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TWO NEW COPEPODS PARASITIC ON CARIBBEAN POLYCHAETES

by

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ABSTRACT

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Two new species of Copepoda, each belonging to a new genus, are described from shallow waters in the Caribbean. One, *Zygomolgides coronicolus* n. gen., n. sp., is a member of the family Lichomolgidae, parasitic on the branchial crown of the serpulid polychaete *Hydroides* cf. *brachyacanthus* from St. Thomas (U.S. Virgin Islands). The other, *Lobosomatium enigmaticum* n. gen., n. sp., is a minute, curiously transformed copepod, of which all appendages (as far as present) are strongly reduced, found ectoparasitic on the body of a syllid polychaete, *Brania glandulosa*, from Curaçao (Netherlands Antilles). Due to the strong morphological modifications, it cannot properly be assigned to any particular family.

Key words: **Zygomolgides n. gen., coronicolus n. sp., Lobosomatium n. gen., enigmaticum n. sp., parasitic Copepoda, Polychaeta, Caribbean.**

INTRODUCTION

A limited number of Copepoda is known as associates of polychaetous worms. Two West Indian samples yielded two hitherto unknown taxa. One, a lichomolgid, was sent to me by Dr. HARRY A. TEN HOVE (Amsterdam), who discovered the parasite during his studies on serpulid worms. The other, of uncertain affinities, was found during fieldwork on the marine interstitial fauna of Curaçao on the central segments of the body of a small syllid polychaete.

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The copepods were treated with lactophenol and genitase, in an attempt to make the body more transparent.

DESCRIPTIVE PART

Zygomolgides n. gen.

Lichomolgidae. Female: Prosome wide, but not swollen. Second antenna with 1 strong claw-like element on segment 3, and 4 slender claw-like elements on segment 4. Mandible narrow, without differentiated basal part, almost uniformly tapering into slener, 'ciliate' lash. Chaetotaxis formula of legs 1 to 4 as follows:
P1 exp. I-0, 1-I, III-I-5; enp. 0-1, 0-1, I-5.
P2 exp. I-0, I-1, III-I-5; enp. 0-1, 0-2, III-2.
P3 exp. I-0, I-1, III-I-5; enp. 0-1, 0-2, III-3.
P4 exp. I-0, I-1, II-I-5; enp. 0-1, 0-II.
Leg 5 long, segment 2 with mediobasal hump, distal armature reaching to end of genital segment. Urosome 5-segmented. Male unknown.
Parasitic on gill filaments of serpulid polychaete.
Type species: *Zygomolgides coronicolus* n. sp.
Etymology: The generic name merges the names of the two most closely related genera, *Zygomolgus* and *Lichmolgides*. The gender is masculine (I.C.Z.N., art. 30b). The specific name is based on the Latin words *corona* and *incolère* (living on the host's branchial crown).

Remarks: The new genus is closely related to *Lichomolgides* GOTTO, 1954 and *Zygomolgus* HUMES & STOCK, 1972, with which it agrees in the configuration of the second antennae, the general structure of the maxilliped, the segmentation pattern of legs 1 to 5, and the chaetotaxis formula of leg 4 (see HUMES 1991, for a key to all 81 genera of Lichomolgidae known at present).

It differs from *Lichomolgides* in (1) body shape (normal poecilostomatoid shape in *Zygomolgides*, with swollen prosome and curiously humped anterior portion of the cephalosome in *Lichomolgides*); (2) the more strongly armed maxilliped of *Zygomolgides*; (3) the armature of endopodite segment 3 of leg 2 (III-3 in *Lichomolgides*, III-2 in *Zygomolgides*); (4) the armature of endopodite segment 3 of leg 3 (III-2 in *Lichomolgides*, III-3 in *Zygomolgides*); (5) the develop-

ment of leg 5 (free segment very short, straight, distal armature just reaching the anterior part of the genital segment in *Lichomolgides*, free segment long and slender, with mediobasal swelling, longest terminal element reaching to distal margin of genital segment).

The maxilliped, as well as legs 2, 3, and 5 of *Zygomolgus* resemble those of *Lichomolgides*, and thus differ from those of *Zygomolgides* in the same way as described above. Moreover, the basal one or two elements on the convex edge of the mandibular lash of *Zygomolgus* are spiniform and well-differentiated from ornamentation with fine setulettes on the distal part of the lash, whereas the lash is uniformly 'ciliate' in *Lichomolgides* and *Zygomolgides*. The two lashes of the second maxilla, in particular the auxiliary lash, are short and armed with strong teeth in *Zygomolgides*, long and armed with very fine teeth in *Zygomolgus* and *Lichomolgides*.

Zygomolgides coronicolus n. sp.

(Figs. 1-16)

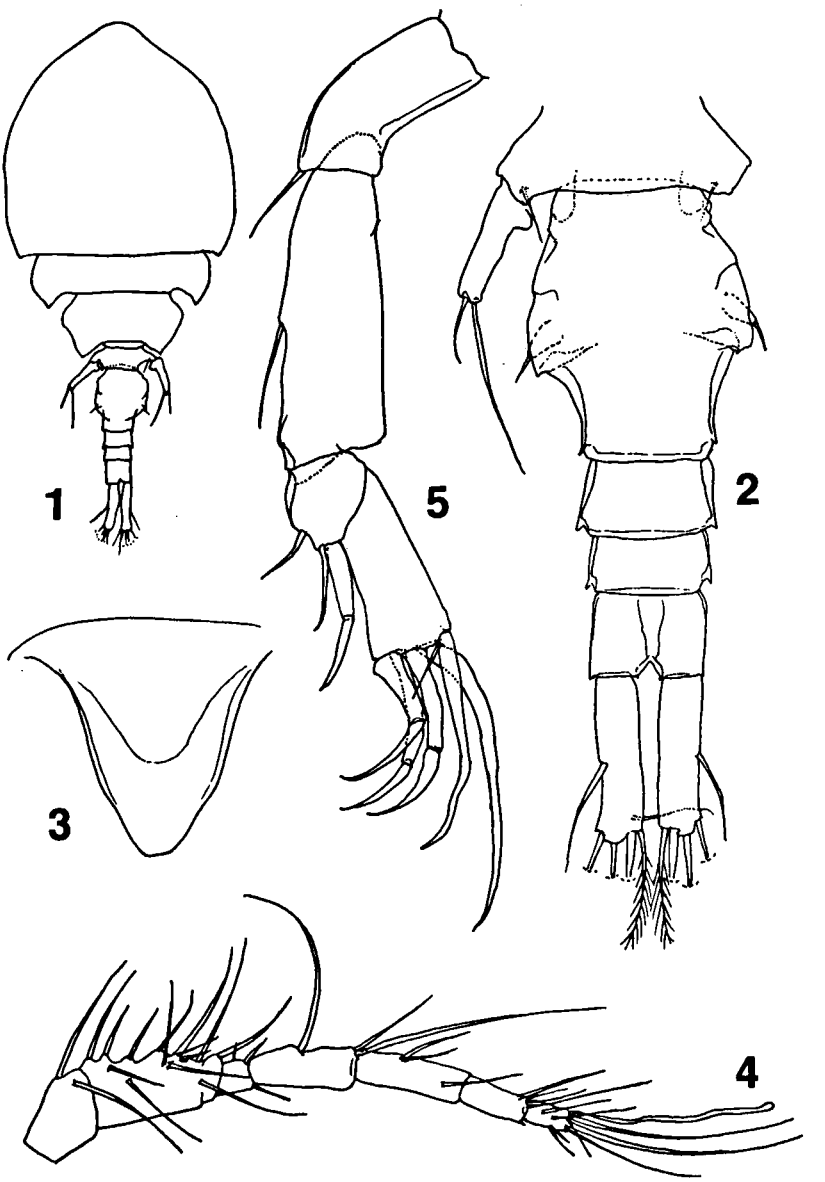
Material: 1 ♀ (holotype) on filament of the branchial crown of the tube-worm *Hydroides* cf. *brachyacanthus* RIOJA, 1941 (Polychaeta, Serpulidae).
U.S. VIRGIN ISLANDS, ST. THOMAS, Long Bay, on corals, 27 Sep. 1923. Holotype completely dissected, mounted in Reyne's modification of Faure's medium, and deposited in the Zoölogisch Museum Amsterdam, ZMA Co. 200.996.

Female: Body (Fig. 1) length 914 μm, greatest width of cephalosome 420 μm. Pedigerous segment 1 completely fused with head. Pedigerous segment 4 almost completely hidden under that bearing leg 3. Epimeral areas distinct, more or less pointed. Genital segment (Fig. 2) longer than wide, widest in middle near genital orifices. Ventroposterior margin of all urosome segments unornamented. Caudal ramus (Fig. 2) more than twice as long as anal segment, 80 μ × 21 μm, with long lateral seta slightly beyond middle of ramus, 4 terminal setae (all broken off, but for medialmost seta), and 1 long, subdistal, dorsal seta. Ovisacs unknown.

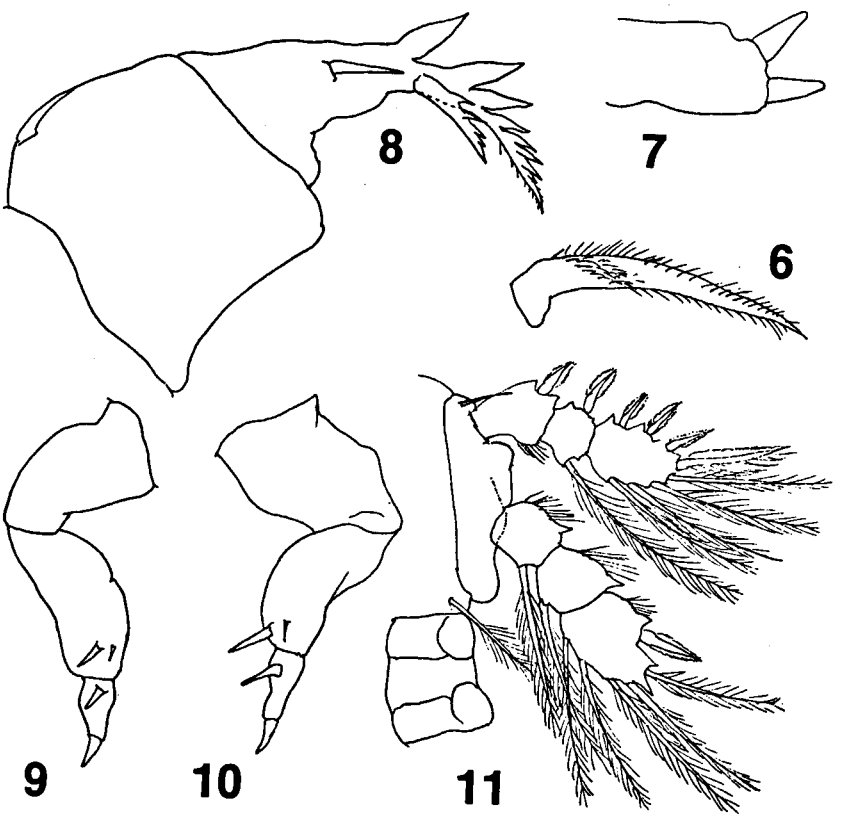
Rostrum large, rounded triangular (Fig. 3). Antenna 1 (Fig. 4) 259 μm long, 7-segmented. Formula for armature: 3, 14, 3, 3, 3, 4, 8 + 1 aesthetasc.

Antenna 2 (Fig. 5) 202 μm long, 4-segmented. Segments 1 and 2 each with 1 seta; segment 3 with 2 setae and 1 claw-like element; segment 4 distally with 4 claw-like elements and 2 more setiform elements.

Mandible (Fig. 6) regularly tapering, slender, pointed lash, with fine



FIGS. 1-5. *Zygomolgides coronicolus* n. gen., n. sp., ♀ holotype. 1, body, dorsal; 2, urosome, ventral; 3, rostrum, ventral; 4, first antenna; 5, second antenna.



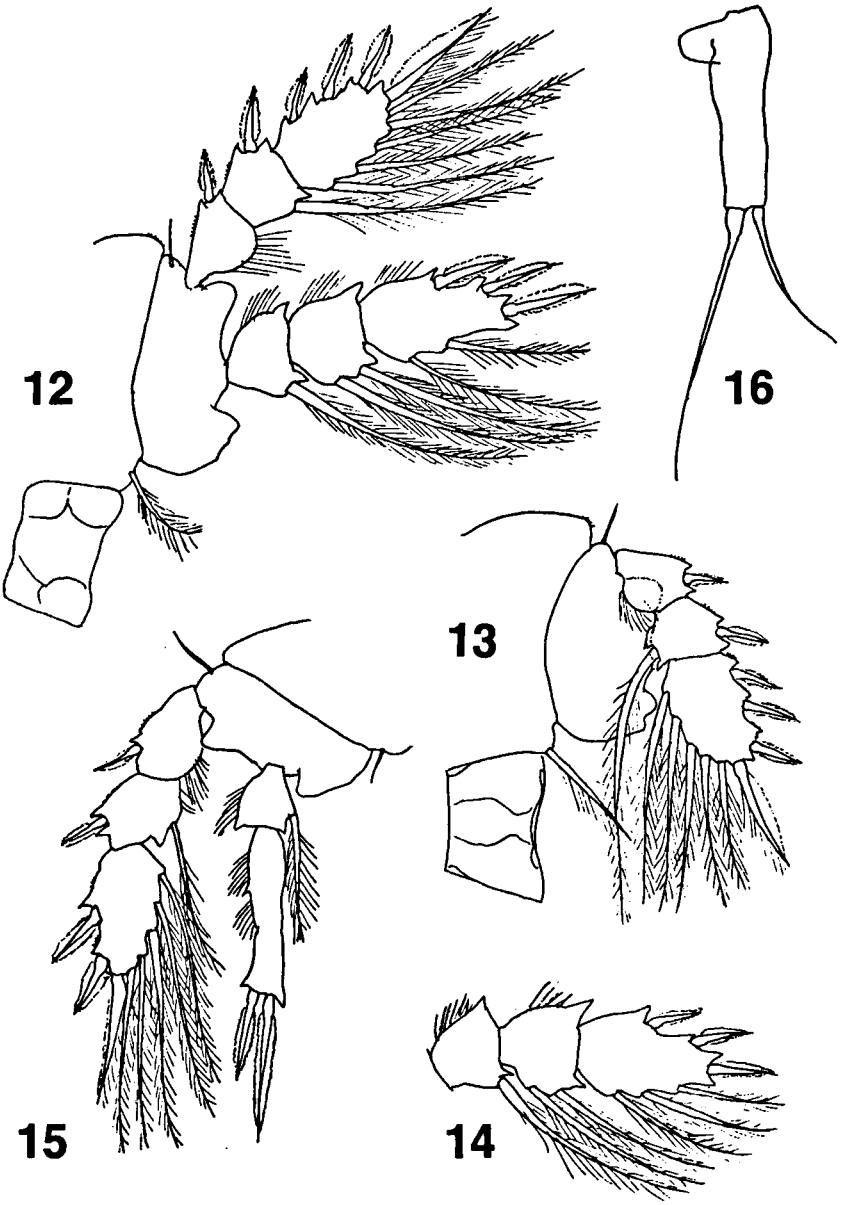
FIGS. 6-11. *Zygomolgides coronicolus* n. gen., n. sp., ♀ holotype.
6, mandible; 7, first maxilla; 8, second maxilla; 9 and 10, maxilliped, seen under different angles; 11, first leg.

setulettes in both margins and a patch of setulettes in proximal part.

Maxilla 1 (Fig. 7) simple lobe with 2 robust, blunt spines on tip.

Maxilla 2 (Fig. 8) with unarmed basal segment. Segment 2 with 1 strong spine and 2 distal lashes; main lash with 3 large proximal teeth and some 8 gradually finer distal teeth; auxiliary lash shorter than main lash, with 4 small teeth.

Maxilliped (Figs. 9-10) consisting of 3 relatively slender segments; segment 2 curved, with 2 subdistal spines; segment 3 with 1 subdistal spine and a heavy distal spine ('claw').



FIGS. 12-16. *Zygomolgides coronicolus* n. gen., n. sp., ♀ holotype.
12, second leg; 13 third leg (endopodite omitted); 14, endopodite of third leg; 15, fourth leg; 16, fifth leg.

Legs 1 to 4 (Figs. 11-15) with 3-segmented rami, but for endopodite 4 which is 2-segmented. Coxopodite of all legs with medial seta (long and plumose on legs 1 to 3, short and naked on leg 4). All basipodites with short lateral seta. Chaetotaxis of legs as in generic diagnosis. Endopodite segment 2 of leg 4 with distinct mediolateral, pointed process, and 2 similar distal processes. Intercoxal plates trapezoidal, without particularities.

Pedigerous segment 5 with short dorsal seta. Leg 5 (Fig. 16) with long free segment, 58 μm long, width in basal part (which has strong medial swelling) 22 μm, distal part narrower, 11 μm wide. Two distal setae, longest reaching to distal margin of genital segment, shortest to genital orifice (Fig. 2).

Leg 6 present as unsegmented lobe, on dorsolateral surface of genital segment, armed with 1 short seta (Fig. 2).

Remarks: The new species is most closely related to the species of the genera *Lichomolgides* and *Zygomolgus*, as discussed above. Both these genera contain predominantly associates of ascidians, but *Zygomolgides* lives on a tube-worm.

Lobosomatium n. gen.

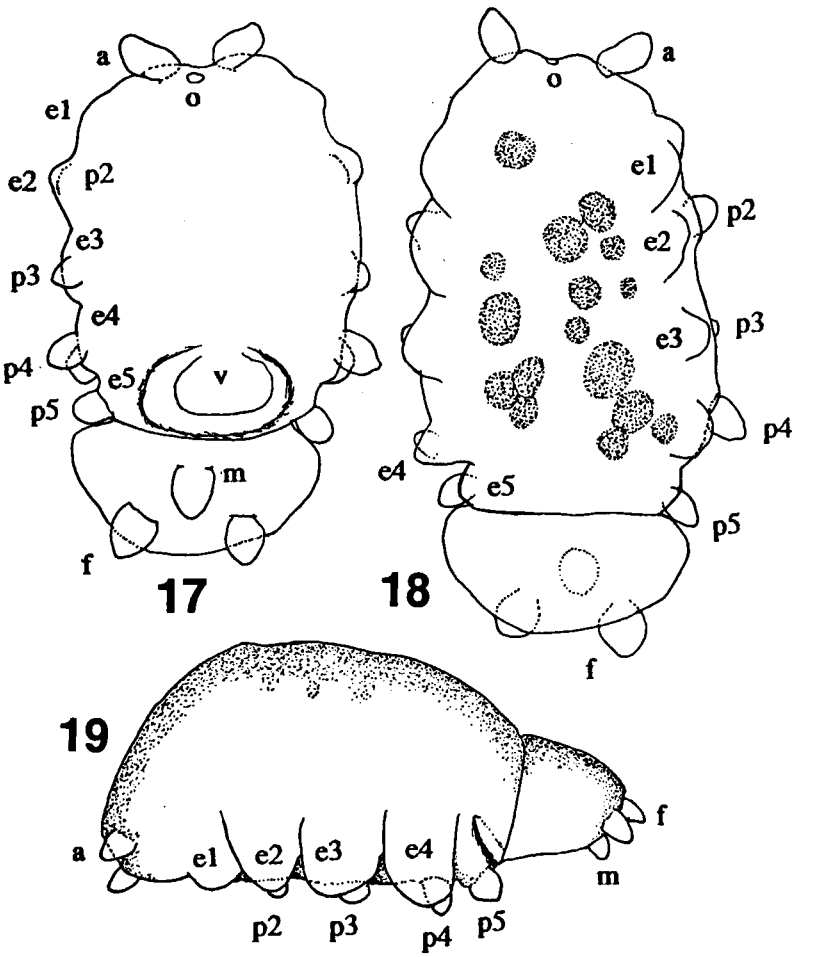
Copepoda incertae sedis.

Female: Body consisting of two sections, an elongate anterior section (cephalosome + metasome) bearing 6 pairs of flat, oval appendages, and a crescent-shaped posterior section (urosome) bearing 1 pair of flat, oval, caudal appendages and a mid-ventral, oval, unpaired process. None of the appendages or processes segmented; all unarmed. Mouth at frontal margin of head; no endosoma. Single, mid-ventral vulva at posterior end of anterior body section. Male unknown.

Minute copepods (less than 0.3 mm long), parasitizing a small polychaete of the family Syllidae.

Type species: *L. enigmaticum* n. sp.

Etymology: The generic name, *Lobosomatium* is a latinized version based on the Greek words λοβός (= lobe) and σωματιον (= diminutive of body). The gender is neuter. The specific name *enigmaticum* is derived from the Greek αἴνιγμα and means puzzling.



FIGS. 17-19. *Lobosomatium enigmaticum* n. gen., n. sp.
17, female (paratype) in ventral view; 18, female (holotype) in dorsal view; 19, female (paratype), from the left. The various parts of the body are interpreted as follows: a = first antenna; el-e5 = epimeral areas 1 to 5; f = furcal ramus; m = mid-ventral urosomal process; o = oral aperture; p2-p5 = legs 2 to 5; v = vulva. Eggs or ovaries are dotted in figure 2.

Lobosomatium enigmaticum n. sp.

(Figs. 17-19)

Material: One ♀ holotype, two ♀ paratypes.

NETHERLANDS ANTILLES, CURAÇAO, Boca Tabla (12°22'19" N 69°06'49" W), sand above low tide line; fixed to central part of body of two specimens of a small polychaete, almost certainly *Brania glandulosa* HARTMANN-SCHRÖDER, 1980 (one of the worms is 0.86 mm long, the other is broken; in the complete host, the copepod was fixed at the boundary of segments 7 and 8); May 19, 1978. Type specimens preserved in the Zoölogisch Museum, Amsterdam, ZMA Co. 200.995.

Female: Body length of two specimens 238 and 290 μm; greatest body width 128 and 135 μm. Body rather strongly sclerotized, brownish, not transparent, divided into two sections. Elongate anterior section bearing small mouth at anterior margin, surrounded by two oval appendages (first antennae?); and 5 pairs of lateral bosses (epimeral areas?), bosses 2 to 5 each provided at posteroventral side with oval appendage, small on bosses 2 and 3, larger on bosses 4 and 5 (legs 2 to 5?). First pair of bosses devoid of 'leg'. Near mid-ventral posterior edge of anterior body section an unpaired, broadly horseshoe-shaped sclerotization is visible (vulva?). No mouthparts.

The crescent-shaped posterior section bears 2 oval appendages of 20 μm long on posteroventral side (caudal rami?). On ventral surface, an unpaired oval process arises.

Eggs or ovaria scattered in anterior body section.

Remarks: These remarkable animals differ from anything known to me. At best, they resemble certain very transformed Copepoda found endoparasitic in Didemnidae (Tunicata), such as the genera *Cephalodelphys, Achelidelphys*, and *Syndelphys* (all described by LAFARGUE & LAUBIER 1977), which are provisionally assigned to the Notodelphyidae. But these resemblances are most probably due to convergences. The specimens described here as *Lobosomatium* offer quite a number of problems, in particular since they lack mouthparts, whereas all remaining appendages are reduced to rounded lobes, without any segmentation and devoid of any armature. This makes it almost impossible to trace the homologies. An attempt of naming these appendages is made here, mainly based on their topography, and not on their morphology, leading to the assumption of the presence of one pair of first antennae, remnants of five pairs of epimeral areas, four pairs of legs, a pair of furcal rami, and an unpaired ventral process, possibly homologous with the so-called medioterminal swelling as found in the Herpyllobiidae (see, for instance, LÜTZEN 1964). [An alternative interpretation might be that the 'epimeral areas' are exopodites of the legs and the 'furcal rami' are homologous

with the genital processes of the Herpyllobiidae.] There are at least two characters that prevent inclusion of *Lobosomatium* in the Herpyllobiidae, *viz.* (1) the presence of only one vulval opening (instead of two), and (2) the absence of an endosoma. The subdivision of the trunk into a large anterior, pedigerous, section and a small posterior section resembles the situation in some genera of the nereicoliform family group (see *Ho* 1984), but all members of that group possess articulated antennae, mouthparts and legs. Since the male of *Lobosomatium* remains unknown, it might be best to range the genus for the moment on the list of "anomalous genera... which so far have defied attempts to place them in the context of an established family" (Gotto 1979: 30).

A dubious egg. On the host polychaete a single strongly sclerotized egg was found, loosely attached to the body of the worm. The size of this perfectly oval egg is, in comparison with the size of the copepod, enormous, *viz.* 204 × 153 μm. Certainly, the size of the eggs in the copepod's body is very much smaller, but these eggs may still be ripening. In conclusion, it is not at all certain that the egg found is that of *Lobosomatium*.

ACKNOWLEDGEMENTS

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