

The Platyschnopidae of America
(Crustacea: Amphipoda)

JAMES DARWIN THOMAS
and
J. LAURENS BARNARD

SMITHSONIAN CONTRIBUTIONS TO ZOOLOGY • NUMBER 375

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SMITHSONIAN INSTITUTION PRESS

City of Washington

1983

ABSTRACT

Thomas, James Darwin, and J. Laurens Barnard. The Platyischnopidae of America (Crustacea: Amphipoda). *Smithsonian Contributions to Zoology*, number 375, 33 pages, 12 figures, 2 tables, 1983.—The known American taxa of this family are divided into genera to complement the oriental taxa. Several unsolved problems remain. The taxa are *Eudevenopus* (new), with type-species *Platyischnopus metagracilis* J.L. Barnard, and including newly reanalyzed *Platyischnopus gracilipes* Schellenberg, *Phoxocephalus capuciatatus* Oliveira (obscure), and a new species, *E. honduranus* (these three may be synonymous); *Tiburionella* (new), with type-species *Platyischnopus viscana* J.L. Barnard; and *Skaptopus* (new), with type-species *S. brychius* (new).

These species are widespread through the Americas. *Skaptopus* is a deep-water taxon in depths of 100+ m whereas the other taxa occur in shallow water. They all have a plough-shaped head and are assumed to be fossorial.

OFFICIAL PUBLICATION DATE is handstamped in a limited number of initial copies and is recorded in the Institution's annual report, *Smithsonian Year*. SERIES COVER DESIGN: The coral *Montastrea cavernosa* (Linnaeus).

Library of Congress Cataloging in Publication Data

Thomas, James Darwin

The Platyischnopidae of America (Crustacea, Amphipoda)

(Smithsonian contributions to zoology ; no. 375)

Bibliography: p.

Supt. of Docs. no.: SI 1.27:375

1. Platyischnopidae—Classification. 2. Crustacea—Classification. 3. Crustacea—America—Classification. I. Barnard, J. Laurens (Jerry Laurens), 1928-. II. Title. III. Series.

QL1.S54 no. 375 [QL444.M315] 591s [595.3'71] 82-600317

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Introduction

Until recently (Barnard and Drummond, 1979) the platyschnopids were an obscure group of a few poorly described species from the Indian Ocean and subtropical America, all placed in one genus, *Platyschnopus*. Now they are recognized at family level, the type genus and its type-species have been clarified, and new genera have been described in the orient (Barnard and Drummond, 1979). The present paper treats the American taxa by reviewing the four previously described species, describing several new taxa, and establishing new genera.

Platyschnopids all have very elongate, plough-shaped heads, and long pereopods, antennae, and uropods armed with spines and setae in the fashion described by carcinologists as "digging appendages." While only two species have actually been observed burrowing in sediments (*E. honduranus* and *T. viscana*) it is assumed all taxa are fossorial.

ACKNOWLEDGMENTS.—We thank Carl H. Saloman, John R. Grady, and Dr. Eugene L. Naka-

mura of National Marine Fisheries in Panama City, Florida, for their help in obtaining their local collections of platyschnopids, sorted out by Dr. E.L. Bousfield of the National Museum of Canada, Ottawa.

Dr. Charlotte Holmquist of the Swedish State Museum in Stockholm very kindly loaned us Schellenberg's original material of *Platyschnopus gracilipes* (now placed in *Eudevenopus*).

We had the good fortune to obtain USA Bureau of Land Management deep-water samples just being accessioned into Smithsonian collections. They were provided to us through the courtesy and assistance of Dr. Meredith E. Jones, Mr. Douglas J. Barr, and Mrs. Renee F. McGinnis. We had on hand original materials of Barnard's eastern Pacific species courtesy of the Allan Hancock Foundation and Janet M. Haig.

We tried to obtain the holotype of *Phoxocephalus capuciatius* Oliveira, a platyschnopid, from Instituto Oswaldo Cruz but were not able to elicit a response. Dr. Lejuene Oliveira, who is no longer at that institute, kindly corresponded with us about our request but could not gain access to the material.

The following people also loaned material: Gary Goeke, Vittor and Associates; David Knott, South Carolina Wildlife and Marine Resources

James Darwin Thomas, Newfound Harbor Marine Institute, Big Pine Key, Florida, USA, 33043. J. Laurens Barnard, Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA, 20560.

Dept.; Keith Spring, Continental Shelf Associates, Inc.; Dr. Les Watling, University of Maine. Dr. Watling and Dr. Larry D. McKinney of Texas A & M University kindly offered helpful suggestions for our study.

We thank Dr. S. Dillon Ripley, The Secretary, Smithsonian Institution, for financial support of the first author during 10 weeks residence at the Smithsonian amphipod laboratory. We also thank Roland H. Brown, Dessie M. Best, Michael R. Carpenter, Janice Clark, and Elizabeth B. Harrison for their help with this project. Carolyn Cox Lyons of New York City inked our drawings.

The research was supported by funds from the National Science Foundation, Grant DEB7920534.

We count this as Contribution No. 79, "Investigations of Marine Shallow-Water Ecosystems Program Reef and Mangrove Study—Belize," under auspices of the Smithsonian Institution and partly supported by the Exxon Corporation. Dr. Klaus Rützler of the Smithsonian organized that field study.

ERRORS IN THE LITERATURE.—In Barnard and Drummond (1979:33, right column, line 7) the word "not" should be removed so the sentence will read "Telson short, spinose dorsally."

TECHNIQUES.—Methods used to describe taxa follow those of Barnard and Drummond (1979). The initial "M." followed by a number 0–100 refers to a point on an appendage, article, or ramus, the distance from which point to the base of the structure is expressed as the percentage of the total length of that structure. For example, a spine at M. 70 on the outer ramus of uropod 3 lies 0.70 (or 70 percent) of the distance from base to apex of the stated ramus.

Formulas of armaments are quoted from proximal to distal on appendages.

Calceolus and aesthetasc formulas cite the elements separated by dashes from base to apex, one number per article, series repetition being cited as "...n" to apex. These elements and spines or setae may also be cited as L = long, s = short, m

= medium sized, 0 = absent, if these proportions are important.

Spine formulas on article 6 of pereopods 3–4 are cited as, for example, 3 + 4 + 1, the first number being lateral elements, the second cited as medial elements, the final as central or middle element(s) near the apex at the base of the dactyl.

Spines between laciniae mobiles and molars on the mandible are termed "rakers."

The term "mopped" refers to the festooning or serial clumping of spines on the outer plate of maxilla 1 shown by Barnard and Drummond (1979:3, fig. 2: *aXI*).

Certain geographic positions of obscurity are cited as latitudes and longitudes.

TEXT ABBREVIATIONS

AHF	The Allan Hancock Foundation
BLM	Bureau of Land Management
NMFL	National Marine Fisheries Laboratory
SSM	The Swedish State Museum
USNM	Collections of the former United States National Museum, deposited in the National Museum of Natural History, Smithsonian Institution

FIGURE ABBREVIATIONS

(used in specimen drawings)

<i>A</i>	antenna	<i>N</i>	molar
<i>B</i>	coxa	<i>O</i>	outer plate or ramus
<i>D</i>	dactyl	<i>P</i>	pereopod
<i>G</i>	gnathopod	<i>Q</i>	palp
<i>H</i>	head	<i>R</i>	uropod
<i>I</i>	inner plate or ramus	<i>S</i>	maxilliped
<i>J</i>	lacinia mobilis	<i>T</i>	telson
<i>K</i>	spine	<i>U</i>	labrum
<i>L</i>	labium	<i>W</i>	epimeron(a)
<i>M</i>	mandible	<i>X</i>	maxilla

Lower case letters on the left side of labels denote specimens cited in the legends and voucher material in the text; lower case letters on the right side of labels indicate the following:

<i>a</i>	anterior	<i>r</i>	right
<i>b</i>	broken	<i>s</i>	setae removed
<i>d</i>	dorsal	<i>v</i>	ventral
<i>q</i>	oblique ventral view		

PLATYISCHNOPIDAE

Key to Genera of Platyischnopidae

(* = New World genera)

1. Head lacking apical process between antennae . *Skaptopus*, * new genus
Head with apical rostral process between antennae 2
2. Article 2 of antenna 1 about 1.4 times as long as article 1, coxa 3 distally tapering *Platyischnopus*
Article 2 of antenna 1 not exceeding 1.1 times as long as article 1, coxa 3 distally broad 3
3. Pleonite 3 with dorsal teeth, mandibular rakers absent, setae on palp article 2 of mandible vestigial or absent *Indischnopus*
Pleonite 3 naked, mandibular rakers present, setae on palp article 2 of mandible present 4
4. Coxa 1 of ordinary length and rectangular 5
Coxa 1 short and shoe-shaped 6
5. Telson lacking lateral brush of setae, posterior lobe of coxa 4 tapering *Tiburonella*, * new genus
Telson with lateral brush of setae, posterior lobe of coxa 4 not tapering *Eudevenopus*, * new genus
6. Article 2 of pereopod 7 with soft notch, telson with dorsofacial spines *Tittakunara*
Article 2 of pereopod 7 with sharp cusp, telson lacking dorsofacial spines 7
7. Article 5 of gnathopods 1-2 longer than article 6, hands chelate *Tomituka*
Article 5 of gnathopods 1-2 scarcely longer than 6, hands poorly chelate *Yurrokus*

Eudevenopus, new genus

ETYMOLOGY.—From the Greek *eu* (true), plus the Latin *devexus* (sloping), and the Greek *opos* (face). The gender is masculine.

DIAGNOSIS.—Platyischnopidae with midsagittal cephalic tooth, equatorial sensory pits. Article 2 of antenna 1 short, bearing only one main group of thin setal spines, article 3 of male not enlarged; article 1 of male flagellum not enlarged nor densely armed. Article 4 of female antenna 2 not elongate and poorly armed (compared to other genera). Mandibular incisors elongate, broad, 3-toothed like phoxocephalids; laciniae mobiles on right and left sides diverse, right thin and linguiform, left flabellate; raker spines 3 or

more on both right and left sides, not strongly diverse; molars tiny, nontritulative, each with 2 spines; no mandibular calluses. Inner plate of maxilla 1 small, subcircular, with one medially pointing seta, outer plate with 7 normal-sized spines (neither mopped nor strongly diverse), palp 1-articulate, setae more than 2 and not aberrant or gigantic. Plates of maxilla 2 ordinary. Plates of maxilliped weak and poorly armed; palp article 2 sparsely spinose medially; dactyl unguiform, lacking apical nail.

Coxae 1-4 increasing in size in ordinary progression, none of coxae 1-3 of unusual form or stunted, coxa 3 scarcely expanded distally, coxa 1 rectangular, coxa 2 weakly expanded apically, coxa 4 very large, with broadly rectangular pos-

terior lobe. Article 5 of gnathopods subequally as long as article 6, gnathopods strongly chelate. Article 2 of pereopod 5 thin, scarcely expanded except weakly expanded apically. Article 2 of pereopod 7 with soft notch and cusp posteroventrally, dactyls of ordinary length.

Pleon dorsally untoothed. Article 2 on outer ramus of uropod 3 thick, long, well armed. Telson poorly cleft, lacking dorsal spines except submarginally near apex, bearing on each side lateral brush of several immensely long setae.

TYPE-SPECIES.—*Platyischnopus metagracilis* J.L. Barnard (1964).

COMPOSITION.—*Platyischnopus gracilipes* Schellenberg (1931), *Phoxocephalus capuciatius* Oliveira (1955), *Eudevenopus honduranus* Thomas and Barnard, new species.

RELATIONSHIP.—This genus differs from *Platyischnopus* (see Barnard and Drummond, 1979) in most of the ways other platyischnopid genera do; for example, in the normal anterior coxae, the more or less normal mouthparts bearing raker spines on the mandibles, normal (not a recurved fascicle) spine arrangement on maxilla 1, unguiform dactyl of maxilliped, and short article 2 of antenna 1 lacking spine groups. It also differs from *Platyischnopus* in the phoxocephalid-like incisors of the mandibles, the weak outer plates of the maxillipeds, and the short article 5 of gnathopod 2.

Eudevenopus differs from *Tittakunara* Barnard and Drummond (1979) in the following characters: (1) unshortened coxa 1; (2) placement of telsonic spines so that none is truly facial or strongly dorsal, the strong lateral armament being composed of several very elongate setae forming a brush; (3) strongly chelate gnathopods; (4) shorter article 5 of gnathopod 2; (5) 1-articulate palp of maxilla 1; (6) poorly setose inner plate of maxilla 1; (7) poorly armed article 4 of female antenna 2; (8) weak plates of the maxilliped.

Eudevenopus differs from *Tomituka* Barnard and Drummond (1979) in characters 1, 2, 4, 5, 6, 7, and 8 cited above for *Tittakunara* plus (9) lack of a callus on the mandibular incisors. The new

genus differs from *Yurrokus* Barnard and Drummond (1979) in characters 1, 2, 3, 5, 6, and 8.

Eudevenopus differs from *Indischnopus* Barnard and Drummond (1979) in characters 2, 3, 4, 8; (10) unguiform dactyl of the maxilliped lacking a nail; and (11) presence of mandibular raker spines and many minor characters such as shapes of maxilla 1, maxilliped, and article 2 and dactyl of pereopod 7.

Eudevenopus gracilipes, *E. honduranus*, and *E. metagracilis* differ from *Tiburonella viscana* in the following ways: (1) only 1 seta on the inner plate of maxilla 1; (2) more widely spaced spines on the outer plate of the maxilliped; (3) fewer elements on the inner plate of the maxilliped; (4) different formula of armaments on article 6 of pereopods 3–4, the elements being thinner and farther proximally along the posterior margin; (5) broader and more quadrate posterior lobe on coxa 4; (6) narrower article 2 of pereopod 5; (7) less distinctive article 2 notch on pereopod 7; (8) longer dactyls of pereopods 5–7; (9) presence of only 1 row of spines on outer rami of uropod 2; (10) longer marginal spines on rami of uropods 1–2 and peduncle of uropod 2; (11) thinner and more poorly armed article 2 of outer ramus on uropod 3; (12) very distinctive telson, with smaller cleft and different armament pattern.

PROBLEMS.—*Eudevenopus* has several described species assignable to it: *Platyischnopus gracilipes* Schellenberg, *Phoxocephalus capuciatius* Oliveira, *Platyischnopus metagracilis* J.L. Barnard. We have no difficulty separating *E. metagracilis*, the type-species, from *E. honduranus*, our new species, but due to lack of material we cannot determine whether or not *E. gracilipes* and *E. capuciatius* are senior synonyms of *E. honduranus*. We suspect they are.

In order to make a name available for use by others we are establishing the tropical species *E. honduranus* but find no harm in continuing to refer to *E. gracilipes* and *E. capuciatius* as possible senior synonyms. Far better this than to have suppressed them by ignoring them and far better this than creating a monster through naming our tropical material by such appellations as *Eudevenopus ?gra-*

TABLE 1.—Armament formulas on uropods of *E. metagracilis*

Specimen	Uropod 1		Uropod 2	
	Outer Ramus	Inner Ramus	Outer Ramus	Inner Ramus
6181-a	SLSL	2	1	2
6181-b	SLSL	2	2	1
6181-p	SSL	3	2	2
6181-d	SLL	3	2	2
6181-e	SL	2	1	1
6193-j	SL	2	1	1
6193-k	SL	2	1	1
6193-q	SL	2	1	1
6193-n*	SS	2	0-1	0-1

* Uropod 2 variable right and left sides.

cilipes or *E. cf. capuciatius*. Until these problems are resolved the genus can be cited as having 4 species, one of which (*E. capuciatius*) is obscure and two others that we have distinguished in very minimal form but which we suspect are synonymous (*E. gracilipes* and *E. honduranus*).

As can be seen in Table 1, the holotype and only known specimen of *E. gracilipes* (deposited in the Swedish State Museum) fits into the middle of a spread of specimens we would ordinarily identify all as one species, our *E. honduranus*. The

large body size and far southern position of *gracilipes* on the west coast of South America make us hesitate in uniting *E. honduranus* with *E. gracilipes*. We have been unable to obtain the Rio de Janeiro holotype of *Phoxocephalus capuciatius* from Instituto Oswaldo Cruz, which is now administered by nontaxonomists, and we cannot confirm that it also would be a synonym senior to *E. honduranus* but junior to *E. gracilipes*.

We have, however, separated *E. capuciatius* and *E. honduranus* from *E. gracilipes* in the following key based on spination of uropods, knowing that the holotype of *E. gracilipes* falls into the middle of an analytical table of variability concerning these characters found on page 19. We maintain the distinction between *E. gracilipes* and the other species because of uncertainties such as (1) the presence of pectinate spines on article 5 of male gnathopod 2 of the holotype of *E. gracilipes*, these spines not yet having been found on 7 specimens we identify as *E. honduranus*; (2) the holotype of *E. gracilipes* being about 1.15 times larger than the largest specimens of *E. honduranus*; and (3) the holotype of *E. gracilipes* coming from the outer extreme of the known distribution of the species complex. Until good materials of this complex can be shown to link up these small discrepancies we prefer to maintain the taxa.

Key to Species of *Eudevenopus* (Adults)

1. Epimeron 2 tooth small, dactyl of pereopod 7 long, subequal or exceeding article 6, inner ramus of uropod 2 shortened, at least one dorsal spine on outer ramus of uropod 1 elongate ***E. metagracilis***
 Epimeron 2 tooth medium, dactyl of pereopod 7 short¹, not exceeding article 6, inner ramus of uropod 2 scarcely shortened, dorsal spines on outer ramus of uropod 1 short 2
2. Inner and outer rami of uropod 2 with 1 dorsal spine, article 2 on outer ramus of uropod 3 with 1 × 2 spines ***E. gracilipes***
 Inner and outer rami of uropod 2 with 2 dorsal spines each, article 2 on outer ramus of uropod 3 with 3 × 2 spines
 ***E. capuciatius* and *E. honduranus***,² new species

¹ Assumed in *E. gracilipes*.

² See pp. 5 for explanation.

***Eudevenopus metagracilis* (J.L. Barnard),
new combination**

FIGURE 1

Platyischnopus metagracilis J.L. Barnard, 1964:225-226, fig. 3; 1969:210.

DESCRIPTION OF FEMALE (female "k," 4.52 mm).—Head about 14 percent of total body length, rostrum scarcely constricted apically, bearing between first antennae weak, subapical, downturned, blunt process flush with cephalic axis. Eyes medium, ommatidia distinct. Article 1 on peduncle of antenna 1 about 0.73 times as long as wide, almost 1.30 times as wide as article 2, ventral margin with 2 setules, unproduced dorsal apex with setules, lateral face naked; article 2 about 0.77 times as long as article 1, apical face with row of thin spine setae, ventral margin naked; article 3 about half as long as article 1, ventral margin with one proximal setule and one apical spine-seta; primary flagellum about 2.0 times as long as peduncle, with 7 articles, article 1 scarcely elongate, posteroventral corner of flagellar articles 1-7 with long (1.1 times as long as accessory flagellum) and 1 short spine setae. Formula of aesthetascs = s-s-s-m-m-L-L; accessory flagellum about 0.30 times as long as primary flagellum, with 2 main articles tipped with minute aesthetasc +2 apical setae. Dorsal margin on article 4 of antenna 2 with 3 groups of 4-5 thin setal spines, ventral margin with 2 obsolescent acclivities bearing 3 spine-setae (plus penicillate), ventral apex with long thin spine and 3 shorter spines; article 5 about 0.73 times as long as article 4, dorsal margin with one group of 3 spine-setae, ventral margin with one group of 2 spines + single penicillate seta, ventral apex with 4 long to medium spines, plus single penicillate seta, flagellum about as long as article 4 of peduncle, with 4 articles.

Mandible with medium-sized palpar hump, mandibles generally of ordinary gammaridean form, incisors of phoxocephalid form, broad, weakly acclivated on broad margins, right incisor with strong outer cusp, broad cutting surface, inner tooth with accessory lateral notch and

tooth, then medial margin with tooth (total 3 teeth, one accessory tooth-notch), left incisor with outer cusp, inner double "sutured" tooth pair (known in phoxocephalids as 3 teeth on 2 branches for total incisor); right lacinia mobilis forming blade weakly distinct from members of raker row, right rakers 6, first raker shortened, left rakers 4 (with 4 accessory setules between pairs), first left raker shortened; left lacinia mobilis broad, flat, 5-toothed, not articulate; right and left molar small, forming weak elongate plaque weakly pebbled, each bearing one small spine; length ratio of mandibular palp articles = 16:70:71, article 1 short, unarmed, article 2 elongate, bearing one apicomедial seta, article 3 with obliquely truncate apex bearing 4 hooked spines, no basofacials. Lower lip with fleshy inner lobes separated on aboral side but bearing accessory vertical lobes, no cones, pubescence weak.

Inner plate of maxilla 1 short, thick, falciform, apex rounded but turned into medial attenuation bearing one short seta; outer plate with 7 spines of ordinary appearance, either bifid, weakly serrate or simple, palp uniarticulate, scarcely overreaching outer plate, with 2 apical, one apicomедial, and one apicolateral setae. Plates of maxilla 2 ordinary, equally extending, outer broader than inner, apical spine-setae thick, stiff, sparse, outer plate with one lateral spine-seta. Plates of maxilliped small and thin, sparsely spinose, inner with 2 apical spines, outer with one apical, one apicomедial spine, one basomedial spine, inner margin with ventral seta, no blank acclivities; palp stout, article 2 with 5 medial setae, article 3 with 5 medial setae, 4 apical and apicolateral setae, dactyl unguiform, with one subbasal setule, one inner notch with 2 setules, nail absent.

Lower margins of coxae 1-4 forming even curve, no disjunctions, coxae progressively longer and broader; coxa 1 longer than broad ($\times 1.65$), with 2 mediofacial setae, one long posteroventral medial seta and one short ventral setule. Coxae 2 slightly expanded ventrally, longer than broad ($\times 1.30$), with 2 mediofacial setae, 1 anteroventral medial setule, and 2 posteroventral setae. Coxa 3 rectangular, longer than broad ($\times 1.40$), antero-

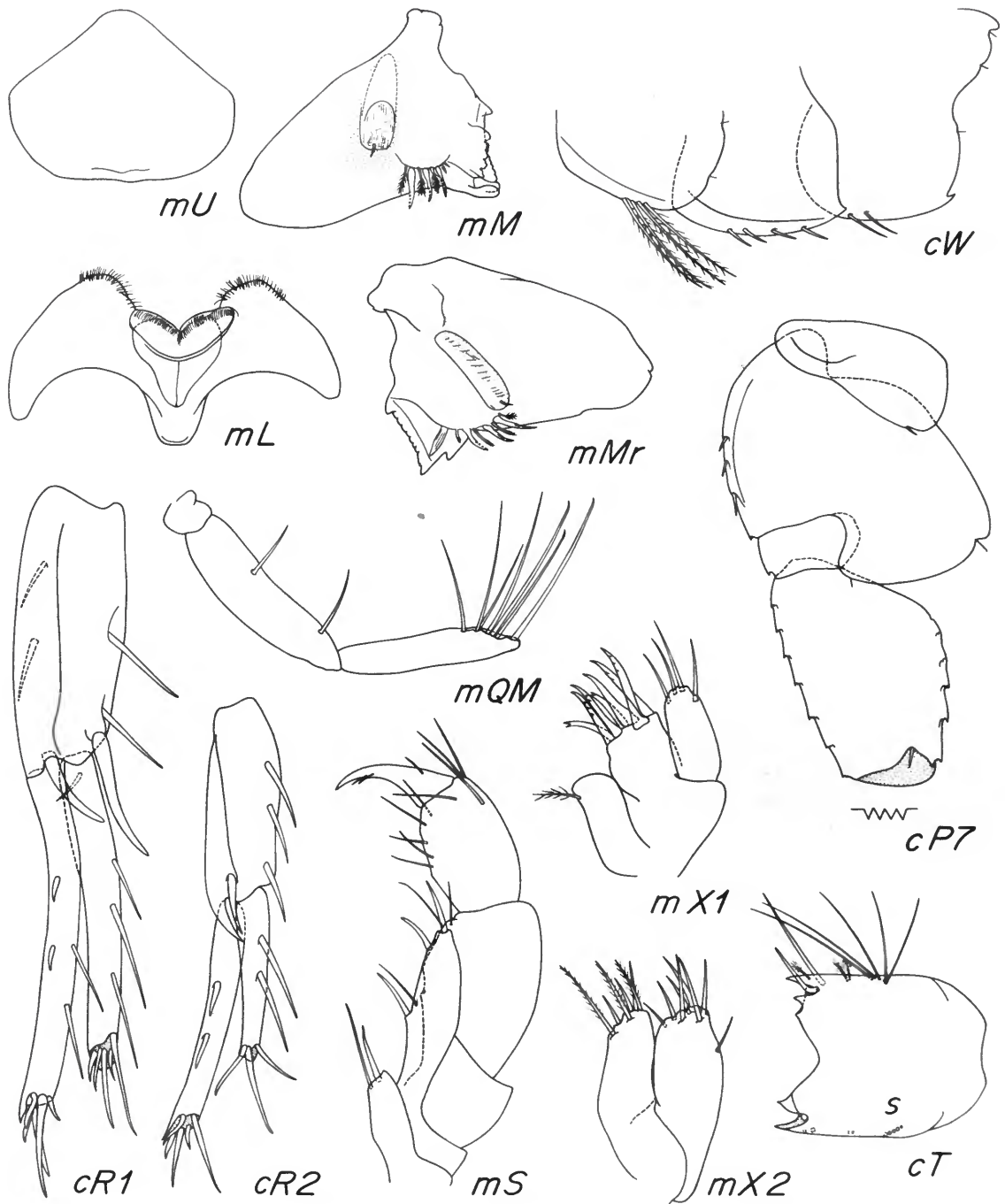


FIGURE 1.—*Eudevenopus metagracilis* (J.L. Barnard), female "l," 6.20 mm (c = female "c," 4.12 mm; m = female "m," 5.85 mm).

ventral margin evenly rounded, posteroventral margin with 2 setae. Coxa 4 very large, rectangular, wider than long ($\times 1.44$), ventral margin with 1 anterior and 3 midventral setae.

Gnathopods similar in configuration and armament to *E. honduranus*, length ratios of articles 5 and 6 of gnathopods 1 and 2 = 75:120 and 64:110.

Pereopods 3 and 4 similar, main apical spine of article 5 extending to M. 68 and M. 61 of article 6 on pereopods 3 and 4 respectively; spine formula for article 6 = 4 + 3 + 0, proximalmost member of lateral set thin and disjunct, dactyls simple apically, with single penicillate seta medially.

Articles 4–5 of pereopod 5 narrow, article 4 of pereopods 6–7 broad and medium respectively; facial spine rows sparse to absent; facial ridge formula on article 2 of pereopods 5–7 = 0–0–1 (part); width ratios of articles 2, 4, 5, 6 on pereopod 5 = 27:26:20:7, on pereopod 6 = 70:55:30:10, on pereopod 7 = 83:54:24:14, length ratios on pereopod 5 = 78:38:36:37, on pereopod 6 = 90:75:57:58, on pereopod 7 = 102:81:72:83; article 2 of pereopod 5 narrow basally, scarcely widening distad, with weak posteroventral lobe; of pereopod 6 orbicular, with adz-shaped posterior lobe; of pereopod 7 broad, galeate, with large soft posteroventral notch and broad, truncate ventral lobe; dactyls long, thin, pointed, dactyl of pereopod 7 about 1.12 times as long as article 6.

Epimeron 1 broadly rounded posteriorly but with 4 small setule notches, midventral margin with 7 long setae; epimeron 2 not dominant, posterior margin scarcely sinuous, largely convex, with small posteroventral tooth, ventral margin with 4 spines; epimeron 3 with weakly convex posterior margin bearing 4 setules, ventral margin with 6 long spines, posteroventral tooth small, sharp, and upturned.

Urosome tall, thick, smooth dorsally, urosomite 2 extremely short, urosomite 1 with large ventral spine near base of uropod 1, uropod 1 exceeding uropod 2, uropod 3 extremely elongate. Peduncle of uropod 1 with 2 lateral facial spines in tandem,

lateral apex with enlarged curved spine, medial apex with larger similar spine, medial margin with 2 elongate thin spines in tandem, rami much longer than peduncle, inner ramus reaching to M. 95 on outer ramus, each with 5 apical spines, outer with 3 other short dorsal spines in tandem (1 lateral, 2 medial), inner with 3 other dorso-medial spines (2 long, 1 medium), and one ventral subbasal guiding spine. Dorsolateral and dorso-medial margins of peduncle on uropod 2 with 1 and 2 spines each, lateral apex of peduncle with long tooth, outer ramus longer than peduncle, inner ramus shorter than peduncle, reaching to M. 72 on outer ramus, outer and inner rami with 5 and 3 apical spines respectively, each with 2 other spines in tandem on dorsal margins, spines on inner ramus more elongate.

Peduncle of uropod 3 scarcely elongate, with 3 basolateral, 4 apicolateral, 2 apicomедial, and 2 dorsal spines, inner ramus small, scale-like, with one medial spine, 1 apical spine plus setule; outer ramus very elongate, article 2 as long as article 1, lateral margin of article 1 with spine formula of 3–3–3–4, of article 2 = 1–1, setal formula of medial margin of article 1 = 1–1–1–1–1–1, of article 2 = 1–1, medial spine formula of article 1 = 0–0–0–0–0–2, lateral seta formula of article 2 = 1–1, apex of article 2 subsharp, with 2 setules (one long, one short).

Telson as broad as long, posterior cleft shallow, about one fourth as long as telson, forming broad gape, each lobe with sharp notch on apex bearing one bent spine, each apicolateral margin with 1 bent spine and 1 penicillate setule, each midlateral margin armed with brush of 4 long setal spines followed posteriorly by paired penicillate setules.

VOUCHER MATERIAL.—AHF, *Velero III* 460–35, female “k,” 4.52 mm. Same, *Velero IV* 6181 (10+ specimens); 6193 (5 specimens); 6194 female “c,” 4.12 mm; female “l,” 6.20 mm; female “m,” 5.85 mm.

RELATIONSHIP.—Differing from *E. honduranus* (= *E. ?capuciatius*, = *E. ?gracilipes*) in the following characters: (1) long dactyl of pereopod 7, a character often lost on museum specimens; (2) smaller

tooth of epimeron 2; (3) conspicuously shortened inner ramus of uropod 2; (4) elongation of at least one spine on the outer ramus of uropod 1 in adults and (5) pairing of spine to seta in the armament couples on article 2 of the outer ramus on uropod 3 (versus pairing of 2 short spines). The armament on the outer ramus of uropod 1 can be described in full adults from the proximal end as "short-long-short-long," with the short spines being lateral and the long spines being medial. Juveniles may be described as "short-long." (See also "Relationship" of *E. honduranus*.)

Table 1 shows variability in armament formulas on the rami of uropods 1-2 in 9 undamaged specimens of varying sizes from 2 *Velero IV* samples of the original material described by J.L. Barnard (1964).

OTHER MATERIAL.—AHF, *Velero III* Pacific Stations, 240-34, Isla Jicarta, Panama, 24 fms (broken female); 401-35, Manta, Ecuador, 1 fm (1 damaged female); 459-35, Playa Blancas, Costa Rica, 2-3 fms (1 male); 460-35, same, 3-5 fms (many specimens); 461-35, Bahía Parker, Costa Rica, 15 fms (1 specimen); 466-35, same, shore (7 specimens); 476-35, Bahía Salinas, Costa Rica, 8 fms (1 specimen). AHF, *Velero IV* Pacific Stations, 6181, Baja California, off Punta San Pablo, 27°25'52"N, 114°37'25"W, 64 m (10+ specimens); 6193, Baja California, off Santa Catarina, 29°24'55"N, 115°12'45"W, 30 m (5 specimens); 6194, Baja California, off Santa Catarina, 29°23'00"N, 115°15'20"W, 47 m (3+ specimens).

DISTRIBUTION.—Eastern Pacific Ocean from Northern Baja California to Ecuador, 0-73 m.

***Eudevenopus gracilipes* (Schellenberg), new combination**

FIGURE 2

Platyischnopus gracilipes Schellenberg, 1931:63-65, fig. 33 [in part].

NOMENCLATURE.—We have examined the type of *E. gracilipes*, which is the male from ?Valparaiso, Chile described by Schellenberg. It is not a senior synonym to *E. metagracilis* and is close to *E.*

honduranus. Schellenberg mistakenly described and figured the appressed inner rami of uropod 3 as the telson instead of the true telson; hence Barnard (1964), thinking this was a good difference, described and compared *P. metagracilis* to *P. gracilipes* on the basis of the incorrect telson. Schellenberg's type has the same telson as *E. metagracilis*.

We believe that the second specimen of *E. gracilipes* described by Schellenberg, from Rio de Janeiro, is not *E. gracilipes* but *Tiburonella viscana* (Barnard) 1964. We have not located that specimen. (The "B.M." depository note of Schellenberg, 1931, could be either Berlin Museum or British Museum according to the introductory remarks of Schellenberg.)

DESCRIPTION OF MALE (holotype male "a," 4.12 mm).—Head about 18 percent of total body length, rostrum scarcely constricted apically (but mashed), between first antennae bearing weak, subapical, downturned, blunt process flush with cephalic axis. Eyes medium, pigment faded, ommatidia distinct. (Antenna 1 badly broken, generally like *P. metagracilis* (1964 illustrations) but apical setae of article 2 much shorter; primary flagellum with 5 articles, all other information unknown.) Dorsal margin on article 4 of antenna 2 pubescent, ventral margin with 2 pairs of setules, ventral apex with 2 setules, face with 2 setules; article 5 about 0.67 times as long as article 4, dorsal margin with 3 groups of male aesthetascs, 2 calceoli, ventral margin with 2 apical setules, face naked, flagellum of elongate male form, calceolus formula = 1-1-0-1-0-1 . . . n.

Mandible with medium-sized palpar hump, mandibles like *E. honduranus* but left mandibular incisor lacking suture form on inner tooth (single only), right lacinia mobilis simple, no prickles, no slit, left flabellate, with 5.5 teeth, right rakers 3 + 1 rudimentary, left = 5 + 1 rudimentary (both sides plus interrakers), molars small, with paired spine (appressed pair seen left side only, right damaged); length ratio of mandibular palp articles = 14 : 72 : 70, article 1 with 2 inner setae (one apical), article 3 with oblique apex bearing 7 spine-setae (one disjunct from margin).

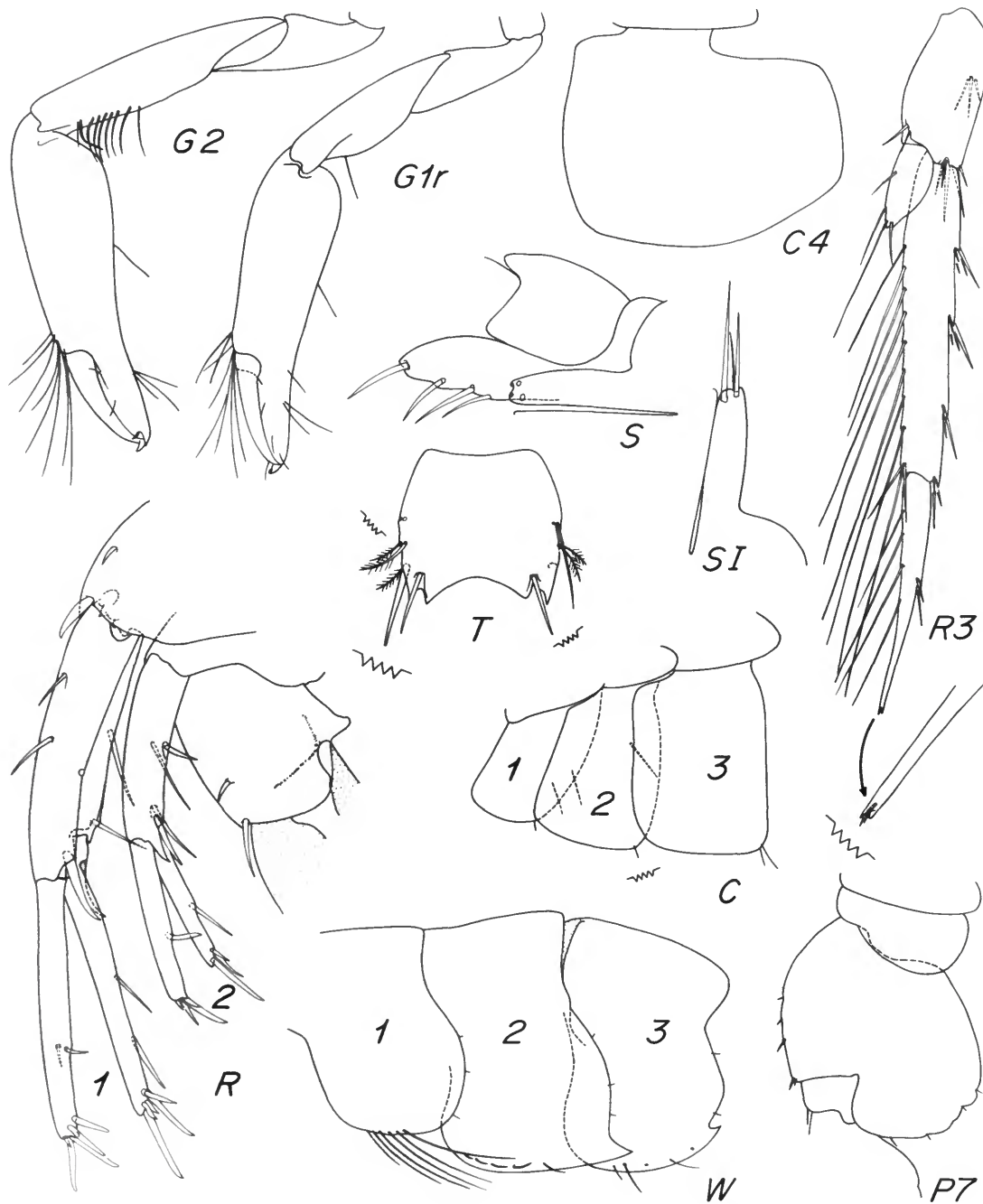


FIGURE 2.—*Eudevenopus gracilipes* (Schellenberg), holotype, male "a," 4.12 mm.

Lower lip like *E. honduranus*.

Inner plate of maxilla 1 with 1 seta, outer plate with 9 spines, palp with 7 setae in formula of 1 apicolateral, 2 apical, 4 medial. Plates of maxilla 2 ordinary, equally extending, almost equally broad, apical spine-setae thick, stiff, sparse, outer plate with 2 and 1 apicolateral setae (compared with Figure 4: X2 of *E. honduranus*, inner plate with 8 setae, outer with 15 setae). Plates of maxilliped small and thin, sparsely spinose, inner with 2 apical spines and one setule, outer with one apical and 3 medial, no gaps, palp very stout, article 2 with medial spine formula of 1-1-2-3-3-1, article 3 with 7 medial, 3 apical, and one apicolateral spine-setae, dactyl unguiform, with one subbasal setule, one inner notch with spine-setule, nail absent.

Lower margins of coxae 1-4 as attached to body forming even curve, no disjunctions, coxae progressively longer and broader, coxa 1 longer than broad, with 2 posterior setae, plus small one at posteroventral corner, coxa 2 weakly expanded anterodistally, longer than broad, with one posteroventral seta, coxa 3 rectangular, about 1.4 times as long as wide, with 2 posteroventral setae, coxa 4 very large, broad, almost 1.25 times as wide as long, posterior lobe of medium extension, broad, adz-shaped, ventral margin naked.

Gnathopods with relatively short article 5, sixth articles strongly chelate, weakly tapering, elongate, axial margins not biconvex, length ratios of articles on gnathopods 1-2 = 68:112 and 98:120; palmar humps small and sharp, each with small flake (damaged); article 3 elongate; posterior margin of article 5 with 1 seta on gnathopod 1 but double apical row of 6-9 short, bent, pectinate setae in each row on gnathopod 2.

Pereopod 4 (= mostly missing, possibly like pereopod 3), main apical spine on article 5 of pereopod 3 extending to M. 75 on article 6; spine formula on article 6 = 3-3-1 noting that third member of lateral situated far proximal and of setal form, spine of set of one of medium length, dactyls simple apically (but curved as in *E. honduranus*).

Pereopods damaged but generally like *Platysis-*

chnopus metagracilis in J.L. Barnard (1964), but pereopod 5 articles 3-7 missing, pereopod 6 article 4 narrower and articles 6-7 missing, pereopod 7 with more scallops on article 2 (see Figure 2: P7), coxa less attenuate and articles 6-7 missing.

Epimeron 1 broadly rounded posteriorly, mid-ventral margin with 6 long setae, epimeron 2 dominant, posterior margin sinuous, posteroventral tooth medium and sharp, ventral margin with 5 short setae, epimeron 3 strongly convex posteriorly, posteroventral tooth small, sharp, weakly upturned, ventral margin with 5 setae.

Urosome tall, thick, smooth dorsally, urosomite 2 extremely short, urosomite 1 with large ventral spine near base of uropod 1 and one midventrally, urosomite 3 with male characters of lateral and paired dorsal denticle rows plus ventral spines; uropod 1 exceeding uropod 2, uropod 3 extremely elongate. Peduncle of uropod 1 with 2 lateral facial spines in tandem, one middorsolateral spine, lateral apex with enlarged curved spine, medial apex with larger similar spine, medial margin with 2 thin spines in tandem, rami not longer than peduncle, outer and inner with 5 apical spines each, outer with 2 other small subapical spines, inner with 2 other subapical long spines in tandem and one subbasal guiding spine (not in figure herein). Dorsolateral and dorsomedial margins of peduncle on uropod 2 each with 2 spines in tandem, lateral apex with long tooth, rami shorter than peduncle, outer and inner rami with 4 and 3 apical spines respectively, each with one other spine on dorsal margin.

Peduncle of uropod 3 scarcely elongate, with 3 basolateral spines, 5 apicolaterals, 2 apicomediales, inner ramus small, scale-like, with 2 medial and 2 apical setae; outer ramus very elongate, article 2 about 0.75 times as long as article 1, lateral margins of article 1 with spine formula of 4-4-3-3, of article 2 = 0-2-0, setal formula on medial margin of article 1 = 1 × 9, article 2 = 1-1-1-1, spine formula = 0 × 8 + 2, apex of article 2 sharp, armed with 2 elements (broken).

Telson as broad as long, posterior "cleft" shallow, about 0.15 as long as telson, forming broad gape, each lobe with sharp apex but setule far

proximal, each notch with spine, each lateral subapex with spine and mentioned setule together, then pair of more proximal setules, then lateral pair of long setae.

MATERIAL.—SSM 6645, male 4.12 mm (new measurement).

TYPE-LOCALITY.—?Valparaiso, Chile.

RELATIONSHIP.—The other specimen from Rio de Janeiro, which Schellenberg included with this species, possibly belongs with *Tiburonella viscana*.

Eudevenopus gracilipes appears to differ from *E. metagracilis* (J.L. Barnard, 1964) in the longer tooth of epimeron 2 and the comb of setae on article 5 of gnathopod 2. If the latter is a male character, however, it may occur in *E. metagracilis*, though the 20+ males of *E. metagracilis* in hand lack this comb.

Eudevenopus gracilipes differs from most adults of *E. honduranus*, new species, in the presence of only 1 dorsal spine on the outer rami of uropods 1–2, the presence of only one pair of spines on article 2 of the outer ramus on uropod 3, the presence of only 1 pair of spines on the outer ramus of uropod 1, the simple right lacinia mobilis, the presence of 3 elements on the inner plate of the maxilliped (versus 2), and the presence of 4 spines on the outer plate of the maxilliped without gaps (versus 2 spines with gaps). But Table 2 demonstrates that the holotype of *E. gracilipes* fits into a series of selected specimens of *E. honduranus* without discontinuity.

The dactyl of pereopod 7 on *E. gracilipes* is missing so we assume it is short because Schellenberg did not mention it; most of his drawings, however, do not come from the *E. gracilipes* holotype, but from the second specimen, which is possibly *T. viscana*.

Eudevenopus gracilipes also differs from *E. metagracilis* in the long (ordinary) inner ramus of uropod 2 and spine formulas on uropods 1–2; *E. metagracilis* has on the outer ramus of the first uropod 2 sets of large spines in tandem, medial and lateral, whereas in *E. gracilipes* only 2 small spines occur as a pair side by side; both rami of uropod 2 in *E. metagracilis* have 2 spines each, whereas *E. gracilipes* has only 1 each.

DISTRIBUTION.—?Valparaiso, Chile.

Eudevenopus honduranus, new species

FIGURES 3–6

?*Platyschnopus gracilipes* Schellenberg, 1931:63–65, fig. 33 [in part].

?*Phoxocephalus capuciatius* Oliveira, 1955:313–317, pl. 1, 2.

DESCRIPTION OF FEMALE (holotype female “b,” 3.3 mm).—Head about 20 percent of total body length (including head), rostrum scarcely constricted apically, bearing between first antennae weak, subapical, downturned, blunt process flush with cephalic axis. Eyes medium, pigment mostly dissolved, ommatidia distinct. Article 1 on peduncle of antenna 1 about 0.90 times as long as wide, almost 2.4 times as wide as article 2, ventral margin with 2 setules, unproduced dorsal apex with 3 setules, lateral face naked; article 2 about 0.90 times as long as article 1, apical face with row of thin spine-setae, ventral margin naked; article 3 about half as long as article 1, ventral margin with one proximal setule and one apical spine-seta; primary flagellum about 1.1 times as long as peduncle, with 5 articles, article 1 scarcely elongate, formula of aesthetascs = L–0–L–L–s; accessory flagellum about 0.55 times as long as primary flagellum, with 3 main articles tipped with a minute aesthetasc. Dorsal margin on article 4 of antenna 2 with 3 groups of 4–5 thin setal spines, ventral margin with 2 obsolescent acclivities bearing 3 spine-setae plus one penicillate seta, ventral apex with long thin spine and 3 shorter spines; article 5 about 0.7 times as long as article 4, dorsal margin with one group of 3 spine-setae, ventral margin with one group of 2 spines, ventral apex with 4 long to medium spines, flagellum about as long as article 4 of peduncle, with 4 articles.

Mandible with medium-sized palpar hump, mandibles generally of ordinary gammaridean form, incisors of phoxocephalid form, broad, weakly acclivated on broad margins, right incisor with strong outer cusp, broad cutting surface, inner tooth with accessory lateral notch and tooth, then medial margin with tooth (total 3 teeth, one accessory tooth-notch), left incisor with outer cusp, inner double “sutured” tooth pair

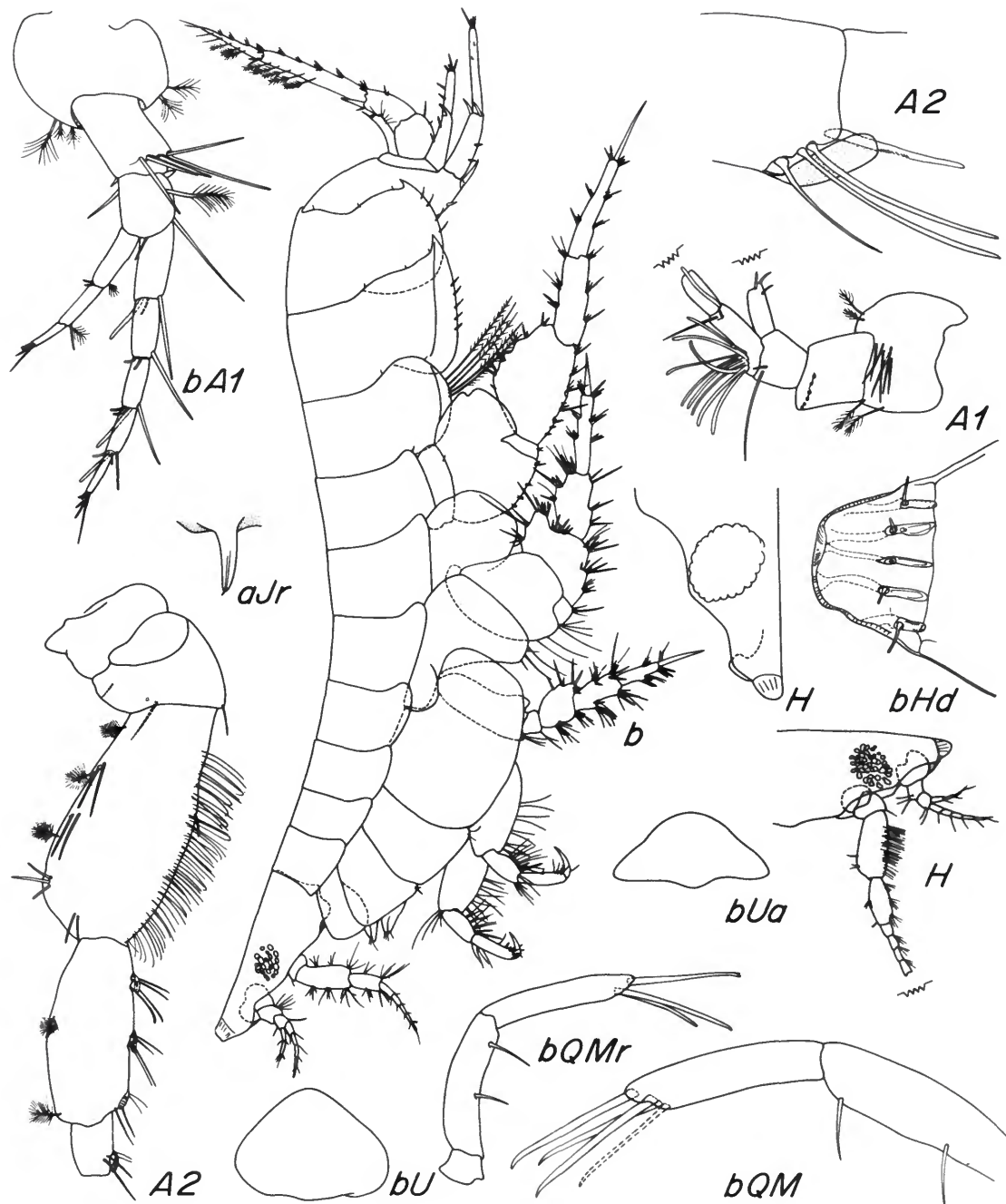


FIGURE 3.—*Eudevenopus honduranus*, new species, male "c," 3.5 mm (a = female "a," 3.6 mm; b = holotype, female "b," 3.3 mm).

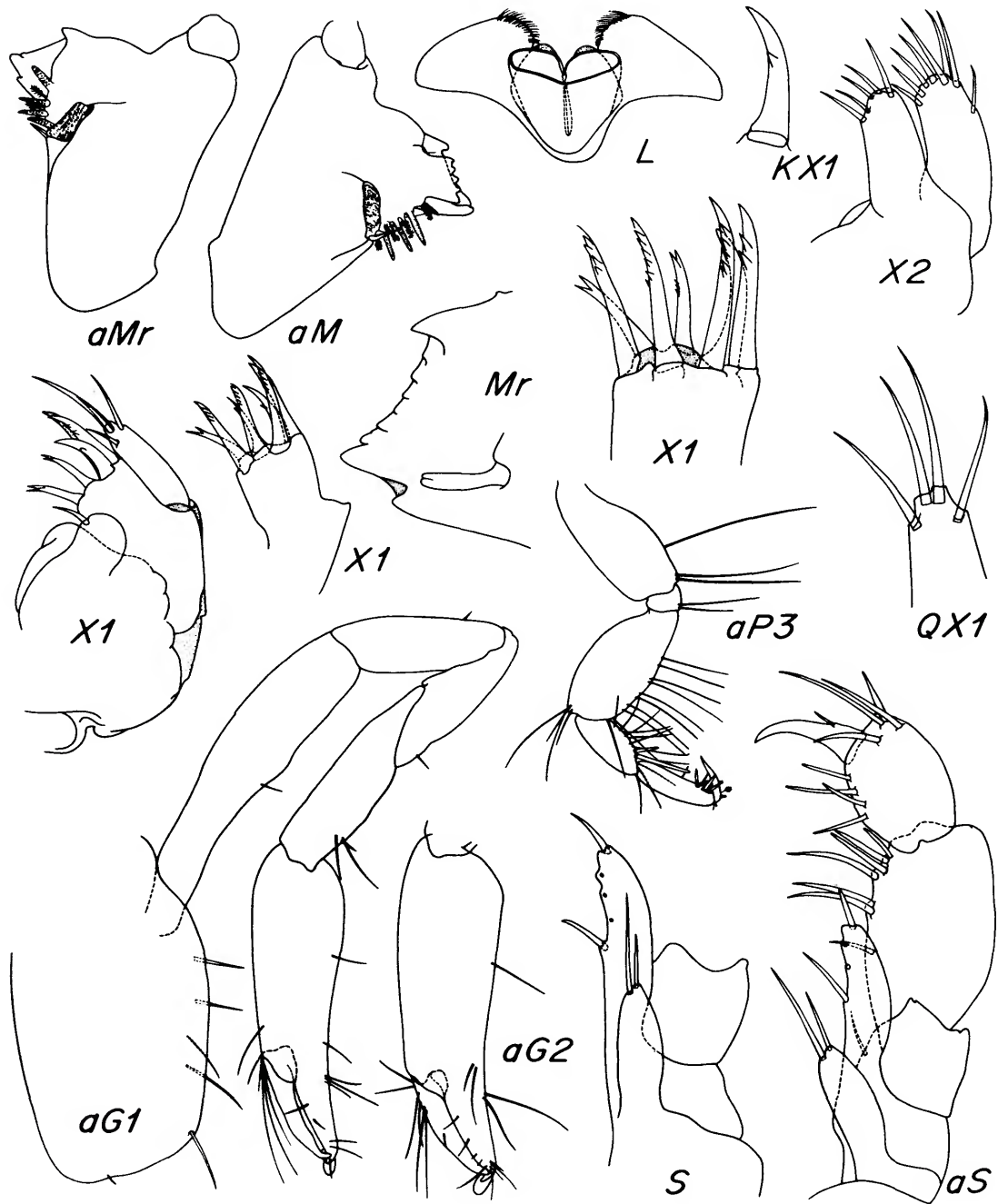


FIGURE 4.—*Eudevenopus honduranus*, new species, holotype, female "b," 3.3 mm (a = female "a," 3.6 mm).

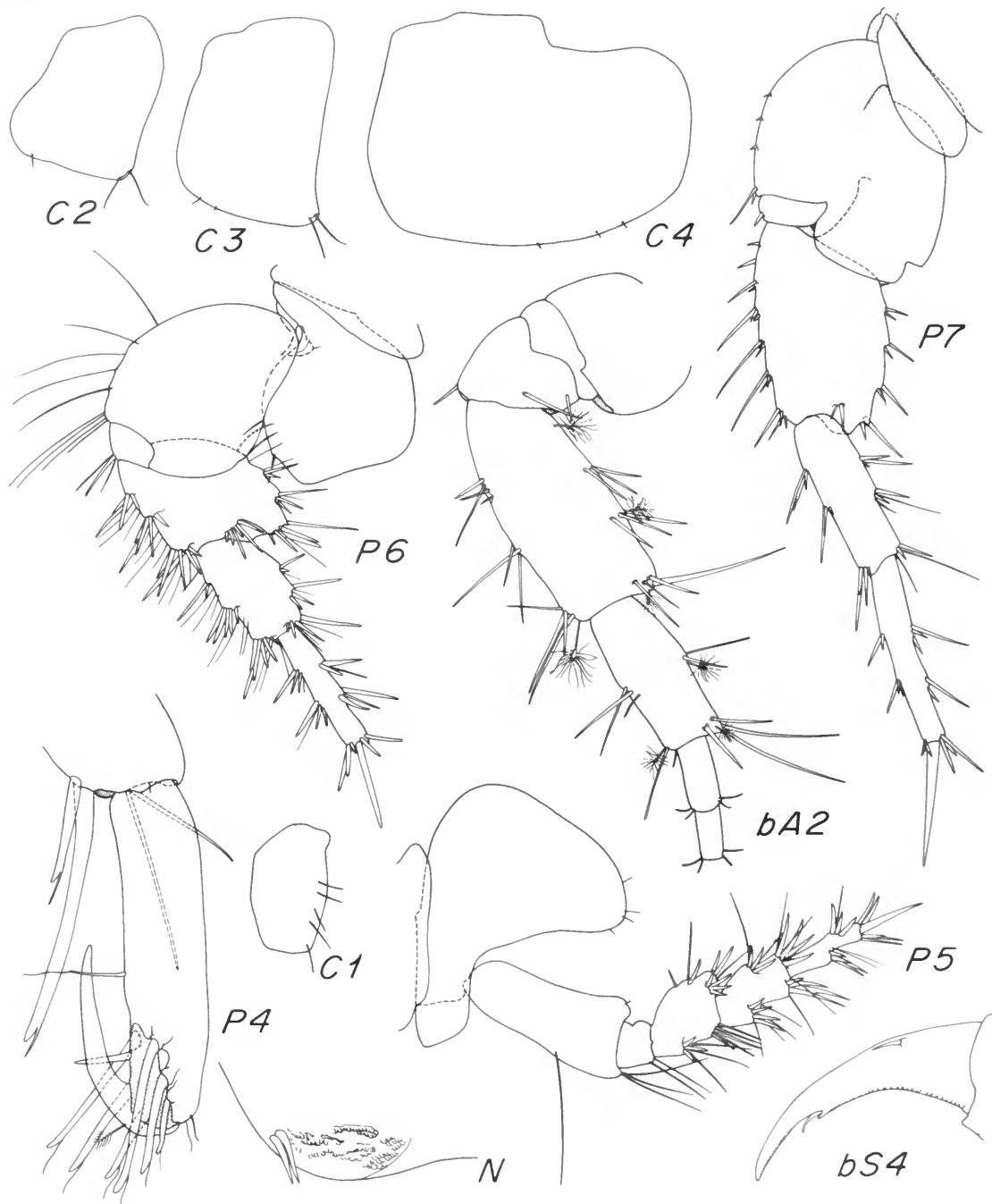


FIGURE 5.—*Eudevenopus honduranus*, new species, female "a," 3.6 mm (*b* = holotype, female "b," 3.3 mm).

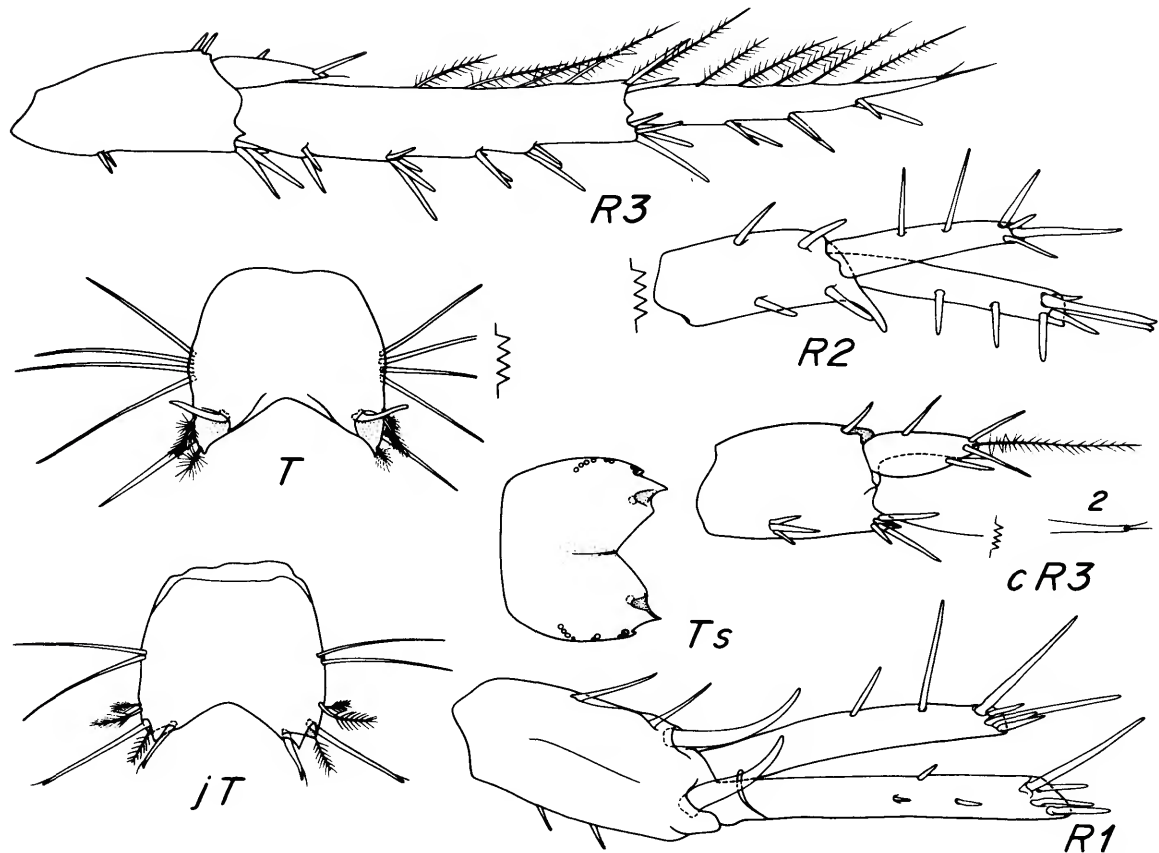


FIGURE 6.—*Eudevenopus honduranus*, new species, holotype, female "b," 3.3 mm (c = male "c," 3.5 mm; j = male juvenile "j," 2.7 mm).

(known in phoxocephalids as 3 teeth on 2 branches for total incisor); right lacinia mobilis absent or like first element of raker row, therefore of typical spine form, but weakly clavate and bifid, right rakers 3 (and 3 interraker setules), left rakers 4 (but with 4 accessory setules), first left raker shortened; left lacinia mobilis broad, flat, 5-toothed, not articulate; right and left molar small, forming weak hump bearing faint plaque finely pebbled or denticulate, each bearing 2 contiguous short spines; length ratio of mandibular palp articles = 17:65:70, article 1 short, unarmed, article 2 elongate, bearing one apico-medial spine-seta, one midspine seta, article 3

with obliquely truncate apex bearing 3 hooked spines, no basofacials.

Lower lip with fleshy inner lobes separated on aboral side but bearing accessory vertical lobes (as shown in Barnard and Drummond, 1979, fig. 13: *L*) and on oral side with horizontal callus near apex of fused inner lobes, raphus therefore occurring only on aboral side; no cones, pubescence obsolescent or absent.

Inner plate of maxilla 1 short, subcircular, apex rounded, medial margin with apical notch bearing one stout spine-seta; outer plate with 7 spines of ordinary appearance, either bifid, weakly serrate or simple, palp uniaarticulate, overreaching outer plate, with 2 apical, one apicomедial and

one apicolateral spine-setae. Plates of maxilla 2 ordinary, equally extending, almost equally broad, apical spine-setae thick, stiff, sparse, outer plate with one apicolateral spine-seta. Plates of maxilliped small and thin, sparsely spinose, inner with 2 apical spines, outer with one apical, one basomedial spine, inner margin with two or more weak acclivities bearing black microbial slime; palp very stout, article 2 with medial spine formula of 1-2-4, article 3 with 4 medial, 3 apical, one apicolateral spines, dactyl unguiform, with one subbasal setule, one inner notch with spine-setule, nail absent.

Lower margins of coxae 1-4 as attached to body forming even curve, no disjunctions, coxae progressively longer and broader, coxa 1 longer than broad, with 5 posterior setae (including one at posterodistal corner); coxa 2 weakly expanded anterodistally, almost as broad as long, with 2 ventrodistal setae; coxa 3 rectangular, about 1.5 times as long as wide, ventroposterior corner weakly attenuate but rounded, bearing 2 setae; coxa 4 very large, broad, almost 1.4 times as wide as long, posterior lobe very long, broad, adz-shaped, ventral margin of coxa 4 with 3 setules.

Gnathopods with relatively short (for the family) article 5, sixth articles strongly chelate, weakly tapering, elongate, axial margins not biconvex, length ratios of articles 5 and 6 on gnathopods 1-2 = 80:110 and 100:118; palmar humps small and sharp, each with large clavate fixed flake; article 3 elongate; posterior margin of article 5 with 3 and 2 setae respectively on gnathopods 1-2.

Pereopod 4 like pereopod 3, main apical spine of article 5 extending to M. 75 on article 6; spine formula on article 6 of both pairs = 4 + 3 + 1 (noting that fourth member of lateral situated far proximal and of setal form), spine of set-of-one, short, dactyls simple apically.

Articles 4-5 of pereopod 5 narrow, article 4 of pereopods 6-7 broad and medium respectively; facial spine rows sparse to absent; facial ridge formula on article 2 of pereopods 5-7 = 0-0-1 (part); width ratios of articles 2, 4, 5, 6 on pereopod 5 = 30:24:20:9, on pereopod 6 =

58:44:26:11, on pereopod 7 = 75:48:20:12, length ratios of pereopod 5 = 60:33:30:30, on pereopod 6 = 72:50:44:49, on pereopod 7 = 82:77:61:70; article 2 of pereopod 5 narrow basally, widening slightly distad, with weak posteroventral lobe; of pereopod 6 orbicular, with adz-shaped posterior lobe; of pereopod 7 broad, galeate, with large soft posteroventral notch and broad, truncate ventral lobe, dactyls long, thin, pointed, dactyl of pereopod 7 about 0.68 times as long as article 6.

Epimeron 1 broadly rounded posteriorly, midventral margin with 5 long setae; epimeron 2 dominant, posterior margin sinuous, posteroventral tooth medium and sharp, midventral margin with 5 short setae; epimeron 3 with weakly convex posterior margin, posteroventral tooth small, sharp, weakly upturned, ventral margin with 4 setae.

Urosome tall, thick, smooth dorsally, urosomite 2 extremely short, urosomite 1 with large ventral spine near base of uropod 1, uropod 1 exceeding uropod 2 slightly, uropod 3 extremely elongate. Peduncle of uropod 1 with 2 lateral facial spines in tandem, one middorsolateral spine, lateral apex with enlarged curved spine, medial apex with larger similar spine, medial margin with 2 thin spines in tandem, rami much longer than peduncle, subequal, outer and inner with 4 and 5 apical spines respectively, outer with 3 other subapical small spines, inner with 2 other subapical long spines in tandem, and one ventral subbasal guiding spine. Dorsolateral and dorsomedial margins of peduncle on uropod 2 each with 2 similar spines, lateral apex of peduncle with long tooth, rami as long as peduncle, outer and inner rami with 5 and 4 apical spines respectively, each with 2 other spines in tandem on dorsal margins, spines on inner ramus more elongate.

Peduncle of uropod 3 scarcely elongate, with 2 basolateral and 2 apicomedia spine pairs and 4 apicolateral spines in group, inner ramus small, scale-like, with one medial spine, one longer apical spine plus setule; outer ramus very elongate, article 2 about 0.8 times as long as article 1, lateral margins of article 1 with spine formula of

2-4-2-3-4, of article 2 = 2-2-2, setal formula of medial margin of article 1 = 1-1-1-1-1, of article 2 = 1-1-1-1-1, spine formula = 0-0-0-0-2, apex of article 2 subsharp, armed with medium seta and setule.

Telson as broad as long, posterior "cleft" shallow, about one third as long as telson, forming broad gape, each lobe with sharp apex armed with penicillate setule, dorsal surface of each apex slightly hollowed, bounded proximally by circular ridge armed with bent spine, each apicolateral margin with long spine and 2 setules, each mid-lateral margin armed with brush of 4 long setal-spines.

DESCRIPTION OF MALE (male "c," 3.5 mm).—Eyes slightly larger than in female. Head with slightly angular ocular lobe (female smoothly sinuous). Antenna 1 distinctive, article 1 of flagellum armed with brush of 9 aesthetascs. Antenna 2 distinctive, article 4 with dorsal pubescence only, ventrally with 3 penicillate setules in tandem, 3 groups of 2-2-3 other setules and 2 apical setules near joint line; article 4 with 3 dorsal male armament sets composed of one calceolus and several stiff setules, ventrally with 2 penicillate setules; flagellum elongate and proliferate, calceolus formula = 1-1-1-0-1 . . . n or 1-1-0-1 . . . n; uropod 3 with slightly larger inner ramus with 2 added armaments, outer ramus less densely armed mainly because this male much smaller than described female, peduncle of uropod 3 with 3 basolateral spines and only one apicomedial spine, inner ramus like female but with one long, apical, plumose seta and additional long apical spine plus one subapicolateral spine, spines on lateral margins of articles 1-2 = 2-4-3-4 and 2-1, medial setal formulas = 1-1-1-1-1 and 1-1-1-1-1, medial spines same as female, article 3 of mandibular palp with 5 apical spines; telson like female but lateral setal brushes with only 2 setae each.

VARIABLES.—Male calceolus formula on antenna 2 flagellum in other specimens also 1-1-0-1 . . . n. Apical spines on article 3 of mandibular palp also 4 in young males, but 5 in adult males and usually 3 in females.

Epimeron 3 with 5 ventral setae in other females.

Telsonic penicillate setules stable but lateral setal brush in juveniles with 2 setae.

The variability of armaments on 19 specimens selected out of 10 of the Saloman samples from the Gulf of Mexico near Panama City, Florida, is condensed in the following tabulation.

We took a large and a small specimen from each of the 9 samples, plus an odd specimen, the large (B) and the small (S) often being larger or smaller than those from other samples. We have arranged table 2 according to descending numerical order of spines on the inner ramus of uropod 1. The Chilean holotype of *E. gracilipes* is inserted into the same table. It is a giant specimen, however, larger than any from Florida; it is very much neotenic in terms of the counts from small Floridian adults. We have also included 5 specimens from Peru.

One may not distinguish Floridian specimens from *E. gracilipes* by any of the 250+ characters we have studied. Perhaps these may one day be tied to growth stages but we have no Chilean collections to study.

ILLUSTRATIONS.—Dorsal view of rostrum showing cephalic pits seen in Figure 3: *bHd*, taxonomic value only at family level as far as known.

Palp of mandible Figure 3: *bQM* (female "b") shows fourth spine in dashed lines, as seen in juvenile males.

Aspect view of maxilla 1 (Figure 4: *X1*, female "b") missing 2 spines, check other enlargement (Figure 4: *X1*) for 7 spined version.

HOLOTYPE.—USNM 184163, female "b," 3.3 mm (illus.).

TYPE-LOCALITY.—Western Caribbean Sea, Belize, False Sitee Point, 30 m from shore, 1.2 m depth, fine sand, 12 Jun 1980, coll. J.D. Thomas.

RELATIONSHIP.—Differing from *E. metagracilis* in the following characters: (1) shorter dactyl of pereopod 7; (2) fewer spines on the outer plate of the maxilliped; (3) fewer spines on article 3 of the mandibular palp; (4) shorter spines on the outer ramus of uropod 1; (5) smaller molar on the right mandible; (6) longer accessory flagellum relative

TABLE 2.—Armament formulas on uropods of *E. honduranus*

Specimen	Uropod 1		Uropod 2		Uropod 3
	Outer Ramus	Inner Ramus	Outer Ramus	Inner Ramus	Article 2 Spine Pairs
	Lat	Med			
H-1/3-1-77B	2 + 1	4	3	3	2
A-2A/8-12-75B	3 + 1	4	3	3	2
H-2/5-2-77B	2 + 2	4	2	3	2
30-1/12-1-76B	2 + 2	4	3	3	2
T-6-1/7-28-77B	2 + 2	4	3	3	2
H-2/6-1-77B	2 + 1	4	3	3	2
2-10-5B	2 + 1	4	3	3	2
30-1/11-1-76B	2 + 1	4	3	3	3
30-1/2-2-77B	3 + 2	3	3	3	3
H-2/5-2-77S	2 + 2	3	2	2	2
30-1/11-1-76S	2 + 2	3	2	2	2
30-2/8-24-76B	2 + 1	3	2	2	2
Peru "a"	2 + 1	2	1	1	2
Peru "b"	2 + 0	3	2	2	2
Peru "c"	2 + 0	2	1	1	2
30-2/8-24-76S	1 + 1	2	2	2	2
30-1/12-1-76S	1 + 1	2	1	0	1
Holotype, Chile	1 + 1	2	1	1	1
Peru "d"	1 + 0	2	2	1	2
H-2/6-1-77S	1 + 0	2	1	1	1
A-2A/8-12-75S	1 + 0	1	1	1	1
H-1/3-1-77S	1 + 0	1	1	1	1
Peru "e"	1 + 0	1	1	0	half
30-1/2-2-77S	1 + 0	1	2	0	2
T-6-1/7-28-77S	1 + 0	1	1	1	2

to the primary flagellum; (7) presence of the middistal posterior spine on article 6 of pereopods 3-4; and the other characters mentioned in the "Relationship" of *E. metagracilis*.

MATERIAL.—Type-locality, female "a," 3.6 mm (illus.); male "c," 3.5 mm (illus.); juvenile male "j," 3.0 mm. NMFL samples, off Panama City, Florida, coll. Carl H. Saloman, between 30°07'N and 30°16'N, 85°46'W and 85°59'W, 2-40 m, 127 samples (1726 specimens). South Melbourne Beach, Florida, coll. Keith Spring, between 7 Jun 1979 and 11 Apr 1980, between 1.9 and 9.4 feet depth below MLW, horizontal distance from HW line between 30 and 100 yds (27-91 m; many specimens). South Carolina, coll. David Knott, off Garden City Beach between 16 Nov 1977 and 22 Aug 1978, Van Veen grab in depths of 3-5 m

(194 specimens); same, off Charleston, 11 Aug 1978, Smith-MacIntyre grab in 11.6 to 14.6 m depth (33 specimens). AHF, *Velero III* Atlantic Stations, 14, 15 Apr 1939, A24-39, Isla Cubagua, Venezuela, 2-5 fms (1 specimen) A27-39, same (2 specimens), A32-39, Isla Coche, Venezuela, 21 fms (1 specimen); Pacific Stations, 394-35, Peru, Lobos de Afueras Islands, 12 fms (200+ specimens); 476-35, Bahía Salinas, Bay, Costa Rica, 8 fms (1 specimen); USNM 128938, La Libertad, Ecuador, 8-12 fms (1 specimen).

DISTRIBUTION.—Atlantic Ocean from South Carolina, USA, to Venezuela (and probably to Rio de Janeiro if *E. capuciatius* is this species); eastern Pacific Ocean from Costa Rica to Ecuador (and probably to Valparaiso, Chile, if *E. gracilipes* is this species); depth, 1-40 m.

***Tiburonella*, new genus**

ETYMOLOGY.—From the Spanish *Tiburón* (shark) and diminutive suffix *ella* (little). Feminine.

DIAGNOSIS.—Platyischnopidae with midsagittal cephalic tooth or keel, sensory pits well developed and equatorial. Article 2 of antenna 1 not elongate, not spinose dorsally and ventrally, often bearing setae distally, article 3 on male not enlarged, not densely armed with aesthetascs, article 1 of flagellum in male weakly enlarged but poorly armed. Article 4 of female antenna 2 not elongate and moderately or well armed (compared to other genera). Mandibular incisors elongate, broad, grossly 3-toothed like phoxocephalids but also superficially serrate; laciniae mobiles on both right and left sides diverse, right side thin, left flabellate, raker spines well developed but inter-raker setules large relative to rakers (unusual in Platyischnopidae), mandibular calluses absent. Inner plate of maxilla 1 large, subrectangular, with 3+ medially pointing setae in adults, outer plate with 9 normal-sized spines (neither strongly diverse nor "mopped"—as shown in Barnard and Drummond, 1979:3, fig. 2: *aX1*), palp 1-articulate, armed with several setae. Plates of maxilla 2 alike. Inner plate of maxilliped rectangular, truncate, apex well armed, outer plate large but poorly armed, palp article 2 moderately setose medially.

Coxae 1–4 increasing in size in ordinary progression, none of coxae 1–3 of unusual form or stunted, coxa 3 scarcely expanded distally, coxae 1–2 rectangular, coxa 4 very large, with large posterior lobe, quadrate or rounded. Article 5 of gnathopods not longer than article 6, gnathopods strongly chelate. Article 2 of pereopod 5 moderately expanded or thin. Article 2 of pereopod 7 without posterior serrations, with soft notch, dactyls of ordinary length or elongate.

Pleon untoothed dorsally. Article 2 on outer ramus of uropod 3 thick, well developed, well armed. Telsonic cleft deep, dorsal spines scarcely facial, mostly in terminal depressions, no lateral brushes of setae.

TYPE-SPECIES.—*Platyischnopus viscana* J.L. Barnard (1964). Unique.

RELATIONSHIP.—This genus is very remote from *Platyischnopus* and *Indischnopus*, moderately remote from other Asian genera such as *Yurrokus*, *Tomituka*, and *Tittakunara*, quite distant from *Skaptopus*, but very close to *Eudevenopus*.

Tiburonella differs from *Eudevenopus* only in the following characters: (1) enlarged and rectangular inner plate of maxilla 1 bearing 3+ setae in adults; (2) distinctive right lacinia mobilis differing from the first raker (in *Eudevenopus* the first element is like a raker and the lacinia mobilis is therefore cited as absent); (3) lack of a lateral brush of setae on the telson; and (4) deep cleft of the telson.

Tiburonella differs from the Asian genera, *Tittakunara*, *Tomituka*, and *Yurrokus*, in the following characters: (1) serrate incisors; (2) much higher counts of raker spines on the mandibles; (3) larger or more rectangular inner plate of maxilla 1; (4) sparser spination on the outer plate of the maxilliped; (5) 1-articulate palp of maxilla 1; and (6) larger and more rectangular coxa 1 and/or coxa 2. *Tiburonella* also differs from each of those genera in one or more of the following characters: lack of mandibular callus; broader winged lower lip; lack of nail on the maxillipedal dactyl; shorter wrists of the gnathopods; the form of the notch on article 2 of pereopod 7; the presence of a tooth on epimeron 3; the double set of incipient spine rows on the outer ramus of uropods 1–2; the well-armed side margins on article 2 of the outer ramus on uropod 3; and the dorsofacial spines on the telson.

Tiburonella differs from *Skaptopus* in the presence of a midventral cephalic keel, serrate incisors, strange inner plate of maxilla 1, broader inner plate of maxilla 2, lack of dactylar nail on the maxillipeds, more broadened and complex pereopods 3–4, broader article 2 of pereopod 5, double rows of spines on outer rami of uropods 1–2, and the well-armed article 2 on the outer ramus of uropod 3.

***Tiburonella viscana* (J.L. Barnard), new combination**

FIGURES 7-9

Platyischnopus viscana J.L. Barnard, 1964:226, fig. 4.

Platyischnopus gracilipes Schellenberg, 1931:63, fig. 33 [female only].—Shoemaker, 1942:9 [?part].

DESCRIPTION OF FEMALE.—Female “j,” 6.20 mm: Head about 19 percent of total body length (including head), rostrum unstricted apically, bearing between first antennae weak, subapical, downturned, blunt process flush with cephalic axis. Eyes medium, darkly pigmented. Article 1 on peduncle of antenna 1 about 0.7 times as long as wide, about 1.9 times as wide as article 2, ventral margin with 4 setules, unproduced dorsal apex with 2 setules, lateral face naked; article 2 almost 0.9 times as long as article 1, apical margin with setal brush, ventral margin naked; article 3 about 0.6 times as long as article 1, of normal size, ventral margin naked, apical margins weakly setose; primary flagellum almost twice as long as peduncle, with 9 articles, basal-most short, formula of aesthetascs = 0-s-s-s-0-s-0-0; accessory flagellum half as long as primary flagellum, with 5 articles. Dorsal (rectified) margin on article 4 of antenna 2 naked, ventral margin with several setules, outer face with 2 sets of glassy spines (apically bifid plus flexible filament), facial and marginal apices also each with small set of spines, (medial face with spine set showing on illustration); article 5 about 0.6 times as long as article 5, with posterofacial and apicofacial rows of setae, plus medial rows more dorsally (showing on illustration); flagellum about 1.2 times as long as articles 4-5 of peduncle combined, with 11 articles.

Mandibles with medium palpar hump, bodies ordinary, incisors of phoxocephalid form but minutely serrate, no calluses, right incisor with 3 teeth, left with 3 humps on 2 branches (really 2 distal humps separated by weak slit); right lacinia mobilis thin, linguiform, weakly bifid, left broad, flabellate, with 6-7 irregular small teeth, rakers of medium size, pectinate, interrakers enlarged and confusable with main rakers, total counts of

both combined, right = 10, left = 11; molar very weak, forming medium boss with faint polygonal texture, each molar with pair of short inner spines; length ratio of 15:47:57, article 1 short, unarmed, article 2 elongate, bearing 3 inner setae, article 3 obliquely truncate, apex with 6 hooked but unawned spines.

Lower lip with fleshy inner lobes separated on aboral side but bearing accessory lobes so weak as to be almost undetectable, on oral side with horizontal callus near apex of fused inner lobes, raphus therefore occurring only on aboral side; each outer lobe with one minute cone; pubescence well developed.

Inner plate of maxilla 1 on right side with long inner plate, on left side with shorter, much broader plate, each plate rectangular but apex rounded weakly, making weakly falcate appearance, each plate with 3 short, medially pointing setae; outer plate with 9-10 spines (illustrated form is 10 spines, opposite lacking spine 3 from medial edge), mostly serrate or bifid, palp uniaarticulate, reaching apex of outer plate, with 2 apical, one apicolateral, and 3 medial setae. Plates of maxilla 2 ordinary, equally extending, almost equally broad, apical spine-setae thick, stiff, abundant, outer plate with lateral setae in formula of 2-1-1. Inner plate of maxilliped rectangular, apex subtruncate, with short spines, 3 apical and 2 apicomедial setae, outer plate elongate, with 3 apicomедial spines and 2 thin medial spines, large naked gaps medially; palp stout, article 2 moderately setose medially, article 3 with row of 4 facial setae, dactyl unguiform, apical nail absorbed, with one accessory setule.

Lower margins of coxae 1-4 as attached to body forming even curve, no disjunctions, coxae progressively longer and broader, coxa 1 longer than broad, with 4 mediofacial setae forming vertical (axial) row, ventral margin with 2 setules; coxa 2 rectangular, with 4 mediofacial setae and 3 ventral setules; coxa 3 similar but weakly beveled anteriorly, with one mediofacial seta and 3 ventral setules; coxa 4 very large, broad, about 1.3 times as wide as long, posterior lobe narrow,

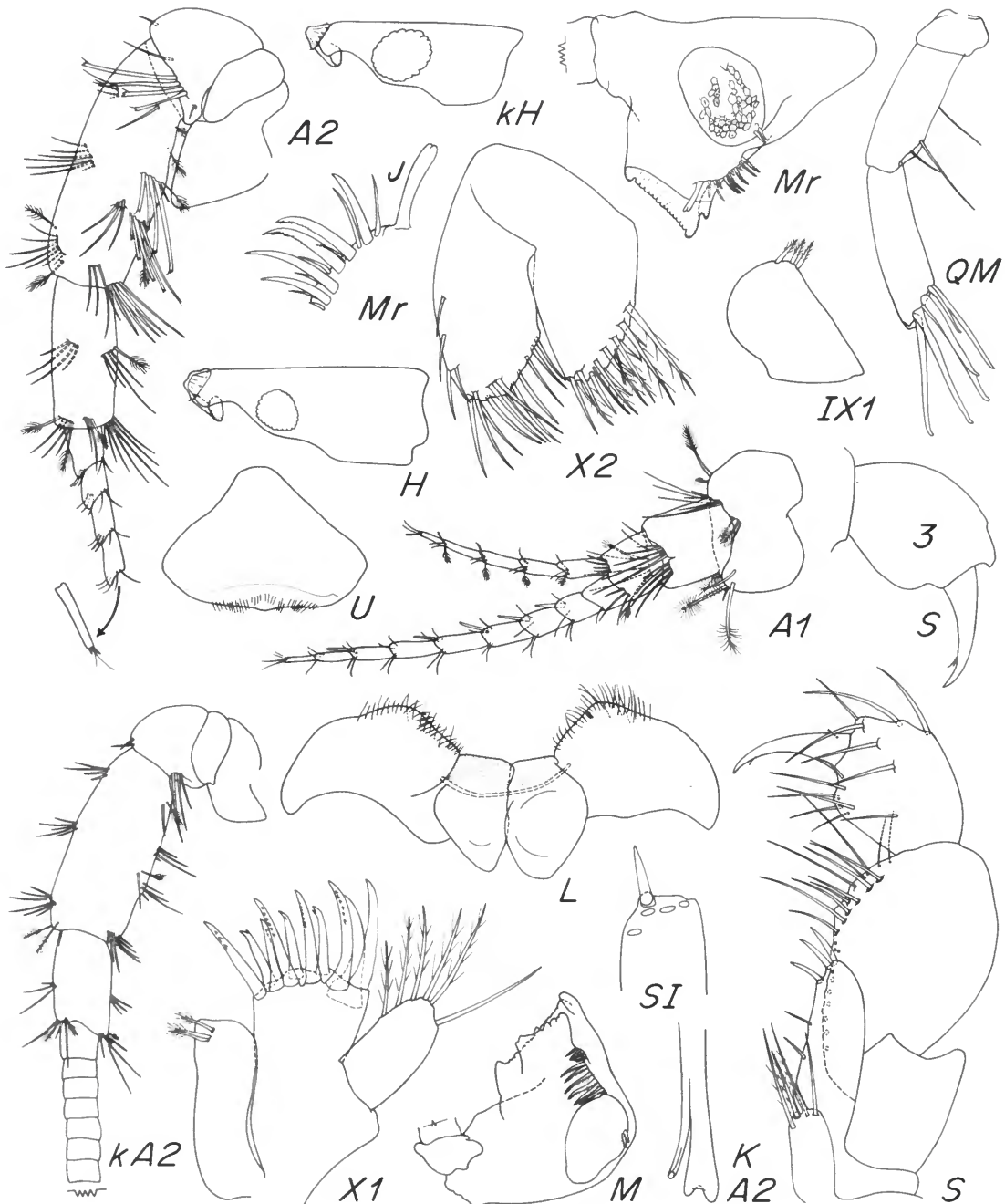


FIGURE 7.—*Tiburonella viscana* (J.L. Barnard), female "j," 6.20 mm (k = male "k," 5.60 mm).

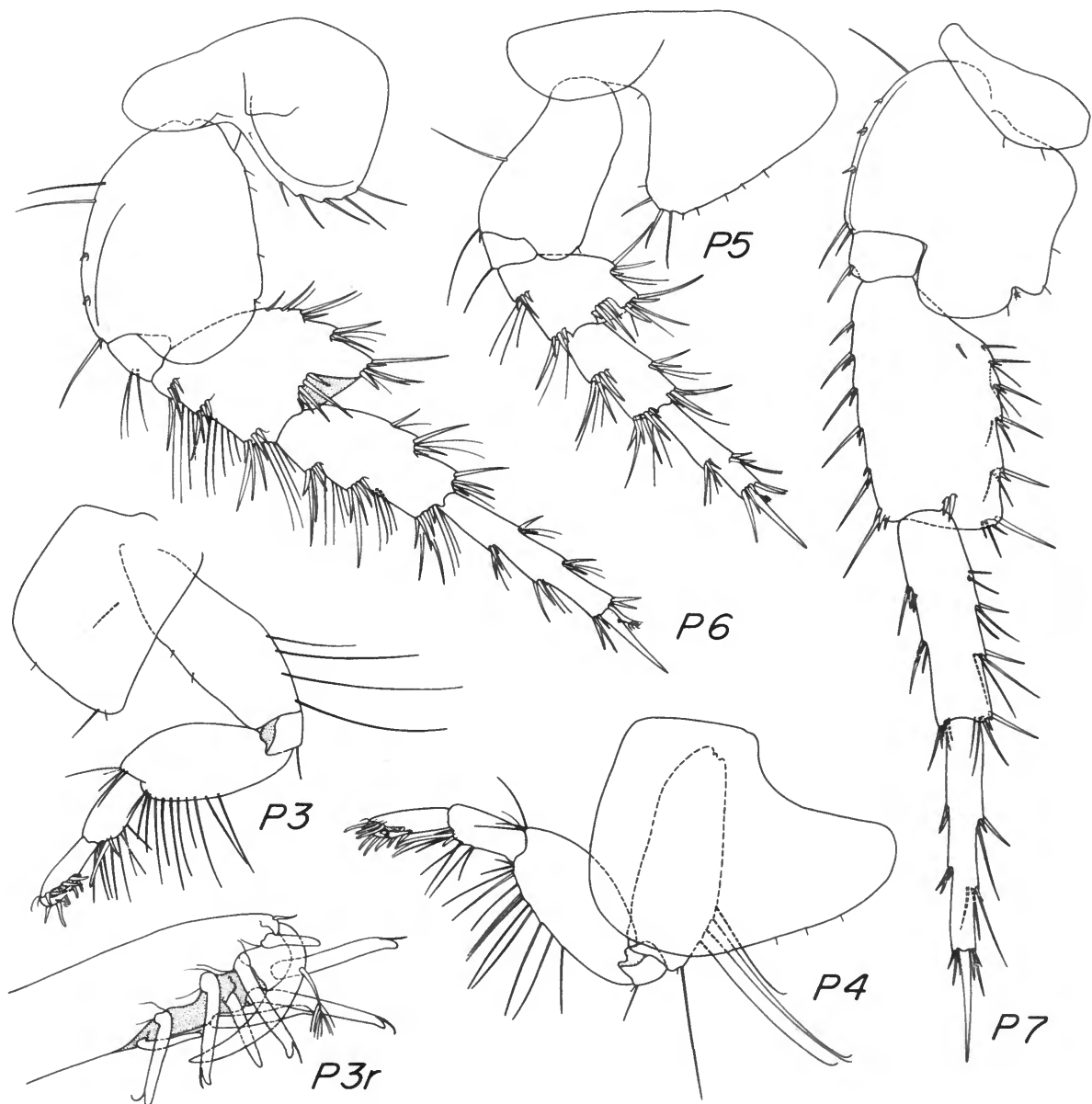


FIGURE 8.—*Tiburonella viscana* (J.L. Barnard), female "j," 6.20 mm.

elongate, attenuate but apically rounded, ventral margin with 4 setules.

Gnathopods with relatively short (for the family) article 5, sixth articles strongly chelate, tapering weakly, slightly elongate, axial margins not

biconvex, length ratios of articles 5 and 6 on gnathopods 1 and 2 = 105:129 and 111:150; palmar humps thin and sharp, with flake; article 3 elongate; only article 2 of gnathopod 2 with long posterior seta.

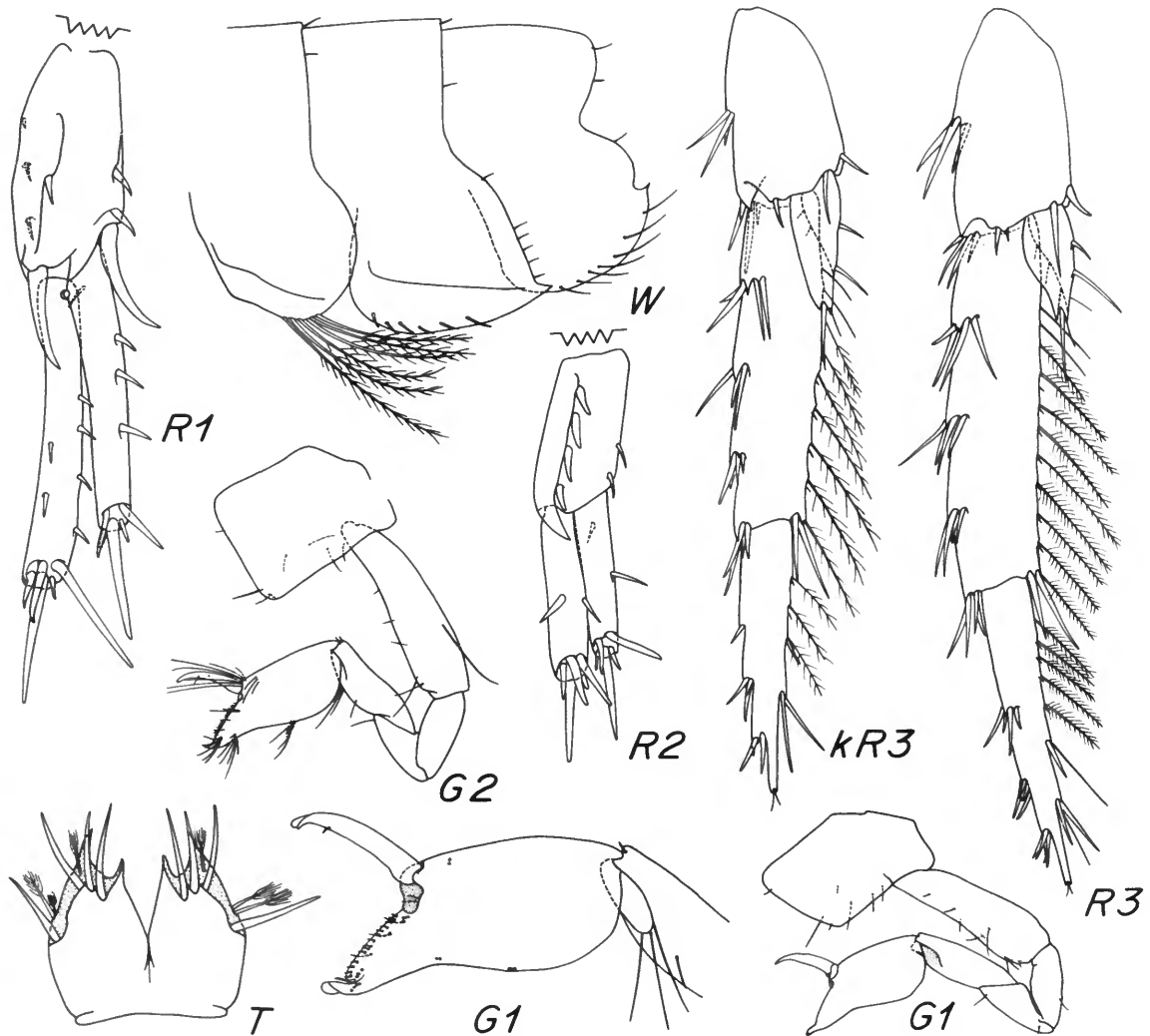


FIGURE 9.—*Tiburonella viscana* (J.L. Barnard), female "j," 6.20 mm (*k* = male "k," 5.60 mm).

Pereopod 4 like pereopod 3, main apical spine on article 5 of pereopods 3-4 extending to M. 60 and M. 75 respectively on article 6; spine formula on article 6 of both pairs = 4 + 4 + 1, spines thick, dactylar nails indistinct.

Article 4 of pereopods 5-7 of medium breadth; facial spine rows weak; facial ridge formula on article 2 of pereopods 5-7 = 0-1-1; width ratios of articles 2, 4, 5, and 6 on pereopod 5 =

36:32:18:10, on pereopod 6 = 60:50:18:12, on pereopod 7 = 74:48:22:12, length ratios on pereopod 5 = 62:34:40:40, on pereopod 6 = 82:60:58:66, on pereopod 7 = 80:85:72:78; article 2 of pereopod 5 of medium width basally, scarcely widening distally, with weak posteroventral lobe; of pereopod 6 pyriform, with subrounded posteroventral lobe; of pereopod 7 broad, galeate, with 2 posterior setules above deep

but soft notch, 2 other setules in and below notch, ventral lobe exceeding article 3; dactyls medium, thin, pointed.

Epimeron 1 broadly rounded posteriorly, mid-ventral margin with brush of 6 closely contiguous long setae; epimeron 2 weakly dominant, posterior margin sinuous, with small posteroventral tooth, ventral margin anteriorly with 6 small spines; epimeron 3 with bulbous posterior margin, attenuate upturned small sharp tooth, ventral margin with 7 medium setae widely spread; dorsal teeth absent.

Urosome tall, thick (but thin side to side), smooth dorsally, urosomite 2 extremely short, urosomite 1 with large ventral spine near base of uropod 1, latter well exceeding uropod 2, uropod 3 extremely elongate. Peduncle of uropod 1 with 3 lateral facial spines in axial tandem, one mid-dorsolateral spine, lateral apex with large spine but no cusp, medial apex with large spine but no cusp, medial margin of peduncle with 2 spines, outer ramus exceeding inner, with 2 dorsolateral marginal spines, 4 dorsomedial marginal spines, inner ramus with 3 dorsomedial marginal spines, no laterals, each apex with 5 diverse spines. Dorsolateral and dorsomedial apices of peduncle on uropod 2 each with spine, lateral also with large cusp, outer ramus slightly exceeding inner, outer with 1 dorsolateral and 1 dorsomedial marginal spine, inner with 1 dorsomedial marginal spine, each apex with 5 diverse spines.

Peduncle of uropod 3 slightly elongate, with set of 3 midfaciolateral spines, 2 apicolateral, 2 apicomедial, and 4 apiconventral spines in group; inner ramus small, scale-like, with 2 medial spines, 1 apical spine, and setule in notch; outer ramus very elongate, article 2 thick, well armed, about 0.85 times as long as article 1; lateral margins of article 1 with spine formula of 4-4-4-4, of article 2 = 4-3-3, or 3-3-3 (right and left), setal formula of medial margin of article 1 = $(1 \times 10) + 1$, spine formula = $(0 \times 10) + 2$, setule formula = $(0 \times 3) + (1 \times 7) + 0$, of article 2, setae = 1-1-1-1-1-1-1, spines = 0-0-0-0-0-1-

2, setules = 0-1-1-1-1-0-0, apex of article 2 with tiny notch bearing 2 tiny setules.

Telson as long as wide, cleft about 2/3 of length, gape narrow, each lobe deeply notched, with sharp apex armed with subapical setule, apicolateral margins sunken below sinuous ridge, each lobe with 3 long dorsofacial spines at ridge and one lateral spine, each side with asymmetrical pair of penicillate setules at M. 55.

Holotype female "v," 6.0 mm: Reexamined from Allan Hancock Foundation collections, catalog no. 5915. Differing from Caribbean female "j" in the following ways: article 2 of mandibular palp with only 2 setae (versus 3); inner plate of maxilliped with only 3 setae and one thick short spine (versus 4 + 1); small dense setules occurring on various margins as follows: coxa 5 anterior margin of posterior lobe = 9-10 (versus 5 in female "j"), posterior article 2 of pereopod 5 = 5 (versus 1); coxa 6 with 6 setules scattered among ventral spines of posterior lobe (versus none), posterior margin of article 2 on pereopod 6 = 6-8 (versus 4-5); coxa 7 posterior and ventral = 9-10 (versus 2) setules; apicoventral margin of peduncle on uropod 3 also densely lined with setules (with appearance of comb); holotype generally spinier than Caribbean specimens.

Female "n," 5.83 mm: Pereopods 5-7 intermediate between Pacific holotype and Caribbean female "j," spination and setulation of intermediate form.

DESCRIPTION OF MALE (male "k," 5.60 mm).—Eyes enlarged (illus.); setae on peduncle of antenna 2 elongate, flagellum proliferate, calceoli not yet developed; lateral spine counts on articles 1-2 of uropod 3 = 4-3-4-4 and 1-3-2 (illus.), this male not fully mature owing to poorly developed antenna 2 flagellum and uropod 3 setosity.

REMARKS.—No distinctions between Pacific and Atlantic specimens of *T. viscana* have been discovered. We are aware that other taxa such as *Metharpinia floridana* and *M. oripacifica* (see J.L. Barnard, 1980:117, 131) differ from each other by the presence or absence of a single spine. We have not been able to find a consistent character

as yet in *viscana* but detailed study of specimens on characters beyond 250 may determine such a difference. The main differences of the Pacific (Mexico) holotype and Atlantic specimens are in setule densities on the posterior thoracic legs but these are intergraded in Pacific specimens from Costa Rica; one suspects the setules occur more densely only in more mature or large specimens from cool waters.

The strange condition of the mandibular rakers is apparent in that the first element next to the lacinia mobilis on either right or left sides is smaller than the second element; if that condition occurred on the right side only we would suggest the right lacinia mobilis to be absent and the element called the lacinia mobilis would be a converted raker spine; however, the left lacinia mobilis is undoubtedly a lacinia mobilis and not a raker so that the shortness of the first raker suggests that it is an interraker setule and that the first raker spine is absent.

The female "j" condition of inner plates of maxilla 1 is apparently an aberrancy.

Both this species and *metagracilis* lack apical cusps on the peduncle of uropod 1; this may prove to be a good cogeneric or supergeneric character.

Stomachs of specimens collected at Belize contained large numbers of harpacticoid copepods, intact and partly digested.

ILLUSTRATIONS.—Figures 7–9 fail to show true relationship of lengths of parts on uropods 1–2, these ratios as follows: uropod 1 peduncle = 100, outer ramus = 126, inner ramus = 110; uropod 2 peduncle = 87 (including tooth), outer ramus = 77, inner ramus = 65.

HOLOTYPE.—AHF 5915, female "v," 6.0 mm (newly designated by letter, not remeasured).

TYPE-LOCALITY.—AHF, *Velero IV* 6205, Mexico, Baja California, Bahía de San Ramon, 30°41'30"N, 116°07'00"W, 27 m, coarse sand, 26 Mar 1959.

VOUCHER MATERIAL.—Caribbean Sea, Belize, Carrie Bow Cay, station JDT Belize 24, among reef crests, 8 m, coarse coral sand, 18 Jun 1979, coll. J.D. Thomas, female "j," 6.20 mm (illus.);

male "k," 5.60 mm (illus.) (and many other specimens). AHF, *Velero III* 478-35, Costa Rica (Pacific), Bahía Salinas, 11°03'13"N, 85°43'20"W, 1.5 fms, coarse sand, 11 Feb 1935, female "n" 5.83 mm.

OTHER MATERIAL.—AHF, *Velero III* Pacific Stations, 268-34, White Friars, Mexico, 25 fms (2 specimens); 234-34, Porto Utria, Colombia, 20 fms (1 specimen); 456-35, Isla Secos, Panama, 12 fms (3 specimens); 459-35, Playa Blancas, Costa Rica, 2-3 fms (1 specimen); 478-35, Bahía Salinas, Costa Rica, 1.5 fms (4 lots); 481-35, same, 6 fms (1 specimen). AHF, Atlantic Stations, A18-39, Aruba, 23 fms (1 specimen); A41-39, Tobago, shore (1 specimen). *Presidential Cruise*, Bahía Magdalena, Baja California, 10–15 fms, USNM 148787 (1 specimen); La Jolla, California, 20 Aug 1918, 69.5 fms, USNM 152786 (1 specimen). Smithsonian-Bredin Expedition, station 24–56, Tobago Cays (west side of Baradal), Grenadines, British West Indies, 17 Mar 1956, from loggerhead sponge in 1 m of water, coll. D.V. Nicholson, USNM 208263 (3 specimens).

Distribution.—Pacific Ocean from La Jolla, California to Bahía Salinas, Costa Rica, 3–27 m; Atlantic Ocean, Belize, 8 m.

Skaptopus, new genus

ETYMOLOGY.—From the Greek *skapto* (dig) plus the Latin *opus* (work). Masculine.

DIAGNOSIS.—Platyischnopidae lacking midsagittal cephalic tooth or keel, sensory pits rudimentary and not equatorial. Article 2 of antenna 1 not elongate, not spinose dorsally and ventrally, often bearing setae distally, article 3 on male enlarged and bearing aesthetascs, article 1 of flagellum in male enlarged but naked. Article 4 of female antenna 2 not elongate and poorly armed (compared to other genera). Mandibular incisors elongate, broad, rudimentarily 3-toothed like phoxocephalids but teeth becoming vestigial; laciniae mobiles on both right and left sides alike, flabellate, 4-toothed, raker spines absent; molars huge, not triturative; mandibular calluses present. Inner plate of maxilla 1 of ordinary size,

subrectangular, with one apical seta, outer plate with 7 normally sized spines (neither mopped nor strongly diverse), palp 1-articulate, armed with one normal seta. Plates of maxilla 2 diverse. Inner plate of maxilliped weakly tapering apically but not in wedge-shaped form of *Platyischnopus*, apex poorly armed, outer plate large but spines sparse, small, widely spaced; palp article 2 poorly setose medially.

Coxae 1–4 increasing in size in ordinary progression, neither of coxae 1–3 of unusual form or stunted, coxa 3 scarcely expanded distally, coxae 1–2 rectangular, coxa 4 very large, with broadly rounded posterior lobe. Article 5 of gnathopods slightly longer than article 6, gnathopods weakly chelate. Article 2 of pereopod 5 thin, scarcely expanded except weakly expanded apically. Article 2 of pereopod 7 with posterior serrations, dactyls of ordinary length.

Pleon dorsally toothed. Article 2 on outer ramus of uropod 3 thin, short, poorly armed. Telson well cleft, dorsally spinose, no lateral brushes of setae.

TYPE-SPECIES.—*Skaptopus brychius*, new species. Unique.

RELATIONSHIP.—Both *Skaptopus* and *Indischnopus* have a general similarity in their appearance because coxae 1–4 all point forward in a seriate rank as opposed to the general mixture of configurations in other genera.

Skaptopus differs from *Indischnopus* in the following ways: (1) lack of a midsagittal cephalic tooth; (2) enlarged article 3 of antenna 1 in the male; (3) flabellate laciniae mobiles; (4) presence of a seta on the inner plate of maxilla 1; (5) smaller and ordinary medial spines on the outer plate of maxilla 1; (6) ordinary seta on the palp of maxilla 1; (7) sparse and widely spaced short spines on the outer plate of the maxilliped; (8) sparse medial setation on palp article 2 of the maxilliped; (9) elongate coxa 1 and narrow coxae 2–3; (10) broadly rounded and wide posterior lobe of coxa 4; (11) thinner pereopod 6; (12) poorly toothed but normally serrate article 2 of pereopod 7; (13) presence of dorsal teeth on pleonites 1–2; (14) sparser armaments on uropods 1–2 and with

shortened outer rami; (15) deeper cleft of telson with sparser armaments; and (16) lack of orthodox cephalic pits arranged equatorially.

Important generic characters in the list above distinguishing *Skaptopus* from *Indischnopus* appear, in this early and evolving taxonomy of the group, to be 5, 7, 9, and 16.

Skaptopus appears to be plesiomorphic in the following attributes: (1) poorly developed and disorganized cephalic pits; (2) lack of ventral cephalic keel; (3) poorly armed antenna 2; (4) ordinary maxillae; (5) ordinary coxae; (6) weakly chelate gnathopods; (7) poorly ornamented and moderately developed pereopods; (8) regular uropods; and (9) deeper than average telsonic cleft. *Skaptopus* and *Indischnopus* could be descendants of a common ancestor but *Skaptopus* cannot be the direct ancestor of *Indischnopus* because the following characters of *Skaptopus* are apomorphic in comparison to *Indischnopus*: (1) enlarged article 3 of male antenna 1; (2) smaller and sparsely armed outer plate of maxilliped; (3) fewer armaments of uropods 1–2.

The lack of ventral cephalic keel on *Skaptopus* suggests relationship to Condukiidae (Barnard and Drummond, 1982) but otherwise the taxa are remote.

***Skaptopus brychius*, new species**

FIGURES 10–12

ETYMOLOGY.—From the Greek *brychios* (deep).

DESCRIPTION OF MALE (holotype male “g,” 2.70 mm).—Head about 18 percent of total body length (including head), rostrum unconstricted apically, with rounded ventral lappet but no midsagittal keel or between-the-antennae process; dorsal cephalic pits rudimentary and arranged in 2 bilateral longitudinal rows. Eyes absent or possibly identifiable as weak capsule containing several angular ommatidial elements. Article 1 on peduncle of antenna 1 about 0.75 times as long as wide (including medial length as measurement standard), more than 1.4 times as wide as article 2, ventral margin with 4 setules, unproduced dorsal apex with 2 setules, lateral face

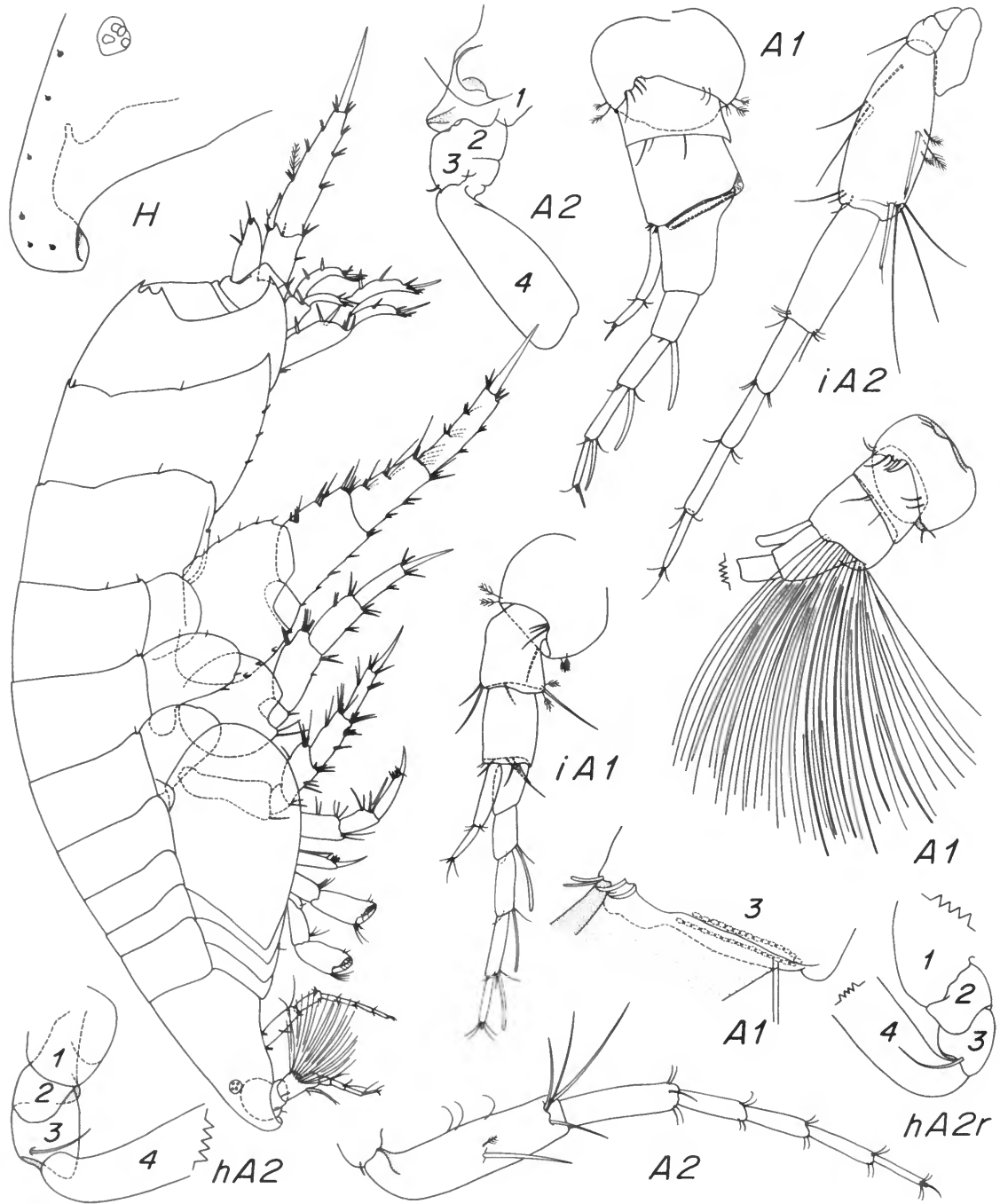


FIGURE 10.—*Skaptopus brychius*, new species, holotype, male "g," 2.70 mm (h = male "h," 2.70 mm; i = female "i," 2.70 mm).

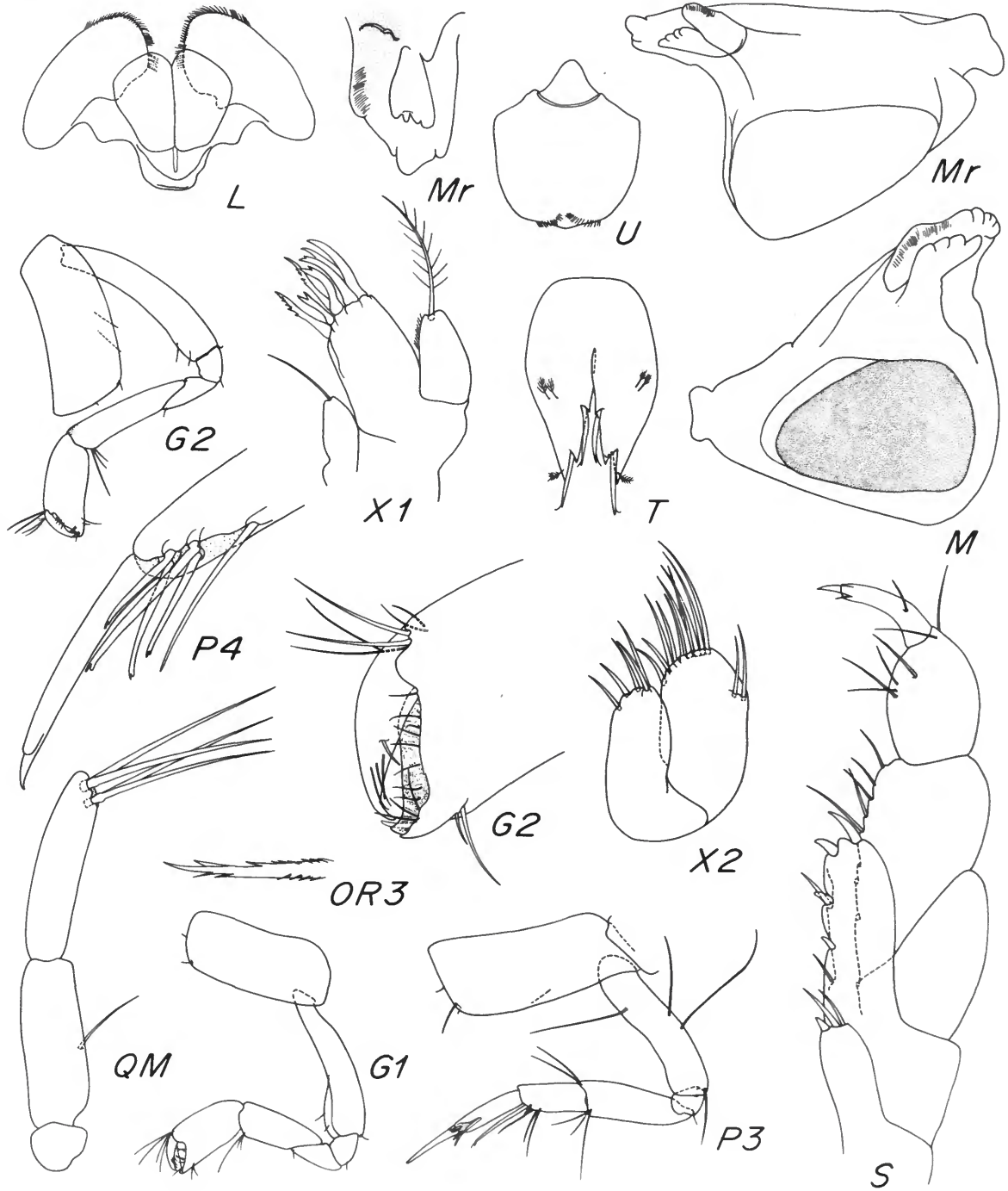


FIGURE 11.—*Skaptopus brychius*, new species, holotype, male "g," 2.70 mm.

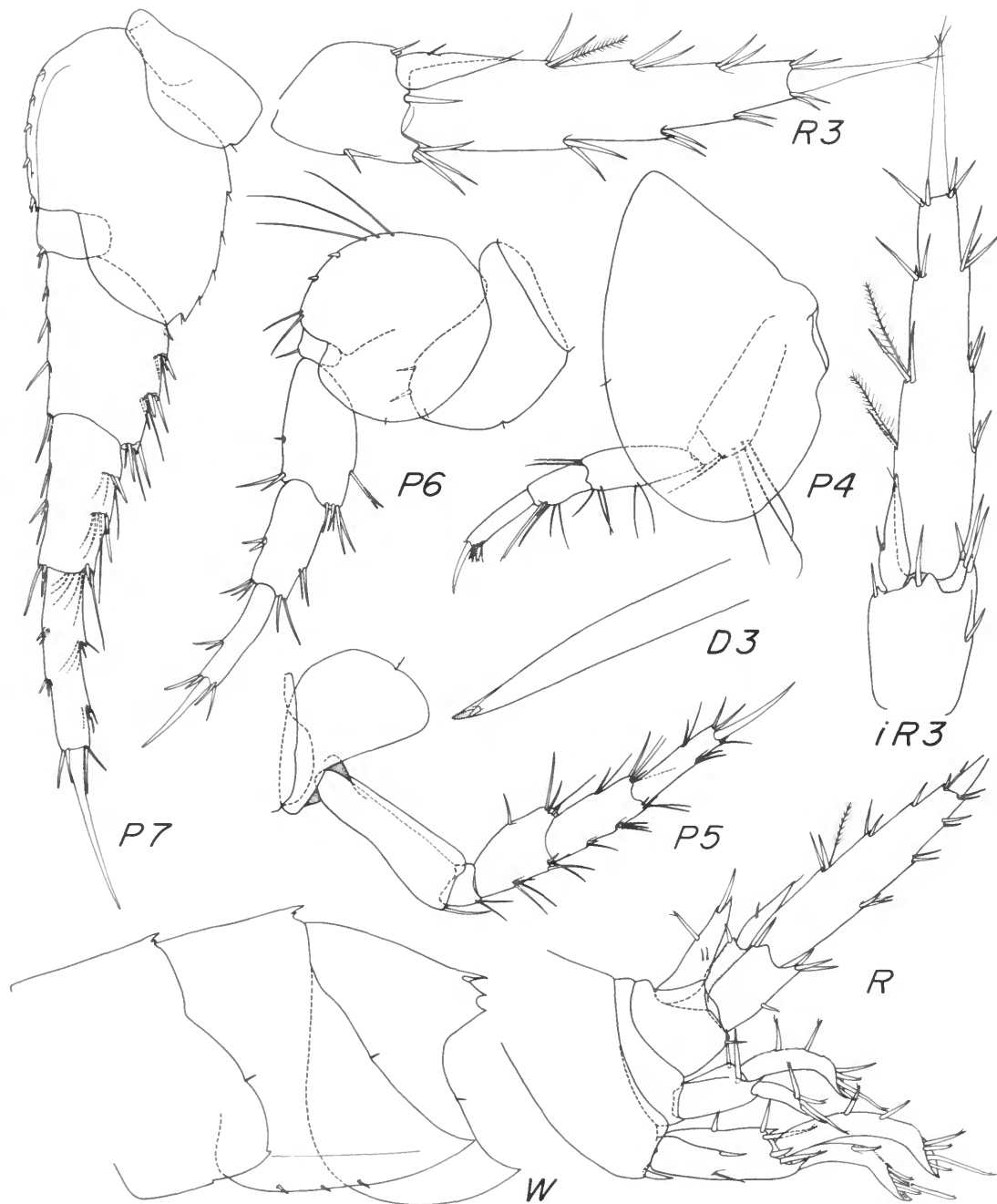


FIGURE 12.—*Skaptopus brychius*, new species, holotype, male "g," 2.70 mm (*i* = female "j," 2.70 mm).

naked; article 2 about half as long as article 1 (using medial length of article 1 again), apical margin with several setules, ventral margin naked; article 3 more than 0.75 times as long as article 1 (using medial lengths), enlarged relative to other platyischnopids, ventral margin naked, apical margins both laterally and medially with wide and dense row of long aesthetascs; primary flagellum almost 1.5 times as long as peduncle, with 5 articles, basalmost elongate, thickened, with sinuous posterior margin but lacking aesthetascs, formula of aesthetascs thus 0-L-L-L-s; accessory flagellum about 0.35 times as long as primary flagellum, with 2 thin articles. Dorsal (rectified) margin on article 4 of antenna 2 naked, ventral margin with 3 setules, outer face with spine and setule, outer apex with group of 4 setae; article 5 about 0.58 times as long as article 4, naked except for setules at apex; flagellum more than 0.80 times as long as articles 4-5 of peduncle combined, with 4 articles.

Mandibles thick, bulky, with small palpar hump, incisors of modified phoxocephalid form, thickened, each with outer callus, right incisor with 3 teeth of phoxocephalid form plus incision and cusp outside largest middle tooth, left incisor with 4 vestigial teeth in 2 branches plus inner slit, each lacinia mobilis flabellate and 4-toothed but right element irregular; raker spines absent; molar huge, weakly pubescent ("mohair" composition); length ratio of mandibular palp articles = 18:60:70, article 1 short, unarmed, article 2 elongate, bearing one midmedial seta, article 3 obliquely truncate, apex bearing 4 straight sharp spines.

Lower lip with fleshy inner lobes, with aboral raphus, oral side lacking structure, cones absent, pubescence ordinary.

Inner plate of maxilla 1 of ordinary subrectangular form, short, subtruncate, armed with one apical simple seta; outer plate with 7 ordinary spines either bifid or weakly serrate or simple; palp uniarticulate, very broad, short, with one apical pluseta. Inner plate or maxilla 2 much shorter and narrower than outer, apical spine-setae thick, stiff, sparse on inner plate, outer plate

with pair of apicolateral spine-setae. Plates of maxilliped sparsely armed, inner small, outer large, inner with truncate apex bearing medial thick spine and 2 lateral spine-setae, outer with 4 medial and apical short thick spines in notches widely separate plus 2 ventrofacial thin spines; palp stout, article 2 with sparse medial setae, article 3 with 1 facial seta, dactyl subunguiform or unguiform, apical nail distinct, short, thick, dactyl not evenly tapered.

Lower margins of coxae 1-4 as attached to body forming even curve, no disjunctions, coxae progressively longer and broader, coxa 1 longer than broad, posteriorly naked, with 2 ventral setules; coxa 2 weakly curved and slightly attenuate anterodistally, with 2 posterofacial setae and 2 ventral setules; coxa 3 similar, with one posterofacial seta, 3 ventral setules; coxa 4 very large, broad, about 1.6 times as wide as long, posterior lobe very broad, rounded, ventral margin with 1 setule.

Gnathopods with relatively short (for the family) article 5, sixth articles weakly chelate, not tapering, weakly elongate, axial margins not biconvex, length ratios of articles 5 and 6 on gnathopods 1-2 = 105:96 and 152:108; palmar humps small and sharp, no flake; article 3 short; posterior margin of article 2 with 0 and 1 seta respectively on gnathopods 1-2.

Pereopod 4 like pereopod 3, main apical spine of article 5 extending to about M. 90 on article 6; spine formula on article 6 of both pairs = 3 + 2 + 0, third member of lateral set not strongly disjunct, dactyls with poorly developed nail demarcation apically.

Articles 4-5 of pereopods 5-7 narrow; facial spine rows sparse to absent; facial ridge formula on article 2 of pereopods 5-7 = 0-0-1 (part); width ratios of articles 2, 4, 5, and 6 on pereopod 5 = 23:21:16:8, on pereopod 6 = 67:27:18:8, on pereopod 7 = 73:43:26:15, length ratios on pereopod 5 = 63:37:40:37, on pereopod 6 = 70:51:42:41, on pereopod 7 = 101:68:58:65, article 2 of pereopod 5 narrow basally, scarcely widening distally, with weak posteroventral lobe; of pereopod 6 orbicular, with adz-shaped poster-

oventral lobe; of pereopod 7 broad, galeate, with 6 posterior serrations, however, ventralmost notch slightly enlarged, posteroventral lobe very large, broad, subtruncate; dactyls medium, thin, pointed.

Epimeron 1 broadly rounded posteriorly but with tiny sharp posteroventral tooth, midventral margin with notch and setal socket (this apparent seta worn off of hundreds of specimens); epimeron 2 dominant, posterior margin sinuous and sweeping into large, sharp, attenuate tooth, ventral margin with 3 widely spaced short spine-setae, epimeron 3 similar but scarcely less dominant, tooth weakly shorter, ventral margin naked; each side of main dorsal tooth margin of pleonites 1-2 with one small accessory tooth, pleonite 3 with 2 large teeth on each side besides middorsal tooth.

Urosome tall, thick (but thin side to side from dorsal view), smooth dorsally, urosomite 2 extremely short, urosomite 1 with large ventral spine near base of uropod 1, latter well exceeding uropod 2, uropod 3 extremely elongate. Peduncle of uropod 1 with one lateral facial spine, one middorsolateral spine, lateral apex with sharp cusp and 2 straight diverse spines, medial apex also with cusp and pair of spines, medial margin with one spine, inner ramus longer than peduncle, outer shorter than inner, outer with one dorsal spine, inner with 2, each ramus with 4 apical diverse spines on oblique sloping margin. Dorsolateral and dorsomedial apices of peduncle on uropod 2 each with spine, lateral also with sharp cusp, inner ramus longer than peduncle, outer shorter than inner, outer ramus lacking dorsal spine, inner with 2 spines, apices like uropod 1.

Peduncle of uropod 3 short, with midfaciolateral spine, one apicolateral and one apicomедial spine, 3 apicoventral spines in group, inner ramus small, scale-like, with one medial and one apical setule; outer ramus very elongate, article 2 about 0.37 times as long as article 1, lateral margins of

article 1 with spine formula of 2-2-2-2, of article 2 = 0, setal formula of medial margin of article 1 = 1-0-0-0, of article 2 = 0, medial spine formula of article 1 = 2-2-2-2, of article 2 = 0, article 2 with 3 apical setules in alternate fashion.

Telson about 1.5 times as long as wide, cleft about 2/3 of length, gape narrow, each lobe with sharp apex armed with setule, then sharp subapical medial acclivity bearing one spine, then fully dorsomedial acclivity along cleft bearing spine with dorsolateral setule pairs at M. 60.

DESCRIPTION OF FEMALE (female "i," 2.70 mm).—Article 3 of antenna 1 slightly smaller than article 2, lacking aesthetascs, article 2 with one apicoventral seta and 2 setules, article 1 of flagellum not enlarged. Article 4 of antenna 2 with additional 3 dorsal setae near base. Article 1 on outer ramus of uropod 3 slightly more strongly spinose, lateral spines = 2-3-3-2, medial spines = 1-2-2-2, medial setae = 1-1-0-0.

VARIABLES.—Aspects of articles 1-3 of antenna 2 shown as several illustrations, these articles inferior, small, articulate but difficult to replicate.

Rami of uropods 1-2, and to some extent their peduncles, curled downward in all preserved specimens (several hundred specimens examined).

HOLOTYPE.—USNM 184164, male "g," 2.70 mm (illus.)

TYPE-LOCALITY.—BLM A2-12, 39°21'36"N, 72°31'18"W, east of Atlantic City, New Jersey, 129 m, 7 Aug 1977. Material deposited in USNM.

MATERIAL.—Type-locality, male "h," 2.70 mm (illus.); female "i," 2.70 mm. Additional 34 BLM stations in general region, each with one or more specimens, from about Cape Henry to Georges Bank; specimens also from USNM, *Fish Hawk* 8832, 21 Aug 1920, 8834, off Cape Henry, Virginia, 43 fms, *Albatross* 2261, 40°04'00"N, 69°29'30"W, 58 fms, 28 Sep 1884.

DISTRIBUTION.—Continental shelf of Atlantic America from about Cape Henry, Virginia, to Georges Bank (40°29'N, 67°43'W), 129-175 m.

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