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ON NEW AND LITTLE KNOWN SPECIES OF *ARCHICONCHOECIA*  
(MYODOCOPA, HALOCYPRIDIDAE) FROM THE SARGASSO  
AND CARIBBEAN SEAS, WITH DESCRIPTIONS  
OF SEVEN NEW SPECIES

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# ON NEW AND LITTLE KNOWN SPECIES OF *ARCHICONCHOECIA* (MYODOCOPA, HALOCYPRIDIDAE) FROM THE SARGASSO AND CARIBBEAN SEAS, WITH DESCRIPTIONS OF SEVEN NEW SPECIES

GEORGIANA B. DEEVEY<sup>1</sup>

**SYNOPSIS:** Except for two relatively well-known species, specimens of the oceanic, planktonic, primarily bathypelagic ostracod genus *Archiconchoecia* have been rarely noted. Four species were described by 1908, and none since then until the past year. Now 14 species are known, including the 7 new species described herein, and also a specimen previously ascribed to a known species which is renamed as a new species. The male of a known species is described for the first time. A key to the 14 species is included. Six of the new species were collected in the Sargasso Sea off Bermuda between 500 and 2000 m-depths. One species was found in the western Caribbean Sea. Quantitatively, species of *Archiconchoecia* constitute only a small proportion of the total numbers of planktonic ostracods in the Sargasso Sea, but their relative importance rises with depth, from 1.2% of the total ostracods in surface waters to 10% over 1500-2000 m-depths. For the 2000 m water column a mean figure of 115 *Archiconchoecia* per square meter of sea surface was obtained from 2 years of monthly sampling in the Sargasso Sea.

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## INTRODUCTION

The genus *Archiconchoecia* Müller was placed in the subfamily Archiconchoecinae by Poulsen (1969), who divided the family Halocyprididae into four subfamilies, the others being the Conchoecinae, Halocyprinae, and Euconchoecinae. Species of *Archiconchoecia* are separated from other planktonic ostracods primarily by having 6 long filaments or setae on the two distal segments of the first antenna, whereas other halocyprids have either 5 or more than 20. Until recently, only four species of this genus had been described, all by 1908: *A. striata* Müller, *A. cucullata* (Brady), *A. cuneata* Müller, and *A. ventricosa* Müller. The first two have been commonly reported and are relatively numerous, *A. striata* from shallow depths and *A. cucullata* from deep water. Since Müller (1908) described the female of *A. cuneata*, this species has been rarely noted (Deevey 1968, Angel and Fasham 1975), and the male has not yet been described. This species is thus far known only from the Atlantic. Müller (1906) gave only a brief description of *A. ventricosa*, and the literature on this species is confused; its specific name is derived from the Latin "ventricosus," meaning pot-bellied. *Ventricosa*-shaped specimens, with strongly swollen anterior margins, have been reported as occurring in the Atlantic, Pacific, and Indian Oceans (Poulsen 1969, Angel 1971/72), and Angel and Fasham (1975) have recorded this species from 10°30'N to 53°N, ca. 20°W, in the eastern North Atlantic. *A. ventricosa* Müller has now been re-described from specimens collected in the Caribbean and Sargasso seas, and another *ventricosa*-shaped species, *A. fabiformis*, has been described from the Caribbean Sea (Deevey 1978a). Poulsen described as *A. ventricosa* a 1.8 mm female from the region of New Caledonia in the South Pacific; this specimen differs in many respects from Müller's description of a female 1.0 mm long and males 0.80-0.85 mm long from the tropical Atlantic. Since Poulsen's (1969:21, Figs. 6-7) female differs from Müller's specimens in size, shape of frontal organ, and in a number of other ways, it is here renamed as *A. poulseni* n. sp.

Zooplankton samples were collected monthly from July 1968 to September 1970 at Station "S," 32°10'N, 64°30'W, in the Sargasso Sea off Bermuda, over four 500 m depth levels between the surface and 2000 m. The quantitative data reported here were obtained with nets of No. 8 mesh (0.202 mm aperture), equipped with flowmeters, using an open net for the upper 500 m, and a Bé multiple plankton sampler for the three lower depth ranges. Examination of the specimens of *Archiconchoecia* obtained in these samples has yielded six new species. Another new species has been found in a sample from the western Caribbean Sea. Aside from *A. fabiformis* and the species described in this report, another new species, *A. versicula*, has been described from the South Pacific (Deevey 1978b). An immature male of *A. versicula* found in the Caribbean Sea extends the range of that species. In all, the species of *Archiconchoecia* now total 14.

Of the 14 species, 10 have been found in the Sargasso Sea, 2 thus far only from the Caribbean, 1 from the South Pacific and the Caribbean, and 1 only from the tropical Pacific. All except *A. poulsenii* n. sp., have been found in either the Sargasso Sea and/or the Caribbean. The depth distributions as known from my data are shown in Table 1. *A. poulsenii* is included in order to make the species list complete, but it's not possible to tell from Poulsen's listing whether this specimen was caught in a tow with 100-3000 m of wire out or of 100-1000 m. *A. fabiformis* was caught in the eastern Caribbean in a tow from 1200-0 m, and *A. bispicula* n. sp. in a vertical tow, probably from around 2000 m, in the western Caribbean. In the Sargasso Sea, *A. ventricosa* has been taken only from 500-1000 m, also the common depth range of *A. cuneata*. Three new species were caught between 1000 and 1500 m, one from 1000-2000 m, and one from 1500-2000 m. *A. striata* is most numerous within the upper 500 m and *A. cucullata* below 500 m. The three specimens of *A. longiseta* n. sp. were taken from 500-1000 and 1500-2000-m depths.

TABLE 1.—VERTICAL DISTRIBUTION OF THE SPECIES OF *Archiconchoecia*.

	Depth in m				
	0	500	1000	1500	2000
<i>Archiconchoecia cucullata</i>					
<i>A. striata</i>					
<i>A. versicula</i>					
<i>A. longiseta</i> n. sp.					
<i>A. cuneata</i>					
<i>A. pilosa</i> n. sp.					
<i>A. ventricosa</i>					
<i>A. bispicula</i> n. sp.	?		?		?
<i>A. poulsenii</i> n. sp.	?		?		?
<i>A. gastros</i> n. sp.					
<i>A. bifurcata</i> n. sp.					
<i>A. falcata</i> n. sp.					
<i>A. fabiformis</i>	?		?		
<i>A. bimucronata</i> n. sp.					

Quantitatively, species of *Archiconchoecia* constitute only a small proportion of the total numbers of halocyprid ostracods in the Sargasso Sea. Only *A. striata* and *A. cucullata* were taken in appreciable numbers. *A. striata* is the only species of any importance within the upper 500 m, and Figure 1, which illustrates the total numbers/1000 m<sup>3</sup> of *Archiconchoecia* over the 0-500 m depth level, gives essentially only the seasonal variations in numbers of this species. During the first year studied, highest numbers of *A. striata* were found between October and January, and there was a second lesser maximum from May to July 1969. The winter of 1969-1970 was exceptionally stormy,

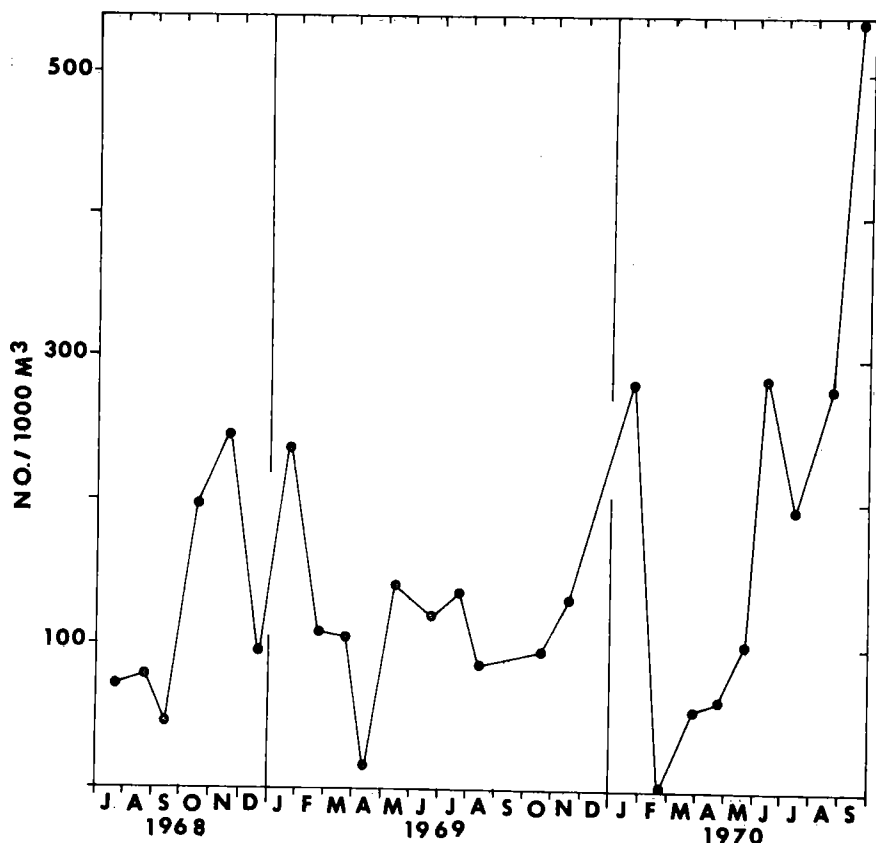


FIGURE 1.—The total numbers/1000 m<sup>3</sup> of *Archiconchoecia* obtained for the 0-500 m depth zone between July 1968 and September 1970 at Station "S" in the Sargasso Sea.

and several sampling periods were missed because of bad weather. In 1970 a cold water mass moved in in February and another from July to September, and *A. striata* was most numerous in January and from June to September. The variations in total numbers of *Archiconchoecia* over the three lower depth ranges, 500-1000 m, 1000-1500 m, and 1500-2000 m, are shown in Figure 2. In this case, the data represent, almost entirely, the numbers recorded for *A. cucullata*, as the other species occurred only as occasional specimens. *A. cucullata* was most numerous between 500 and 1500 m but also occurred consistently between 1500- and 2000 m-depths.

The mean numbers of *Archiconchoecia* obtained for the 2-year period over the four depth levels are listed in Table 2. It is apparent that only a third as many were present between 500 and 1000 m as in the upper 500 m; around half as many were found between 1000 and 1500 m as between 500 and 1000 m, and this number was reduced to a third over the 1500-2000 m depth range. However the relative importance of *Archiconchoecia* increased with

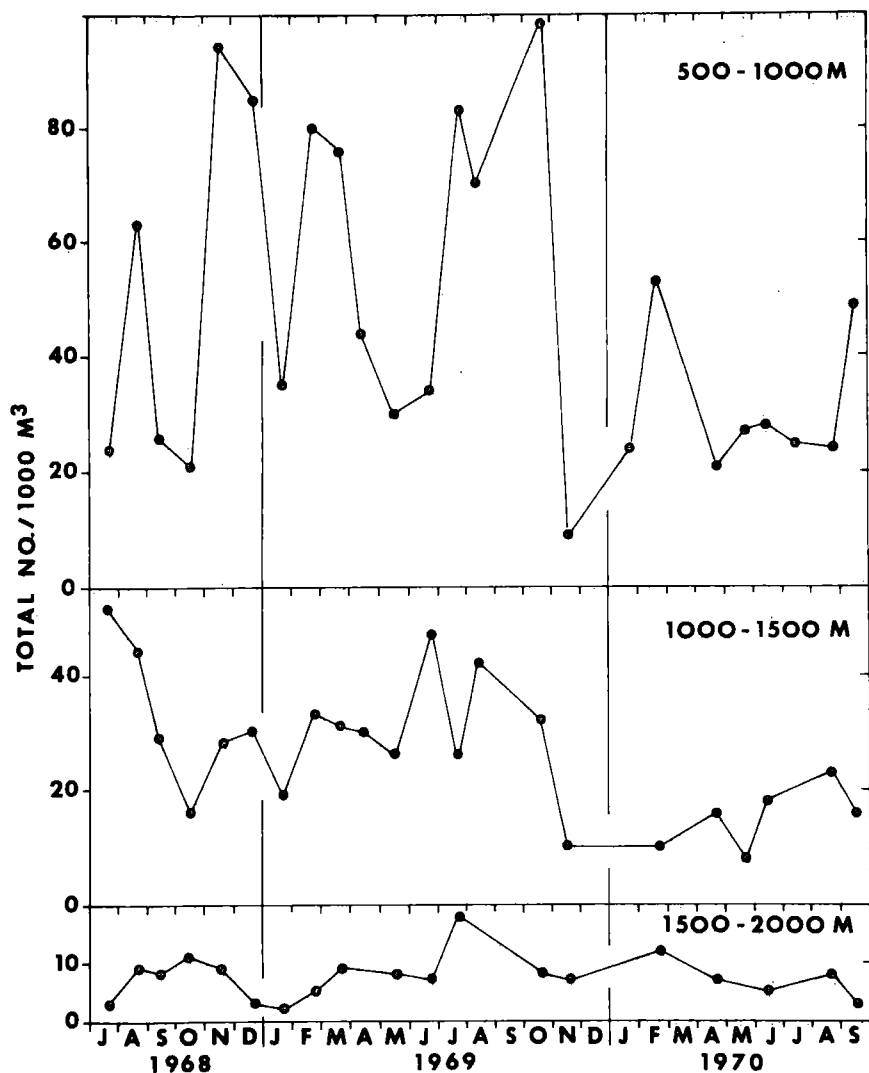


FIGURE 2.—The total numbers/1000 m<sup>3</sup> of *Archiconchoecia* recorded over the three depth zones; 500-1000 m, 1000-1500 m, and 1500-2000 m, between July 1968 and September 1970 at Station "S" in the Sargasso Sea.

depth, from 1.2% of the total numbers of ostracods in the upper 500 m to 10% of the total numbers between 1500 and 2000 m-depths. This is because *A. cucullata* occurred consistently in the deeper waters, as other halocyprids decreased more rapidly in numbers with depth. For the 2000 m water column, the data yield a mean figure of 115 *Archiconchoecia* per square meter of sea surface.

TABLE 2.—MEAN TOTAL NUMBERS OF *Archiconchoecia* AND PERCENT OF TOTAL OSTRACODS OVER THE FOUR DEPTH ZONES BETWEEN THE SURFACE AND 2000 m.

Depth	Mean No./1000 m <sup>3</sup>	Mean % of total ostracods
0-500 m	148	1.2
500-1000 m	47	2.9
1000-1500 m	27	7.5
1500-2000 m	8	10.0

Diagnoses of the genus *Archiconchoecia* have been given by Müller (1894, 1906) and Poulsen (1969). As noted, members of this genus differ from other halocyprids primarily in having six long filaments on the two distal segments of the first antenna. Also there is no processus mammillaris on the basal segment of the endopodite of the second antenna, as is found in the genus *Conchoecia*. There is little sexual dimorphism. The structure of the first antenna, mandible, maxilla, fifth and sixth limbs, and furca is similar in both sexes. Males are differentiated by their clasping organs on the endopodite of the second antenna and the possession of a penis. There may be six, seven, or eight pairs of claws on the furca of mature individuals.

The following key indicates the diagnostic characteristics of the 14 species of *Archiconchoecia*. Descriptions and figures of the new species are given, and also descriptions and figures of the male and female *A. cuneata*. The other species have been described adequately elsewhere (Müller 1894, 1906; Deevey 1968, 1978a, b). Poulsen's description of the specimen he ascribed to *A. ventricosa* must remain as the description of *A. poulseni* n. sp.

## ACKNOWLEDGMENTS

One of the new species here described was collected by Harding B. Owre Michel on Cruise P-6803 of the PILLSBURY in the Caribbean Sea, and I am greatly indebted to Dr. Michel for the pleasure and privilege of examining the ostracods in some of her collections. This work was partially supported by National Science Foundation Grants GB-15575, GA-31736, and GA-36512.

KEY TO ADULTS OF THE SPECIES OF THE GENUS *Archiconchoecia*

- 1a) The postero-dorsal corner of the right shell with a long point; 2 dorsal bristles or setae on the 1st antenna; the 2 bristles on the basal segment of the endopodite of the 2nd antenna about equal in length, or the distal bristle is slightly longer than the proximal one ..... *A. cucullata* (Brady)
- b) Both shell valves without a dorsoposterior spine; 1 dorsal seta on the 2nd segment of the 1st antenna; the proximal bristle on the basal segment of the endopodite of the 2nd antenna shorter than the distal bristle ..... 2
- 2a) 7 or 8 claws on furca of mature individuals; 2nd segment of the exopodite of the 5th limb with 2 ventral setae ..... 4
- b) 6 claws on furca; 2nd segment of the exopodite of the 5th limb with 1 ventral seta ..... 3



- 3a) Shell with concentric striations, indentation on dorsal margin; basal segment of the exopodite of the 2nd antenna ca. 55-60% length of shaft; frontal organ rounded at tip and bare of hairs or spinules ..... *A. striata* Müller
- b) Shell with striations somewhat paralleling ventral margin, no indentation on dorsal margin; basal segment of exopodite of 2nd antenna ca. 75% the length of the shaft; frontal organ rounded at tip with tiny hairs or spinules at the tip and ventrally distally .... *A. versicula* Deevey
- 4a) Distal seta of 1st antenna much longer than the other 5; filaments of distal segment of the endopodite of the 2nd antenna very short and thin, no more than 1 1/2 times the length of the longer bristle on the basal segment; a clear crescent-shaped lens at the posteroventral corner of each shell; no dorsal seta on penultimate segment of 5th and 6th limbs ..... *A. longiseta* n. sp.
- b) All 6 filaments of 1st antenna of about equal length; filaments of distal segment of endopodite of 2nd antenna about as long as the exopodite setae; no clear lens at posteroventral corner of shell; dorsal seta present on penultimate segment of 5th and 6th limbs ..... 5
- 5a) Distal segment of 6th limb 1/3 to 1/2 as long as preceding segment, and with 3 short thick setae, the longer no more than twice the length of the distal segment; thin ventral seta of distal segment of 5th limb longer than 2 thicker claw-setae; 8 claws on furca; 2 bristles on basal segment of endopodite of 2nd antenna not coarsely spinous; anterior margin of shell may or may not be swollen ..... 6
- b) Distal segment of 6th limb no more than 1/4 as long as preceding segment and with at least 2 relatively long slim claw-setae, the longest more than 4 times the length of the distal segment; ventral seta of distal segment of 5th limb shorter than 2 claw-setae; 7 or 8 claws on furca; 2 bristles on basal segment of endopodite of 2nd antenna coarsely spinous; anterior margin of shell swollen ..... 7
- 6a) Proximal bristle of basal segment of endopodite of 2nd antenna about 1/2 the length of the distal bristle; frontal organ rounded at tip; male penis curves upwards to a slim tip; left male clasper shorter than right clasper, and slim ..... *A. cuneata* Müller
- b) Proximal bristle of basal segment of endopodite of 2nd antenna ca. 75% length of distal bristle; frontal organ rounded at tip but with 2 tiny bumps; penis with blunt squared tip; left male clasper shorter than right clasper, and exceptionally thick ..... *A. pilosa* n. sp.
- 7a) Furca with 7 claws in mature individuals ..... 8
- b) Furca with 8 claws ..... 9
- 8a) Frontal organ with one thin needle-like prolongation at tip, basal segment of the exopodite of the 2nd antenna less than 50% length of shaft; proximal bristle of the basal segment of the endopodite of the 2nd antenna ca. 75% the length of the distal bristle ..... *A. ventricosa* Müller
- b) Frontal organ with 2 thin needle-like prolongations at tip, otherwise similar to *A. ventricosa* in proportions of 2nd antenna ..... *A. bispicula*, n. sp.
- c) Tip of frontal organ bifurcate ..... *A. poulsenii* n. sp.
- 9a) Mature specimens more than 1.5 mm long; basal segment of the exopodite of the 2nd antenna ca. 63% length of shaft; proximal bristle of the basal segment of endopodite of 2nd antenna 63-64% length of distal bristle; distal segments of 5th and 6th limbs with 2 long claw-setae and a shorter ventral seta ..... *A. gastroles* n. sp.
- b) Mature specimens more than 1.5 mm long; basal segment of the exopodite of 2nd antenna less than 60% length of shaft; proximal bristle of basal segment of endopodite of 2nd antenna 55-60% length of distal bristle; 3 distal setae on 5th and 6th limbs about equal in length ..... *A. bifurcata* n. sp.
- c) Mature specimens less than 1.5 mm long ..... 10
- 10a) Frontal organ rounded at tip with a few tiny spinules; distal segment of 6th limb as long as preceding segment and with 2 very long setae about as long as the entire 6th limb; basal segment of exopodite of 2nd antenna ca. 55% length of shaft; proximal bristle of basal segment of endopodite of 2nd antenna 65-75% length of distal bristle ..... *A. falcata* n. sp.

- b) Frontal organ rounded at tip without spinules; distal segment of the 6th limb ca. 1/4 as long as penultimate segment, with 2 long and 1 short setae slightly longer than the distal segment; basal segment of exopodite of 2nd antenna 60% length of shaft; proximal bristle of basal segment of endopodite of 2nd antenna ca. 60% length of distal bristle ..... *A. fabiformis* Deevey
- c) Frontal organ rounded at tip with 2 slim needle-like prolongations; distal segments of 5th and 6th limbs with 2 long and 1 very short setae, the latter no longer than the distal segment; basal segment of exopodite of 2nd antenna a little more than 60% length of shaft ..... *A. bimucronata* n. sp.

### *Archiconchoecia cuneata* Müller

#### Figures 3-4

*Archiconchoecia cuneata* G. W. Müller, 1908, p. 63, Pl. 8, Figs. 1-4.

*Archiconchoecia cuneata* Deevey, 1968, p. 26, Fig. 6.

Müller described this species from a single female and a juvenile specimen collected in October 1901 at 19°S, 20°W, in the Atlantic. The only other records are for several females from the Sargasso Sea (Deevey 1968), and Angel and Fasham (1975) listed it, with no accompanying data, as occurring at 18°N and 40°N in the eastern North Atlantic. *A. cuneata* is therefore known only from the Atlantic, between 40°N and 19°S. The male has never been described. Although the specimens already described from the Sargasso Sea were caught within the upper 500 m, monthly sampling from 1968-1970 yielded specimens of this species consistently from depths of 500-1000 m. As only the shell, frontal organ, and 1st and 2nd antennae have been described, the female is now redescribed more fully, and the male is described for the first time.

**MATERIAL.**—Male, 0.72 mm long, collected 18 March 1969 in a tow from 500-1000 m, 1 slide; male, 0.77 mm long, collected 12 September 1968 in a tow from 500-1000 m, 1 slide; female, 0.87 mm long, collected 11 August 1969 in a tow from 500-1000 m, 1 slide. All slides deposited in the National Museum of Natural History, Smithsonian Institution (NMNH 171279, 171280, and 171281).

**DESCRIPTION OF MALE.**—*Shell* (Fig. 3d): Rostrum blunt in lateral view, anterior margin rounded, ventral margin slightly rounded, posterior margin rounded, sometimes rather cone-shaped. Height of shell greater than half the length at the anterior end, decreasing in height posteriorly. Asymmetrical glands small, right gland about half way up the posterior margin, left gland at posterodorsal corner.

*First antenna and frontal organ* (Fig. 3e): Frontal organ short, rounded at tip without hairs or spinules. Second segment of 1st antenna with long coarsely spinous dorsal seta. Sixth segment with 4, 5th segment with 2 long wide fragile filaments all of equal length and pointed at the tip. Hairs ventrally on the 5th segment above the attachment of the filaments.

*Second antennae* (Fig. 3f-h): Basal segment of exopodite 50% length of shaft, and with a row of proximal dorsal spinules. The proximal bristle on the basal segment of the endopodite is 55-58% the length of the distal bristle. Both are slim, the proximal bristle especially so, and bare of spinules. The bristles are borne on a rounded protuberance with long hairs around their bases. The 5 filaments on the distal segment are unequal in length, the most proximal being the shortest. The right clasper is curved and strong, the left clasper slightly curved and much shorter. The 2 slim bristles at the bases of the clasping organs are relatively long for this genus.

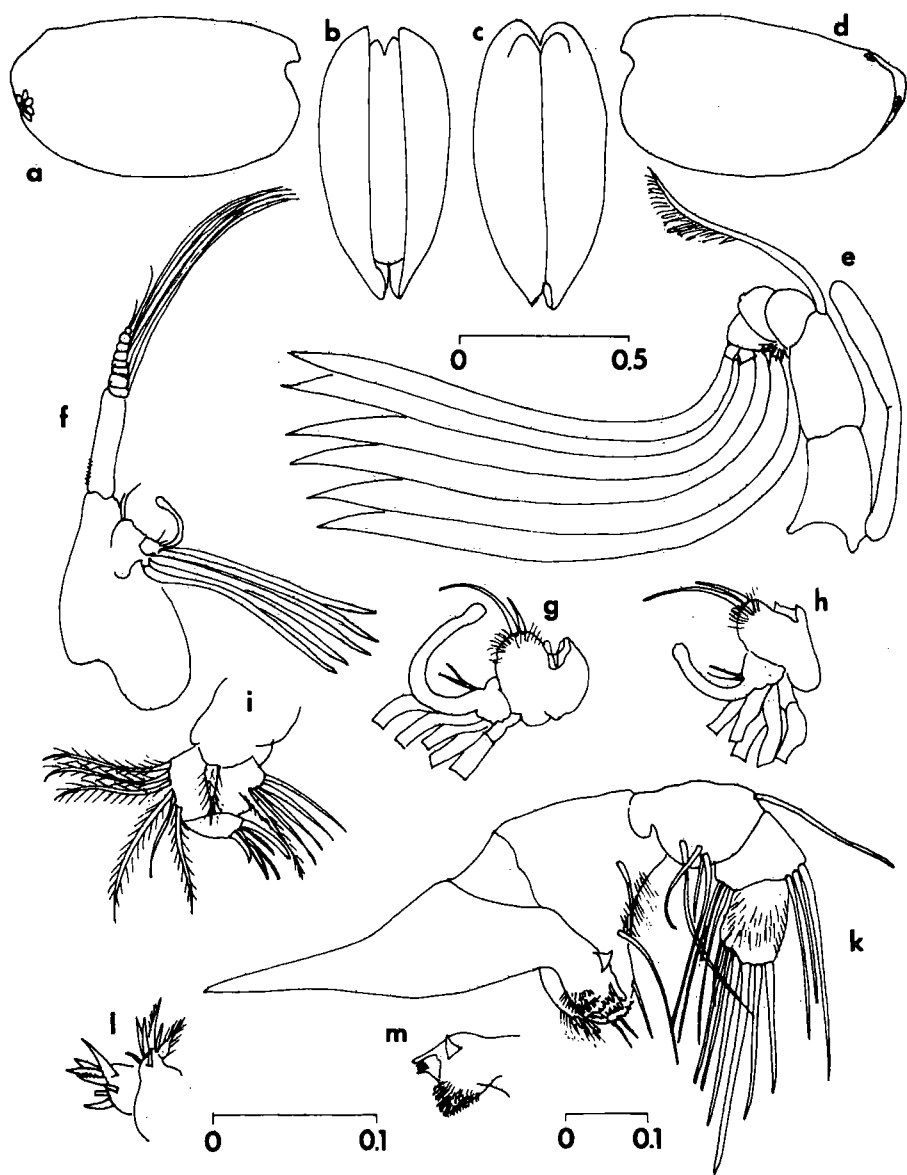


FIGURE 3.—*Archiconchoecia cuneata* Müller. (a-c) Lateral, ventral and dorsal views of shell of immature female; (d) Lateral view of male, 0.72 mm long; (e) Frontal organ and 1st antenna of male; (f) Right 2nd antenna of male; (g) Endopodite of male right 2nd antenna, filaments cut off; (h) Endopodite of male left 2nd antenna, filaments cut off; (i) Endopodite of male maxilla; (k) Male mandible; (l) Coxal and precoxal endites of male; and (m) Coxa of female. Scale at top center for a-d, at bottom right for f, at bottom left for e, g-m. Scales in mm.

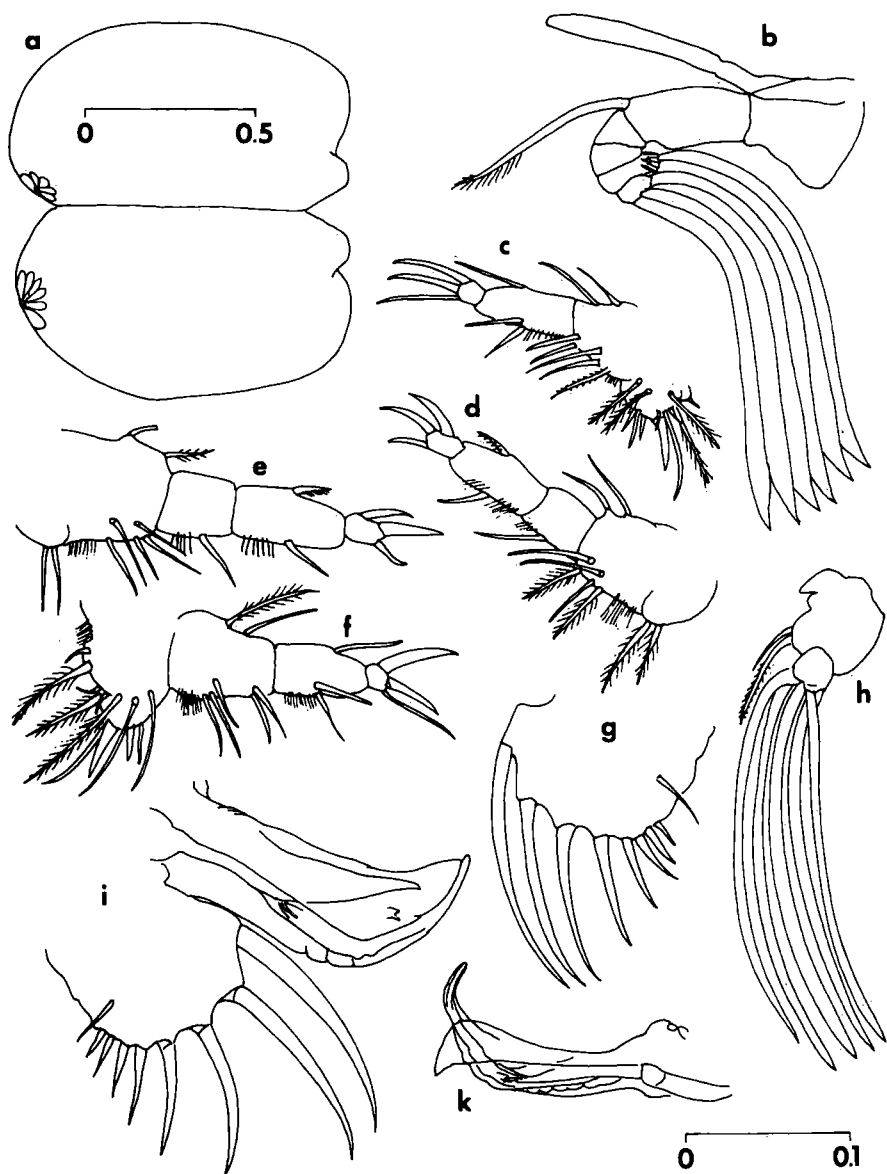


FIGURE 4.—*Archiconchoecia cuneata* Müller. (a) Shell of 0.89 mm female, opened out; (b) Female frontal organ and 1st antenna; (c) Male 5th limb; (d) Male 6th limb; (e) Female 6th limb; (f) Female 5th limb; (g) Female furca; (h) Endopodite of female 2nd antenna; (i) Male penis and furca; and (k) Penis of another male. Scale on a for a, at bottom right for b-k. Scales in mm.

**Mandible** (Fig. 3k, m): The distal segment of the endopodite is relatively long and covered with hairs; it bears 7 setae, the 2nd segment 5 setae, and the 1st segment 1 dorsal and 4 ventral setae, of which 2 are quite short. As in the other species, the toothrow of the basale has 6 serrated teeth and 2 large teeth. The basale has 4 setae distally and 1 near the articulation with the endopodite, but the dorsal seta is apparently lacking. The coxa is distinctive, since the masticatory surface is especially protuberant (Fig. 3m) and bears rather large rounded denticles as well as bristles.

**Maxilla** (Fig. 3i, l): The anterior margin of the endopodite bears 6 long plumose setae; posteriorly there are 5 setae, 1 of which is plumose. The 2 claws on the distal segment are relatively short and thick; 3 setae were noted between them, 1 very long. The coxal and pre-coxal endites consist of at least 8 bristles each.

**Fifth limb** (Fig. 4c): On the distal segment of the exopodite the thin ventral seta is longer than the middle and dorsal claw-setae, and the dorsal seta is longer than the middle one. This is the case only in 1 other species, *A. pilosa*, n. sp. In other species the ventral seta is shortest and the middle seta the longest. The 2nd segment has 2 ventral setae and 1 dorsal seta, the 1st segment 7 setae. The protopodite and endopodite have a total of at least 10 setae and a small and large claw.

**Sixth limb** (Fig. 4d): The ventral seta is the shortest on the distal segment of the exopodite, and the dorsal and middle or distal claw-setae are exceptionally thick and short and of about the same length, the distal seta being slightly longer. The dorsal seta on the penultimate segment is also exceptionally thick and spinous; the 2nd segment has a single ventral seta, and the 1st segment 5 ventral and 2 dorsal setae. There are long hairs on the ventral sides of the 1st to 3rd segments.

**Penis** (Fig. 4i, k): This is of distinctive shape, plump, with an upturned pointed tip.

**Furca** (Fig. 4i): This has 8 claws and a single unpaired bristle.

**DESCRIPTION OF FEMALE.**—**Shell** (Fig. 3a-c, 4a): This is similar to the male's, but does not decrease in height posteriorly. Height slightly greater than half the length. The frontal organ and 1st antenna are similar to those of the male (Fig. 4b). On the 2nd antenna, the basal segment of the exopodite is 50% the length of the shaft and has a proximal dorsal row of spinules, as in the male. The proximal bristle of the basal segment of the endopodite is ca. 58% the length of the distal bristle, but there are no long hairs at the bases of these bristles (Fig. 4h), as in the male; also the distal bristle has spinules distally.

The mandible, maxilla, 5th and 6th limbs (Fig. 4e, f), and furca are also similar to those of the male. The female therefore differs from the male somewhat in shape of shell, in lacking clasping organs and a penis, and in details of the endopodite of the 2nd antenna.

**REMARKS.**—*A. cuneata* is most closely related to *A. pilosa* n. sp. in the characters of the 5th and 6th limbs and in the type of bristles on the basal segment of the endopodite of the 2nd antenna. It differs from *A. pilosa* n. sp. in size, in the relative lengths of the 2 bristles of the basal segment of the endopodite of the 2nd antenna, and in the shape of the male penis and clasping organs. It differs from all other species of *Archiconchoecia* in shell shape, and, most notably, the lengths of the distal setae of the 5th and 6th limbs, and the character of the bristles on the endopodite of the 2nd antenna. After *A. striata* and *A. cucullata*, it was the third commonest species in the Sargasso Sea.

### *Archiconchoecia pilosa* new species

#### Figures 5-6

**HOLOTYPE.**—Male, 1.35 mm long. One slide, deposited in the National Museum of Natural History, Smithsonian Institution (NMNH 171282).

TYPE LOCALITY.—Station "S," 32°10'N, 64°30'W, in the Sargasso Sea. From a 1500-2000 m tow collected 25 June 1969.

ETYMOLOGY.—The specific name is derived from the Latin "pilosus," meaning hairy, and refers to the fact that most of the appendages are hairier than in the other species.

DESCRIPTION OF MALE.—*Shell* (Fig. 5a): Anterior margin of shell swollen, ventral margin slightly rounded, posterior margin rounded; slight indication of sculpturing, as lines approximately paralleling the ventral margin, near the anterior margin. Shell height greatest at the anterior end, diminishing by at least 1/3 at the posterior end. Right asymmetrical gland small, at approximately 1/2 the height of the posterior margin; no indication of left asymmetrical gland.

*First antenna and frontal organ* (Fig. 5b, c): Frontal organ appears 2-jointed, rounded at the tip with 2 tiny points, shorter than the 1st antenna. First antenna with characteristic coarsely spinous dorsal seta borne at distal end of 2nd segment. Hairs around base of dorsal seta and also dorsally on 4th segment; hairs around clear circular structure on ventral side of 4th segment. The 5th and 6th segments bear 6 wide and fragile long filaments of equal length, pointed at the tip.

*Second antenna* (Fig. 5e-g): The 2 bristles on the basal segment of the endopodite are long and slim and without spinules, and have hairs around their bases. The proximal bristle is ca. 75% the length of the distal bristle. The 5 filaments of the distal segment of the endopodite are unequal in length. The right clasping organ is relatively thick, strong, and curved, the left clasper shorter, thicker, and club-like.

*Mandible* (Fig. 6a, e): The distal segment of the endopodite is exceptionally long for members of this genus, and is covered with hairs; the 2nd segment also bears shorter hairs. The distal segment has 7 setae, the 2nd segment 5, and the 1st segment 5, of which 4 are ventral and the 2 shorter of the 4 are considerably longer than in other species. The basale is also quite hairy, with 4 setae near the distal end and 1 near the articulation with the endopodite. The coxa has several tooththrows and one large thick curving tooth, as well as the masticatory pad of spines or bristles, and a knob-like articular process.

*Maxilla* (Fig. 5d, 6c): The basal segment of the endopodite has 6 long plumose setae anteriorly, and 5 setae of which 1 is plumose on the posterior side. There are spinules along the anterior distal edge. The distal segment has 2 claw-setae and 3 setae. The coxal and precoxal endites have hairy bases and bear a number of relatively long bristles, many of them spinous.

*Fifth limb* (Fig. 6b): The distal segment of the exopodite has 2 claw-setae and a slightly longer slim ventral seta, a character which distinguishes this species and *A. cuneata* from other known species of *Archiconchoecia*. The 2nd segment has 1 dorsal and 2 ventral relatively long setae, and is hairy ventrally. The 3rd segment has a long dorsal seta and 7 other setae. The protopodite and endopodite are partially covered with hairs and have a total of 10 setae and a thick claw.

*Sixth limb* (Fig. 6d): The distal exopodite segment has 2 short thick claw-setae and a short ventral seta; the relative shortness of these setae distinguishes this species from all other species except *A. cuneata*. The 1st, 2nd, and 3rd segments are hairy ventrally and have, respectively, 7 setae, 1 seta, and 2 setae.

*Penis* (Fig. 6f): This ends bluntly with a small dorsally-pointed tip.

*Furca* (Fig. 6g): This has 8 claws and a single unpaired bristle.

REMARKS.—This species is most closely related to *A. cuneata* in the characters of the 5th and 6th limbs and in the type of bristles on the basal segment of the endopodite of the 2nd antenna, which are slim and not coarsely spinous as in other species. It differs from *A. cuneata* in being somewhat larger in size, having hairier appendages, in the relative lengths of the 2 bristles

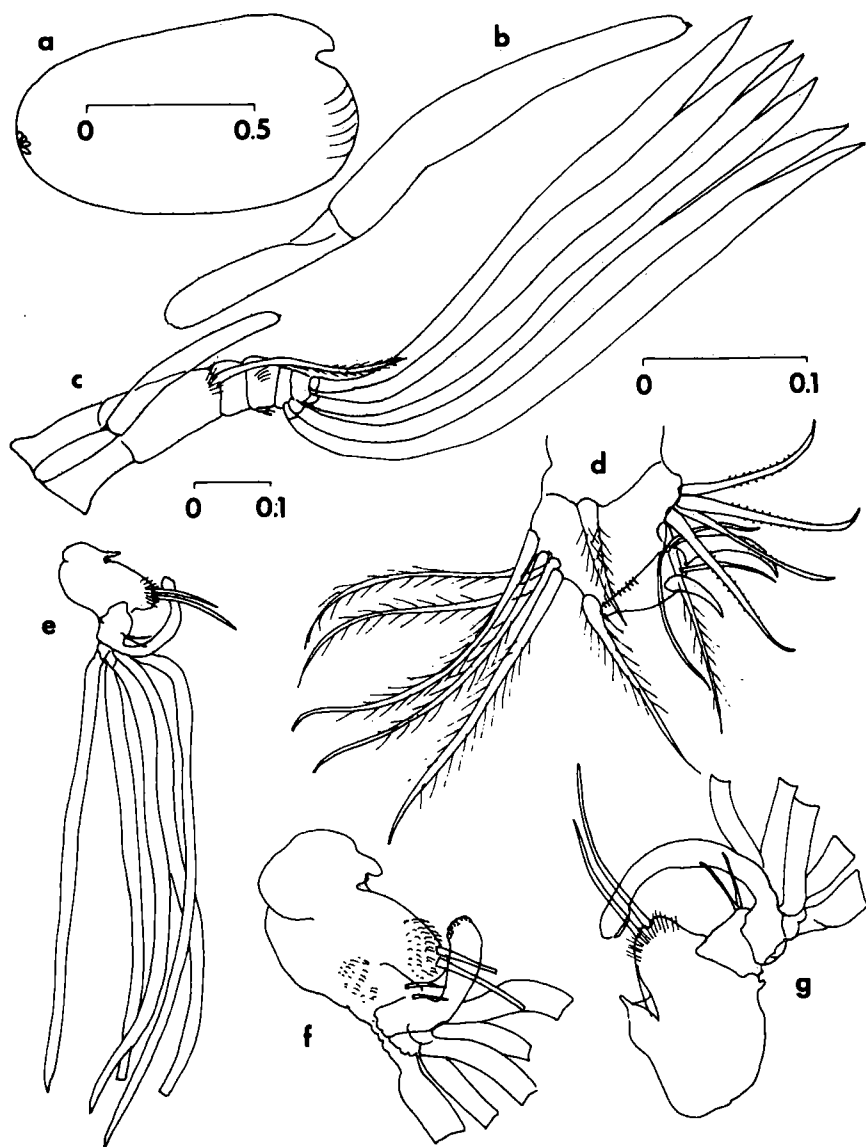


FIGURE 5.—*Archiconchoecia pilosa* n. sp., Male. (a) Lateral view of male; (b) Frontal organ; (c) Frontal organ and 1st antenna; (d) Endopodite of maxilla; (e) Endopodite of right 2nd antenna; (f) Endopodite of left 2nd antenna, filaments cut off; and (g) Endopodite of right 2nd antenna, filaments cut off. Scale on a for a, at left center for c and e, at right for b, d, f, g. Scales in mm.

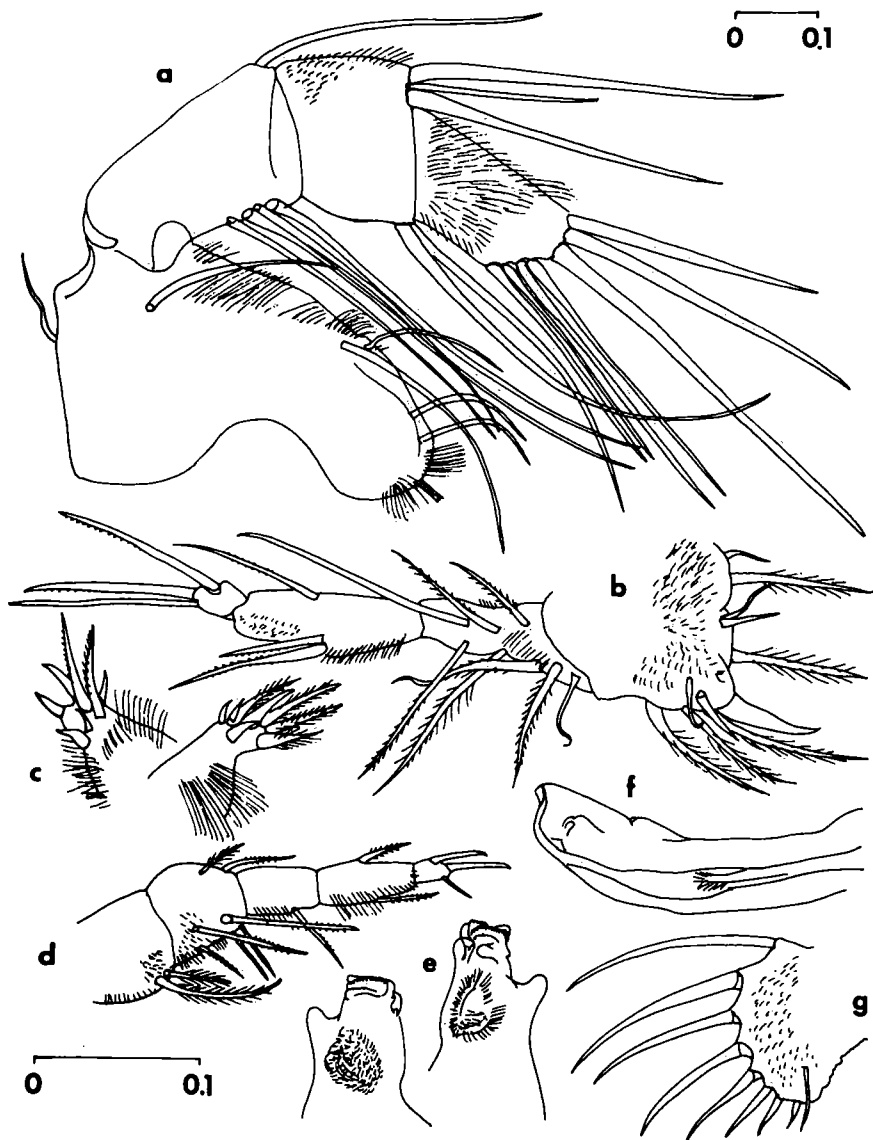


FIGURE 6.—*Archiconchoecia pilosa* n. sp., Male. (a) Endopodite and basale of mandible; (b) 5th limb; (c) Coxal and precoxal endites; (d) 6th limb; (e) Two views of tooththrows and masticatory surface of coxa; (f) Penis; and (g) Furca. Scale at top right for d and g, at bottom left for a-c, e, f. Scales in mm.



on the basal segment of the endopodite of the 2nd antenna, in having tiny bumps at the tip of the rounded frontal organ, and in the shape of the male penis and clasping organs, especially the left clasper. *A. pilosa* n. sp. differs from all other species of *Archiconchoecia* in these same respects, and in the lengths of the distal setae of the 5th and 6th limbs, and the character of the bristles on the endopodite of the 2nd antenna.

*Archiconchoecia longiseta* new species

Figures 7-9

**HOLOTYPE.**—Female, 1.30 mm long by 0.74 mm high. One slide, deposited in the National Museum of Natural History, Smithsonian Institution (NMNH 171283). Collected 11 July 1970 in a haul from 1500-2000 m.

**PARATYPE.**—Female, 1.27 mm long. One slide, deposited in the National Museum of Natural History, Smithsonian Institution (NMNH 171284). Collected on 19 February 1970 in a haul from 1500-2000 m.

**TYPE LOCALITY.**—Station "S": 32°10'N, 64°30'W, in the Sargasso Sea.

**ETYMOLOGY.**—The specific name refers to the fact that one of the six filaments of the 1st antenna is much longer than the other five in this species.

**DESCRIPTION OF FEMALE.**—*Shell* (Fig. 7a, c): Anterior, ventral, and posterior margins rounded, dorsal margin nearly straight. Clear lens-like structure near posteroventral corner of each shell. Right asymmetrical gland 1/3 to 1/2 of the way up the posterior margin, left gland near posterodorsal corner. No sculpturing noted on shell. Height of shell somewhat greater than 1/2 the length.

*First antenna and frontal organ* (Fig. 7d, e): Frontal organ with 1-2 tiny points at tip, tiny hairs on ventral surface. 2nd segment of 1st antenna with large spinous dorsal seta. Hairs distally on 2nd, 3rd and 4th segments. Five of the 6 setae borne on the 5th and 6th segments are exceptionally short and slim; the 6th and most distal seta is very slim and almost twice as long as the other 5, but it is not otherwise differentiated, as is the principal seta of the 1st antenna in the genus *Conchoecia*.

*Second antenna* (Fig. 7b, f): The basal segment of the exopodite is 52-57% the length of the shaft. The 2 bristles on the basal segment of the endopodite are long, slim and coarsely spinous, the proximal bristle being 80-85% the length of the distal one. There are spinules or hairs around the bases of the bristles. The 5 filaments of the distal segment of the endopodite are exceptionally slim and short, barely longer than the 2 bristles of the basal segment, and at least 4 of them have tiny spinules down the distal 1/2 of their lengths (see Fig. 7b). The distal bristle of the basal segment is 78-79% the length of the longest filament of the distal segment. There are spinules distally on the distal segment.

*Mandible* (Fig. 8a, e): The distal segment of the endopodite is relatively long and is covered with hairs; it bears 7 setae, the 2nd segment 5 setae, and the 1st segment 5. The 4 ventral setae on the 1st segment are shorter than in other species. The basale has 4 setae distally and 1 near the articulation with the endopodite; its toothrow, as is typical for this genus, consists of 6 serrated but imperfectly separated teeth and 2 large teeth (Fig. 8e). The coxa is distinctive (Fig. 8a) and has several tooth rows and a masticatory pad of long bristles.

*Maxilla* (Fig. 8b-d): The endopodite is distinctive. The distal segment bears an exceptionally long and strongly curved large claw-seta and an unusually small smaller claw-seta, as well as the usual 3 setae. The setae of the basal segment are short and bare, and there are only 2 on the posterior surface, but 6 on the anterior surface, and there may be 2 (Fig. 8d) or 3 (Fig. 8b) short lateral setae. The distal end of the basal segment has many hairs or spinules. The coxal and precoxal endites (Fig. 8c) bear 9-10 bristles each; several on the precoxal endite are exceptionally long and spinous.

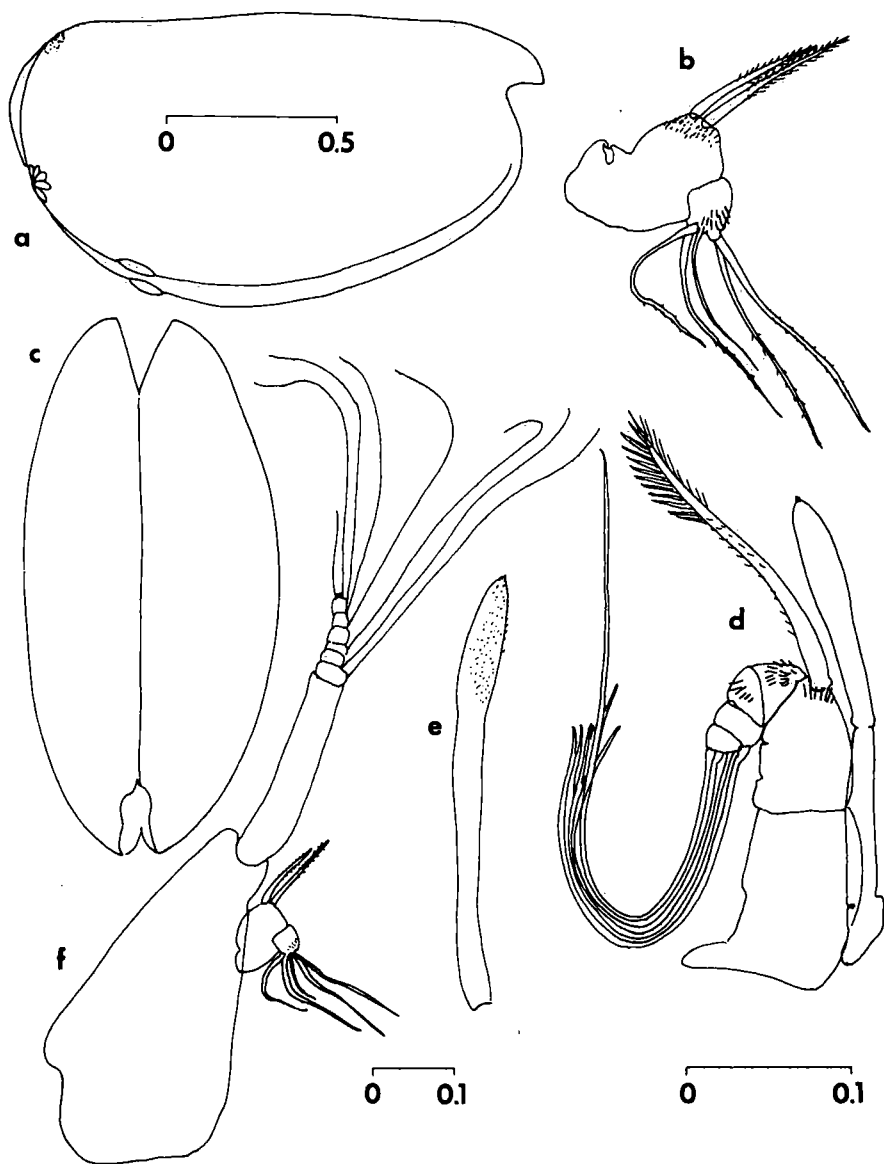


FIGURE 7.—*Archiconchoecia longiseta* n. sp., Female. (a) Lateral view of female; (b) Endopodite of 2nd antenna; (c) Dorsal view of female; (d) Frontal organ and 1st antenna; (e) Ventral view of frontal organ; and (f) 2nd antenna. Scale on a for a and c, at bottom center for f, at bottom right for b, d, e. Scales in mm.

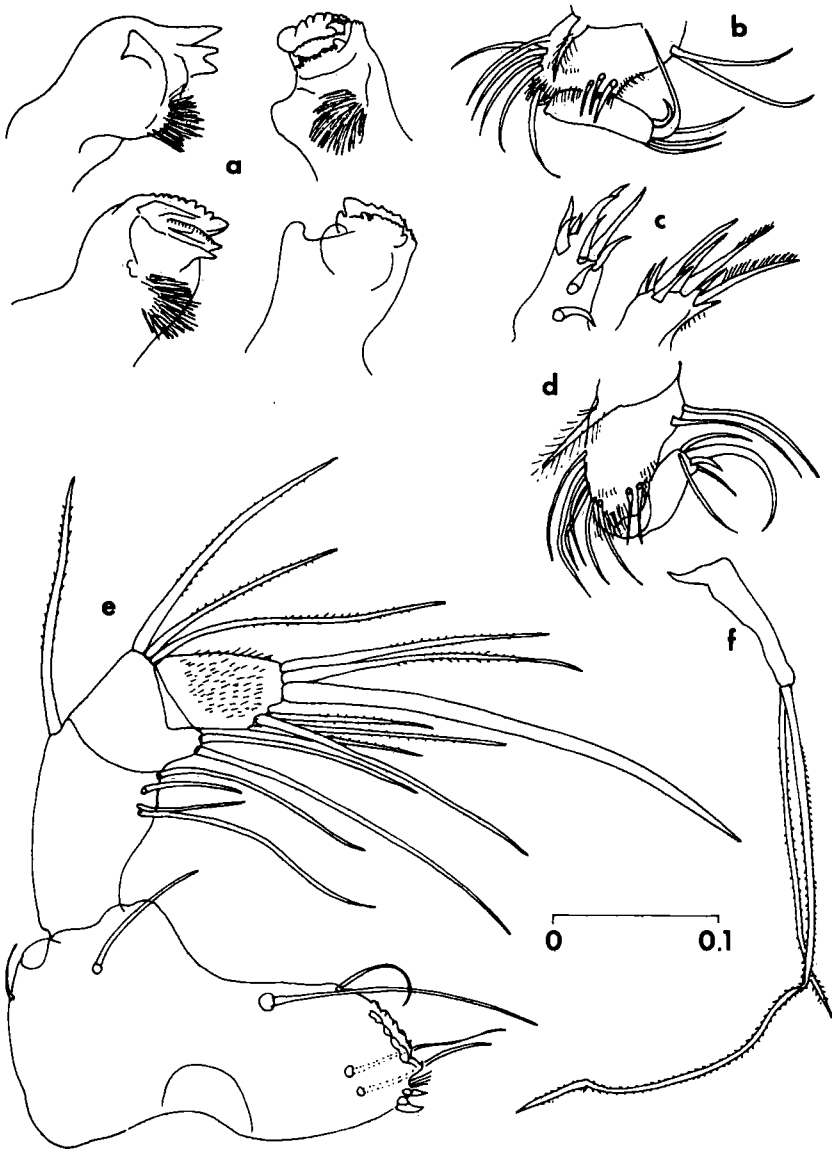


FIGURE 8.—*Archiconchoecia longiseta* n. sp., Female. (a) Four views of tooththrows and masticatory surface of coxa; (b) Endopodite of maxilla; (c) Coxal and precoxal endites; (d) Endopodite of maxilla of another female; (e) Endopodite and basale of mandible; and (f) 7th limb. Scale at bottom right for a-f, in mm.

*Fifth limb (Fig. 9b):* The distal segment of the exopodite is small and has 2 subequal claw-setae and a shorter ventral seta. On one specimen 4 setae were present on the distal segment (Fig. 9c). In this species the dorsal seta on the 2nd segment is lacking, and the 1st segment has 7 setae. The protopodite and endopodite have 11 setae, of which 4 are plumose, and 2 claw-setae, the larger thick and strongly curved. The epipodial appendage has 3 groups of 4-5-4 long plumose setae each.

*Sixth limb (Fig. 9d):* The distal segment of the exopodite bears 2 long slim claw-setae and a shorter ventral seta about half the length of the other 2. As is the case in the 5th limb,

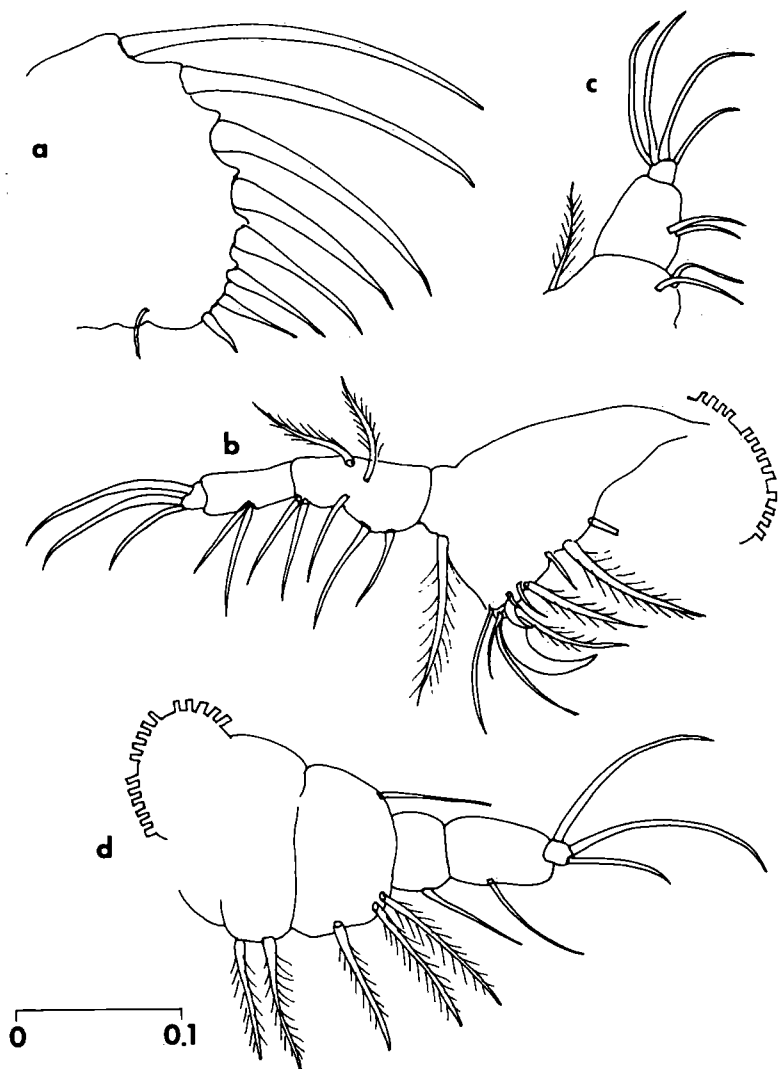


FIGURE 9.—*Archiconchoecia longiseta* n. sp., Female. (a) Furca; (b) 5th limb; (c) Distal segments of another 5th limb; and (d) 6th limb. Scale at bottom left for a-d, in mm.

the penultimate segment lacks the dorsal seta found in the other species. The 2nd segment has a single ventral seta, and the 1st segment only 3 plumose ventral setae and a dorsal seta. The epipodial appendage has 3 groups of 5-5-6 long plumose setae each.

*Seventh limb* (Fig. 8f): This has 2 setae armed with tiny spinules, the longer approximately twice the length of the shorter.

*Furca* (Fig. 9a): This has 8 slim claws and a single unpaired bristle.

**REMARKS.**—*A. longiseta* n. sp. differs from all known species of *Archiconchoecia* in having a clear lens-like structure at the posteroventral corner of each shell, in having 1 of the 6 setae of the 1st antenna much longer than the other 5, in having very short thin filaments on the distal segment of the endopodite of the 2nd antenna, in the very long curved claw on the endopodite of the maxilla, in the relative lengths of the distal setae of the 5th and 6th limbs, and also in lacking the dorsal seta on the penultimate segment of the 5th and 6th limbs.

### *Archiconchoecia bispicula* new species

#### Figure 10

**HOLOTYPE.**—Female, 1.02 mm long by 0.58 mm high. One slide, deposited in the National Museum of Natural History, Smithsonian Institution (NMNH 171285).

**TYPE LOCALITY.**—'Pillsbury' Cruise 6803, Station 18: 17°18'N, 85°27'W, in the western Caribbean Sea, from a vertical tow collected 22 April 1968.

**ETYMOLOGY.**—The specific name refers to the 2 slim prolongations on the tip of the frontal organ of this species.

**DESCRIPTION OF FEMALE.**—*Shell* (Fig. 10a): *Ventricosa*-shaped, anterior margin strongly swollen, ventral margin slightly indented, posterior margin rounded. Faint indication of a sculpturing consisting of parallel lines at the anterior margin of the shell. Height of shell somewhat greater than half the length. Right asymmetrical gland at 1/3 to 1/2 the shell height on the posterior margin, left gland at posterodorsal corner.

*Frontal organ and first antenna* (Fig. 10b, c): Frontal organ unjointed, with 2 thin prolongations at tip. The first antenna is similar to that of all other species of *Archiconchoecia*, except *A. cucullata* and *A. longiseta* n. sp. in having a large coarsely spinous dorsal seta on the 2nd segment and 6 long filaments of equal length, pointed at the tip, on the 5th and 6th segments.

*Second antenna* (Fig. 10a, d): Basal segment of the exopodite 43% length of shaft. The 2 bristles on the basal segment of the endopodite are borne on a rounded protuberance without hairs, the proximal bristle being 77% the length of the distal bristle. Hairs on ventral surface of endopodite. Five filaments of distal segment unequal in length, the most distal being the shortest.

*Mandible* (Fig. 10e, i, k): The endopodite and basale are similar to those of *A. ventricosa* and other species; the toothrow of the basale has 6 partially separated serrated teeth and 2 large teeth. The coxa has clusters of teeth and a masticatory pad of short spines or bristles.

*Maxilla* (Fig. 10f): The basal segment of the endopodite is similar to that of *A. ventricosa*, with 6 setae on the anterior margin and 4 posteriorly. The precoxal endite has 7 bristles, 2 long and spinous; the coxal endite has 8 relatively short and curved bristles.

*Fifth limb* (Fig. 10g): The setation of the exopodite is similar to that of *A. ventricosa*, as are the relative lengths of the 3 setae on the distal segment. The protopodite and endopodite have at least 11 setae, 4 plumose, and a thick curved claw. Hairs are present around the base of the 5th limb.

*Sixth limb* (Fig. 10h): The setation of the exopodite of the 6th limb is also similar to that

of *A. ventricosa*, with 5 setae on the 1st segment, 1 on the 2nd, and 2 on the 3rd. The long claw-seta on the distal segment is almost twice as long as the dorsal slim claw-seta, and the dorsal seta is almost twice as long as the ventral seta.

*Furca* (Fig. 10l): This has 7 slim claws and a single unpaired seta.

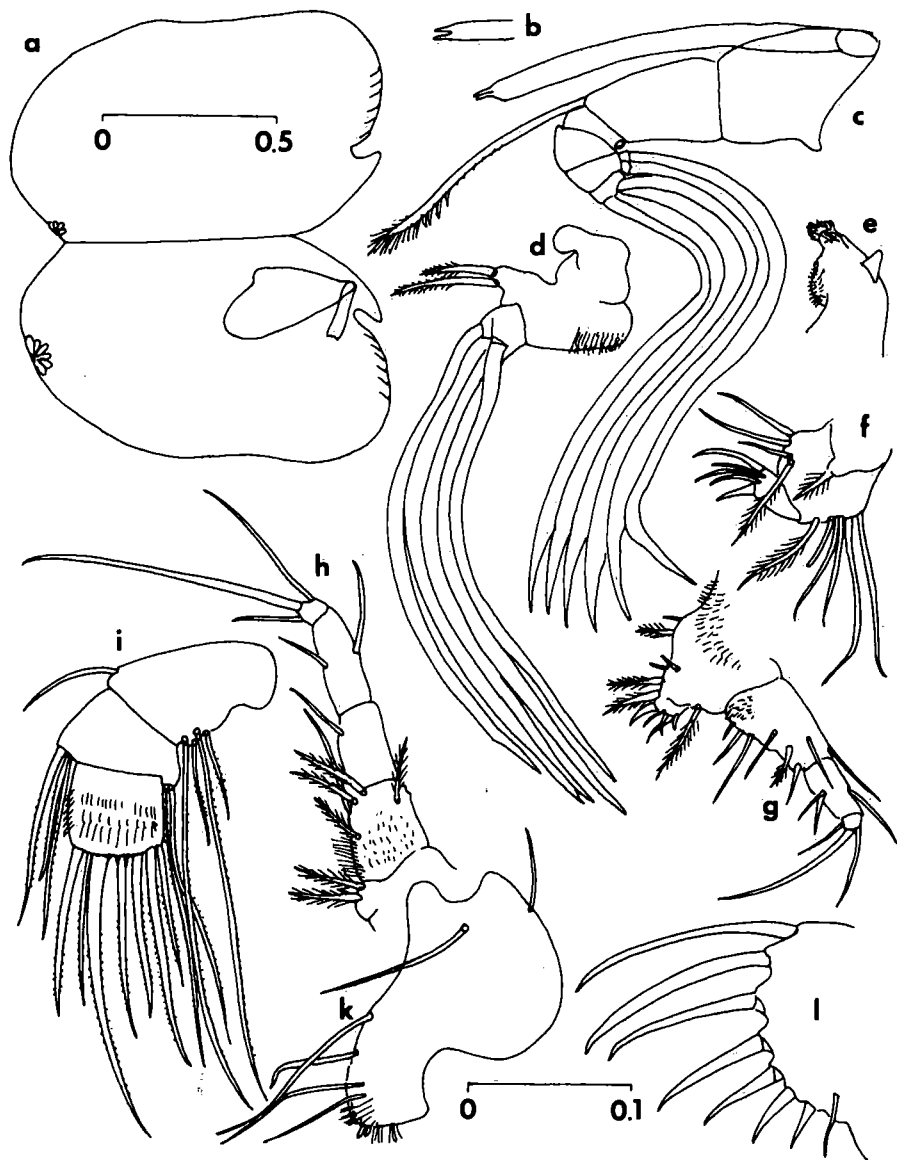


FIGURE 10.—*Archiconchoecia bispicula* n. sp., Female. (a) Female shell, opened out; (b) Dorsal view of tip of frontal organ; (c) Frontal organ and 1st antenna; (d) Endopodite of 2nd antenna; (e) Tooththrows and masticatory surface of coxa of mandible; (f) Endopodite of maxilla; (g) 5th limb; (h) 6th limb; (i) Endopodite of mandible; (k) Basale of mandible; and (l) Furca. Scale on a for a, at bottom for b-l. Scales in mm.

REMARKS.—This species is most closely related to *A. ventricosa*, with which it agrees in most details. It differs from that species in having 2 slim prolongations on the tip of the frontal organ, and in the relative lengths of the filaments of the distal segment of the endopodite of the 2nd antenna. *A. bispicula* n. sp. differs from the other *ventricosa*-shaped species, except *A. poulsoni* n. sp. (from which it differs in size and other respects) in having only 7 claws on the furca, and from all other species of *Archiconchoecia* in the characters of the 5th and 6th limbs and 2nd antenna in particular.

*Archiconchoecia falcata* new species

Figures 11-12

HOLOTYPE.—Female, 1.30 mm long by 0.64 mm high, collected 25 June 1969 in a tow from 1000-1500 m. One slide, deposited in the National Museum of Natural History, Smithsonian Institution (NMNH 171286).

PARATYPE.—Immature male, 1.1 mm long by 0.6 mm high, collected 24 February 1969 in a tow from 1500-2000 m. One slide, deposited in the National Museum of Natural History (NMNH 171287).

TYPE LOCALITY.—Station "S": 32°10'N, 64°30'W, in the Sargasso Sea.

*Etymology*: The specific name is derived from the Latin "falcatus", meaning curved or sickle-shaped, and refers to the swollen anterior margin of the shell.

DESCRIPTION OF FEMALE.—*Shell* (Fig. 11a): Anterior margin swollen, ventral margin slightly indented, posterior margin rounded, shell *ventricosa*-shaped. Height approximately twice the length. Right asymmetrical gland at 1/3rd to 1/2 shell height on the posterior margin, location of left gland not established, possibly in a comparable position on the left posterior margin. No sculpturing noted on shell.

*Frontal organ and first antenna* (Fig. 11c, e): Frontal organ unjointed, rounded at tip with a few very tiny hairs or spinules on the tip. Strong spinous dorsal seta on the 2nd segment of the 1st antenna. The 2 filaments borne on the 5th segment and the 4 on the 6th are of equal length and pointed at the tip. No hairs or spinules noted on the segments of the 1st antenna.

*Second antenna* (Fig. 11d, g): The basal segment of the exopodite is 53-56% the length of the shaft. The 2 bristles on the basal segment of the endopodite are coarsely spinous, the proximal bristle being 65-68% the length of the distal bristle. Hairs on ventral surface of endopodite. The 5 filaments on the distal segment are approximately equal in length. The distal segment of the endopodite of the immature male (Fig. 11f) has a small knob as the anlage of the clasping organ, and 2 short bristles.

*Mandible* (Fig. 12a, d): The distal segment of the endopodite is covered with hairs and is relatively long. The setation of the endopodite and basale is similar to that of the other species, and the tooththrow of the basale consists of the usual 6 imperfectly separated serrated teeth and 2 larger teeth. The coxa has several tooththrows of fine teeth, with several larger teeth (Fig. 12d).

*Maxilla* (Fig. 12b, c): The basal segment of the endopodite has 5 anterior, 2 lateral and 4 posterior setae. The distal segment has the usual 2 claws and 3 thin setae. The coxal and pre-coxal endites consist of 7-8 bristles each, several long and spinous.

*Fifth limb* (Fig. 12e, f): The long claw-seta on the distal segment of the exopodite is twice as long as the ventral seta and not quite twice as long as the dorsal claw-seta. The 2nd segment has 1 dorsal and 2 ventral setae and some long hairs ventrally. The 1st segment has 12 setae in the female, but only 11 setae were noted on the immature male; both specimens had long hairs ventrally. The protopodite and endopodite have 11 setae of varying lengths, and 2 relatively short claws.

*Sixth limb* (Fig. 12g): This limb was represented only by stumps in the female, but the immature male has a 6th limb very different from all other *Archiconchoecia*, in that the distal

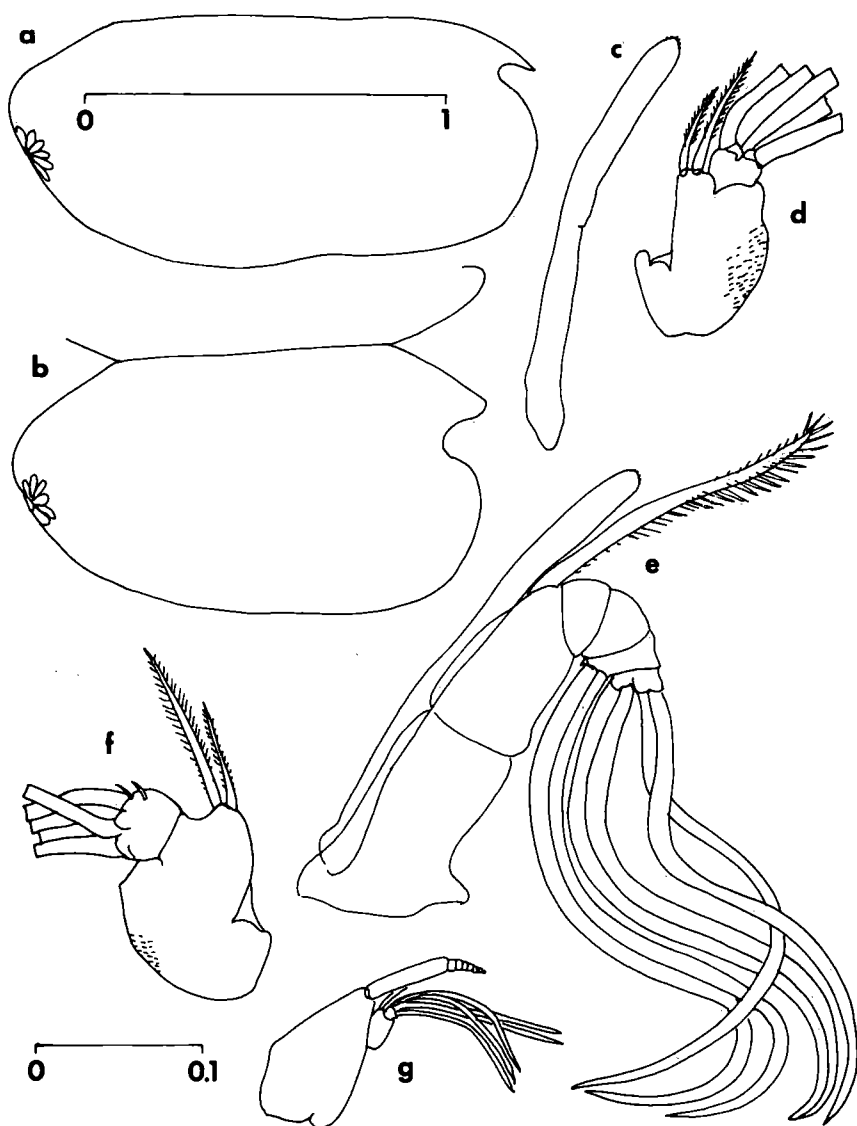


FIGURE 11.—*Archiconchoecia falcata* n. sp. (a) Lateral view of female; (b) Immature male right shell, flattened out; (c) Female frontal organ; (d) Endopodite of female 2nd antenna, filaments cut off; (e) Frontal organ and 1st antenna of immature male; (f) Endopodite of immature male 2nd antenna, filaments cut off; and (g) Female 2nd antenna. Scale on a for a, b, g, at lower left for c-f. Scales in mm.





FIGURE 12.—*Archiconchoecia falcata* n. sp. (a) Endopodite and basale of immature male; (b) Endopodite of maxilla of immature male; (c) Coxal and precoxal endites of female; (d) Tooththrows and masticatory pad of female coxa; (e) Immature Male 5th limb; (f) Female 5th limb; (g) 6th limb of immature male; and (h) Female furca. Scale at bottom for a-h, in mm.

segment is elongate and bears 2 very long slim nonplumose setae that are almost as long as the entire limb. There was no sign of a 3rd seta on the distal segment. The penultimate segment is somewhat shorter than the distal segment, and bare of setae. The 2nd segment of the exopodite has only 1 small ventral seta, the 1st segment 7 setae. Such a 6th limb, with very long distal setae, approaches the condition in males of the genus *Conchoecia*, which have 3 long plumose setae.

*Furca* (Fig. 12h): The female furca has 8 claws and an unpaired bristle, the immature male 7 claws and an unpaired bristle.

REMARKS.—*A. falcata* n. sp. differs from other *Archiconchoecia* in the relative lengths of the basal segment of the exopodite of the 2nd antenna to the shaft, and of the bristles on the basal segment of the endopodite. It differs particularly from all species in having a very distinctive 6th limb, with 2 very long setae.

*Archiconchoecia bimucronata* new species

Figures 13-14.

HOLOTYPE.—Male, 0.90 mm long by 0.54 mm high at the anterior end and 0.40 mm high posteriorly. One slide, deposited in the National Museum of Natural History, Smithsonian Institution (NMNH 171288).

TYPE LOCALITY.—Station "S": 32°10'N, 64°30'W, in the Sargasso Sea, collected 15 September 1970 in a tow from 1000-1500 m.

ETYMOLOGY.—The specific name is derived from the Latin "mucronatus", meaning pointed, and refers to the fact that the frontal organ bears 2 long slim prolongations.

DESCRIPTION OF MALE.—*Shell* (Fig. 13a, g): Anterior margin swollen, ventral margin nearly straight, posterior margin rounded, *ventricosa*-shaped. Dorsal margin slopes downward so that the greatest height is at the anterior end, as in the *A. ventricosa* male. Shoulder vaults not developed, shell evenly rounded; some indication of a sculpturing of parallel lines at the anterior end of the shell, as in *A. ventricosa*, *A. bispicula*, n. sp., and *A. pilosa*, n. sp. Right asymmetrical gland just above the rounded posteroventral corner, left gland at the posterodorsal corner.

*Frontal organ and first antenna* (Fig. 13c, d): The frontal organ is rounded at the tip, with 2 slim needle-like prolongations, and extends slightly beyond the 6th segment of the 1st antenna. First antenna as in most of the other species, with a large coarsely spinous dorsal seta on the 2nd segment and 6 long wide filaments, of equal length and pointed at the tip, borne on the 5th and 6th segments. No hairs or spinules noted on the segments of the 1st antenna.

*Second antenna* (Fig. 13b, e, f): As illustrated in Figure 13b, the basal segment of the exopodite is 50% the length of the shaft. The proximal bristle on the basal segment of the endopodite is 61-62% the length of the distal bristle, and both are coarsely spinous. The filaments of the distal segment of the endopodite are unequal in length, the most proximal being shorter than the others. The right clasping organ is slim, relatively long and curved near its base; the left clasper is shorter, more roundly curved, and thicker near the tip. The 2 bristles at the bases of the clasping organs are quite short.

*Mandible* (Fig. 14b-d): The distal segment of the endopodite is covered with hairs and relatively short and square. The setation of the endopodite is similar to that of *A. ventricosa* and *A. bispicula*, n. sp. The toothrow of the basale is also similar to that of other species, with 6 imperfectly separated serrated teeth and 2 large teeth.

*Maxilla* (Fig. 14a): The basal segment of the endopodite has 5 setae, 3 plumose, on the anterior margin, 1 lateral and 3 posterior setae. The distal segment has the usual smaller and larger claws and 3 thin setae.

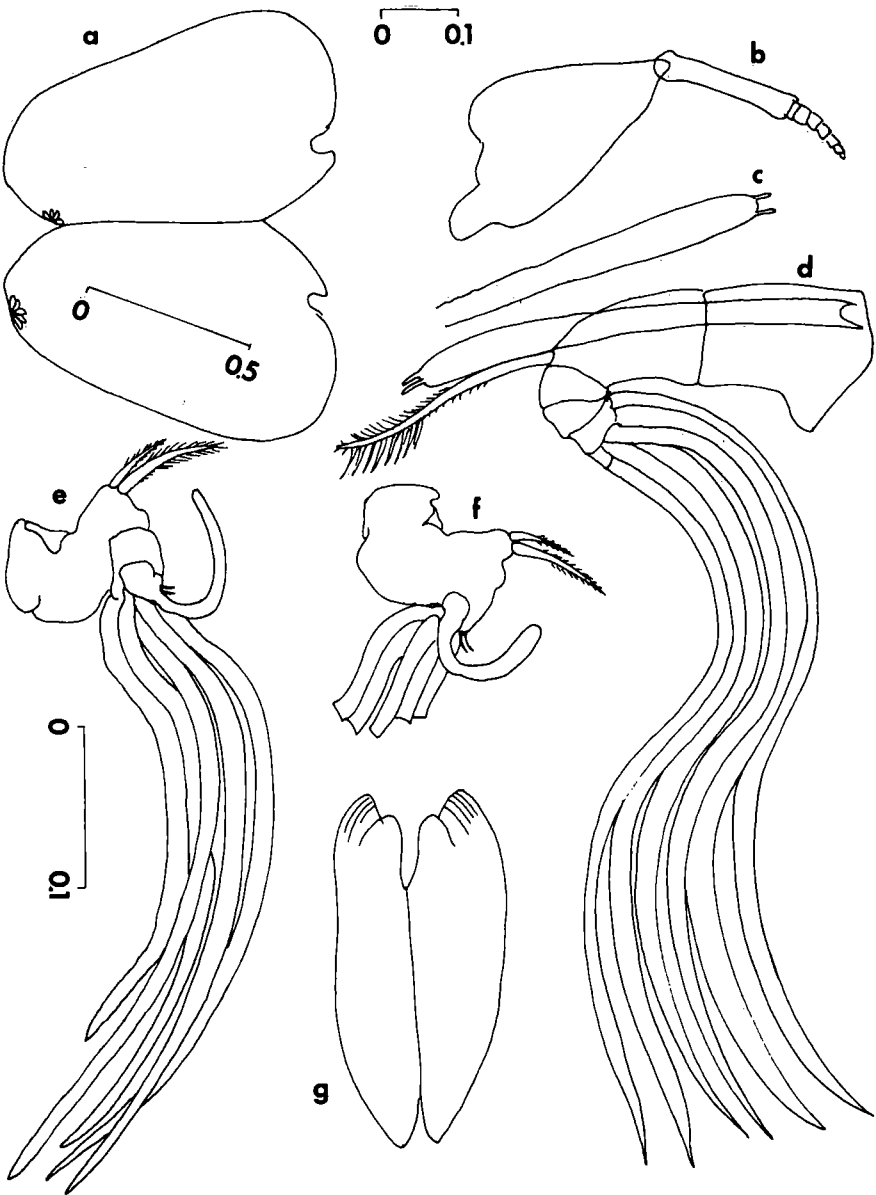


FIGURE 13.—*Archiconchoecia bimucronata* n. sp., Male. (a) Male shell, opened out; (b) Shaft and exopodite of 2nd antenna, lacking setae; (c) Dorsal view of frontal organ; (d) Frontal organ and 1st antenna; (e) Endopodite of right 2nd antenna; (f) Endopodite of left 2nd antenna, filaments cut off; and (g) Dorsal view of shell. Scale on a for a and g, at top center for b, at lower left for c-f. Scales in mm.

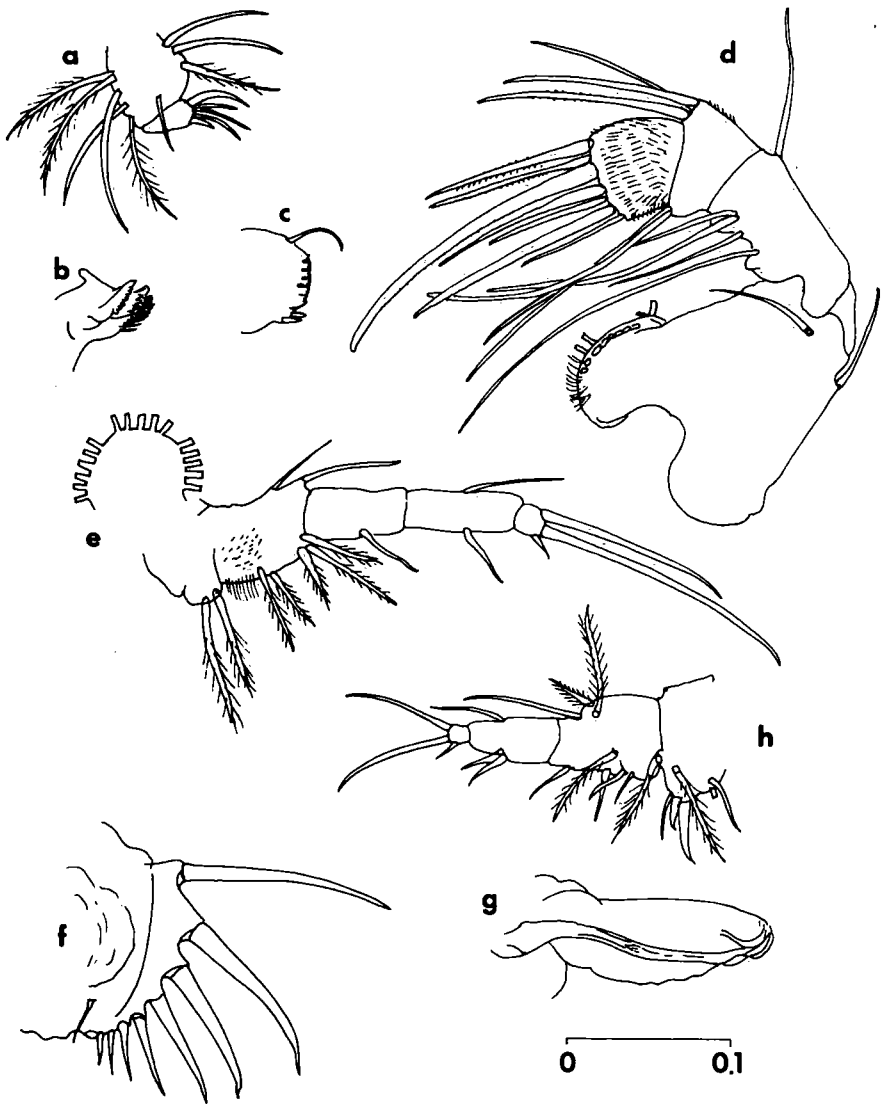


FIGURE 14.—*Archiconchoecia bimucronata* n. sp., Male. (a) Endopodite of maxilla; (b) Toothrows and masticatory pad of coxa; (c) Tooththrow of basale of mandible; (d) Endopodite and basale of mandible; (e) 6th limb; (f) Furca; (g) Penis; and (h) 5th limb. Scale at bottom right for a-h, in mm.

*Fifth limb (Fig. 14h):* The dorsal claw-seta on the distal segment of the exopodite is about 80% the length of the longer claw-seta; the ventral seta is exceptionally short, only 1/5 the length of the longer claw-seta. The 2nd segment has 2 ventral and 1 dorsal setae and the 1st segment 7 setae, of which 3 are plumose, and a longer dorsal seta.

*Sixth limb (Fig. 14e):* The dorsal claw-seta on the distal segment of the exopodite is around 72% the length of the exceptionally longer claw-seta, whereas the ventral seta is exceptionally short, around 1/10 the length of the longer claw-seta. The penultimate segment has a dorsal and a ventral seta, the 2nd segment 1 ventral seta, and the 1st segment 5 plumose ventral setae and 2 dorsal setae and is covered with hairs proximally. The epipodial appendage has 3 groups of 6-5-5 long plumose setae each.

*Furca (Fig. 14f):* This has 8 slim claws and a single unpaired bristle.

*Penis (Fig. 14g):* This is relatively short and plump, thicker at the middle, and rounded at the tip.

**REMARKS.**—*A. bimucronata* n. sp. is *ventricosa*-shaped, and is closely related to *A. ventricosa*, *A. fabiformis*, and *A. bispicula* n. sp., but differs from these species either in features of the frontal organ or number of claws on the furca, and also in the relative lengths of the basal segment of the exopodite of the 2nd antenna to the shaft and of the 2 bristles on the basal segment of the endopodite. It differs from all the other species in having a very short ventral seta on the distal segments of the 5th and 6th limbs.

### *Archiconchoecia bifurcata* new species

Figures 15-16

**HOLOTYPE.**—Female, 1.65 mm long by 0.90 mm high. Collected 13 April 1969 in a tow from 1000-1500 m. Two slides, deposited in the National Museum of Natural History, Smithsonian Institution (NMNH 171289).

**PARATYPES.**—Immature female, 1.4 mm long by 0.8 mm high. Collected 24 July 1968 in a tow from 1000-1500 m. Two slides. Immature male, 1.25 mm long by 0.72 mm high. Collected 12 September 1968 in a tow from 1000-1500 m. One slide. Slides deposited in the National Museum of Natural History (NMNH 171290 and 171291).

**TYPE LOCALITY.**—Station "S": 32°10'N, 64°30'W, in the Sargasso Sea.

**ETYMOLOGY.**—The specific name is derived from the Latin "furcatus", meaning forked, and refers to the bifurcate frontal organ.

**DESCRIPTION OF FEMALE.**—*Shell (Fig. 15a-c):* Anterior margin swollen, ventral margin nearly straight, posterior margin rounded, *ventricosa*-shaped. No indication of sculpturing on shell. Height of shell slightly greater than half the length. Right asymmetrical gland approximately half way up the posterior margin, left gland at posterodorsal corner; glands well developed. Shoulder vaults not developed, shell evenly rounded in anterior or posterior view.

*Frontal organ and first antenna (Fig. 15d, e):* Frontal organ jointed, slightly longer than the extended segments of the 1st antenna, forked at tip with 2 sharp points. First antenna as in most of the other species, with a strong coarsely spinous dorsal bristle on the 2nd segment, and 6 long slim filaments, pointed at the tips and of equal length, borne on the 5th and 6th segments. A few spinules dorsally on the 4th segment.

*Second antenna (Fig. 15f, g):* The basal segment of the exopodite is 58-63% the length of the shaft. The proximal bristle on the basal segment of the endopodite is ca. 60% the length of the distal bristle; both are coarsely spinous and are borne on a rounded protuberance. The 5 long slim filaments on the distal segment of the endopodite are subequal in length and pointed at the tip. No hairs or spinules were noted on the endopodite.

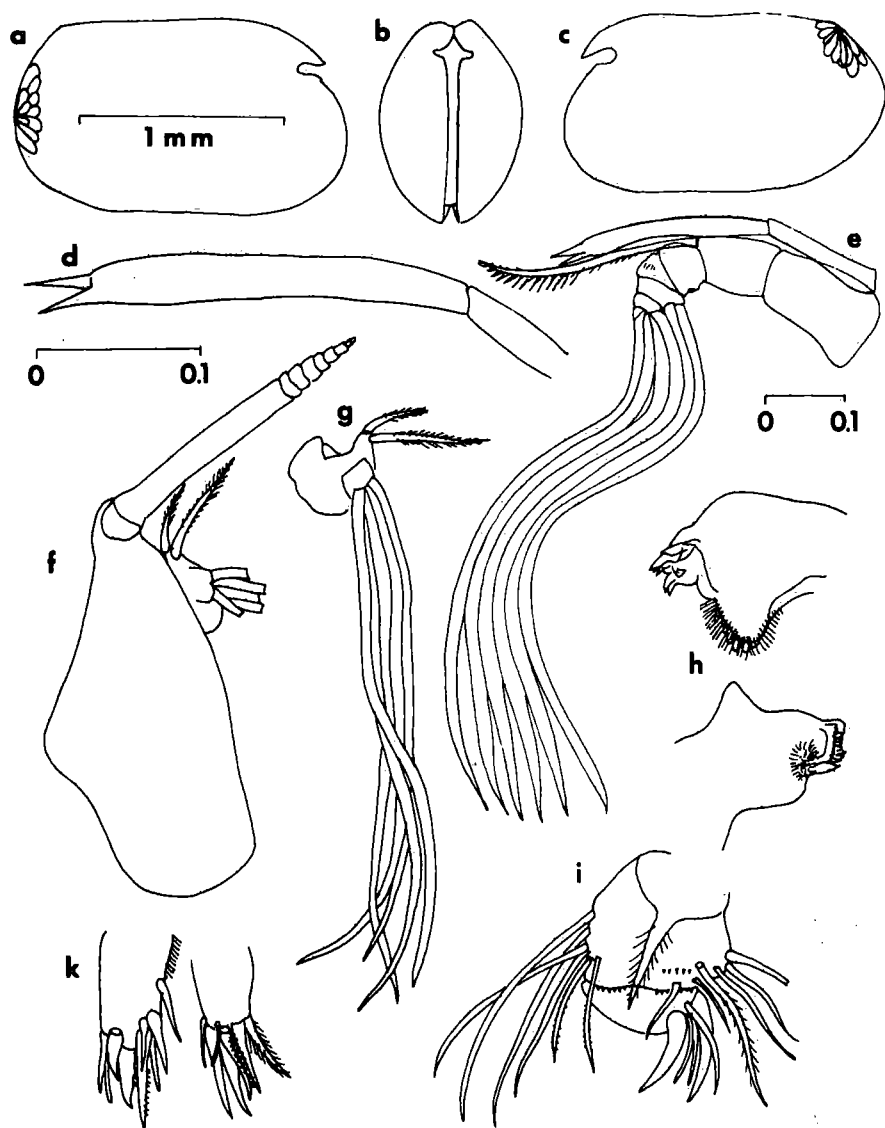


FIGURE 15.—*Archiconchoecia bifurcata* n. sp., Female. (a-c) Lateral view of right shell, anterior view, lateral view of left shell; (d) Distal segment of frontal organ, (e) Frontal organ and 1st antenna; (f) 2nd antenna, lacking exopodite setae and endopodite filaments; (g) Endopodite of 2nd antenna; (h) 2 views of tooththrows and masticatory pad of coxa of mandible; (i) Endopodite of maxilla; and (k) Coxal and precoxal endites of maxilla. Scale on a for a-c, at upper left for d, h, i, k, at upper right for e-g. Scales in mm.

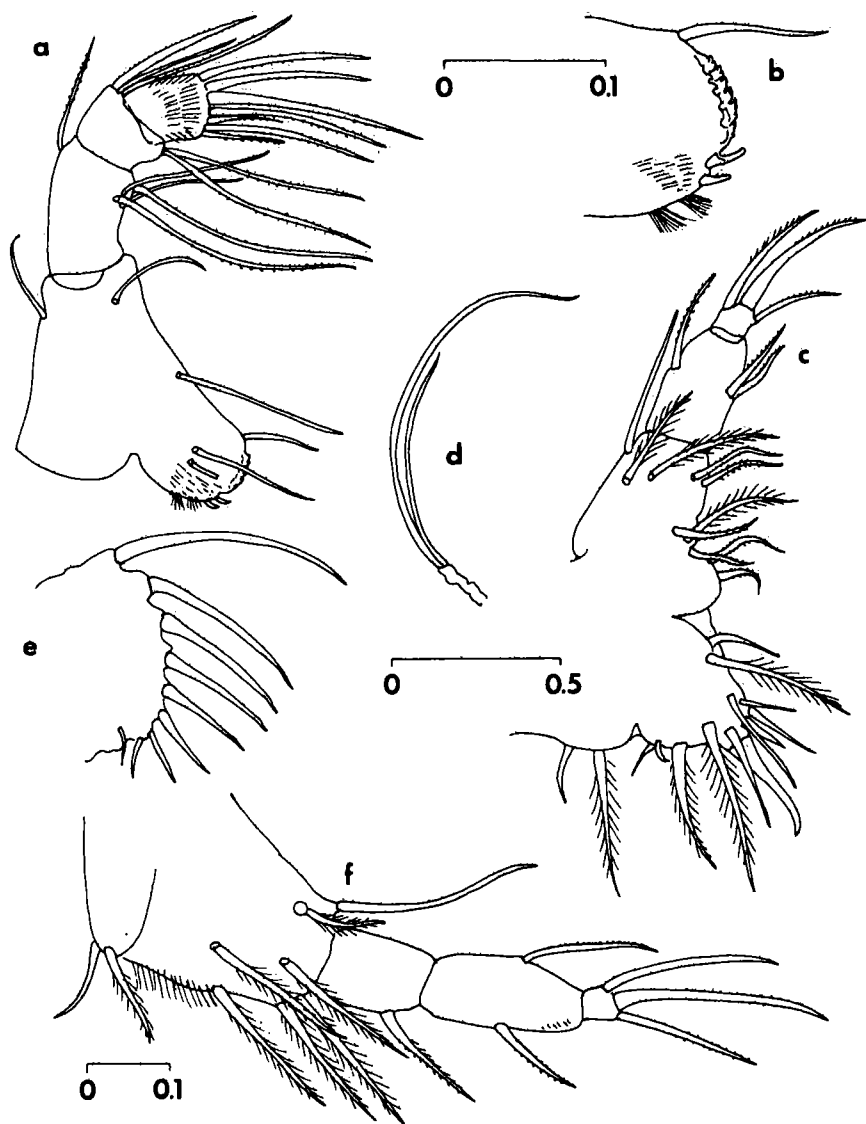


FIGURE 16.—*Archiconchoecia bifurcata* n. sp., Female. (a) Endopodite and basale of mandible; (b) Toothrow of basale; (c) 5th limb; (d) 7th limb; (e) Furca; and (f) 6th limb. Scale at bottom left for a and d, at top for b, c, f, at center for e. Scales in mm.

**Mandible** (Fig. 15h, 16a, b): The distal segment of the endopodite is relatively short and square and covered with hairs. The setation of the endopodite and basale is similar to that of most of the other species. The tooththrow of the basale consists of 6 partially separated serrated teeth and 2 large teeth, as in the other species. The coxa has several tooththrows (Fig. 15h), but the masticatory pad is exceptionally protuberant and is covered with bristles and large denticles.

**Maxilla** (Fig. 15i, k): On the anterior margin of the basal segment of the endopodite are 2 short and 4 long nonplumose setae; on the posterior side are 4 setae, 1 plumose, and 2 short lateral setae. The distal margin of the basal segment is armed with spines. The distal segment has the usual 2 relatively short and thick claws and 3 short setae. The coxal endite has at least 9 bristles, the precoxal 7, of which several are spinous.

**Fifth limb** (Fig. 16c): The dorsal claw-seta on the distal segment of the exopodite is only a little shorter than the strong longer distal claw-seta, which is almost twice as long as the ventral seta. All 3 setae are unusually strong and thick. The 2nd segment has 1 dorsal and 2 ventral setae, and the 1st segment 9 setae, 3 plumose, plus a relatively long dorsal seta. The protopodite and endopodite have a total of 12 setae, 4 plumose, and a large thick claw and a small claw. The epipodial appendage is in 3 groups of 4-5-4 long plumose setae each.

**Sixth limb** (Fig. 16f): The 3 setae on the distal segment of the exopodite do not differ greatly in length; the dorsal claw-seta is around 83% the length of the longer claw-seta, and the ventral seta is about 66% the length of the longer seta. The penultimate segment has a dorsal and a ventral seta and some hairs ventrally, the 2nd segment a single ventral seta, and the 1st segment 6 plumose setae and a slim bare dorsal seta. The epipodial appendage has 3 groups of 5-5-7 long plumose setae each, one of the latter being much smaller than the other 6.

**Furca** (Fig. 16e): This has 8 claws and a small unpaired bristle. The immature female and the immature male both had 7 claws on the furca.

**Seventh limb** (Fig. 16d): This bears 2 bare setae, the shorter 56% the length of the longer.

**REMARKS.**—This species appears to be most closely related to *A. poulseni* n. sp., with which it agrees in having a bifurcate frontal organ, but from which it differs in lacking hairs or spinules on the frontal organ and on the basal segment of the endopodite of the 2nd antenna, and in having 8 claws on the furca, rather than 7. Poulsen (1969) did not describe the relative lengths of the basal segment of the exopodite of the 2nd antenna to the shaft, nor say whether the 5 filaments on the distal segment of the 2nd antenna were equal or unequal in length. However *A. bifurcata* n. sp. differs from *A. poulseni* n. sp. in the setation of the endopodite of the maxilla and of the 5th limb. *A. bifurcata* n. sp. differs from other species of *Archiconchoecia*, as well as other *ventricosa*-shaped species, in having a jointed bifurcate frontal organ and in the relative lengths of the basal segment of the exopodite of the 2nd antenna to the shaft, and of the 2 bristles on the basal segment of the endopodite.

### *Archiconchoecia gastrodes* new species

#### Figures 17-18

**HOLOTYPE.**—Female, 1.85 mm long by 0.87 mm high. One slide, deposited in the National Museum of Natural History, Smithsonian Institution (NMNH 171292).

**TYPE LOCALITY.**—Station "S": 32°10'N, 64°30'W, in the Sargasso Sea, collected 19 February 1970 in a tow from 1000-1500 m.



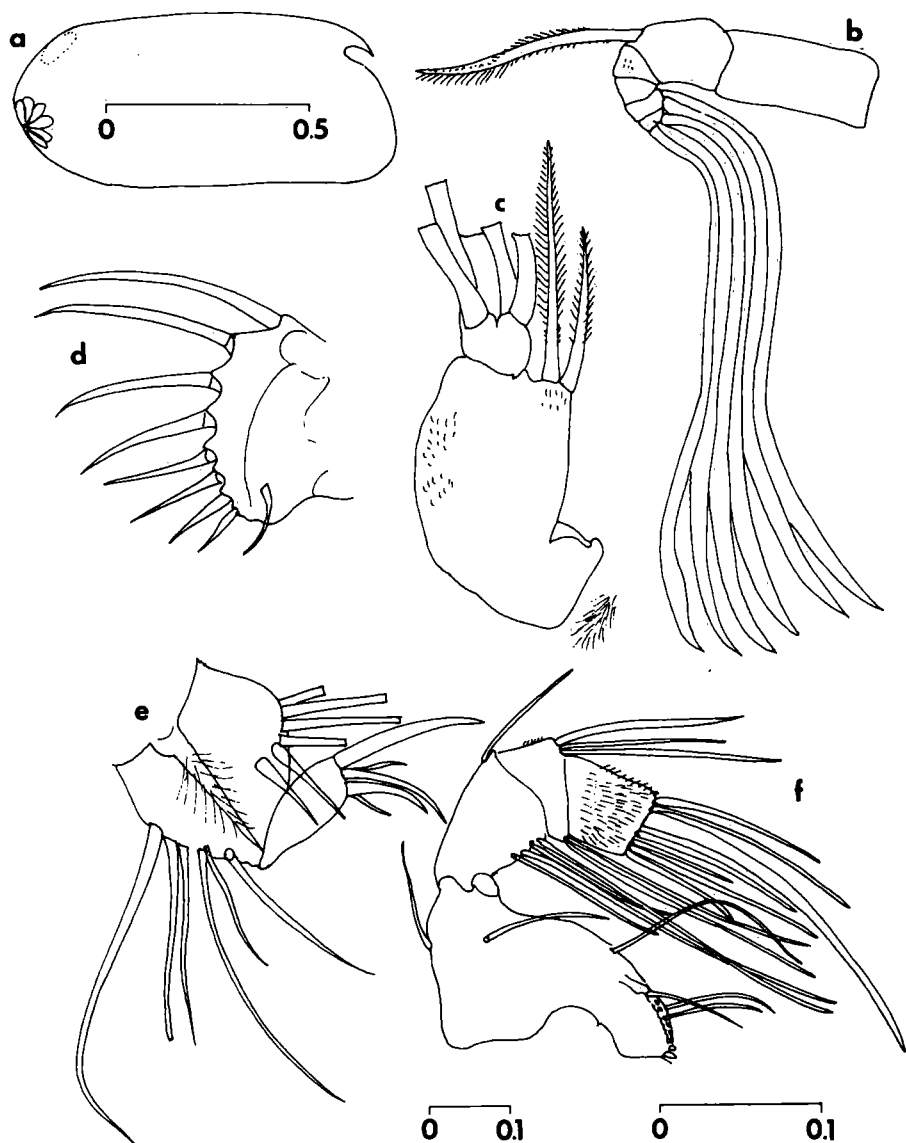


FIGURE 17.—*Archiconchoecia gastroides* n. sp., Female. (a) Lateral view of female; (b) 1st antenna; (c) Endopodite of 2nd antenna, filaments cut off; (d) Furca; (e) Endopodite of maxilla; and (f) Endopodite and basale of mandible. Scale on a for a, at center bottom for b, d, f, at right bottom for c, e. Scales in mm.



FIGURE 18.—*Archiconchoecia gastrodes* n. sp., Female. (a) Toothrows and masticatory pad of coxa; (b) Endopodite of 2nd antenna; (c) 2nd antenna, lacking exopodite setae and endopodite filaments; (d) 5th limb; and (e) 6th limb. Scale at bottom left for a, d, e, at bottom right for b, at bottom center for c. Scales in mm.

ETYMOLOGY.—The specific name is from the Greek "gastrodes", meaning pot-bellied, and refers to the swollen anterior margin of the shell.

DESCRIPTION OF FEMALE.—*Shell* (Fig. 17a): Anterior margin swollen, ventral margin almost straight, posterior margin rounded, *ventricosa*-shaped. No indication of sculpturing on shell. Height of shell a little less than half the length. Right asymmetrical gland between  $1/3$  and  $1/2$  the shell height on the posterior margin, left gland near posterodorsal corner.

*First antenna* (Fig. 17b): Unfortunately the frontal organ of this specimen was lost, so it is not known if it was bifurcate, rounded, or with prolongations. The 1st antenna is similar to that of most of the other species, with a long strong spinous dorsal seta on the 2nd segment, and 6 long filaments of equal length and pointed at the tip borne on the 5th and 6th segments. The 3rd segment has a few spinules dorsally.

*Second antenna* (Fig. 17c, 18b, c): The basal segment of the exopodite is around 60% the length of the shaft. The proximal bristle on the basal segment of the endopodite is about 64% the length of the distal bristle. The 2 bristles are not borne on a noticeably rounded protuberance, as in *A. bifurcata*, n. sp. The long thin filaments on the distal segment of the endopodite are unequal in length. On the basal segment of the endopodite, there are a few spinules ventrally and near the bases of the 2 bristles. On the shaft, just beneath the attachment of the endopodite, is a bunch of long hairs.

*Mandible* (Fig. 17f, 18a): The setation of the endopodite and basale is as in the other species, and the toothrow of the basale similarly consists of 6 imperfectly separated serrated teeth and 2 large teeth. The coxa has several closely set tooththrows, and the masticatory pad consists of small spines or bristles as in most of the other species.

*Maxilla* (Fig. 17e): The basal segment of the endopodite has 6 slim bare setae on the anterior side, 1 much shorter than the others. There are also 6 bare setae posteriorly, and no spines or spinules on the distal margin, as in *A. bifurcata*, n. sp. The 2 claws on the distal segment are exceptionally slim, and 2 of the 3 setae are quite slim and short. The coxal endite has 9 curving bristles, the precoxal at least 8, of which several are long and spinous.

*Fifth limb* (Fig. 18d): The setae on the distal segment of the exopodite are slim, the ventral seta being 37% the length of the longer claw-seta, the dorsal seta 74% the length of the longest seta. The 2nd segment has 2 ventral and 1 dorsal seta and is covered with hairs ventrally. The 1st segment has 10 setae, 3 plumose, and a longer dorsal seta; it has some hairs dorsally and ventrally. The protopodite and endopodite have 10 setae, 4 plumose, and 2 relatively slim claws. The epipodial appendage has 3 groups of 4-5-4 long plumose setae each.

*Sixth limb* (Fig. 18e): The relative lengths of the slim setae on the distal segment of the exopodite are similar to those on the distal segment of the 5th limb; the ventral seta is around 40% the length of the longer claw-seta, the dorsal seta around 78% the length of the longer seta. The penultimate segment has a dorsal and a ventral seta, the 2nd segment 1 ventral seta, and the 1st segment 6 plumose setae and a long bare dorsal seta. The 1st segment is covered with hairs ventrally. The epipodial appendage has 3 groups of 5-5-6 long plumose setae each.

*Furca* (Fig. 17d): This has 8 slim claws and a single unpaired bristle.

REMARKS.—*A. gastrodes* n. sp. is in the same size range as *A. poulsenii* n. sp. and *A. bifurcata* n. sp., but it differs from the former in having 8 claws on the furca and from both these species, as well as from other species, in the relative lengths of the distal setae on the 5th and 6th limbs, and in details of the endopodite of the 2nd antenna and the setation of the endopodite of the maxilla.

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