

TWO NEW SPECIES OF *LICHOMOLGUS* (COPEPODA, CYCLOPOIDA) FROM AN ACTINIARIAN IN MADAGASCAR

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RÉSUMÉ

Les auteurs décrivent deux espèces nouvelles des copépodes cyclopoïdes, *Lichomolgus politus* n. sp. et *Lichomolgus simulans* n. sp., associées à une petite actinie *Rhodactis rhodostoma* à Nosy Komba (près de Nosy Bé), au nord-ouest de Madagascar.

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Three species of *Lichomolgus* have already been recorded from actinarians in Madagascar. They are *L. cuspis*, *L. gemmatus*, and *L. magnificus*, all described by Humes (1964). These copepods live in association with two members of the family Stoichactinidae, *Stoichactis giganteum* (Forskål) and *Radianthus ritteri* (Kwietniewski). The two new lichomolgids described below came from the small sea anemone *Rhodactis rhodostoma* (Ehrenberg), family Actinodiscidae.

The collection of the copepods (by the first author) occurred partly in 1960 during an expedition to Nosy Bé by the Academy of Natural Sciences of Philadelphia and partly in 1963-64 during the work of the U.S. Program in Biology of the International Indian Ocean Expedition.

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We wish to thank Mr. Charles E. Cutress of the United States National Museum for the identification of the actinarian and the staff of the Centre d'Océanographie et des Pêches at Nosy Bé for assistance with the field work.

LICHOMOLGUS POLITUS n. sp.

Figs. 1-28

Type material. — 47 females and 13 males from 60 *Rhodactis rhodostoma* (Ehrenberg), attached to dead *Acropora* in 1 m, Pte. Ambarionaomby, Nosy Komba, near Nosy Bé, Madagascar. Collected May 29, 1964. Holotype female, allotype, and 48 paratypes (39 females and 9 males) deposited in the United States National Museum, Washington, and the remaining paratypes in the collection of A. G. Humes.

Other specimens (all from *Rhodactis rhodostoma* at Pte. Ambarionaomby). — 11 females, 17 males, and 1 copepodid from 50 hosts in 2 m, August 18, 1960; 12 females and 19 males from 30 hosts in 0,5 m, June 24, 1963; and 9 females and 4 males from 40 hosts in 1 m, July 3, 1963.

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Female. — The body (fig. 1) has a moderately broadened prosome and slender urosome. The length (not including the setae on the caudal rami) is 1.78 mm (1.61-1.94 mm) and the greatest width, at the junction of the head and the segment of leg 1, is 0.74 mm (0.70-0.78 mm), based on 10 specimens. The ratio of length to width of the prosome is 1.43 : 1. The segment of leg 1 is separated dorsally and laterally from the head by a distinct furrow. The epimeral areas of the metasomal segments are rounded.

The segment of leg 5 (fig. 2) is narrowed anteriorly and broadened posteriorly where its greatest width is 224 μ . The free segment of leg 5 is attached somewhat ventrally on the posterolateral edge. The genital segment is longer than wide, 275 \times 224 μ ; it is moderately swollen in its midregion where the egg sacs are attached dorsolaterally. Each area of attachment of the egg sacs (fig. 3) bears two small blunt spines 8 μ in length, with their tips very finely punctate. The three postgenital segments measure 96 \times 122, 68 \times 155, and 115 \times 130 μ respectively from anterior to posterior. The posteroventral margin of the anal segment along the insertions of each caudal ramus bears a row of minute spinules.

The caudal ramus (fig. 4) is elongated, 3.8 times longer than wide, 190 \times 52 μ in greatest dimensions, and inserted a little dorsally on the anal segment. The outer lateral seta and the outer terminal seta are both 91 μ in length and naked. The inner terminal seta is 143 μ in length and has a few proximal inner hairs. The two long terminal setae, inserted between a slight dorsal flap and a larger ventral flap (with a row of minute spinules along its edge), are 360 μ (outer) and 505 μ (inner) in length and naked. The small pedicellate dorsal seta is 38 μ long. The dorsal and ventral surfaces of the ramus have minute scattered spinules.

The dorsal surface of the prosome and the dorsal and ventral surfaces of the urosome bear scattered refractile points and hairs. The ratio of the length of the prosome to that of the urosome is 1.55 : 1.

The egg sac (fig. 5) is moderately elongated, 784 \times 358 μ , with each of the many eggs about 83 μ in diameter.

The rostral area (fig. 6) is well-defined.

The seven segments of the first antenna (fig. 7) have the following lengths (measured along their posterior non-setiferous margins) : 50 (99 μ along the anterior margin), 211, 34, 92, 72, 55, and 32 μ respectively. The formula for the armature is 4, 13 (3+2+8), 6, 3, 4+1 aesthete, 2+1 aesthete, and 7+1 aesthete. All the setae are naked. On the proximal ventral region of segment 3 there is a sclerotization suggesting an intercalary segment.

The second antenna (fig. 8) is slender and 4-segmented. The elongated first and second segments bear a small inner seta. The short third segment bears three inner setae, one much smaller than the other two. The elongated fourth segment measures about 100 \times 21 μ and bears terminally seven elements (one large setule and six smaller setules) and a single claw 55 μ long (measured along its axis). All the setae and setules are naked.

The labrum (fig. 9) has two broad lobes, each with a minute medial marginal spiniform hyaline process.

The mandible (fig. 10) has a basal region separated into two parts by a waist-like constriction. The distal of these two areas has on its outer margin a sclerotization bearing a row of prominent spinules followed by a hyaline striated fringe, and on its inner margin a row of slender spinules; the terminal lash has lateral spinules. The paragnath (fig. 11) has its hairy distal region bilobed, with the posterior lobe bearing a small knob-like excrescence. The first maxilla (fig. 12) is a single segment bearing four setae, one subterminal small and naked, and three terminal of which one is armed bilaterally with minute spinules and the two others are naked. The second maxilla (fig. 13) is 2-segmented. The basal segment is large and unarmed. The distal segment is gradually attenuated into a spiniform process with its outer edge bearing teeth along its first three-fourths and slender spinules on its distal fourth; the segment bears two inner setae (one with prominent bilateral spinules, the other with a row of minute spinules along one side) and a small hyaline

proximal outer setule. The 3-segmented maxilliped (fig. 14) has the first segment elongated and unarmed, the second segment somewhat stouter with two very unequal setae (one of them long and scythe-shaped), and the third segment small with a terminal spiniform barbed process, a spine with minute spinules along one side, and a slender hyaline seta.

The area between the maxillipeds and the first pair of legs (fig. 15) is not produced ventrally and a lightly sclerotized line connects the bases of the maxillipeds.

The rami of legs 1-4 (figs. 16, 17, 18, and 19) are 3-segmented, except for the endopod of leg 4 which is 2-segmented. The spine and setal formula is as follows (the Roman numerals representing the spines, the Arabic numerals the setae) :

P 1	protopod	0-1 ; 1-0	exp.	I-0 ; I-1 ; III-I-4
			end.	0-1 ; 0-1 ; I-5
P 2	protopod	0-1 ; 1-0	exp.	I-0 ; I-1 ; III-I-5
			end.	0-1 ; 0-2 ; I-II-3
P 3	protopod	0-1 ; 1-0	exp.	I-0 ; I-1 ; III-I-5
			end.	0-1 ; 0-2 ; I-II-2
P 4	protopod	0-1 ; 1-0	exp.	I-0 ; I-1 ; II-I-5
			end.	0-1 ; II

The inner seta on the coxa is long and feathered in legs 1-3, but short (9 μ) and naked in leg 4. A row of hairs is present on the inner margin of the basis in legs 1-3, but these hairs are absent in leg 4. The endopod of leg 4 is distinctly 2-segmented, the first segment $46 \times 51 \mu$, with its inner seta 80 μ long. The second segment is 88 μ long (95 μ including the spinous processes) $\times 40 \mu$ in greatest width, ornamented with an outer interrupted row of hairs and a terminal row of spinules, and armed with two terminal spines 64 μ (inner) and 42 μ (outer) in length.

Leg 5 (fig. 20) has a moderately elongated free segment of somewhat irregular outline, measuring 94 μ along the outer edge, 77 μ along the inner edge, and 41 μ in greatest width, or about 2.1 times longer than wide. It bears small dorsolateral spinules along the outer margin and is armed with two terminal naked setae 63 μ (inner) and 53 μ (outer) in length. The seta arising from the body near the base of the free segment is about 30 μ long and unornamented.

Leg 6 is doubtless represented by the two spines on the area of attachment of the egg sac (see fig. 3).

The color in life in transmitted light is very slightly amber, the eye red, the egg sacs grayish green.

Male. — The body form (fig. 21) resembles that of the female. The length (excluding the setae on the caudal rami) is 1.33 mm (1.26-1.40 mm) and the greatest width is 0.44 mm (0.42-0.46 mm), based on 10 specimens. The ratio of the length of the prosome to its width is 1.7 : 1.

The genital segment (fig. 22) is subquadrate, $285 \times 280 \mu$. There are four postgenital segments, 50×86 , 50×82 , 41×78 , and $77 \times 85 \mu$ respectively from anterior to posterior.

The caudal ramus, measuring $138 \times 36 \mu$, is similar to that of the female.

The dorsal surface of the prosome and the dorsal and ventral surfaces of the urosome bear refractile points and hairs. The ratio of the length of the prosome to that of the urosome is 1.16 : 1.

The rostral area is like that of the female.

The first antenna (fig. 23) resembles that of the female, but there are three long aesthetes added (two on segment 2 and one on segment 4), making the formula 4, 13+2 aesthetes (3+1 aesthete, 2, 8+1 aesthete), 6, 3+1 aesthete, 4+1 aesthete, 2+1 aesthete, and 7+1 aesthete.

The second antenna is like that of the female, but there are many small refractile knobs on the inner surface of the first two segments (fig. 24).

The labrum, mandible, paragnath, and first maxilla resemble those of the female. The second maxilla is also like that in the opposite sex but the first segment is a little more swollen.

The maxilliped (fig. 25) is 4-segmented and slender. The first segment is unarmed, the second bears two inner setae and two rows of spinules, the third is very short and unarmed, and the fourth forms the proximal part of the claw and bears two setae, one hyaline and naked, 15 μ long, the other minutely barbed and 46 μ long. The entire claw is 211 μ long (measured along its axis and not along its curvature). The narrow hyaline membrane along the concave edge of the claw is indented at about midway, at which point there is a break in the sclerotization. There is a prominent terminal lamella.

The area between the maxillipeds and the first pair of legs is like that of the female.

Legs 1-4 resemble those of the female and have the same spine and setal formula except for the last segment of the endopod of leg 1 (fig. 26) where the formula is I-I-4, the outermost seta here being transformed to a spine.

Leg 5 (fig. 27) is much more slender than in the female, the free segment measuring $59 \times 17 \mu$, or 3 times longer than wide. The two terminal naked setae are 47 and 45 μ in length and the seta arising from the body near the insertion of the free segment is 44 μ long.

Leg 6 (fig. 28) consists of a ventrolateral flap on the ventral surface of the genital segment. It bears two slender naked setae 44 and 35 μ in length.

Spermatophores were not observed.

The color in life in transmitted light resembles that of the female, but often there is a greenish area in the middle of the cephalosome.

(The specific name *politus* is a Latin adjective meaning polished, elegant.)

Relationship to the host. — It is apparent that *Lichomolgus politus* lives within the coelenterates, since the copepods were recovered only after the hosts had been thoroughly torn apart, never in washings of the intact anemones.

Comparison with other species. — *Lichomolgus politus* may be compared with those species ascribed to *Lichomolgus* which have the armature of II-I-5 on the last segment of the endopod of leg 4, the caudal ramus more than 3 times but less than 4 times longer than wide, and only a single terminal claw on the second antenna. It thus resembles *L. simplex* and *L. gigas*, both described by Thompson and A. Scott in 1903 from Ceylon. *L. simplex*, based on a few specimens found in sponge washings in the Gulf of Manaar, is much smaller (female 0.88 mm, male 0.8 mm), the first antenna is described as 6-segmented (the second segment shown in Thompson and Scott's fig. 28, Pl. XV, being of about the same length as the fourth), the maxilliped of the female apparently lacks the large conspicuous seta on the second segment, and the general aspect of the female is different.

L. gigas, based on one male and one female, from general washings of dredged invertebrates, is a little larger (female 2 mm, male 1.4 mm), the ratio of the length of the prosome of the female to that of the urosome (measured from Thompson and Scott's fig. 21, Pl. XVI) is 1.25 : 1, the form of the free segment of leg 5 in the female appears to be somewhat different, and the outline of the genital segment in the male is not as subquadrate as in *L. politus*. The proportional lengths of the segments of the first antenna, however, closely resemble those of *L. politus*. (One male of *L. gigas* was listed by A. Scott, 1909, p. 264, in washings from dredged invertebrates, in 1595 m, Siboga Station 226, 5° 26'.7S, 127° 36'.5E, midway between the Lucipara and Schildpad Islands, but no description or figures were given.)

LICHOMOLGUS SIMULANS n. sp.

Figs. 29-53

Type material. — 11 females and 12 males from 30 *Rhodactis rhodostoma* (Ehrenberg), attached to dead *Acropora* in 0.5 m, at Pte. Ambarionaomby, Nosy Komba, near Nosy Bé,

Madagascar. Collected June 24, 1963. Holotype female, allotype, and 17 paratypes (8 females and 9 males) deposited in the United States National Museum, Washington, and the remaining paratypes (dissected) in the collection of A. G. Humes.

Other specimens (all from *Rhodactis rhodostoma* at Pte. Ambarionaomby). — 3 females and 1 male from 50 hosts, in 2 m, August 18, 1960; 3 females and 1 male from 60 hosts, in 1 m, May 29, 1964; and 3 females from 40 hosts, in 1 m, July 3, 1963.

Female. — The body form (fig. 29) resembles that of *L. politus*. The length (without the setae on the caudal rami) is 1.40 mm (1.30-1.51 mm) and the greatest width is 0.61 mm (0.56-0.66 mm), based on 10 specimens. The ratio of length to width of the prosome is 1.4 : 1.

The segment of leg 5 (fig. 30) is 211 μ wide. The genital segment is longer than wide, 221 \times 174 μ , its sides not as swollen as in the previous species and with small indentations just posterior to the attachment areas of the egg sacs. Each area of attachment of the egg sacs (fig. 31) is dorsolateral in position and bears two blunt naked spines 12 μ in length. The dorsolateral surface of the genital segment in the vicinity of the attachment areas is very delicately pilose. The three postgenital segments are 55 \times 107, 44 \times 100, and 70 \times 104 μ respectively from anterior to posterior.

The caudal ramus (fig. 32) measures 68 \times 45 μ in greatest dimensions, or 1.5 times longer than wide. The outer lateral seta is 146 μ in length and naked. The outer terminal seta is 150 μ and haired along its proximal half. The inner lateral seta is 295 μ and bears fine spinules along its proximal half. The two long terminal setae are 448 μ (outer) and 571 μ (inner) and naked. The pedicellate dorsal seta is 42 μ in length and feathered. The surface of the ramus lacks fine ornamentation.

The ratio of the length of the prosome to that of the urosome is 1.8 : 1.

The egg sac resembles that of *L. politus*, 661 \times 224 μ , with each egg about 60 μ in diameter.

The rostral area (fig. 33) is well-defined.

The first antenna (fig. 34) has seven segments of somewhat different relative lengths than in the preceding species. The lengths of the segments (measured along their posterior non-setiferous margins) are 39 (83 μ along the anterior edge), 160, 29, 91, 74, 55, and 34 μ . The armature is like that of *L. politus*, but one seta on segment 1 and another on the distal end of segment 2 are much longer.

The 4-segmented second antenna (fig. 35) is similar to that of *L. politus*, but there are a few spinules on the postero-inner surface of the second segment, and the last segment is more elongated and slender, 133 \times 18 μ , bearing only six terminal elements and a claw 60 μ long.

The lobes of the labrum (fig. 36) lack the small medial spiniform processes seen in *L. politus*.

The mandible (fig. 37) closely resembles that of the previous species, but the spinules on the sclerotization on the outer margin of the basal region are smaller. The paragnath (fig. 38) has an undivided hairy tip bearing a small knob-like process. The first maxilla (fig. 39) is a single segment, with the subterminal element not articulated with the segment and the three terminal setae minutely barbed. The second maxilla (fig. 40) resembles very closely that of *L. politus*. The maxilliped (fig. 41) is also much like that of the preceding species except for minor differences in the ornamentation of the elements.

The area between the maxillipeds and the first pair of legs (fig. 42) resembles that of *L. politus*.

Legs 1-4 (figs. 43, 44, 45, and 46) resemble in major respects those of the previous species, and have the same spine and setal formula. In leg 4 (fig. 46) the inner seta on the coxa is short (25 μ) and naked, and there are hairs on the inner margin of the basis as in the other legs. The first segment of the endopod is 43 \times 49 μ , with its inner seta 94 μ long. The second segment is 104 μ long (109 μ including the spinous processes) \times 49 μ at its widest part (or 32 μ at the narrowest part), with its two terminal spines 69 μ (inner) and 40 μ (outer) in length.

Leg 5 (fig. 47) has a moderately elongated free segment, 143 μ in greatest length along the

spinulose outer margin and $65\ \mu$ in greatest width at the level of the inner basal expansion. The inner margin distal to the expansion is slightly irregular with a slight notch about midway to the extremity. The two naked terminal setae are $130\ \mu$ (inner) and $78\ \mu$ (outer) in length. The seta on the body near the insertion of the free segment is $45\ \mu$ in length and feathered.

Leg 6 is represented by the two spines located on the area of attachment of the egg sacs (see fig. 31).

The color in life in transmitted light is translucent, the eye red, the ovary dark gray.

Male. — The body form (fig. 48) resembles that of *L. politus*. The length (not including the setae on the caudal rami) is 0.96 mm (0.85-1.08 mm) and the greatest width is 0.38 mm (0.36-0.40 mm), based on 10 specimens. The ratio of the length of the prosome to its width is 1.56 : 1

The genital segment (fig. 49) is a little longer than wide, $265 \times 224\ \mu$, with nearly parallel sides. The four postgenital segments measure 38×73 , 38×73 , 23×69 , and $53 \times 76\ \mu$ respectively from anterior to posterior.

The caudal ramus is like that of the female, though smaller ($52 \times 34\ \mu$).

The ratio of the length of the prosome to that of the urosome is 1.35 : 1.

The rostral area is like that of the female.

The first antenna resembles that of the female, but has three added aesthetes as in the male of *L. politus*.

The second antenna is similar to that of the female, but both first and second segments have numerous conspicuous spinules on their postero-inner surfaces (fig. 50).

The labrum, mandible, paragnath, and first maxilla resemble those of the female. As in *L. politus*, the basal segment of the second maxilla is slightly more swollen than in the female.

The maxilliped (fig. 51) resembles that of *L. politus*, but the claw ($213\ \mu$ in length) is more evenly arcuate and the terminal lamella is less conspicuous.

The area between the maxillipeds and the first pair of legs is like that in the female.

Legs 1-4 resemble those of the female, with the same spine and setal formula except for the last segment of the endopod of leg 1 (fig. 52) where the formula is I-I-4, the outermost seta here transformed to a spine as in *L. politus*.

Leg 5 (fig. 53) has a free segment measuring $62 \times 18\ \mu$, without a basal expansion. The surficial spinules are more numerous than in the female. The two terminal naked setae are $28\ \mu$ (inner) and $70\ \mu$ (outer) in length. The seta arising on the body near the insertion of the free segment is $35\ \mu$ long and feathered.

Leg 6 is like that of *L. politus*, but the two setae are longer, 52 and 44 μ .

Spermatophores were not observed.

(Features not mentioned in the description of *L. simulans* but described in *L. politus* may be assumed to be similar to the latter species.)

The color in life in transmitted light is similar to that of the female.

(The specific name *simulans*, Latin = imitating, refers to the many similarities of this species with *L. politus*.)

Relationship to the host. — As in the case of *L. politus*, this species was recovered only from washings of well-dissected *Rhodactis* and may be assumed to inhabit the gastrovascular cavity of these coelenterates rather than the outer surface.

Comparison with other species. — *Lichomolgus simulans* may be compared with those species of the genus *Lichomolgus* which have the formula II-I-5 for the last segment of the exopod of leg 4, the caudal ramus 1.5 times or less longer than wide, and a single claw on the second antenna. *L. anomalus* A. Scott, 1909, p. 264 (collected from washings of dredged invertebrates, in 1595 m, Siboga Station 226, between the Lucipara and Schildpad Islands), though possessing these features,

is much smaller (both male and female 0.67 mm), the prosome in the female is fully 3 times longer than the urosome, the fifth leg in the female is attenuated distally and is armed with a single seta, and the endopod of leg 1 in the male is curiously modified.

L. elegans Thompson and A. Scott, 1903, originally described from a single female found in washings of dredged invertebrates in Ceylon, has a notched genital segment, and leg 5 (in Thompson and Scott's fig. 8, Pl. XVI) does not show the prominent basal expansion seen in *L. simulans*. The relative lengths of the segments of the first antenna are, however, rather similar to those of *L. simulans*. (A. Scott, 1909, p. 264, lists one specimen of *L. elegans* in washings of dredged invertebrates, in 1595 m, Siboga Station 226, but gives no further description.)

L. simulans may be readily distinguished from *L. politus* by its smaller size, the shorter caudal rami, and the basal expansion on leg 5 in the female. These two species from *Rhodactis* in Madagascar have many features in common, however, such as the proportional lengths of the segments of the first antenna, the general structure and armature of the second antenna, the form of the mouthparts, and the spine and setal formula of legs 1-4. Thus, in spite of the obvious differences between them, they appear to be rather closely related.

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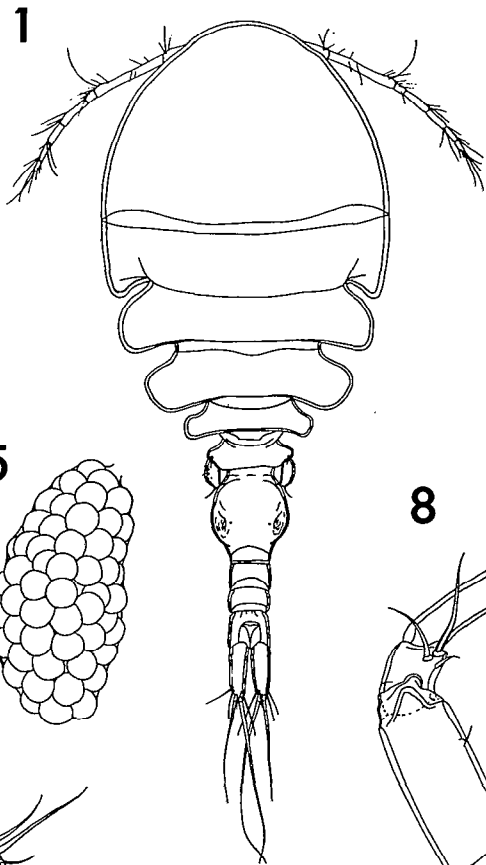
EXPLANATION OF THE FIGURES

All the figures have been drawn with the aid of a camera lucida. The letter after the explanation of each figure refers to the scale at which the figure was drawn.

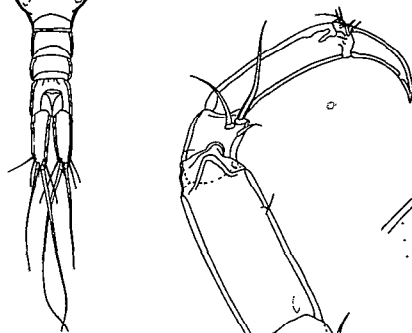
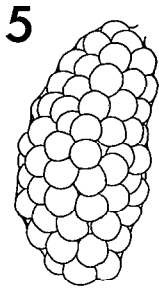
Fig. 1-10. — *Lichomolgus politus* n. sp., female

1. — Body, dorsal (A)
2. — Urosome, dorsal (B)
3. — Area of attachment of egg sac, dorsal (C)
4. — Caudal ramus, dorsal (D)
5. — Egg sac, dorsal (A)
6. — Rostral area, ventral (E)
7. — First antenna, dorsal (F)
8. — Second antenna, slightly inner (F)
9. — Labrum, with paragnaths indicated by dashed lines, ventral (D)
10. — Mandible, posterior (D)

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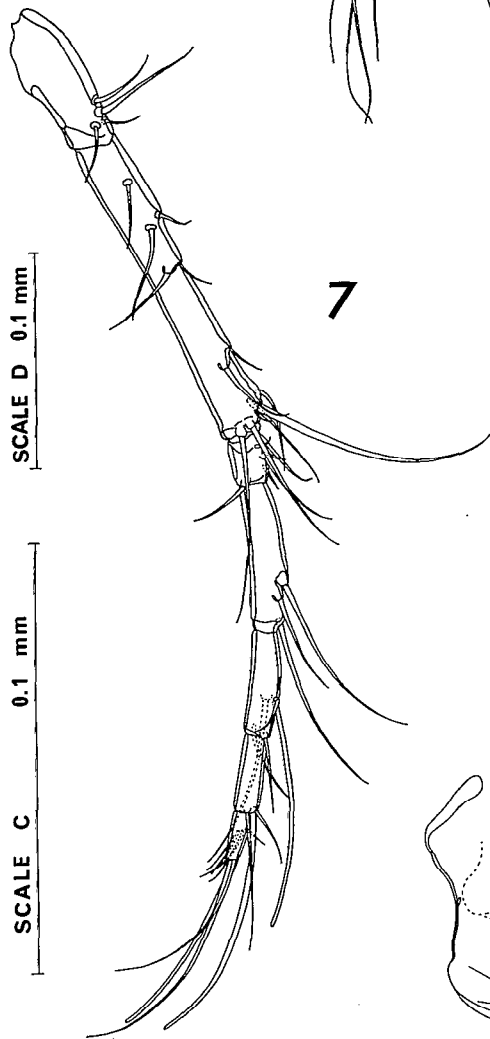


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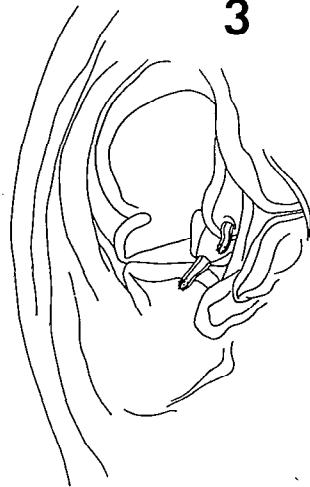


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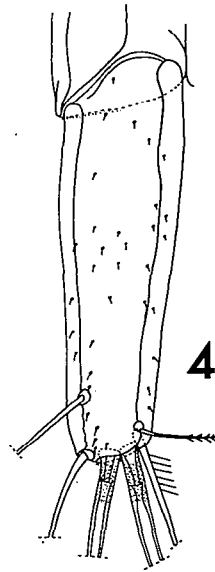
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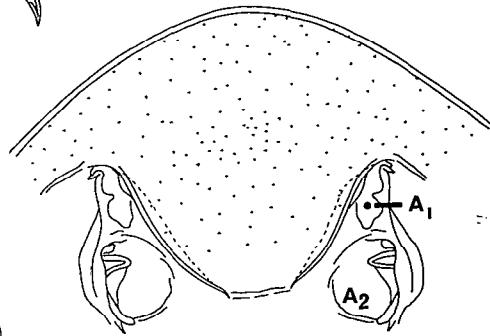
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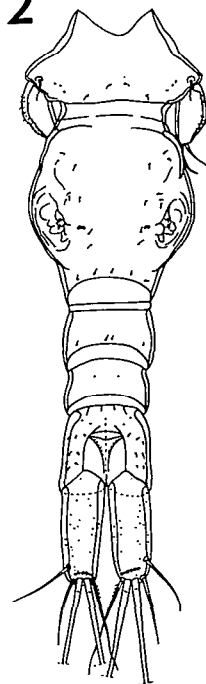
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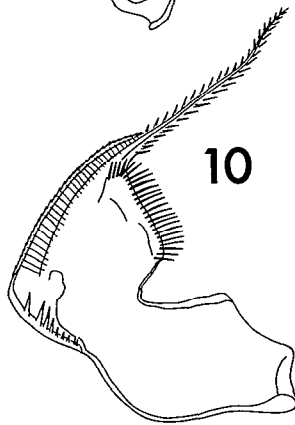
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SCALE E 0.3 mm

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SCALE A 1 mm

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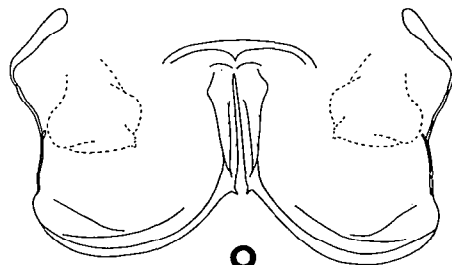
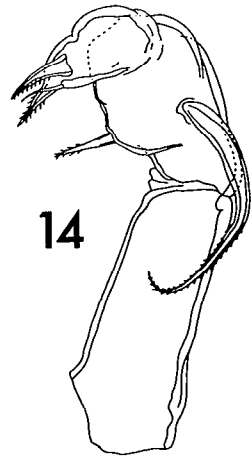
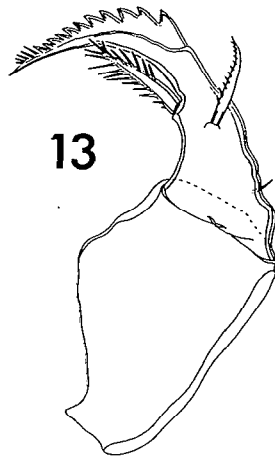
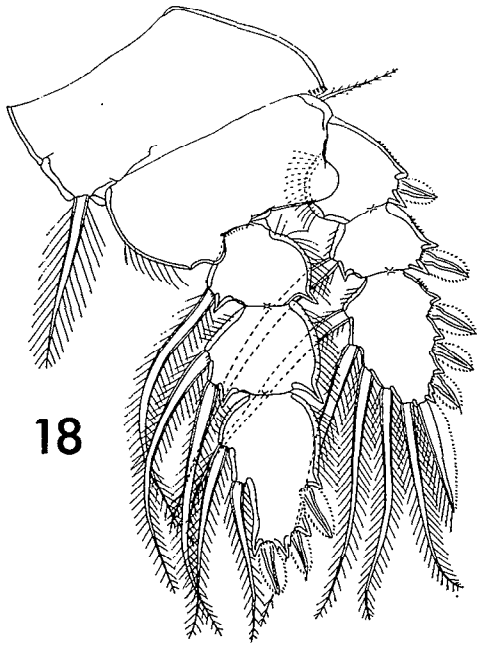
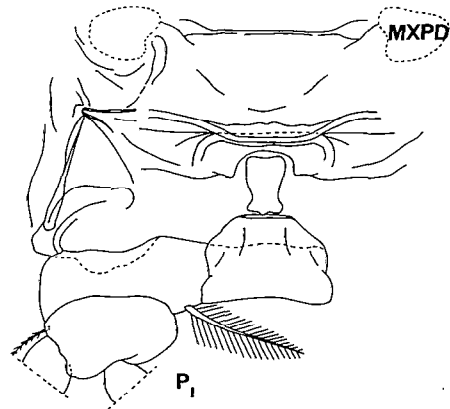


Fig. 11-19. — *Lichomolgus politus* n. sp., female (continued)

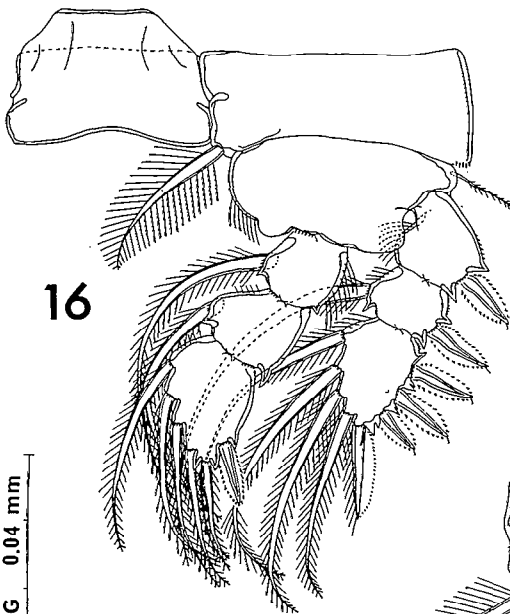
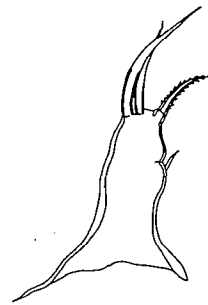
11. — Paragnath, ventral (G)
12. — First maxilla, posterior (D)
13. — Second maxilla, posterior (D)
14. — Maxilliped, postero-inner (D)
15. — Area between maxillipeds and first pair of legs, ventral (E)
16. — Leg 1, anterior (F)
17. — Leg 2, anterior (F)
18. — Leg 3, anterior (F)
19. — Leg 4, anterior (F)



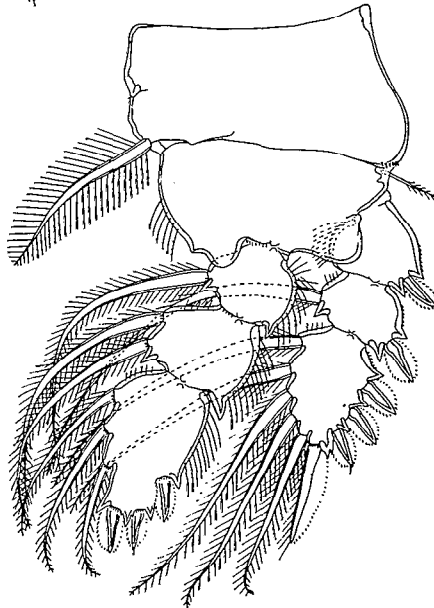
15



12

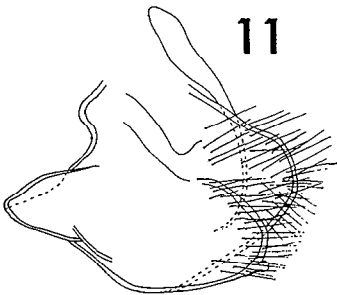


17



SCALE G 0.04 mm

11



19

Fig. 20. — *Lichomolgus politus* n. sp., female (continued)

20. — Leg 5, dorsal (H)

Fig. 21-28. — *Lichomolgus politus* n. sp., male

21. — Body, dorsal (I)

22. — Urosome, dorsal (E)

23. — First antenna, ventral (F)

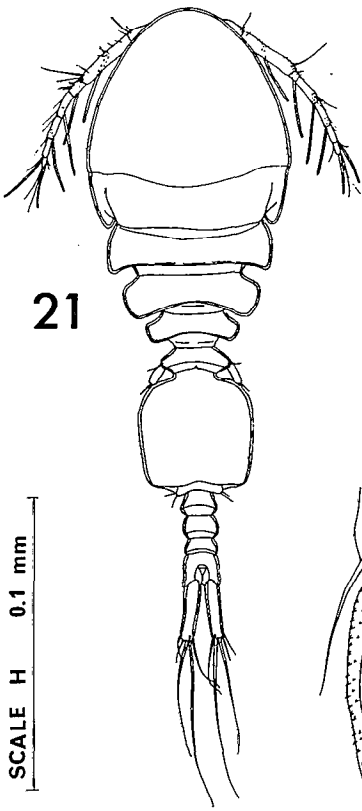
24. — First two segments of second antenna, inner (H)

25. — Maxilliped, inner (F)

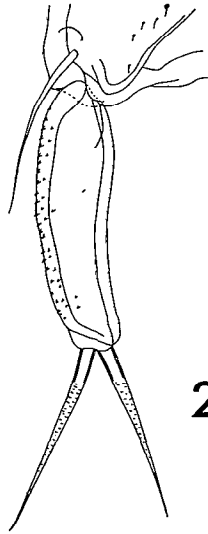
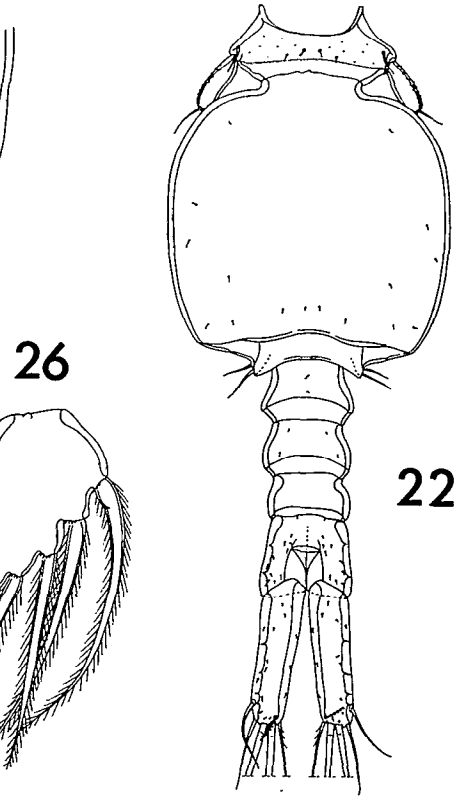
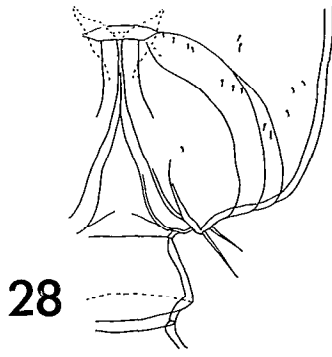
26. — Last segment of endopod of leg 1, anterior (H)

27. — Leg 5, dorsal (C)

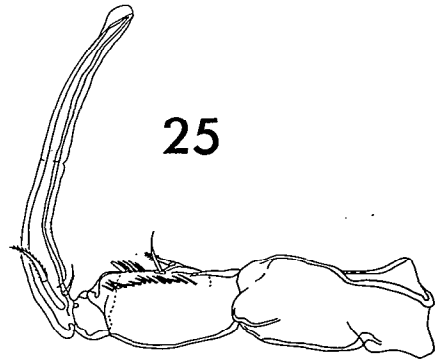
28. — Leg 6, ventral (F)



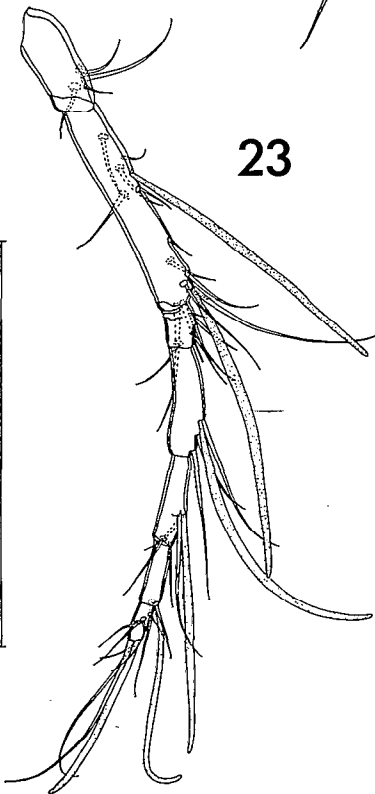
SCALE H 0.1 mm



27

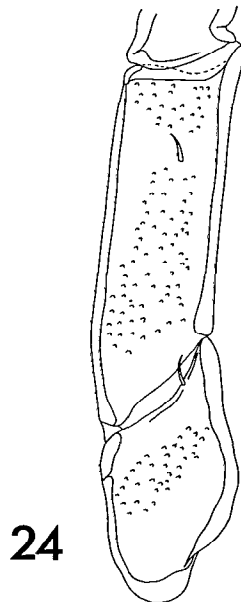


25

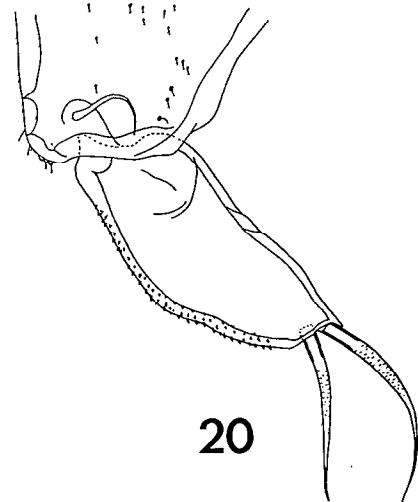


23

SCALE I 1 mm



24



20

Fig. 29-37. — *Lichomolgus simulans* n. sp., female

- 29. — Body, dorsal (A)
- 30. — Urosome, dorsal (E)
- 31. — Area of attachment of egg sac, dorsal (C)
- 32. — Caudal ramus, dorsal (H)
- 33. — Rostral area, ventral (E)
- 34. — First antenna, ventral (F)
- 35. — Second antenna, posterior (F)
- 36. — Labrum, with paragnaths indicated by dashed lines, ventral (D)
- 37. — Mandible, posterior (D)

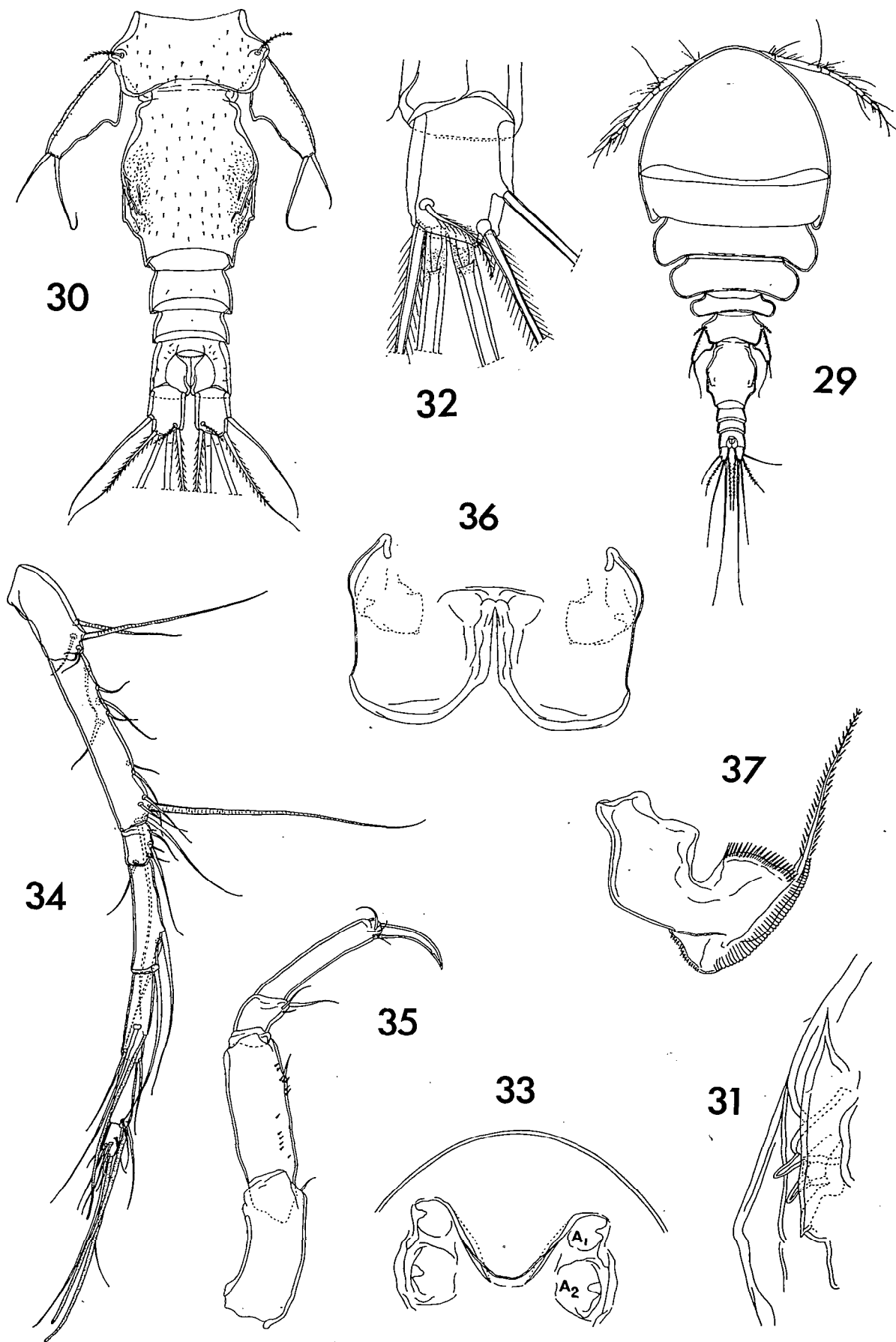
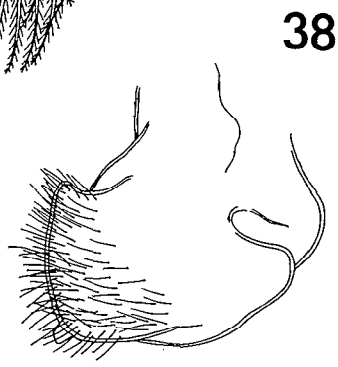
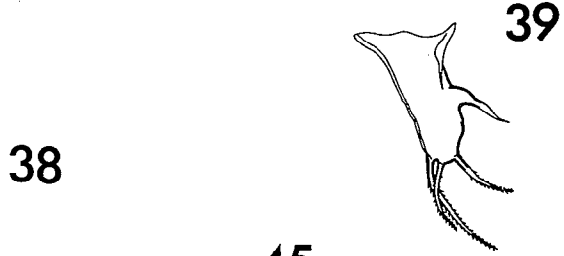
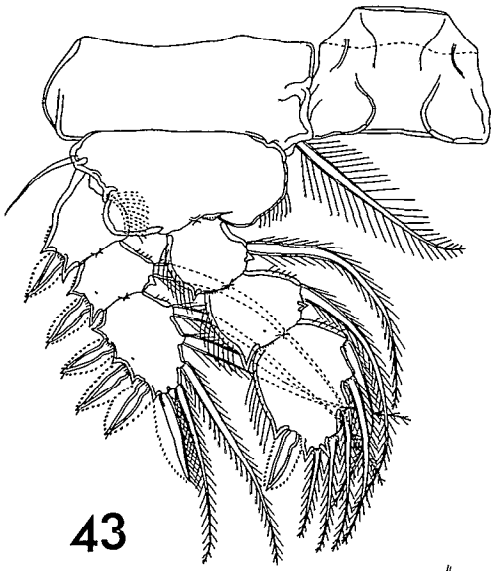
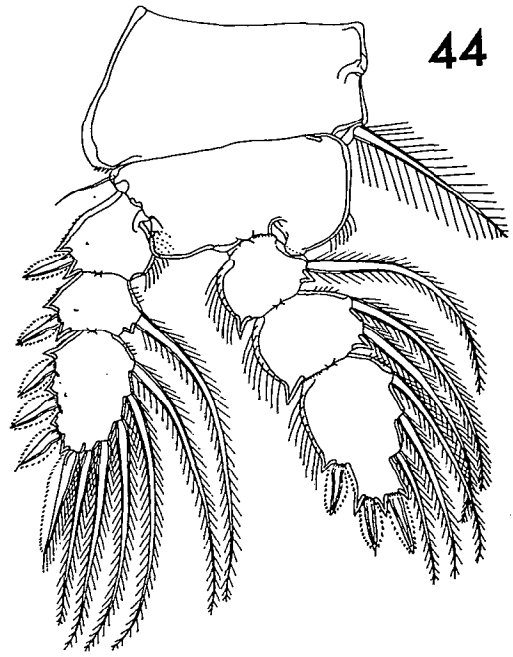
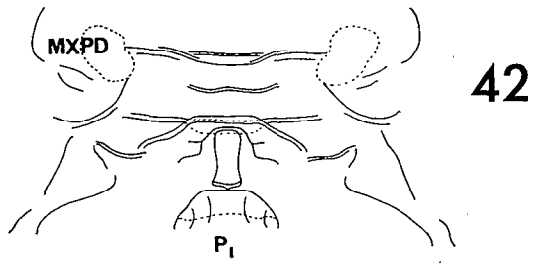


Fig. 38-45. — *Lichomolgus simulans* n. sp., female (continued)

- 38. — Paragnath, ventral (G)
- 39. — First maxilla, anterior (D)
- 40. — Second maxilla, posterior (D)
- 41. — Maxilliped, posterior (D)
- 42. — Area between maxillipeds and first pair of legs, ventral (E)
- 43. — Leg 1, anterior (F)
- 44. — Leg 2, anterior (F)
- 45. — Leg 3, anterior (F)



45

41

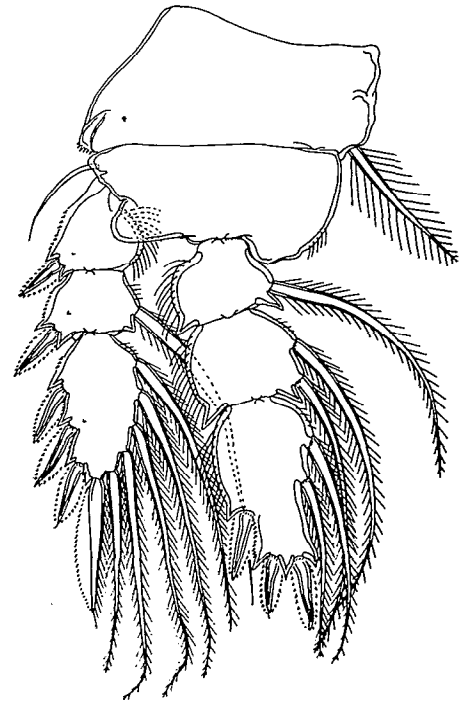
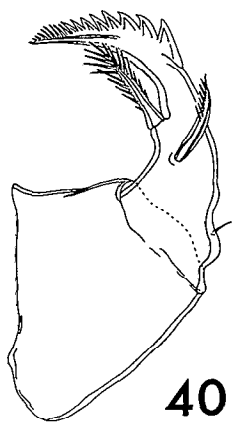
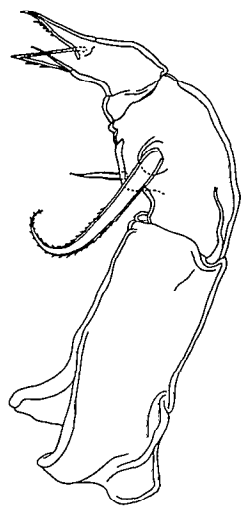


Fig. 46-47. — *Lichomolgus simulans* n. sp., female (continued)

46. — Leg 4, anterior (F)

47. — Leg 5, dorsal (D)

Fig. 48-53. — *Lichomolgus simulans* n. sp., male

48. — Body, dorsal (I)

49. — Urosome, dorsal (E)

50. — First two segments of second antenna, posterior (D)

51. — Maxilliped, inner (F)

52. — Last segment of endopod of leg 1, anterior (H)

53. — Leg 5, dorsal (C)

