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DESCRIPTION OF THE NEW GENUS *ALLOPATHES* (CNIDARIA: ANTIPATHARIA) AND ITS TYPE SPECIES *CIRRIPATHES DESBONNI*

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Abstract.—The rarely collected species originally described as *Cirripathes desbonni* is redescribed based on two specimens. A neotype is designated because the type is presumed to be lost. A new genus, *Allopathes,* is proposed for this species based on its unusual colony form: numerous elongate, mostly unbranched stems originating from a short, trunk-like base. *Antipathes robillardi* Bell is also placed in this genus, which gives the genus a range of western Atlantic and Mauritius at 129–161 m.

In September, 1989 the second author participated in a cruise of the *Johnson-Sea-Link I* research submersible (stations 2582–2595) off the southeastern coast of Louisiana. Eight species of Antipatharia were observed, photographed, and collected (Cairns et al. 1994), one of which was *Allopathes desbonni.* This species is composed of numerous long, slender, mostly unbranched stems arising from a stout, trunk-like base. We consider the distinctive nature of the corallum of this species and one other, *A. robillardi,* to justify establishing a new genus, and include a redescription of the species.

Allopathes, new genus

Diagnosis.—Corallum consisting of numerous elongate stems arising from a short trunk-like base. Stems generally straight but may be slightly coiled at their distal end; mostly unbranched, but occasionally with first and second-order branches arising from the lowermost parts of the stems. Spines typically arranged in verticils around circumference of axis. Polyps in a single row along length of axis.

Discussion.—As was noted by Duchassaing & Michelotti (1864) the generic affinites of *Cirripathes* (=*Allopathes*) *desbonni* are not clearly defined. The individual stems resemble those of *Cirrhipathes* and *Stichopathes,* and the arrangement of the polyps in a single row would tend to associate the species more with *Stichopathes.* The latter was treated as a subgenus of *Cirrhipathes* by some (e.g., Van Pesch 1914). However, the morphology of the spines of *Allopathes,* and its tendency to develop long branches, would suggest an affinity with *Antipathes verticillata* (Brook 1889). Placing *Antipathes desbonni* in *Stichopathes* or *Cirrhipathes* would substantially alter the major diagnostic character of those genera, i.e., the unbranched growth form of the corallum, which we do not believe to be justified. Likewise, placing *A. desbonni* in *Antipathes* would diminish the significance of the unique morphology of the corallum. Although the genus *Antipathes* currently is a heterogeneous assemblage of species, it is our view that natural groupings of species tend to center around distinct types of skeletal morphology which, when evaluated in association with characteristics of the spines and polyps, are likely to define generic or subgeneric taxa. Therefore, we consider it appropriate to establish a new genus for *desbonni* and also include in it *Antipathes robillardi* Bell, 1891.

Etymology.—From Greek *allos,* other +

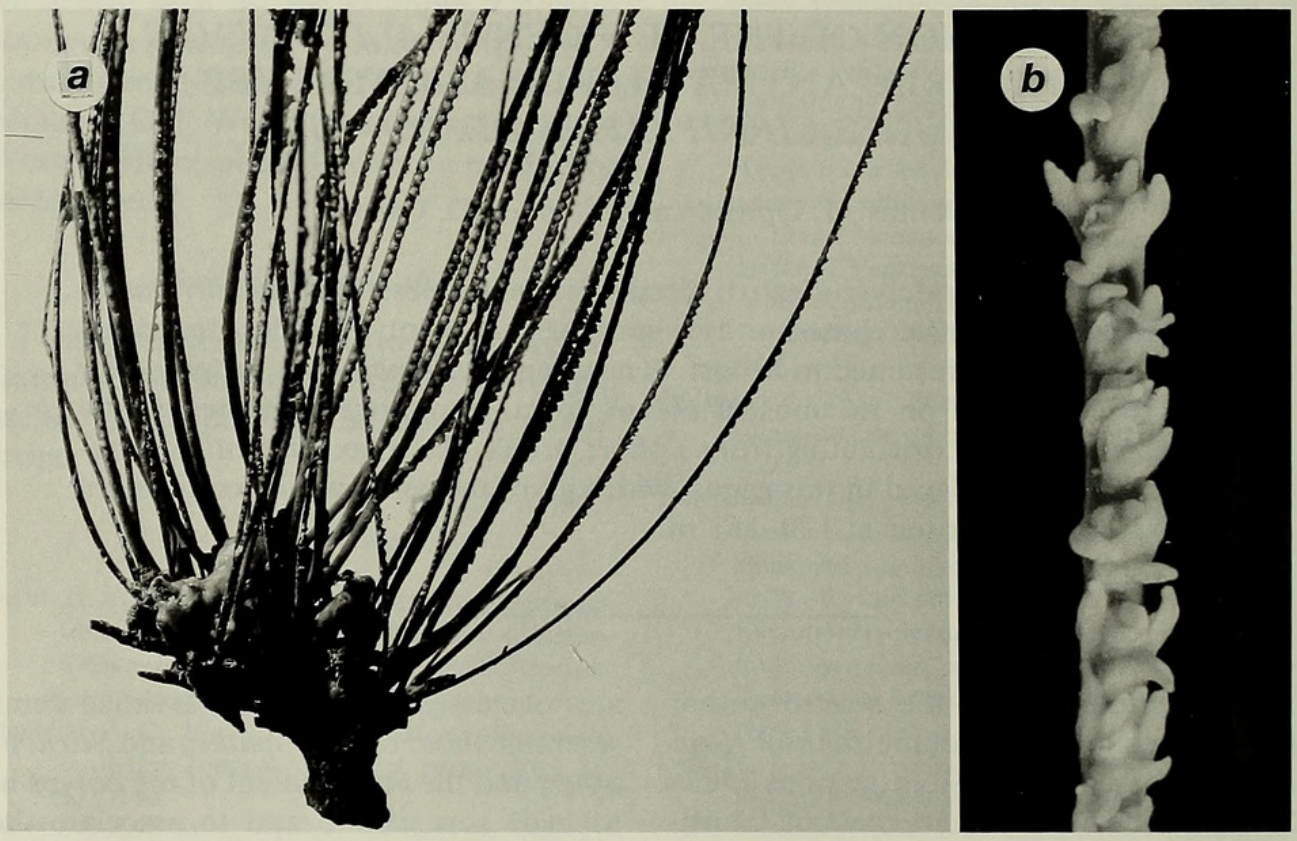

Fig. 1. *Allopathes desbonni,* neotype (USNM 88327). a, Basal section of corallum showing the origin of the stems, ×0.75; b, Section of stem with polyps, ×6.

pathes, second component of *Antipathes,* in allusion to its taxonomic relationship. Gender: feminine.

Type species.—*Cirripathes desbonni,* here designated. *Cirripathes* is an incorrect spelling of *Cirrhipathes.*

Allopathes desbonni
(Duchassaing & Michelotti, 1864),
new combination
Figs. 1–4

Cirripathes Desbonni Duchassaing & Michelotti, 1864:142.

Not *Antipathes* (*Cirrhipathes*) *Desbonnii.*—Pourtalès, 1874:46.—1878:209 (=*Stichopathes pourtalesi* Brook).

Antipathes (*Cirrhipathes*) *Desbonni.*—Pourtalès, 1880:114, pl. iii, figs. 6–7.

Stichopathes? *desbonni.*—Brook, 1889:92.

Material examined.—Gulf of Mexico, off southeastern Louisiana, 27°44.62′N, 91°07.9′W, 129–144 m, *Johnson-Sea-Link I* Stn 2585, USNM 88327, neotype.—Off Montserrat, Lesser Antilles, *Blake* Stn 155, 88 fm (=161 m), one specimen in the Museum of Comparative Zoology, Harvard University.

Diagnosis.—Corallum large, about 1 m in height, with numerous mostly unbranched stems arising from a short trunk-like base (Fig. 1a); stems generally straight and stiff, but flexible and somewhat coiled near apex; occasionally branched near base. Spines typically conical, acute, and usually 0.10–0.14 mm (but up to 0.20 mm) from midpoint of base to apex; with cone-shaped tubercles on upper two-thirds or more of surface. Spines arranged in verticils of varying regularity and in longitudinal rows with 3 or 4 spines per millimeter in each row. Polyps arranged in one row along stems and branches; 1.0–1.2 mm in transverse diameter (from proximal side of proximal lateral tentacles to distal side of distal lateral tentacles); interpolypar space about 0.4–0.5 mm; from 5 to 7 polyps per centimeter (Fig. 1b).

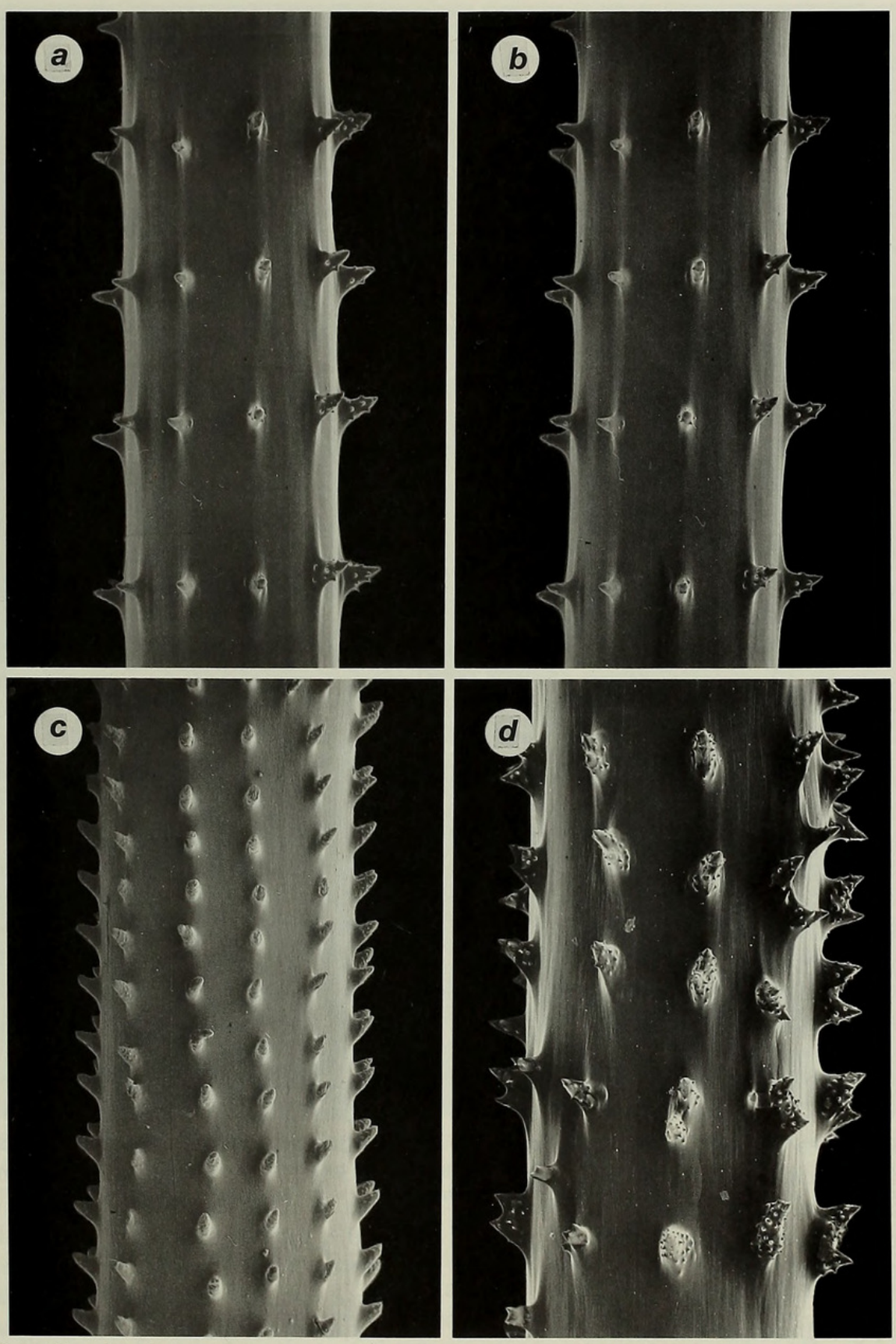

Fig. 2. *Allopathes desbonni,* neotype (USNM 88327). a, b, Section of stem 0.5 mm in diameter, showing arrangement of spines, stereo pair, ×59; c, Section of stem 1.5 mm in diameter, ×25; d, Section of stem 0.85 mm in diameter with bifid spines, ×46.

Description.—The neotype consists of a cluster of about 40 stems attached to a 4 cm long "trunk," as well as several dozen detached pieces. This specimen was only part of a much larger colony, the remainder of which was not collected. Individual stems reach a maximum length of about 90 cm and are 0.5–2.3 mm in diameter at their base (average 1.47 mm, $n = 24$). Stems 46, 53 and 75 cm long have basal diameters of 1.1, 2.3, and 1.5 mm, respectively. All stems arise directly from the base (Fig. 1a) and most are unbranched; however, a few have a single branch that originates not more than 1 centimeter above the basal end of the stem. The branches are unbranched and can be as long as the stem from which they arise. The axial diameter of a stem or branch decreases regularly from base to apex, e.g., for one 52-cm long stem, the diameter is 2.3 mm at the base, 1.7 mm at a height of 10 cm, 1.1 mm at 30 cm, 0.7 mm at 40 cm, and 0.3 mm at its distal end.

The stems and branches of the corallum radiate upward from the base. They are relatively straight and stiff for most of their length; however, near the apex (i.e., upper 10 cm or more) they curve and even form a loose coil. This occurs regardless of the overall length of the stem or branch, and is associated with an increased flexibility of the axis due to a very thin sclerenchymal layer and a relatively wide central axial canal (0.20–0.36 mm). Because of these factors the tips of the stems and branches collapse when dried.

Axial spines (Figs. 2, 3, 4a–c) are arranged in longitudinal rows and also in verticils, although the regularity of the verticils varies considerably from point to point. Six or seven longitudinal rows of spines can be seen in viewing one side of the axis and 13 rows were counted around the entire circumference of one segment of axis having a diameter of 1.6 mm. The distance between the spines in each row varies on different parts of the axis and ranges from 0.24 to 0.40 mm; however, in general, there are usually 3 or 4 spines per millimeter in each row.

Spines are generally uniform in size at any given point on the corallum, though they vary in size and appearance along the length of the axis, as well as around the circumference. Spines on the polyp-side of the axis are generally larger than those on the abpolypar side. The spines also increase in size from the distal end of a stem or branch to the basal end; however, the rate of increase is not uniform from one stem or branch to another. About 1 cm from the distal end where the axial diameter is about 0.2 mm, the spines are quite small, 0.04–0.06 mm from the tip to the center of the base, somewhat compressed laterally, triangular in shape, and have only a few small conical protuberances on their surface. With increasing axial diameter the spines become larger; i.e., 0.07–0.09 mm (axial diameter about 0.3 mm), 0.10–0.12 mm (axial diameter 0.4–0.7 mm, Fig. 3a), 0.10–0.16 mm (axial diameter 0.7–1.0 mm, Fig. 3b), and 0.12–0.20 mm (axial diameter over 1.0 mm). Overall, the typical polypar spine is 0.10–0.14 mm tall, conical in shape, with an acute to slightly rounded apex, and with cone-shaped tubercles scattered over the surface. The corresponding abpolypar spines are generally 0.02 to 0.06 mm smaller and usually have fewer surface tubercles. For example, at the midpoint of one 30-cm long stem (axial diameter about 0.9 mm) the polypar spines measure 0.10–0.12 mm and the abpolypar spines 0.08 mm. The spines on the lowermost portion of each stem (usually within 5 to 10 cm of the basal end and regardless of total length of the stem) differ from the typical spines in being almost smooth-surfaced (Figs. 2c, 3c). These spines are large (usually 0.16–0.20 mm), have a sharp apex and tend to be directed distally. In addition, on some stems, and particularly where the axial diameter is 1.0 mm or more, the polypar spines can become rather wide and blunt with numerous surface tubercles (Figs. 4b, c). The location and abundance

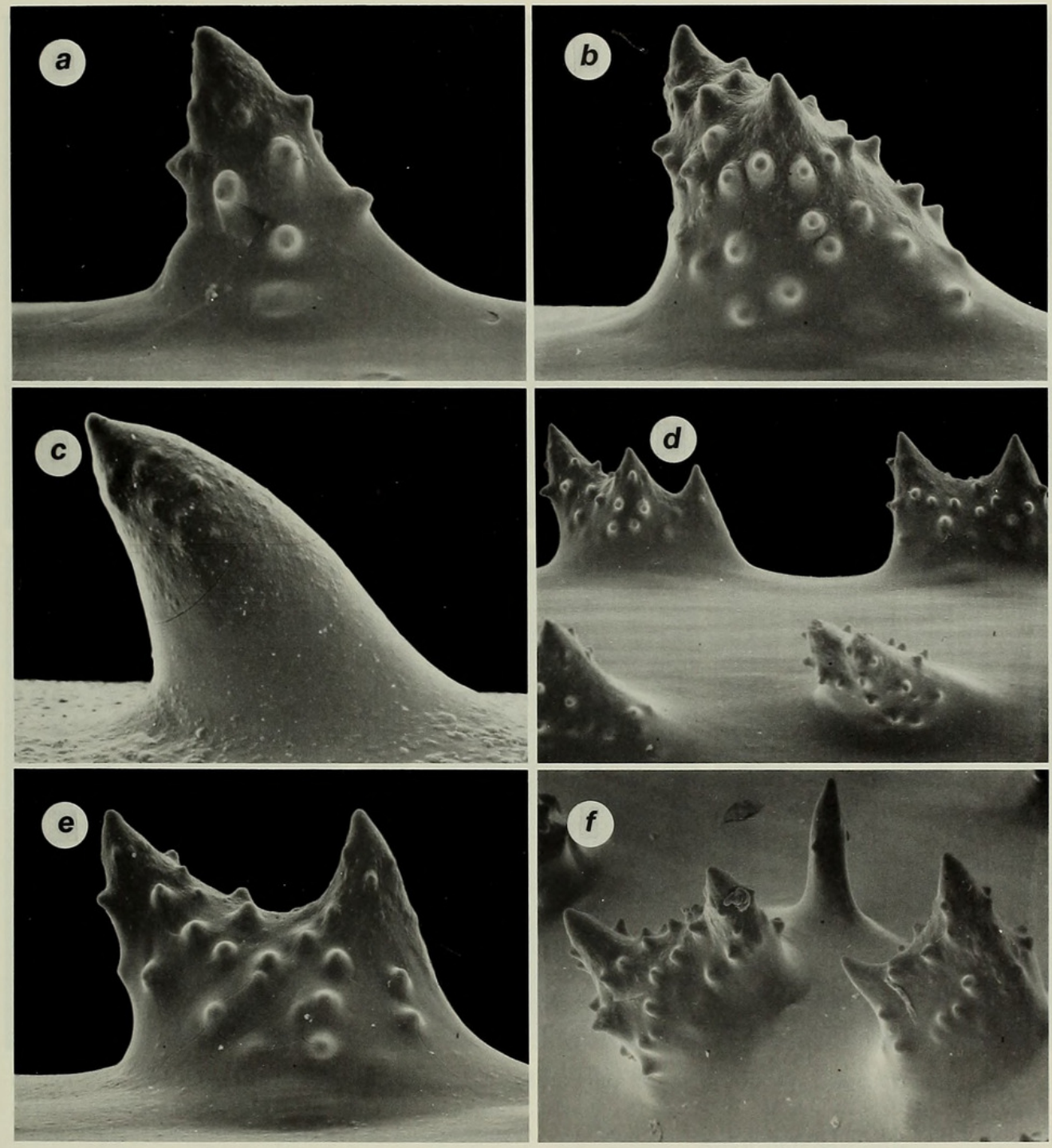

Fig. 3. *Allopathes desbonni*, neotype (USNM 88327). a, Spine from section of stem about 0.5 mm diameter, ×365; b, Spine from section of stem about 0.8 mm in diameter, ×245; c, Smooth spine from lowermost portion of stem, ×240; d–f, Bifid and trifid spines from stem 0.85 mm in diameter, ×115, ×245, ×170, respectively.

of these blunt spines varies from stem to stem, but they are never found at the distal or basal ends of the stem. A very atypical condition was found on sections of one stem where the primary polypar spines were bifurcated and trifurcated and occasionally accompanied by an acicular secondary spine (Figs. 2d, 3d–f).

Polyps are arranged in a single row along the entire length of the stems and branches (Fig. 1b). They are generally 1.0–1.2 mm in transverse diameter (from the distal side of the distal lateral tentacles to the proximal side of the proximal lateral tentacles), and separated by a space of 0.4–0.5 mm, resulting in about 6 or 7 polyps per centi-

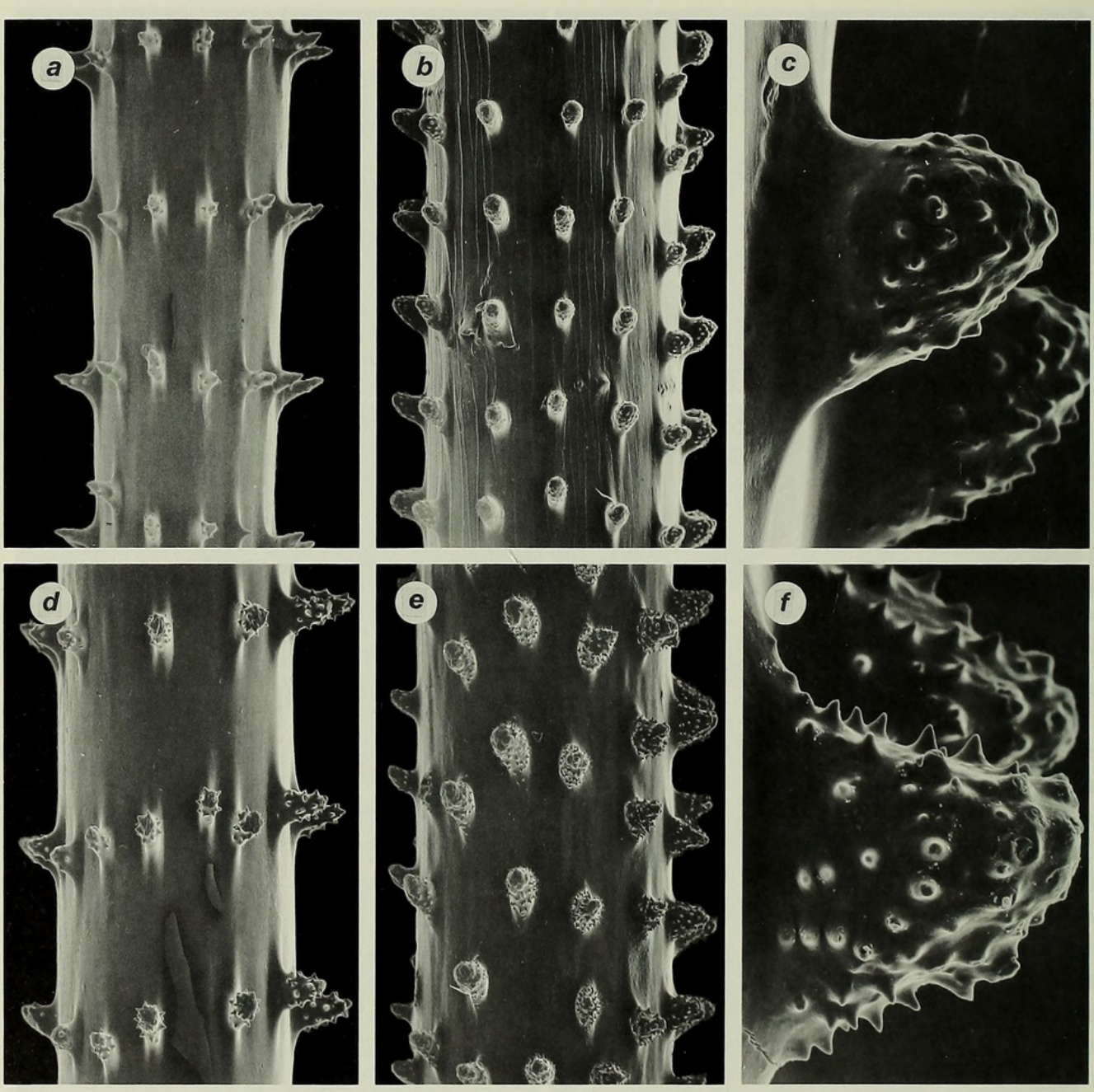

Fig. 4. *Allopathes desbonni* (a–c, neotype, USNM 88327; d–f, *Blake* Stn 155). a, Section of stem 0.3 mm in diameter, ×70; b, Section of stem 0.9 mm in diameter, with large, blunt spines, ×31; c, Blunt spine, ×250; d, Section of stem 0.4 mm in diameter, ×69; e, Section of stem about 0.8 mm in diameter with large, blunt spines, ×34; f, Blune spine, ×25.

meter. Near the base of the stems there can be as few as 5 polyps per centimeter. In a preserved state the sagittal tentacles are about 1.5 mm long and appear about twice as long as the lateral tentacles.

Remarks.—Duchassaing & Michelotti's (1864) original description of this species is as follows: "Simplex filiformis, caudata, nigra, spinis minutis, confluentibus. Species lenta, nec flexuose spiralis . . ." None of Duchassaing & Michelotti's antipatharian types are in the collections of the Turin Museum (Rossi, pers. comm.), and it is unlikely that they still exist. For this reason a neotype is designated.

Pourtalès (1874, 1878) originally confused Duchassaing & Michelotti's species with a single-stemmed *Cirrhipathes,* but in

the *Blake* collection Pourtalès (1880) found one cluster of stems joined at the base which he recognized as the true *C. desbonni.* He noted that the axial spines on the younger parts of the corallum were arranged in verticils, as well as in longitudinal rows; however, he did not provide a detailed description of the spines and made no mention of surface sculpturing.

We re-examined the *Blake* specimen and found it to consist of about twelve stems, the longest of which is about 46 cm in length and about 1.5 mm in basal diameter. Most are broken at their distal end and also broken off from the trunk. Neither the size of the spines (0.10–0.18 mm) nor their density (3 or 4 per mm in each row) are appreciably different from the *Johnson-Sea-Link* specimen and, as in the latter case, the spines on the basal end of the stems are relatively smooth and acute, whereas others slightly higher up are rather wide and blunt. However, on many of the stems from the *Blake* specimen, the spines have much more strongly developed surface sculpturing than the *Johnson-Sea-Link* specimen. The surface tubercles are larger and more distinct, even on spines on the abpolypar side of the axis (Figs. 4d–f). Polyps are not present on the *Blake* specimen.

Whether the differences in surface sculpturing of the spines is indicative of a species level differentiation is difficult to determine in view of the condition and limited amount of material available.

Comparisons.—A species of antipatharian from Mauritius, *Antipathes robillardi* Bell, 1891, is very similar in general appearance to *A. desbonni.* The type specimen of *A. robillardi* could not be located in the collections of the British Museum so a direct comparison with *A. desbonni* was not possible. However, from Bell's description and illustration, it can be determined that the two species are of comparable size (stems about 1 m long), and both have spines arranged in verticils. Bell reported that the corallum of *A. robillardi* consisted of several trunks which gave rise to numerous stems, many of which were simple, but some were said to "divide at once two or three times," and one was said to divide at a height greater than 7.5 cm from the base. In the neotype of *A. desbonni* very few of the stems divide, and none at a height greater than 1 cm. Bell reported that the spines of *A. robillardi* were blunt and his illustration shows eight rows in lateral view; however, the spines were not described as having any surface sculpturing, and the illustration is not detailed enough to indicate whether they have conical tubercles like those in the neotype of *A. desbonni.* There is, however, another species from Mauritius, *Antipathes verticillata* (Brook), that has verticillated spines that are very similar in appearance to those of *A. desbonni*; i.e., they are conical, acute, and covered with sharp, conical tubercles (Brook 1889: plate XII, figs. 25 and 25a). Significantly though, the corallum of *A. verticillata* differs from that of *A. desbonni* and *A. robillardi* in being branched, with long simple, mostly unilaterally arranged branchlets, a condition not unlike that occurring in the western Atlantic species *Antipathes pedata.* Spines in the latter species are not arranged in verticils; however, they do have distinct surface tubercles not unlike those occurring in *A. verticillata.*

Distribution.—Gulf of Mexico off southeastern Louisiana; off Montserrat, Lesser Antilles; 129–161 m.

Acknowledgments

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