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GAMMARIDEAN AMPHIPODA FROM THE SOUTH CHINA SEA

by

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GAMMARIDEAN AMPHIPODA FROM THE SOUTH CHINA SEA

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INTRODUCTION

The NAGA Expedition, sponsored by Thailand, South Viet Nam, and the United States, conducted a program of marine investigations in the Gulf of Thailand and the South China Sea during the years 1960-1961. In connection with this program, a bottom fauna survey was made in the Bay of Nhatrang, South Viet Nam. Identifiable amphipods, representing 14 established species and 21 new species, were recovered from 97 of more than 360 stations sampled in the bay and form the basis of this paper.

The large number of new species found in the South China Sea reflects the absence of previous taxonomic investigations in this area. The amphipod fauna of the surrounding waters is known primarily through work done in the earlier part of this century. Giles began investigations of Indian waters in the late 1800's. The most noted works on the area are those of A. O. Walker. In his 1904 paper, Walker identified 80 species collected from the coasts of Ceylon. Walker's report and the paper published by Nayar (1959) on the amphipods of the Madras Coast, in which 41 species are reported, are the two major works on the amphipod fauna of the Ceylon area. The pelagic amphipods of Travancore were treated by Pillai (1957). Throughout this century scattered work has been done by other investigators, but no recent work has been done on a large-scale basis. Eight species recorded from Ceylon by Walker and Nayar are represented in the present material.

Pirlot, in the 1930's, published the results of the amphipod material which had been collected by the SIBOGA Expedition to the East Indies at the turn of the century. This work remains the most thorough account of Indonesian Amphipoda. Only four species recorded by Pirlot from Indonesia are represented in the present material; however, many of the new species described herein closely resemble several species described by Pirlot. Of these species, the ones showing the closest resemblance are those of the genus *Byblis*.

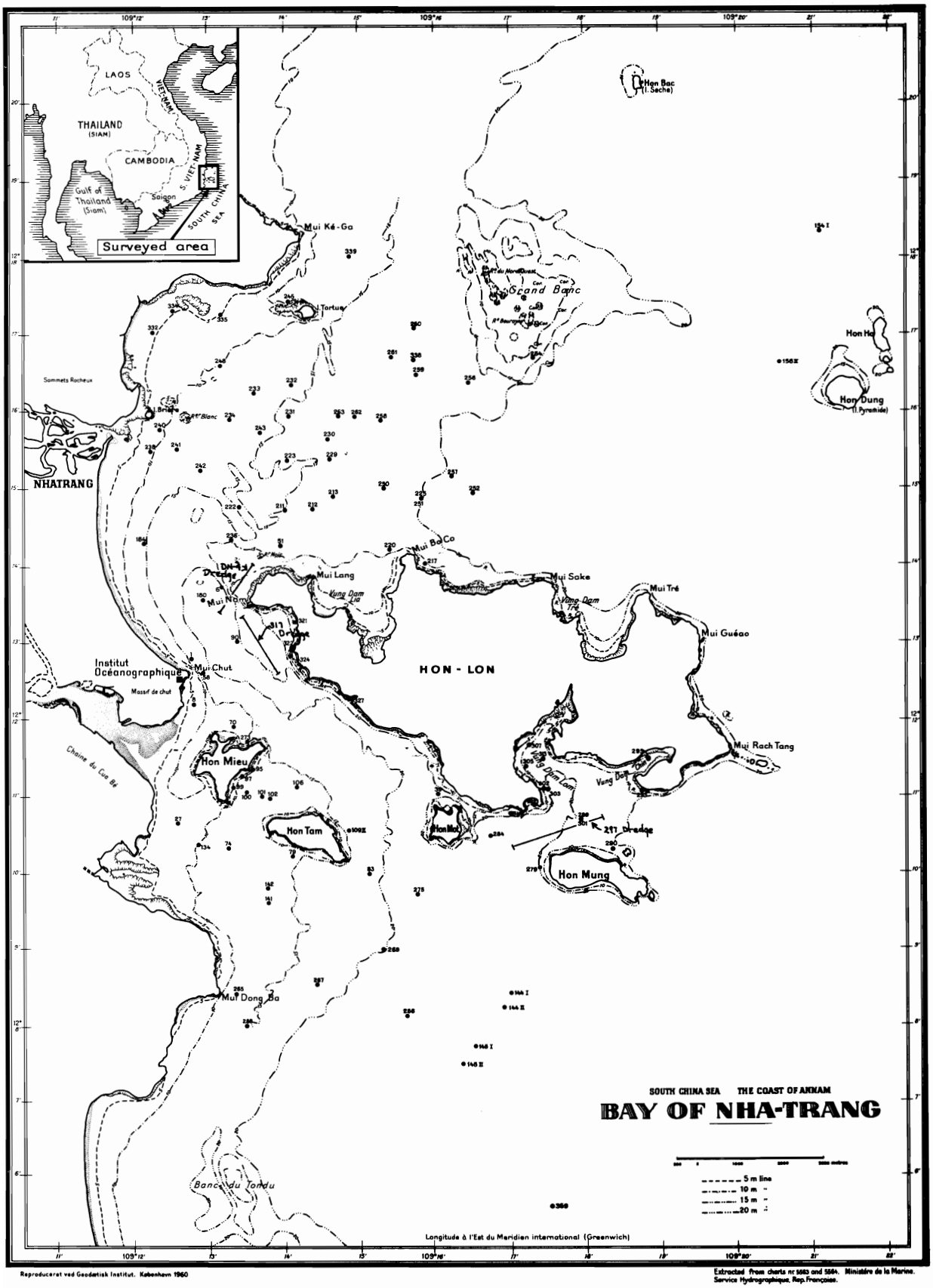
Several species recorded herein also have been recorded in Japan. Apparently a higher incidence of intermingling of Japanese or Indian species than of Indonesian or western Pacific species occurs in the South China Sea. It is interesting to note that many of the morphological characters used as taxonomic criteria in several of the species found in the Bay of Nhatrang are so extreme as to suggest subgeneric differentiation. These exaggerated characters are noticeable especially in species of the better represented genera, *Ampelisca, Byblis,* and *Urothoe,* but they are apparent also in most of the other genera, especially *Lepidepecreum* and *Cheiriphotis*.

ACKNOWLEDGMENTS

The writer wishes to express her gratitude and indebtedness to Dr. J. Laurens Barnard, United States National Museum, under whom the work was originally undertaken, for his encouragement of the writer's work with amphipods and for his invaluable advice and assistance throughout the duration of this study. For advice, the writer is grateful to Dr. Cadet Hand, under whom the work was completed. To Dr. Ralph Smith and Dr. Paul Hurd, Jr., she is grateful for criticism in the preparation of the manuscript.

The writer is indebted to Dr. Victor Gallardo who kindly loaned her the material which he had collected in the Bay of Nhatrang. To the Beaudette Foundation and to Mr. and Mrs. Harold Imbach she is grateful for support during the tenure of this study. Her thanks are due also to Mr. and Mrs. Roger McConnell and to Miss Karla Jones for assistance in the preparation of the manuscript. The writer is also indebted to the Scripps Institution of Oceanography for publishing this paper.

CHART 1.
Location of stations, bottom fauna survey, Bay of Nhatrang, South Viet Nam



Extracted from charts nr 5583 and 5584. Ministère de la Marine. Service Hydrographique, Rep. Française.

TABLE 1. Station data, bottom fauna survey, Bay of Nhatrang, South Viet Nam, 1960

Station Number	Date (1960)	Depth (meters)	Gear*	Volume (liters)	Type of Bottom
1	Jan. 4	15.0	P	12.0	Mud (f)*
6	Jan. 4	20.0	P	4.0	Sandy mud
8	Jan. 7	8.0	P	12.0	Mud
27	Jan. 8	8.0	vV	12.0	Mud
39	Jan. 11	20.0	P	12.0	Mud
51	Jan. 14	15.0	vV	4.0	Fine gray sand
58	Jan. 16	20.0	P	10.0	Mud
70	Jan. 16	15.0	P	13.0	Mud
74	Jan. 20	10.0	P	7.5	Sandy mud
79-I[1]	Jan. 20	15.0	vV	8.5	Mud
79-II[1]	Jan. 20	15.0	vV	8.5	Mud
83	Jan. 20	18.0	vV	9.0	Mud
90-I[1]	Feb. 2	22.0	P	10.0	Mud (f)
95-I[1]	Feb. 5	5.0	vV	2.5	Fine sand (f)
97-II[1]	Feb. 5	8.5	vV	7.0	Sandy mud (f)
99	Feb. 5	8.0	vV	2.5	Mud
100-I[1]	Feb. 5	14.0	vV	11.0	Mud
100-II[1]	Feb. 5	14.0	vV	11.0	Mud
101-II[1]	Feb. 5	12.0	vV	10.0	Mud
102	Feb. 5	11.0	vV	3.5	Mud
106-II[1]	Feb. 10	14.0	P	13.0	Mud (f)
109-II	Feb. 10	15.0	P	12.0	Mud (f)
134-I[1]	Feb. 16	7.0	vV	2.0	Mud (f)
134-II[1]	Feb. 16	7.0	vV	11.0	Mud (f)
141-Ia[1]	Feb. 16	13.0	vV	9.0	Mud (f)
141-Ib[1]	Feb. 16	13.0	vV	9.0	Mud (f)
141-Ic[1]	Feb. 16	13.0	vV	9.0	Mud (f)
142-I[1]	Feb. 16	12.0	vV	8.5	Mud (f)
144-I	Feb. 23	38.0	P	10.0	Mud (f)
144-II	Feb. 23	38.0	P	10.0	Mud (f)
145-I	Feb. 23	35.0	vV	6.0	Sand
145-II	Feb. 23	35.0	vV	2.5	Fine sand
154-I	Feb. 24	43.0	P	12.0	Mud
156-II(4)[1]	Feb. 24	34.0	vV	2.0	Muddy sand (c)*
180	Mar. 1	19.0	vV	13.0	Sandy mud
184	Mar. 1	12.0	vV	4.0	Muddy sand
211	Mar. 7	15.0	2 vV	10.0	Coarse red sand
212	Mar. 7	15.0	2 vV	8.0	Coarse brownish red sand
213	Mar. 7	16.0	2 vV	8.0	Coarse brownish red sand
217	Mar. 7	15.0	2 vV	10.0	Fine gray sand
220	Mar. 7	16.0	vV	5.5	Fine brown sand
222	Mar. 8	14.0	2 vV	9.0	Fine brown sand
223	Mar. 8	15.0	2 vV	10.5	Fine brown sand
225	Mar. 8	19.0	vV	6.0	Fine brown sand
229	Mar. 8	15.0	vV	4.0	Fine brown sand

TABLE 1. (Continued)

Station Number	Date (1960)	Depth (meters)	Gear*	Volume (liters)	Type of Bottom
230	Mar. 8	15.0	vV	12.0	Sandy mud (f)
231-I[1]	Mar. 8	14.0	vV	6.0	Sandy mud
231-II[1]	Mar. 8	14.0	vV	6.0	Sandy mud
232-I[1]	Mar. 8	12.0	vV	1.5	Fine brown sand
232-II[1]	Mar. 8	12.0	vV	3.0	Medium brown sand
233	Mar. 8	12.0	vV	2.5	Muddy sand
234	Mar. 8	15.0	vV	3.0	Fine brown sand
236	Mar. 8	16.0	vV	1.0	Fine brown sand
238	Mar. 16	8.0	2 vV	11.5	Fine sand (little mud)
240-I[1]	Mar. 16	9.0	vV	5.0	Sandy mud
240-II[1]	Mar. 16	9.0	vV	7.0	Sandy mud
241	Mar. 16	13.0	vV	8.0	Sandy mud
242	Mar. 16	14.0	2 vV	8.0	Fine brown sand
243	Mar. 16	15.0	2 vV	7.0	Fine brown sand
245	Mar. 16	11.0	2 vV	5.0	Muddy sand (c)
248	Mar. 16	9.0	vV	11.0	Sandy mud
250	Mar. 18	19.0	vV	5.0	Brown coarse sand
251	Mar. 18	20.0	vV	5.5	Fine brown sand
252	Mar. 18	20.0	vV	5.0	Fine brown sand
254	Mar. 18	14.0	vV	3.5	Coarse brown sand
256	Mar. 18	17.0	vV	4.0	Coarse brown sand
257	Mar. 18	19.0	vV	6.0	Fine brown sand
258	Mar. 18	19.0	vV	3.5	Medium brown sand with shell fragments
259	Mar. 18	19.0	vV	12.0	Sandy mud
260-II[1]	Mar. 18	17.0	vV	5.0	White very fine sand (c)
261	Mar. 18	17.0	vV	7.0	Sandy mud
262	Mar. 18	16.0	vV	4.0	Medium brown sand
263	Mar. 18	16.0	vV	10.0	Sandy mud
265	Mar. 21	11.0	vV	4.0	Coarse sand
266	Mar. 21	14.0	vV	5.5	Fine gray sand
267	Mar. 21	15.0	vV	4.0	Coarse brown sand
268	Mar. 21	24.0	vV	9.0	Coarse sand
269	Mar. 21	20.0	vV	5.0	Coarse sand (little mud)
273	Mar. 23	3.5	vV	1.0	Packed fine sand
275	Mar. 23	19.0	vV	14.0	Mud
279	Mar. 23	24.0	vV	11.0	Muddy sand
282	Mar. 23	10.0	vV	4.0	Coarse sand
284	Mar. 23	20.0	vV	15.0	Mud
289	Mar. 25	18.0	vV	4.5	Fine gray sand
290	Mar. 25	15.0	vV	3.0	Fine sand
293	Mar. 25	13.0	vV	7.0	Fine sand (c)
295	Mar. 25	9.0	vV	4.0	Coarse sand (coralific & shells)
297	Mar. 25	Dredge between Hon Lon and Hon Mung			Muddy sand

TABLE 1. (Continued)

Station Number	Date (1960)	Depth (meters)	Gear*	Volume (liters)	Type of Bottom
299	Mar. 30	10.0	vV	7.0	Fine sand
301	Mar. 30	22.0	vV	14.0	Mud
302	Mar. 30	14.0	vV	1.0	Coarse sand (coral rests)
303	Mar. 30	15.0	vV	2.5	Brown medium sand
305	Mar. 30	13.0	vV	6.0	Fine sand (little muddy)
307	Mar. 30	4.0	2 vV	7.0	Fine sand
313	Mar. 30	16.0	vV	12.0	Mud
317	Apr. 1	Dredge SW of Hon Lon			Mud
321	Apr. 4	4.5	vV	3.0	Coarse brown sand
322	Apr. 4	6.0	2 vV	3.0	Coarse brown sand (shells & coral rests)
324	Apr. 4	8.0	vV	3.0	Sand (little mud)
327	Apr. 4	7.0	vV	3.5	Fine sand
332	Mar. 7	5.0	vV	7.0	Muddy fine sand
334	Mar. 7	4.0	vV	12.0	Fine sandy mud
335	Mar. 7	4.0	vV	8.0	Sandy mud
338	Mar. 7	16.0	vV	5.5	Sandy mud
339	Mar. 7	12.0	vV	10.0	Mud (little sandy)
359	12°05′05″N 109°17′33″E	38.0	vV		Coralline sand
DN-4	Dredge around Mui Nam, Hon Lon				

* P = Petersen Grab 0.1 m²; vV = van Veen Grab 0.1 m²; (c) = Calcareous; (f) = Foraminifera.
[1] = two samples taken at the same station; represented on Chart 1 by the Arabic symbol only.

TABLE 2. List of Amphipoda by station. The numbers in parentheses represent the number of specimens in each sample

Station 1
Cheiriphotis megacheles? (Giles) (1)
Leucothoe alcyone new species (3)

Station 6
Ampelisca cyclops iyoensis
new combination (1)

Station 8
Eriopisa elongata (Bruzelius) (1)

Station 27
Ampelisca cyclops iyoensis
new combination (1)

Station 39
Eriopisella propagatio new species (1)

Station 51
Urothoe spinidigitus Walker (2)

Station 58
Eriopisa elongata (Bruzelius) (1)

Station 70
Eriopisa elongata (Bruzelius) (2)

Station 74
Ampelisca misakiensis Dahl (1)

Station 79-I
Ampelisca cyclops iyoensis
new combination (2)

Station 79-II
Eriopisella propagatio new species (1)

Station 83
Eriopisa elongata (Bruzelius) (1)
Grandidierella gilesi? Coutiere (1)

Station 90-I
Eriopisa elongata (Bruzelius) (2)

Station 95-I
Ampelisca honmungensis new species (1)

Station 97-II
Urothoe gelasina new species (1)

Station 99
Ampelisca miharaensis Nagata (1)

Station 100-I
Eriopisa elongata (Bruzelius) (1)

Station 100-II
Eriopisa elongata (Bruzelius) (2)

Station 101-II
Eriopisa elongata (Bruzelius) (1)

Station 102
Byblis unidentified (1)
Eriopisa elongata (Bruzelius) (1)

Station 106-II
Eriopisa elongata (Bruzelius) (1)

Station 109-II
Eriopisa elongata (Bruzelius) (1)

Station 134-I
Eriopisa elongata (Bruzelius) (1)

Station 134-II
Eriopisa elongata (Bruzelius) (2)
Eriopisella propagatio new species (1)

Station 141-Ia
Ampelisca cyclops iyoensis
new combination (1)

Station 141-Ib
Ampelisca cyclops iyoensis
new combination (1)

Station 141-Ic
Byblis calisto new species (1)

Station 142-I
Ampelisca cyclops iyoensis
new combination (2)

Station 144-I
Ampelisca bocki Dahl (1)
Ampelisca cyclops iyoensis
new combination (1)

Station 144-II
Ampelisca cyclops iyoensis
new combination (2)
Ampelisca misakiensis Dahl (1)

Station 145-I
Ampelisca cyclops cyclops Walker (3)

Station 145-II
Eriopisella propagatio new species (1)

Station 156-II(4)
Byblis io new species (1)

Station 180
Ampelisca honmungensis new species (1)

Station 184
Idunella pauli new species (1)

Station 211
Idunella pauli new species (1)
Megaluropus agilis Hoek (1)

Station 212
Idunella pauli new species (1)

Station 213
Ampelisca brevicornis (Costa) (1)
Megaluropus agilis Hoek (2)

TABLE 2. (Continued)

Station 217
Cheiriphotis megacheles? (Giles) (1)
Urothoe carda new species (1)

Station 220
Photis species A (1)

Station 222
Ampelisca maia new species (1)
Megaluropus agilis Hoek (1)
Synchelidium miraculum new species (1)

Station 223
Megaluropus agilis Hoek (3)

Station 225
Idunella pauli new species (1)
Megaluropus agilis Hoek (1)

Station 229
Ampelisca cyclops iyoensis new combination (1)
Idunella pauli new species (2)
Megaluropus agilis Hoek (1)
Urothoe carda new species (1)
Urothoe orientalis Gurjanova (1)

Station 230
Ampelisca brevicornis (Costa) (1)

Station 231-II
Ampelisca brevicornis (Costa) (1)

Station 232-I
Urothoe orientalis Gurjanova (1)

Station 232-II
Cheiriphotis megacheles? (Giles) (3)
Megaluropus agilis Hoek (2)
Urothoe gelasina new species (2)

Station 233
Ampelisca brevicornis (Costa) (1)
Cheiriphotis megacheles? (Giles) (3)
Photis species B (1)

Station 234
Idunella pauli new species (1)
Megaluropus agilis Hoek (1)

Station 236
Synchelidium miraculum new species (1)

Station 238
Ampelisca cyclops cyclops Walker (2)

Station 240-I
Ampelisca cyclops cyclops Walker (2)

Station 240-II
Ampelisca cyclops cyclops Walker (2)

Station 242
Cheiriphotis megacheles? (Giles) (1)
Megaluropus agilis Hoek (2)
Urothoe spinidigitus Walker (2)

Station 243
Urothoe carda new species (3)
Urothoe cuspis new species (1)
Urothoe gelasina new species (12)

Station 245
Ampelisca brevicornis (Costa) (1)
Idunella janisae new species (1)

Station 248
Ampelisca misakiensis Dahl (1)

Station 250
Ampelisca unidentified (1)
Idunella pauli new species (1)
Synchelidium miraculum new species (3)
Urothoe carda new species (1)
Urothoe cuspis new species (1)
Urothoe gelasina new species (1)
Urothoe spinidigitus Walker (1)

Station 251
Ampelisca brevicornis (Costa) (4)
Megaluropus agilis Hoek (5)
Oediceroides ornithorhynchus Pirlot (1)
Socarnes dissimulantia new species (1)
Urothoe cuspis new species (2)
Urothoe spinidigitus Walker (1)

Station 252
Ampelisca brevicornis (Costa) (1)
Cheiriphotis megacheles? (Giles) (2)
Megaluropus agilis Hoek (2)

Station 254
Megaluropus agilis Hoek (1)
Urothoe orientalis Gurjanova (1)

Station 256
Lepidepecreum nudum new species (1)
Megaluropus agilis Hoek (1)

Station 257
Cheiriphotis megacheles? (Giles) (3)
Megaluropus agilis Hoek (10)

Station 258
Urothoe gelasina new species (2)

Station 259
Urothoe gelasina new species (1)

TABLE 2. (Continued)

Station 260-II
Ampelisca brevicornis (Costa) (1)
Megaluropus agilis Hoek (4)
Urothoe gelasina new species (1)
Urothoe spinìdigitus Walker (3)

Station 261
Ampelisca brevicornis (Costa) (2)
Ampelisca cyclops iyoensis new combination (1)
Byblis calisto new species (6)
Cheiriphotis megacheles? (Giles) (2)
Eriopisella propagatio new species (1)

Station 262
Ampelisca brevicornis (Costa) (1)
Ampelisca miharaensis Nagata (1)
Cheiriphotis megacheles? (Giles) (1)
Megaluropus agilis Hoek (4)

Station 263
Ampelisca brevicornis (Costa) (1)
Ampelisca cyclops iyoensis new combination (1)
Cheiriphotis megacheles? (Giles) (3)
Eriopisella propagatio new species (1)

Station 265
Ampelisca chinensis new species (1)
Megaluropus agilis Hoek (1)
Phoxocephalus? unidentified (1)
Synchelidium miraculum new species (1)

Station 266
Ampelisca brevicornis (Costa) (1)
Cheiriphotis megacheles? (Giles) (1)
Megaluropus agilis Hoek (3)
Synchelidium miraculum new species (4)
Urothoe spinidigitus Walker (2)

Station 267
Cheiriphotis megacheles? (Giles) (1)
Lysianassa cinghalensis (Stebbing) (1)
Oedicerotidae Genus species (1)
Urothoe gelasina new species (1)

Station 268
Ampelisca brevicornis (Costa) (1)
Ampelisca cyclops Walker, variety (1)

Station 269
Synchelidium miraculum new species (1)

Station 273
Ampelisca bocki Dahl (1)
Ampelisca brevicornis (Costa) (1)

Station 275
Ampelisca brevicornis (Costa) (1)
Ampelisca cyclops iyoensis new combination (2)
Byblis pilosa new species (1)

Station 279
Ampelisca honmungensis new species (1)

Station 282
Ampelisca misakiensis Dahl (1)
Ampelisca orops new species (1)

Station 284
Ampelisca misakiensis Dahl (1)
Cheiriphotis megacheles? (Giles) (1)

Station 289
Byblis febris new species (1)

Station 290
Ampelisca orops new species (1)

Station 293
Ampelisca orops new species (1)

Station 295
Gammaridae unidentified (1)

Station 297
Ampelisca cyclops iyoensis new combination (2)
Ampelisca honmungensis new species (2)
Ampelisca misakiensis Dahl (2)
Byblis pilosa new species (9)

Station 299
Idunella pauli new species (1)
Megaluropus agilis Hoek (1)

Station 301
Ampelisca misakiensis Dahl (1)

Station 302
Urothoe gelasina new species (1)

Station 303
Idunella janisae new species (1)

Station 305
Ampelisca chinensis new species (1)
Eriopisella propagatio new species (8)
Idunella serra new species (2)
Synchelidium miraculum new species (1)
Urothoe orientalis Gurjanova (1)
Urothoe spinidigitus Walker (1)

Station 307
Cymadusa vadosa new species (1)

Station 313
Eriopisella propagatio new species (1)

TABLE 2. (Continued)

Station 317
Ampelisca bocki Dahl (1)
Ampelisca cyclops iyoensis new combination (1)
Grandidierella gilesi? Coutiere (1)

Station 321
Ampelisca bocki Dahl (1)
Ampelisca orops new species (1)

Station 322
Ampelisca misakiensis Dahl (1)
Ampelisca orops new species (1)

Station 324
Leucothoe furina (Savigny) (1)

Station 327
Photis species B (1)
Synchelidium miraculum new species (1)
Urothoe gelasina new species (1)

Station 332
Ampelisca brevicornis (Costa) (1)
Ampelisca cyclops cyclops Walker (1)
Ampelisca honmungensis new species (1)
Byblis calisto new species (1)

Station 334
Byblis calisto new species (1)
Eriopisella propagatio new species (1)

Station 335
Grandidierella gilesi? Coutiere (2)

Station 338
Ampelisca brevicornis (Costa) (1)

Station 339
Ampelisca cyclops cyclops Walker (1)
Byblis calisto new species (1)

Station 359
Ampelisca cyclops iyoensis new combination (1)
Phoxocephalidae unidentified (1)

Station DN-4
Ampelisca misakiensis Dahl (2)
Byblis pilosa new species (1)

Station ?
Megaluropus agilis Hoek (2)

SYSTEMATICS

Family LYSIANASSIDAE

Genus *Lepidepecreum* Bate and Westwood

Lepidepecreum nudum new species

Plate 1

DIAGNOSIS OF MALE:

Eyes present; article 7 of gnathopod 1 fifty per cent longer than palm; article 2 of pereopod 5 with short posterior lobe extending to end of article 3; dorsal surface of body smooth, lacking carinae; dorsal surface of pleonal segment 4 lacking process; inner rami of uropods 1 and 2 slightly shorter than outer rami.

OTHER CHARACTERS:

Epistome-upper lip complex without sinus; antenna 2 exceeds body in length; pereopods 1 and 2 similar.

FEMALE:

Unknown.

HOLOTYPE:

Male, 10.0 mm, deposited in University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 256, 12°16′55″N, 109°16′53″E, March 18, 1960, 17.0 m, coarse brown sand.

MATERIAL:

Station 256 (1).

REMARKS:

The specific name refers to the absence of body ornamentation in this species.

Microlysias Stebbing (1918) may be a junior synonym of *Lepidepecreum.* The major diagnostic character of *Microlysias* is the inflated fifth peduncular article of antenna 2 in the male. In the present material the peduncular articles of antenna 2 are stouter than those generally found in the genus *Lepidepecreum.* Peduncular articles 1 through 4 are slightly stouter, and article 5 is less inflated than those of *Microlysias.*

Genus *Lysianassa* Milne Edwards

Lysianassa cinghalensis (Stebbing)

Lysianax cinghalensis Stebbing 1897: 28, fig. 7A; Walker 1904: 242-243, pl. 1, fig. 6.
Lysianassa cinghalensis (Stebbing).—K. H. Barnard 1937: 142.

MATERIAL:

Station 267 (1).

DISTRIBUTION:

Seychelles, Red Sea, Gulf of Oman, and Ceylon.

Genus *Socarnes* Boeck

Socarnes dissimulantia new species

Plate 2

DIAGNOSIS OF MALE:

Lateral cephalic lobes narrow; peduncles of antennae 1 and 2 stout; first peduncular article of antenna 1 nearly as broad as long; peduncle of antenna 2 extends one half of the way along flagellum of antenna 1; posteroventral corner of third pleonal epimeron blunt, produced backwards very slightly, posterior margin smooth.

OTHER CHARACTERS:

Eyes apparently absent; antenna 2 extends two thirds of the way along body.

FEMALE:

Unknown.

HOLOTYPE:

Male, 4.7 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 251, 12°14′50″N, 109°15′45″E, March 18, 1960, 20.0 m, fine brown sand.

MATERIAL:

Station 251 (1).

RELATIONSHIP:

This species most closely resembles *S. vahli* (Krøyer) as in Sars (1895) and *S. erythrophthalmus* Robertson as in Chevreux and Fage (1925). Both *S. vahli* and *S. erythrophthalmus* can be distinguished from *S. dissimulantia* by the long, slender peduncle of antenna 1 and by the slender peduncle of antenna 2 being subequal in length to the peduncle of antenna 1.

Family AMPELISCIDAE

Genus *Ampelisca* Krøyer

Key to the Species of *Ampelisca* found in Viet Nam

1. Head produced into large rostrum; antenna 1 inserted posteroventral to rostrum 2
1. Head not produced into rostrum 4

2. Article 5 of pereopod 5 twice as long as article 4 ..... *misakiensis*
2. Article 5 of pereopod 5 not twice as long as article 4 ..... *cyclops* 3

3. Article 6 of pereopod 5 very stout; third pleonal epimeron strongly bisinuate, with a large tooth; rami of uropod 2 poorly spinose ..... *cyclops cyclops*
3. Article 6 of pereopod 5 slender; third pleonal epimeron poorly sinuate with a small tooth; rami of uropod 2 densely spinose ..... *cyclops iyoensis* new combination

4. Third pleonal epimeron quadrate or rounded posteroventrally 5
4. Third pleonal epimeron with a posteroventral tooth 6

5. Antenna 1 with peduncular articles 1 and 2 equal in length ..... *bocki*
5. Antenna 1 with peduncular article 2 longer than peduncular article 1 ..... *chinensis* new species

6. Article 4 of pereopod 5 with large posterior lobe covering article 5 ..... *brevicornis*
6. Article 4 of pereopod 5 lacking large posterior lobe, article 5 not covered 7

7. Article 5 of pereopod 5 twice as long as article 4 ..... *honmungensis* new species
7. Article 5 of pereopod 5 not twice as long as article 4 8

8. Antenna 1 subequal in length to peduncle of antenna 2 or shorter ..... *orops* new species
8. Antenna 1 longer than peduncle of antenna 2 9

9. Anterior edge of head strongly incised; posteroventral corner of second pleonal epimeron not produced into a well-developed tooth ..... *miharaensis*
9. Anterior edge of head not strongly incised; posteroventral corner of second pleonal epimeron produced into a well-developed tooth ..... *maia* new species

Ampelisca bocki Dahl

Ampelisca bocki Dahl 1945: 2-6, figs. 1-3; Nagata 1959: 274.

MATERIAL:

Stations 144-I (1), 273 (1), 317 (1), 321 (1).

DISTRIBUTION:

Kobe Bay, Mihara Bay, and (from fish stomachs) Seto Inland Sea, Japan.

REMARKS:

The present specimens differ from Dahl's description by the more quadrate posteroventral corner of the third pleonal epimeron, similar to that shown for *A. aequicornis* Bruzelius as in Sars (1895) and *A. naikaiensis* Nagata (1959). The dorsal process of the first urosomal segment is straight, shallow, and posteriorly subangular as in *A. aequicornis*. In other respects the specimens resemble *A. naikaiensis,* but like *A. bocki,* they have peduncular article 2 of antenna 1 as short as article 1. Article 2 of antenna 1 is as thick as article 1, unlike Dahl's drawing for *A. bocki,* but perhaps the drawing was made with article 2 slightly turned.

Possibly *A. zamboangae* Stebbing (1888) is a senior synonym of *A. bocki* or the two represent subspecies of a common stem. The problem cannot be resolved because the female of *A. zamboangae* is unknown. Males of both species are very similar except that antenna 1 of *A. zamboangae* is slightly longer than the peduncle of antenna 2 whereas Dahl describes the male of *A. bocki* as having the first antenna reaching about to the end of the mesosome.

Ampelisca brevicornis (Costa) new synonymy

Plate 3

Araneops brevicornis Costa 1853: 171-172.

Ampelisca laevigata Liljeborg.—Sars 1895: 169, pl. 59, fig. 1.

Ampelisca brevicornis (Costa).—Walker 1904: 253; Stebbing 1906: 100-101; Chevreux and Fage 1925: 77-78, figs. 67-68; Schellenberg 1925: 130-132, fig. 9 (including varieties); Pirlot 1936: 277-278; K. H. Barnard 1937: 148-149; Dahl 1945: 9-12, fig. 8; Reid 1951: 206-210, figs. 10-15; Nagata 1959: 265-266, fig. 2; Nagata 1960: 167-168.

Ampelisca senegalensis Chevreux 1925: 289-291, figs. 3-4.

DISCUSSION:

More than fifty identifications of this species have been published since Stebbing's monograph which omits many of the references made to it prior to 1906. Listed above are the references pertinent to identification of this species, including all references from the Red Sea to Japan in the Indo-Pacific. The species is recorded from the Lofoten Islands in the North Atlantic to South Africa, through the Mediterranean and Red Seas, through the Indian Ocean, through Indonesia, and north to Japan. Because the species occurs from the boreal to the tropics and back, it is strange that it has not penetrated into the Eastern Pacific as far south as California, where thousands of samples from intertidal to oceanic depths (2000 m) have failed to include it. None of the species described from that area can be considered, by any stretch of the imagination, to be *A. brevicornis*. *Ampelisca pugetica* Stimpson (= *Ampelisca californica* Holmes as in J. L. Barnard [1954]) is decidedly not *A. brevicornis* because of the shortened first uropod, the saddle-shaped urosomal carina, and the thinness of the rami of uropod 3. No reference to *A. brevicornis* has ever been made in the Western Atlantic, so apparently the species is confined to the Eastern Hemisphere.

Within the Eastern Hemisphere *A. brevicornis* exhibits numerous variations, many of which have been named by Schellenberg (1925) and Reid (1951) or noted by Dahl (1945), Pirlot (1936), and others. It would probably be wise to cease naming all of these mutants, ecophenotypes and races, unless they can definitely be shown to be subspecies. It has not been noticed previously that *Ampelisca senegalensis* Chevreux (1925) belongs to the African complex of varieties described by Reid (1951) and Schellenberg (1925).

The present specimens are drawn in detail; they apparently represent still another genotype or ecophenotype because of their third uropods, although they bear close resemblance to Schellenberg's variety *platypus*. In the present specimens the first antenna is much shorter than that of *platypus*, the lower edge of article 2 of pereopod 5 is not posteriorly beveled, and the apex of the outer ramus of uropod 3 is shaped differently (see figures in Reid [1951]).

DIAGNOSIS OF FEMALE:

Head normally truncate in front, anteroventral cephalic margin parallel to dorsum of head; 2 pairs of corneal lenses present and visible laterally, ventral pair situated at antennal corner of head; antenna 1 reaching end of peduncular article 4 of antenna 2, peduncular article 2 one and three tenths times as long as article 1; antenna 2 shorter than body, peduncular article 4 one and two fifths times as long as article 5; pereopods 1 and 2 with fourth articles much broader than terminal articles (compare with *Ampelisca gibba* Sars [1895]), seventh articles longer than articles 5 and 6 combined; posterodistal ends of fifth articles of pereopods 3 and 4 not produced; posteroventral margin of article 2 of pereopod 5 truncated, not beveled, article 3 slightly longer than article 4 (without lobes), hind lobe of article 4 proboscoid and fully covering article 5, anterior edge with a sharp conical lobe, article 5 large (compare with *A. gibba*), article 6 inflated, as long as articles 3 and 4 combined, article 7 slightly shorter than article 6; second pleonal epimeron with rounded posteroventral corner, tooth absent; third pleonal epimeron with moderately strong tooth at posteroventral corner, above which the margin is strongly convex but not as much as in typical Norwegian *A. brevicornis;* first urosomal segment with large dorsal process that nearly becomes a carina dorsally, flattopped or slightly sloping; uropod 1 exceeding end of uropod 2, outer ramus naked, inner ramus bearing a few spines; both rami of uropod 2 sparsely spiniferous; uropod 3 with rami subfoliaceous, especially the symmetrically pointed inner ramus, outer ramus asymmetrically pointed, with rather broad, truncated distal portion to one side of point; telson cleft four fifths of its length, apices acute, with one seta at tip, dorsal surface of lobes with small setae.

MATERIAL:

Stations 213 (1), 230 (1), 231-II (1), 233 (1), 245 (1), 251 (4), 252 (1), 260-II (1), 261 (2), 262 (1), 263 (1), 266 (1), 268 (1), 273 (1), 275 (1), 332 (1), 338 (1).

REMARKS:

There is some variation in the present material. The first antennae vary somewhat in their extent from slightly longer to slightly shorter than the end of peduncular article 4 of antenna 2. The shape of the third pleonal epimeron varies from that shown in plate 3 to a considerably less projecting tooth and less convex hind margin. The process of the first urosomal segment varies from the largest condition shown in plate 3 to a lower process or to one with a very sharp posterior corner.

Ampelisca chinensis new species

Plate 4

DIAGNOSIS OF FEMALE:

Anterior cephalic margin incised, anteroventral margin straight, oblique; two pairs of corneal lenses present, both pairs visible laterally, ventral pair located below lateral angle of head; antenna 1 subequal in length to peduncle of antenna 2, article 2 of peduncle of antenna 1 one and one half times as long as article 1; antenna 2 short, article 4 of peduncle slightly shorter than article 5; coxae 1-3 each with a slit in posteroventral corner and a very slight tooth; seventh articles of pereopods 1 and 2 subequal in length to articles 5 and 6 combined; pereopods 3 and 4 with posterodistal ends of fifth articles poorly produced, sixth articles shorter than fifth articles; posterior lobe of article 2 of pereopod 5 intermediate in breadth for the genus, ventral setose edge unevenly rounded, article 3 much longer than article 4, stout, article 4 small, article 5 longer than article 4, article 6 longer than article 5, not inflated, article 7 longer than article 6; third pleonal epimeron evenly convex behind, posteroventral corner quadrate; dorsal process of urosomal segment 1 nearly straight margined, slightly elevated above remaining segment; uropod 1 extending beyond uropod 2, rami nearly naked, each with 1 or 2 spines, dorsal edges of peduncle and rami finely serrate; outer ramus of uropod 2 nearly naked, with or without a spine, dorsal edge finely serrate, inner ramus with a few spines, dorsal edge finely serrate; rami of uropod 3 slender, lanceolate, nearly naked with only a few setae; telson with subtruncate apices, each apex bearing one fairly stout spine, a few spines on dorsum of each lobe, cleft three fourths of its length.

OTHER CHARACTERS:

The mouthparts are similar to those figured for *A. orops* new species except that the inner plate of maxilla 1 has no setae. Gnathopods 1 and 2 are similar to those shown for *A. tenuicornis* Liljeborg in Sars (1895) except that gnathopod 1 is slightly narrower.

HOLOTYPE:

Female, 4.0 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 305, 12°11′25″N, 109°17′10″E, March 30, 1960, 13.0 m, fine sand (little muddy).

MATERIAL:

Stations 265 (1), 305 (1).

REMARKS:

The specific name refers to its discovery in the China Sea.

RELATIONSHIP:

This new species closely resembles *A. tenuicornis* but is distinguished by the longer peduncle of antenna 1, by the narrower first gnathopod, by the shorter seventh articles of pereopods 1 and 2, by the longer seventh article of pereopod 5, by the more quadrate posteroventral corner of the third pleonal epimeron, by the straight-margined dorsal process on the first urosomal segment, and by the longer first uropod.

A. chinensis differs from *A. typica* (Bate) as in Sars (1895) by the longer peduncle of antenna 1, by the straight-margined dorsal process on the first urosomal segment and by the longer first uropod.

A. aequicornis Bruzelius as in Sars (1895) and *A. naikaiensis* Nagata (1959) are distinguished from *A. chinensis* by the long first antennae.

A. brevicornis (Costa), *A. miharaensis* Nagata (1959), *A. cyclops cyclops* Walker, *A. cyclops iyoensis* new combination, *A. maia* new species and *A. orops* new species are distinguished from *A. chinensis* by the tooth on the posteroventral corner of the third pleonal epimeron. *A. maia* also differs from *A. chinensis* by its elongated first antenna. *A. cyclops* and *A. misakiensis* Dahl (1945) also are distinguished from *A. chinensis* by the presence of a large rostrum with antenna 1 inserted posteroventral to it.

A. chinensis differs from *A. bocki* Dahl (1945) by the long peduncular article 2 of antenna 1.

A. chinensis differs from *A. honmungensis* new species by the shape of the head, by the absence of a process on peduncular article 1 of antenna 1, by the more slender fifth pereopod and by the quadrate posteroventral corner of the third pleonal epimeron.

Ampelisca cyclops Walker new synonymy
Ampelisca cyclops Walker, variety, + *Ampelisca cyclops cyclops* Walker, + *Ampelisca cyclops iyoensis* new combination

Plate 5

Ampelisca cyclops Walker 1904: 253-254, pl. 2, fig. 14; Pirlot 1936: 280; K. H. Barnard 1937: 149; Pillai 1957: 31-32, fig. I, 5-9.

Ampelisca iyoensis Nagata 1959: 274-277, figs. 9-11.

DISCUSSION:

Ampelisca cyclops Walker (1904) from the Indian Ocean and *Ampelisca iyoensis* Nagata (1959) from the Seto Inland Sea, Japan, occur together in the Bay of Nhatrang with what appears to be some hybridization. Most of the population can be separated into two phenotypes representing the originally described species. These phenotypes should be retained as subspecies until more investigations in Japanese and Indian waters have been made and it can be determined whether or not the two phenotypes occur together everywhere.

Ampelisca cyclops cyclops Walker

Plate 5, D-Q

DIAGNOSIS:

This subspecies is especially distinguished by the very stout sixth article of pereopod 5 which, because of its stoutness, appears to be strongly offset in its attachment to article 5; the first antenna

is short, scarcely reaching the end of article 4 of antenna 2, a character in contradistinction to Walker's original figures of this species; the third pleonal epimeron is very strongly bisinuate; the rami of uropod 2 are poorly spinose.

MATERIAL:

Stations 145-I (3), 238 (2), 240-I (2), 240-II (2), 332 (1), 339 (1).

Ampelisca cyclops iyoensis new combination

Plate 5, A-C

DIAGNOSIS:

Article 6 of pereopod 5 is slender, and although article 5 is produced anteroventrally as much as in the typical subspecies, article 6 is not as strongly offset; the first antenna usually slightly longer than in *A. c. cyclops;* the third pleonal epimeron poorly sinuate posteriorly with a very small tooth at the posterodistal corner; the rami of uropod 2 very densely spinose.

MATERIAL:

Stations 6 (1), 27 (1), 79-I (2), 141-Ia (1), 141-Ib (1), 142-I (2), 144-I (1), 144-II (2), 229 (1), 261 (1), 263 (1), 275 (2), 297 (2), 317 (1), 359 (1).

Ampelisca cyclops Walker, variety

Plate 5, R-T

MATERIAL:

Station 268 (1).

REMARKS:

This specimen appears to be an intergrade between the two subspecies diagnosed herein. Intergradation occurs slightly in specimens of both subspecies; some have either more or fewer spines on the rami of uropod 2 than typically denoted for their category, some have slightly more or less bisinuation of the third pleonal epimeron, and some have more or less stoutly developed sixth articles of pereopod 5 than normal for their subspecies.

A. cyclops is an unusual species in respect to the anterior cephalic process. The cephalic process bears one pair of anterolateral corneal lenses with antenna 1 inserted posteroventrally to the rostrum; thus the cephalon lacks the ventral pair of lenses seen in most other species of *Ampelisca.* Another character demonstrating the close relationship between the two subspecies is the presence of an unusually large, hooked spine on the anteroventral margin of the first pleonal epimeron, not heretofore noted for either subspecies. The shortness of antenna 1 in *A. c. cyclops* from Nhatrang is an unusual and confounding character because all prior descriptions of both subspecies have antenna 1 reaching nearly to or slightly beyond the end of the peduncle of antenna 2. Perhaps this is a result of hybridization between the two subspecies. It is not clear whether or not the third pleonal epimeron described herein for *A. c. cyclops* is similar to that of Walker's, Pirlot's or Pillai's material. The *A. c. cyclops* herein reported may be of different genetic constitution than those specimens.

Ampelisca honmungensis new species

Plate 6

DIAGNOSIS OF FEMALE:

Head normally truncate anteriorly, anteroventral margin evenly and shallowly oblique, not

excavate; two pairs of corneal lenses present, both visible laterally, ventral pair situated at antennal corner of head; antenna 1 reaching about half way along peduncular article 5 of antenna 2, peduncular articles 1 and 2 equal in length, short, article 1 strongly produced dorsally and distally; antenna 2 much shorter than body; coxae 1-3 each with a small slit at posterodistal corner, no distinct tooth projecting; seventh articles of pereopods 1 and 2 longer than articles 5 and 6 combined; pereopods 3 and 4 with posterodistal ends of fifth articles poorly produced, sixth articles subequal in length to fifth articles; article 2 of pereopod 5 with posterior lobe intermediate in breadth for the genus, ventral setose edge slightly oblique, article 3 much longer than article 4, stout, article 4 small, article 5 longer than article 4, article 6 longer than article 5 and more slender, not inflated, article 7 slightly shorter than article 6; third pleonal epimeron slightly convex behind, posterodistal corner produced to a very small but broad tooth; dorsal process of urosomal segment 1 nearly obsolete but distinct, quite low, sinuous, not formed into a keel; uropod 1 extending to end of uropod 2, slender, peduncle with a few spines, outer ramus naked, inner with a few small marginal spines; peduncle of uropod 2 with a few spines, both rami with several spines; rami of uropod 3 slender, lanceolate, inner broader than outer, not especially modified or setose; telson with subtruncate apices, acutely cuspidate medially, each apex with 3 short spines, dorsum of each lobe with several small spines, cleft two thirds to three fourths of its length.

MALE:

Unknown.

HOLOTYPE:

Female, 9.4 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 279, 12°10′00″N, 109°17′25″E, March 23, 1960, 24.0 m, muddy sand.

MATERIAL:

Stations 95 (1), 180 (1), 279 (1), 297 (2), 332 (1).

REMARKS:

This species is named after the Island Hon Mung in the Bay of Nhatrang.

This species is unique in the genus *Ampelisca* for its first peduncular article of antenna 1 bearing a process. Because the male is unknown, it is not known whether or not this process differs sexually.

Urosomal segment 1 in the specimens other than that figured, including the holotype, is practically flat and scarcely projects above the following segment.

RELATIONSHIP:

A. honmungensis closely resembles *A. bocki* Dahl (1945) but differs by the occurrence of the process on peduncular article 1 of antenna 1 and by the slightly produced posterodistal corner of the third pleonal epimeron.

A. jarli Reid (1951) has a large, bulbous dorsal process on urosomal segment 1, typical of males, but in other respects it is similar to this new species, except, of course, for the absence of the anterior process on the first peduncular article of antenna 1.

A. zamboangae Stebbing (1888), based on a male, and the new species, based on a female, differ essentially only by the process of antenna 1, although in the new species the seventh articles of pereopods 1 and 2 are longer, article 6 of pereopod 4 (and 3?) is longer, and the posterior lobe of article 2 of pereopod 5 is broader.

A. honmungensis is distinguished easily from *A. cyclops* Walker (1904), variety, *A. cyclops cyclops* Walker, *A. cyclops iyoensis* new combination and *A. misakiensis* Dahl (1945) by the normally truncate head with the dorsal and ventral pairs of corneal lenses.

A. honmungensis is distinguished from all other species found in Viet Nam, *A. brevicornis* (Costa), *A. orops* new species, *A. chinensis* new species, *A. maia* new species and *A. miharaensis* Nagata (1959), by the first and second peduncular articles of antenna 1 being equal in length and by the unique first peduncular article being strongly produced dorsally and distally.

Ampelisca maia new species

Plate 7

DIAGNOSIS OF FEMALE:

Anterior cephalic margin slightly incised, anteroventral cephalic margin straight, oblique; two pairs of corneal lenses present, both pairs visible laterally, ventral pair located slightly below the lateral cephalic angle; antenna 1 extending two thirds of the way along antenna 2, article 2 of peduncle about 1.3 times as long as article 1; antenna 2 as long as pereon, article 4 of peduncle 1.2 times as long as article 5; coxae 1-3 with a small slit and a very slight tooth at lower posterior corner; seventh articles of pereopods 1 and 2 longer than articles 5 and 6 combined; pereopods 3 and 4 with posterodistal ends of fifth articles slightly produced, sixth articles shorter than fifth articles; posterior lobe of article 2 of pereopod 5 intermediate in breadth for the genus, ventral setose edge oblique, article 3 longer than article 4, stout, articles 4 and 5 subequal in length, article 6 longer than article 5, slightly broader, very slightly inflated, articles 6 and 7 subequal in length; posteroventral corner of second pleonal epimeron produced into a very distinct tooth; posterior edge of third pleonal epimeron convex, posteroventral corner produced into a small but indistinct tooth; dorsal edge of first urosomal segment straight, only slightly elevated above the remaining segment; uropod 1 extending beyond uropod 2, outer ramus lacking spines, both edges spinulose, inner ramus with a few spines, both edges spinulose; outer ramus of uropod 2 lacking spines, dorsal edge spinulose, inner ramus with a few spines, both edges spinulose; rami of uropod 3 slender, lanceolate, inner ramus broader than outer, ventral margin of outer ramus with several spines, dorsal edge spinulose and sparsely setose; telson with one spine on each apex, a few spines on the dorsum of each lobe, cleft about four fifths of its length.

OTHER CHARACTERS:

Mouthparts and gnathopods 1 and 2 similar to those shown for *A. typica* (Bate) in Sars (1895).

MALE:

Unknown.

HOLOTYPE:

Female, 3.5 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 222, 12°14′50″N, 109°13′30″E, March 8, 1960, 14.0 m, fine brown sand.

MATERIAL:

Station 222 (1).

REMARKS:

The present specimen has been described as a new species, despite its close resemblance to several established species of *Ampelisca,* because the second pleonal epimeron bears a well-developed tooth on the posteroventral corner (see table 3). Fifty-eight of the ninety-eight known species (including three dubious species and the three other new species described herein) have the posteroventral corner of the second pleonal epimeron either quadrate or with a very small point. *A. holmesi* Pearse, has a slight tooth; two species, *A. spinimana* Chevreux, and the new species at hand have a well-developed tooth. The condition of the second pleonal epimeron is unknown in thirty-seven species.

The specific name is derived from Greek mythology.

RELATIONSHIP:

A. maia most closely resembles *A. chevreuxi* Walker (1904) and *A. miharaensis* Nagata (1959). *A. maia* is distinguished from *A. miharaensis* by the less deeply incised anterior margin of the head, by the longer seventh articles of pereopods 1 and 2, by the less oblique ventral edge of the posterior lobe of article 2 of pereopod 5, by the broader article 3 of pereopod 5, and by the straight-margined dorsal process on the first urosomal segment.

A. maia is distinguished from *A. chevreuxi* Walker, *A. spinimana* Chevreux as in Chevreux and Fage (1925), *A. chinensis* new species, *A. brevicornis* (Costa), *A. honmungensis* new species and *A. orops* new species, by the long first antenna reaching two thirds of the way along antenna 2.

A. maia is distinguished from *A. zamboangae* Stebbing (1888), *A. spinipes* Boeck as in Sars (1895), *A. aequicornis* Bruzelius as in Sars (1895), and *A. serraticaudata* Chevreux as in Chevreux and Fage (1925) by the well-developed tooth on the posteroventral corner of the second pleonal epimeron.

A. maia differs from *A. naikaiensis* Nagata (1959) by the more strongly quadrate posterior lobe of article 2 of pereopod 5, by the small tooth on the posteroventral corner of the third pleonal epimeron, and by the straight-margined dorsal process on the first urosomal segment.

A. maia is distinguished from *A. natalensis* K. H. Barnard (1916) by the longer peduncle of antenna 1, by the more transverse ventral edge (without the concave posterior margin) of the lobe on article 2 of pereopod 5, by the broader third article and less inflated sixth article, and by the spines on the dorsum and apices of the telson.

A. cyclops Walker (1904), variety, *A. cyclops cyclops* Walker, *A. cyclops iyoensis* new combination, and *A. misakiensis* Dahl (1945) all have the large rostrum, bearing one pair of corneal lenses, with the first antenna inserted posteroventral to the rostrum.

A. bocki Dahl (1945) differs from *A. maia* by the first and second peduncular articles of antenna 1 being equal in length.

Ampelisca miharaensis Nagata

Plate 8

Ampelisca miharaensis Nagata 1959: 266-270, figs. 3-5; Nagata 1960: 168.

MATERIAL:

Stations 99 (1), 262 (1).

TABLE 3. The condition of the posterodistal corner of the second pleonal epimeron in the species of *Ampelisca*. 1 = quadrate or small tooth; 2 = tooth; 3 = condition unknown. (see J. L. Barnard [1958] for references)

Ampelisca	1	2	3
abyssicola	X		
acinaces	X		
aequicornis	X		
agassizi	X		
albedo	X		
amblyops	X		
amblyopsoides	X		
anomala	X		
araucana			X
australis	X		
barnardi			X
bidentata			X
birulai	X		
bocki	X		
bouvieri			X
brachyceras			X
bransfieldi			X
brevicornis	X		
brevisimulata	X		
byblisoides	X		
chevreuxi			X
chiltoni	X		
chinensis n. sp.	X		
coeca	X		
compacta			X
composita			X
compressa	X		
cristata	X		
cristoides	X		
ctenopus			X
cucullata			X
cyclops	X		
daleyi			X
diadema	X		
eoa			X
eschrichti	X		
excavata			X
furcigera	X		
fusca	X		
gibba	X		
gusta	X		
hancocki	X		
hemicryptops			X
hermosa	X		
heterodactyla			X
holmesi		X	
honmungensis n. sp.	X		
hupferi	X		
incerta			X
indentata	X		
jarli			X
latifrons			X
lobata	X		
lunata	X		
macrocephala	X		
maia n. sp.		X	
mexicana	X		
miharaensis	X		
milleri			X
miops			X
misakiensis	X		
naikaiensis			X
natalensis			X
odontoplax	X		
orops n. sp.	X		
pacifica	X		
palmata			X
panamensis			X
parapanamensis			X
plumosa	X		
pugetica	X		
pusilla	X		
pygmaea			X
romigi	X		
rostrata			X
rubella			X
sarsi			X
scabripes			X
schellenbergi	X		
serraticaudata	X		
shoemakeri	X		
soleata			X
spinifer	X		
spinimana		X	
spinipes	X		
statenensis	X		
stenopus			X
subbrevicornis			X
tenuicornis	X		
tridens	X		
typica	X		
uncinata	X		
unidentata			X
vadorum	X		
venetiensis	X		
zamboangae	X		
(japonica)*	X		
(limicola)*	X		
(nordmanni)*			X

* dubious species

DISTRIBUTION:

Seto Inland Sea, Japan (from fish stomachs and bottom samples).

REMARKS:

The two specimens of *A. miharaensis* in the present collection agree with Nagata's description and drawings except that the corneal lenses are situated more submarginally, the dorsal process of the first urosomal segment is larger, and the telson is slightly shorter, has blunter apices, and is cleft three fifths of its length.

Ampelisca misakiensis Dahl

Plate 9

Ampelisca misakiensis Dahl 1945: 6-9, figs. 5-6.

MATERIAL:

Stations 74 (1), 144-II (1), 248 (1), 282 (1), 284 (1), 297 (2), 301 (1), 322 (1), DN-4 (2).

DISTRIBUTION:

Sagami Sea, Japan.

REMARKS:

The specimens in the present collection, although quite variable, differ from those described by Dahl in the seemingly larger cephalic process bearing the eyes, the shorter first antenna, the more strongly produced fifth articles of pereopods 3 and 4, the somewhat stouter fifth article of pereopod 5, and the perfectly rounded posteroventral corner of the third pleonal epimeron. Perhaps, like *A. cyclops* Walker (1904) and *A. iyoensis* Nagata (1959) reported upon herein, these specimens represent a genetically distinct population worthy of subspecific designation.

Coxa 1 is rather strongly turned forward, and both coxae 1 and 2 are bluntly produced at their posteroventral corners. The processes of urosomal segments 1 and 2-3 (fused) are quite variable as shown in plate 9. The armature of uropod 1 is distinctive, the lateral distal corner of the peduncle having a sharp cusp.

All the specimens except the one from station 282 have the short first antenna, the latter having it exceeding the peduncle of antenna 2 by one half the length of article 5 of antenna 2. All specimens have the long cephalic process except those from stations 144-II and 301 which have the cephalic process short as shown in plate 9 N, similar to Dahl's figure.

Ampelisca orops new species

Plate 10

DIAGNOSIS OF FEMALE:

Head without rostrum, anterior cephalic margin incised and sloping anteriorly, anteroventral cephalic margin oblique, ventral portion broadly incised around peduncle of antenna 2; dorsal pair of corneal lenses absent, ventral pair visible laterally, located on anteroventral cephalic margin below lateral angle; antenna 1 subequal in length to peduncle of antenna 2, article 2 of peduncle about 1.5 times as long as article 1; antenna 2 slightly shorter than body, article 4 of peduncle about 1.2 times as long as article 5; coxae 1-3 with a small slit at each posteroventral corner, no distinct tooth projecting; article 7 of pereopod 1 subequal in length to articles 5 and 6 combined;

pereopods 3 and 4 with posterodistal ends of fifth articles poorly produced, sixth articles slightly shorter than fifth articles; posterior lobe of article 2 of pereopod 5 intermediate in breadth for the genus, ventral setose edge oblique, article 3 longer than article 4, moderately stout, articles 4 and 5 subequal in length, article 5 slightly stouter than article 4, article 6 twice as long as article 5, inflated, article 7 about three fourths as long as article 6; third pleonal epimeron weakly bisinuate posteriorly, posteroventral corner produced into a distinct tooth; dorsal process on urosomal segment 1 solid, slightly sinuous, ending behind in a straight, erect, obtuse lobe; uropod 1 extends one half way along rami of uropod 2, outer ramus with several minute, admarginal spines, inner ramus with a few small, marginal spines, dorsal edge spinulose; both rami of uropod 2 with several spines and spinulose dorsal edges, outer ramus with a long apical spine; rami of uropod 3 slender, lanceolate, not especially modified or setose, inner broader than outer; telson with long acute medially cusped apices, each apex with 2 spines, dorsum of each lobe with several spines, cleft about three fourths of its length.

OTHER CHARACTERS:

The second pleonal epimeron has an oblique ridge running across it.

HOLOTYPE:

Female?, 4.0 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 321, 12°13′20″N, 109°14′05″E, April 4, 1960, 4.5 m, coarse brown sand.

MATERIAL:

Stations 282 (1), 290 (1), 293 (1), 321 (1), 322 (1).

REMARKS:

The specific name is derived from two words referring to the orient and the condition of the eyes.

RELATIONSHIP:

A. miops K. H. Barnard (1916) closely resembles this species but is distinguished by the longer first uropod and by the keel on the first urosomal segment. *A. orops* may prove to be subspecifically related to *A. miops*. *A. natalensis* K. H. Barnard (1916) apparently is distinguished by the presence of a dorsal pair of corneal lenses, by the ventral lenses occurring in the lateral cephalic angle, by the keel on the first urosomal segment, by the smaller tooth on the posteroventral corner of the third pleonal epimeron, and by the shape of article 2 of pereopods 4 and 5 (as seen in Reid [1951]).

A. lunata Schellenberg (1938) differs by the presence of a dorsal pair of corneal lenses, by the smaller tooth on the posteroventral corner of the third pleonal epimeron, by the saddle-shaped dorsal process on the first urosomal segment, and by the large anterior and posterior lobes on article 4 of pereopod 5.

A. tridens Walker (1904) differs by the tricarinate dorsal process on the first urosomal segment, and by the shorter first uropod that reaches only to the end of the peduncle of uropod 2.

A. furcigera Bulycheva (1936) differs by the massive, flat hump on the first urosomal segment, by the erect, conical process on the fused second and third urosomal segment, and by the long fifth article of pereopod 5 being three times longer than article 4.

A. cyclops Walker (1904), variety, *A. cyclops cyclops* Walker, *A. cyclops iyoensis* new com-

bination, and *A. misakiensis* Dahl (1945) differ by the large rostrum with the first antenna inserted posteroventrally to it.

A. chinensis new species is distinguished by the shape of the head, by the dorsal pair of corneal lenses, by the quadrate posteroventral corner on the third pleonal epimeron, and by the long first uropod.

A. maia new species differs by the shape of the head, by the dorsal pair of corneal lenses, by the long first antenna, and by the long first uropod.

A. miharaensis Nagata (1959) differs by the shape of the head, by the dorsal pair of corneal lenses, and by the shape of the dorsal process on the first urosomal segment.

A. honmungensis new species differs by the shape of the head, by the dorsal pair of corneal lenses, and by the anterodistal process on the first peduncular article of antenna 1.

A. brevicornis (Costa) differs by the shape of the head, by the dorsal pair of corneal lenses, by the large posterior lobe on article 4 of pereopod 5, and by the long first uropod.

Genus *Byblis* Boeck

Byblis calisto new species

Plate 11

DIAGNOSIS:

Anterior cephalic margin straight, lower anterior margin oblique to upper margin, ventral cephalic margin blending evenly with the anterior cephalic margin; dorsal and ventral pairs of corneal lenses present, both pairs large, visible laterally, ventral pair occurring at the acute lateral cephalic angle; length of antenna 1 subequal to peduncle of antenna 2, peduncular article 2 2.4 times as long as article 1 (in male article 2 1.7 times as long as article 1) and one half as long as peduncular article 4 of antenna 2 (in male two fifths as long as article 4); antenna 2 extending one half the length of body (in male antenna 2 equal in length to body), peduncular article 4 exceeding peduncle of antenna 1 in length, peduncular article 5 three fourths as long as article 4 (in male peduncular articles 4 and 5 subequal in length); coxa 1 longer than remaining coxae; article 5 of pereopod 1 slightly shorter than article 5 of pereopod 2; article 6 of pereopod 1 1.7 times as long as article 5; article 6 of pereopod 2 1.2 times as long as article 5; ends of fifth articles of pereopods 3 and 4 without posterodistal projections; article 2 of pereopod 4 without a cusp on the posterodistal corner; posterior lobe of article 2 of pereopod 5 extending beyond article 5, article 4 without posterodistal lobe, longer than article 3, article 6 almost twice as long as article 4, longer than article 6, lateral surface of article 5 with scattered spines, article 7 one half as long as article 6; uropod 3 with opposing edges of rami multiserrate; telson cleft about one half of its length.

OTHER CHARACTERS:

Mouthparts like *B. kallarthra* Stebbing (1887); posterior edge of article 2 of pereopod 3 with cusp; distal end of peduncle of uropod 1 with a large lateral spine; uropod 1 extending slightly beyond uropod 2.

HOLOTYPE:

Female, 6.25 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 332, 12°17′00″N, 109°12′15″E, March 7, 1960, 5.0 m, muddy fine sand.

MATERIAL:

Stations 141-Ic (1), 261 (6), 332 (1), 334 (1), 339 (1).

REMARKS:

The telson of the figured female appears to be cleft slightly more than one half of its length whereas the telson figured for another female is cleft less than one half of its length.

RELATIONSHIP:

This new species closely resembles *B. kallarthra* but is distinguished by the slightly longer antenna 1 with longer peduncular article 2, by the shorter coxae 2-4, especially the short broad fourth coxa with the straight ventral edge, by the shorter article 7 of gnathopod 1, by the longer article 7 of pereopod 1, by the shorter article 6 and longer article 7 of pereopod 2, by the shorter fifth articles of pereopods 3 and 4, articles 5 and 6 of pereopod 5 being nearer the same length, and by the difference in setation and spination of the telson.

B. calisto is distinguished from *B. mucronata* Pirlot (1936) by the shorter, broader, and more serrated coxa 3, by the shorter and broader fourth coxa, by the absence of a cusp on the posterodistal corner of article 2 of pereopod 4, by the longer article 5 and by the longer posterior lobe on article 2 of pereopod 5.

B. crenulata Pirlot (1936) differs from *B. calisto* by the shorter peduncular article 2 of antenna 2, by the longer, narrower coxae 2-4, by the shorter article 5 and the shorter posterior lobe on article 2 of pereopod 5, and by the longer first uropod.

B. calisto differs from *B. rhinoceros* Pirlot (1936) by the ventral and anterior cephalic margins blending evenly, by the serrated anterior coxae, by the shorter and broader coxae 2-4, by the longer article 5, and by the longer posterior lobe on article 2 of pereopod 5.

B. daleyi (Giles) as redescribed by Pirlot (1936) differs from *B. calisto* by the longer, narrower coxae 2-4, by the shorter seventh articles of pereopods 1 and 2, by the shorter article 7 and the shorter posterior lobe on article 2 of pereopod 5, and by the less deeply cleft telson.

B. affinis Sars (1895) is distinguished from *B. calisto* by the long first antenna, by the longer, narrower coxae 2-4, by the shorter seventh articles of pereopods 1 and 2, and by the shorter posterior lobe on article 2 and shorter fifth article of pereopod 5.

B. lepta (Giles) (1888) differs from *B. calisto* by the fifth articles of pereopods 1 and 2 being unequal in length.

B. calisto differs from the other species found in Viet Nam, *B. pilosa* new species, *B. febris* new species, and *B. io* new species by the ventral and anterior cephalic margins blending evenly, by the serrated anterior coxae, by the shorter and broader fourth coxa, and by the longer seventh articles of pereopods 1 and 2. It also differs from *B. pilosa* by the absence of a posterodistal projection on the ends of the fifth articles of pereopods 3 and 4, by the longer article 5 and longer posterior lobe on article 2 of pereopod 5, and by the large lateral spine on the distal end of the peduncle of uropod 1. *B. calisto* also lacks the well-marked posterodistal lobe on article 4 of pereopod 5 which is present in *B. febris*. *B. io* differs from *B. calisto* by the presence of a large apical spine on each lobe of the telson.

Byblis febris new species

Plate 12

DIAGNOSIS OF MALE:

Head without rostrum, anterior cephalic margin produced in middle to distinct obtuse point,

anteroventral margin subparallel to dorsal margin, ventral margin sharply set off from anterior margin; dorsal and ventral pairs of corneal lenses present, both pairs visible laterally, ventral pair large, positioned at lateral angle of head; antenna 1 shorter than peduncle of antenna 2, article 2 of peduncle about 1.7 times as long as article 1 and two fifths as long as peduncular article 4 of antenna 2; antenna 2 exceeds body in length, peduncular article 5 slightly shorter than article 4, article 4 longer than peduncle of antenna 1; coxa 1 slightly longer than remaining coxae; fifth articles of pereopods 1 and 2 subequal in length, article 6 1.5 times as long as article 5; pereopods 3 and 4 without posterodistal projections on ends of fifth articles; article 2 of pereopod 4 without cusp on posterodistal corner; hind lobe of article 2 of pereopod 5 extends two thirds of the way along article 5, article 4 with posterodistal corner produced into a lobe, longer than article 3, article 5 longer than article 4, slightly longer than article 6, article 7 one half as long as article 6; uropod 3 with opposing edges of rami multiserrate; telson cleft slightly less than one fourth of its length.

OTHER CHARACTERS:

Mouthparts like those figured for *B. pilosa* new species except article 3 of mandibular palp one half as long as article 2, the lacinia mobilis is similar to the primary cutting edge on the right mandible and more platelike with smaller, more numerous teeth on the left mandible, and the inner and outer plates of the maxilliped reach slightly beyond palp articles 1 and 2, respectively; gnathopods 1 and 2 similar to those figured for *B. pilosa* except article 7 of gnathopod 1 two fifths as long as article 6, article 6 four fifths as long as article 5; large lateral spine on distal end of peduncle of uropod 1; uropods 1 and 2 end evenly, extending one half way along rami of uropod 3.

FEMALE:

Unknown.

HOLOTYPE:

Male, 9.3 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 289, 12°10′40″N, 109°18′00″E, March 25, 1960, 18.0 m, fine gray sand.

MATERIAL:

Station 289 (1).

RELATIONSHIP:

This species closely resembles *B. gaimardi* (Krøyer) as in Sars (1895) but is distinguished from both *B. gaimardi* and *B. longicornis* Sars (1895) by the shorter first antenna and by the more deeply cleft telson.

B. febris also resembles *B. rhinoceros* Pirlot (1936) but is distinguished by the shorter first antenna, by pereopod 5 with a longer posterior lobe on article 2, with a posterior lobe on article 4, and with a longer fifth article, by the less deeply cleft telson, and by the first and second uropods ending evenly.

B. crenulata Pirlot (1936) differs from *B. febris* by the anterior and ventral cephalic margins blending evenly, by the shorter peduncular article 2 of antenna 1, by the first and second uropods ending unevenly, and by the more deeply cleft telson.

B. febris differs from *B. mucronata* Pirlot (1936) by the shorter first antenna, by the absence

of a cusp on the posterodistal corner of article 2 of pereopod 4, and by the first and second uropods ending evenly.

B. daleyi (Giles), as redescribed by Pirlot (1936), differs from *B. febris* by the longer peduncular article 2 of antenna 1, by the straight anterior cephalic margin, by the posterodistal projections on the ends of the fifth articles of pereopods 3 and 4, and by the more deeply cleft telson.

B. lepta (Giles) (1888) differs from *B. febris* by the unequal fifth articles of pereopods 1 and 2.

B. febris is distinguished from *B. kallarthra* Stebbing (1887) by the obtuse point on the anterior cephalic margin, by the shorter first and second uropods, and by the less deeply cleft telson.

B. pilosa is distinguished from *B. febris* by the longer first and second uropods, by the absence of a distolateral spine on the peduncle of uropod 1, by the posterodistal projections on the ends of the fifth articles of pereopods 3 and 4, and by the more deeply cleft telson.

B. febris is distinguished from *B. calisto* new species by the obtuse point on the anterior cephalic margin, by the anterior and ventral cephalic margins being sharply offset, by the shorter seventh articles of pereopods 1 and 2, by the nonserrate coxae 1-3, by the longer, narrower fourth coxa, and by the less deeply cleft telson.

B. io new species is distinguished from *B. febris* by the straight anterior cephalic margin, by the longer peduncular article 2 of antenna 1, and by the more deeply cleft telson.

Byblis io new species

Plate 13

DIAGNOSIS (sex unknown):

Anterior cephalic margin straight, ventral anterior margin oblique to dorsal cephalic margin, ventral cephalic margin sharply set off from anterior margin; dorsal and ventral pairs of corneal lenses present, both pairs large, visible laterally, ventral pair positioned at lateral cephalic angle; antenna 1 shorter than peduncle of antenna 2, peduncular article 2 more than three times as long as article 1 and two fifths as long as peduncular article 4 of antenna 2; antenna 2 exceeds body in length, peduncular article 5 slightly shorter than article 4, article 4 longer than peduncle of antenna 1; coxae 2 and 3 slightly shorter than coxa 1; fifth articles of pereopods 1 and 2 subequal in length, sixth articles 1.5 times as long as fifth articles; pereopods 3 and 4 without posterodistal projections on ends of the fifth articles; article 2 of pereopod 4 without cusp on posterodistal corner; posterior lobe of article 2 of pereopod 5 extending almost to end of article 5, article 4 with anterodistal corner produced into a small lobe and posterodistal corner produced into a fairly well-developed lobe, longer than article 3, article 5 longer than articles 4 and 6, article 7 a little more than one half as long as article 6; uropod 3 with opposing edges of rami multiserrate; telson cleft slightly more than one third of its length.

OTHER CHARACTERS:

Mouthparts like *B. gaimardi* Krøyer as in Sars (1895); gnathopods similar to those figured for *B. pilosa* new species; uropods 1 and 3 ending evenly, uropod 2 slightly shorter.

HOLOTYPE:

Sex unknown, 6.0 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 156-II, 12°16′40″N, 109°20′35″E, February 24, 1960, 34.0 m, muddy sand (calcareous).

MATERIAL:

Station 156-II(4) (1).

REMARKS:

The specific name is derived from Greek mythology.

RELATIONSHIP:

This new species closely resembles *B. daleyi* (Giles), as redescribed by Pirlot (1936). It differs from *B. daleyi* by the shape of coxa 4, by the longer, broader posterior lobe of article 2 of pereopod 5, and by the broader telson.

B. io differs from *B. crenulata* Pirlot (1936) by the length of article 2 of antenna 1, by the position of the ventral pair of corneal lenses, by the well set-off anterior and ventral cephalic margins, and by the large lateral spine on the distal end of the peduncle of uropod 1.

B. io differs from *B. rhinoceros* Pirlot (1936) by the straight anterior cephalic margin, by the long peduncular article 2 of antenna 1, by the shape of coxa 4, by the length of pereopod 5, and by the length of article 5 of pereopod 5.

B. io differs from *B. mucronata* Pirlot (1936) by the straight anterior cephalic margin, by the short first antenna, by the absence of a cusp on article 2 of pereopod 4, and by the long posterior lobe on article 2 of pereopod 5.

B. lepta (Giles) (1888) is distinguished from *B. io* by the unequal fifth article of pereopods 1 and 2.

B. calisto new species differs from *B. io* by the slightly shorter peduncular article 2 of antenna 1, by the longer article 5 of pereopod 5, and by the less deeply cleft telson.

B. io differs from *B. pilosa* new species by the straight anterior head margin, by the longer article 2 of the peduncle of antenna 1, by the absence of posterodistal projections on the fifth articles of pereopods 3 and 4, and by the spine on the laterodistal corner of the peduncle of uropod 1.

B. io differs from *B. febris* new species by the straight anterior cephalic margin, by the long peduncular article 2 of antenna 1, by the slightly longer article 5 of pereopod 5, and by the more deeply cleft telson.

B. affinis Sars (1895) differs from *B. io* by the longer first antenna, by the shorter peduncular article 2 of antenna 1, and by the longer posterior lobe on article 2 of pereopod 5.

B. kallarthra Stebbing (1887) differs from *B. io* by the shorter first antenna, by the shorter article 2 of pereopod 1, by the longer article 5 of pereopod 5, by the shorter article 7 of pereopod 5, and by the more deeply cleft telson.

Byblis pilosa new species

Plate 14

DIAGNOSIS OF MALE:

Head with small rostrum, anterior cephalic margin produced in middle to small obtuse point,

lower anterior margin oblique to dorsal cephalic margin, anterior and ventral cephalic margins set off from one another; dorsal and ventral pairs of corneal lenses present, both pairs visible laterally, ventral pair situated at rounded lateral cephalic angle; antenna 1 slightly longer than peduncle of antenna 2, peduncular article 2 1.4 times as long as article 1 and two fifths as long as peduncular article 4 of antenna 2; antenna 2 exceeds body in length, peduncular article 5 slightly longer than article 4, peduncular article 4 exceeds peduncle of antenna 1 in length; coxa 1 slightly longer than the remaining coxae; article 5 of pereopods 1 and 2 subequal in length, article 6 1.7 times as long as article 5; pereopods 3 and 4 with ends of fifth articles produced into distinct posterodistal projections; article 2 of pereopod 4 without cusp on posterodistal corner; posterior lobe of article 2 of pereopod 5 extends one half of the way along article 5, article 4 with posterodistal corner produced into small lobe, longer than article 3, article 5 longer than article 4 and slightly longer than article 6, article 7 slightly more than one half as long as article 6; uropod 3 with opposing edges of rami multiserrate; telson cleft two fifths of its length.

OTHER CHARACTERS:

Pereopods 1 and 2 similar, pereopod 2 longer and more setose; pereopods 3 and 4 with article 6 slightly longer than article 5; distal end of peduncle of uropod 1 without large lateral spine; head of holotype with a scar by the anterodorsal corner of the dorsal corneal lens.

HOLOTYPE:

Male, 7.5 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 275, 12°09′43″N, 109°15′45″E, March 23, 1960, 19.0 m, mud.

MATERIAL:

Stations 275 (1), 297 (9), DN-4 (1).

REMARKS:

The specific name refers to the setose condition of this species.

RELATIONSHIP:

This species closely resembles *B. rhinoceros* Pirlot (1936) but is distinguished by the well-developed posterodistal projections on the ends of the fifth articles of pereopods 3 and 4, by the subequal fifth and sixth articles of pereopods 3 and 4, by the longer, narrower posterior lobe of article 2 of pereopod 5, and by the absence of a large lateral spine on the distal end of the peduncle of uropod 1.

B. pilosa is distinguished from *B. crenulata* Pirlot (1936) by the longer peduncle of the first antenna, by the subequal fourth and fifth peduncular articles of antenna 2, by the more distinct posterodistal projections on the ends of the fifth articles of pereopods 3 and 4, by the less distinct posterodistal lobe on article 4 of pereopod 5, and by the absence of a large lateral spine on the distal end of the peduncle of uropod 1.

B. daleyi (Giles), as redescribed by Pirlot (1936), differs from *B. pilosa* by the less distinct posterodistal projections on the ends of the fifth articles of pereopods 3 and 4, by the shorter sixth articles of pereopods 3 and 4, by the large lateral spine on the distal end of the peduncle of uropod 1, and by the telson cleft less than one third of its length.

B. pilosa differs from *B. mucronata* Pirlot (1936) by the shorter peduncle of the first antenna, by the shorter first antenna, by the distinct posterodistal projections on the ends of the fifth articles

of pereopods 3 and 4, by the longer sixth articles of pereopods 3 and 4, by the absence of a cusp on the posterodistal corner of article 2 of pereopod 4, and by the absence of a large lateral spine on the distal end of the peduncle of uropod 1.

B. lepta (Giles) (1888) differs from *B. pilosa* by the unequal fifth articles of pereopods 1 and 2.

B. kallarthra Stebbing (1887) differs from *B. pilosa* by the absence of posterodistal projections on the ends of the fifth articles of pereopods 3 and 4, by the shorter sixth articles of pereopods 3 and 4, by the longer posterior lobe of article 2 of pereopod 5, by the large lateral spine on the distal end of the peduncle of uropod 1, and by the telson cleft more than one half of its length.

B. pilosa differs from *B. affinis* Sars (1895) by the shorter first antenna, by the shorter peduncular article 2 of the first antenna, by the shorter peduncle of the first antenna, by the peduncular article 4 of antenna 2 being longer than the peduncle of antenna 2, and by the subequal fifth and sixth articles of pereopods 3 and 4.

B. pilosa is distinguished from *B. calisto* new species by the ventral cephalic margin being sharply set off from the anterior cephalic margin, by the unserrated anterior coxae; by the longer coxa 4, by the shorter seventh articles of pereopods 1 and 2, by the longer article 6 and posterodistal projections on the ends of the fifth articles of pereopods 3 and 4, by the shorter article 5 and shorter posterior lobe on article 2 of pereopod 5, and by the absence of a large lateral spine on the distal end of the peduncle of uropod 1.

B. febris new species differs from *B. pilosa* by the absence of posterodistal projections on the ends of the fifth articles of pereopods 3 and 4, by the posterodistal lobe on article 4 of pereopod 5, by the large lateral spine on the distal end of the peduncle of uropod 1, and by the shorter first and second uropods.

B. pilosa differs from *B. io* new species by the obtuse point in the middle of the anterior cephalic margin, by the longer first antenna, by the distinct posterodistal projection on the ends of the fifth articles of pereopods 3 and 4, by the subequal fifth and sixth articles of pereopods 3 and 4, by the absence of a large lateral spine on the distal end of the peduncle of uropod 1, and by the absence of a large apical spine on each lobe of the telson.

Family HAUSTORIIDAE

Genus *Urothoe* Dana

Key to the Genus *Urothoe*

The following species are not described in sufficient detail to enable their incorporation into this key: *Urothoe bairdi* Bate, *Urothoe irrostrata* Dana, *Urothoe pinnata* K. H. Barnard, and *Urothoe serrulidactylus* K. H. Barnard.

J. L. Barnard (1962a) has separated the species of *Urothoe* into four groups based on gnathopodal configurations. The groups are based on the gnathopod types represented by *Urothoe falcata* Schellenberg (1931), *Urothoe elegans* Bate (see Sars 1895), *Urothoe grimaldii* Chevreux (see Chevreux and Fage 1925), and *Urothoe simplignathia* J. L. Barnard (1962a).

1. Gnathopods 1 and 2 similar 2

1. Gnathopods 1 and 2 dissimilar; gnathopod 1 simple, lacking palm; gnathopod 2 with dis-

tinct palm (like *U. falcata*) ..... Key A

2. Gnathopods 1 and 2 subchelate, bearing palms 3
2. Gnathopods 1 and 2 simple, lacking palms ..... *simplignathia*

3. Gnathopods 1 and 2 with short, stout sixth articles expanded into poorly defined palms (like *U. elegans*) ..... Key B
3. Gnathopods 1 and 2 with slender, elongated sixth articles with short, blunt palmar surfaces (like *U. grimaldii*) ..... Key C

Key A

Gnathopods 1 and 2 dissimilar. Gnathopod 1 simple with slender, elongated sixth article lacking a palm. Gnathopod 2 has distinct, often transverse or otherwise rounded palm (like *U. falcata*).

1. Third pleonal epimeron with a large, acute, upturned tooth ..... *falcata*
1. Third pleonal epimeron without a large, acute, upturned tooth 2

2. Coxa 2 broad, acuminately cuspidate anterodistally and posterodistally ..... *cuspis* new species
2. Coxa 2 not acuminate except possibly posterodistally 3

3. Ventral cephalic prolongation acute, eyes present, article 2 of pereopod 3 expanded asymmetrically, with acuminate posterodistal corner, second pleonal epimeron setose ..... *orientalis*
3. Ventral cephalic prolongation rounded, eyes absent, article 2 of pereopod 3 slender, with parallel anterior and posterior edges, second pleonal epimeron naked ..... *rotundifrons*
3. Ventral cephalic prolongation rounded, eyes present, article 2 of pereopod 3 expanded asymmetrically, with blunt posterodistal corner, second pleonal epimeron setose (see Key C) ..... *carda* new species

Key B

Gnathopods 1 and 2 similar with short, stout sixth articles expanded into poorly defined palms (like *U. elegans*).

1. Third pleonal epimeron with a distinct tooth 2
1. Third pleonal epimeron without a distinct tooth 4

2. Eyes present 3
2. Eyes absent ..... *vemae*

3. Pereopod 3, article 5 at least twice as broad as article 4 ..... *dentata*
3. Pereopod 3, article 5 not broader than article 4 ..... *denticulata*

4. Article 5 of pereopod 3 broader than article 4 5
4. Article 5 of pereopod 3 not broader than article 4 7

5. Article 7 of pereopod 3 bearing spines ..... *spinidigitus*
5. Article 7 of pereopod 3 not bearing spines 6

6. Rami of uropod 2 smooth ..... *pulchella*
6. Rami of uropod 2 not smooth (see Key C) ..... *ruber*

7. Eyes present 8
7. Eyes absent ..... *abbreviata*

8. Gnathopods 1 and 2, sixth articles without defining spine 9
8. Gnathopods 1 and 2, sixth articles with defining spines 10

9. Accessory flagellum 6 articulate, second pleonal epimeron strongly setose, gnathopodal palms poorly developed ..... *brevicornis*
9. Accessory flagellum 3 articulate, second pleonal epimeron naked, gnathopodal palms clearly distinct ..... *elegans*

10. Uropod 1, peduncle with numerous short marginal spines ..... *poucheti*
10. Uropod 1, peduncle with a few large spines 11

11. Lateral margin of head below eye strongly advanced forward, coxa 1 armed with distal spines ..... *varvarini*
11. Lateral margin of head below eye straight, coxa 1 nearly naked, with 1 setule ..... *gelasina* new species

KEY C

Gnathopods 1 and 2 are similar, article 6 elongated, slender with a short, blunt palmar surface (like *U. grimaldii*).

1. Article 7 of pereopod 3 bearing spines 2
1. Article 7 of pereopod 3 not bearing spines, often with setae 3

2. Head with a slight rostrum ..... *grimaldii*
2. Head without a rostrum ..... *pestai*

3. Gnathopod 2 slightly chelate, article 2 of pereopod 3 bluntly quadrate ..... *ruber*
3. Gnathopod 2 not chelate, article 2 of pereopod 3 very sharply quadrate ..... *leone*
3. Gnathopod 2 with a slight accessory palm but not chelate, article 2 of pereopod 3 bluntly quadrate ..... *carda* new species

Urothoe carda new species

Plate 15

DIAGNOSIS:

Head with only a slight trace of a rostrum; eyes present; lateral cephalic margin below eye nearly straight; ventral cephalic prolongation blunt; gnathopods 1 and 2 dissimilar, (*U. falcata* type); gnathopod 1 simple, coxa 1 nearly naked; gnathopod 2 subchelate, with accessory palm lacking teeth, no palmar defining spines, coxa 2 somewhat acuminate distally; article 2 of pereopod 3 asymmetrically expanded, posterodistal corner blunt, article 5 broader than article 4, article 7 setose but lacking spines; second pleonal epimeron with a small tooth, setose; third pleonal epimeron produced posteriorly, posterodistal corner blunt, bearing simple setae on ventral margin; uropods 1 and 2 ending evenly; peduncle of uropod 1 with 4 large spines, rami with rows of minute teeth along the entire length; peduncle of uropod 2 with 2 large spines, rami with minute teeth along the entire length.

OTHER CHARACTERS:

Upper lip, lower lip, and maxilla 2 like *U. orientalis* Gurjanova (1951), mandible like *U. orientalis* except second joint with 5 long setae, and the last joint with 5 short marginal spines and with 3 long and 1 short apical spines. Maxilla 1 and maxilliped figured.

HOLOTYPE:

Male, 3.5 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 243, 12°15′45″N, 109°13′40″E, March 16, 1960, 15.0 m, fine brown sand.

MATERIAL:

Stations 217 (1), 229 (1), 243 (3), 250 (1).

REMARKS:

The specific name refers to the pectinate condition of the rami of the first and second uropods.

RELATIONSHIP:

The present species is similar to *U. simplignathia* J. L. Barnard (1962a), *U. leone* Reid (1951), and it is especially close to *U. orientalis* Gurjanova (1951) reported herein.

U. carda has gnathopods which are similar to those of *U. simplignathia* except that gnathopod 2 has an accessory palm. The gnathopods of *U. carda* also resemble those of *U. leone* except that gnathopod 1 is simple and that gnathopod 2 has the accessory palm. The third pereopods of the two species are similar except for the more acute, downward-hooked posterodistal corner of the second article in *U. leone.*

U. carda is very similar to *U. orientalis.* Gnathopod 1 is nearly the same; the coxae of *U. carda* are slightly broader and more rectangular. The second gnathopods are similar except that *U. orientalis* lacks the accessory palm. The third pereopods of both species are similar; *U. carda* has a broader fifth article, and the posterodistal corner is blunter. The ventral cephalic prolongation is blunt whereas it is very acute in *U. orientalis.*

U. carda differs from *U. cuspis* new species by the shape of coxa 2, by the narrower fifth article of pereopod 3, and by the absence of spines on article 7 of pereopod 3. The gnathopods of these two species are similar.

U. spinidigitus Walker (1904) is distinguished from *U. carda* by the subchelate first and second gnathopods and by the spiniferous seventh article of pereopod 3.

U. gelasina new species differs from *U. carda* by the subchelate first gnathopod and by the absence of an accessory palm on the second gnathopod.

Urothoe cuspis new species

Plate 16

DIAGNOSIS:

Head with a very slight rostrum; eyes present; lateral cephalic margin below eye advanced forward; ventral cephalic prolongation with acute cusp; gnathopods 1 and 2 dissimilar, (*U. falcata* type); gnathopod 1 simple, coxa nearly naked; gnathopod 2 subchelate, with accessory palm which has 4 stout teeth, no palmar defining spine, coxa broad, acuminately cusped anterodistally and posterodistally; article 2 of pereopod 3 asymmetrically expanded, with quadrate posterodistal corner, article 5 broader than articles 4 or 6, article 7 with several (3 or 4 in the present material) large, long spines; second pleonal epimeron produced posteriorly with a small tooth, setose; third pleonal epimeron produced posteriorly, posterodistal corner produced into a small tooth, 1 or 2 setae on ventral margin; uropods 1 and 2 ending evenly; peduncle of uropod 1 with a spine on each posterodistal corner and several long setae, both rami smooth; peduncle of uropod 2 with one large spine on the dorsal surface, rami smooth.

OTHER CHARACTERS:

Mouthparts like those figured for *U. orientalis* Gurjanova; maxilla 1 figured.

HOLOTYPE:

Female, 3.75 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 243, 12°15′45″N, 109°13′40″E, March 16, 1960, 15.0 m, fine brown sand.

MATERIAL:

Stations 243 (1), 250 (1), 251 (2).

REMARKS:

The specific name refers to the cuspidate condition of the ventral cephalic prolongation and of the second coxa.

The figured specimen has 3 spines on the left dactyl of pereopod 3 and 4 spines on the right dactyl. The specimen from station 250 has 3 spines on the dactyl of each third pereopod.

RELATIONSHIP:

U. cuspis is distinguished from all other species of *Urothoe* by the acuminately cuspidate second coxa. The dissimilar gnathopods distinguish *U. cuspis* from *U. spinidigitus* Walker (1904) and from *U. gelasina* new species. The broad fifth article and spiniferous dactyl of pereopod 3 distinguish it from *U. orientalis* Gurjanova (1951) and from *U. carda* new species.

Urothoe gelasina new species

Plate 17

DIAGNOSIS:

Head with rostrum; eyes present; lateral cephalic margin below eye straight; ventral cephalic prolongation blunt; gnathopods 1 and 2 similar, (*U. elegans* type); gnathopod 1 with palmar defining spines, coxa rectangular with several small spines; gnathopod 2 with palmar defining spines, coxa somewhat acuminate distally; article 2 of pereopod 3 asymmetrically expanded, posterodistal corner blunt, article 5 not broader than article 4, article 7 without setae or spines; second pleonal epimeron with small tooth, spines on the posterior margin, setose; third pleonal epimeron produced posteriorly, posterodistal corner blunt; uropod 1 exceeding uropod 2 in length, peduncle bearing several large spines, both inner and outer rami with 1 spine; peduncle of uropod 2 bearing a few spines, outer ramus with one spine, inner ramus smooth.

HOLOTYPE:

Female, 3.5 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 258, 12°15′55″N, 109°15′15″E, March 18, 1960, 19.0 m, medium brown sand with shell fragments.

MATERIAL:

Stations 97-II (1), 232-II (2), 243 (12), 250 (1), 258 (2), 259 (1), 260-II (1), 267 (1), 302 (1), 327 (1).

REMARKS:

Several large specimens, appearing to represent large adults, have thinner, more setose gnathopods than the smaller specimens.

RELATIONSHIP:

This species closely resembles *U. brevicornis* Bate as in Chevreux and Fage (1925). It varies from *U. brevicornis* by the longer first antenna, by the two-articulate accessory flagellum, by the distinct rostrum, by the blunt ventral cephalic prolongation, by the shorter, less setose inner plate of maxilla 1, and by the gnathopodal palmar defining spines.

The blunt posterodistal corner of the third pleonal epimeron distinguishes *U. gelasina* from *U. vemae* J. L. Barnard (1962a), from *U. dentata* Schellenberg (1925), and from *U. denticulata* Gurjanova (1951).

The broad fifth article of pereopod 3 distinguishes *U. gelasina* from *U. spinidigitus* Walker (1904), from *U. pulchella* (Costa) as in Chevreux and Fage (1925), and from *U. ruber* Giles as in Pillai (1957).

U. gelasina differs from *U. elegans* Bate as in Gurjanova (1962) and from *U. varvarini* Gurjanova (1962) by the straight lateral cephalic margin and by the blunt ventral cephalic prolongation. *U. gelasina* also differs from *U. elegans* by the gnathopodal palmar defining spine. It differs further from *U. varvarini* by the setose second pleonal epimeron.

U. gelasina differs from *U. poucheti* Chevreux as in Stebbing (1906) by the spines on the peduncle of uropod 1 and on the rami of uropods 1 and 2.

Urothoe orientalis Gurjanova

Plate 18

Urothoe orientalis Gurjanova 1951: 354-356, figs. 211a-211b; Gurjanova 1962: 428.

DESCRIPTION:

Head with slight rostrum; eyes present; lateral cephalic margin below the eye advanced slightly forward; ventral cephalic prolongation acute; gnathopods 1 and 2 dissimilar, (*U. falcata* type); gnathopod 1 simple, coxa naked; gnathopod 2 subchelate, palm without defining spines, coxa slightly acuminate posterodistally; article 2 of pereopod 3 expanded asymmetrically with acuminate posterodistal corner, article 5 not broader than article 4, article 7 with setae but not bearing spines; second pleonal epimeron setose; third pleonal epimeron produced posteriorly, posterodistal corner blunt; uropod 1 exceeding uropod 2 in length, peduncle with large spines, outer ramus with 2 spines, inner ramus without spines; peduncle of uropod 2 with large spines, outer ramus with 2 spines, inner ramus lacking spines.

MATERIAL:

Stations 229 (1), 232 (1), 254 (1), 305 (1).

DISTRIBUTION:

Sea of Okhotsk and Sea of Japan.

REMARKS:

The present specimens differ from Gurjanova's drawings by the presence of spines on the outer ramus of uropods 1 and 2. The figured female specimen has the posterodistal corner of ar-

ticle 2 of pereopod 3 acutely hooked distally, but the figured male specimen lacks this exaggerated condition and agrees with Gurjanova's drawings.

Urothoe spinidigitus Walker

Plate 19

Urothoe spinidigitus Walker 1904: 245-246, pl. I, fig. 9.

DESCRIPTION:

Head with slight rostrum; eyes present; lateral cephalic margin below eye advanced slightly forward; lateral cephalic prolongation blunt; gnathopods 1 and 2 similar, subchelate, (*U. elegans* type); gnathopod 1 with 1 palmar defining spine, coxa rectangular, naked; gnathopod 2 with 1 palmar defining spine, coxa nearly rectangular, slightly acuminate posterodistally, posterodistal corner with several small spines; pereopod 3 article 2 asymmetrically expanded with posterodistal corner blunt, article 5 broader than article 4, article 7 bearing 4 short and 4 long spines; second pleonal epimeron setose, produced posteriorly, posterodistal corner blunt; uropod 1 slightly exceeding uropod 2 in length, peduncle with large spines, rami smooth; uropod 2 peduncle with large spines, rami smooth.

MATERIAL:

Stations 51 (2), 242 (2), 250 (1), 251 (1), 260-II (3), 266 (2), 305 (1).

DISTRIBUTION:

Cheval Paar.

REMARKS:

The present specimens differ in several respects from Walker's description. Walker describes all three pleonal epimera as being rounded posteroventrally whereas in the present material the second pleonal epimeron has a small tooth. Coxae 1-4 differ from Walker's description by not being overly small, by coxa 1 not being acutely angular in front, by coxa 2 being slightly expanded distally with several small spines on the posterodistal corner, and by coxae 3 and 4 not being irregularly oblong. Article 5 of gnathopod 2 is not subequal but considerably shorter in length than article 6. Article 5 of pereopod 1 has more than 4 spines. Article 2 of pereopod 3 has a quadrate posterodistal corner, and the position of spines on article 7 is different. Article 2 of pereopod 4 has a more setose posterior margin, and the relative lengths of articles 4, 5, and 6 are somewhat different from that described by Walker. Article 2 of pereopod 5 is not twice as long as broad.

Family LEUCOTHOIDAE

Genus *Leucothoe* Leach

Leucothoe alcyone new species

Plate 20

DIAGNOSIS:

Rostrum short, extending two sevenths of the way along peduncular article 1 of antenna 1; article 3 of mandibular palp two fifths as long as article 2; posteroproximal edge of coxa 4 oblique, nearly straight; anterior edge of article 5 of gnathopod 1 two thirds as long as article 6, article 7 less than one fifth as long as article 6; palm of gnathopod 2 with 2 small projections near the

dactylar hinge, palm defined by a stout tooth; third pleonal epimeron with an acute, upturned, bifid tooth with a sinus located dorsally; telson twice as long as broad.

OTHER CHARACTERS:

Mouthparts are generally like those of *Leucothoe spinicarpa* (Abildgaard) as in Sars (1895) except that the mandibular palp is shorter in *L. alcyone,* the outer plate of maxilla 1 has 7 spines, maxilla 2 is less setose than in *L. spinicarpa,* the inner lobes of the maxilliped are slightly longer, the outer plate and lateral edge of the first palp article of the maxilliped are less setose than in *L. spinicarpa;* uropod 3 is unknown.

HOLOTYPE:

Male, 3.0 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 1, 12°12′50″N, 109°12′45″E, January 4, 1960, 15.0 m, mud (Foraminifera).

MATERIAL:

Station 1 (3).

REMARKS:

The specific name is derived from Greek mythology.

RELATIONSHIP:

The species of *Leucothoe* are difficult to distinguish; however, *L. alcyone* is distinguished from all other species by the bifid tooth on the posterodistal corner of the third pleonal epimeron.

Leucothoe furina (Savigny)

Plate 21

Leucothoe hornelli Walker 1904: 258-259, pl. 3, figs. 17.

Leucothoe furina (Savigny).—Cecchini 1929: 771-773; K. H. Barnard 1931: 120; K. H. Barnard 1937: 152; Pirlot 1936: 294; Ruffo 1938: 156.

MATERIAL:

Station 324 (1).

DISTRIBUTION:

Red Sea, Suez, South Arabian Coast, Ceylon, Maldives, East Indies, Australia, Gambier Archipelago.

Family LILJEBORGIIDAE

Genus *Idunella* Sars

Key to the Genus *Idunella*

1. Peduncular articles 4 and 5 of antenna 2 spinose ..... *pauli* new species
1. Peduncular articles 4 and 5 of antenna 2 not spinose 2
2. Antenna 1 much longer than peduncle of antenna 2 3
2. Antenna 1 subequal in length to peduncle of antenna 2 or shorter 4
3. Second pleonal segment with minute dorsal teeth; outer ramus of uropod 3 almost as long as inner ramus ..... *aequicornis*

3. Second, fourth, and fifth pleonal segments with minute dorsal teeth; outer ramus of uropod 3 much shorter than inner ramus ..... *chilkensis*

4. Outer ramus of uropod 3 much shorter than inner ramus ..... *serra* new species

4. Outer ramus of uropod 3 as long as inner ramus 5

5. Palm of gnathopod 1, in male and female, subparallel to dorsal margin of article 6..... *longirostris*

5. Palm of gnathopod 1, in male and female, not subparallel to dorsal margin of article 6 ..... *janisae* new species

Idunella janisae new species

Plate 22

DIAGNOSIS:

Antenna 1 subequal in length to the peduncle of antenna 2; peduncular articles 4 and 5 of antenna 2 not spinose; palm of gnathopod 1 not subparallel to dorsal margin of article 6; article 7 of first male gnathopod fitting palm; posterior edge of third pleonal epimeron bisinuate, posterodistal corner with a tooth; second pleonal segment with several minute dorsal teeth, segments 4 and 5 each with a single dorsal tooth; outer ramus of uropod 3 subequal in length to inner ramus.

HOLOTYPE:

Female, 4.75 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 245, 12°17′25″N, 109°14′03″E, March 16, 1960, 11.0 m, muddy sand (calcareous).

MATERIAL:

Stations 245 (1), 303 (1).

RELATIONSHIP:

I. janisae most closely resembles *I. longirostris* (Chevreux) (1920). *I. janisae* differs by the numerous dorsal teeth on the second pleonal segment and by the first gnathopodal palm being oblique to the dorsal margin of article 6.

I. janisae is distinguished from *I. chilkensis* Chilton (1921) and *I. serra* new species by the subequal rami of uropod 3.

I. janisae differs from *I. pauli* new species by the nonspinose fourth and fifth peduncular articles of antenna 2, and by the dorsal teeth on the pleonal segments.

I. aequicornis (Sars) (1895) differs from *I. janisae* by the first and second antennae being subequal in length.

Idunella pauli new species

Plate 23

DIAGNOSIS:

Antenna 1 subequal in length to peduncle of antenna 2; peduncular articles 4 and 5 of antenna 2 spinose; palm of gnathopod 1 not subparallel to dorsal margin of article 6; article 7 of first male gnathopod fitting palm; pleonal segments lack dorsal teeth; posterior edge of third pleonal epimeron broadly bisinuate, posteroventral corner with a small tooth; outer ramus of uropod 3 subequal in length to inner ramus.

HOLOTYPE:

Female, 4.5 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 229, 12°15′23″N, 109°14′35″E, March 8, 1960, 15.0 m, fine brown sand.

MATERIAL:

Stations 184 (?1), 211 (1), 212 (1), 225 (1), 229 (2), 234 (1), 250 (1), 299 (1).

RELATIONSHIP:

This species is unique because of its spinose fourth and fifth peduncular articles of antenna 2.

It is easily distinguished from all other species in the genus, *I. chilkensis* Chilton (1921), *I. aequicornis* (Sars) (1895), *I. longirostris* (Chevreux) (1920), *I. janisae* new species, and *I. serra* new species by the spinose fourth and fifth peduncular articles of antenna 2, and also by the absence of dorsal teeth on the pleonal segments. It is not closely related to any one species.

Idunella serra new species

Plate 24

DIAGNOSIS:

Antenna 1 subequal in length to peduncle of antenna 2; peduncular articles 4 and 5 of antenna 2 not spinose; palm of gnathopod 1 not subparallel to dorsal margin of article 6; article 7 of first male gnathopod not fitting palm; pleonal segments 1-5 each with several minute dorsal teeth; posterior edge of third pleonal epimeron convex, posteroventral corner produced into a very small tooth; outer ramus of uropod 3 much shorter than inner ramus.

HOLOTYPE:

Male, 5.0 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 305, 12°11′25″N, 109°17′10″E, March 30, 1960, 13.0 m, fine sand (little muddy).

MATERIAL:

Station 305 (2).

RELATIONSHIP:

I. serra more closely resembles *I. chilkensis* Chilton (1921) than any other species, but *I. serra* differs from *I. chilkensis* by the short first antenna and by the dorsal teeth on pleonal segments 1-5.

I. serra is distinguished from *I. aequicornis* (Sars) (1895), *I. longirostris* (Chevreux) (1920), *I. pauli* new species, and *I. janisae* new species by the short outer ramus of the third uropod and by the absence of a well-developed tooth on the posteroventral corner of the third pleonal epimeron.

Family OEDICEROTIDAE

Genus *Oediceroides* Stebbing

Oediceroides ornithorhynchus Pirlot

Plate 25

Oediceroides ornithorhynchus Pirlot 1932: 93-98, figs. 31-33.

MATERIAL:

Station 251 (1).

DISTRIBUTION:

Flores Sea.

REMARKS:

The present specimen agrees with Pirlot's figures except for the rostrum which has two small cystlike structures. A cyst is located on the anterolateral margin on each side of the rostral tip posterior to the beak. The structures are similar to those described for *Oediceroides cystifera* Schellenberg (1931). It is possible that this is a good specific character and that the present specimen represents a new species, but it should be retained in *O. ornithorhynchus* until it can be determined whether or not the structures are present in Pirlot's original material. The cysts are light in color and could be overlooked easily.

Genus *Synchelidium* Sars

Synchelidium miraculum new species

Plate 26

DIAGNOSIS:

Rostrum acute, deflexed perpendicularly, extending over peduncular article 1 of antenna 1; eyes large, situated in anterodorsal corner of head; antenna 1 subequal in length to peduncle of antenna 2, article 2 1.2 times as long as article 1, article 3 two fifths as long as article 1 (in male article 2 three fifths as long as article 1, article 3 one fifth as long as article 1); peduncular article 5 of antenna 2 1.4 times as long as article 4 (antenna 2 of male longer than in female, article 5 1.6 times as long as article 4); gnathopod 1 with oblique palm departing 60° from a line perpendicular to axis of appendage, article 5 with small posterior lobe; article 6 of gnathopod 2 slightly exceeding article 2 in length, article 7 one fifth as long as article 6; article 7 of pereopods 1 and 2 more than one half as long as article 6; article 2 of pereopods 3 and 4 more than one half as broad as long, distal end of article 4 twice as broad as article 5; article 2 of pereopod 5 with posterior lobe exceeding article 3 by about the width of article 3; third pleonal epimeron rounded posterodistally; telson slightly emarginate, unarmed.

HOLOTYPE:

Female, 5.0 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 266, 12°08′00″N, 109°13′30″E, March 21, 1960, 14.0 m, fine gray sand.

MATERIAL:

Stations 222 (1), 236 (1), 250 (3), 265 (1), 266 (4), 269 (1), 305 (1), 327 (1).

RELATIONSHIP:

This new species is distinguished from all other species of *Synchelidium,* except *S. longidigitatum* Ruffo (1947), by the long dactyls of pereopods 1 and 2. It is distinguished from *S. longidigitatum* by the distinct posterior lobe on article 2 of pereopod 5, the longer and more inflated fourth articles of pereopods 1-4, the shorter fifth article of pereopod 4, and the unarmed telson.

Oedicerotidae Genus species

Plate 27

DISCUSSION:

This specimen probably represents a new genus of the family Oedicerotidae. It has been completely figured, but it has been left unnamed because only a single specimen exists and because there are several questionable points concerning the mouthparts. Unfortunately the lower lip was damaged during dissection so that the condition of the inner lobes is unknown. Apparently, the mandibular molar is absent. It is not clear whether or not the palp of the first maxilla is uni- or biarticulate, and it also is not clear whether or not the inner plate of the maxilliped exists. The third uropod is unknown.

This specimen is distinguished from *Arrhis* Stebbing, *Bathymedon* Sars, *Carolobatea* Stebbing, *Oediceroides* Stebbing, *Oediceropsis* Liljeborg, *Oediceros* Krøyer, *Paroediceros* Sars, *Pontocrates* Boeck, *Synchelidium* Sars, and *Westwoodilla* Bate, all in Stebbing (1906), *Anoediceros* Pirlot (1932), *Bathyporeiapus* Schellenberg (1931), *Lopiceros* J. L. Barnard (1961), *Methalimedon* Schellenberg (1931), and *Parhalimedon* Chevreux (1906) by the subchelate first and second gnathopods with oblique palms, by the long sixth article, and by the long lobe on the fifth article guarding article 6. It is apparently distinguished from the remaining genera, *Acanthostepheia* Boeck, *Aceroides* Sars, *Exoediceros* Stebbing, *Gulbarentsia* Stebbing, *Halicreion* Boeck, *Monoculodes* Stimpson, *Monoculopsis* Sars, *Perioculodes* Sars, all in Stebbing (1906), *Arrhinopsis* Stappers (1911), *Exoediceropsis* Schellenberg (1931), *Metoediceros* Schellenberg (1931), *Oedicerina* Stephensen (1931), *Paraperioculodes* K. H. Barnard (1932), *Paroediceroides* Schellenberg (1931), and *Perioculopsis* Schellenberg (1931) by the somewhat projecting but untoothed primary mandibular plate and by the apparent absence of a mandibular molar.

MATERIAL:

Station 267 (1).

Family GAMMARIDAE

Genus *Eriopisa* Stebbing

Eriopisa elongata (Bruzelius)

Eriopisa elongata (Bruzelius). — Della Valle 1893: 706, pl. 38, figs. 17-30, pl. 60, fig. 5; Sars 1895: 515-516, pl. 181, fig. 2; Stebbing 1906: 411; Gurjanova 1951: 744-745, fig. 514; (see Stebbing [1906] for synonymy).

MATERIAL:

Stations 8 (1), 58 (1), 70 (2), 83 (1), 90-I (2), 100-I (1), 100-II (2), 101-II (1), 102 (1), 106-II (1), 109-II (1), 134-I (1), 134-II (2).

DISTRIBUTION:

Arctic Ocean, Barents Sea, North Atlantic Ocean, North Sea, Skagerrak, Kattegat, Mediterranean Sea.

REMARKS:

The present material agrees with the figures in Sars (1895) except that Sars shows accessory gills in his drawings of a male specimen. None of the present material has accessory gills, but several of the females have developing brood plates which have a single, small seta at the tip and

which otherwise, in size and shape, resemble accessory gills. Probably Sars' figures represent a female with rudimentary brood plates.

Genus *Eriopisella* Chevreux
Eriopisella propagatio new species
Plate 28

DIAGNOSIS:

Anteroventral cephalic corner prolonged distally and partially covering gland cone on peduncular article 2 of antenna 2, apex of projection incised, bearing a seta; posterior edge of third pleonal epimeron slightly convex, posteroventral corner with a distinct tooth; telson cleft three fourths of its length.

OTHER CHARACTERS:

Accessory flagellum uniarticulate; eyes apparently absent; article 2 of pereopod 5 slightly inflated, lower posteroventral corner produced into a lobe extending one half of the way along article 3.

HOLOTYPE:

Female, 5.0 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 145-II, 12°07′30″N, 109°16′20″E, February 23, 1960, 35.0 m, fine sand.

MATERIAL:

Stations 39 (1), 79 (1), 134-II (1), 145-II (1), 261 (1), 263 (1), 305 (8), 313 (1), 334 (1).

RELATIONSHIP:

This species is distinguished from the other two species in the genus, *E. pusilla* Chevreux (1920) and *E. sechellensis* (Chevreux) (1901), by the distally prolonged anteroventral corner of the head and by the lobe on the posteroventral corner of article 2 of pereopod 5. *E. propagatio* differs from *E. pusilla* by the tooth on the posteroventral corner of the third pleonal epimeron and from *E. sechellensis* by the apparent absence of eyes.

Genus *Megaluropus* Hoek
Megaluropus agilis Hoek

Megaluropus agilis Hoek.—Walker 1904: 278-279; Chevreux and Fage 1925: 226-227, figs. 236-237; Gurjanova 1951: 745-746, fig. 515; Reid 1951: 236; Pillai 1957: 50-51, fig. X; J. L. Barnard 1963: 223-224, fig. 2.

MATERIAL:

Stations 211 (1), 213 (2), 222 (1), 223 (3), 225 (1), 229 (1), 232-II (2), 234 (1), 242 (2), 251 (5), 252 (2), 254 (1), 256 (1), 257 (10), 260-II (4), 262 (1), 265 (1), 266 (3), 299 (1), unknown station (2).

DISTRIBUTION:

Eastern Atlantic Ocean, Mediterranean Sea, Western Europe, north to Kattegat, Canary Islands, South Africa, Port Said, Travancore, Ceylon, Baja California.

REMARKS:

The present specimens agree in most respects with the descriptions given by both Chevreux and Fage and Pillai. In the material at hand the third coxa is as large or larger than the first coxa in females and smaller than the first coxa in males.

Family ISAEIDAE

Genus *Cheiriphotis* Walker

Cheiriphotis megacheles? (Giles)

Plate 29

Cheiriphotis delloyei Pirlot 1934: 231-235, fig. 100.

Cheiriphotis durbanensis K. H. Barnard 1916: 247-249.

Cheiriphotis megacheles (Giles).—Walker 1904: 284-285, pl. 6, figs. 42; Stebbing 1910: 461; Schellenberg 1926: 383, fig. 65; K. H. Barnard 1937: 167-169, fig. 14; Pirlot 1938: 345; K. H. Barnard 1940: 480; Ruffo 1956: 215; Pillai 1957: 57-58, fig. XV; Nayar 1959: 33-34, pl. XI, figs. 23-25; J. L. Barnard 1962: 17, fig. 4.

Cheiriphotis walkeri Stebbing 1918: 68-69, pl. 12.

Eurystheus monuropus Walker 1909: 340-341, pl. 43, fig. 8.

DESCRIPTION OF MALE:

Head with short rostrum, anterolateral head angle produced about one third of the way along peduncular article 3 of antenna 2; antennae 1 and 2 subequal in length; peduncle of antennae 1 and 2 subequal in length; peduncular article 1 of antenna 1 three fourths as long as article 2, subequal in length to article 3, accessory flagellum long, as long as first three articles of the flagellum; peduncular article 4 of antenna 2 slightly longer than article 5; coxae short; gnathopod 1, article 2, subequal in length to article 5, article 6 four fifths as long as article 5, dactyl as long as oblique palm; gnathopod 2, anterior margin of article 2 with a concave groove, article 4 with a small posterodistal lobe, article 6 large, three fourths as broad as long, palm departing 50° from a line perpendicular to the axis of the appendage, bearing 2 large teeth on palm and one large palmar defining tooth; pereopods 1 and 2 similar; pereopod 3, article 2, three fourths as broad as long, slightly narrowing distally, article 4 longer than article 5, shorter than article 6, dactyl curved; pereopod 4, article 2, slightly narrowed distally, two thirds as broad as long, articles 4 and 5 subequal in length, shorter than article 6; pereopod 5, article 2, subequal to article 6 in length, with short, rounded posterior lobe, article 4 shorter than article 5; second pleonal epimeron with plumose setae along ventral edge; third pleonal epimeron with posteroventral corner produced posteriorly, without a tooth; rounded posterodorsal corners of pleonal segments 4 and 5 with setae; uropods ending evenly; uropod 1 spinose, 1 spine and setae on lateral posteroventral corner of peduncle, rami subequal in length, three fourths as long as the peduncle; uropod 2 spinose, rami subequal in length, nearly as long as the peduncle; uropod 3 spinose, outer ramus subequal to the peduncle in length, inner ramus bearing one apical and one lateral spine, one fourth as long as outer ramus; telson emarginate, each lateral angle with 2 spines and a seta, 2 lateral setae on each side.

DESCRIPTION OF FEMALE:

Like the male except palm of gnathopod 1 more densely spinose; gnathopod 2 smaller, article 5 two thirds as long as article 6, palm oblique, bearing 1 fairly large spine in the middle of the palm (no teeth), some specimens have a palmar defining tooth.

MATERIAL:

Stations 1 (1), 217 (1), 232-II (3), 233 (3), 242 (1), 252 (2), 257 (3), 261 (2), 262 (1), 263 (3), 266 (1), 267 (1), 284 (1).

DISTRIBUTION:

Known throughout the Indian Ocean from South Africa to Indonesia, from the Red Sea, and from southern California.

REMARKS:

This species has been described under several different generic and specific names. All described species of *Cheiriphotis* are now placed in *C. megacheles* except *Cheiriphotis australiae* Stebbing (1910). *C. megacheles* displays a wide range of variability because the second gnathopods and third uropods vary with age. As age increases in the male, gnathopod 2 develops a more transverse palm with smaller but more numerous teeth. The inner ramus of the third uropod varies from a condition one half as long as the outer ramus in younger specimens to a condition of being absent in older specimens.

The present material has been tentatively identified as *C. megacheles,* and it has been completely described and figured. The material varies most noticeably from the other described material by the longer peduncular article 2 of antenna 1, by coxa 1 not reaching the base of antenna 2, and by the longer sixth articles of pereopods 3 and 5.

The extremes of variability of *Cheiriphotis* are listed in table 4. The table is incomplete in many places because many characters have not been described by earlier workers. Perhaps as specimens from recorded localities are redescribed, and as material from new localities is described, the gaps in the table will be filled in, and a less variable set of characters for the description of the species will emerge.

Genus *Photis* Krøyer

Photis species A

Plate 30

DIAGNOSIS:

Lateral cephalic lobes angular, extending one sixth of the way along peduncular article 3 of antenna 2; peduncular articles 4 and 5 of antenna 2 subequal in length, peduncle twice as long as flagellum; coxa 1 slightly shorter than coxae 3-5, coxa 2 longer than wide; anterior edge of article 5 of gnathopod 1 with 4 large spines, palm excavate, article 7 reaching defining spine, posterior edge of article 7 serrate; article 2 of gnathopod 2 with a well-developed anterodistal lobe bearing stridulation ridges along the anterior edge, palm oblique with a large defining tooth and a smaller accessory tooth, with a process near the dactylar hinge, article 7 shorter than palm, posterior edge of article 7 serrate; pereopods 3 and 4 with a spine on the posteroventral corner of article 6; third pleonal epimeron produced posteriorly, posteroventral corner blunt; outer ramus of uropod 1 slightly shorter than inner ramus, rami shorter than peduncle, serrate, each ramus with a large apical spine; outer ramus of uropod 2 slightly shorter than inner ramus, rami subequal to peduncle in length, serrate, each ramus with a large apical spine; inner ramus of uropod 3 one fourth as long as first article of outer ramus, second article of outer ramus minute.

OTHER CHARACTERS:

Mouthparts like *Photis reinhardi* Krøyer in Sars (1895); outer plate of maxilla 1 with 10

TABLE 4. The range of variability shown by *Cheiriphotis*

Reference	Locality	Peduncle of antenna 1 subequal in length to peduncle of antenna 2	Length of article 2 of antenna 1 compared to length of article 1	Coxa 1 reaching base of antenna 2	Coxae 5-6 with well-marked narrow hind lobes	Second pleonal epimeron with setae along ventral edge	Length of article 6 of male gnathopod 1 compared to article 5	Male gnathopod 2—Angle palm departs from a line perpendicular to axis of appendage	Male gnathopod 2—Angle palm departs from a line parallel to anterior margin of article 6	Number of teeth on palm of male gnathopod 2	Male gnathopod 2—Width of article 6 compared to length	Male gnathopod 2—Lobelike projection on anterodistal corner of article 2	Pereopod 3 article 6 subequal in length to articles 4-5 combined	Pereopod 5 articles 2 and 6 subequal in length	Uropods ending evenly	Length of rami of uropod 1 compared to peduncle	Length of rami of uropod 2 compared to peduncle	Length of inner ramus of uropod 3 compared to outer ramus
australiae																		
1. Stebbing (1910)	Australia	0	1.0	+	0		0.8	55°	45°	2	0.8	0	+	0	+	0.6	1.0	0.25
megacheles																		
2. Schellenberg (1926)	Simons Bay, South Africa						1.0	40°	20°	5	0.7							
3. K. H. Barnard (1916)	Durban Bay, South Africa		1.0				<1.0	55°	50°	3-4	1.0	+				<1.0	<1.0	minute
4. Stebbing (1918)	Natal, South Africa	0	1.1				1.0	35°	−10°	2	1.0	+		0			1.0	0
5. Stebbing (1910)	Bird Island, South Africa																	
6. Walker (1909)	Indian Ocean; Red Sea; British East Africa		>1.0					55°	45°	3	0.7	?+	+		0	<1.0	<1.0	minute
7. K. H. Barnard (1937)	Southern Arabia							**35°**	**25°**	**5**	0.75							0
8. Pillai (1957)	Travancore						1.0	35°	15°	5	0.9	0	+		0	0.6	0.9	0
9. Walker (1904); Ruffo (1956)	Ceylon Madras	+	>1.0				0.9	40° 50°	0° 30°	6 3-4	0.9 0.7	0	+		0	<1.0	<1.0	minute
10. Nayar (1959)	Madras	+	1.1				0.8	45°	35°	?6	0.8	?+			0	<1.0	<1.0	
11. Material reported herein	South China Sea	+	1.5	0	+	+	0.75	50°	55°	3	0.7	0	0	+	+	0.75	0.9	0.25
12. Pirlot (1934)	Flores Sea	0	0.8	+	0	0	0.9	65°	60°	3	0.5	+	+	0	+	0.7	1.0	minute
13. Pirlot (1938)	Aru Island																	
14. J. L. Barnard (1962)	Southern California	0	0.85	+	0	0	0.9	65°	60°	3	0.7	+	+	0	+	0.5	0.65	0.5

+ indicates condition present; 0 indicates condition absent.

spines on the right side and 9 on the left side; antenna 1 unknown; pereopods like *P. reinhardi;* telson unknown.

MATERIAL:

Station 220 (1).

Photis species B

Plate 31

DIAGNOSIS OF FEMALE:

Lateral cephalic lobes extending more than two thirds of the way along article 3 of antenna 2; antenna 1 with minute uniarticulate accessory flagellum, articles 1 and 3 of peduncle subequal in length, article 2 1.5 times as long as article 1, peduncle and flagellum subequal in length; palm of gnathopod 1 oblique, not excavate, defined by a spine, article 7 reaching the end of the palm, posterior edge of article 7 serrate; article 2 of gnathopod 2 with the anteroventral corner produced into a small lobe, palm excavate, defined by a spine, process near dactylar hinge, article 7 reaching the end of the palm, posterior edge of article 7 serrate; other parts like *P.* sp. A except that the inner plate of maxilla 2 has a row of 16 spines on the inner surface (*P.* sp. A has 8) and the outer plate of the maxilliped has 9 teeth (*P.* sp. A has 7); antenna 2, pereopods 3-5, and telson unknown.

MATERIAL:

Stations 233 (1), 327 (1).

REMARKS:

The material at hand has been described, but it has not been named; *P.* sp. B probably represents the female of *P.* sp. A.

The male specimen differs from *P. macrocoxa* Shoemaker (1945) by the more equal size and shape of coxae 1-4, by the spines on the anterior edge of article 5 of gnathopod 1, by the slightly different shape of the palm of gnathopod 1, by the large anteroventral lobe on article 2 of gnathopod 2, by the accessory defining tooth on the palm of gnathopod 2, and by the single undivided process near the dactylar hinge of gnathopod 2. *P.* sp. B differs from *P. macrocoxa* by the anteroventral lobe on article 2 of gnathopod 2 and by the process on the palm near the dactylar hinge.

P. sp. A differs from *P. tenuicornis* Sars (1895) by the spines on the anterior edge of article 5 of gnathopod 1, by the slightly different position of the accessory defining tooth on the palm of gnathopod 2, and by the more proximal position of the process near the dactylar hinge of gnathopod 2. *P.* sp. B differs from *P. tenuicornis* by the excavate palm with the process near the dactylar hinge of gnathopod 2.

P. sp. A is distinguished from *Photis* sp. of Pirlot (1938) by the shorter and more angular lateral cephalic lobes (this may be an age difference because Pirlot's specimen was larger than the present male specimen and the larger female *P.* sp. B agrees with the head shape of Pirlot's specimen), by the spines on the anterior edge of article 5 of gnathopod 1, by the excavate palm of gnathopod 1, by the slightly shorter articles 5-7 of pereopods 1 and 2, by the spine on the posterodistal corner of article 6 of pereopods 3 and 4, and by the shorter second and third pleonal epimera.

P. sp. A differs from *P. hawaiensis* J. L. Barnard (1955) by the smaller and more angular lateral cephalic lobes (the lateral cephalic lobes of *P.* sp. B agree more closely with *P. hawaiensis*), by the spines on the anterior edge of article 5 of gnathopod 1, by the excavate palm of gnathopod 1, by the absence of a setose process on the anterior edge of article 5 of gnathopod 2, by the less

oblique palm of gnathopod 2, by the larger defining tooth and the presence of an accessory defining tooth on the palm of gnathopod 2, and by the shorter article 7 of gnathopod 2. *P.* sp. B differs from *P. hawaiensis* by the slight excavation of the palm of gnathopod 2 behind the process near the dactylar hinge.

P. sp. A differs from *P. dentata* Shoemaker (1945) by the shorter flagellum of antenna 2, by the spines on the anterior edge of article 5 of gnathopod 1, by the excavate palm of gnathopod 1, by the shorter article 7 of gnathopod 1, by the anteroventral lobe on article 2 of gnathopod 2, by the different position of the palmar defining tooth and the presence of an accessory defining tooth on gnathopod 2, by the shorter article 7 of gnathopod 2, and the unproduced first pleonal epimeron. *P.* sp. B differs from *P. dentata* by the anteroventral lobe on article 2 of gnathopod 2 and by the slightly different shape of the palm of gnathopod 2 with the process near the dactylar hinge.

P. sp. A differs from *P. uncinata* K. H. Barnard (1932) by the absence of an anteroventral process on article 2 of gnathopod 1, by the spines on the anterior edge of article 5 of gnathopod 1, by the more excavate palm of gnathopod 1, by the large rounded anteroventral lobe on the palm of gnathopod 2, and by the large palmar defining tooth, by the accessory defining tooth, and by the process near the dactylar hinge of gnathopod 2.

P. sp. A. differs from *P. longimanus* Walker (1904) by the first coxa being longer than wide, by the spines on the anterior edge of article 5 of gnathopod 1, by the excavate palm of gnathopod 1, by the shorter article 7 of gnathopod 1, by the less prominent posterior lobe of article 5 of gnathopod 2, and by the shorter seventh article of gnathopod 2.

P. sp. A differs from *P. africana* Schellenberg (1925) by the spines on the anterior edge of article 5 of gnathopod 1, by the anteroventral lobe of article 2 of gnathopod 2, by the defining tooth and accessory defining tooth on the palm of gnathopod 2, and by the more distal position of the process near the dactylar hinge of gnathopod 2. *P.* sp. B differs from *P. africana* by its anteroventral lobe on article 2 of gnathopod 2 and by the process near the dactylar hinge of gnathopod 2.

P. sp. A differs from *P. longicaudata* (Bate) in Sars (1895) by the spines on the anterior edge of article 5 of gnathopod 1, by the excavate palm of gnathopod 1, and by the large palmar defining tooth and by the accessory defining tooth of gnathopod 2.

The above discussion indicates that the present male specimen differs by only minor characters from several species of *Photis*. However, it cannot positively be identified with any established species, and since there is only one male specimen, it is impossible to determine whether or not it is a new species or merely a developmental state of some established species. Therefore, the status of this male specimen and of the dubious female specimens will have to remain in question until more material from the South China Sea can allow a positive identification.

Family AMPITHOIDAE

Genus *Cymadusa* Savigny

Cymadusa vadosa new species

Plate 32

DIAGNOSIS:

Article 2 of mandibular palp three fourths as long as article 3, 8 spines in spine row; outer plate of maxilla 1 with 10 apical spines; outer plate of maxilliped extends beyond palp article 2, inner plate with 2 apical spines on the proximal corner, article 4 of palp long and narrow, article 2 of

gnathopod 1 bearing a lobe on the anteroventral corner, article 5 shorter than article 6; article 2 of gnathopod 2 bearing a lobe on anteroventral corner, article 7 exceeding distinct palm; posteroventral corner of the third pleonal epimeron quadrate; rami of uropod 3 two thirds as long as peduncle, outer ramus with 2 recurved spines on both right and left sides.

HOLOTYPE:

Male, 8.5 mm, deposited in the University Zoological Museum, Copenhagen, Denmark.

TYPE LOCALITY:

Station 307, 12°11′40″N, 109°17′15″E, March 30, 1960, 4.0 m, fine sand.

MATERIAL:

Station 307 (1).

REMARKS:

The specific name refers to the shallow area in which this species was found.

RELATIONSHIP:

This species is distinguished from *C. filosa* Savigny in Shoemaker (1935), *C. hawaiensis* (Schellenberg) (1938), *C. australis* (K. H. Barnard) (1916), and *C. sardenta* (Oliveira) (1953) by gnathopod 1 with article 5 shorter than article 6.

C. vadosa differs from *C. brevidactyla* (Chevreux) (1908) by gnathopod 2 with the dactyl exceeding the palm, and it differs from *C. variata* (Sheard) (1936) by the symmetrical arrangement of spines on the outer ramus of the third uropods.

C. oceanica J. L. Barnard (1955) has gnathopod 2 with a more transverse palm, the mandibular palp articles 2 and 3 subequal in length, and the maxilliped with the fourth palp article short and the inner plate with one apical spine.

C. vadosa differs from *C. crassicornis* (Costa) in Ruffo (1947a) by gnathopod 2 with article 6 more rectangular and with the palm less oblique, by uropod 3 with the rami two thirds as long as the peduncle, and by the shape of coxa 1.

Family COROPHIIDAE

Genus *Grandidierella* Coutiere

Grandidierella gilesi? Chilton

Plate 33

Grandidierella gilesi Chilton 1921: 552-554, fig. 11; Chilton 1925: 537; K. H. Barnard 1935: 300; Schellenberg 1938: 93; Nayar 1959: 40, pl. XIV, fig. 6.

MATERIAL:

Station 83 (1), 317 (1), 335 (2).

DISTRIBUTION:

Chilka Lake; Tale Sap; Patani Rivers, Siamese Malay States; Tumidalameta Hill, Vizagapstam; Mamumbam Channel, Travancore; Lapinig; Adyar.

REMARKS:

The present specimens have been tentatively identified as *G. gilesi* on the basis of the female gnathopods. None of the specimens have more than the first peduncular article of antenna 1 or the

first three peduncular articles of antenna 2. The gnathopods of the single male specimen are missing.

The present female gnathopods are similar to Chilton's description and figure except that the sixth articles of both gnathopods 1 and 2 are longer, and the distal portion of article 6 of gnathopod 1 has a small lobe similar to the one found on gnathopod 2. No other described species appears to have female gnathopods similar to *G. gilesi.* The female gnathopods of *G. macronyx* K. H. Barnard (1935) are unknown.

The inner plate of the maxilliped differs from the type species *G. mahafalensis* Coutiere (1904). *G. gilesi* has 2 spines on the anteroproximal corner while *G. mahafalensis* has one spine on the corner and one set in one fourth of the breadth of the plate. The single ramus of uropod 3 has a minute second article.

SUMMARY

One hundred and six of more than 360 grab and dredge samples collected in the Bay of Nhatrang contain amphipods. Thirty-four species are reported, 20 for the first time, 3 species are described but not named, and 5 specimens are unidentifiable.

The specimens are all benthic forms from shallow water. The depths of positive amphipod stations range from 3.5 meters to 43.0 meters, with the majority of stations less than 20.0 meters.

The density of amphipods in the bay is very low. In terms of the total area sampled, amphipods show a density of 7.5 specimens per square meter; in terms of the total area of positive samples, the density is 31 specimens per square meter. The latter density is equivalent to 3 specimens per positive sample whereas Pirlot (1936, 1938) had an average of 9 specimens per sample in his littoral amphipods from the East Indies. Only 8 species are represented by numerous specimens, *Ampelisca brevicornis* (Costa) (21), *Ampelisca cyclops* Walker (32), *Cheiriphotis megacheles?* (Giles) (23), *Eriopisa elongata* (Bruzelius) (17), *Eriopisella propagatio* new species (16), *Megaluropus agilis* Hoek (48), *Synchelidium miraculum* new species (19), and *Urothoe gelasina* new species (23). The remaining species are represented by less than 15 specimens each, and many are represented by a single specimen.

The high percentage of new species in the collection not only indicates the absence of previous taxonomic work in the South China Sea, but it also demonstrates the tendency toward subgeneric differentiation which many of the species show. In most of the established species reported herein, morphological characters are somewhat more extreme than have been previously reported.

Cheiriphotis megacheles? (Giles) a species with a wide existing range of variability, exhibits even greater variability in the present material than previously shown. The most noticeable differences in *Cheiriphotos megacheles* are those of the comparative lengths of the first two articles of antenna 1, of articles 3, 4 and 5 of pereopod 3, and of articles 2 and 6 of pereopod 5. Also, coxa 1 does not reach the base of antenna 2 as it does in other material.

Lepidepecreum, a cold-water genus with body ornamentation, is represented in the South China Sea by a new species lacking any keels or teeth. The only distinctive character of *Lepidepecreum* ornamentation which *L. nudum* new species has retained is the produced first peduncular article of the first antenna.

In *Ampelisca* and *Urothoe* the established species reported herein exhibit greater variation in cephalic, coxal, and epimeral shapes, in eye position, in antennal relationships, and in setation and spination of the appendages than is shown by specimens reported from other areas.

Most of the previously known species reported herein are found in adjacent northern and tropical western waters and not in the tropical eastern or southern waters. *Leucothoe furina* (Savigny) is the only species which has been found in the eastern Pacific and it is found throughout Indonesia, the Indian Ocean and the Red Sea as well. *Ampelisca brevicornis* (Costa), *Cheiriphotis megacheles* (Giles), *Lysianassa cinghalensis* (Stebbing), and *Megaluropus agilis* Hoek are all found in the Red Sea and in the Indian Ocean. *Ampelisca cyclops cyclops* Walker and *Grandidierella gilesi* Chilton are found in the Indian Ocean and Indonesia. *Ampelisca spinidigitus* Walker is found in the Indian Ocean. *Oediceroides ornithorhynchus* Pirlot is also found in Indonesia.

Ampelisca bocki Dahl, *Ampelisca cyclops iyoensis* new combination, *Ampelisca miharaensis* Nagata, *Ampelisca misakiensis* Dahl, and *Urothoe orientalis* Gurjanova are found in Japanese

waters as well as in the South China Sea. *Ampelisca cyclops cyclops* from the western waters and *Ampelisca cyclops iyoensis* from Japanese waters occur together in the Bay of Nhatrang and show evidence of hybridization.

It is strange, since the Indian Ocean and the South China Sea are effectively separated by land barriers and distance, that so many species are found in both seas, but most of the species have not been found in Indonesia. Perhaps this reflects the relative amount of work that has been done in the two areas. It is also strange that so many species are found in the South China Sea and in colder Japanese waters but again they are not found in the more proximal, warmer Indonesian waters. Since three of the species found in Japan and recorded in the South China Sea have been described within the last few years, further investigations will probably extend the ranges of these species, as well as the ranges of many of others.

More investigation of the amphipod fauna of the South China Sea and adjacent waters is necessary before many of the problems suggested in the present material can be resolved. More specimens are needed for many of the species before degrees of variation can be established and subgenera and subspecies erected. Surveys of surrounding areas are necessary to establish distribution patterns.

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APPENDIX

Indo-Pacific distribution of gammaridean Amphipoda compiled from the literature:

1 = Red Sea;
2 = East Africa;
3 = Arabian Sea; India, Bay of Bengal;
4 = Indonesia and North Australia;
5 = Pacific Ocean (Micronesia, Polynesia, Hawaiian Islands);
6 = South China Sea;
7 = Japan

The list is restricted to the genera found in the Bay of Nhatrang and to records of 200 meters or less

Species	1	2	3	4	5	6	7
Ampelisca australis					X		
Ampelisca birulai							X
Ampelisca bocki						X	X
Ampelisca brachyceras			X				
Ampelisca brevicornis	X	X	X			X	
Ampelisca chinensis n. sp.						X	
Ampelisca cyclops cyclops		X	X	X		X	
Ampelisca cyclops iyoensis n. comb.						X	X
Ampelisca daleyi			X				
Ampelisca eschrichti							X
Ampelisca furcigera							X
Ampelisca honmungensis n. sp.						X	
*(Ampelisca japonica)**							X
Ampelisca lunata					X		
Ampelisca macrocephala							X
Ampelisca maia n. sp.						X	
Ampelisca miharaensis						X	X
Ampelisca misakiensis						X	X
Ampelisca naikaiensis							X
Ampelisca orops n. sp.						X	
Ampelisca pusilla			X				
Ampelisca pygmaea					X		
Ampelisca scabripes		X	X				
Ampelisca subbrevicornis				X			
Ampelisca tenuicornis		X					
Ampelisca tridens			X	X			
Ampelisca zamboangae	X		X	X			
Byblis calisto n. sp.						X	
Byblis crenulata				X			
Byblis daleyi of Pirlot (1936)				X			
Byblis febris n. sp.						X	
Byblis gaimardi							X
Byblis io n. sp.						X	
Byblis japonicus							X
Byblis kallarthra				X			
Byblis lepta		X	X				

* Species in parentheses are dubious.

APPENDIX (Continued)

Species	1	2	3	4	5	6	7
Byblis longicornis							X
Byblis mucronata				X			
Byblis pilosa n. sp.						X	
Byblis rhinoceros				X			
Cheiriphotis megacheles		X	X	X		?X	
Cymadusa brevidactyla				X	X		
Cymadusa filosa	X	X	X	X	X		
Cymadusa hawaiensis					X		
Cymadusa oceanica					X		
Cymadusa vadosa n. sp.						X	
Eriopisa chilkensis			X				
Eriopisa elongata						X	
Eriopisella propagatio n. sp.						X	
Eriopisella sechellensis	X		X				
Grandidierella bispinosa					X		
Grandidierella bonnieri			X				
Grandidierella gilesi			X	X		?X	
Grandidierella gravipes			X				
Grandidierella japonica							X
Grandidierella macronyx			X				
Grandidierella mahafalensis		X					
Grandidierella megnae			X				
Grandidierella perlata					X		
Idunella chilkensis			X				
Idunella janisae n. sp.						X	
Idunella pauli n. sp.						X	
Idunella serra n. sp.						X	
Lepidepecreum annulatum							X
Lepidepecreum comatum							X
Lepidepecreum eoum							X
Lepidepecreum nudum n. sp.					X		
Leucothoe acanthopus	X						
Leucothoe alcyone n. sp.						X	
Leucothoe brevidigitata				X			
(Leucothoe crassimana)	X						
Leucothoe furina	X	X	X	X	X	X	
Leucothoe n. sp. to be described by J. L. Barnard					X		
Leucothoe minuscula					X		
Leucothoe n. sp. to be described by J. L. Barnard					X		
Leucothoe spinicarpa	X	X	X	X			
Leucothoe stegoceras	X		X				
(Leucothoe stylifera)							X
Leucothoe tridens?				X	X		
Lysianassa coelochir		X	X				
Lysianassa ceratina	X	X					

APPENDIX (Continued)

Species	1	2	3	4	5	6	7
Lysianassa cinghalensis	X	X	X			X	
Megaluropus agilis	X		X			X	
Oediceroides ornithorhynchus				X		X	
Photis digitata			X				
Photis distinguenda		X					
Photis dolichommata		X		?X			
Photis geniculata			X				
Photis hawaiensis					X		
Photis lamellifera	X						
Photis longicaudata	X	X	X				
Photis longimanus			X				
Photis nana			X				
Photis producta							X
Photis reinhardi							X
Photis species A, reported herein						X	
Photis species B, reported herein						X	
Socarnes bidenticulatus							X
Socarnes dissimulantia n. sp.						X	
Socarnes vahli							X
Synchelidium brevicarpum			X				
Synchelidium haplocheles			X				
Synchelidium miraculum n. sp.						X	
Urothoe carda n. sp.						X	
Urothoe cuspis n. sp.						X	
Urothoe elegans	X						
Urothoe gelasina n. sp.						X	
(Urothoe irrostrata)	X						
Urothoe orientalis						X	X
Urothoe pestai	X						
Urothoe spinidigitus			X			X	
Urothoe ruber			X				

PLATE 1

Lepidepecreum nudum new species, Holotype, Male, 10.0 mm, Station 256. A. Lateral view. B. Ventral view of epistome-upper-lip complex. C. Left mandible. D. Right mandible. E. Lower lip. F, G. Maxillae 1, 2. H. Maxilliped. I. Peduncle of antenna 2. J, K. Gnathopods 1, 2. L, M, N. Uropods 1, 2, 3. O. Telson.

Note: a zigzag mark at the end of an appendage indicates that the rest of the appendage was absent.

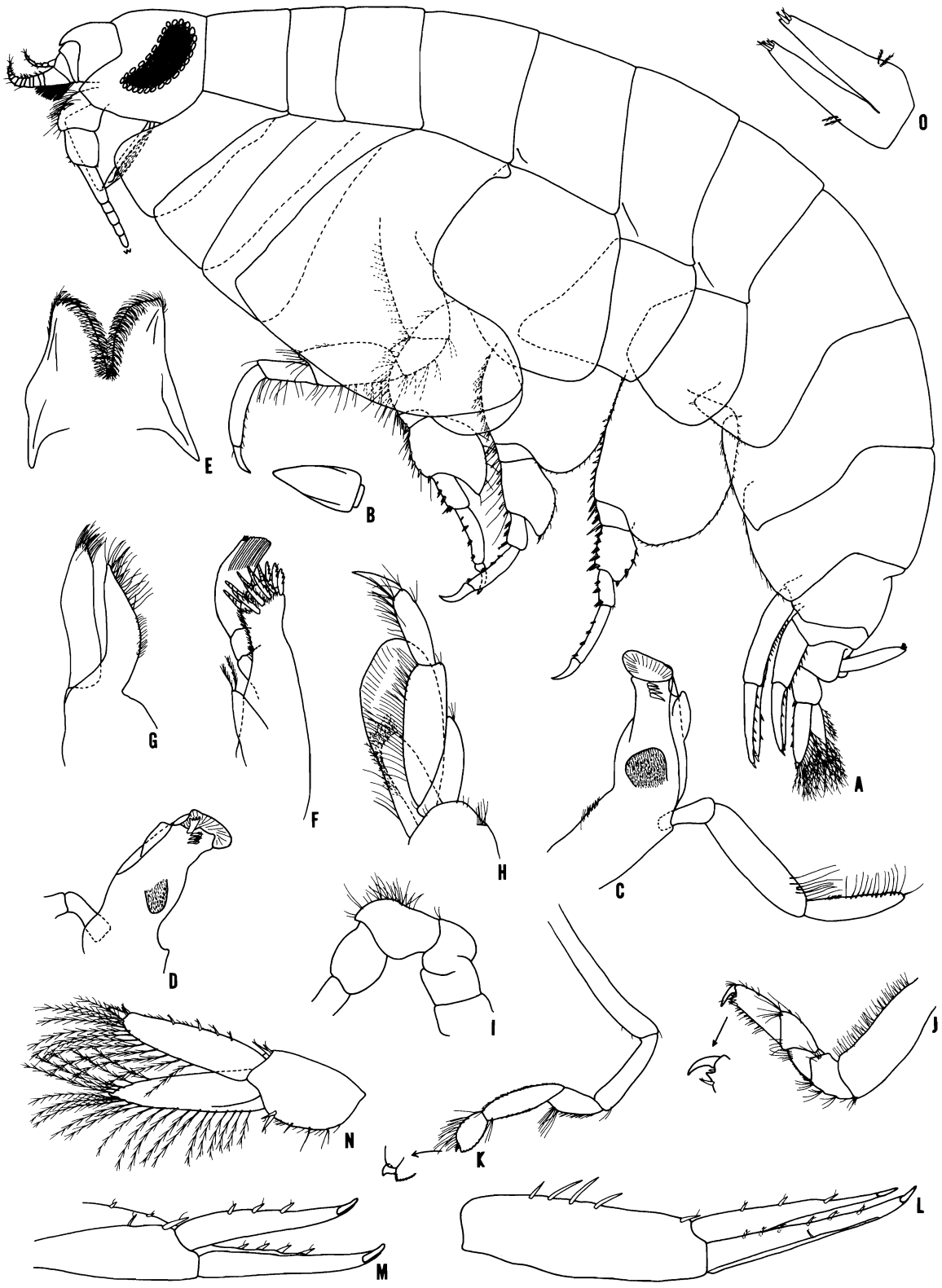
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PLATE 2

Socarnes dissimulantia new species, Holotype, Male, 4.7 mm, Station 251. A. Lateral view. B. Mandible. C, D. Maxillae 1, 2. E. Maxilliped. F. Gnathopod 1. G, H, I. Uropods 1, 2, 3. J. Telson.

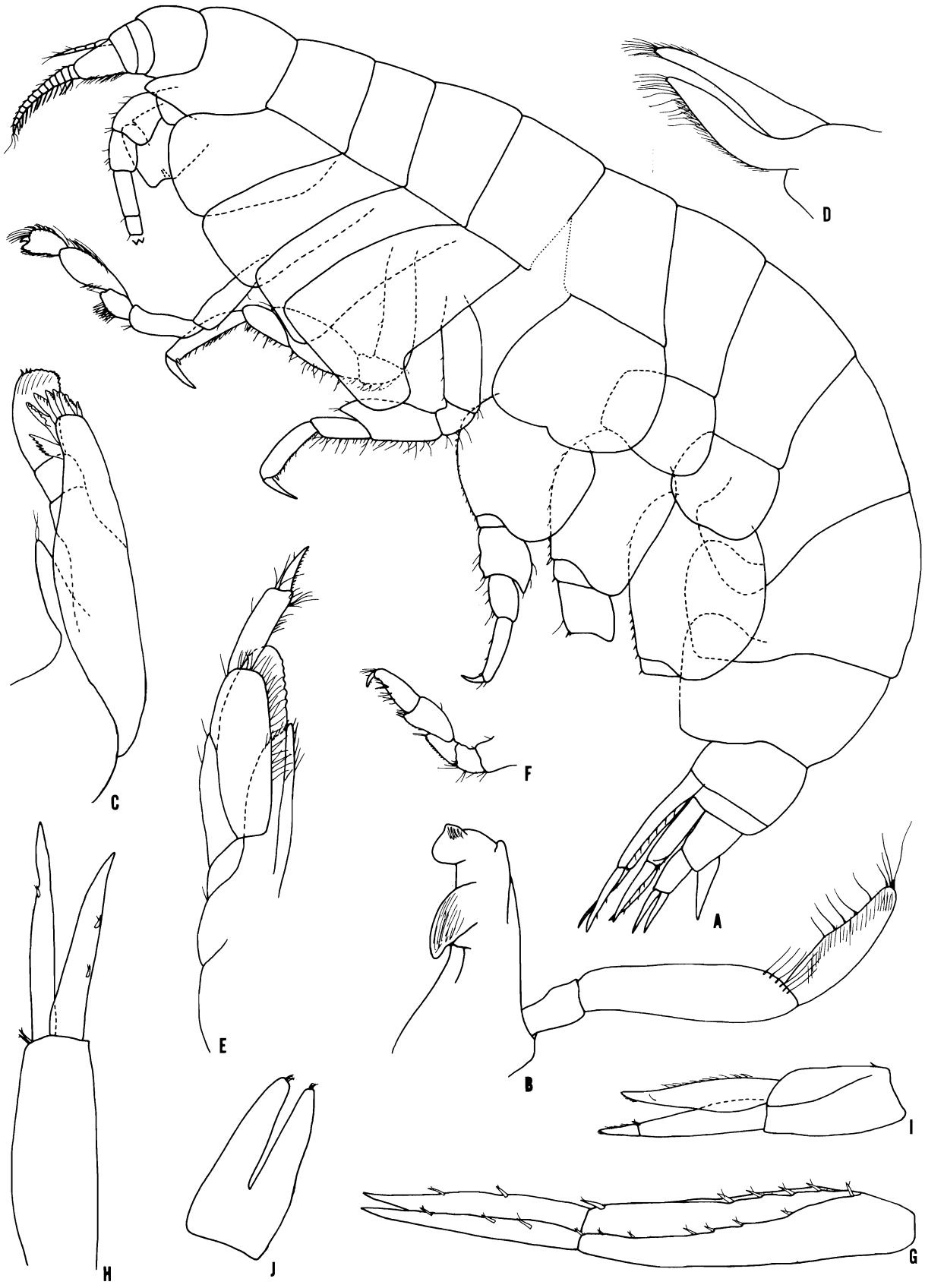
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PLATE 3

Ampelisca brevicornis (Costa), Female, 8.0 mm, Station 251. A. Head. B. Head enlarged. C. Peduncle of antenna 1. D, E. Gnathopods 1, 2. F. Spine on lower posterior corner of coxa 2. G, H, I. Pereopods 1, 2, 3. J. Pereopod 4 (aberrant). K. Articles 2-5 of pereopod 4 (normal). L. Pereopod 5. M. Pereopod 5 enlarged without setae. N. Pleon. O, P, Q. Uropods 1, 2, 3. R. Outer ramus of uropod 3 enlarged. S. Inner ramus of uropod 3 enlarged. T. Tip of outer side of outer ramus of uropod 3. U. Telson.

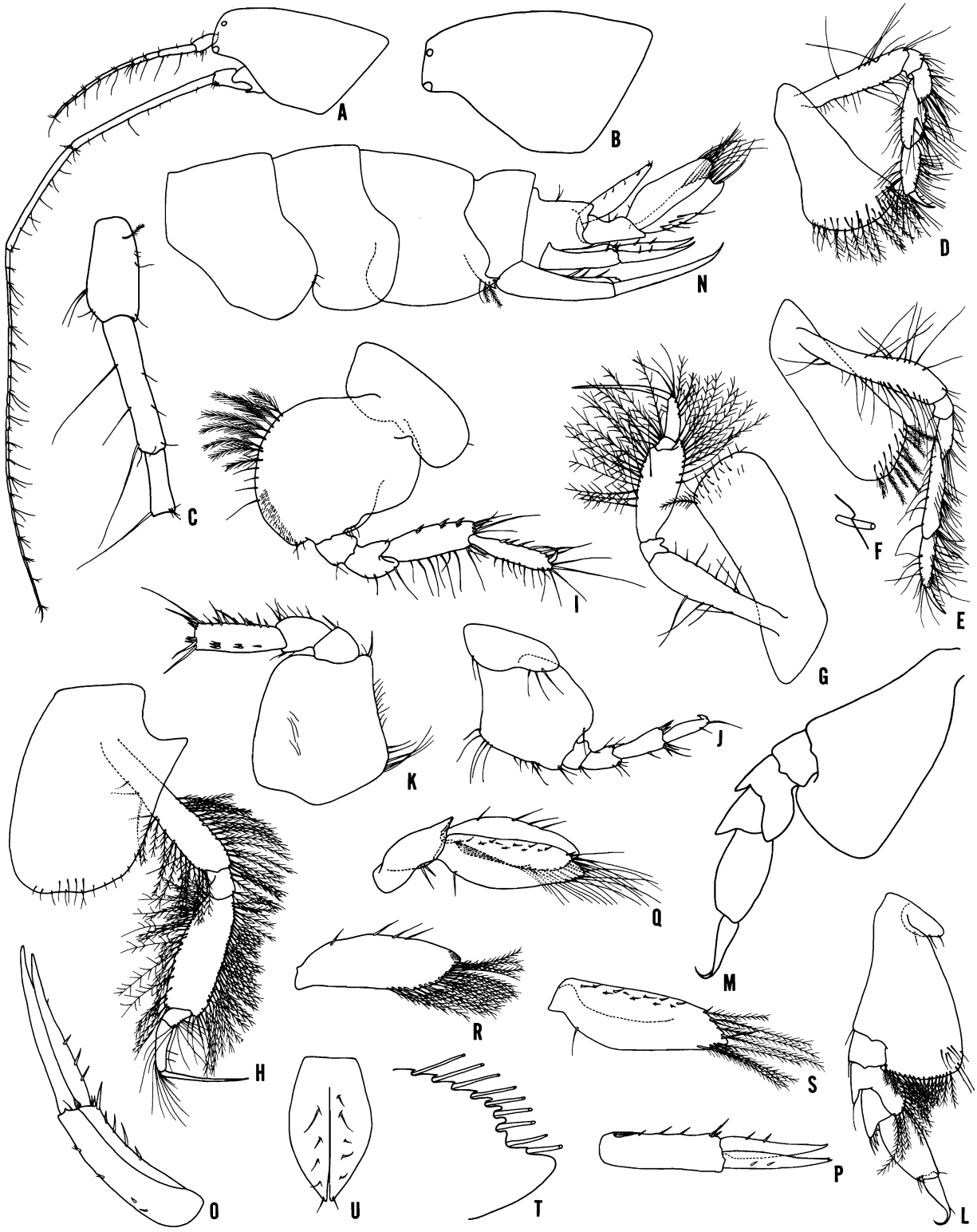
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PLATE 4

Ampelisca chinensis new species, Holotype, Female, 4.0 mm, Station 305. A. Head. B, C. Coxae 1, 2. D, E, F, G, H. Pereopods 1, 2, 3, 4, 5. I. Pleon. J, K, L. Uropods 1, 2, 3. M. Telson.

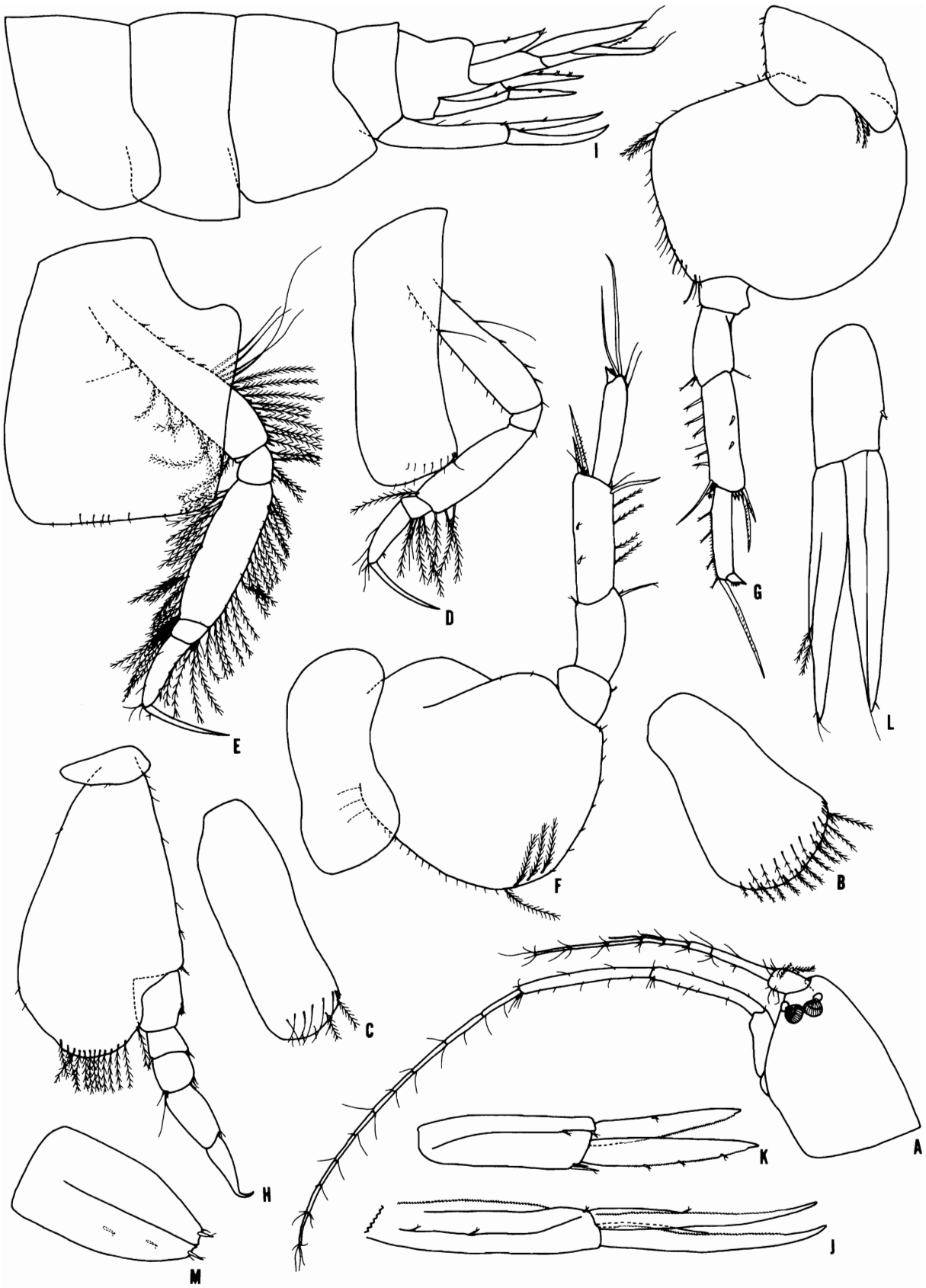
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PLATE 5

Ampelisca cyclops iyoensis new combination, Female, 12.5 mm, Station 27. A. Pereopod 5. B. Third pleonal epimeron, Female, 7.3 mm, Station 263. C. Uropod 2. *Ampelisca cyclops cyclops* Walker, Female, 9.0 mm, Station 145-I. D. Lateral view. E. Head enlarged. F, G. Gnathopods 1, 2. H, I, J, K, L. Pereopods 1, 2, 3, 4, 5. M, N, O. Uropods 1, 2, 3. P. Outer ramus of uropod 3. Q. Telson. *Ampelisca cyclops* Walker, variety, Female, 7.0 mm, Station 268. R. Pereopod 5. S. Third pleonal epimeron. T. Uropod 2.

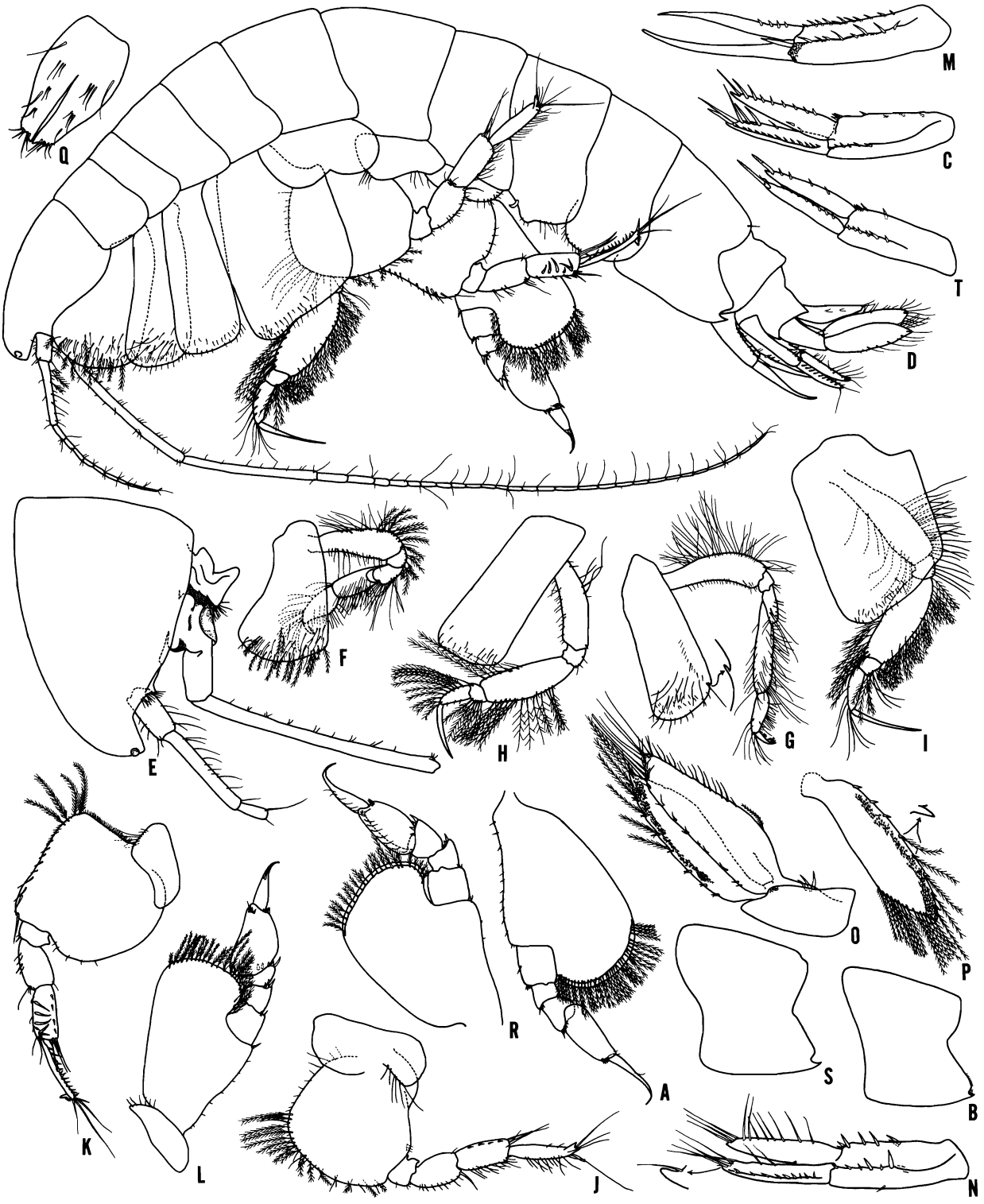
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PLATE 6

Ampelisca honmungensis new species, Female, 7.5 mm, Station 297. A. Head. B. Antenna 1. C, D, E. Posteroventral corners of coxae 1, 2, 3. F, G. Gnathopods 1, 2. H, I, J, K, L. Pereopods 1, 2, 3, 4, 5. M. Pereopod 5 enlarged. N. Pleon. O, P, Q. Uropods 1, 2, 3. R. Uropod 3 enlarged. S. Telson. T. Telson enlarged.

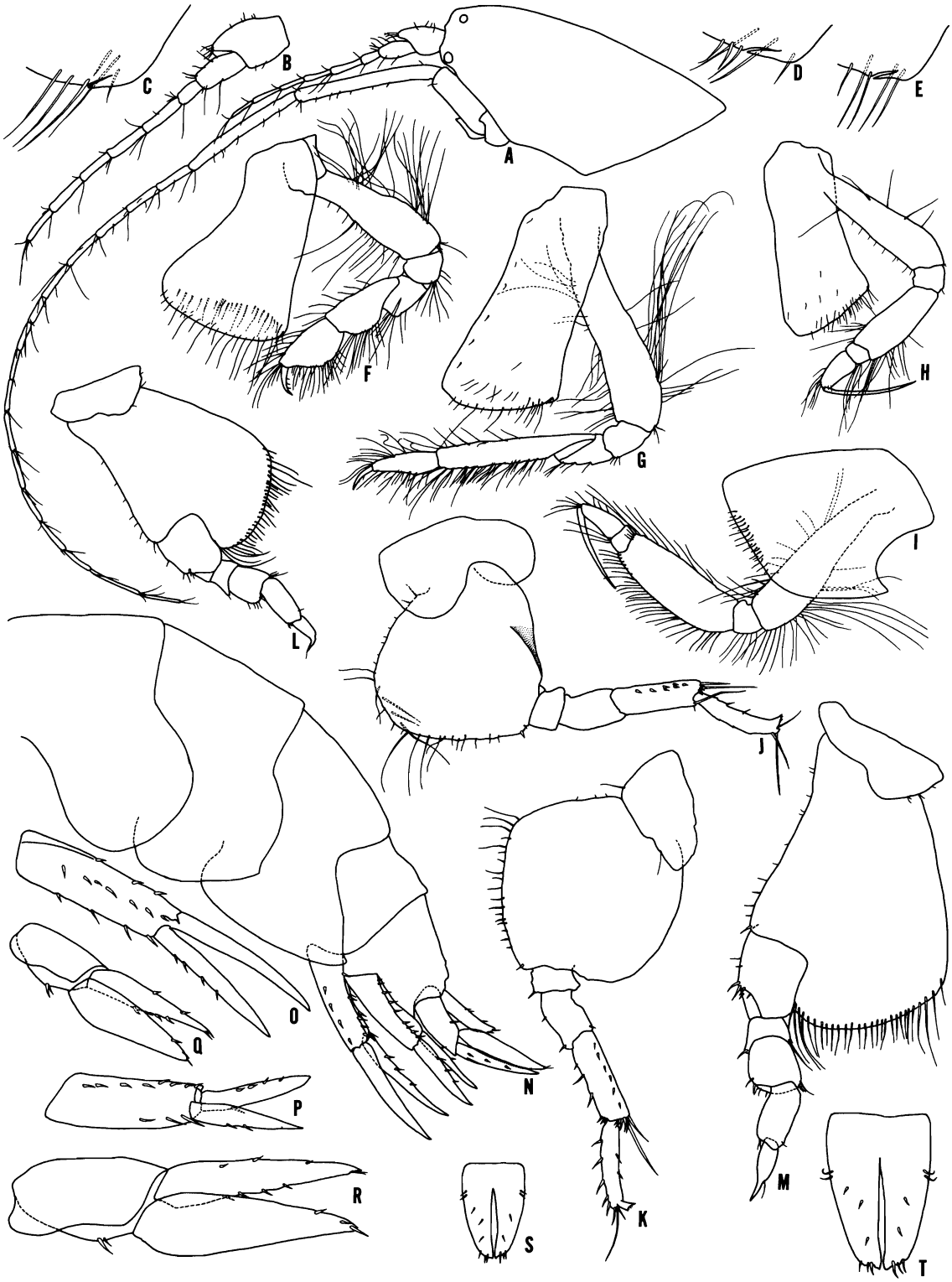
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PLATE 7

Ampelisca maia new species, Holotype, Female, 3.5 mm, Station 222. A. Head. B, C. Coxae 1, 2. D, E, F, G, H. Pereopods 1, 2, 3, 4, 5. I. Pleon J, K, L. Uropods 1, 2, 3. M. Telson.

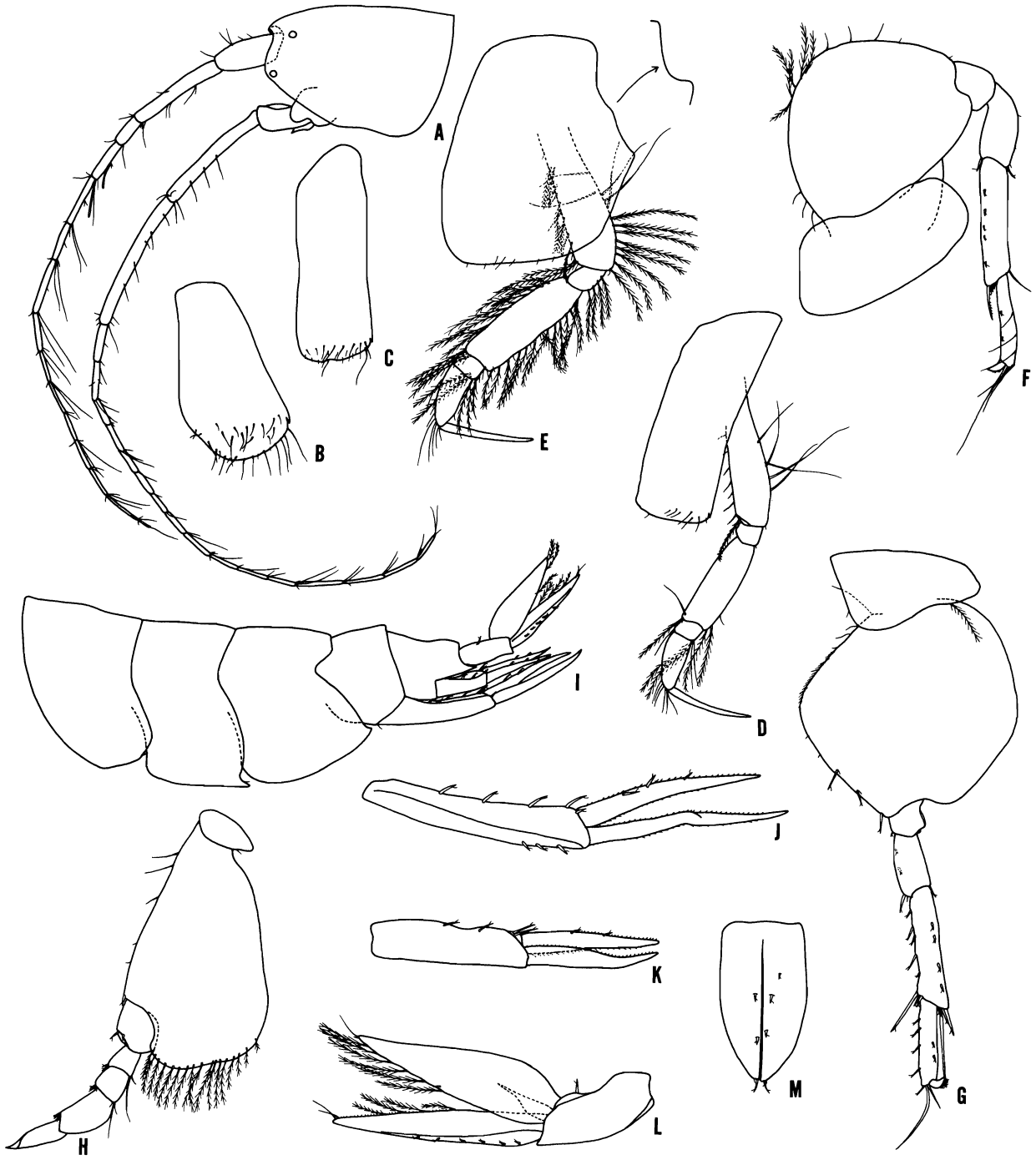
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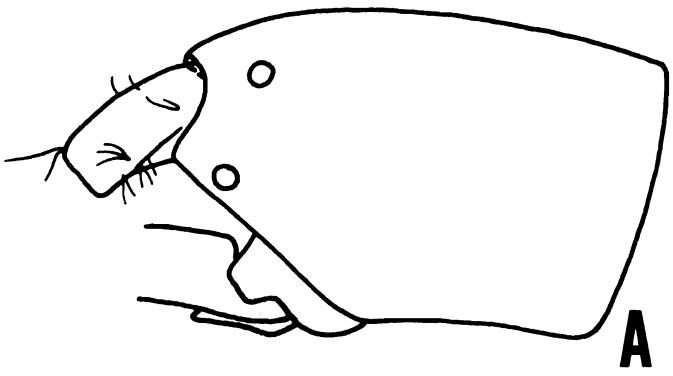
PLATE 8

Ampelisca miharaensis Nagata, Female?, 3.25 mm, Station 262. A. Head. B. Posteroventral corner of third pleonal epimeron. C. Dorsal edge of first urosomal segement. D. Telson.



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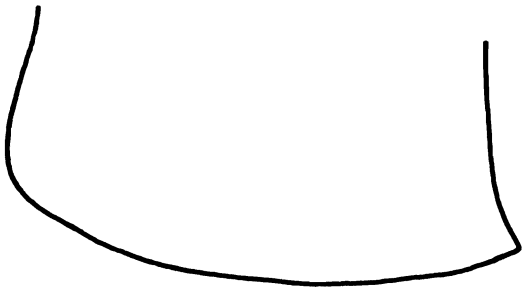

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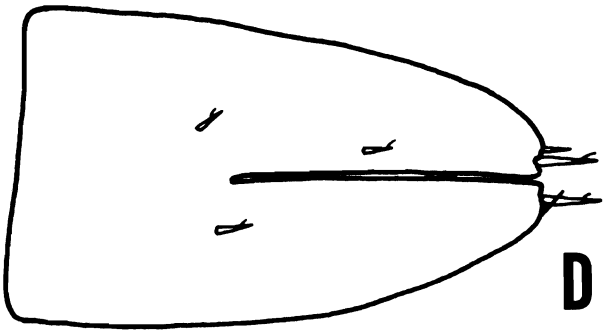

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PLATE 9

Ampelisca misakiensis Dahl, Female, 7.0 mm, Station 74. A. Lateral view. B, C. Gnathopods 1, 2. D, E, F, G, H. Pereopods 1, 2, 3, 4, 5. I. Third pleonal epimeron. J, K, L. Uropods 1, 2, 3. M. Telson. Female, 4.8 mm, Station 144-II. N. Head. O. Dorsal portion of urosomal segments 1, 2-3. Female, 6.8 mm, Station DN-4. P. Dorsal portion of urosomal segments 1, 2-3. Female, 5.0 mm, Station 297. Q. Dorsal portion of urosomal segments 1, 2-3. Female, 4.3 mm, Station 301. R. Dorsal portion of urosomal segments 1, 2-3.

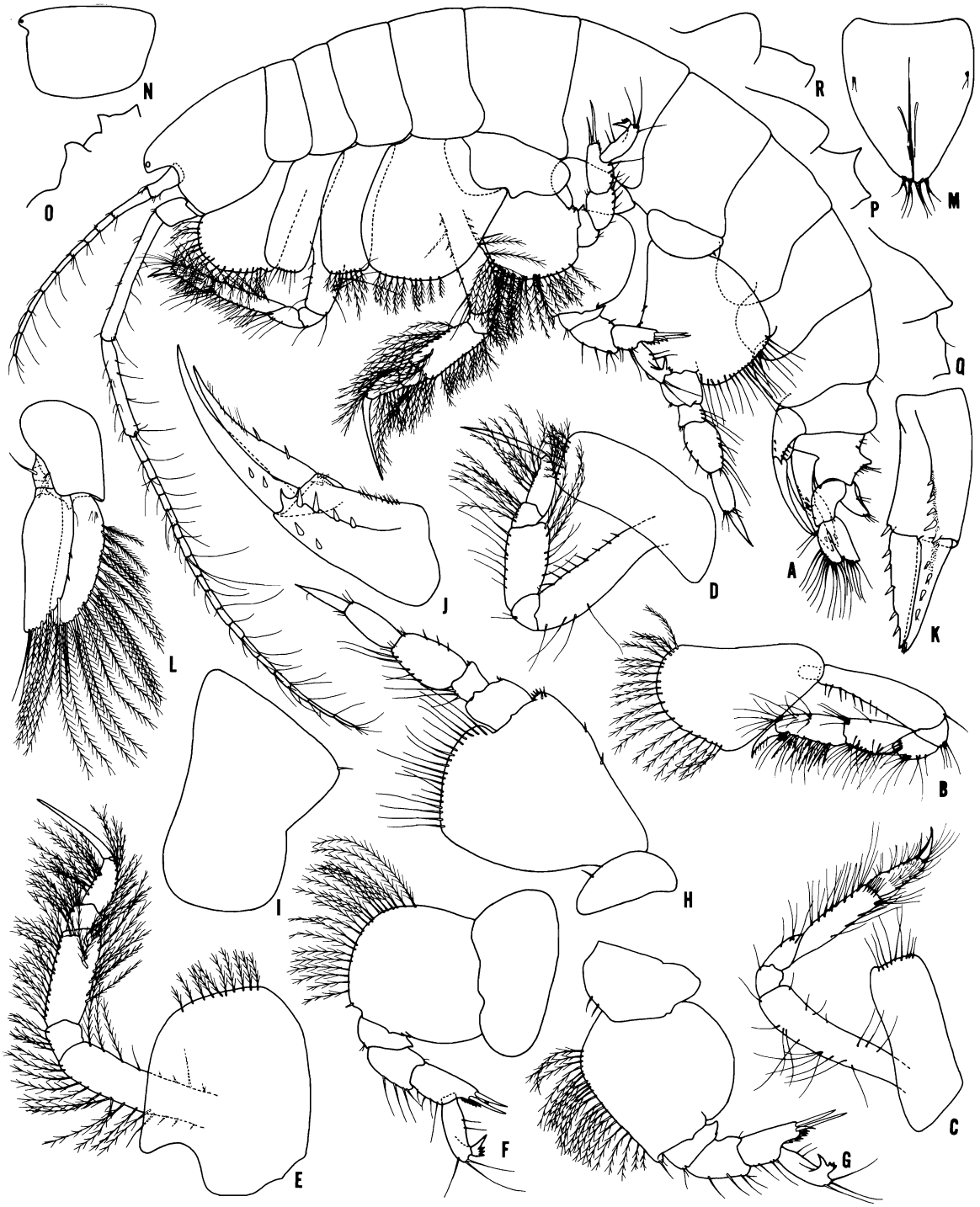
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PLATE 10

Ampelisca orops new species, Female, 5.25 mm, Station 282. A. Lateral view. B. Upper lip. C. Mandible. D. Lower lip. E, F. Maxillae 1, 2. G. Maxilliped. H, I. Enlarged articles 6-7 of gnathopods 1, 2. J. Pereopod 5. K. Enlarged third pleonal segment. L, M, N. Uropods 1, 2, 3. O. Telson.

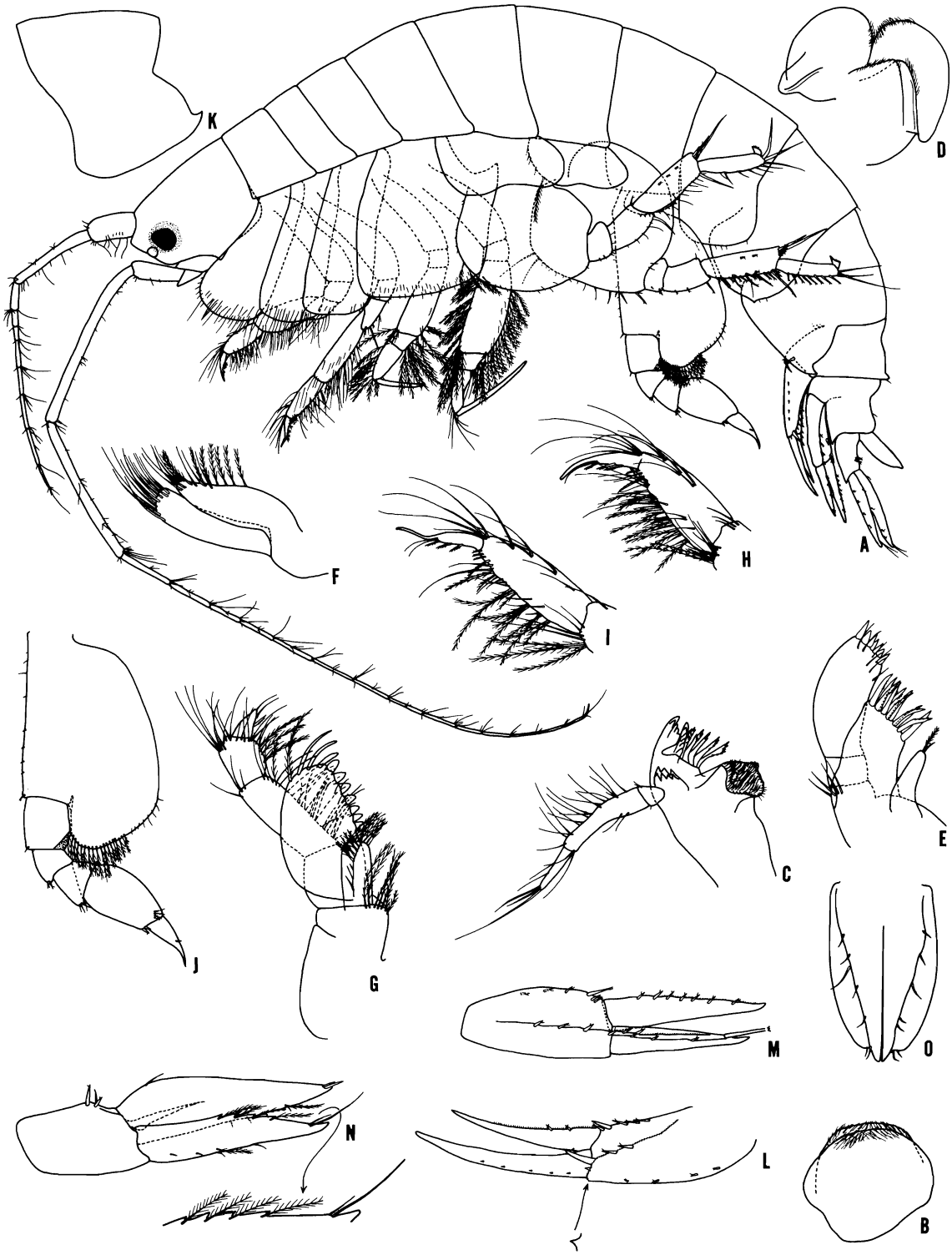
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PLATE 11

Byblis calisto new species, Holotype, Female, 6.25 mm, Station 332. A. Head. B. Mandibular palp. C, D. Coxae 1, 2. E, F, G, H, I. Pereopods 1, 2, 3, 4, 5. J. Enlarged tip of spines found on articles 5 of pereopods 3 and 4. K. Uropod 3. L. Telson. Female, 5.75 mm, Station 261. M. Telson without spines to show cleft. Male, 5.5 mm, Station 339. N. Mandibular palp. O. Peduncle of antenna 1. P. Peduncular articles 4-5 of antenna 2. Q. Uropod 3.

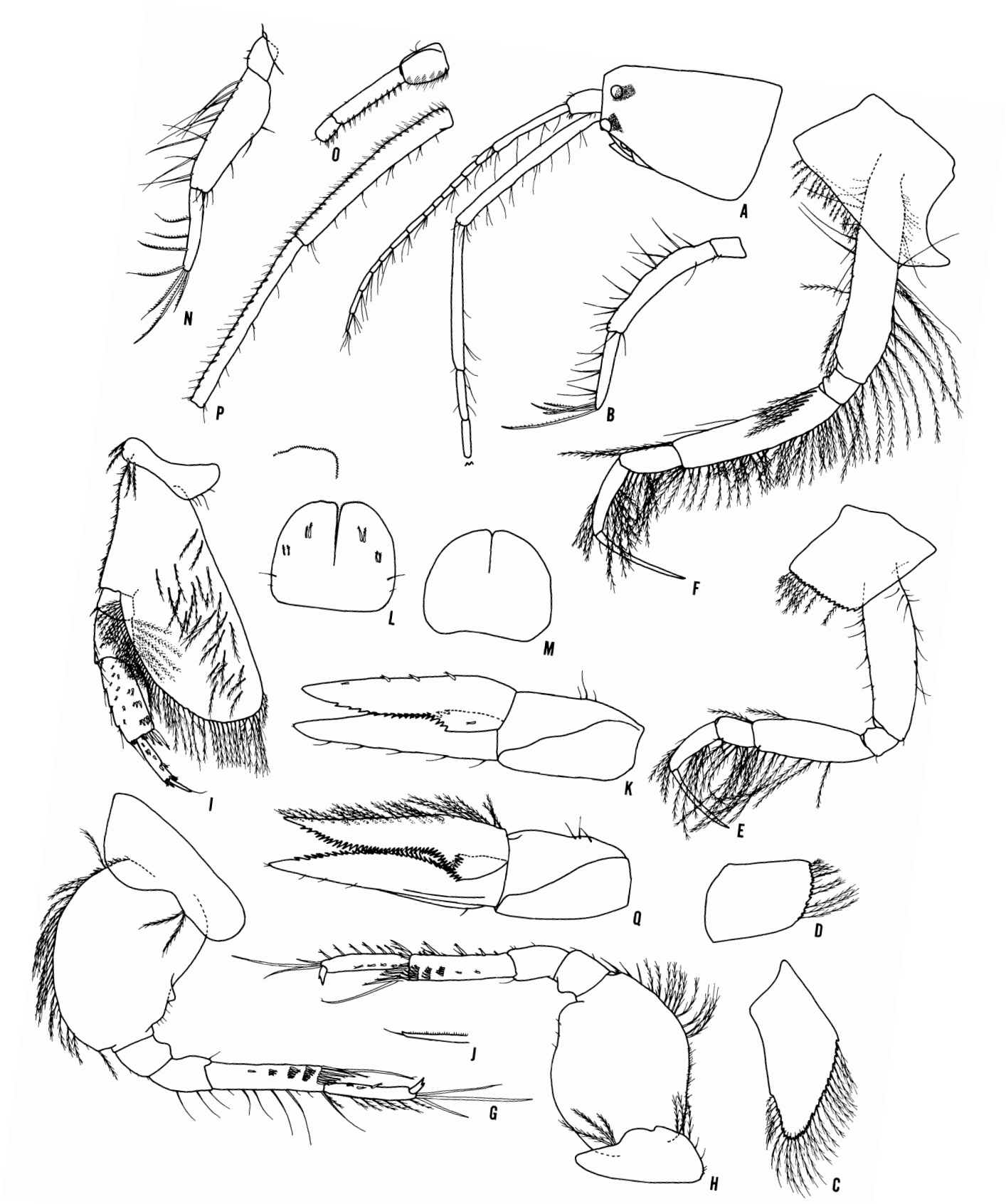
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PLATE 12

Byblis febris new species, Holotype, Male, 9.3 mm, Station 289. A. Head. B, C. Coxae 1, 2. D, E. Articles 5-7 of gnathopods 1 and 2 without setae. F, G, H, I, J. Pereopods 1, 2, 3, 4, 5. K. Mesosome. L, M, N. Uropods 1, 2, 3. O. Telson.

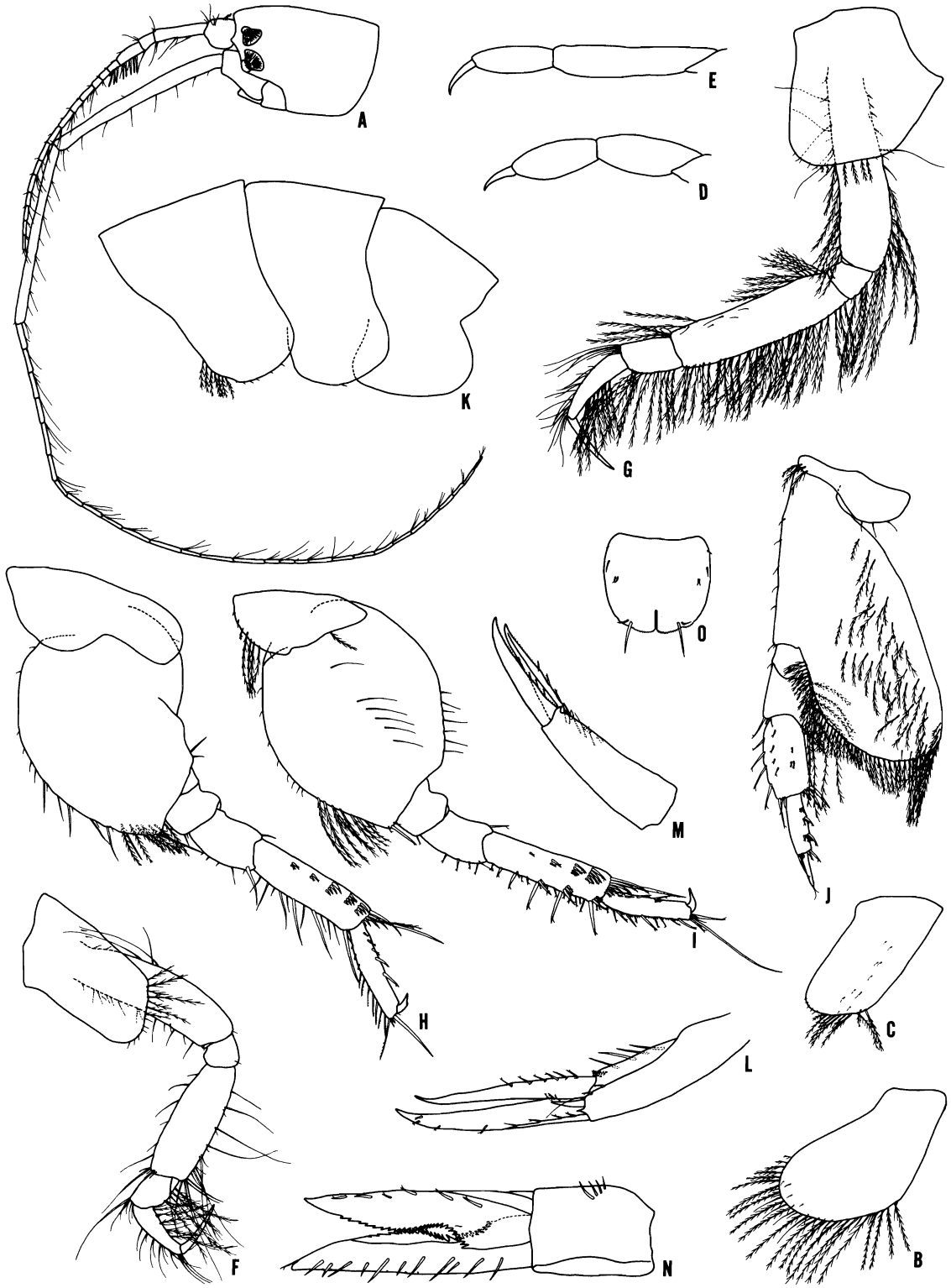
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PLATE 13

Byblis io new species, Holotype, Sex?, 6.0 mm, Station 156-II-(4). A. Head. B, C. Coxae 1, 2. D, E. Articles 5-7 of gnathopods 1, 2. F, G, H, I, J. Pereopods 1, 2, 3, 4, 5. K. Pleon. L, M, N. Uropods 1, 2, 3. O. Telson.

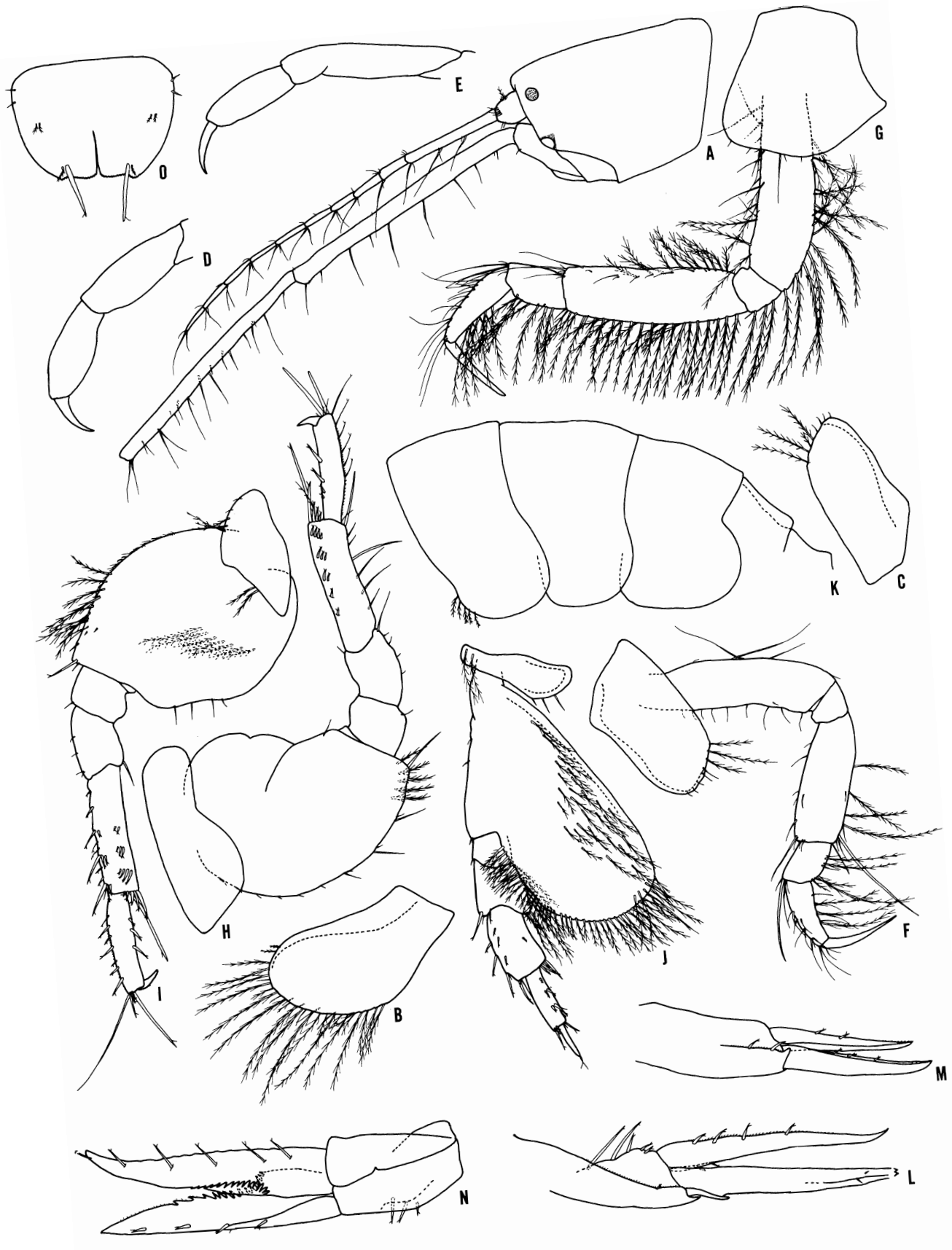
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PLATE 14

Byblis pilosa new species, Holotype, Male, 7.5 mm, Station 275. A. Lateral view. B. Lower lip. C. Right mandible. D. Left mandible without palp. E, F. Maxillae 1, 2. G. Maxilliped. H. Pereopod 5 enlarged. I, J, K. Uropods 1, 2, 3. L. Telson.

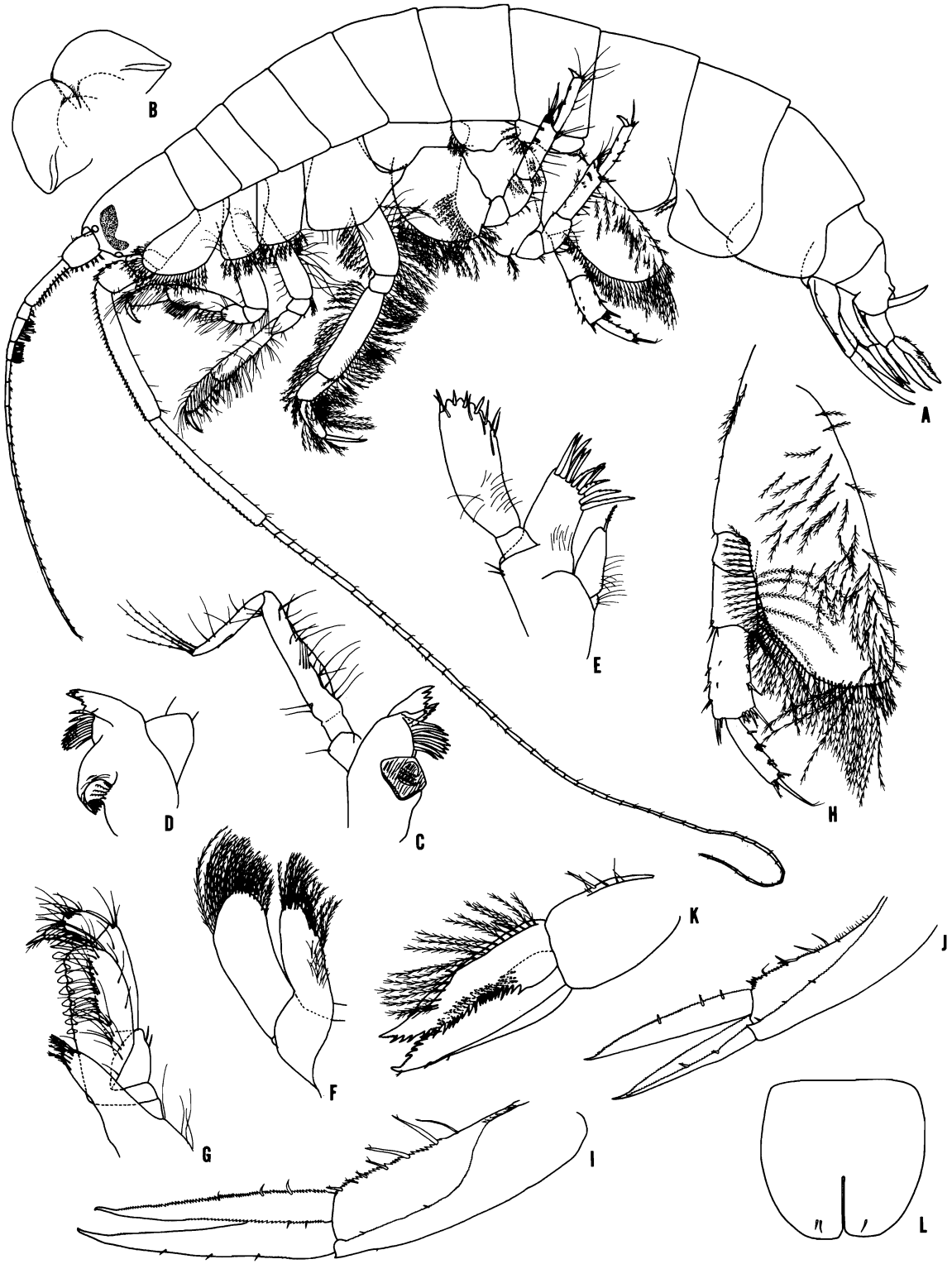
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PLATE 15

Urothoe carda new species, Female, 3.0 mm, Station 229. A. Head. B. Maxilla 1. C. Maxilliped without setae. D, E. Gnathopods 1, 2. F, G. Enlarged articles 6-7 of gnathopods 1, 2 without setae. H. Enlarged palm of gnathopod 2. I, J, K, L, M. Pereopods 1, 2, 3, 4, 5. N, O, P. Enlarged articles 7 of pereopods 3, 4, 5. Q. Pleon. R, S, T. Uropods 1, 2, 3. U. Telson.

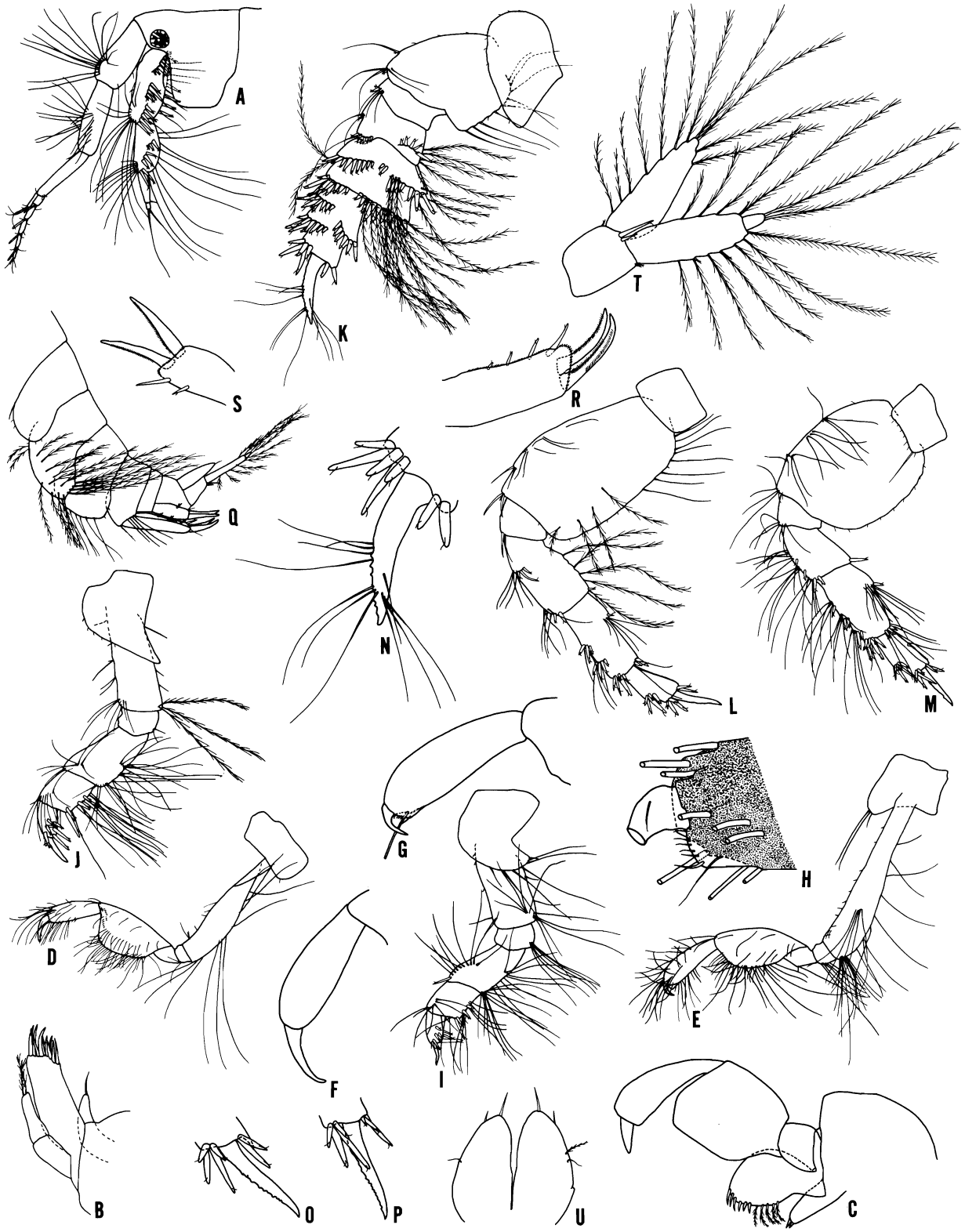
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PLATE 16

Urothoe cuspis new species, Holotype, Female, 3.75 mm, Station 243. A. Head. B. Maxilla 1. C, D. Gnathopods 1, 2. E, F. Palm and article 7 of gnathopods 1, 2 without setae. G. Enlarged palm and article 7 of gnathopod 2. H, I, J, K, L. Pereopods 1, 2, 3, 4, 5. M, N, O. Enlarged dactyls of pereopods 3, 4, 5. P. Pleon. Q, R, S. Uropods 1, 2, 3. T. Telson.

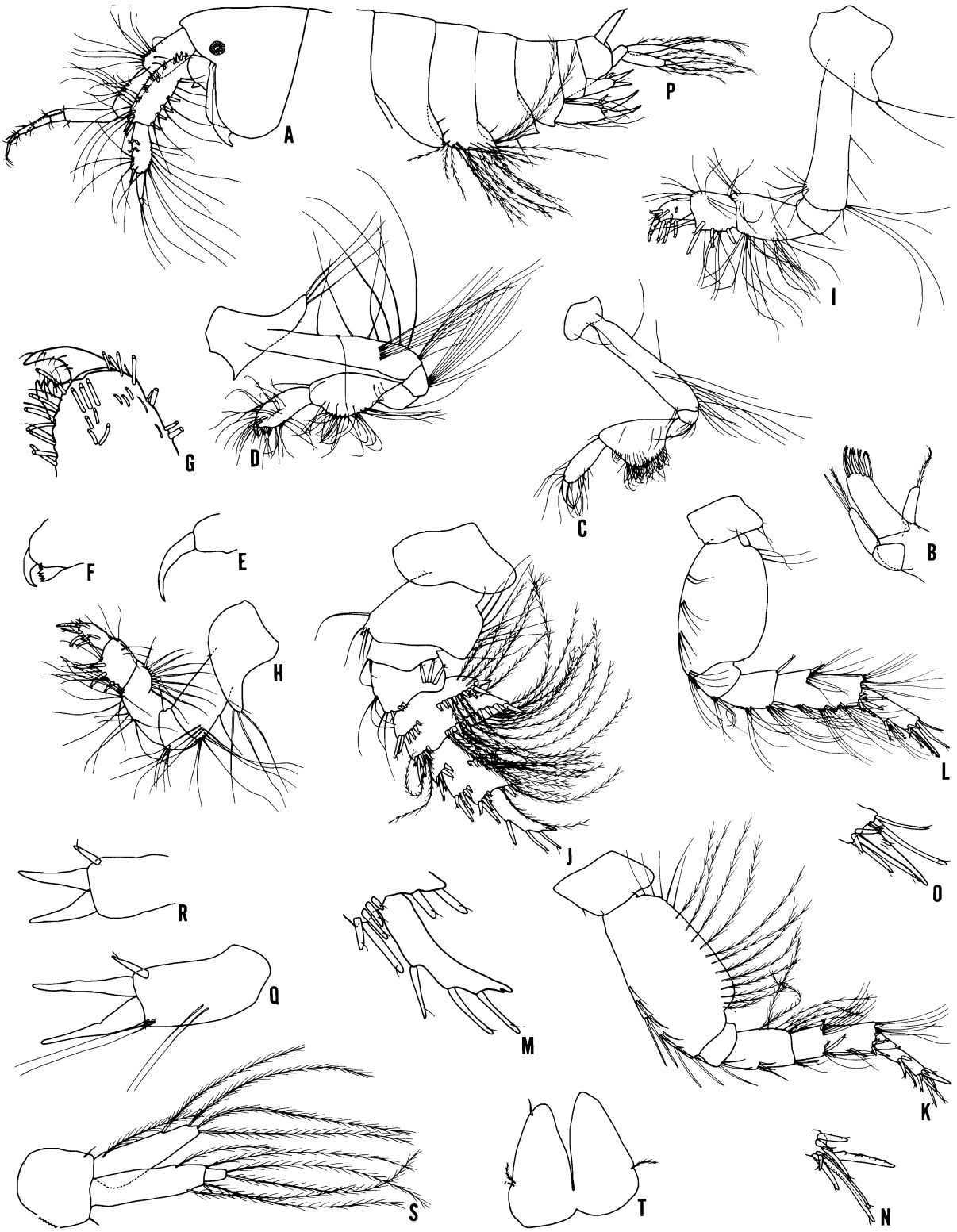
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PLATE 17

Urothoe gelasina new species, Holotype, Female, 3.5 mm, Station 258. A. Head. B. Mandible. C. Lower lip. D, E. Maxillae 1, 2. F. Maxilliped. G. Maxilliped without setae. H, I. Gnathopods 1, 2. J, K. Enlarged palms and articles 7 of gnathopods 1, 2. L, M, N, O, P. Pereopods 1, 2, 3, 4, 5. Q. Enlarged spines of articles 6-7 of pereopod 4. R. Pleon. S, T, U. Uropods 1, 2, 3. V. Telson. Female, 4.0 mm, Station 232-II, large adults. W, X. Gnathopods 1, 2. Y, Z. Enlarged palms and articles 7 of gnathopods 1, 2.

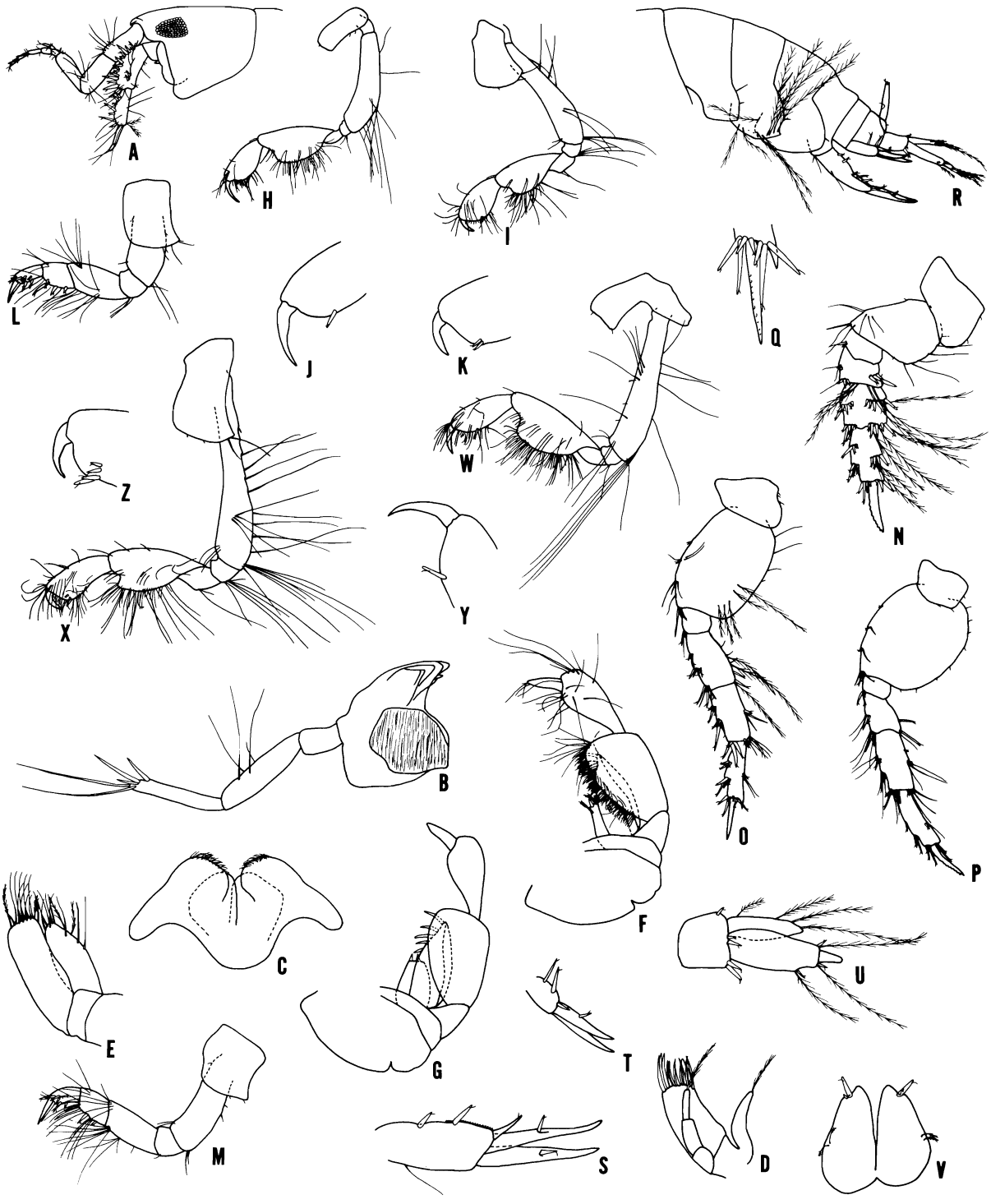
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PLATE 18

Urothoe orientalis Gurjanova, Female, 4.0 mm, Station 232-I. A. Lateral view. B, C. Maxillae 1, 2. D. Maxilliped. E. Maxilliped without setae. F, G. Gnathopods 1, 2. H. Enlarged palm and dactyl of gnathopod 2. I. Enlarged dactyl to show large spine on article 6 of pereopod 2. J, K, L. Enlarged dactyls of pereopods 3, 4, 5. M, N, O. Uropods 1, 2, 3. P. Telson. Male, 4.0 mm, Station 229. Q. Lateral view of head. R. Mandible. S. Lower lip. T, U. Articles 6-7 of gnathopods 1, 2 without setae. V. Pereopod 3.

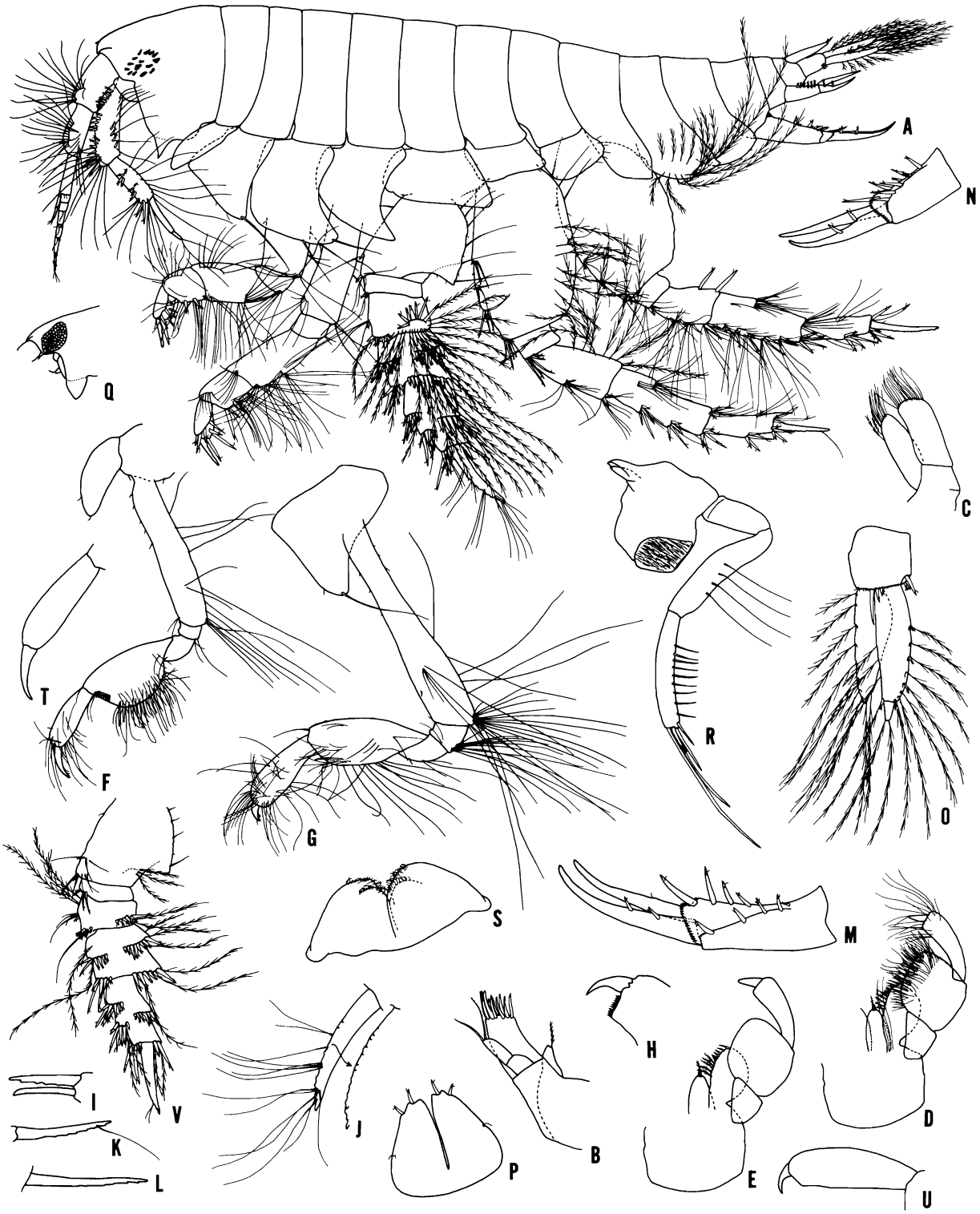
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PLATE 19

Urothoe spinidigitus Walker, Male, 3.75 mm, Station 260-II. A. Lateral view. B. Upper lip. C. Mandible. D. Lower lip. E, F. Maxillae 1, 2. G, H. Gnathopods 1, 2. I, J. Enlarged palms and articles 7 of gnathopods 1, 2. K, L, M. Enlarged articles 7 of pereopods 3, 4, 5. N, O, P. Uropods 1, 2, 3. Q. Telson. Male, 3.5 mm, Station 251. R. Maxilliped. S. Maxilliped without setae.

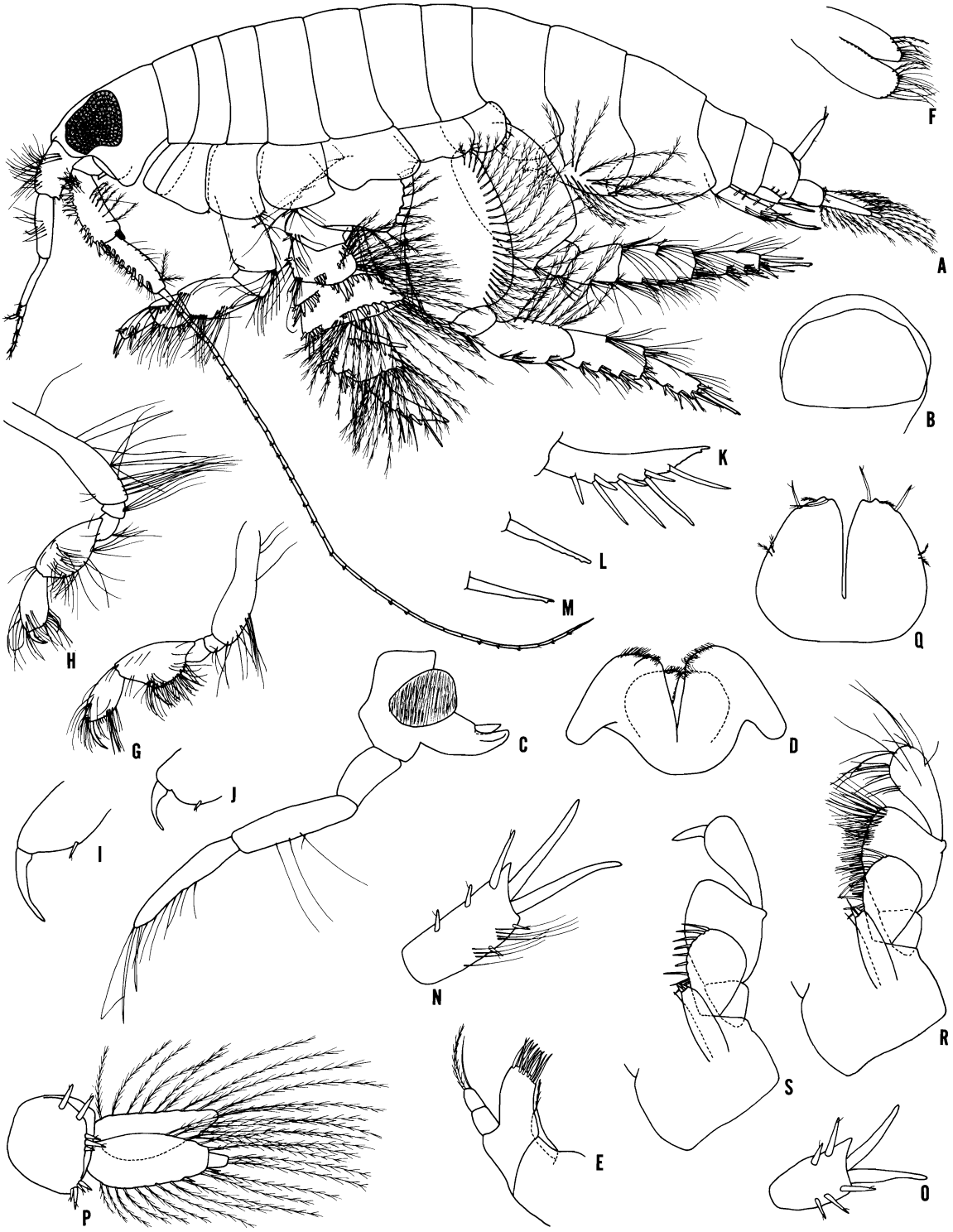
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PLATE 20

Leucothoe alcyone new species, Female, 3.75 mm, Station 1. A. Head. B. Mandibular palp. C. Coxa 4. D, E. Gnathopods 1, 2. F, G, H, I. Pereopods 1, 3, 4, 5. J. Pleonal segments 1, 2, 3. K, L. Uropods 1, 2. M. Telson.

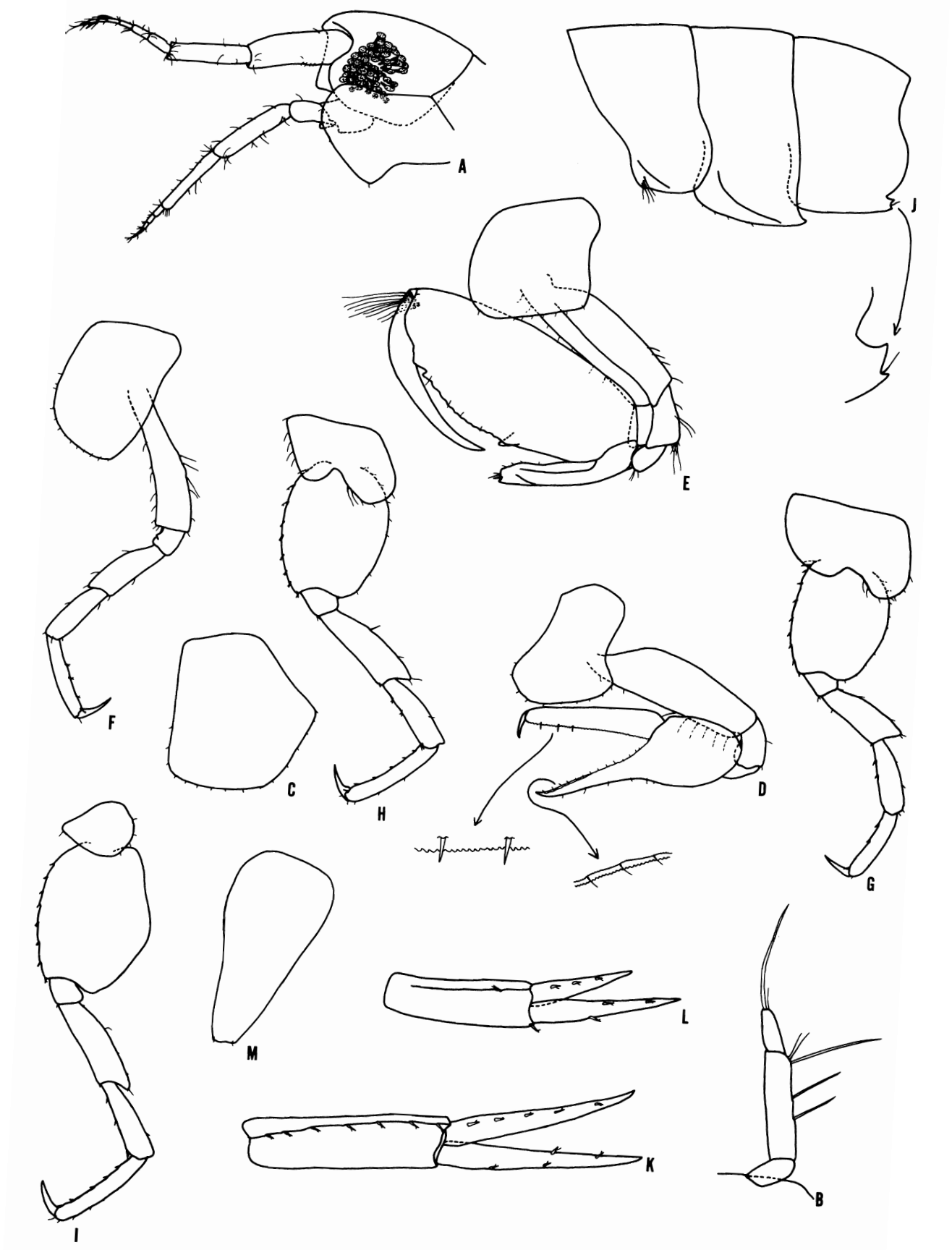
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PLATE 21

Leucothoe furina (Savigny), Male, 4.0 mm, Station 324, dotted lines indicate indistinct margins due to molting. A. Head. B. Mandibular palp. C. Coxa 3. D, E. Gnathopods 1, 2. F, G, H, I. Pereopods 2, 3, 4, 5. J. Pleonal segments 1, 2, 3. K, L, M. Uropods 1, 2, 3. N. Telson.

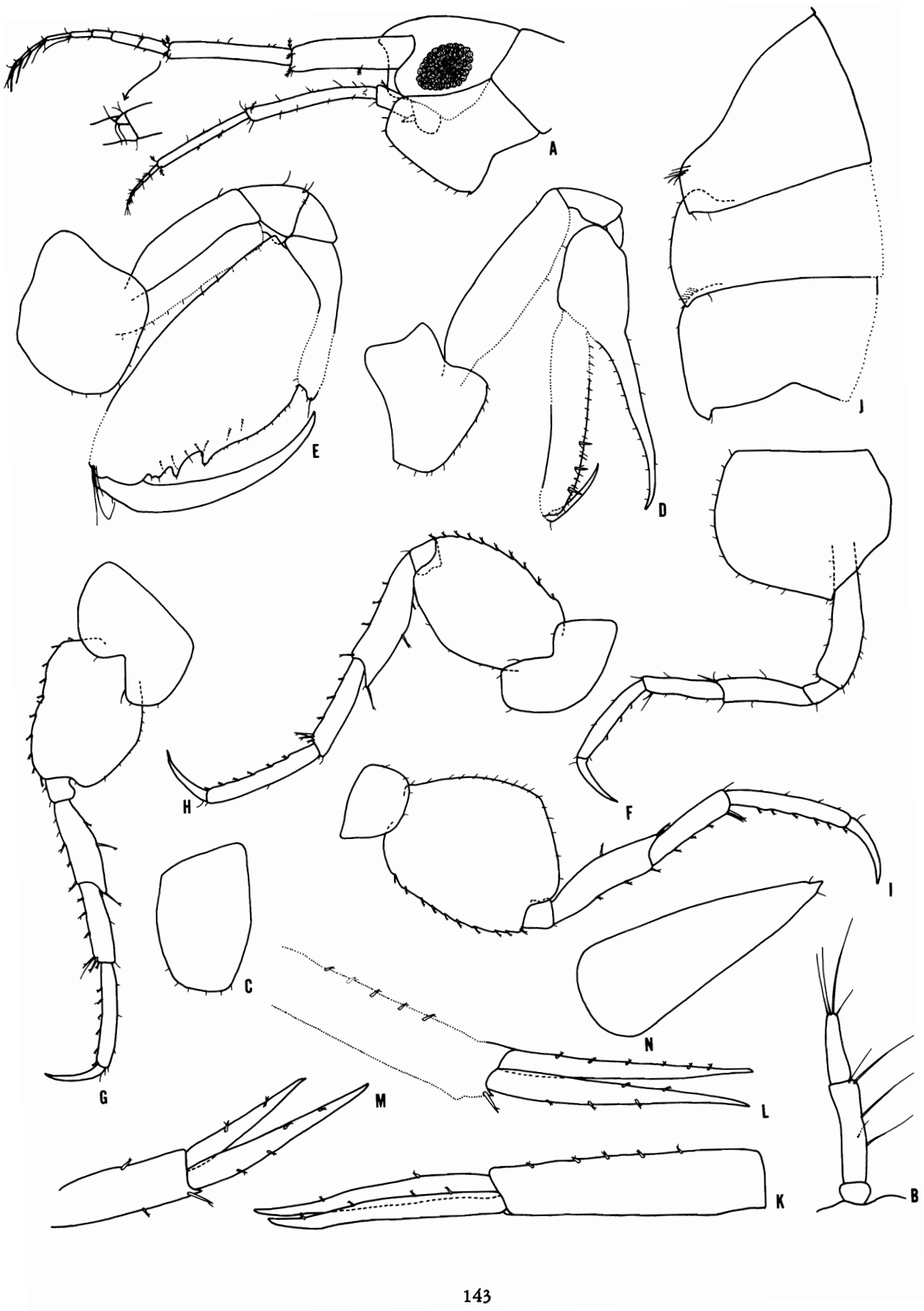
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PLATE 22

Idunella janisae new species, Female, 5.0 mm, Station 303. A. Head. B. Head enlarged. C. Mandible. D, E. Maxillae 1, 2. F. Maxilliped. G. Coxa 4. H. Palm of gnathopod 1. I. Gnathopod 2. J, K, L, M. Pereopods 1, 3, 4, 5. N. Pleon. O, P. Uropods 1, 2. Q. Telson. Holotype, Female, 4.75 mm, Station 245. R. Uropod 3.

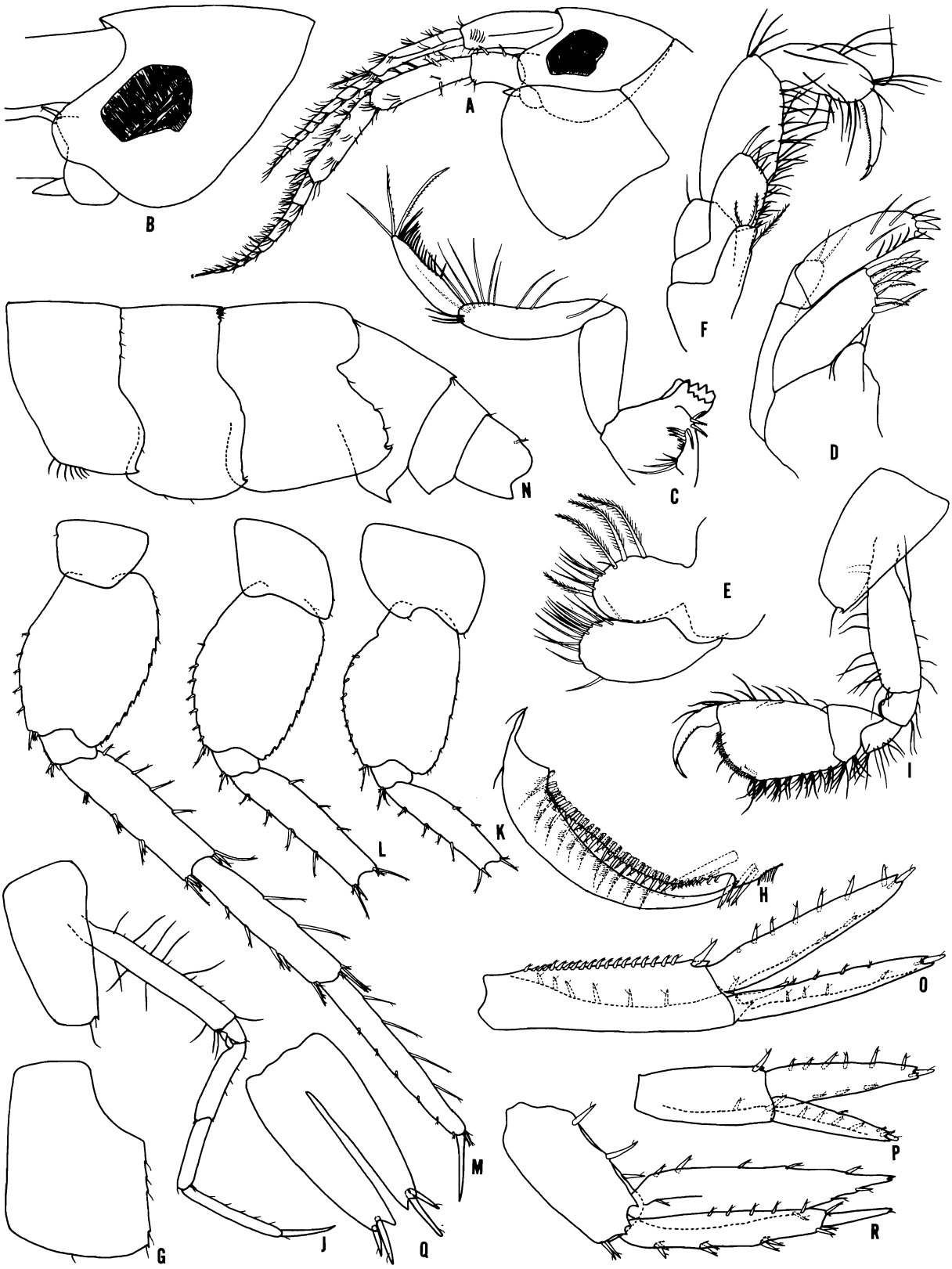
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PLATE 23

Idunella pauli new species, Female, 5.0 mm, Station 250. A. Lateral view. B. Accessory flagellum enlarged. C. Mandible. D. Mandibular molar. E. Maxilla 2. F. Maxilliped. G. Palm of gnathopod 1 enlarged. H. Palm of gnathopod 2 enlarged. I, J, K. Uropods 1, 2, 3. L. Telson. Male, 4.5 mm, Station 299. M. Lower lip. N. Maxilla 1. O. Gnathopod 1. P. Palm of gnathopod 1 enlarged.

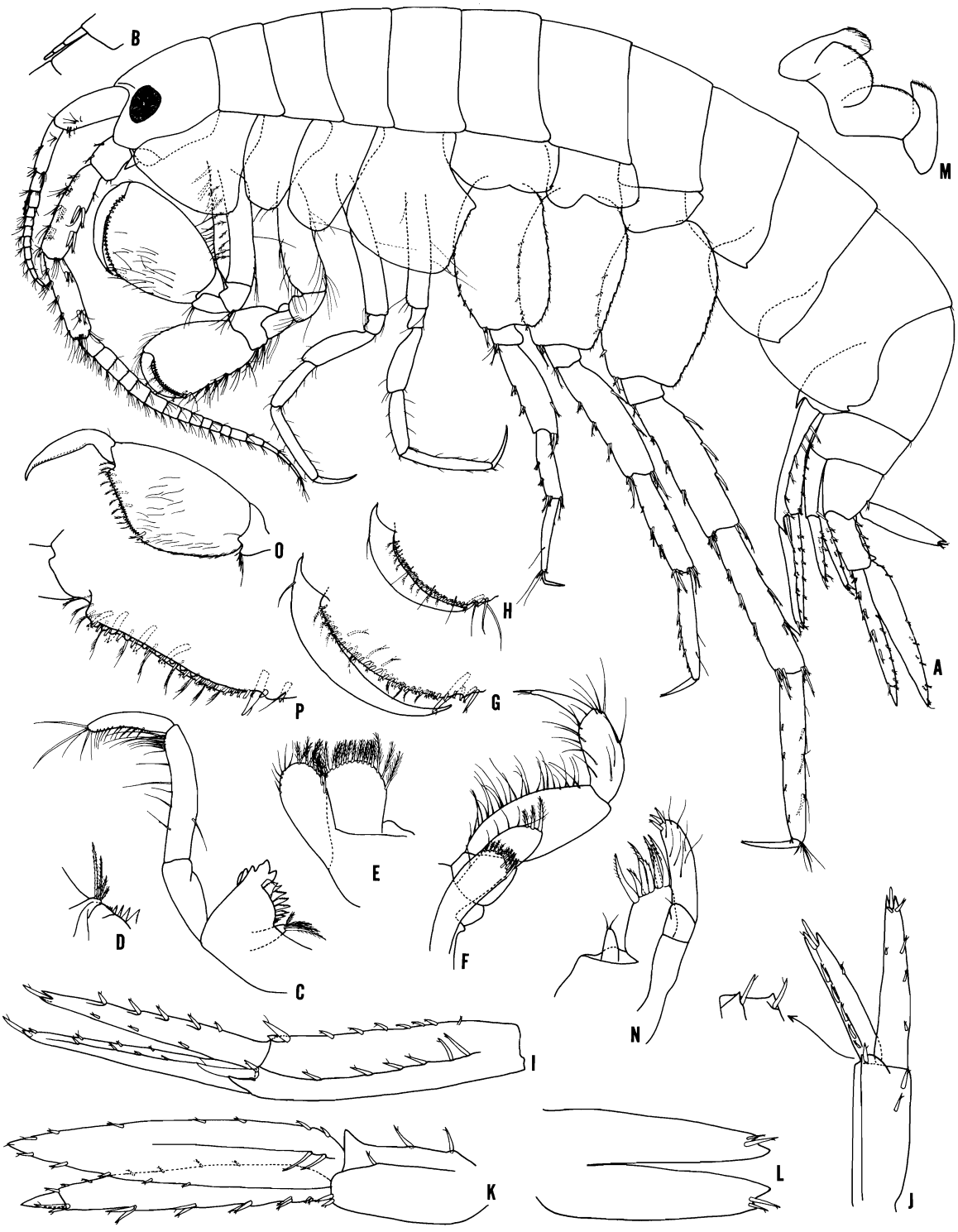
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PLATE 24

Idunella serra new species, Holotype, Male, 5.0 mm, Station 305. A. Head. B. Head enlarged. C. Mandible. D. Lower lip. E, F. Maxillae 1, 2. G. Maxilliped. H. Coxa 4. I. Gnathopod 1. J. Palm of gnathopod 1 enlarged. K. Gnathopod 2. L, M, N, O. Pereopods 1, 3, 4, 5. P. Pleon. Q, R, S. Pleonal epimera 1, 2, 3. T, U, V. Uropods 1, 2, 3. W. Telson. Female, 5.0 mm, Station 305. X. Gnathopod 1.


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PLATE 25

Oediceroides ornithorhynchus Pirlot, Female, 11.0 mm, Station 251. Lateral view of head.

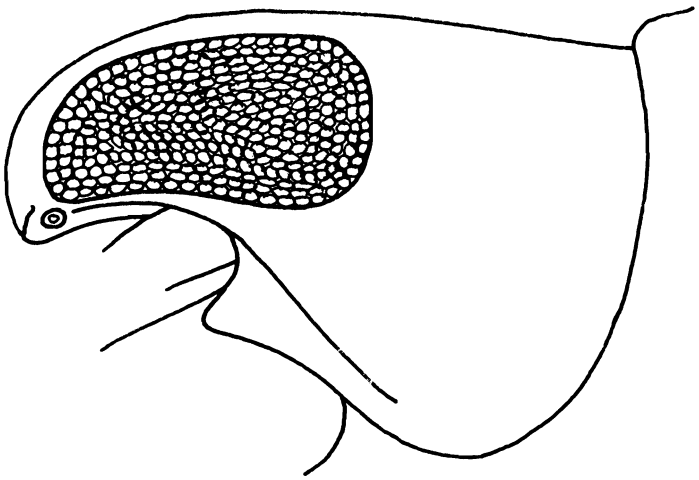

PLATE 26

Synchelidium miraculum new species, Male, 3.5 mm, Station 327. A. Lateral view. B. Mandible. C. Mandibular molar. D. Maxilla 2. E. Maxilliped. F. Articles 3-7 of gnathopod 1. G. Articles 6-7 of gnathopod 2. H. Pereopod 1. I, J, K. Uropods 1, 2, 3. L. Telson. Female, 3.5 mm, Station 250. M, N. Antennae 1, 2. O. Lower lip. Female, 4.75 mm, Station 222. P. Maxilla 1.

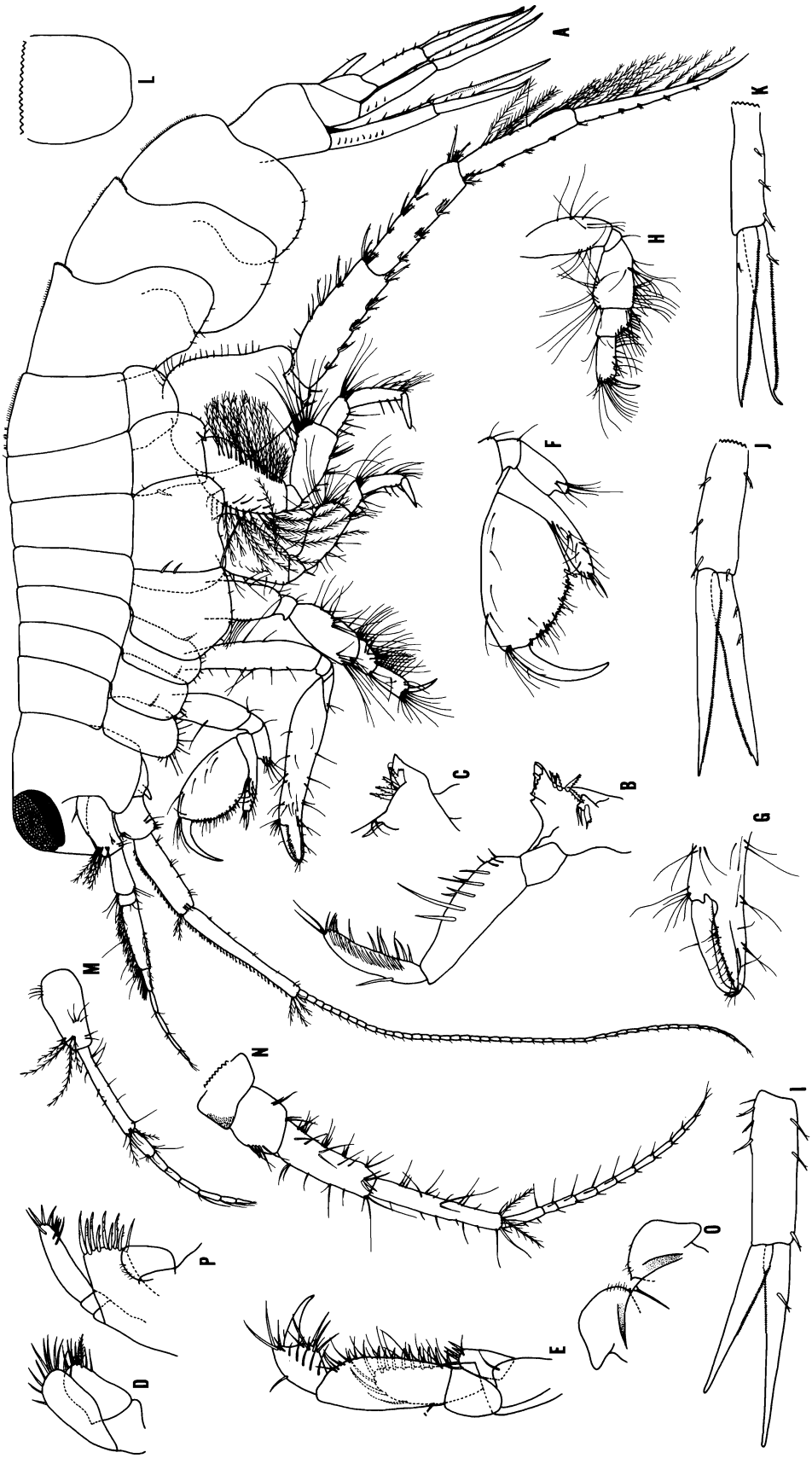
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PLATE 27

Oedicerotidae Genus species, Female, 3.0 mm, Station 267. A. Lateral view. B. Right mandible. C. Primary plate and spine row of left mandible. D, E. Maxillae 1, 2. F. Maxilliped. G, H. Enlarged articles 5-7 of gnathopods 1, 2. I, J. Uropods 1, 2. K. Telson.

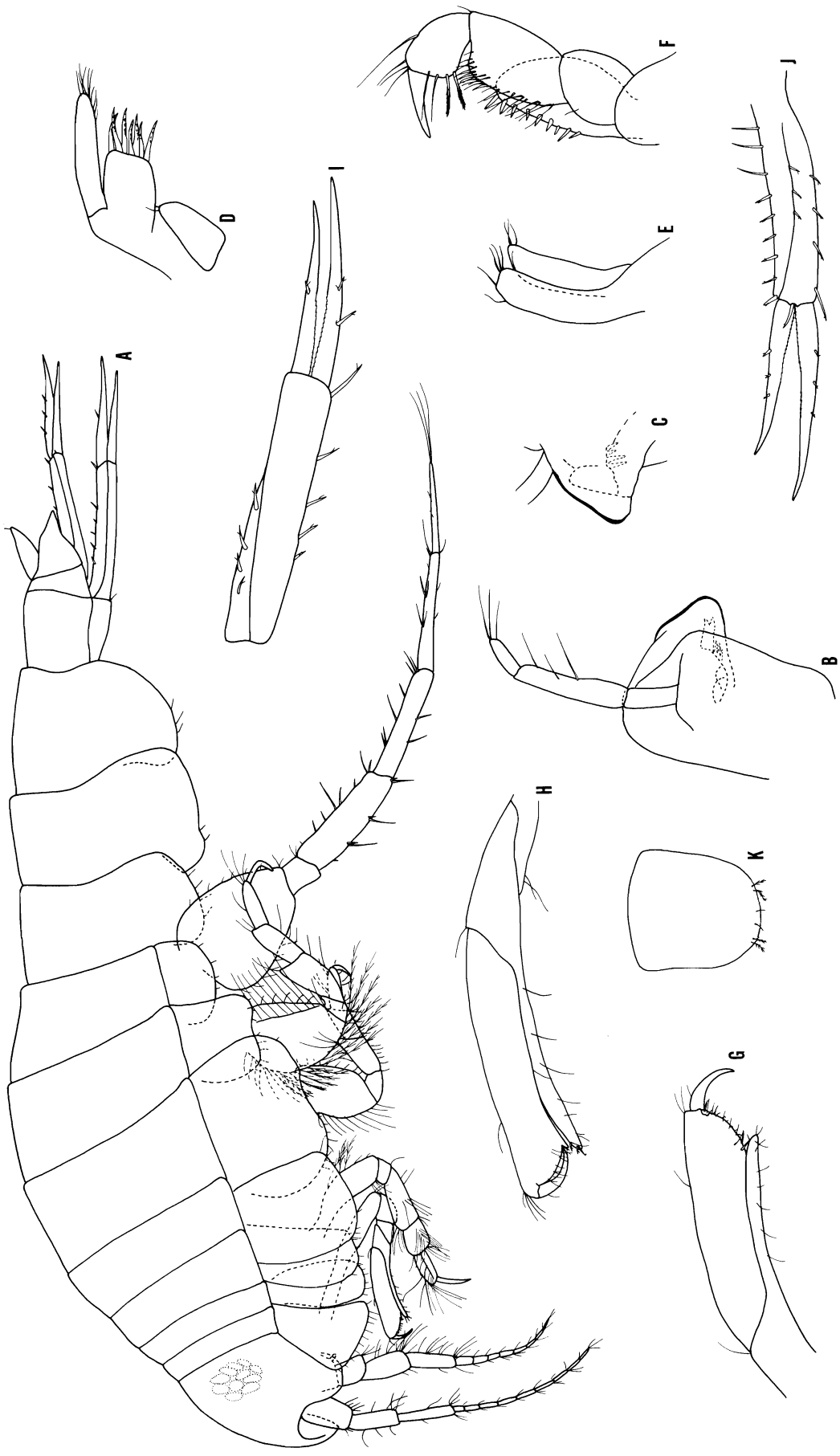
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PLATE 28

Eriopisella propagatio new species, Sex?, 3.5 mm, Station 313. A. Lateral view. B. Upper lip. C. Mandible. D, E. Maxillae 1, 2. F. Maxilliped. G, H. Gnathopods 1, 2. I, J, K. Uropods 1, 2, 3. L. Telson.

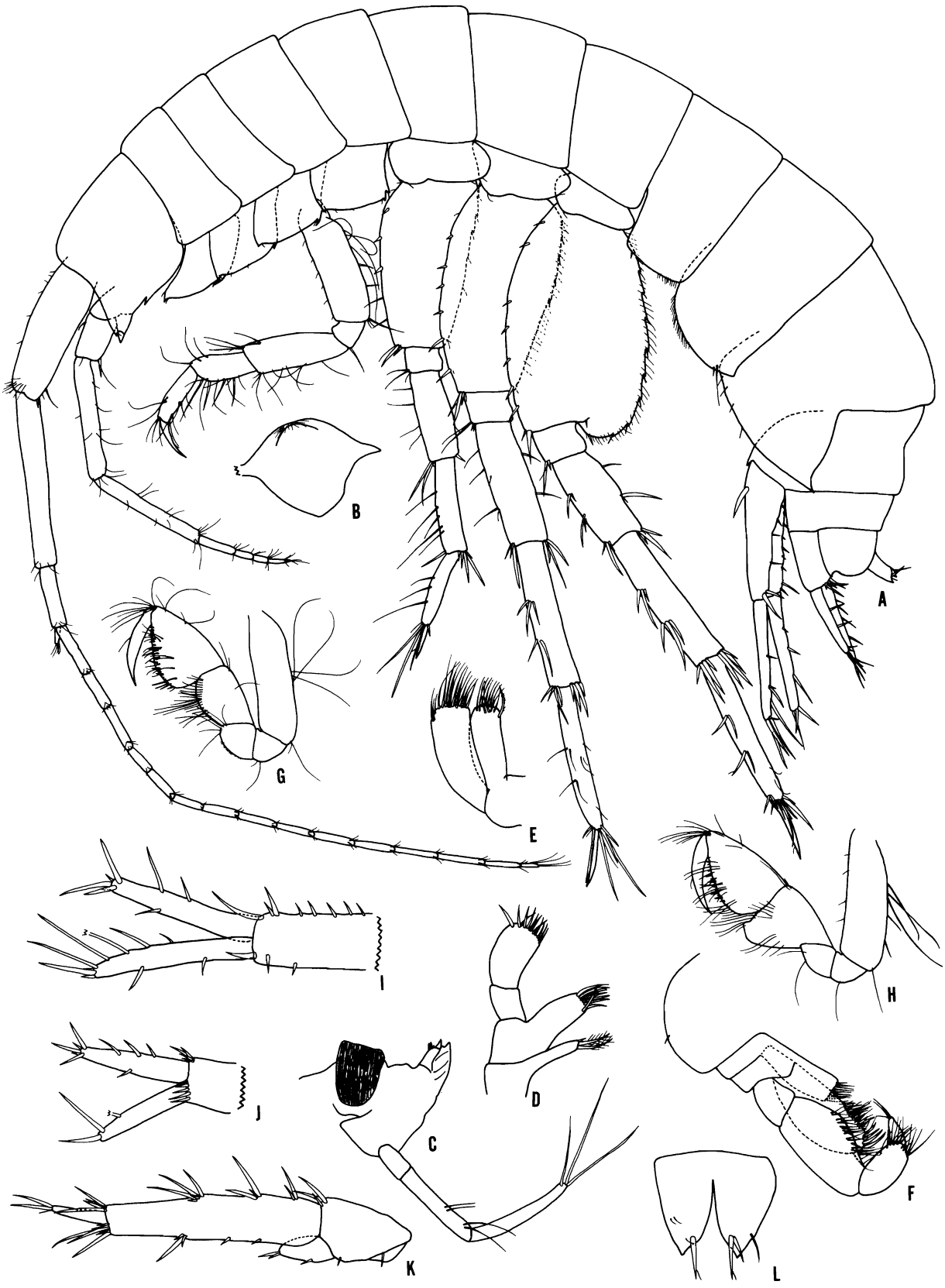
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PLATE 29

Cheiriphotis megacheles? (Giles), Male, 5.0 mm, Station 261. A. Lateral view. B. Mandible. C. Lower lip. D, E. Maxillae 1, 2. F. Maxilliped. G, H, I. Uropods 1, 2, 3. J. Telson. Female, 6.75 mm, Station 252. K, L. Gnathopods 1, 2. M. Gnathopod 2 articles 6-7 without setae.

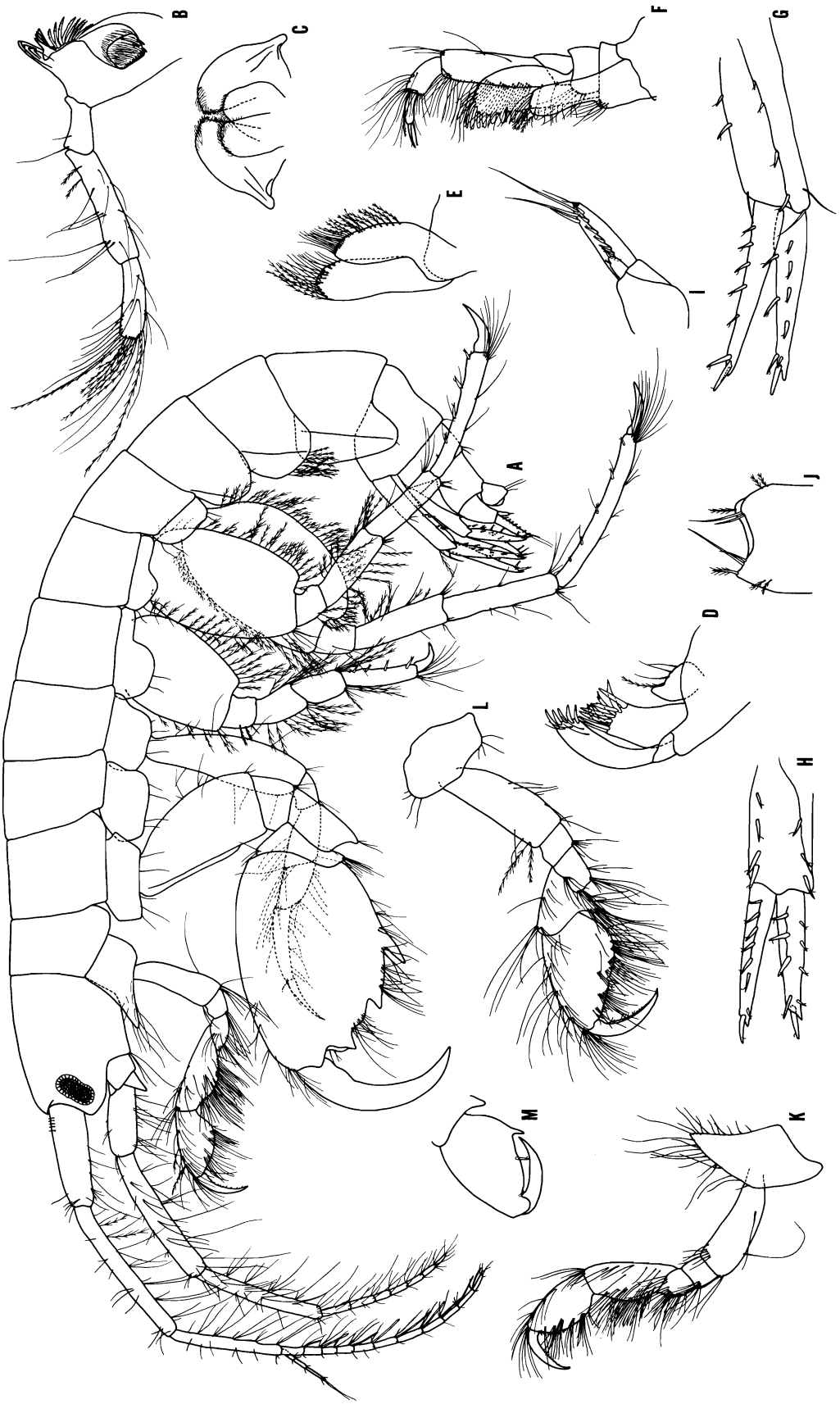
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PLATE 30

Photis species A, Male, 2.75 mm, Station 220. A. Head. B. Antenna 2. C. Upper lip. D. Mandible. E. Lower lip. F, G. Maxillae 1, 2. H. Maxilliped. I. Gnathopod 1. J. Article 6 of gnathopod 1 without setae. K. Gnathopod 2. L. Article 6 of gnathopod 2 without setae. M, N, O, P, Q. Pereopods 1, 2, 3, 4, 5. R. Mesosome. S, T, U. Uropods 1, 2, 3.

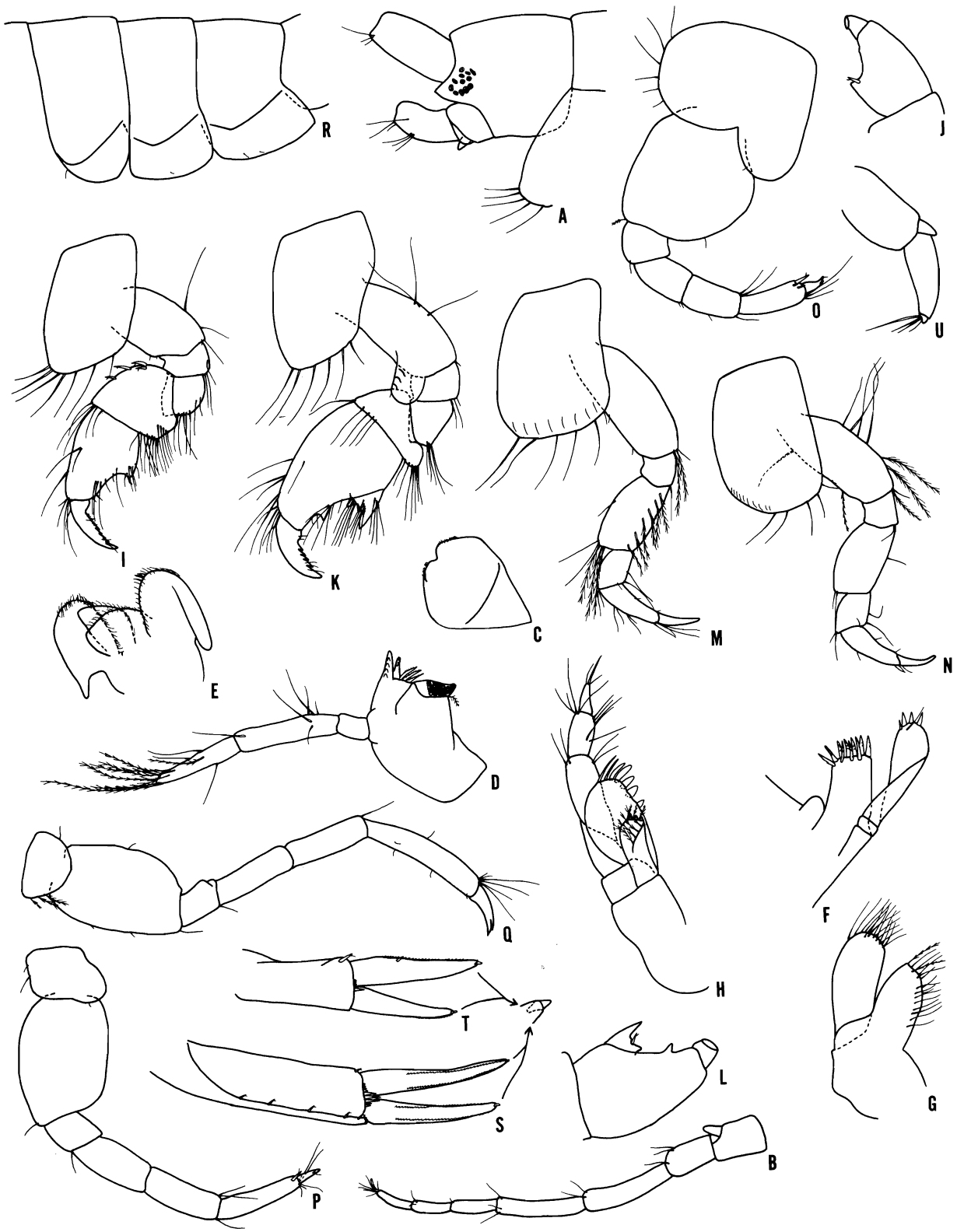
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PLATE 31

Photis species B, Female, 4.0 mm, Station 233. A. Head. B. Antenna 1. C, D. Gnathopods 1, 2. E. Article 6 of gnathopod 2 without setae.

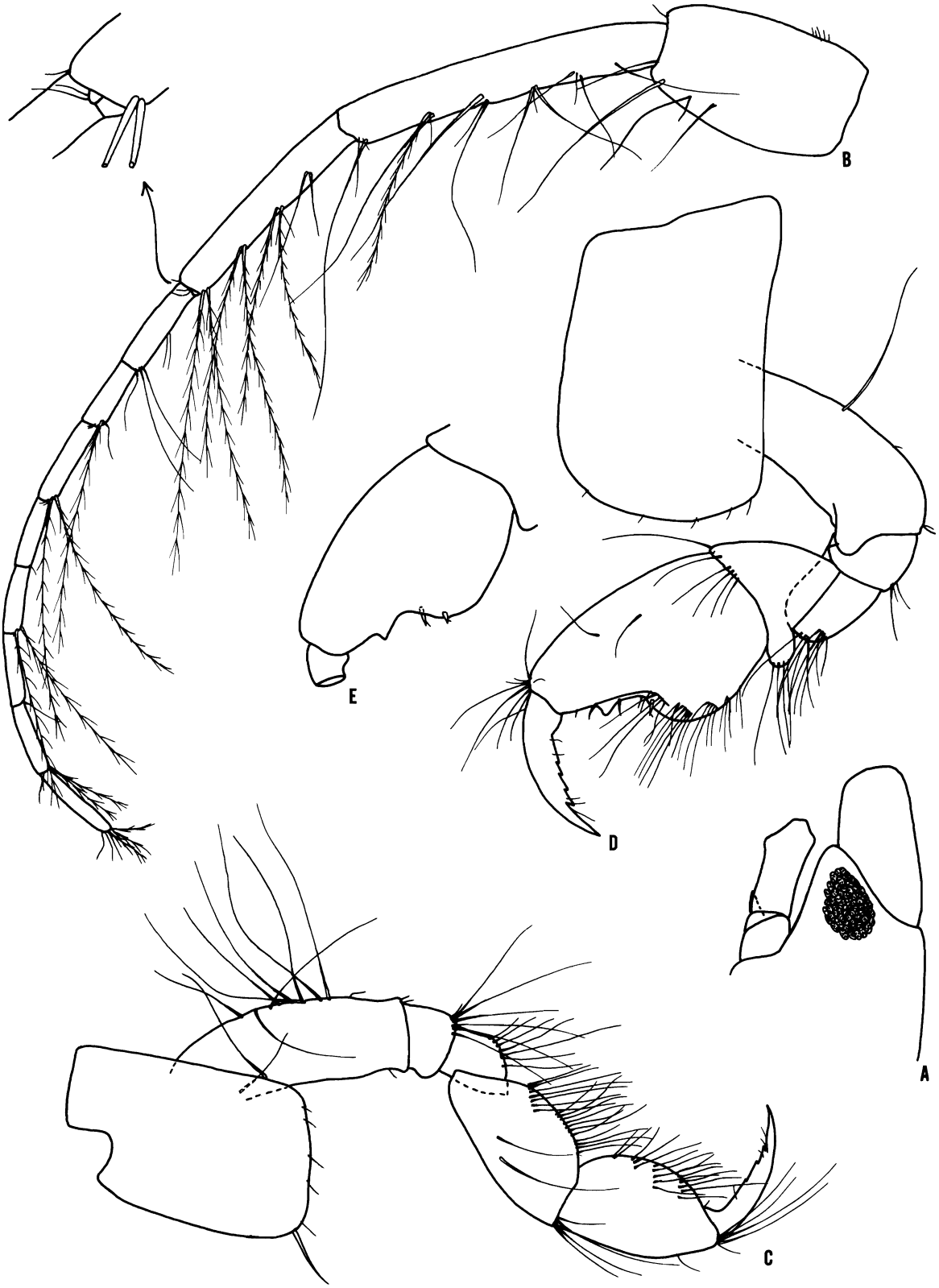
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PLATE 32

Cymadusa vadosa new species, Holotype, Male, 8.5 mm, Station 307. A. Head. B. Upper lip. C. Mandible. D. Lower lip. E, F. Maxillae 1, 2. G. Maxilliped. H. Coxa 4. I, J. Gnathopods 1, 2. K, L, M, N. Pereopods 1, 3, 4, 5. O. Pleonal segments 1, 2, 3. P. Uropod 1. Q. Uropod 3. R. Uropod 2. S. Telson.

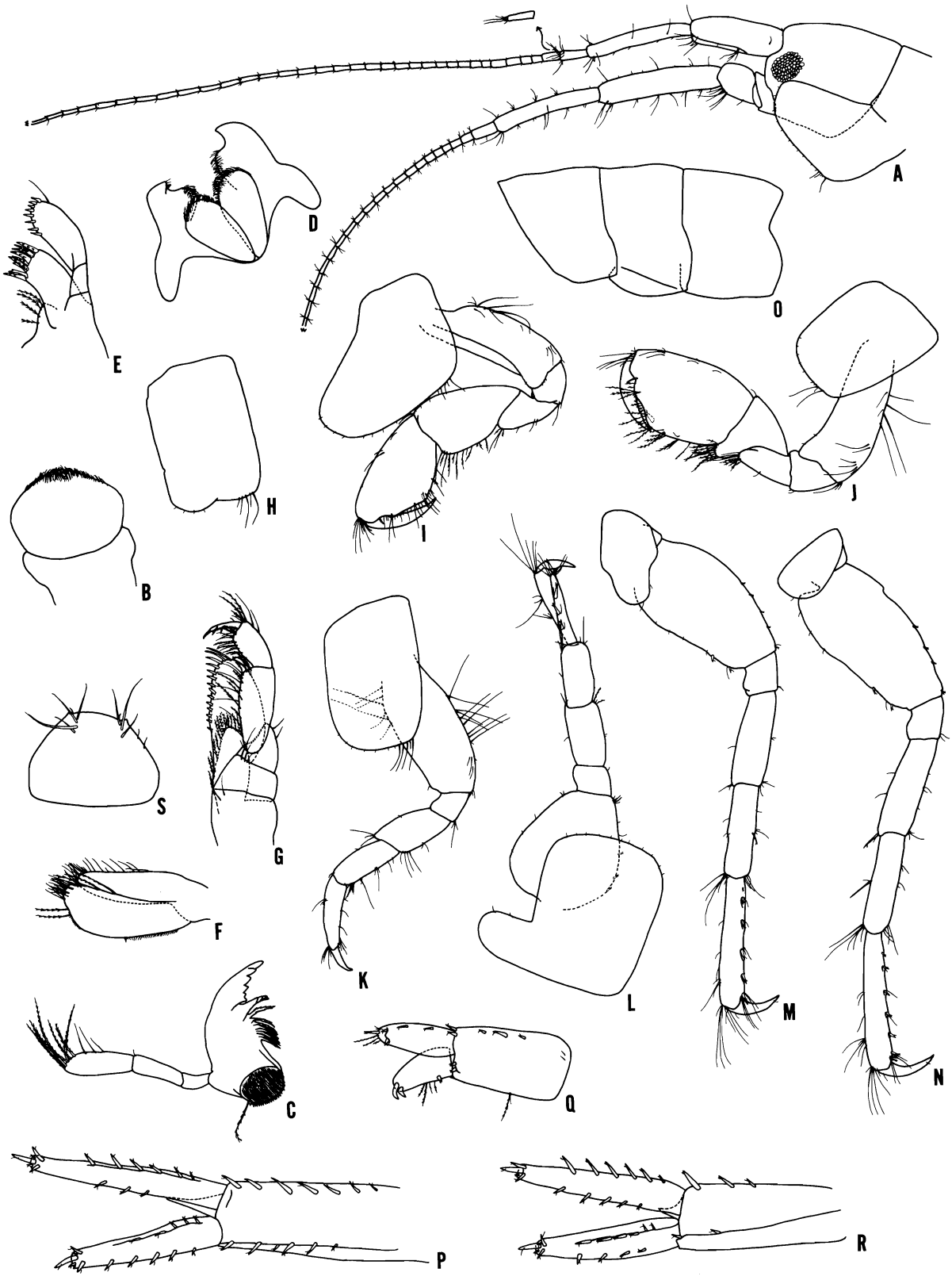
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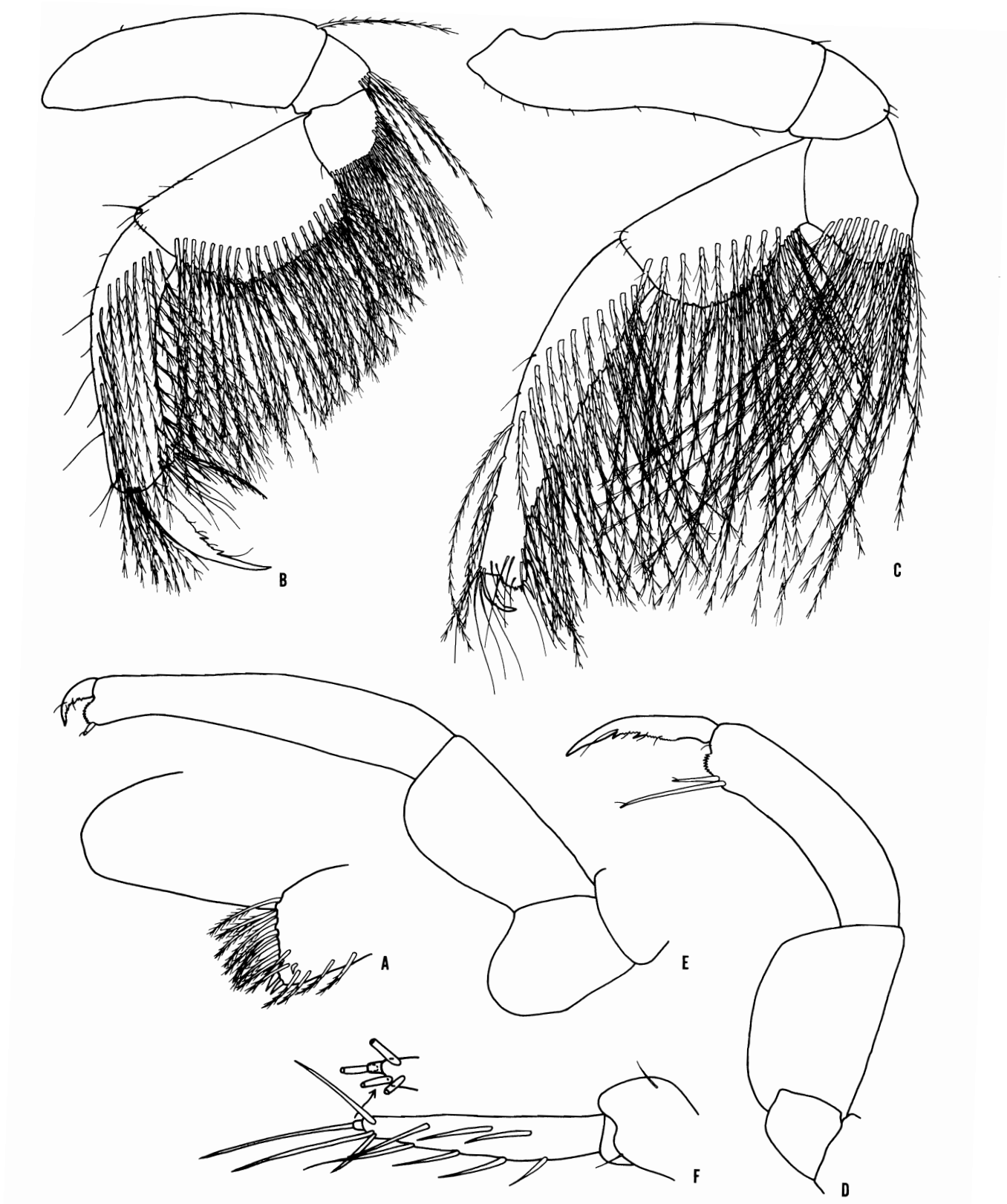
PLATE 33

Grandidierella gilesi? Chilton, Female, 5.0 mm, Station 83. A. Upper portion of inner plate and part of outer plate (without setae) of maxilliped. B, C. Gnathopods 1, 2. D, E. Last 4 articles of gnathopods 1, 2 without setae. F. Uropod 3 with enlarged second article of outer ramus.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