

## Cyclopoid Copepods (Lichomolgidae) Associated with the Scleractinian *Cyphastrea* in New Caledonia<sup>1</sup>

ARTHUR G. HUMES<sup>2</sup>

**ABSTRACT:** *Diallagomolgus* n. gen., from hard corals of the genus *Cyphastrea* in intertidal pools in New Caledonia, is characterized by the third segment of the second antenna being longer than the fourth segment, the mandible bearing a triangular proximally directed toothlike process on its base, and the second maxilla having an extremely abbreviated lash. Two new species of *Diallagomolgus* are described, *Diallagomolgus productus* from *Cyphastrea chalcidicum* and *Cyphastrea gardineri* and *Diallagomolgus vicinus* from *Cyphastrea chalcidicum*. A key to genera of Lichomolgidae with only one terminal element on two-segmented endopod of leg 4 is provided.

ALTHOUGH MORE THAN 100 copepods have been recorded as associates of Scleractinia (Humes 1979a), no copepods have thus far been reported from *Cyphastrea*. Near Noumea, New Caledonia, two new poecilostome copepods belonging to a new genus were collected from colonies of *Cyphastrea* growing in shallow intertidal pools.

### MATERIALS AND METHODS

The corals were isolated in plastic pails as soon as they were collected. Later they were washed thoroughly in seawater containing about 5 percent ethyl alcohol. The water was then passed through a fine net and the copepods recovered from the sediment that was retained. All measurements were made from specimens cleared in lactic acid. The figures were drawn with the aid of a camera lucida.

LICHOMOLGIDAE KOSSMANN, 1877

### *Diallagomolgus* n. gen.

**DIAGNOSIS:** Body cyclopiform. Urosome in female five-segmented, in male six-segmented. Caudal ramus with six setae. Rostrum linguiform. First antenna seven-segmented. Second antenna four-segmented, third segment longer than fourth, with one terminal claw.

Labrum with two broad lobes. Mandible with triangular proximally directed toothlike process on convex side of base. Lash moderately long. Paragnath a small lobe. First maxilla with three setae, one with broad lamellae. Second maxilla two-segmented. First segment elongate. Second segment with proximal inner crescentic sclerotization and very abbreviated lash. Maxilliped three-segmented in female, third segment with two setae and having pointed tip; in male, four-segmented (assuming proximal part of claw to represent fourth segment).

Legs 1-4 biramous with three-segmented rami, except endopod of leg 4 which is two-segmented. Leg 4 with third segment of exopod having armature III, I, 5. Endopod of leg 4 with 0-1; I. Leg 5 with free segment armed with two setae.

Other features as in species below.

Associated with scleractinian corals.

Gender masculine.

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<sup>2</sup>Boston University Marine Program, Marine Biological Laboratory, Woods Hole, Massachusetts 02543.

TYPE SPECIES: *Diallagomolgus productus* n. sp.

ETYMOLOGY: The generic name is a combination of διαλλαγή (an interchange), alluding to the third segment of the second antenna being longer than the fourth segment, which is the reverse of the condition in most lichomolgids, and μολγός, a common combining form in the Lichomolgidae.

REMARKS: *Diallagomolgus* n. gen. is char-

acterized by the third segment of the second antenna being longer than the fourth segment, the mandible bearing a triangular proximally directed toothlike process on its base, and the second maxilla having an extremely abbreviated lash. A key for distinguishing the new genus from other lichomolgid genera which exhibit only one terminal element on the two-segmented endopod of leg 4 is provided below.

KEY TO GENERA OF LICHOMOLGIDAE WITH ONLY ONE TERMINAL ELEMENT ON TWO-SEGMENTED ENDOPOD OF LEG 4

1. Leg 4 endopod with armature 0-0; I ..... *Monomolgus* Humes and Frost, 1964  
Leg 4 endopod with 0-1; I ..... 2
2. Second antenna three-segmented ..... *Prionomolgus* Humes and Ho, 1968  
Second antenna four-segmented ..... 3
3. Third segment of second antenna longer than fourth segment; base of mandible with triangular proximally directed toothlike process ..... *Diallagomolgus* new genus  
Third segment of second antenna shorter than fourth segment, base of mandible without such process ..... 4
4. Mandible with a strong seta near base of lash; body of female cylindrical, with only traces of segmentation ..... *Botulosoma* Carton, 1974  
Mandible without such seta; body of female cycloform ..... 5
5. Second antenna with three terminal claws ..... 6  
Second antenna with one terminal claw ..... 7
6. Third segment of leg 1 exopod with armature II, I, 4 ..... *Gelastomolgus* Humes, 1968  
Third segment of leg 1 exopod with III, I, 4 ..... *Debruma* Humes and Stock, 1972
7. First segment of second maxilla with long digitiform process .....  
..... *Andrianellus* Humes and Stock, 1972  
First segment of second maxilla without such process ..... 8
8. Second segment of first antenna with spinulose area; third segment of leg 3 endopod with armature I, 2 ..... *Karanges* Humes, 1979  
Second segment of first antenna without spinulose area; third segment of leg 3 endopod with I, II, 2 ..... *Clamocus* Humes, 1979b

***Diallagomolgus productus* n. sp.**

Figures 1, 2, 3a-h

TYPE MATERIAL: From the scleractinian *Cyphastrea chalcidicum* (Forskål); 116 ♀♀, 64 ♂♂; from one colony in intertidal pool, west of Paita, north of Noumea, New Caledonia, 22°07'10" S, 166°13'55" E, 22 July 1971. Holotype ♀, allotype, and 172 paratypes (112 ♀♀, 60 ♂♂) deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.; the remain-

ing paratypes (dissected) in the collection of the author.

OTHER SPECIMENS: From *Cyphastrea chalcidicum*; 7 ♀♀, 12 ♂♂, and 1 copepodid; from one colony in 1 m, west of Isle Mando, near Noumea, 22°18'59" S, 166°09'30" E, 1 July 1971.

From *Cyphastrea gardineri* Matthai; 7 ♀♀, 5 ♂♂; from one colony in intertidal pool, Ricaudy Reef, near Noumea, 22°19'00" S, 166°26'44" E, 25 July 1971.

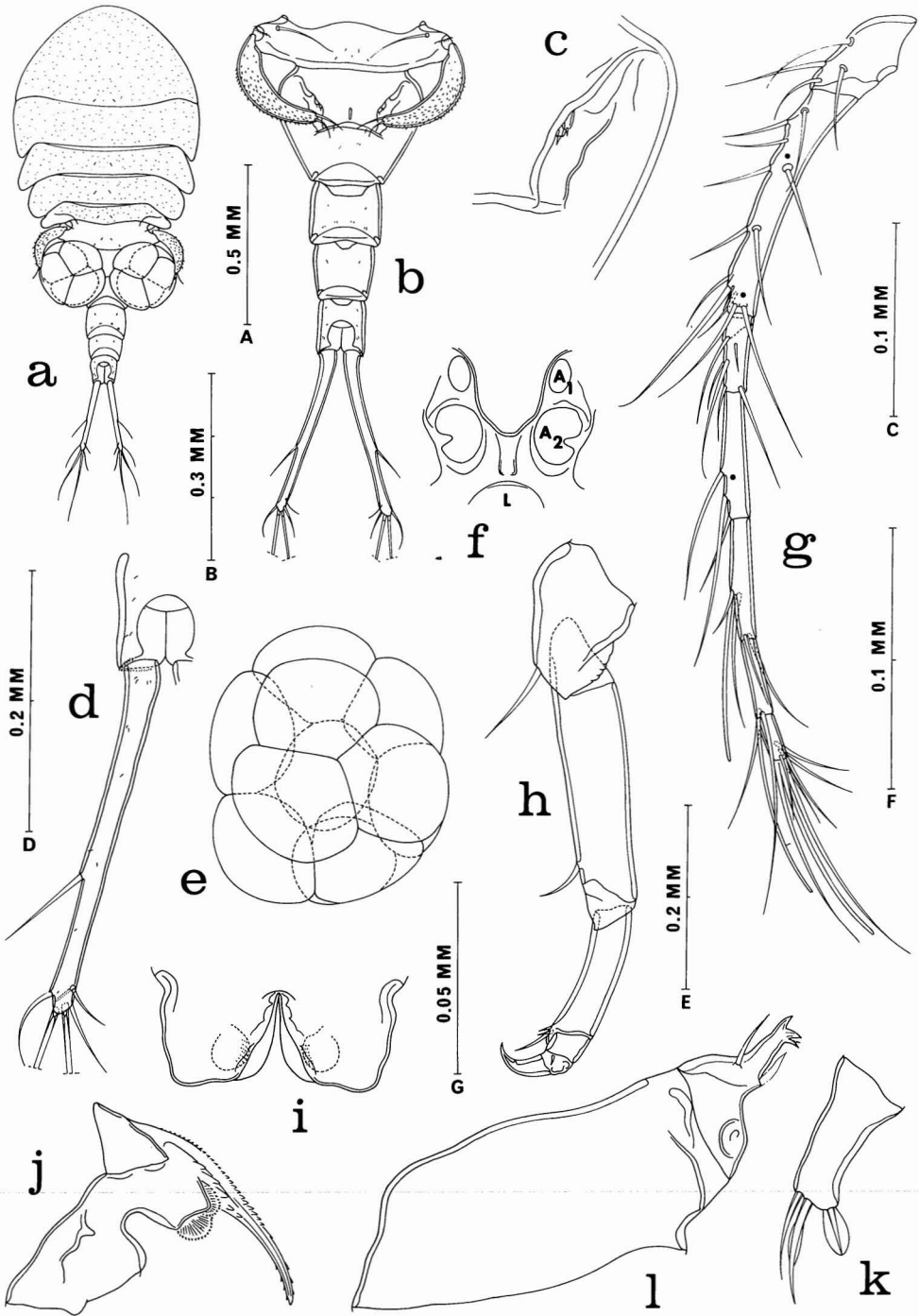


FIGURE 1. *Diallagomolgus productus* n. gen., n. sp. Female: *a*, dorsal (scale A); *b*, urosome, dorsal (scale B); *c*, genital area, dorsal (scale C); *d*, caudal ramus, dorsal (scale D); *e*, egg sac, dorsal (scale E); *f*, rostrum, ventral (scale E); *g*, first antenna, dorsal (scale C); *h*, second antenna, posterior (scale C); *i*, labrum, with position of paragnaths indicated by broken lines, ventral (scale F); *j*, mandible, posterior (scale G); *k*, first maxilla, posterior (scale G); *l*, second maxilla, posterior (scale G). Key: A<sub>1</sub> = first antenna, A<sub>2</sub> = second antenna, L = labrum.

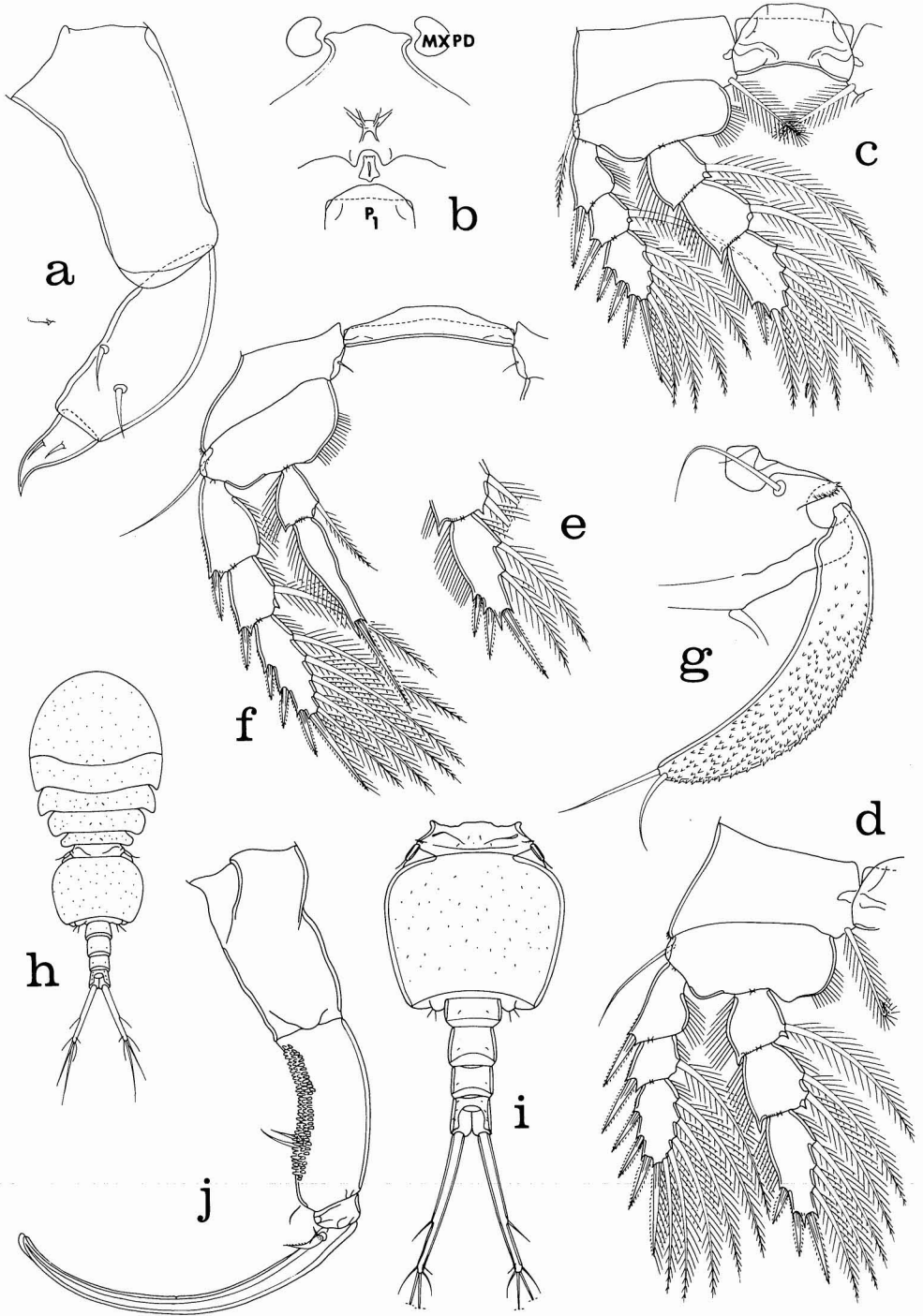


FIGURE 2 *Diallagomolgus productus* n. gen., n. sp. Female: *a*, maxilliped, inner (scale G); *b*, area between maxillipeds and first pair of legs, ventral (scale E); *c*, leg 1 and intercoxal plate, anterior (scale D); *d*, leg 2, anterior (scale D); *e*, third segment of endopod of leg 3, anterior (scale D); *f*, leg 4 and intercoxal plate, anterior (scale D); *g*, leg 5, dorsal (scale C). Male: *h*, dorsal (scale A); *i*, urosome, dorsal (scale B); *j*, maxilliped, inner (scale D). Key: MXPD = maxilliped, P<sub>1</sub> = leg 1. Scales are shown in Figure 1.

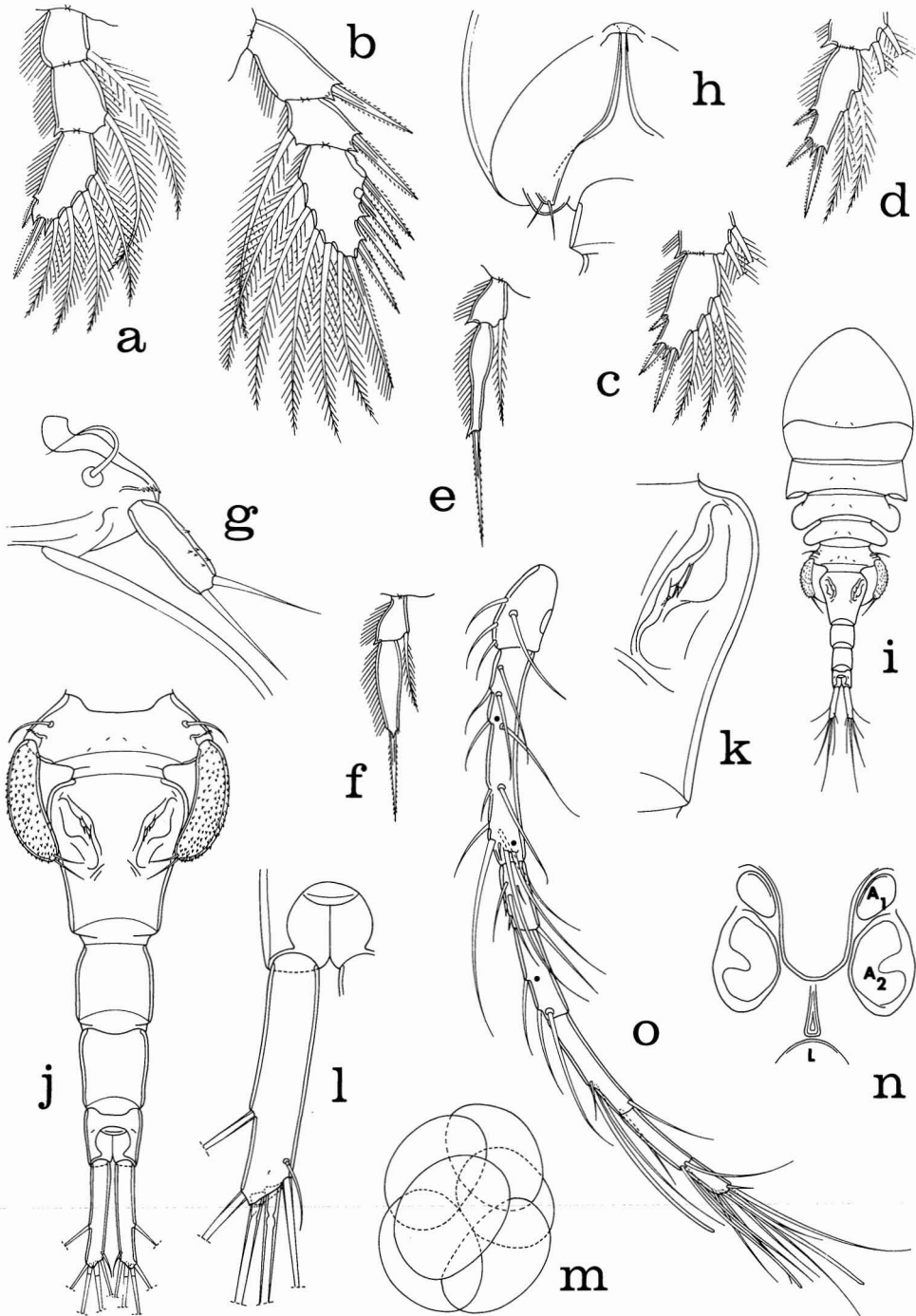


FIGURE 3. *Diallagomolgus productus* n. gen., n. sp. Male: *a*, endopod of leg 1, anterior (scale D); *b*, abnormal exopod of leg 1, anterior (scale C); *c*, third segment of endopod of leg 2, anterior (scale D); *d*, third segment of endopod of leg 3, anterior (scale D); *e*, endopod of leg 4, anterior (scale D); *f*, endopod of leg 4, anterior (scale D); *g*, leg 5, dorsal (scale G); *h*, leg 6, ventral (scale D). *Diallagomolgus vicinus* n. gen., n. sp. Female: *i*, dorsal (scale A); *j*, urosome, dorsal (scale E); *k*, genital area, dorsal (scale C); *l*, caudal ramus, dorsal (scale F); *m*, egg sac, ventral (scale E); *n*, rostrum, ventral (scale D); *o*, first antenna, dorsal (scale C). Key: A<sub>1</sub> = first antenna, A<sub>2</sub> = second antenna, L = labrum. Scales are shown in Figure 1.

FEMALE: Body (Figure 1a) with prosome only slightly expanded. Length (not including setae on caudal rami) 1.32 mm (1.24–1.43 mm) and greatest width 0.56 mm (0.54–0.59 mm), based on 10 specimens cleared in lactic acid. Segment of leg 1 separated dorsally from head. Epimeral areas of legs 1–4 rounded. Ratio of length to width of prosome 1.19 : 1. Ratio of length of prosome to that of ursome approximately 1 : 1.

Segment of leg 5 (Figure 1b) 78 × 297 μm. Genital segment 180 × 228 μm, wider than long, in dorsal view widest in anterior third and tapered posteriorly. Genital areas situated dorsally in widest part of segment. Each area (Figure 1c) with two minute setae about 4 μm long. Three postgenital segments (Figure 1b) from anterior to posterior 96 × 104, 86 × 90, and 83 × 73 μm. Posterior margin of anal segment (Figure 1d) with row of minute spinules on both sides.

Caudal ramus (Figure 1d) very long and slender, 263 × 18 μm; ratio of length to width 14.6 : 1. Outer lateral seta 70 μm, dorsal seta 32 μm, outermost terminal seta 65 μm, innermost terminal seta 57 μm, and two median terminal setae 135 μm (outer) and 198 μm (inner), both inserted under a small dorsal flange. Row of small spinules ventrally near distal end of ramus. All setae naked.

Dorsal surface of body with few hairs (sensilla) and many small refractile points as in Figure 1a.

Egg sac (Figure 1a) spherical, 213 × 203 μm, with 5 eggs; or subspherical (Figure 1e), 300 × 275 μm, with 11 eggs. Egg diameter 104–130 μm.

Rostrum (Figure 1f) linguiform. First

P <sub>1</sub>	coxa	0-1	basis	1-0	exp	I-0;	I-1;	III, I, 4
					enp	0-1;	0-1;	I, 5
P <sub>2</sub>	coxa	0-1	basis	1-0	exp	I-0;	I-1;	III, I, 5
					enp	0-1;	0-2;	I, II, 3
P <sub>3</sub>	coxa	0-1	basis	1-0	exp	I-0;	I-1;	III, I, 5
					enp	0-1;	0-2;	I, II, 2
P <sub>4</sub>	coxa	0-1	basis	1-0	exp	I-0;	I-1;	III, I, 5
					enp	0-1;	I	

Leg 4 (Figure 2f) with inner coxal seta 11 μm long and naked. Exopod 195 μm long. Endopod with first segment 42 × 31 μm, its

antenna (Figure 1g) 380 μm long. Lengths of seven segments (measured along their posterior or nonsetiferous margins): 27 (60 μm along anterior margin), 122, 40, 60, 60, 39, and 23 μm, respectively. Formula for armature: 4, 13, 6, 3, 4 + 1 aesthete, 2 + 1 aesthete, and 7 + 1 aesthete. All setae naked.

Second antenna (Figure 1h) 260 μm long including claw and four-segmented, with formula 1, 1, 3, and one claw plus a small setule. Third segment approximately 65 μm long. Fourth segment short, 12 μm along outer side, 9 μm along inner side, and 15.5 μm wide. Claw 27 μm along its axis.

Labrum (Figure 1i) with two truncated posteroventral lobes. Mandible (Figure 1j) with a conical hyaline process on convex side of base. Lash short with a few minute barbs. Paragnath (Figure 1i) a small lobe with a few spinules. First maxilla (Figure 1k) with three elements, two of them having hyaline lamellae. Second maxilla (Figure 1l) two-segmented, with large unornamented first segment. Second segment bearing a posterior surficial seta and an inner seta, and terminating in an extremely abbreviated lash bearing two large proximal teeth and a distal spinule. Maxilliped (Figure 2a) three-segmented, with second segment bearing two setae. Third segment also with two setae and terminating in a recurved pointed tip.

Ventral area between maxillipeds and first pair of legs (Figure 2b) not protuberant.

Legs 1–4 (Figures 2c–f) with three-segmented rami, except endopod of leg 4 which is two-segmented. Spine and setal formula as follows (Roman numerals indicate spines, Arabic numerals represent setae):

feathered inner seta 60 μm; second segment elongate, length with processes 94 μm, excluding processes 84 μm, greatest width 21

$\mu\text{m}$ , least width  $8 \mu\text{m}$ . Terminal barbed spine  $79 \mu\text{m}$ .

Leg 5 (Figure 2g) with elongate free segment  $164 \times 39 \mu\text{m}$ , directed over dorsal side of genital segment, bearing two terminal naked setae  $50 \mu\text{m}$  and  $45 \mu\text{m}$ . Dorsal and outer surface of free segment with many small spines. Near insertion of free segment a dorsal row of spinules. Dorsal seta about  $78 \mu\text{m}$  long, naked, and directed medially.

Leg 6 represented by two small setae on genital area (Figure 1c).

Living specimens in transmitted light opaque with few small reddish globules in prosome; intestine brown, eye red, egg sacs gray.

**MALE:** Body (Figure 2h) a little more slender than in female. Length  $1.19 \text{ mm}$  ( $1.12$ – $1.25 \text{ mm}$ ) and greatest width  $0.42 \text{ mm}$  ( $0.39$ – $0.44 \text{ mm}$ ), based on 10 specimens cleared in lactic acid. Ratio of length to width of prosome  $1.3 : 1$ . Ratio of length of prosome to that of urosome  $0.88 : 1$ .

Segment of leg 5 (Figure 2i)  $39 \times 164 \mu\text{m}$ . Genital segment  $273 \times 230 \mu\text{m}$ , a little longer than wide. Four postgenital segments from anterior to posterior  $38 \times 83$ ,  $60 \times 77$ ,  $47 \times 68$ , and  $52 \times 65 \mu\text{m}$ .

Caudal ramus resembling that of female, but smaller;  $226 \times 15 \mu\text{m}$ ; ratio  $15 : 1$ .

Rostrum as in female. First antenna like that of female but three very long aesthetes added at points indicated by dots in Figure 1g. Two aesthetes on second segment  $286 \mu\text{m}$  long, nearly as long as entire antenna ( $312 \mu\text{m}$ ). Second antenna as in female.

Labrum, mandible, paragnath, first maxilla, and second maxilla like those of female. Maxilliped (Figure 2j) slender. Second segment bearing two naked setae and numerous small spines. Claw  $250 \mu\text{m}$  along its axis, with two unequal proximal setae, longer seta with barbules along one edge.

Ventral area between maxillipeds and first pair of legs as in female.

Legs 1–4 segmented as in female and having similar armature except for third segment of endopod of leg 1 (Figure 3a), where formula is I, I, 4, instead of I, 5 as in female. One male with abnormal armature

on third segment of left exopod of leg 1, where formula is IV, I, 5 (Figure 3b) instead of usual III, I, 5. Third segment of endopod of leg 2 (Figure 3c) with spines  $16.5$ ,  $28.5$ , and  $44 \mu\text{m}$  from outer to inner (compared with  $29$ ,  $34$ , and  $55 \mu\text{m}$  in female); these spines in leg 3 (Figure 3d)  $18$ ,  $26$ , and  $48 \mu\text{m}$  (in female,  $29$ ,  $35$ , and  $57 \mu\text{m}$ ). Endopod of leg 4 as in female or variable (Figure 3e, f).

Leg 5 (Figure 3g) with short free segment  $29 \times 9 \mu\text{m}$ , ratio  $3.1 : 1$ , ornamented with a few small spines.

Leg 6 (Figure 3h) a posteroventral flap on genital segment bearing two slender naked setae about  $25 \mu\text{m}$  long.

Spermatophore not seen.

Living specimens with color like that of female.

**ETYMOLOGY:** The specific name *productus* (Latin meaning prolonged) alludes to the very long caudal rami in this species.

### *Diallagomolgus vicinus* n. sp.

Figures 3i–o, 4, 5

**TYPE MATERIAL:** From *Cyphastrea chalcidicum* (Forskål); 94 ♀♀, 30 ♂♂, and 2 copepodids; from six colonies in intertidal pools, Ricaudy Reef, near Noumea, New Caledonia,  $22^{\circ}19'00'' \text{ S}$ ,  $166^{\circ}26'44'' \text{ E}$ , 21 July 1971. Holotype ♀, allotype, and 115 paratypes (89 ♀♀, 26 ♂♂) deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.; the remaining paratypes (dissected) and the copepodids in the collection of the author.

**FEMALE:** Body (Figure 3i) with slender prosome. Length (not including setae on caudal rami)  $1.20 \text{ mm}$  ( $1.12$ – $1.27 \text{ mm}$ ) and greatest width  $0.40 \text{ mm}$  ( $0.39$ – $0.43 \text{ mm}$ ), based on 10 specimens cleared in lactic acid. Segment of leg 1 separated from head by weak transverse dorsal furrow. Epimeral areas of segment of leg 1 not produced, those of segment of leg 2 pointed, and those of segments of legs 3 and 4 rounded. Ratio of length to width of prosome  $1.67 : 1$ . Ratio of length of prosome to that of urosome  $1.26 : 1$ .

Segment of leg 5 (Figure 3j)  $78 \times 195 \mu\text{m}$ .



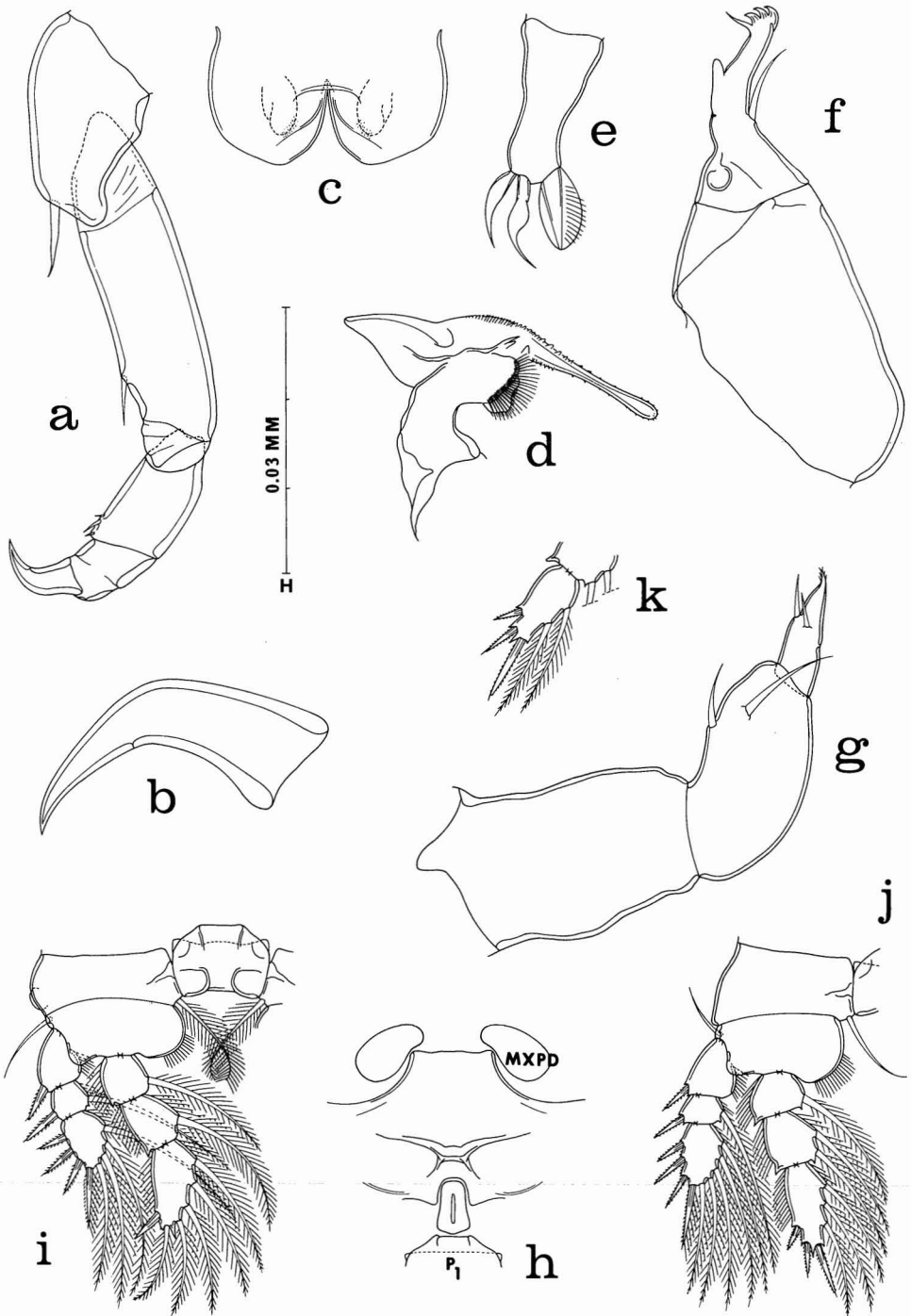


FIGURE 4. *Diallagomolgus vicinus* n. gen., n. sp. Female: *a*, second antenna, posterior (scale F); *b*, claw of second antenna, posterior (scale H); *c*, labrum, with position of paragnaths indicated by broken lines, ventral (scale F); *d*, mandible, posterior (scale G); *e*, first maxilla, anterior (scale G); *f*, second maxilla, posterior (scale G); *g*, maxilliped, posterior (scale G); *h*, area between maxillipeds and first pair of legs, ventral (scale D); *i*, leg 1 and intercoxal plate, anterior (scale D); *j*, leg 2, anterior (scale D); *k*, third segment of endopod of leg 3, anterior (scale D). Key: MXPD = maxilliped, P<sub>1</sub> = leg 1. Scales A-G are shown in Figure 1.



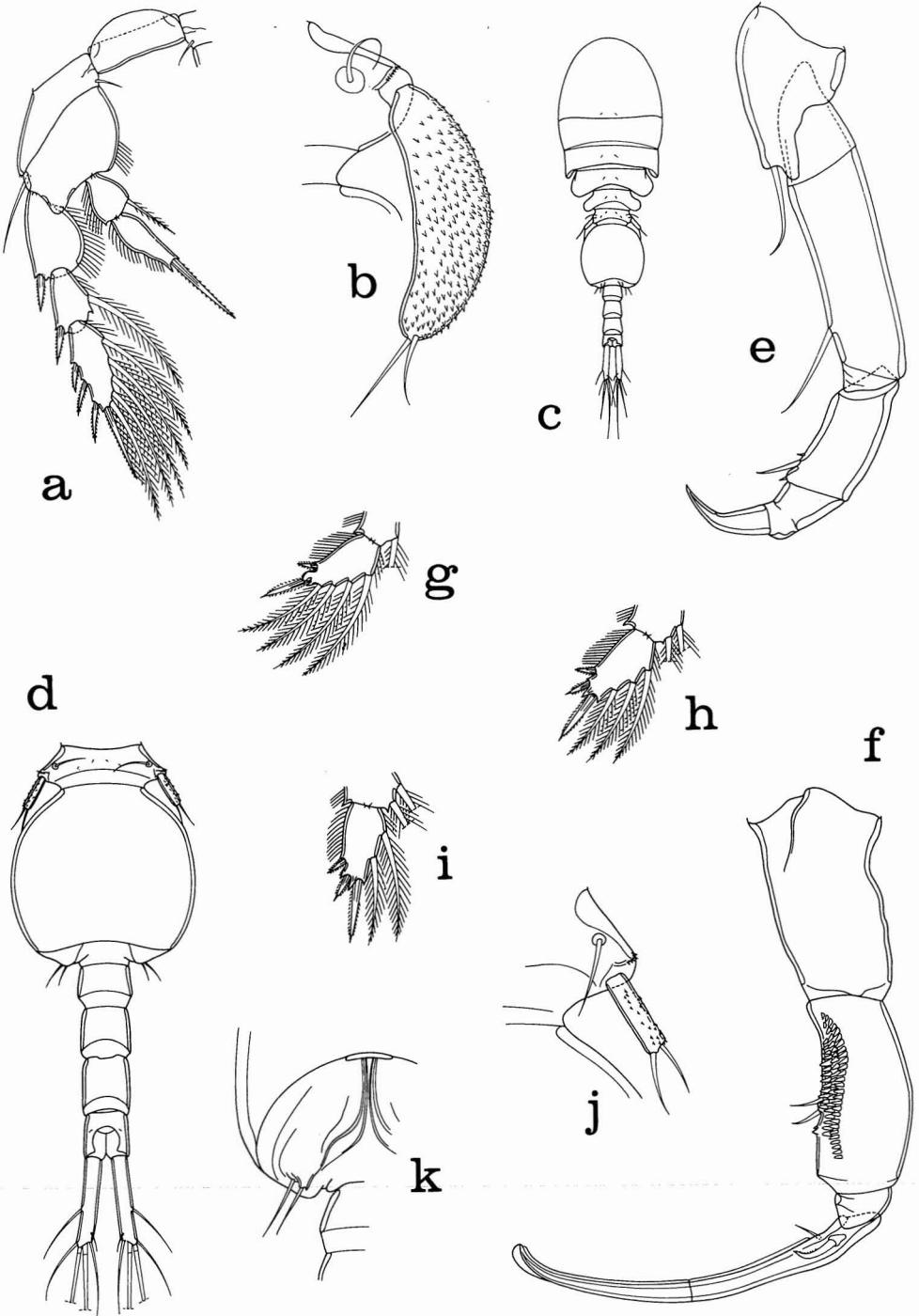


FIGURE 5. *Diallagomolgus vicinus* n. gen., n. sp. Female: *a*, leg 4 and intercoxal plate, anterior (scale D); *b*, leg 5, dorsal (scale C). Male: *c*, dorsal (scale A); *d*, urosome, dorsal (scale E); *e*, second antenna, posterior (scale F); *f*, maxilliped, inner (scale C); *g*, third segment of endopod of leg 1, anterior (scale D); *h*, third segment of endopod of leg 2, anterior (scale D); *i*, third segment of endopod of leg 3, anterior (scale D); *j*, leg 5, dorsal (scale F); *k*, leg 6, ventral (scale D). Scales are shown in Figure 1.

Genital segment  $174 \times 149 \mu\text{m}$ , longer than wide, widest anteriorly and tapered posteriorly. Genital areas located dorsolaterally in anterior half of segment. Each area (Figure 3k) with two minute spines about  $6 \mu\text{m}$  long. Three postgenital segments from anterior to posterior  $85 \times 77$ ,  $83 \times 65$ , and  $60 \times 57 \mu\text{m}$ . Posteroventral margin of anal segment (Figure 3l) smooth.

Caudal ramus (Figure 3l) elongate,  $88 \times 17.5 \mu\text{m}$ ; ratio of length to width 5.03:1. Outer lateral seta  $68 \mu\text{m}$ , dorsal seta  $24 \mu\text{m}$ , outermost terminal seta  $68 \mu\text{m}$ , innermost terminal seta  $104 \mu\text{m}$ , and two median terminal setae  $156 \mu\text{m}$  (outer) and  $237 \mu\text{m}$  (inner), both inserted between smooth dorsal flange and ventral flange with row of extremely small spinules. All setae naked.

Dorsal surface of body with few hairs (sensilla) as in Figure 3i.

Egg sac (Figure 3m)  $220 \times 180 \mu\text{m}$ , containing six oval eggs with diameters of  $109\text{--}135 \mu\text{m}$ .

Rostrum (Figure 3n) linguiform. First antenna (Figure 3o) slender,  $352 \mu\text{m}$  long. Lengths of seven segments (measured along their posterior nonsetiferous margins): 27 ( $50 \mu\text{m}$  along anterior margin), 109, 31, 45, 57, 39, and  $21 \mu\text{m}$ , respectively. Formula for armature as in *Diallagomolgus productus*. All setae naked.

Second antenna (Figure 4a)  $210 \mu\text{m}$  long and four-segmented with formula 1, 1, 3, and one claw. Inner seta on second segment  $17 \mu\text{m}$ . Third segment  $47 \mu\text{m}$  along outer side,  $39 \mu\text{m}$  along inner side, and  $26 \mu\text{m}$  wide. Longest seta  $10 \mu\text{m}$ . Fourth segment  $31 \mu\text{m}$  along outer side,  $13 \mu\text{m}$  along inner side, and  $21 \mu\text{m}$  wide. Claw  $34 \mu\text{m}$  along its axis and slightly bent as in Figure 4b. All setae naked.

Labrum (Figure 4c) with two posteroventral lobes. Mandible (Figure 4d) resembling that of *Diallagomolgus productus*, but spinules on inner side of basal area clearly separated from each other and tip of lash slightly swollen. Paragnath (Figure 4c) a small lobe with a few small obscure spinules. First maxilla (Figure 4e) with three elements, one spiniform with broad lamellae (one of these lamellae with delicate ribs), other two ele-

ments setiform but swollen. Second maxilla (Figure 4f) with large unornamented first segment. Second segment bearing an outer seta and an inner hyaline lobe without a distinct articulation; segment terminating in a very short lash bearing three proximal teeth. Maxilliped (Figure 4g) similar to that of *D. productus*; third segment with minutely spinulose tip.

Ventral area between maxillipeds and first pair of legs (Figure 4h) not protuberant.

Legs 1-4 (Figures 4i-k, 5a) segmented and armed as in *Diallagomolgus productus*. Exopod of leg 1 lacking usual spiniform processes near insertions of flagellate spines. Leg 4 (Figure 5a) with smooth inner coxal seta  $22 \mu\text{m}$ . Exopod  $164 \mu\text{m}$  long. Endopod with first segment  $32 \times 32 \mu\text{m}$ , its feathered seta  $44 \mu\text{m}$ ; second segment  $52 \mu\text{m}$  excluding spiniform process,  $58 \mu\text{m}$  with process, and  $21 \mu\text{m}$  in greatest width. Terminal barbed spine  $69 \mu\text{m}$ .

Leg 5 (Figure 5b) with elongate free segment  $127 \times 37 \mu\text{m}$ , its dorsal surface spinose. Two terminal setae  $44 \mu\text{m}$  and  $32 \mu\text{m}$ . Near insertion of free segment a dorsal row of spinules. Dorsal seta about  $42 \mu\text{m}$ . All setae smooth.

Leg 6 represented by two minute spines on genital area (Figure 3k).

Living specimens in transmitted light opaque; intestine brown, eye red, egg sacs gray.

MALE: Body (Figure 5c) slender, with prosome less pointed than in female. Length  $1.06 \text{ mm}$  ( $1.02\text{--}1.09 \text{ mm}$ ) and greatest width  $0.34 \text{ mm}$  ( $0.33\text{--}0.35 \text{ mm}$ ), based on 10 specimens cleared in lactic acid. Ratio of length to width of prosome 1.67:1. Ratio of length of prosome to that of urosome 1.02:1.

Segment of leg 5 (Figure 5d)  $42 \times 125 \mu\text{m}$ . Genital segment  $187 \times 203 \mu\text{m}$ , slightly wider than long. Four postgenital segments from anterior to posterior  $42 \times 60$ ,  $52 \times 58$ ,  $60 \times 53$ , and  $44 \times 47 \mu\text{m}$ .

Caudal ramus resembling that of female, but slightly longer,  $100 \times 18 \mu\text{m}$ ; ratio 5.56:1.

Rostrum as in female. First antenna like

TABLE 1  
DISTINGUISHING FEATURES OF *Diallagomolgus productus* AND *D. vicinus*

	<i>D. productus</i>	<i>D. vicinus</i>
♀ genital segment	Wider than long	Longer than wide
♀ caudal ramus	14.6 : 1	5.03 : 1
Inner element on second segment of second maxilla	Smooth seta	Hyaline lobe
♀ endopod of leg 4	Long, 126 $\mu$ m	Short, 84 $\mu$ m
♀ free segment of leg 5	164 $\times$ 39 $\mu$ m	127 $\times$ 37 $\mu$ m

that of female but three long aesthetes added at points indicated by dots in Figure 3o. Two aesthetes on second segment about 200  $\mu$ m long. Length of antenna 280  $\mu$ m.

Second antenna (Figure 5e) resembling that of female but seta on second segment longer, 34  $\mu$ m. Third segment 48  $\mu$ m along outer side, 37  $\mu$ m along inner side, and 21  $\mu$ m wide; longest seta 15  $\mu$ m. Fourth segment 29  $\mu$ m along outer side, 9  $\mu$ m along inner side. Claw 36  $\mu$ m along its axis.

Labrum, mandible, paragnath, first maxilla, and second maxilla like those of female. Maxilliped (Figure 5f) resembling that of *Diallagomolgus productus*. Claw 190  $\mu$ m along its axis including terminal lamella.

Legs 1–4 segmented as in female and having similar armature, except for third segment of endopod of leg 1 (Figure 5g) where formula is I, I, 4, instead of I, 5 as in female. Third segment of endopod of leg 2 (Figure 5h) with spines 15, 15, and 37  $\mu$ m (measured without terminal flagellum) from outer to inner (compared with 19, 22, and 37  $\mu$ m in female); these spines in leg 3 (Figure 5i) 15, 15, and 38  $\mu$ m (in female, 22, 25, and 45  $\mu$ m). Leg 4 as in female.

Leg 5 (Figure 5j) with free segment 33  $\times$  9  $\mu$ m; ratio 3.99:1; ornamented with small spines.

Leg 6 (Figure 5k) a posteroventral flap on genital segment bearing two slender naked setae 42  $\mu$ m and 34  $\mu$ m.

Spermatophore not seen.

Living specimens with color like that of female.

ETYMOLOGY: The specific name *vicinus* (Latin meaning neighboring or similar) refers

to the many points of similarity between this species and *Diallagomolgus productus*.

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#### LITERATURE CITED

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