STUDIES ON THE FAUNA OF CURAÇAO AND OTHER CARIBBEAN ISLANDS: No. 109.

# COPEPODS OF THE GENUS SCAMBICORNUS (Cyclopoida, Lichomolgidae) associated with Holothurians in the West Indies

by

ARTHUR G. HUMES
(Boston University, Boston, Massachusetts)

The material described below came from washings of holothurians in the West Indies. It was collected in part by the author and Dr. R. U. GOODING during the summer of 1959 in the Bahamas, Barbados, Puerto Rico, and Jamaica. This field work was aided by a grant (G-8628) from the National Science Foundation of the U.S. The rest of the material was collected by Dr. J. H. STOCK in 1958 at Curaçao and Bonaire, with the support of the Netherlands Foundation for the Advancement of Research in Surinam and the Netherlands Antilles (WOSUNA). The study of the specimens has been aided by grants (GB-1809 and GB-5838) from the National Science Foundation.

I am indebted to Dr. ELISABETH DEICHMANN of the Museum of Comparative Zoology, Harvard University, for the identification of the holothurian hosts collected in 1958 and 1959.

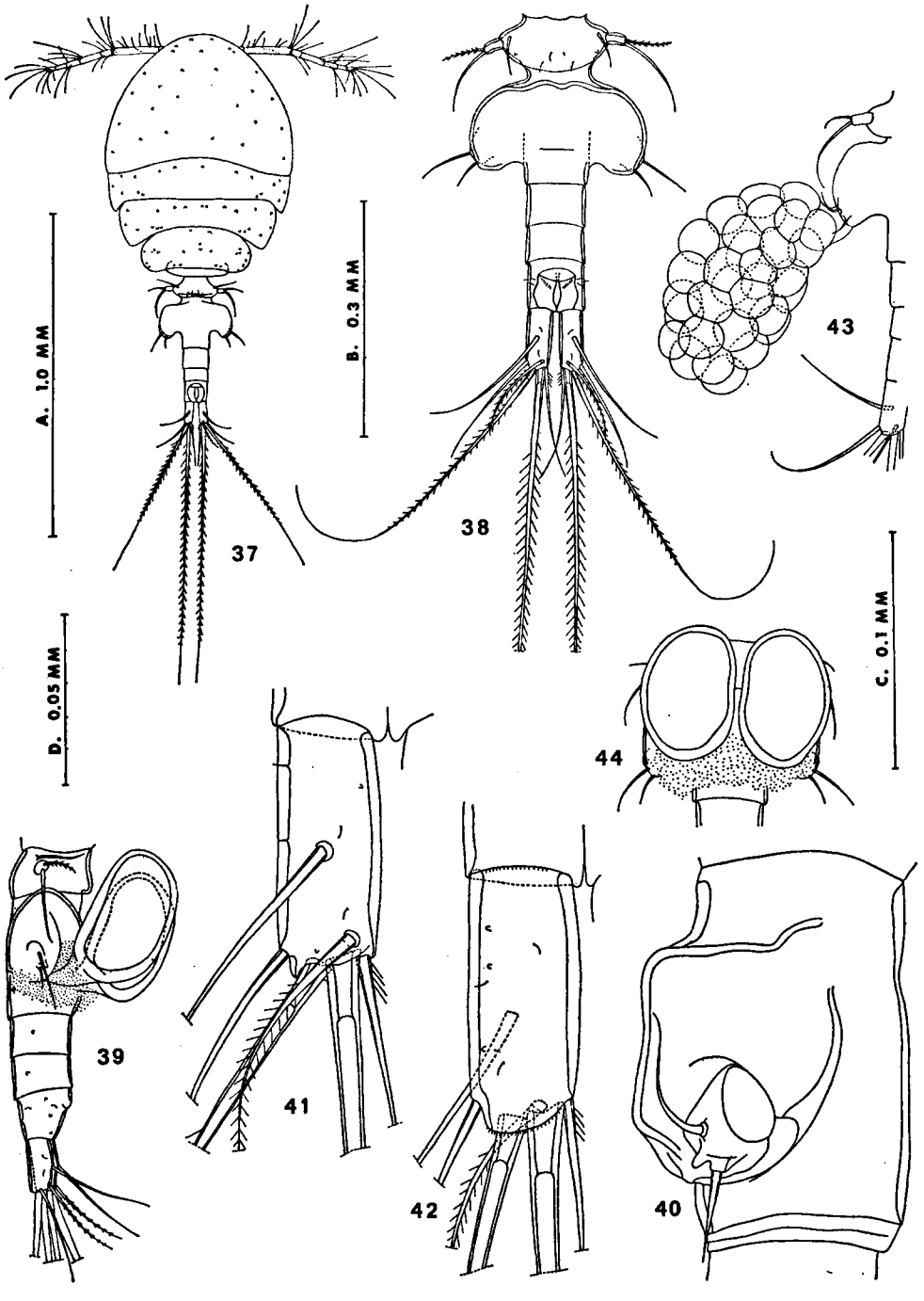
The material covered in this paper comprises:

*Scambicornus sculptus* n.sp., from Curaçao, Bonaire, Barbados, Jamaica, Puerto Rico, and the Bahamas (figs. 37–78), and

*Scambicornus* sp. (male only), from Curaçao, Barbados, Jamaica, and the Bahamas (figs. 79–83).

## Genus **Scambicornus** Heegaard, 1944

Synonym: *Preherrmannella* Sewell, 1949. (See STOCK, 1964).


A. 1.0 MM
B. 0.3 MM
C. 0.1 MM
D. 0.05 MM
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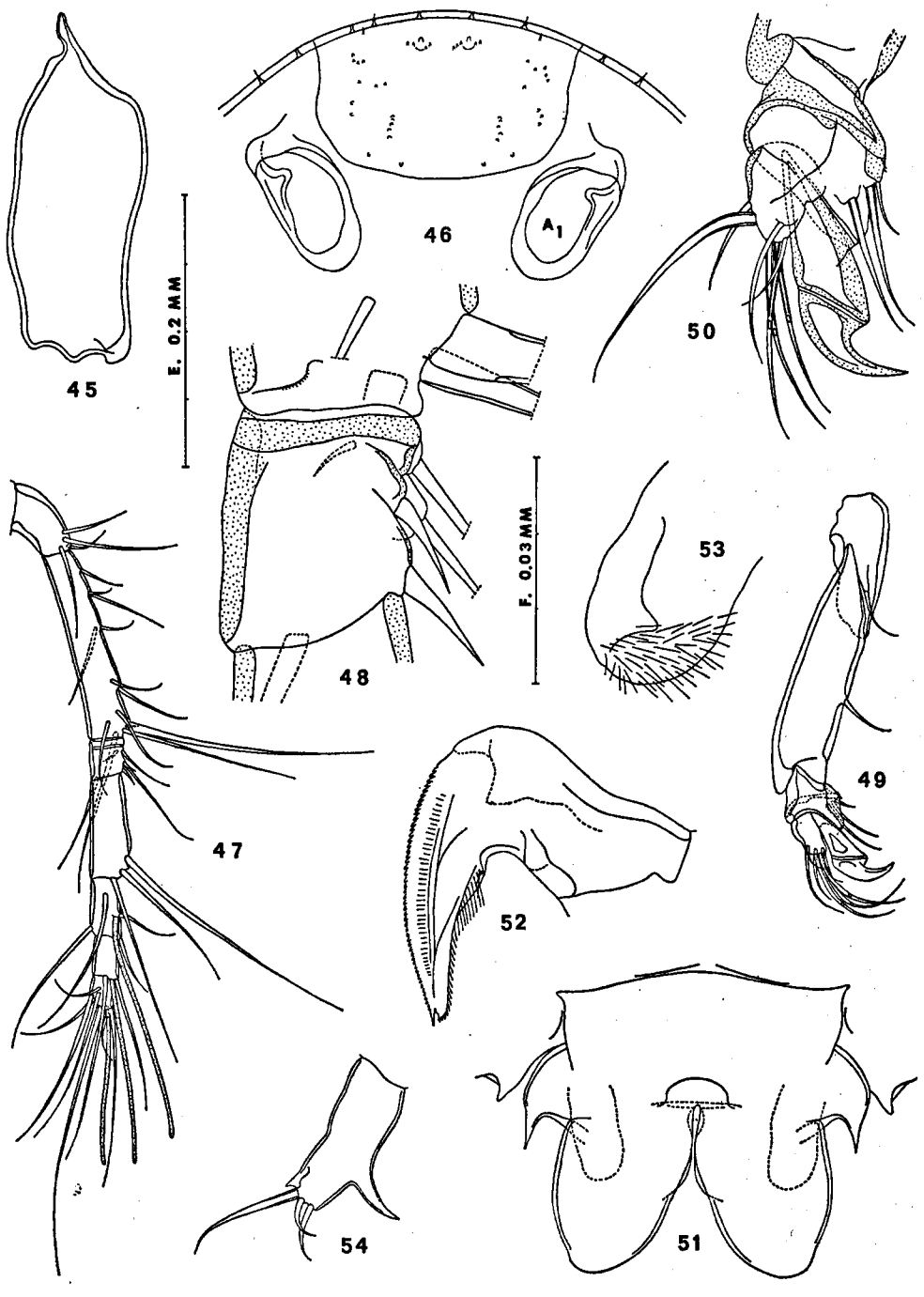
## Scambicornus sculptus n. sp.

Type material. – JAMAICA: 85 females and 12 males washed from the body surface of 10 *Isostichopus badionotus* (Selenka), in 3 m, at Drunkenman's Cay, off Kingston, August 29, 1959. Holotype female, allotype, and 25 paratypes (23 females, 2 males) deposited in the United States National Museum, Washington; the same number of paratypes in the Zoölogisch Museum, Amsterdam, and the British Museum (Natural History), London; and the remaining paratypes in the collection of A. G. Humes.

Other specimens from *Isostichopus badionotus* (Selenka). – BARBADOS: 2 males and 4 copepodids from 1 host under an intertidal rock at Hasting's Reef, off St. Matthias' Church, July 20, 1959. – 23 females, 6 males, and 8 copepodids from 1 host under wreck, in 8 m, Carlisle Bay, Bridgetown, July 6, 1959. – Southwestern PUERTO RICO: 7 females from 1 host, in 0.5 m, on a small reef south of the southern end of Magueyes I., near La Parguera, July 31, 1959. – 4 females, 1 male, and 1 copepodid from 4 hosts, in 3 m, at Laurel Reef, near Magueyes I., August 13, 1959. – 3 females from 11 hosts, in 3 m, Enrique Reef, near Magueyes I., August 17, 1959. – JAMAICA: 10 females and 2 copepodids from 12 hosts, in 2.5 m, Drunkenman's Cay, off Kingston, August 28, 1959. – BAHAMAS: 23 females and 6 males from 4 hosts, in 1 m, near ferry landing, South Bimini, June 7, 1959. – 38 females, 8 males, and 1 copepodid from 6 hosts, in 2 m, off Lerner Marine Laboratory, North Bimini, June 3, 1959. – 13 females, 5 males, and 9 copepodids from 3 hosts, in 1 m, west of northern end of Pigeon Cay, Bimini lagoon, June 4, 1959. – 37 females and 6 males from 5 hosts, in 2 m, west of Pigeon Cay, Bimini lagoon, June 9, 1959.

Specimens from *Ludwigothuria mexicana* (Ludwig). – BAHAMAS: 4 females and 1 male from 5 hosts, in 2 m, off Lerner Marine Laboratory, North Bimini, May 30, 1959. – 10 females and 1 male from 3 hosts, in 1 m, southern end of Pigeon Cay, Bimini lagoon, June 4, 1959. – 1 female and 1 male from 2 hosts, in 1 m, near ferry landing, South Bimini, June 7, 1959. – 7 females and 2 males from 2 hosts, in 2 m, western end of Pigeon Cay, Bimini lagoon, June 8, 1959. – 15 females and 2 males from 11 hosts, in 2 m, near ferry landing, South Bimini, June 7, 1959. – JAMAICA: 10 females and 1 male from 8 hosts, in 5 m, northern side of Lime Cay, off Kingston, August 30, 1959. – 22 females, 9 males, and 4 copepodids from 1 host, in 2 m, Maiden Cay, off Kingston, September 4, 1959. – CURAÇAO (collected by J. H. Stock): 1 female and 1 male from 1 host, in about 2.5 m, Piscadera Bay, November 10, 1958. – 4 females, 1 male, and 1 copepodid from 1 host, in about 2.5 m, Piscadera Bay, November 14, 1958. – BONAIRE (collected by J. H. Stock): 2 females from 1 host, in about 3 m, harbor of Kralendijk, December 31, 1958.

FIGURES 37–44. *Scambicornus sculptus* n.sp., female. – 37, Dorsal (A). – 38, Urosome, dorsal (B). – 39, Urosome, with spermatophores attached, lateral (B). – 40, Genital segment showing area of attachment of egg sac, lateral (C). – 41, Caudal ramus, dorsal (D). – 42, Same, ventral (D). – 43, Egg sac with edge of urosome, ventral (B). – 44, Spermatophores attached to genital segment, dorsal (B). – All figures were drawn with the aid of a camera lucida. The letter after each figure refers to the scale at which the figure was drawn. Abbreviations used: $A_1$ = first antenna, MXPD = maxilliped, and $P_1$ = leg 1.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E. 0.2 MM
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A1
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F. 0.03 MM
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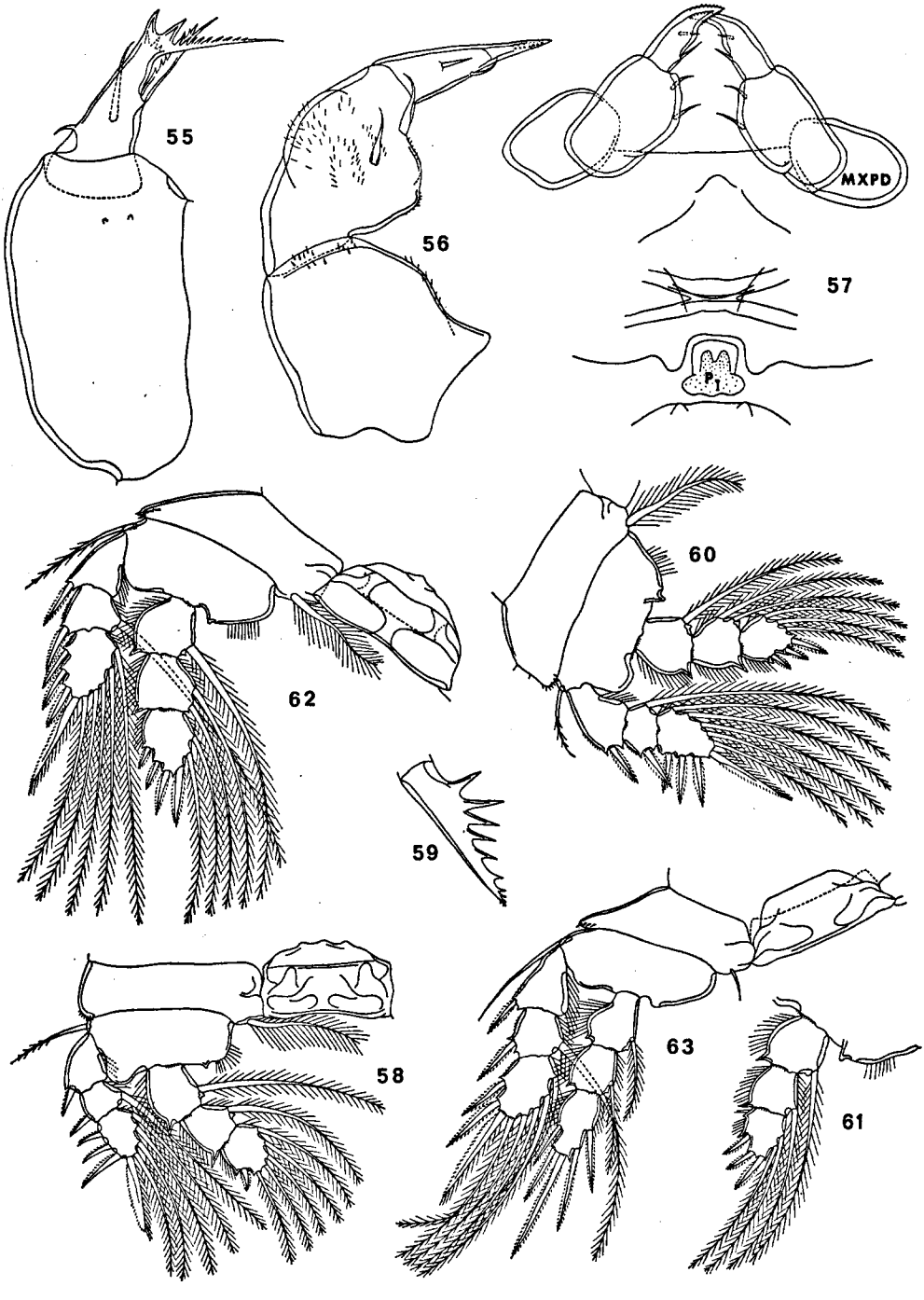
Specimens from *Actinopyga agassizii* (Selenka). – BAHAMAS: 43 females, 9 males, and 4 copepodids from 56 hosts, in 2 m, off Lerner Marine Laboratory, North Bimini, June 1, 1959. – 15 females and 4 males from 21 hosts, in 1 m, west of northern end of Pigeon Cay, Bimini, June 4, 1959. – 6 females and 1 copepodid from 11 hosts, in 2 m, near ferry landing, South Bimini, June 7, 1959. – 3 females and 3 males from 1 host, in 0.5 m, Porgy Bay, North Bimini, June 6, 1959. – JAMAICA: 10 females, 1 male, and 6 copepodids from 19 hosts, in 2 m, Drunkenman's Cay, off Kingston, September 3, 1959.

Specimens from *Ludwigothuria grisea* (Selenka). – JAMAICA: 1 female from 11 hosts, in 2 m, near old quarantine station, Kingston Harbor, September 5, 1959. – BONAIRE (collected by J. H. Stock): 2 females from 1 host, southern coast near the northernmost obelisk, December 28, 1958.

FEMALE.– The body (fig. 37) is lichomolgid in appearance and is not unusually widened. The length (not including the setae on the caudal rami) is 1.18 mm (1.06–1.28 mm) and the greatest width 0.59 mm (0.55–0.62 mm), based on 10 specimens in lactic acid. The segment bearing leg 1 is separated from the head region by a transverse dorsal furrow. The posterior epimeral areas of this segment are moderately acute, those of the following segment less so, and those of the segment of leg 3 broadly rounded. In dorsal view the segment of leg 4 is small, without pronounced epimera, and partly overlapped by the preceding segment. The dorsal surface of the prosome bears scattered minute knobs.

The segment of leg 5 bears dorsally a transverse group of four fine setules. The genital segment (fig. 38) is wider than long, 162 × 224 μ, expanded laterally in its anterior three-fourths but abruptly narrowed in its posterior fourth. The areas of attachment of the egg sacs are located laterally on the two wings of the segment (fig. 39). Each attachment area (fig. 40) bears two setae and a small rounded projection between them. The three postgenital segments are nearly equal in length (57, 46, and 63 μ respectively), but the middle

FIGURES 45–54. *Scambicornus sculptus* n.sp., female (continued). – 45, Empty spermatophore as attached to female, dorsal (C). – 46, Rostral area, ventral (E). – 47, First antenna, ventral (E). – 48, Third segment of first antenna, ventral (F). – 49, Second antenna, dorsal and somewhat outer (E). – 50, Distal part of second antenna, ventral and somewhat inner (D). – 51, Labrum, with positions of paragnaths indicated by dashed lines, ventral (D). – 52, Mandible, posterior (D). – 53, Paragnath, ventral (F). – 54, First maxilla, posterior (D).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segment is slightly shorter than the others. The last postgenital segment bears a few hairs on its dorsal surface and has ventrally a row of minute spinules near the insertions of the caudal rami. The ratio of the length of the prosome to that of the urosome is 1.65:1.

The caudal ramus (figs. 38, 41, 42) is 73 × 34 μ, the ratio of length to width being 2.1:1. The naked lateral seta is situated somewhat dorsally and in specimens preserved in alcohol stands erect. The outermost terminal seta is naked and the innermost bears only a short inner row of hairs. The two long median terminal setae are feathered as indicated in fig. 38. The dorsal seta is pedicellate and feathered. The dorsal and ventral surfaces of the ramus bear a few knobs and hairs as indicated in figs. 41 and 42.

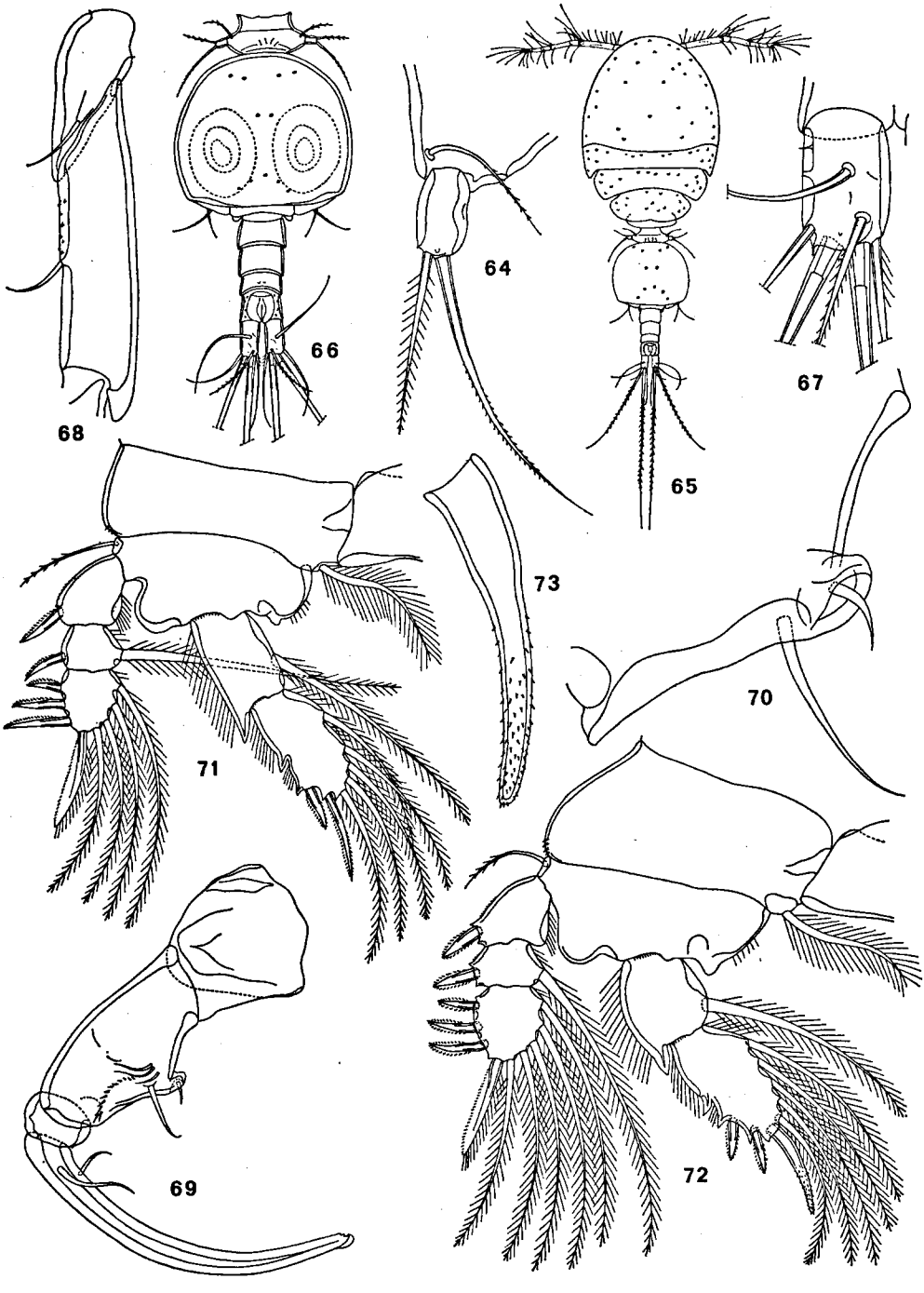
The egg sac (fig. 43), measuring about 305 × 192 μ, reaches to the end of the caudal rami and contains about 40–50 small eggs, each approximately 57 μ in diameter.

The spermatophores, when attached to the female (figs. 39 and 44), lie over the dorsal surface of the genital segment, directed anteriorly.

The rostral area (fig. 46) is not well-developed, but is seen ventrally as a broad rounded area bearing numerous small refractile knobs. The first antenna (fig. 47) is 7-segmented, with the third segment showing a small sclerotized region on its ventral surface (fig. 48) which suggests an intercalary segment. The lengths of the segments (measured along their posterior non-setiferous borders, beginning at the base) are 30, 143, 30, 70, 43, 30, and 24 μ respectively. The setae and aesthetes of these segments are arranged as follows: 4, 13, 6, 3, 4 + 1 aesthete, 2 + 1 aesthete, and 7 + 1 aesthete. All the setae are naked.

The second antenna (fig. 49) is 4-segmented and slender. Measured along their setiferous borders the lengths of the segments are 104,

FIGURES 55–63. *Scambicornus sculptus* n.sp., female (continued). – 55, Second maxilla, anterior (D). – 56, Maxilliped, posterior and somewhat dorsal (D). – 57, Region between bases of maxillipeds and first leg, ventral (C). – 58, leg 1, anterior (E). – 59, Outer spine on second exopod segment of leg 1, anterior (F). – 60, Leg 2, anterior (E). – 61, Abnormal endopod of leg 2, anterior (E). – 62, Leg 3, anterior (E). – 63, Leg 4, anterior (E).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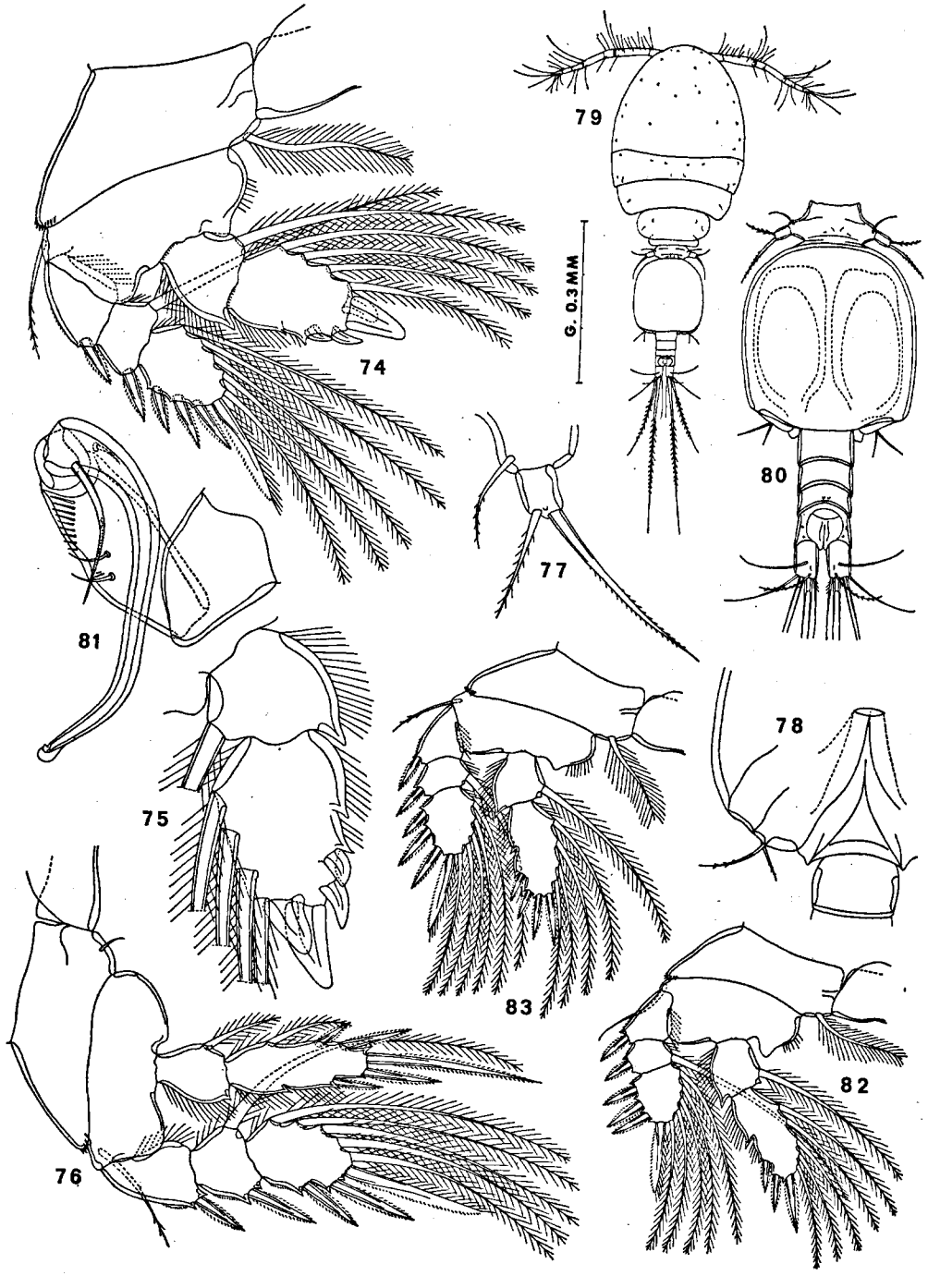
110, 40 and 29 μ, and along the opposite side 23, 186, 40, and 29 μ, the differences in the first two segments brought about by the overlapping of these segments. The first segment bears a single distal seta and the second a seta midway on its inner margin. The third segment bears three inner setae (one of them much shorter than the others), a row of minute spinules, and a strongly sclerotized claw (fig. 50). The entire length of the claw (measured along its axis) is 73 μ, and the distal recurved portion beyond the pseudo-articulation 44 μ. The short fourth segment is inserted somewhat eccentrically on the third and reaches only to about one-third of the length of the claw. It bears seven setae, arranged as indicated in fig. 50. All the setae on the second antenna are naked.

The posteroventral border of the labrum (fig. 51) is deeply indented and smooth, forming two elongated lobes. Laterally at the base of each lobe there is a winglike, pointed expansion.

The mandible (fig. 52) bears along the convex margin of the blade a row of serrulations and along the inner margin a row of hairs. The paragnath (fig. 53) is a somewhat elongated rounded lobe bearing hairs. The first maxilla (fig. 54) consists of a single segment with three terminal setae (one long and two short) and a lateral spinelike process which may represent a spine, although its articulation is not evident. The second maxilla (fig. 55) is 2-segmented. The large first segment is unornamented except for two small knobs. The smaller second segment is elongated and slender, terminating in two dentiform processes followed by a long attenuated setiform projection unilaterally armed with a row of spinules and borne at an angle to the main part of the segment. This segment also bears subterminally three small dentiform processes, on its inner margin a seta unilaterally with a row of spinules, on its posterior surface a naked seta, and on its proximal outer margin a small naked seta.

FIGURES 64–73. *Scambicornus sculptus* n.sp., 64, female (continued), 65–73, male. – 64, Leg 5, dorsal (D). – 65, Dorsal (A). – 66, Urosome, dorsal (B). – 67, Caudal ramus, dorsal (D). – 68, First two segments of second antenna, dorsal and somewhat outer (C). – 69, Maxilliped, inner, ventral, and somewhat oblique (C). – 70, Inner edge of second segment of maxilliped, outer, dorsal, and somewhat oblique (F). – 71, Leg 1, anterior (C). – 72, Leg 2, anterior (C). – 73, Terminal spine on endopod of leg 2, anterior (F).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The maxilliped (fig. 56) is 3-segmented. The first segment bears a few spinules and hairs as indicated in the figure. The second is somewhat swollen and bears two spiniform setae and hairs as indicated. The third is slender, bears two setae, and is attenuated distally to form a straight process (suggesting a claw, but not recurved) with a row of minute spinules along each side.

The ventral area between the bases of the maxillipeds and the first pair of legs (fig. 57) shows a transverse sclerotization, but does not protrude ventrally. A weakly sclerotized line connects the bases of the maxillipeds.

The rami of legs 1–4 (figs. 58, 60, 62 and 63) are 3-segmented, with the spine and setal formula as follows (the Roman numerals representing spines, the Arabic numerals setae):

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| $P_1$ | protopod | 0–1 | 1–0 | exp | I–0 | I–1 | III, I, 4 |
| | | | | end | 0–1 | 0–1 | I, 5 |
| $P_2$ | protopod | 0–1 | 1–0 | exp | I–0 | I–1 | III, I, 5 |
| | | | | end | 0–1 | 0–2 | I, II, 3 |
| $P_3$ | protopod | 0–1 | 1–0 | exp | I–0 | I–1 | III, I, 5 |
| | | | | end | 0–1 | 0–2 | I, III, 2 |
| $P_4$ | protopod | 0–1 | 1–0 | exp | I–0 | I–1 | II, I, 5 |
| | | | | end | 0–1 | 0–1 | I, II, II |

In legs 1–3 the coxa has a large plumose inner seta, but this seta is small (22 μ in length) and naked on leg 4. The basis of legs 1–4 has an outer seta (which usually shows a few lateral hairs) and a row of hairs along its inner margin (except in leg 4 where this margin is smooth).

The outer spines of the exopod of leg 1 show a coarse unilateral spinulation (fig. 59); those of legs 2–4 have a finer bilateral fringe.

FIGURES 74–78. *Scambicornus sculptus* n.sp., male (continued). – 74, Leg 3, anterior (C). – 75, Endopod of leg 3, posterior (D). – 76, Leg 4, anterior (C). – 77, Leg 5, dorsal (D). – 78, Leg 6, ventral (E).

FIGURES 79–83. *Scambicornus* sp., male. – 79, Dorsal (G). – 80, Urosome, dorsal (E). – 81, Maxilliped, dorsal and somewhat anterior (D). – 82, Leg 2, anterior (C). – 83, Leg, 3 anterior (C).

In one female the endopod of leg 2 was normal on one side, but had the formula 0–1 ; 0–1 ; I, II, 2 on the other (fig. 61). The last segment of the endopod of leg 4 bears five fringed spines.

The fifth leg (fig. 64) has a single free segment measuring 27 × 16 μ, nearly 1.7 times longer than wide, with a slight indentation on the posterior margin, and bearing two unequal terminal setae, the anterior one 55 μ long and lightly feathered, the posterior one 93 μ and having short lateral hairs. The seta on the body near the base of this segment is weakly plumose.

The sixth leg is probably represented by the two setae near the attachment of the egg sac (see fig. 40).

The color in life in transmitted light is translucid to slightly amber. The ovary is opaque gray and the eye is red.

MALE.– In its general form the body (fig. 65) resembles that of the female. The length (excluding the setae on the caudal rami) is 0.98 mm (0.90–1.12 mm) and the greatest width 0.43 mm (0.41–0.45 mm), based on 10 specimens in lactic acid. The genital segment (fig. 66) is rather globular in dorsal view, a little wider than long, 216 × 235 μ, and bears a few minute refractile knobs on its dorsal surface. The four postgenital segments are 43, 43, 30, and 41 μ in length respectively, the third being shorter than the others. The ratio of the length of the prosome to that of the urosome is 1.37:1.

The caudal ramus (fig. 67) resembles that of the female, but is relatively shorter, 47 × 27 μ, or 1.7 times longer than wide.

The rostral area and the first antenna are like those of the female. The second antenna also resembles that of the female, but there are a few minute spinules on the inner margin of the second segment proximal to the seta (fig. 68).

The labrum, mandible, paragnath, first maxilla, and second maxilla are like those of the opposite sex.

The maxilliped (fig. 69) is strongly prehensile, rather slender, and 4-segmented (assuming that the proximal part of the claw represents a fourth segment). The first segment is somewhat quadrate (54 μ long) and unarmed. The second is elongated (93 μ long) with an inner excavated prominence (fig. 70) in which the shorter of the two naked inner setae arises. On the inner ventral surface of this segment

there are three slender naked setae and a row of spinules as shown in the figure. The third segment is short (26 μ) and unarmed. The fourth segment forms part of the long recurved claw, 156 μ in length (measured in a straight line from the base to the extremity), showing a slight suggestion of division in the middle, and bearing two unequal naked setae near its base. The region between the bases of the maxillipeds and the first pair of legs is like that of the female.

Legs 1–4 (figs. 71, 72, 74, 76) have 3-segmented exopods but 2-segmented endopods. The spine and setal formula is as follows (the Roman numerals representing spines, the Arabic numerals setae; the formulas within brackets suggesting the original armature of the endopods before fusion of the last two segments):

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| $P_1$ | protopod | 0–1 | 1–0 | exp | I–0 | I–1 | III, I, 4 |
| | | | | end | 0–1 | I, I, 5 | [0–1 0–1 I, I, 4] |
| $P_2$ | protopod | 0–1 | 1–0 | exp | I–0 | I–1 | III, I, 5 |
| | | | | end | 0–1 | I, II, 5 | [0–1 0–2 I, II, 3] |
| $P_3$ | protopod | 0–1 | 1–0 | exp | I–0 | I–1 | III, I, 5 |
| | | | | end | 0–1 | I, III, 4 | [0–1 0–2 I, III, 2] |
| $P_4$ | protopod | 0–1 | 1–0 | exp | I–0 | I–1 | II, I, 5 |
| | | | | end | 0–1 | I, II, II, 1 | [0–1 0–1 I, II, II] |

The formula for the exopods is thus identical with that of the female. The distal segments of each endopod apparently represent a fusion of two original segments whose probable armature is suggested in the brackets above. Legs 1–4 have the coxa and basis ornamented as in the female.

Sexual dimorphism occurs in the armature of legs 1–3. In leg 1 the next to the outermost element on the distal segment of the endopod is a spine, instead of a seta as in the female. In leg 2 the inner terminal spine on the distal segment of the endopod is larger than in the female and covered with minute spinules in its distal half (fig. 73). In leg 3 the four spines on the distal segment of the endopod are short, stout, well-sclerotized, and naked (fig. 75).

The fifth leg (fig. 77) resembles that of the female, but is relatively shorter, 16 × 13 μ, about 1.2 times longer than wide. The two terminal setae are 37 and 64 μ long respectively.

The sixth leg (fig. 78) is represented by a ventrolateral ridge on the posterior part of the genital segment, bearing two lightly plumose setae 32 and 52 μ in length.

The spermatophore (figs. 39 and 44) is nearly oval, about 165 × 120 μ as seen in dorsal view. A mass of opaque cement substance obscures the point of its attachment. On a few females the spermatophores had a different form (fig. 45), being rather flattened and elongated, 157 × 58 μ including the neck, and directed posteriorly rather than anteriorly. Such spermatophores appeared to be empty.

The color is similar to that of the female.

**The specific name *sculptus* (Latin = carved) alludes to the curious excavation on the second segment of the maxilliped of the male.**

REMARKS.– The 2-segmented condition of the endopods of legs 1–4 in the male distinguishes *S. sculptus* from fourteen other species in the genus in which the segmentation of the male legs is known, namely, *S. hamatus* Heegaard, 1944; *S. idoneus*, *S. tuberatus*, *S. modestus*, *S. campanulipes*, *S. subtilis*, *S. subgrandis*, and *S. poculiferus*, all described by Humes & Cressey, 1961 (though at that time placed in the genus *Preherrmannella*); *S. armoricanus* (Bocquet, Stock & Kleeton, 1963); *S. petiti* (Stock & Kleeton, 1963); *S. changeuxi* (Stock & Kleeton, 1963); *S. adduensis* (Sewell, 1949); *S. brevicauda* (Sewell, 1949); and *S. lobulatus* Humes, 1967.

In the remaining seven species males are either unknown or the segmentation of legs 1–4 in that sex undescribed, and hence distinction must be made on other grounds. In *S. propinquus* (Nicholls, 1944), *S. finmarchicus* (T. Scott, 1903), *S. nicobaricus* (Sewell, 1949), and *S. tenuicaudis* (Sars, 1918) the last segment of the second antenna is normally developed (i.e., elongated), instead of short as in *S. sculptus*. In *S. prehensilis* (Sars, 1918) and *S. serendibicus* (Thompson & A. Scott, 1903) the caudal ramus in the female is about 4.5–5 times longer than wide instead of 2:1. In *S. robustus* (Thompson & A. Scott, 1903) the fifth leg of the female is rudimentary, the genital segment of the female is less expanded laterally, and the mandible has a longer lash.

Like several species of *Scambicornus* from Madagascar (*S. idoneus, S. tuberatus, S. modestus, S. campanulipes,* and *S. subtilis*) this West Indian form is not restricted to a single host. It occurs on four species of holothurians in three genera (*Isostichopus badionotus, Ludwigothuria mexicana, L. grisea,* and *Actinopyga agassizii*). Its range includes Curaçao, Bonaire, Barbados, Jamaica, Puerto Rico, and the Bahamas.

## **Scambicornus** sp.

Present in many collections along with *S. sculptus* there were males which in some ways resemble the male of *S. sculptus*, but are much smaller and show certain differences. No females were found which could be recognized as belonging with these males. In view of the absence of females and some question as to the identity of these males, they are left unnamed. Specimens have been deposited in the United States National Museum, Washington, and in the Zoölogisch Museum, Amsterdam.

Specimens from *Isostichopus badionotus* (Selenka). – BAHAMAS: 26 males from 4 hosts, in 1 m, near ferry landing, South Bimini, June 7, 1959. – 17 from 6 hosts, in 2 m, off Lerner Marine Laboratory, North Bimini, June 3, 1959, – 14 from 3 hosts, in 1 m, west of northern end of Pigeon Cay, Bimini lagoon, June 4, 1959. – 32 from 5 hosts, in 2 m, west of Pigeon Cay, Bimini lagoon, June 9, 1959. – BARBADOS: 9 from 1 host under wreck, in 8 m, Carlisle Bay, Bridgetown, July 6, 1959. – 2 from 1 host under intertidal rock at Hasting's Reef, off St. Matthias' Church, July 20, 1959. – JAMAICA: 2 from 12 hosts, in 2.5 m, Drunkenman's Cay, off Kingston, August 28, 1959. – 3 from 1 host, in 1 m, on rock near tide gauge, Port Royal, September 2, 1959. – 20 from 10 hosts, in 3 m, Drunkenman's Cay, off Kingston, August 29, 1959.

Specimens from *Ludwigothuria mexicana* (Selenka). – BAHAMAS: 2 males from 5 hosts, in 2 m, off Lerner Marine Laboratory, North Bimini, May 30, 1959. – 3 from 3 hosts, in 1 m, southern end of Pigeon Cay, Bimini lagoon, June 4, 1959. – 1 from 2 hosts, in 1 m, near ferry landing, South Bimini, June 7, 1959. – 15 from 11 hosts, in 2 m, near ferry landing, South Bimini, June 7, 1959. – JAMAICA: 6 from 1 host, in 2 m, Maiden Cay, off Kingston, September 4, 1959. – CURAÇAO (collected by J. H. Stock): 1 male from 1 host, in about 2.5 m, Piscadera Bay, November 10, 1958.

Specimens from *Actinopyga agassizii* (Selenka). – BAHAMAS: 12 males from 56 hosts, in 2 m, off Lerner Marine Laboratory, North Bimini, June 1, 1959. – 2 from 21 hosts, in 1 m, west of northern end of Pigeon Cay, Bimini, June 4, 1959. – 2 from 1 host, in 0.5 m, Porgy Bay, North Bimini, June 6, 1959. – JAMAICA: 4 from 19 hosts, in 2 m, Drunkenman's Cay, off Kingston, September 3, 1959.

MALE.– In general form the body (fig. 79) resembles *S. sculptus*, but is much smaller. The length (not including the setae on the caudal rami) is 0.63 mm (0.60–0.66 mm) and the greatest width 0.26 mm (0.25–0.28 mm), based on 10 specimens in lactic acid. The

genital segment (fig. 80) is more elongated than in *S. sculptus*, being 148 × 130 μ, or a little longer than wide. The caudal ramus measures 31 × 21 μ, about 1.5 times longer than wide.

The maxilliped (fig. 81) lacks the excavated prominence on the second segment, but otherwise the armature of this segment suggests that of *S. sculptus*. The claw (106 μ in length) is relatively very long (longer than the rest of the maxilliped) and characteristically bent as shown in the figure. The two setae near the base of the claw are very unequal, one being unusually long and well-developed.

Legs 1–4 are segmented and armed as in *S. sculptus*. The endopods of leg 2 (fig. 82) and leg 3 (fig. 83) do not show the modified elements seen in the male of that species. Leg 5 (fig. 80) has a small free segment, 12 × 8 μ, but otherwise is much like that of *S. sculptus*.

The color in life is similar to that of *S. sculptus*.

All other features of this male resemble closely those of *S. sculptus*.

REMARKS. – Various numbers of these small males were found in twenty collections in company with *S. sculptus* (and in certain other collections without *S. sculptus*), on *Isostichopus badionotus*, *Ludwigothuria mexicana*, and *Actinopyga agassizii* in Curaçao, Barbados, Jamaica, and the Bahamas.

The absence of females attributable to these males is puzzling. When *Scambicornus* is collected from washings of holothurians, specimens of both sexes are usually found. These males are presumably mature, since well-formed spermatophores could be seen inside the genital segment of some individuals. The possibility remains, however, that they molt once more to attain the size and characters of the male of *S. sculptus*. Their identity could be clarified by suitable developmental studies or by the discovery of females belonging with them.

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