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A NEW GENUS OF PRIMITIVE MARINE HADZIID (AMPHIPODA) FROM BIMINI AND PUERTO RICO

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A new genus of marine hadziid bearing eyes and well developed male gnathopod 2 typical of marine gammarid amphipods (Crustacea) is described from shallow marine waters of Bimini and Puerto Rico. The family Hadziidae, established by S. Karaman (1943) and later synonymized with Gammaridae by Stock and Nijssen (1965), is resurrected, newly diagnosed and restricted in content.

Hadziids are primarily Tethyan in distribution and were originally discovered in caves of Yugoslavia by S. Karaman (1932). Most of the taxa are subterranean, having been found in ground waters and caves of the Mediterranean, in northern Mexico, or on islands of the Indian Ocean, and Caribbean Sea. Only three species, including that described herein, occur in fully marine habitats. The first to be discovered was *Liagoceradocus pusillus* J. L. Barnard, 1965, from a Micronesian atoll. Barnard did not recognize the "freshwater" affinity of his blind species and erected a new genus, *Liagoceradocus*, now recognized as a synonym of *Hadzia*.

A second IndoPacific species was established by Barnard (in press). That species lives in anchialine environments (Holthuis, 1973, anchialine, "near the sea") i.e., in lava ponds of Hawaii. Lava ponds are pools of brackish water near the sea in lava fields, the ponded water being interconnected by percolation to underground porous aquifers which themselves are influenced by ingressing seawater. A third marine hadziid,

Dulzura sal, was described by Barnard (1969) from the marine intertidal of southern California, but again was not recognized as a taxon having affinity with *Hadzia*. That monotypic genus is also blind but lives among the roots or basal stems of the seagrass, *Phyllospadix* sp., or on substrates under rocks.

Eriopisa schoenerae Fox, 1973, is removed to our new genus as the type-species of *Protohadzia*. It is a marine species originally found in Bimini Lagoon, Bahama Islands, and here reported in fully adult male condition from Puerto Rico.

Hadzia curasavica (Stephensen, 1933) occurs in marine salines of Curaçao but these are not anchialine (Stock, in litt.). All other species of the family occur in groundwater or caves not associated with the sea. We consider only *Protohadzia schoenerae*, *Dulzura sal*, and *Hadzia pusilla* to be of fully marine occurrence.

Terms

The following terms are used to describe stages of uropod 3:

Dispariramus, outer and inner rami dissimilar;

Aequiramus, outer and inner rami similar in length, shape and patterns of armament;

Magniramus, both rami extending equally (rami can differ in spination and therefore be either dispariramus or aequiramus);

Parviramus, inner ramus reduced to a scale lacking all but terminal armaments (uropod 3 therefore dispariramus);

Variramus, inner ramus not fully elongate, often of parviramus form but bearing armaments other than terminal (uropod 3 therefore dispariramus).

Presence of a conspicuous article 2 on the outer ramus results in a classification of dispariramus; such uropod 3 can be magniramus, variramus or parviramus; an aequiramus uropod 3 is always magniramus but a magniramus uropod 3 is not always aequiramus.

Family Hadziidae (sensu stricto), revived

S. Karaman, 1943:206.

New diagnosis: Coxal gills present on pereonites 2–6. Inner plates of maxillae densely setose medially, maxilla 2 with oblique facial row

on inner plate. Gnathopod 1 of melitid form, small, wrist elongate, hand subrectangular, palm transverse or nearly so, gnathopod 2 of female enfeebled but larger than gnathopod 1, wrist slightly to greatly elongate, diamond shaped, hand elongate, slender, palm indistinct from posterior margin of hand, latter bearing groups of sparse, stiff, apically curved setae; gnathopod 2 of male various, either similar to female or of enlarged version or weakly similar to ceradocid gnathopod 2 but wrist diamond shaped, not apically invaginated to fit hand. Uropod 1 with stout basofacial spine(s) on peduncle. Telson cleft. Segments of urosome free, naked or bearing scattered spines never organized into contiguous groups, usually one dorsolateral spine on weak tooth on each side of urosomite 2. Uropod 3 dispariramus.

Description: Accessory flagellum 1–4 articulate. Antenna 1 longer than antenna 2, nongeniculate. Lateral cephalic cheeks unnotched. Male gnathopod 2 usually with medial pubescence on wrist.

Type-genus: *Hadzia* Karaman, 1932

Composition: *Dulzura* J. L. Barnard, 1969; and *Protohadzia*, new genus. The Hadziidae in strictest sense, comprising *Hadzia*, *Protohadzia*, and *Dulzura*, differ from the restricted Melitidae as outlined by Barnard (1976) in the special form of female gnathopod 2, on which the palm is obsolescent and the sparse groups of stiff and bent posterior setae of the hand extend into the margin against which the dactyl closes.

No melitid has these setae extended into that position, though *Eriopisa longiramus* Stock and Nijssen (1965) and *Psammoniphargus* Ruffo have those posterior setae. In the latter 2 taxa, however, the palm of female gnathopod 2 is distinct and well defined.

The weckeliid genera as listed by Barnard (1976) do not necessarily have those setae extended into the palm of female gnathopod 2. That situation plus the aequiramus uropod 3 suggest that weckeliids and hadziids are distinct at family level and have different origins. Hadziids are clearly of melitid origins from the vicinity of such ancestral types as *Eriopisa longiramus* (requiring a distinct genus) whereas weckeliids appear to have origins in the ceradocid group, perhaps near *Paraweckelia*.

Members of *Eriopisa* and *Hadzia* (and allies) have been confused in the past, mainly by J. L. Barnard (1970) who described 2 species of *Eriopisa*, which now are shown to be in the Hadziidae. Through the advice and precedents of the junior author, Fox (1973) assigned his species *schoenerae* to *Eriopisa* but the new definitions of the families and genera presented by Barnard (1976) demonstrate the proper allocations of the several species. The species of *Eriopisa* are restricted to the following: *australiensis* (Chilton), *chilkensis* (Chilton), *epistomata* Griffiths, *garthi* J. L. Barnard, *peresi* Ledoyer, *philippensis* (Chilton) and *seurati* Gauthier. *Eriopisa longiramus* Stock and Nijssen and *E. caeca* (S. Karaman) should be assigned to the revived genus *Psammogammarus* S. Karaman based on the apparent loss of sexual dimorphism in gnathopod 2 and the evenly but minutely spinose palm of gnathopod

2. *Eriopisa (?) hamakua* J. L. Barnard is transferred to *Dulzura* and *E. laakona* J. L. Barnard is transferred to *Hadzia.*

The following genera were formerly aligned with hadziids but are placed in or near the Melitidae because of their non-hadziid female gnathopod 2 and/or the presence of fleshy inner lobes on the lower lip: *Paraweckelia*, *Paraniphargus*, *Psammoniphargus*, and *Eriopisa*. *Eriopisella*, *Netamelita*, *Microniphargus* and *Indoniphargus*, as a family group, are characterized by the neotenic ("heterochronous") gnathopod 2.

Metacrangonyx is an obvious apomorph of the Hadziidae but it is removed from the Hadziidae because of the extreme reduction in uropod 3 and the fusion of the telsonic lobes. *Dulzura* may be an aberrant hadziid but it also could be derived from melitids and may have to be removed to a satellite position. *Dulzura* lacks inner lobes on the lower lip, but male gnathopod 2 is not hadziid because it has a setose palm.

The Hadziidae therefore comprise 3 genera with primarily Tethyan distributions. *Hadzia* is the most widespread genus, containing one marine species in a Micronesian atoll, 2 species in anchialine and marine environments of Hawaii, 4 species in underground waters or caves of Caribbean islands, and 4 species in European caves and groundwater in Portugal, Italy and Yugoslavia. *Protohadzia* is represented by one species from *Thalassia* beds and lagoons in shallow marine waters of Bimini and Puerto Rico. As a satellite, *Dulzura* is known by 2 species from the marine intertidal of California and Hawaii.

Dulzura hamakua (J. L. Barnard), new combination

Eriopisa (?) hamakua J. L. Barnard, 1970:138–140, figs. 83, 84

Remarks: *Eriopisa (?) hamakua* from Hawaii is transferred to *Dulzura.* It differs from the type-species, *D. sal* J. L. Barnard, in the nasiform shape and sharp posterior point on epimeron 3.

Hadzia (?) *laakona* (J. L. Barnard), new combination

Eriopisa laakona J. L. Barnard, 1970:140–143, figs. 85, 86.

Remarks: *Eriopisa laakona* from Hawaii is transferred to *Hadzia* with a questionmark to denote the possibility that it represents a new genus of the Hadziidae characterized by shortened telson. In any event it is no longer referable to *Eriopisa.*

Key to the Hadziid and Weckeliid Genera

1. Uropod 3 dispariramus, outer ramus 2-articulate 2
   Uropod 3 aequiramus, outer ramus 1-articulate 4
2. Eyes present, male gnathopod 2 palm with apical protrusion ..... *Protohadzia*
   Eyes absent, male gnathopod 2 lacking apical protrusion 3
3. Male gnathopod 2 with densely setose palm ..... *Dulzura*

Palm of male gnathopod 2 not densely setose, with small spines and occasional seta ..... *Hadzia*

4. Mandibular palp 3-articulate ..... *Alloweckelia*
   Mandibular palp 0–1-articulate 5
5. Male gnathopod 2 neotenic, small, palm short and highly distal ..... *Mexiweckelia particeps*
   Male gnathopod 2 enlarged, palm elongate 6
6. Mandibular palp 1-articulate, accessory flagellum 4-articulate ..... *Weckelia*
   Mandibular palp absent, accessory flagellum 0–1-articulate ..... *Mexiweckelia*

Protohadzia, new genus

Diagnosis: Eyes present but lacking ommatidia; accessory flagellum 2-articulate; mandibular palp 3-articulate; male gnathopod 1 with 4 rows of long facial setae on article 5; male gnathopod 2 extremely enlarged, palm poorly setose, with apical spinose projection, dactyl crenulate on inner margin but lacking teeth or spines; uropod 1 lacking special apicomedial spine but apicolateral margin with special spine; urosome naked dorsally; uropod 3 with 2 articles on outer ramus; uropod 2 with apicomedial comb.

Type-species: *Eriopisa schoenerae* Fox, 1973. Genus monotypic. Gender feminine.

Relationship: The key to genera of haziids and weckeliids is arranged more or less in a phyletic order with progress from primitive to advanced genera, and progress from marine to freshwater habitation. *Protohadzia* appear to be very primitive in the presence of eyes, the highly enlarged male gnathopod 2 with differentiated palm similar to other marine gammarids and in the normalcy of other characters such as fully developed mandibular palp and article 2 on the outer ramus of uropod 3, in the basalwards position of the basofacial spine on uropod 1, in the absence of inner spines on the dactyl of gnathopod 2 and in the absence of dorsal spination on the urosome.

Protohadzia is specialized, however, in the grossly setose outer face of article 5 on male gnathopod 1 and in the extremely shortened inner ramus of uropod 3 and therefore *Protohadzia* is not the perfect ancestral model to the other genera.

Protohadzia belongs to the hadziid group of the Gammaridae (sensu lato) in which female gnathopod 2 is enfeebled. The wrist is elongate, the hand is thin, the palm is either very short and strongly overlapped by the dactyl or merges completely with the posterior margin of the hand, and the posterior part of the hand is armed with stiff apically curved setae. In hadziids male gnathopod 2 is often very similar or identical to female gnathopod 2 or is enlarged. In the enlarged form the palm and posterior margin of the hand merge almost completely even if the apex is sculptured. Inner lobes of the lower lip are absent.

Uropod 3 of *Protohadzia* is dispariramus, the outer ramus 2-articulate and the inner ramus uniarticulate. Uropod 3 is also parviramus, the inner ramus being reduced to the form of a scale and lacking medial setae. In *Hadzia*, uropod 3 varies between the almost fully magniramus form to the almost fully parviramus form, but because it does not quite reach either extreme, it is best categorized as variramus. *Protohadzia* differs from *Hadzia* in the closely proximal placement of the basofacial spine on uropod 1 and in the well developed, almost ceradocid-like male gnathopod 2. Uropod 3 of weckeliids such as *Weckelia*, *Mexiweckelia* (sensu lato) and *Alloweckelia* is almost aequiramus and is generally magniramus. This raises the possibility that they may have different ancestors from *Hadzia* and *Protohadzia*, possibly in the ceradocids, near *Paraweckelia*.

An ancestor to *Protohadzia* would be visualized as having the magniramus uropod 3 with elongate inner ramus similar to many species of *Hadzia*, especially those of Europe. Several of the Caribbean species of *Hadzia* have a somewhat shortened inner ramus and most species of *Hadzia* have developed medial spines on the telsonic lobes.

In many ways, *Eriopisa longiramus* Stock and Nijssen, 1965, fits the ancestral model. It appears to be the next closest morphotype to *Hadzia* and *Protohadzia*. Uropod 3 is variramus and dispariramus but the inner lobes of the lower lip are large and fleshy and female gnathopod 2 has a distinct palm, so that it must be assigned to the melitid genera. In that group, uropod 3 of *E. longiramus* is unique because other melitids have a fully parviramus uropod 3. If such genera as *Pontoniphargus* in the niphargid group are to be retained because of variramus uropod 3 then *Eriopisa longiramus* probably should be assigned to a new genus but for the moment could be allocated to *Psammogammarus* S. Karaman. *Eriopisa longiramus* has a much better developed female gnathopod 2 than the hadziids, the palm being distinct and defined. However, the wrist is elongate as in hadziids and the bent posterior setae on the hand are weakly developed. *Eriopisa longiramus* would form a good plesiomorph of hadziids, just as it does of *Eriopisa*, but it is not generally ancestral to melitids because of adaptations such as reduced coxae.

The geographically contiguous *Alloweckelia*, known from a cave in Puerto Rico, shares with *Protohadzia* the strongly basal spine on uropod 1 but otherwise differs in the fusion of article 2 on the outer ramus of uropod 3 to article 1 and in the development of dorsal spination on the urosome, the loss of structure on male gnathopod 2, and the slight development of ornaments on the inner edge of the dactyl. The latter character suggests that *Alloweckelia* might have a more direct relationship to *Protohadzia* than to *Hadzia* in which the dactylar ornaments have developed fully into spines, but *Alloweckelia* bears an elongate inner ramus on uropod 3 and cannot be a direct descendent of *P. schoenerae*.

Alloweckelia shows the stepwise intergradation between *Protohadzia* and the various taxa of the *Mexiweckelia* group, including *Weckelia* and

M. particeps, in the smallness of the mandibular palp and the loss of articulation apically on the outer ramus of uropod 3. In the *Mexiweckelia* group the outer ramus bears a long middle spine resembling an article but bearing an apical trigger and an apparent neural canal typical of spines (specimens of all species of the group except *M. texensis* re-examined in Smithsonian collections). The *Alloweckelia* and *Mexiweckelia* groups have lost the medial comb on the peduncle of uropod 2 typical of *Protohadzia*, *Hadzia* and *Dulzura*.

Paraweckelia has been placed by earlier students in the hadziid group but gnathopod 2 of the female is fully melitid in form. *Paraweckelia* is so close to *Ceradocus* that it can scarcely be distinguished. It has the normally midlateral setules shifted towards the apex of the telson. *Dulzura* has the fully hadziid form of gnathopod 2 but male gnathopod 2 is somewhat enlarged and the palm is densely setose, unlike *Hadzia* and *Protohadzia*. Uropod 3 is dispariramus and parviramus so that *Dulzura* would otherwise fit into the very narrowest hadziid group. It also lacks inner lobes on the lower lip like *Hadzia*, but in contrast to the *Weckelia* group where faint inner lobes persist. In melitids the plesiomorphic lower lip has fully fleshy inner lobes but these often are reduced, even in *Melita*, almost to the level seen in *Weckelia*. Hadziids may have a melitid ancestry as marked by the dispariramus uropod 3 and the weckeliids may have a ceradocid ancestry because of the aequiramus uropod 3 but both groups have many similarities in female gnathopod 2, although the development of an enfeebled gnathopod 2 could be a case of convergence. The same may be said of the mittenform gnathopods in the several genera of eriopisellids and in the salentinellids, where several ancestral morphotypes can be proposed.

Protohadzia schoenerae (Fox), new combination
Figures 1–5

Eriopisa schoenerae Fox, 1973:153–159, figs. 5–8.

Description of male: Ocular lobe of head distinct, marked below by weak excavation, anteroventral corner of head subquadrate, eyes present, composed of deep purple pigment granules in irregular blobs, occasionally split apart into several subdivisions or coalesced and vacuolate, ommatidia not visible. Antenna 1 elongate, article 1 with small apicoventral spine, article 2 about 0.95 times as long as article 1, article 3 about 0.35 times as long as article 1, accessory flagellum with 2 articles, second article minute, primary flagellum with 21–23 articles, about 1.5 times as long as peduncle; article 5 of antenna 2 about 1.1 times as long as article 4, flagellum with 13 articles, about 1.55 times as long as article 4. Prebuccal parts almost flat anteriorly, upper lip pyriform, distinct from epistome. Right lacinia mobilis weakly bifid, poorly gaping, each branch densely denticulate, right rakers 4, raker number 2 largest and apically brushy, left rakers 4, all thin and similar to each

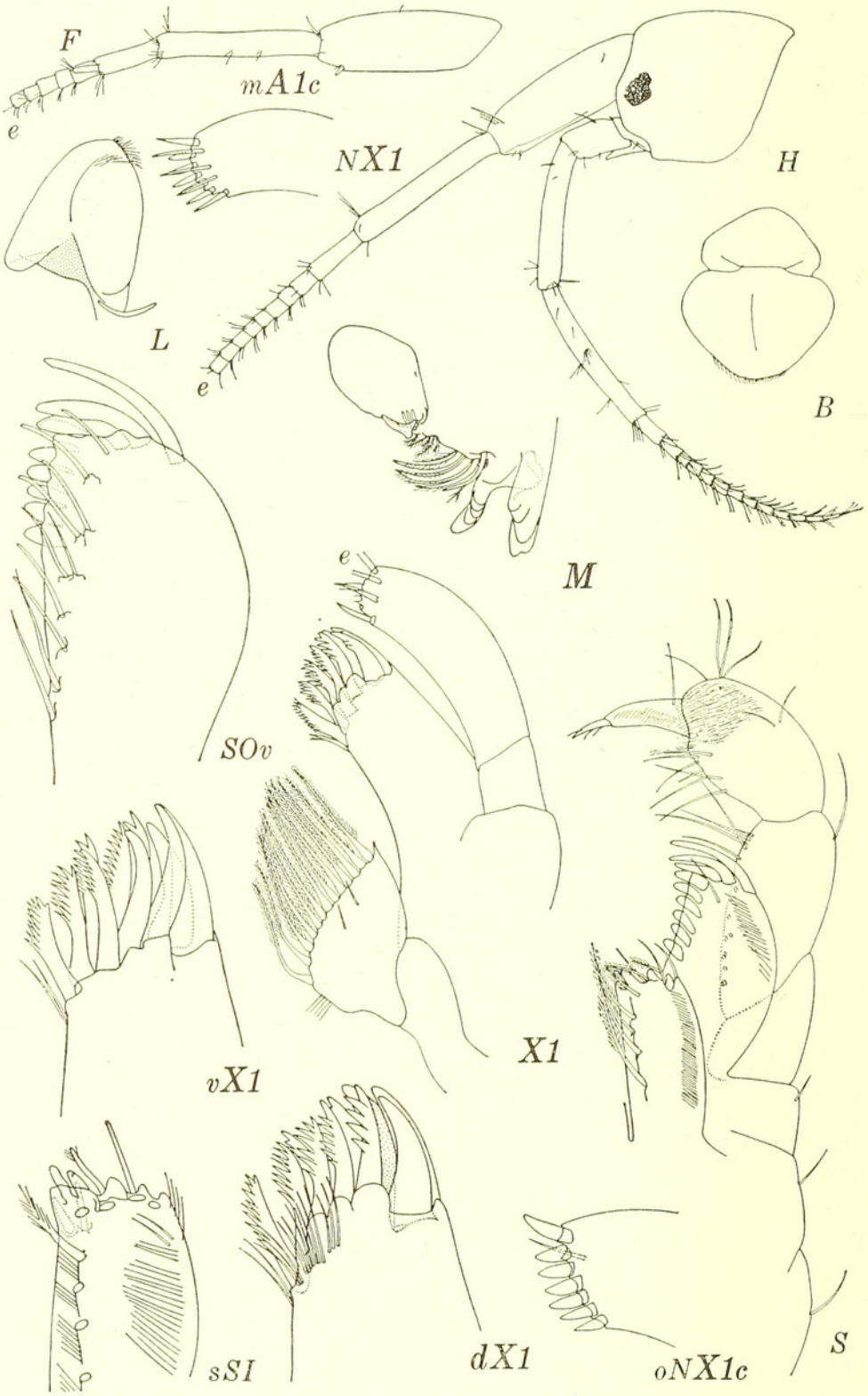

FIG. 1. *Protohadzia schoenerae* (Fox), male "a" 5.16 mm; c = female "c" 4.42 mm. A, Antenna; B, Prebuccal, anterior; C, Coxa; D, Dactyl; E, Epimeron; F, Accessory flagellum; G, Gnathopod; H, Head; I, Inner plate or ramus; J, Pleopod; L, Lower lip; M, Mandible; N, Palp;

other, left rakers each pair with intercalated plusetule, left molar with flake, right molar with sinus at position of flake base seen on left molar, palp article 1 weakly elongate, article 2 with 2 inner setae, article 3 about 1.25 times as long as article 2, thin, falciform, closely lined with medial spines along inner curve from mark 25 to apex. Lower lip lacking inner lobes. Inner plate of maxilla 1 densely setose medially, with sharp apical cusp, outer plate with 10 spines, oral surface with extended lobules on 3 spines, medial apex with 2 setules, right and left palps distinctive, right palp thin, bearing 6–7 thin apical spines and 1–3 submarginal facial setae, left palp broad, apex with 7 thick spines and one submarginal facial seta; inner plate of maxilla 2 slightly broader than outer plate, with medial setae and oblique facial row of setae. Inner plate of maxilliped subrectangular, significantly smaller than outer plate, article 1 of palp lacking apicolateral seta, apical nail of dactyl stout. Coxae 1–3 subquadrate, with weakly concave posterior margins, coxa 4 somewhat shorter, naked posteriorly. Article 5 of gnathopod 1 elongate, article 6 about 0.65 times as long as article 5, palm almost transverse, article 6 rectangular, article 4 with medial fuzz, article 5 with 4 oblique faciolateral rows of elongate setae, no medial fuzz, dactyl with several tube-setae (apices flared and circular); articles 3–5 of gnathopod 2 short, article 5 with posterodistal protrusion medially, article 5 with rounded-flat and setose posterior margin, posteromedial surface fuzzy, article 6 greatly elongate, about 3.3 times as long as article 5, palm and posterior margin confluent and sinuate, proximal part densely setose, distal part weakly setose and spinose, extended apically into adz-shaped false palm bearing spines and setae, posteromedial margin with weak callus for apex of deeply curved dactyl, latter situated at mark 55 on posterior margin, inner margin of dactyl weakly crenulate, lateral face of article 6 mostly naked, medial face with about 6 anterior groups of setae. No pereopodal dactyl with accessory outer distal setae but pereopods 5–7 with additional inner flagellar scale at base of main setule; coxa 5 small; article 2 of pereopods 5–7 narrow, subrectangular, each with weak posteroventral lobe, article 2 of pereopod 5 tapering proximally, article 5 of pereopod 6 with special posteromedial comb of long spines. Epimera 1–3 with small posteroventral tooth, epimera 1–2 with facial ridge, epimeron 1 naked, epimeron 2 with one ventrofacial spine, epimeron 3 with 5 ventral spines and occasionally with submarginal facial spine. Basofacial spine on peduncle of uropod 1 short and strongly shifted proximally (from position normal to other

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←

O, Outer plate or ramus; P, Pereopod; R, Uropod; S, Maxilliped; T, Telson; U, Molar; V, Gill; W, Pleon; X, Maxilla; Y, Lacinia mobilis; d, Dorsal; e, Removed or missing; m, Medial; n, Peduncle; o, Opposite; s, Setae removed; u, Right; v, Ventral.

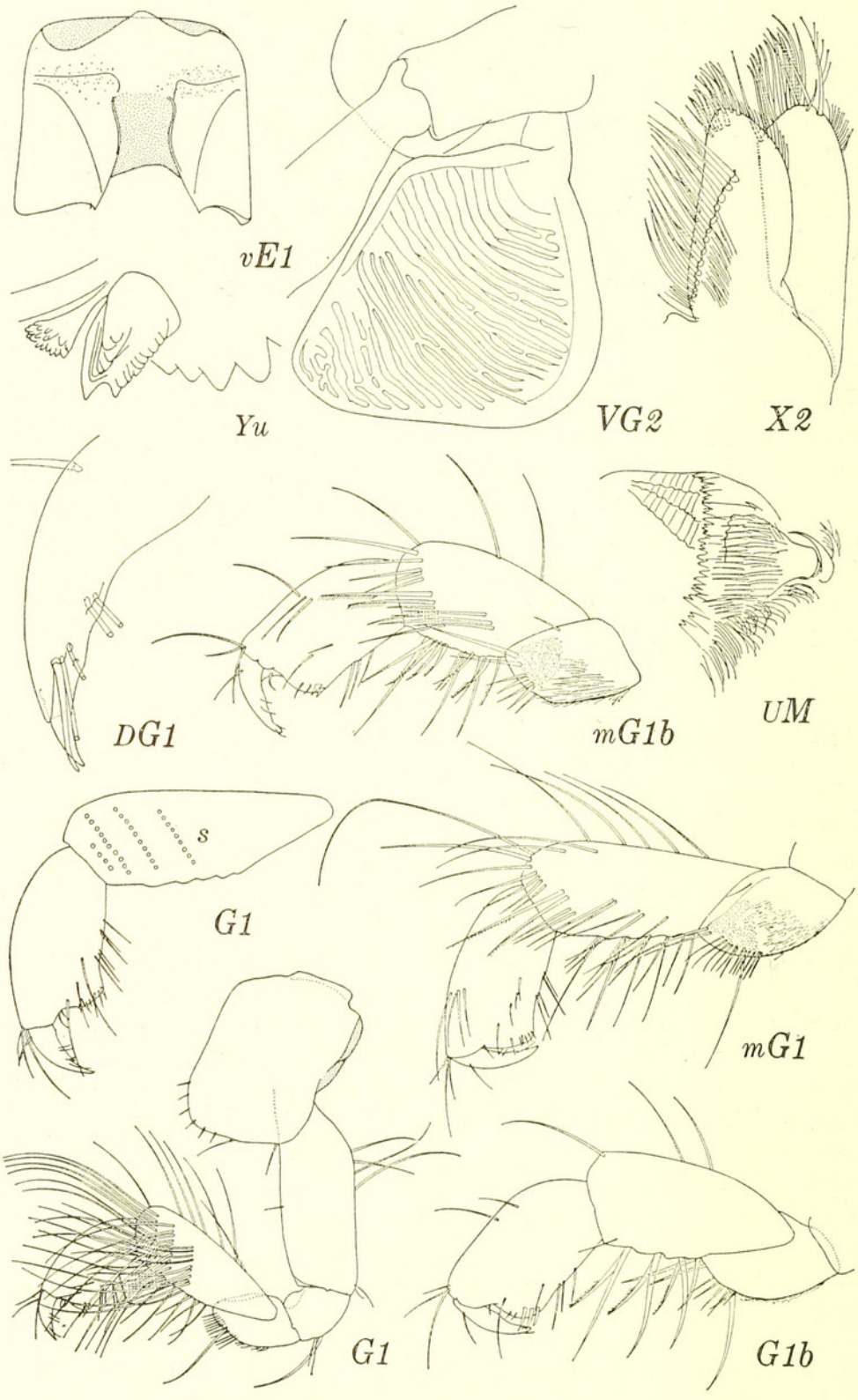

FIG. 2. *Protohadzia schoenerae* (Fox), male "a" 5.16 mm; b = female "b" 3.37 mm. See fig. 1 for symbols.

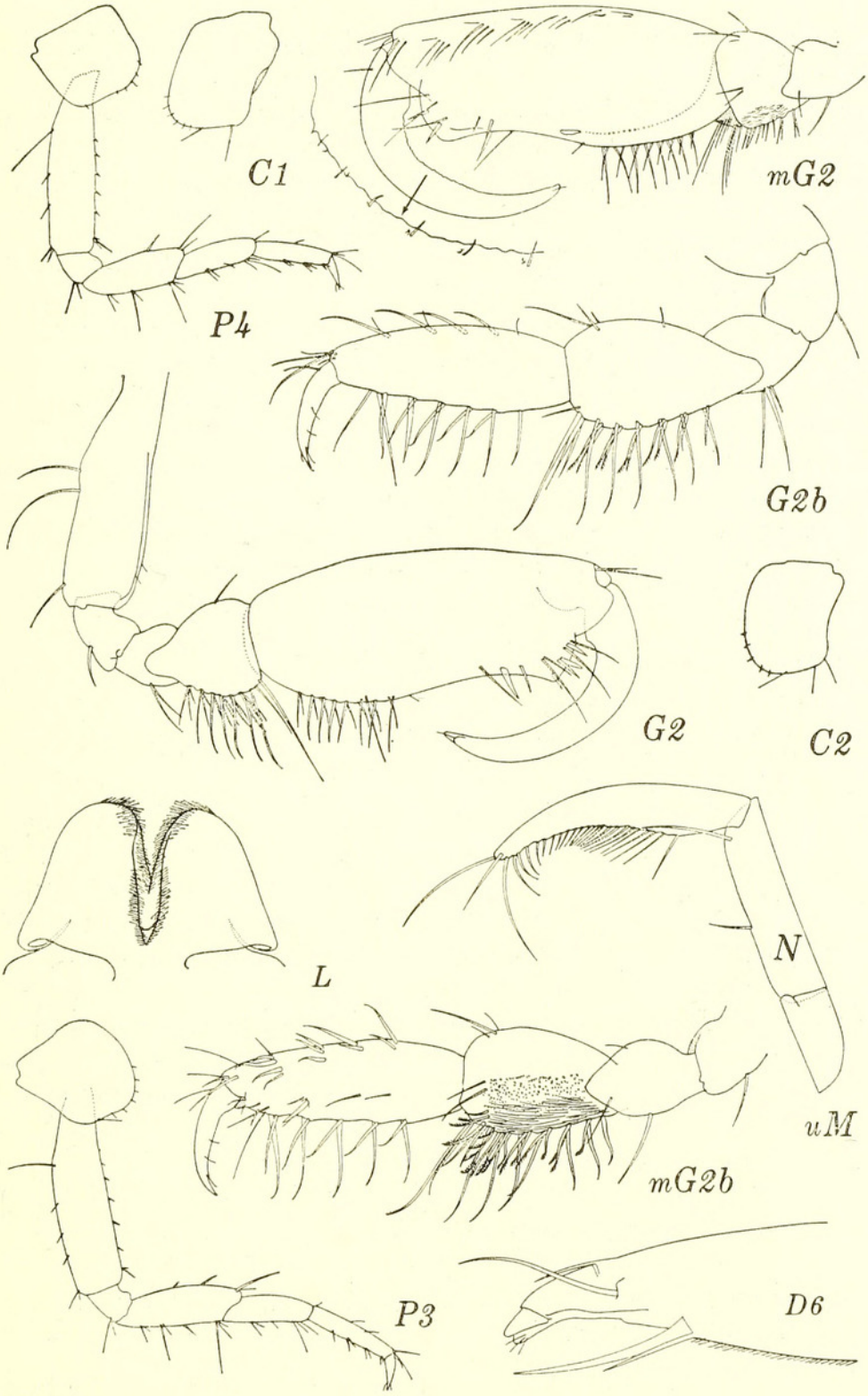

FIG. 3. *Protohadzia schoenerae* (FOX), male "a" 5.16 mm; b = female "b" 3.37 mm. See fig. 1 for symbols.

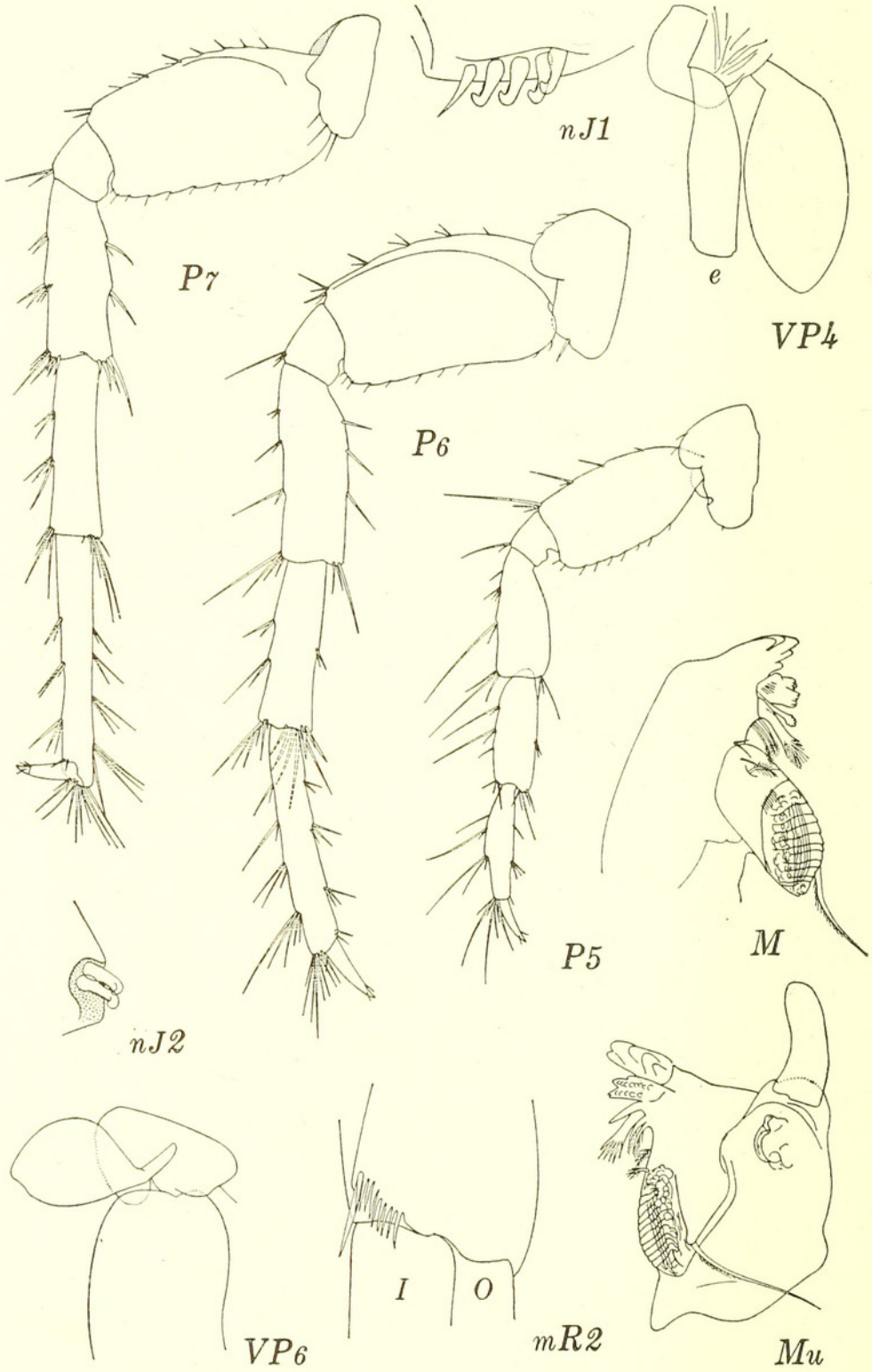

FIG. 4. *Protohadzia schoenerae* (Fox), male "a" 5.16 mm. See fig. 1 for symbols.

hadziids), lateral margin with 3 small dorsal spines and one enlarged (occasionally missing) fully apical spine, medial margin of peduncle with 3 dorsal spines, no enlarged apical spine, outer ramus naked dorsally, apex with nail and 3 accessory nails, inner ramus with 3 dorsal spines and similar apex, peduncle of uropod 2 with 6 dorsolateral spines, apicalmost weakly shifted to full apical position, medial apex with one dorsal spine and ventral comb of 7–9 fused spines, outer ramus with one dorsal spine, apical nail, 3 accessory nails and one spinule, inner ramus with 2 lateral and 4 medial spines and similar apex. Uropod 3 highly elongate, peduncle with one midventral spine laterally, one mid medial spinule, one apicomedial spine, 4 ventrolateral spines, inner ramus short, scale-like, pointed, attenuate, with either one subapical setule, or one stout spine plus one subapical setule, article 1 of outer ramus with 4 lateral acclivities plus apical declivity, spine formula from proximal end = 2-2-3-2-3, medial margin with 2 acclivities and apical declivity, spine formula = 2-2-3, article 2 about 0.20 times as long as article 1, with 2 subapical setules. Telson elongate, each apex narrow, bifid, each bearing lateral setule, long middle spine, short medial spine, lateral margins with 3 acclivities each bearing spine and setule, no medial spine. Coxal gills present on pereonites 2–6, pedunculate, those of pereonites 2–3 large and diamond-shaped, those of pereonites 4–5 elongate oval, that of pereonite 6 turned forward, short and ovate. Pleopods elongate, outer rami shorter than inner by one article of length, apical articles minute, each with 2 setae, outer rami with 6 articles, inner with 7, only peduncle of pleopod 3 with subapical setae. Urosomites lacking dorsal spines, urosomite 1 with spine at base of uropod 1. Cuticle with bulbar setules and striations in form of human unwhorled fingerprints (striations probably composed of tiny scale-serrations visible only under SEM).

Female: Article 5 of gnathopod 1 shorter than in male, lacking lateral and facial rows of elongate setae; gnathopod 2 much smaller than in male, of typical hadziid form, article 5 elongate, over 80 percent as long as article 6, palm and posterior margin of article 6 confluent, with sparse bundles of stiff, curved setae, lacking palmar protrusion, inner margin of dactyl with setules, no spines; article 4 of pereopod 5 with posterior spines, either one set of one spine plus setule or 2 sets of 2 and one spines, all longest anterior setae of pereopod 5 much shorter than in male.

Observations: Sterna of pleosome highly ventrad, epimeron 1 anteriorly merging with sternum, anterior margin plastered to belly and then fully fused, this pleonite 1 with anterior sleeve-like extension fitting obliquely along ventroposterior margin of pereonite 7, flexible, pulled downward in our illustration; setal formulas on article 2 of pereopods 1–4, long posteriors = 4-2-1-1, short posteriors = 1-2-5-4, long anteriors = 0, short anteriors = 2-2-8-9.

Females in hand smaller than males, therefore generally less spinose

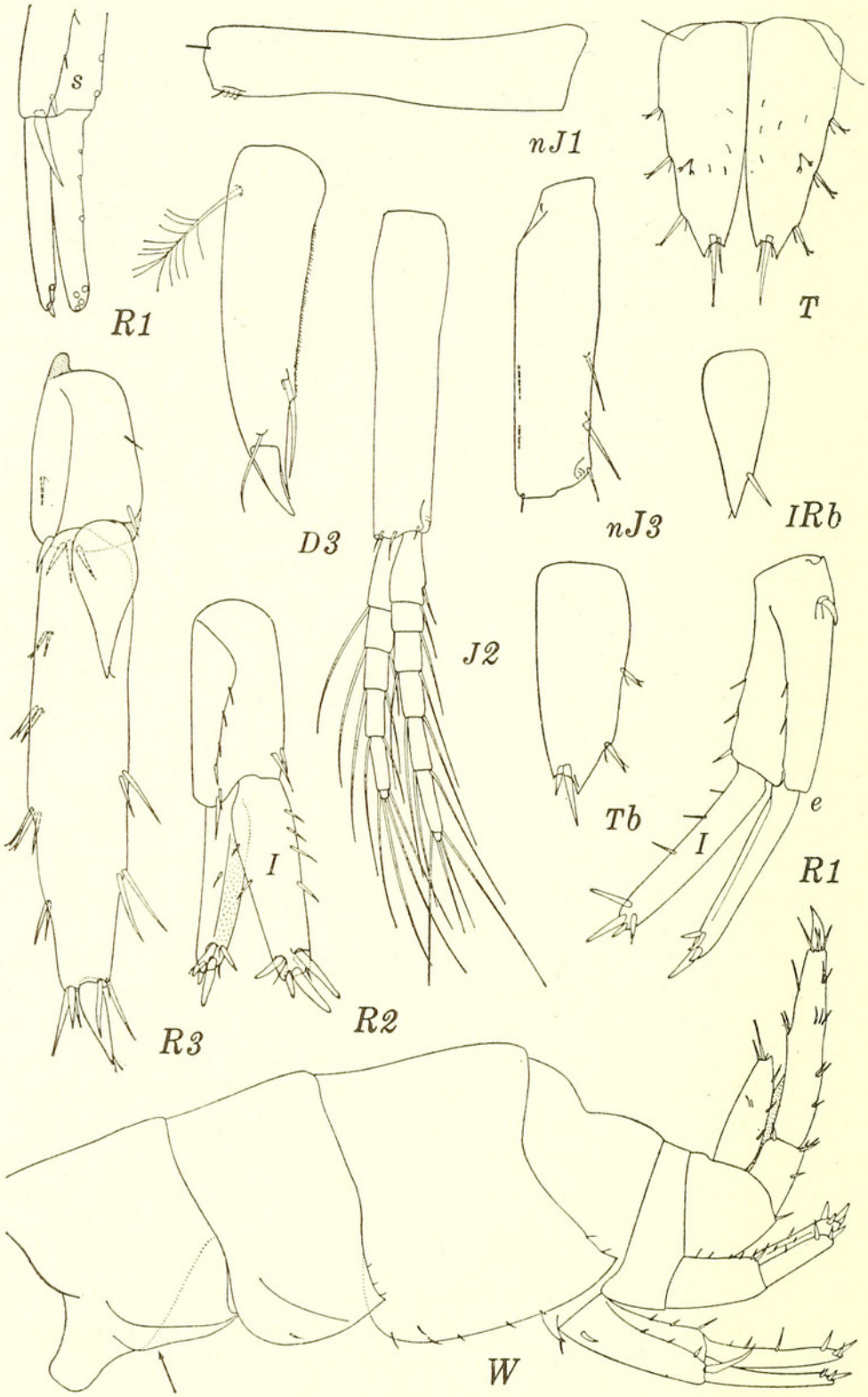

FIG. 5. *Protohadzia schoenerae* (Fox), male "a" 5.16 mm; b = female "b" 3.37 mm; arrow on W is point of attachment for pleopod 1. See fig. 1 for symbols.

and setose, especially in uropods, telson and epimera, for example epimeron 3 with only 3 ventral spines (5 in male), telson with only 2 lateral spine sets (each with one spine, one setule); gill of gnathopod 2 smaller relative to gill of pereopod 4 than in male; pleopods generally with fewer articles in rami, for example pleopod 2 of female "b" with 5 articles in each ramus on right side, on left side outer with 5, inner with 6 articles, peduncular hooks also fewer, for example pleopod 3 with 2 hooks in female, 4 in male.

Male "a" with only subapical setule on inner ramus of uropod 3 but 3 other specimens, one male and 2 females, with additional stout subapical spine on medial margin.

Voucher: USNM No. 154426, male "a" 5.16 mm long.

Locality: Puerto Rico, La Parguera, Corona Reef, 17°58'N, 67°03'W, intertidal, backreef area, in bed of *Thalassia testudinum*, 6 June 1975, coll. R. J. Zimmerman.

Remarks: Gnathopod 2 of our male "a" is better developed than the male shown by Fox (1973) but otherwise the two groups of specimens from Bimini and Puerto Rico, appear to be conspecific. Fox's drawing of the lower lip (his figure 8B) apparently is an aboral view, which we depict in our figure 1L. The oral view of our figure 3L shows that inner lobes are absent.

Distribution: Bahama Islands, Bimini lagoon; Puerto Rico, sublittoral, in *Thalassia* bed.

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