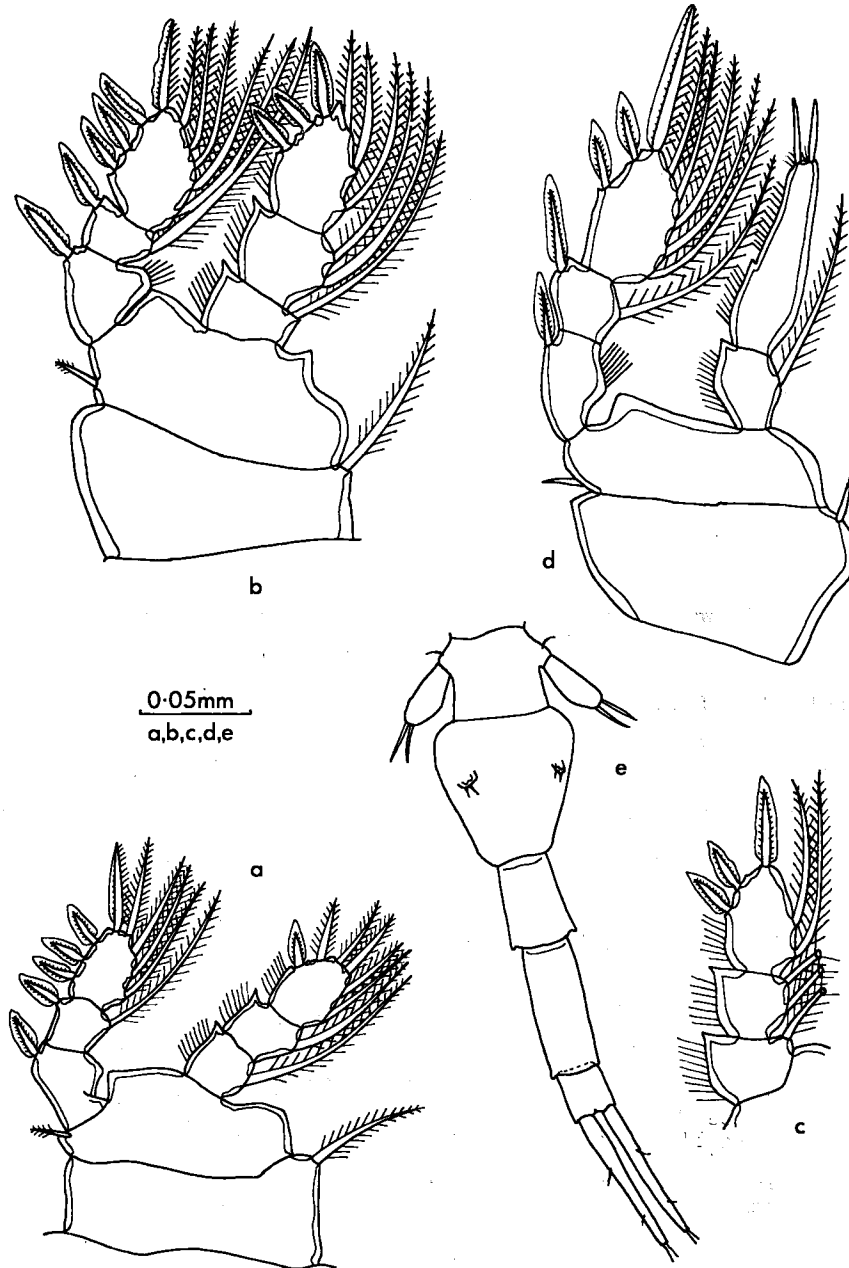


FIG. 2.—*Lichomolgus uncus* n.sp., female: (a) first leg, (b) second leg, (c) endopod of third leg, (d) fourth leg, (e) fifth leg and urosome.

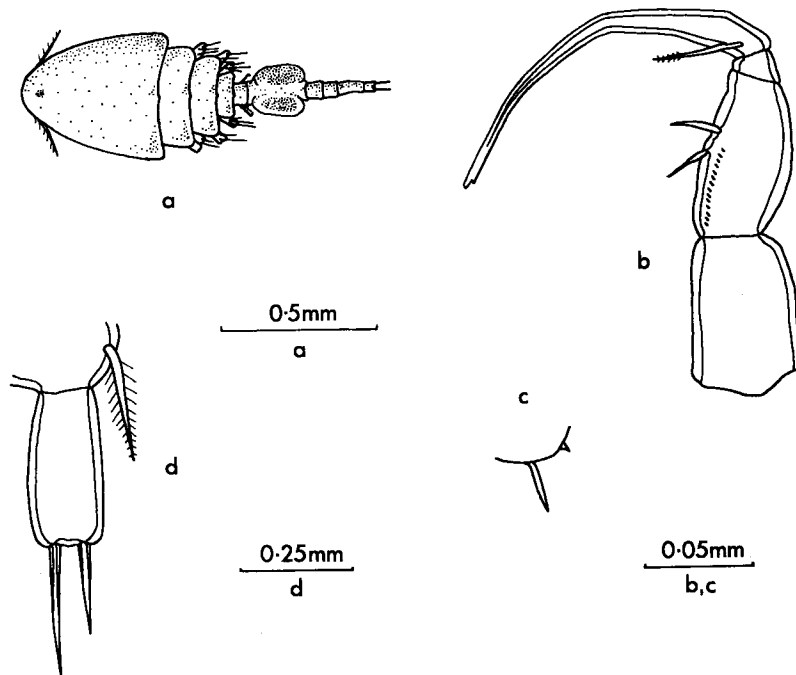


FIG. 3.—*Lichomolgus uncus* n.sp., male: (a) dorsal view, (b) maxilliped, (c) fifth leg, (d) sixth leg.

*Leg 6* is represented by two setae near the attachment of the ovisac.

*Caudal ramus*. Ratio length to width 10:1. There is a short seta on outer surface approximately halfway along ramus. A short setule, also on outer surface, is just back from apex which bears two short naked setae.

*Colour in life*: Light golden yellow, with a red eyespot.

*Male* (Fig. 3)

Smaller than female, with a more pointed prosome and a six-segmented urosome. Length, excluding ramal setae, 1.0 mm (0.90-1.20 mm); greatest width 0.38 mm (0.30-0.45 mm) (based on ten specimens in alcohol). Ratio of prosome to urosome 1.14:1.0. The only appendages showing marked sexual dimorphism are maxilliped and legs 5 and 6.

*Maxilliped* (Fig. 3b): slender and three-segmented (four-segmented if the proximal part of the claw represents a segment). Second segment bears two setae and a row of setules. Claw strongly curved, 168  $\mu$ m in length, bears a proximal seta.

*Leg 5* (Fig. 3c) bears rectangular free segment with two almost equal terminal setae.

*Leg 6* (Fig. 3d) represented by a naked seta and a setule or very short spine near posterior end of segment.

*Colour in life*: resembles that of the female.

*Type material*: Holotype female from *Perna canaliculus* (Gmelin, 1791) from a depth of 4 m off Ward Island, Wellington Harbour (41° 10' S, 173° 55' E), November 1973. Deposited in the National Museum, Wellington, (Z. Cr. 1974).

*Paratypes*: 8 females and 5 males from *Perna canaliculus* (Gmelin, 1791) dredged from a depth of 4 m off Ward Island, Wellington Harbour, November 1973. Deposited in the National Museum, Wellington. (Z. Cr. 1975-6).

38 females, 20 males and 2 copepodids from *P. canaliculus* collected off Ward Island between December 1973 and March 1974, and 6 females and 2 males from 5 m depth, Crail Bay, Marlborough Sounds (41° 06' S, 174° 00' E), December 1973 and March 1974 remain in author's collection.

The specific name (*uncus*), Latin for "hook", refers to the long curved claw on the antenna.

#### DISCUSSION

Of the seventeen described species of *Lichomolgus* (see Humes and Stock 1973), only two have more than two claws on the antenna. These are *L. leptodermatus*

Gooding, 1957, with three claws, and *L. elegantulus* Stock, 1960, with four claws. In neither of these two species does a claw on the antenna exceed twice the length of the other claws, as does one on the antenna of *L. uncus*.

*Lichomolgus uncus* shows no trace of an articulation on the third segment of the antenna, where the setae are inserted, as described for *L. leptodermatus* and *L. elegantulus* but this segment articulates with a tiny fourth segment below the base of the claws.

The genital segment of *L. leptodermatus* is wider at the posterior end than at the anterior end, unlike that of *L. uncus*, which is wider at the anterior end than at the posterior end.

The caudal ramus of *L. elegantulus* bears five setae on the apex, and two of these setae are longer than the ramus. There are four setae on the caudal ramus of *L. leptodermatus*, the longest being 5/8 the length of the ramus. *Lichomolgus uncus* has two short setae on the apex of the caudal ramus. Both setae are less than one-quarter the length of the ramus.

*Lichomolgus uncus* occurs on the surface of the gills of *P. canaliculus*, and also inside the gill water tubes, where the copepods can be seen as tiny opaque lumps under the surface. They move little unless disturbed. The females lose their ovisacs very quickly after removal from the host.

Despite a careful search, no early copepodid stages were found, although two late instar copepodids were obtained in November 1973.

*Lichomolgus leptodermatus* was described by Gooding (1957) from the gills of *Laevicardium* where it occurs in cysts or small swellings of the gill tissues. This copepod also showed little movement until released from the gill cyst, and the females shed their ovisacs soon after removal from the host. Gooding also failed to find any early copepod instars and postulated that the infection of the shellfish took place in one of the last copepodid stages. The nature of the association between *L. uncus* and *P. canaliculus* remains unknown. The presence of the copepod has no observable effect on the mussel.

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