

UPOGEBIA SYNAGELAS, NEW SPECIES, A COMMENSAL
MUD SHRIMP FROM SPONGES IN THE WESTERN
CENTRAL ATLANTIC (DECAPODA: UPOGEBIIDAE)

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Abstract.—*Upogebia synagelas*, a new species of mud shrimp from the western central Atlantic, lives commensally as adult male-female pairs in species of the agelasid sponge, *Agelas*, in the eastern Gulf of Mexico and West Indian region. Both adults and zoea I are described. The species is similar to *U. ramphula* of the eastern Pacific.

Specimens of an undescribed species of *Upogebia* were brought to my attention recently by Drs. Paula J. B. Scott of McMaster University, Hamilton, Ontario, Canada, and Elizabeth Sides, Dublin, Ireland. Both of these investigators have found the species living commensally in the agelasid sponge, *Agelas sceptrum* (Lamarck), and both Scott, Reiswig, and Marcotte (in press) and E. Sides have observed that the adults live as male-female pairs in the sponge whereas juveniles may occur singly. Michael Dardeau and associates of the Marine Environmental Sciences Consortium, Dauphin Island, Alabama, have found the shrimp in *A. dispar* Duchassaing and Michelotti on the Florida Middle Grounds in the Eastern Gulf of Mexico and the Bahama Islands. The purpose of this paper is to describe the adult shrimp as well as selected features of the zoea stage I, with comparative remarks on similar species.

Type specimens and larval material have been placed in the crustacean collection of the United States National Museum of Natural History (USNM) and in the research collection of the Marine Environmental Sciences Consortium (MESC), Dauphin Island Sea Lab, Dauphin Island, Alabama 36528.

Upogebia synagelas, new species
Figs. 1–3

Material examined.—Jamaica: USNM 233572, ♂ Holotype; USNM 233573, ♀ Allotype; USNM 233574, 1 ♂, 1 ♀, Paratypes; Discovery Bay, 18°28'N, 77°24'W, spur and groove reefs on Fore Reef, Long Term Survey site, 27.4–35 m (90–115 ft.), P. J. B. Scott, SCUBA, 3 Oct 1985, host sponge *Agelas sceptrum*.—USNM 233575, 2 ♂, 2 ♀ (ovig., 1 with eyed eggs, 1 with variably hatched zoeae) Paratypes; Pear Tree Bottom, 22 m, J. Woodley, 25 Nov 1985, occurring as pairs in *A. sceptrum*.

Barbados: USNM 233576, 2 ♂, 1 ♀; 233577, 1 ♂, 3 ♀ ovig., Paratypes; “Nurse’s Jetty, on Bank Reef,” 1 km W Holetown, St. James, 13°10.7'N, 59°38.9'W, 18.3 m (60 ft.), H. M. Reiswig collection No. 76-8-9.1, SCUBA, 9 Aug 1976, host sponge *A. sceptrum* (specimens in collection of Redpath Museum, McGill University Cat. No. RMI 2727).

MESC, Paratypes.

Florida Middle Grounds, coral reef, Gulf of Mexico: Sta 151, 28°32'20"N, 84°18'36"W: MESC 6183-4563, 1 juv., diver collected, 27.4 m, 5 Oct 1978; MESC 6183-

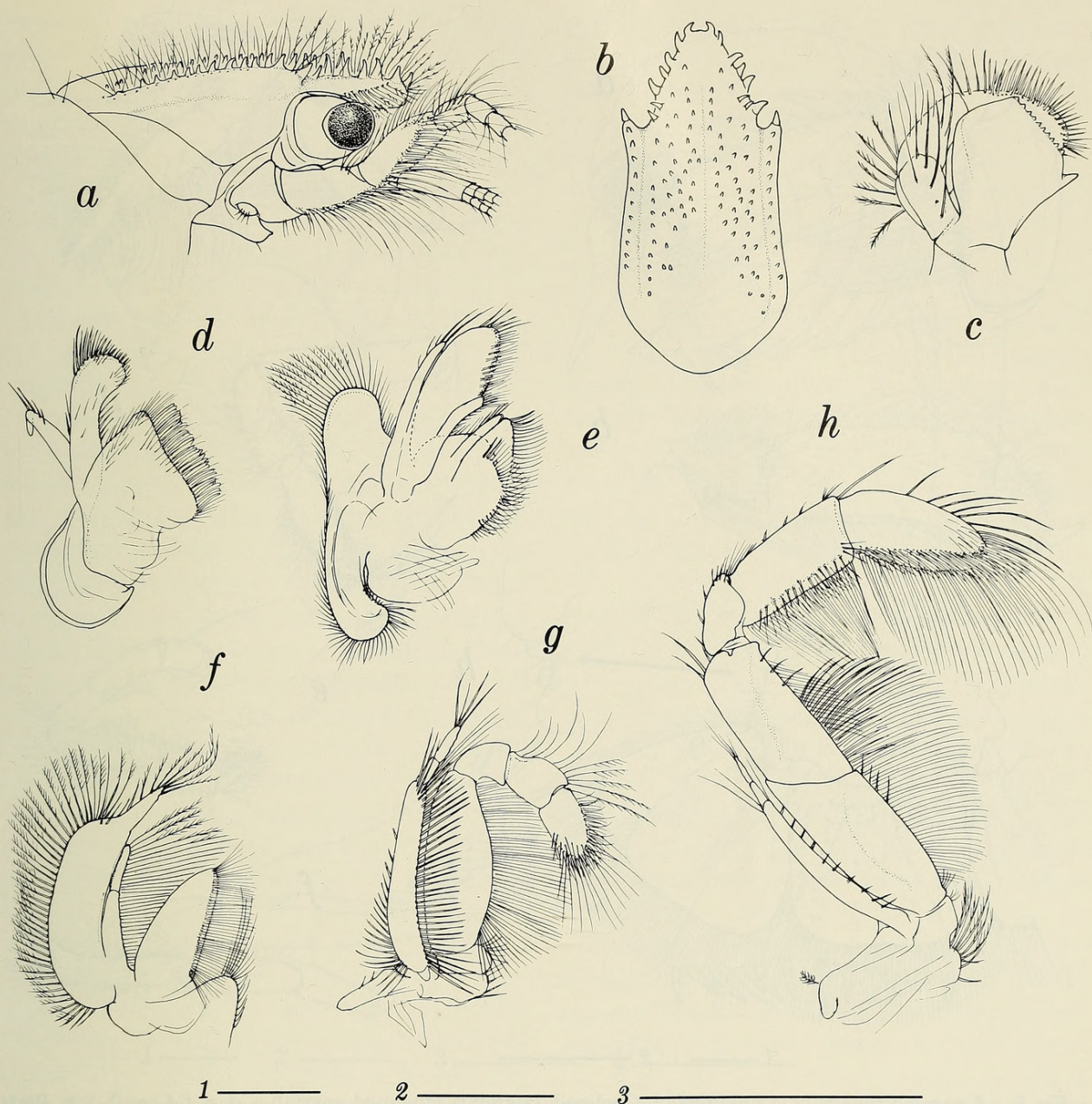


Fig. 1. *Upogebia synagelas*, ♂ holotype: a, Cephalic region, lateral; b, Anterior carapace, dorsal; c, Mandible; d, e, Maxilla 1, 2; f, g, h, Maxilliped 1, 2, 3. Scales all 1 mm: 1 = a-b; 2 = c; 3 = d-h.

4558, 1 juv., diver collected, 31.3–33 m, 17 Jan 1979; MESC 6183-4574, 5 juv., diver collected, 27.4 m, 18 Jan 1979.—Sta 481, 28°30'52"N, 84°18'59"W: MESC 6183-4589, 1 ♂, diver collected, 29 m, 6 Oct 1978; MESC 6183-4556, 2 juv., diver collected 29 m, 8 Oct 1978; MESC 6183-4580, 2 ♂ (juv.), diver collected, 29 m, 8 Oct 1978; MESC 6183-4587, 1 juv., diver collected, 29 m, 8 Oct 1978; MESC 6183-4552, 1 juv. (tiny), submersible, 37.5 m, 8 Nov 1978.—Sta 491, 28°27'18"N, 84°17'02"W: MESC 6183-

4575, 1 ♂, diver collected, 29 m, 16 Oct 1978.—Sta 482, 28°31'06"N, 84°18'55"W: MESC 6183-4578, 1 ♀ (juv.), diver collected, 33.5 m, 8 Jul 1979.—Sta 2315, 28°34'05"N, 84°14'11"W: MESC 6183-10523, 1 juv., Capetown dredge, 38 m, 30 Aug 1977.

Bahamas: Freeport, Grand Bahama Island: MESC 6183-10524, 1 juv., diver collected, 21–23 m, Nov 1975; MESC 6183-10525, 1 ♂, 2 ♀ (1 ovig.), 1 frag., diver collected, 21–23 m, Nov 1975.

Diagnosis.—Projections to either side of

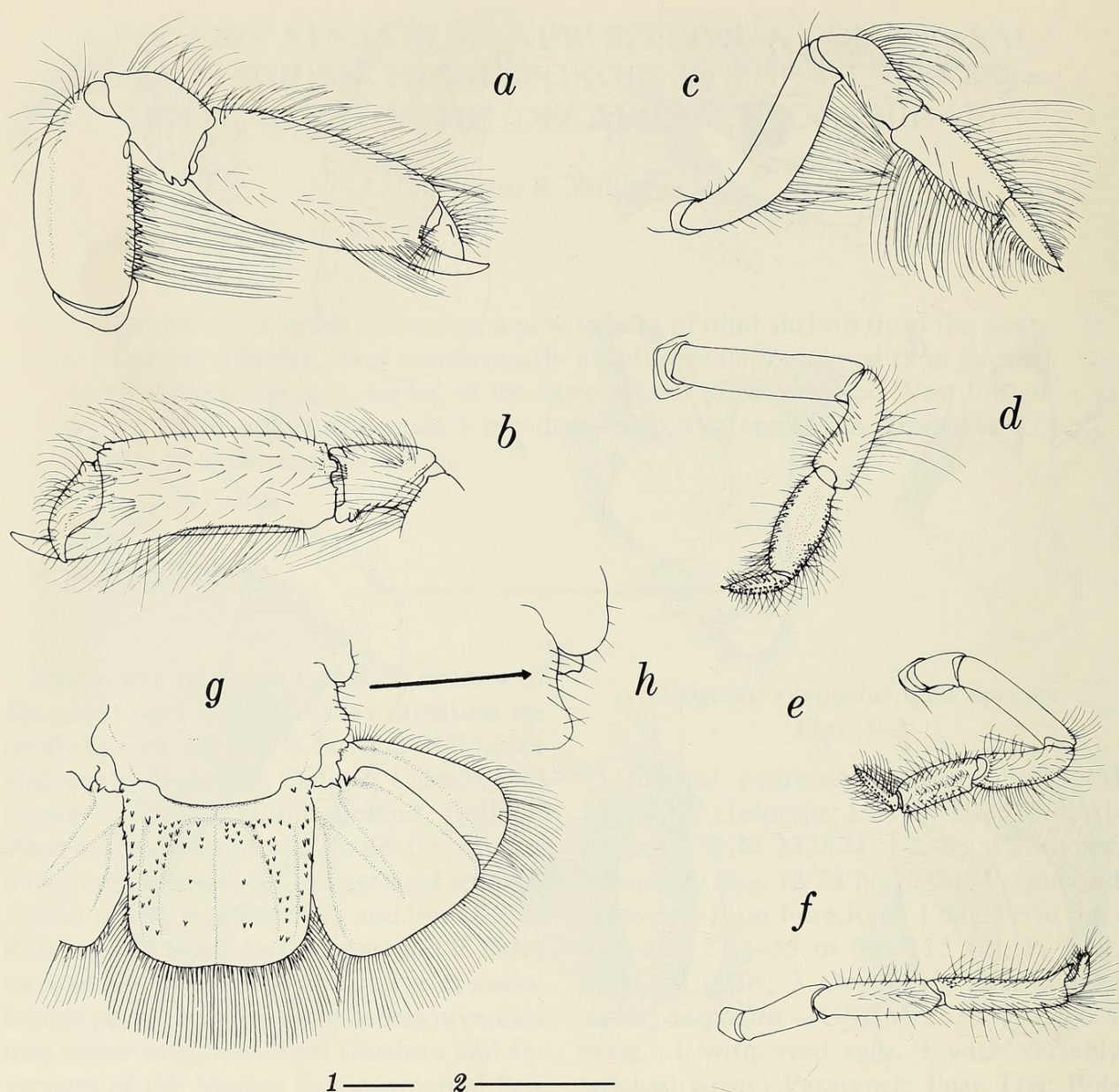


Fig. 2. *Upogebia synagelas*, ♂ holotype: a, Cheliped, lateral; b, Cheliped, mesial; c, d, e, f, Legs 2-5; g, Parts of abdominal segment 6, telson and uropods; h, Parts of lateral margin, segments 5-6. Scales all 1 mm: 1 = a-g; 2 = h.

rostrum ending in acute spine. Postocular spine absent. First and second abdominal segments lacking ventral spines; sixth segment bearing anterolateral process; telson longer than wide, slightly narrowed posteriorly. Chelipeds with fully developed fixed finger equal to dactyl in length, merus with ventral row of low spines; remaining legs spineless.

Description.—Rostrum truncate, triangular in dorsal view, slightly broader than long, downturned tip exceeding eyestalks; 4-6 strong acute spines along each lateral

margin; dorsal surface bearing anterior mat of long silky setae followed by field of scattered spines angling toward sides posteriorly, gastric region smooth; ornamented part separated from, and flanked on each side by, slightly sinuous ridge bearing crest of about 11 spines grading from slender anteriorly on lateral rostral process to sharp tubercles posteriorly. Postorbital spine absent. Shoulder lateral to cervical groove prominent; thalassinidean line faint but extending to posterior margin of carapace.

Abdomen weakly sclerotized; first 2 seg-

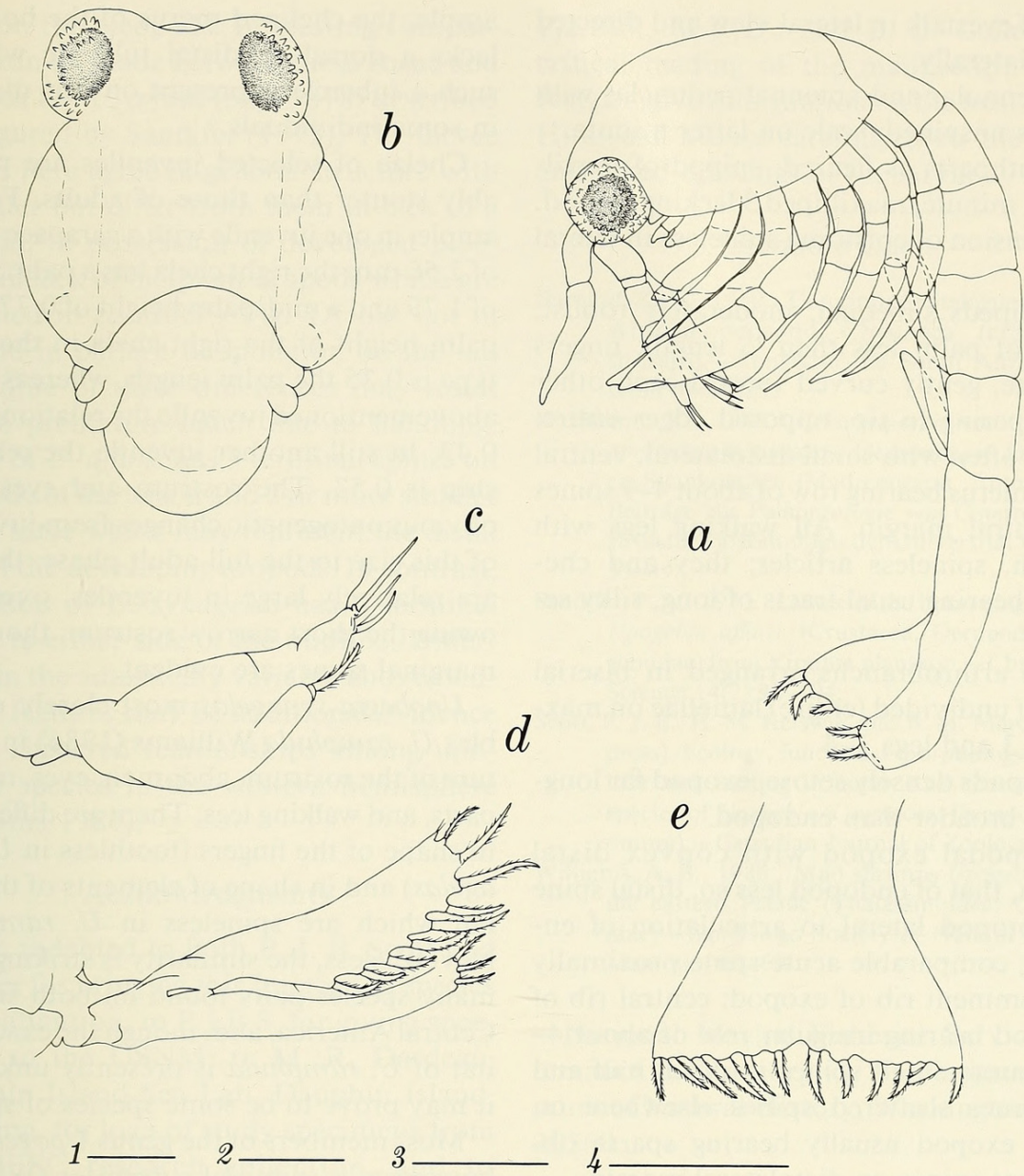


Fig. 3. *Upogebia synagelas*, Zoea I, just hatched or in process of hatching but still partly encapsulated in egg membrane. a, Lateral view, semidiagrammatic; b, Dorsal view, cephalothorax and proximal part of abdomen; c, Antennule; d, Antenna; e, Telson, composite of 2 specimens. Scales all 0.5 mm: 1 = a-b; 2 = c; 3 = d; 4 = e.

ments lacking spines or spinules on sterna, pleura and bases of pleopods; pleura of segment 1 very poorly developed, of 2-5 rather well developed and bearing plumose setae on margins from middle of 2 to middle of 5, pilose tract extending dorsally to some extent near anterior and posterior margin of tergum on segment 3, scattered setae elsewhere dorsally; segment 6 broader than long, bearing slightly hooked process on antero-lateral margin and behind it an irregularly rounded lobe, marked dorsally on each side

with an obsolescent, irregularly lunate furrow. Telson as long as uropods, slightly wider than long, somewhat narrowed and rounded posteriorly; median longitudinal furrow and broader submarginal furrow at each side; small acute spines irregularly placed along lateral margins as well as submarginally and irregularly on raised tracts, some spines clustered in twos and threes. Eyestalks rather stout, clearly exceeded by rostrum; cornea large but narrower than

base of eyestalk in lateral view and directed anterolaterally.

Antennular and antennal peduncles with articles unspined; scale on latter minute.

Mouthparts as figured; epipod of maxilliped 1 minute, maxilliped 3 lacking epipod.

Extension of epistome spineless in lateral view.

Chelipeds subequal, moderately robust, depth of palm less than $\frac{1}{2}$ length; fingers elongate, gently curved toward each other and tapering to tip, opposed edges entire; carpus often with small distolateral, ventral spine; merus bearing row of about 4–9 spines on ventral margin. All walking legs with smooth, spineless articles; they and chelipeds bearing usual tracts of long, silky setae.

Two arthrobranchs arranged in biserial rows of undivided (entire) lamellae on maxilliped 3 and legs 1–4.

Pleopods densely setose, exopod far longer and broader than endopod.

Uropodal exopod with convex distal margin, that of endopod less so, distal spine on protopod lateral to articulation of endopod; comparable acute spine proximally on prominent rib of exopod; central rib of endopod bearing irregular row of about 4–12 or more small spines in distal half and sometimes scattered spines elsewhere on blade, exopod usually bearing sparse obsolescent spines on distolateral margin.

Measurements (mm).—Holotype ♂, length anterior carapace 3.84, length carapace 6.34, length right chela including fixed finger 4.8, height 1.66. Allotype ovigerous ♀, same, 4.22, 6.49; 4.67, 1.34; 4.48, 1.34; eggs of one individual approximately 0.9×1.04 in diameter.

Known range.—Confined to the material studied.

Color.—Chelipeds with distal parts of palm colored shades of orange, fingers similar but light at tips.

Remarks.—There is considerable variation in the amount of spination on the tail fan and in ornamentation elsewhere; for ex-

ample, the cheliped merus of the holotype lacks a dorsal subdistal tubercle whereas such a tubercle is present on this member in some individuals.

Chelae of selected juveniles are noticeably stouter than those of adults. For example, in one juvenile with a carapace length of 2.56 mm the right chela has a palm length of 1.79 and a mid-palm height of 0.77; mid-palm height of the right chela in the holotype is 0.35 the palm length, whereas in the abovementioned juvenile the relationship is 0.43. In still another juvenile the relationship is 0.53. The rostrum and eyes show obvious ontogenetic changes from juveniles of this size to the full adult phase; the eyes are relatively large in juveniles, overshadowing the short narrow rostrum, though its marginal spines are evident.

Upobegia synagelas most closely resembles *U. ramphula* Williams (1986) in structure of the rostrum, abdomen, eyes, mouthparts, and walking legs. There are differences in shape of the fingers (toothless in *U. synagelas*) and in shape of elements of the tail fan which are spineless in *U. ramphula*. Nevertheless, the similarity is striking, as in many species pairs found on both sides of Central America, and, though the exact habitat of *U. ramphula* is presently unknown, it may prove to be some species of sponge.

Most members of the genus *Upogebia* are burrowers in subtidal substrates (Williams 1986). Some are highly specialized for burrowing in stony corals (Kleemann 1984), and still others are adapted for living in the cavities of sponges (Barnard 1950).

Etymology.—A noun in apposition from the Greek *syn*, with, and *Agelas*, the generic name of the host sponge.

Notes on Zoea I Fig. 3

Jamaican females studied (see above) are ovigerous, and one of them bears both hatching and recently hatched zoeae I among

setae on the pleopods. Interesting comparisons can be made between these zoeae and the zoea I of *U. affinis* (Say, 1818) described and figured by Sandifer (1973). The larvae figured here agree in general structure with the latter but differ from them in lack of a rostrum, in possession of developed pleopods, in lack of incipient uropods which are indicated in Sandifer's Fig. 1A but not in 1B, and in pattern of spination on the tail fan. Some of these differences may result from a premature hatch due to handling. Zoea I of *U. affinis* has 5 terminal spines on each side of the telson and 2 or more smaller lateral setae which may represent the distal edge of the developing uropods. In contrast, the telson of *U. synagelas* has 6 terminal spines to either side of the midline. Differences in the admittedly variable abovementioned features may be additional evidence of the clustered relationships among upogebian species in the western hemisphere (Williams 1986).

Acknowledgments

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