

REDESCRIPTION OF *SYNALPHEUS SCAPHOCERIS*
COUTIÈRE, 1910 (DECAPODA: ALPHEIDAE) WITH NEW
RECORDS FROM THE GULF OF MEXICO

M. R. Dardeau

A B S T R A C T

Synalpheus scaphoceris Coutière, 1910, can be distinguished from the closely related *S. townsendi* Coutière, 1909, by the strongly produced ventral rostral process, the blunt dorsodistal process of major pereopod 1 and the absence of appendices internae on the pleopods of the male. Male-female pairs of *S. scaphoceris* were associated only with individuals of *Madracis decactis* (Lyman, 1857), a scleractinian coral, in samples from the Florida Middle Ground. Oviparous females were present in fall and summer but not in winter samples. Juveniles were present in fall and winter but not in summer samples. The first zoeal stage of *S. scaphoceris* is figured.

Many subspecies described in Coutière's otherwise enduring work on American *Synalpheus* (1909, 1910) have since proved to be invalid. Subsequent material revealed that specimens representing extremes of a range of variation often received subspecific or varietal names (Christoffersen, 1979; Dardeau, 1984; Williams, 1984). On the other hand, Christoffersen (1979) suggested that *Synalpheus townsendi scaphoceris* Coutière, 1910, be considered a distinct species. Examination of material collected from the northern Gulf of Mexico has disclosed consistent morphological differences as well as a distinct color pattern which support recognition of *S. scaphoceris* at the specific level.

METHODS

Ten individual heads of the coral *Madracis decactis* (Lyman, 1857) were collected during each of 3 seasons (fall, winter, and summer) from 2 stations (Station 151, 28°32'N, 84°19'W; Station 247, 28°36'N, 84°16'W) on the Florida Middle Ground (FMG) by divers from Dauphin Island Sea Lab. Samples were taken in depths ranging from 26 to 34 m. Each individual coral was bagged in situ; the bag was then sealed and returned to the surface for processing. Processing included determination of coral volume by displacement and removal and identification of cryptofauna.

The Middle Ground material was deposited in the invertebrate collection of the Marine Environmental Sciences Consortium, Dauphin Island, Alabama (MESC). Additional material, including the holotype, from the National Museum of Natural History, Washington, D.C. (USNM) and Texas A&M University, College Station, Texas (TAMU), was examined. Specimens were measured to the nearest 0.1 mm using an ocular reticule calibrated to a stage micrometer. Measurements given are carapace length, measured from the posterior margin of the ocular sinuses to the posterior margin of the carapace. All drawings were made with the aid of a camera lucida. Although the description is based on the holotype, the illustrations are of other material because of my reluctance to dissect the type.

Synalpheus scaphoceris Coutière, 1910

Figs. 1-3

Synalpheus townsendi scaphoceris Coutière, 1910: 486, 487, fig. 2; Schmitt, 1924: 66; 1930: 344; 1935: 152; Christoffersen, 1979: 355.

?*Synalpheus townsendi*—Pequegnat and Ray, 1974: 249 [in part], fig. 55a, b. [Not fig. 53d, = *S. townsendi* Coutière, 1909].

Synalpheus townsendi—Ray, 1974: 175-180 [in part].

Synalpheus scaphoceris—Dardeau, 1984: 11, 109, 111.

Material Examined.—FMG Station 151: 1 ♂, 4.2; 1 oviparous ♀, 4.7; 3 October 1978; MESC 6179-2884.—4 ♂♂, 3.2-3.9; 5 oviparous ♀♀, 3.6-4.6; 3 juveniles, 2.0-2.4; 5 October 1978; MESC 6179-2880.—1 ♂, 3.8; 5 October 1978; MESC 6179-4086.—1 ♂, 4.2; 1 ♀, 4.5; 17 January 1979; MESC 6179-

2893.—1 ♂, 3.4; 18 January 1979; MESC 6179-2876.—1 ♂, 3.7; 1 ♀, 4.2; 1 juvenile, 1.9; 18 January 1979; MESC 6179-2886.—1 ♂, 4.7; 1 ♀, 4.5; 1 juvenile, 2.5; 19 January 1979; MESC 6179-2874.—1 ♂, 3.8; 1 ovigerous ♀, 4.2; 28 June 1979; MESC 6179-2863.—1 ♂, 3.8; 1 ovigerous ♀, 4.9; 28 June 1979; MESC 6179-2881.—FMG Station 247: 1 ♂, 3.4; 1 ovigerous ♀, 4.7; 11 October 1978; MESC 6179-1534.—2 ♂♂, 3.2, 3.6; 13 October 1978; MESC 6179-1545.—1 ♂, 3.8; 1 ovigerous ♀, 4.1; 13 October 1978; MESC 6179-2869.—1 ♂, 4.0; 1 spent ♀, 5.0; 13 October 1978; MESC 6179-1538.—1 ♂, 3.8; 1 ♀ (with infertile eggs), 4.3; 26 January 1979; MESC 6179-2885.—1 ♂, 4.2; 30 January 1979; MESC 6179-2890.—2 ♂♂, 3.8, 3.8; 2 ♀♀, 3.8, 4.0; 30 January 1979; MESC 6179-2879.—1 ♂, 4.2; 1 ovigerous ♀, 3.8; 21 June 1979; MESC 6179-2871.—1 ovigerous ♀, 4.6; 21 June 1979; MESC 6179-2877.—Additional material: 1 ♂, 4.8; 1 ovigerous ♀, 4.7; FMG; 28°27'N, 84°17'W; 30 m; 14 October 1978; collected by diver; *Madracis decactis*; MESC 6179-2873.—1 ovigerous ♀, 4.4; off Sanibel Island; 26°32.0'N, 82°41.5'W; 25 m; 29 March 1978; dredge; Hourglass Station J; MESC 6179-2862.—1 ♀, 4.3; Bird Key Reef, Tortugas, Florida; 1 July 1931; W. L. Schmitt (coll.); USNM 65991.—1 ♂, 3.4; Tortugas, Florida; J. F. McClendon (coll.); holotype; USNM 40019.—1 ♂, 3.5; Spanish Bay, Curaçao; 5 May 1920; *Porites furcata*; C. J. van der Horst (coll.); USNM 57559.—3 ♂♂, 2.9–3.7; 1 ovigerous ♀, 3.8; 1 juvenile, 2.5; Isla de Lobos, Mexico; 21°27'N, 97°14'W; 9.8 m; 10 October 1972; collected by diver; TAMU 2-2126.—1 ♂, 3.1; 1 ♀, 3.8; West Flower Garden Bank; 27°52'N, 93°49'W; 22.9 m; 12 January 1972; collected by diver from large coral head; TAMU 2-6465.—1 ovigerous ♀, 4.0; East Flower Garden Bank; 27°53'N, 93°28'W; 19.8 m; 3 December 1972; rotenone collection; TAMU 2-6474.

Description.—Rostrum acute, narrower than ocular teeth; ventral rostral process very strongly produced with cavity posteroventrally to accept ocular beak. Triangular ocular teeth broad at base, tapering to slender, sharp, medially directed tips. Pterygostomial angle of carapace acute (60°).

Pleuron of first somite with posteroventral hook indefinite, posteroventral margin subrectangular at best; that of second broadly rounded, those of third, fourth, and fifth subrectangular, that of sixth acute. Telson broad, subrectangular with lateral margins very slightly converging and broadly convex posterior margin; dorsal surface armed with 2 pairs of strong spines, anterior pair situated just posterior to midlength of telson, posterior pair about halfway between anterior pair and posterior margin of telson; posterior margin armed with 2 pairs of spines, mesial pair long and slender, at least 3 times as long as lateral pair, this lateral pair not extending beyond posterior margin of telson.

Stylocerite long, slender and acute, extending nearly to distal margin of second segment of antennular peduncle. First segment longer than second, second longer than third.

Scaphocerite extending just beyond distal margin of third segment of antennular peduncle; blade well developed, broad, length 2.8 times width. Basicerite neither armed nor angulate dorsally; lateral spine short and stout, extending about to distal margin of basal segment of antennular peduncle. Carpocerite 4.5 times as long as broad, extending well beyond antennular peduncle.

Maxilliped 3 extending well beyond antennal peduncle, tipped with stout teeth.

Major (right) pereopod 1 chela 3.5 times as long as broad, not noticeably twisted; fingers nearly one-half as long as palm; palm terminating dorsodistally in obscure, blunt projection; carpus very short and broad; merus half as long as palm, with sharp spine distally on flexor margin. Chela of minor pereopod 2.5 times as long as broad; dactyl simple distally, fixed finger with obscure cant slightly posterior to well-defined distal tooth; length of carpus less than one-fourth that of chela. Pereopod 2 overreaching antennal peduncle by length of chela and carpus; fingers slightly longer than palm; carpus twice as long as chela, composed of 5 segments; proximal article subequal to combined lengths of distal 4; second, third, and fourth articles subequal, each about one-half as long as fifth; merus nearly as long as carpus and about 1.5 times as long as ischium. Third and fifth pereopods with dactyls elongate, biunguiculate; superior margin of extensor ter-

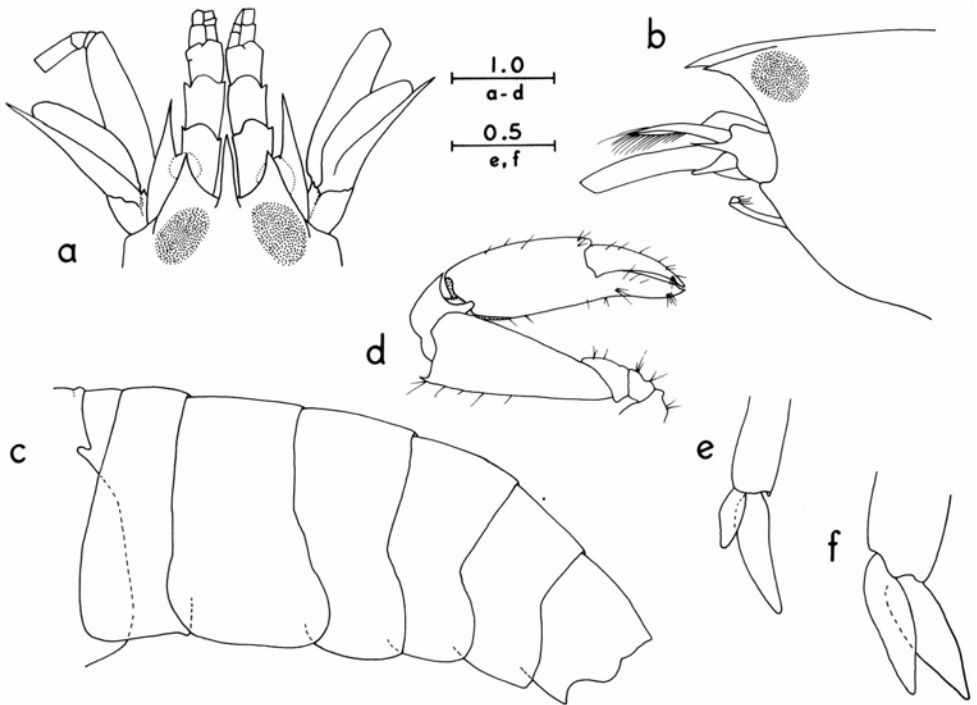


Fig. 1. *Synalpheus scaphoceris*, male, cl 3.9, MESC 6179–2880; a, anterior region, dorsal view; b, same, lateral view; c, abdomen; d, right minor pereiopod 1; e, right pleopod 1; f, right pleopod 2. Scale lines in mm.

minal process strongly curved, subparallel to shorter and narrower flexor terminal process, both diverging from axis of segment. Third pereiopod overreaching antennal peduncle by dactyl, and two-thirds of propodus; propodus slightly more than 3.5 times as long as dactyl, flexor margin armed throughout length with 4 movable spinules in addition to distal one, carpus about one-half as long as propodus, armed with movable spinule at distal end of flexor margin; merus unarmed, subequal in length to propodus. Fourth pereiopod lacking. Fifth pereiopod overreaching antennal peduncle by dactyl and one-fourth of propodus; propodus about 3 times as long as dactyl, distal one-half of flexor margin armed with 3 spinules in addition to distal pair, middle third with 6 oblique rows of setae; carpus unarmed, nearly three-fourths length of propodus; merus unarmed, slightly more than three-fourths length of propodus. Appendix interna absent on pleopods 2–5. Uropods broad; lateral branch with single fixed spine on lateral margin forming notch with sutural spine, diaeresis prominent; movable spine lacking but probably broken off.

Variation.—The width and flatness of the dorsal surface of the rostrum is exaggerated in material from the Dry Tortugas.

Coloration.—Based on notes taken from live material from the Florida Middle Ground: carapace, abdomen, telson, and uropods with dense scattering of large red chromatophores on translucent orange background; gastric region deep brownish green; eggs greenish yellow; telson and uropods may have bluish cast distally. Peduncles of antennae and antennules outlined in mottled red, flagella translucent

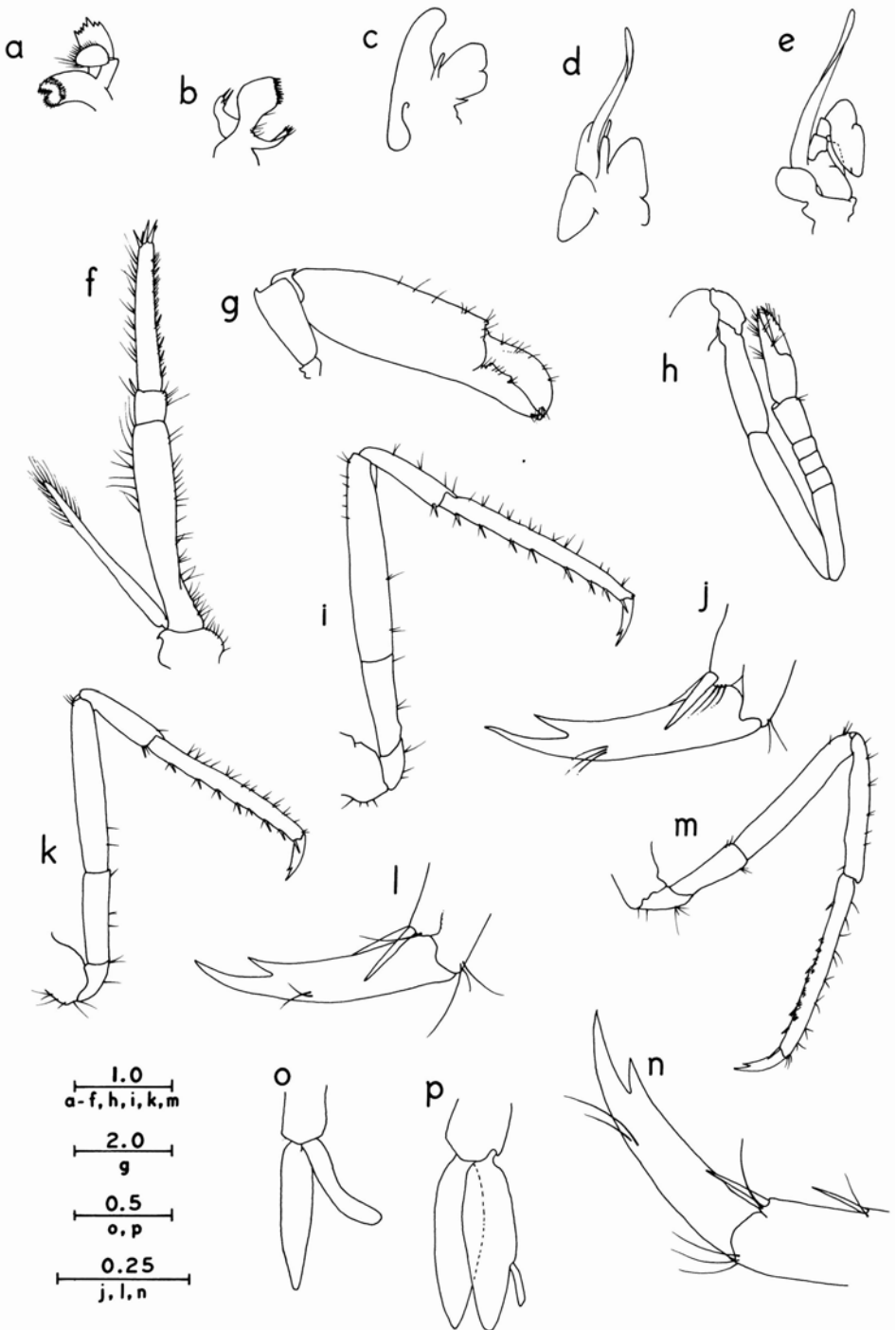


Fig. 2. *Synalpheus scaphoceris*, ovigerous female, cl. 4.0, MESC 6179-2880; a, right mandible; b, right maxilla 1; c, right maxilla 2; d, right maxilliped 1; e, right maxilliped 2; f, right maxilliped 3; g, right major pereiopod 1; h, right pereiopod 2; i, right pereiopod 3; j, same, dactyl; k, right pereiopod 4; l, same, dactyl; m, right pereiopod 5; n, same, dactyl; o, left pleopod 1; p, left pleopod 2. Scale lines in mm.

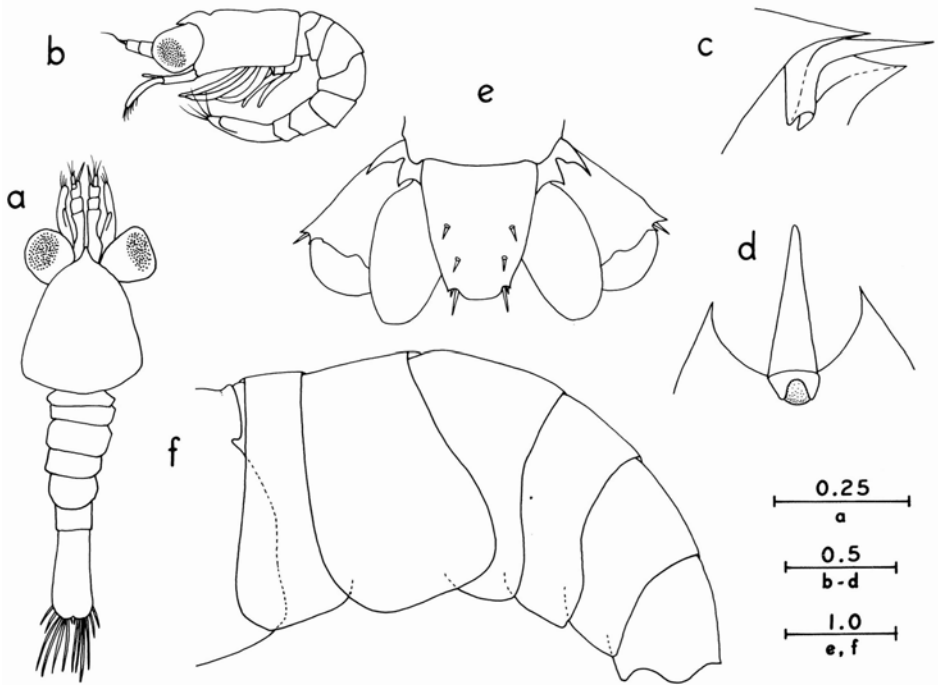


Fig. 3. *Synalpheus scaphoceris*, first zoea, rostral carapace length (from anterior tip of rostrum to posterior margin of carapace) 0.28, MESC 6179-2873; a, dorsal view; b, lateral view. Ovigerous female, cl 4.0, MESC 6179-2880; c, ventral rostral projection, lateral view; d, same, ventral view; e, telson and uropods; f, abdomen. Scale lines in mm.

red; scaphocerite and stylocerite irregularly mottled red. Maxilliped 3 and pereopods 3–5 densely covered with reddish orange chromatophores, color appearing solid under low magnification, dactyls of pereopods clear; tips of fingers of major and minor pereopods yellow, margins of fingers blue, distal margin of palm of major chela reddish yellow, propodus of major and minor pereopods reddish orange proximally. Newly hatched zoea clear, without color.

Schmitt (1930) noted that the color of the major chela of *S. scaphoceris* is different from that of *S. townsendi*. Pequegnat and Ray (1974: 283, fig. 55b) included a black and white photograph of *S. scaphoceris* showing the distinctive spotted pattern of fresh material.

Measurements (carapace length, = cl, in mm).—Males, 2.5–4.8; ovigerous females, 3.6–4.9; females without eggs, 3.8–4.7; female with infertile eggs, 4.3; juveniles, 1.9–2.5.

Habitat.—Associated with living and dead coral (Pequegnat and Ray, 1974), including *Porites furcata* Lamarck, 1816 (Schmitt, 1924). All of the specimens from the Florida Middle Ground were associated with large individuals of *Madracis decactis* (Lyman, 1857).

Distribution.—Gulf of Mexico: Isla de Lobos, Mexico (Ray, 1974), West Flower Garden Bank (Pequegnat and Ray, 1974), East Flower Garden Bank, Florida Middle Ground, and off Sanibel Island (present study), Dry Tortugas (Coutière, 1910; Schmitt, 1930); Caribbean: Puerto Rico (Schmitt, 1935) and Curaçao

(Schmitt, 1924); Western Atlantic: Brazil (Christoffersen, 1979). Distributed bathymetrically from shallow water to 30 m (present study).

Remarks.—*Synalpheus scaphoceris* can be distinguished from the morphologically similar *S. townsendi* by the distinctive spotted color pattern, the strongly produced ventral rostral process with a cavity posteroventrally which encompasses the ocular beak (Fig. 3c, d), the blunt dorsodistal process of major pereiopod 1, and the absence of appendices internae on the pleopods of males. Although Coutière (1910) separated his subspecies from *S. townsendi* by the greater breadth of the blade of the scaphocerite, measurement of large series of both species did not substantiate this difference.

Pequegnat and Ray (1974) noted that the color pattern and major pereiopod of their material differed from typical *S. townsendi* but did not recognize that it represented a distinct species. Their figure 53d is an illustration of *S. townsendi* taken from Coutière (1909).

Freshly hatched zoeae were released by a live female being examined for coloration. This first zoeal stage is figured (Fig. 3a, b) despite the possibility that it represents a premature hatch due to handling.

Abundance and Seasonality of the Population.—Ovigerous females were present in fall and summer but not in winter samples. Juveniles were present in fall and winter but not in summer samples. *Synalpheus scaphoceris* occurred less frequently in fewer numbers and at much lower densities in samples of the host coral than did *S. townsendi* (Dardeau, 1984).

ACKNOWLEDGEMENTS

I am grateful to T. S. Hopkins and his team of divers for logistic support under Bureau of Land Management Contract AA551-CT8-35 and to T. J. Bright and L. H. Pequegnat for access to material. This represents MESC Contribution Number 086.

LITERATURE CITED

- Christoffersen, M. L. 1979. Campagne de la Calypso au large des côtes Atlantiques de l'Amérique du sud (1961–1962). I. Decapod Crustacea: Alpheoidea.—*Résultats Scientifiques des Campagnes de la Calypso* 11: 297–377.
- Coutière, H. 1909. The American species of snapping shrimps of the genus *Synalpheus*.—*Proceedings of the United States National Museum* 36: 1–93.
- . 1910. The snapping shrimps (Alpheidae) of the Dry Tortugas, Florida.—*Proceedings of the United States National Museum* 37: 485–487.
- Dardeau, M. R. 1984. *Synalpheus* shrimps (Crustacea: Decapoda: Alpheidae). I. The Gambarelloides group, with a description of a new species.—*Memoirs of the Hourglass Cruises* 7: 1–125.
- Pequegnat, L. H., and J. P. Ray. 1974. Crustacea and other arthropods.—*In*: T. J. Bright and L. H. Pequegnat, eds., *Biota of the West Flower Garden Bank*. Pp. 232–288. Gulf Publishing Company, Houston, Texas.
- Ray, J. P. 1974. A study of the coral reef crustaceans (Decapoda and Stomatopoda) of two Gulf of Mexico reef systems: West Flower Garden, Texas, and Isla de Lobos, Veracruz, Mexico.—Ph.D. Dissertation, Texas A&M University, College Station, Texas. Pp. 1–323.
- Schmitt, W. L. 1924. The macruran, anomuran and stomatopod Crustacea.—[Fauna van Curaçao.] *Bijdragen Tot de Dierkunde* 23: 61–81.
- . 1930. Some observations on the Crustacea of Tortugas, Florida.—*Carnegie Institution of Washington Yearbook* 29: 343–346.
- . 1935. Crustacea Macrura and Anomura of Porto Rico and the Virgin Islands.—*Science Survey of Porto Rico (New York Academy of Sciences)* 15: 125–227.
- Williams, A. B. 1984. Shrimps, lobsters, and crabs of the Atlantic coast of the Eastern United States, Maine to Florida.—*Smithsonian Institution Press*. Pp. 1–550.

RECEIVED: 9 December 1985.

ACCEPTED: 27 January 1986.

Address: Dauphin Island Sea Lab, P.O. Box 369, Dauphin Island, Alabama 26528.