

***Asterospicularia randalli*: A New Species of  
Asterospiculariidae (Octocorallia: Alcyonacea)  
from Guam<sup>1</sup>**

MICHAEL J. GAWEL

*The Marine Laboratory, University of Guam, P. O. Box EK, Agana, Guam 96910*

**Abstract**—*Asterospicularia randalli*, a new second species of a previously monotypic family Asterospiculariidae is described. The species is characterized by the presence of both stellate and thin oval disc-like sclerites.

While conducting a quantitative survey of the soft corals of Cocos Lagoon at the southern end of Guam from September 1973 to June 1974 (Randall et al., 1975), I discovered numerous colonies of a small species of soft coral of the order Alcyonacea. Only a small number of specimens was collected at that time to be examined microscopically later. The shape of the internal calcareous sclerites (spicules) constitutes one of the most important characters for distinguishing the families, genera, and species of Alcyonacea. (On the recommendation of Frederick M. Bayer and David L. Pawson of the United States National Museum I am substituting the term "sclerite" for the commonly used word "spicule" which classically referred only to something long, sharp and spine-like.) The very abundant larger sclerites isolated from all examined colonies of this species were found to be identical to the unique sclerites previously known only from a single soft coral colony found thirty-five years ago in southern Taiwan (Utinomi, 1951) and from some questionable fragments from Indonesia (Thomson and Dean, 1931).

Family *Asterospiculariidae* Utinomi, 1951  
Type Genus *Asterospicularia* Utinomi, 1951

The family Asterospiculariidae was created by Utinomi on the basis of a single colony he obtained in June 1938 at the southernmost point of Taiwan. His description of this new genus and species, *Asterospicularia laurae*, was delayed until 1951. The unique characteristics of this specimen which justify its separation from other families of alcyonarians are: 1) numerous stellate sclerites, 2) presence of lacunae or small chambers containing usually more than one sclerite, and 3) no trace of pinnules on the tentacles. Additional characters mentioned in the family description are: 4) bushy growth type, with mushroom-like polyp-bearing lobes and sterile common stalk, 5) polyps of similar size, capable of considerable contraction and with uniform spiculation continuing from the coenenchyme, 6) polyp cavities united by means of

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well-developed endodermal cell-strings or solenia running in mesogloea partitions between sclerite cavities, and 7) no dimorphism of polyps.

***Asterospicularia randalli* n. sp.**

Figs. 1-3

**DIAGNOSIS:** Asterospiculariid with a low (5-20 mm) sterile base giving rise to usually fewer than fifty short stalks, each bearing a capitulum with normally 50 to 100 polyps. Polyps monomorphic, highly contractile, up to 1.5 mm in height and 1 mm in diameter excluding tentacles. Tentacles contractile and bearing three rows of 4 to 8 pinnules on each lateral side. Pinnules highly contractile. Tentacles and pinnules containing flat, oblong, disc-like sclerites .013 to .021 mm in length, some with slight medial constrictions. Coenenchyme between polyps formed of mesogloea full of lacunae, each containing one or more stellate sclerites 0.025 to 0.060 mm in diameter (Fig. 1). Stellate sclerites and lacunae also present in polyps but missing from tips and oral surfaces of tentacles.

**MATERIALS EXAMINED:** Cocos Lagoon, Guam, 0 to 7 m MLLW, Sept. 1973 to May 1974, 83 colonies; Shark's Hole, Guam, 0 to 3 m MLLW, June 1975, 4 colonies.

**HOLOTYPE:** USNM 54134 (Formerly M. J. G. 73.9.20-19). Single colony collected Sept. 20, 1973, at inner edge of windward barrier reef of Cocos Lagoon, Guam in 5 feet of water by Michael J. Gawel.

**PARATYPES:** (all collected at Cocos Lagoon, Guam): USNM 54135—three colonies, Sept. 20, 1973; USNM 54136—six colonies, Mar. 28, 1974; Rijksmuseum N. H., Leiden No. Coel. 11523—six colonies, June 4, 1974; Seto Mar. Bio. Lab., Sirahama, Japan. SMBL-Type No. 267—two colonies, May 2, 1974; B. P. Bishop Museum, Hawaii, No. D475—eight colonies, April 11, 1974; and University of Guam Mar. Lab. No. M. J. G. 74.3.21.1—forty-four colonies, Mar. 21, 1974.

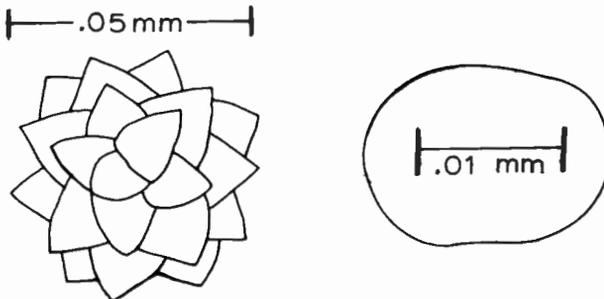


Fig. 1. *Asterospicularia randalli*. A. typical stellate sclerite B. oval disc-like sclerite from the tentacles.



Fig. 2. *Asterospicularia randalli* colony in situ.

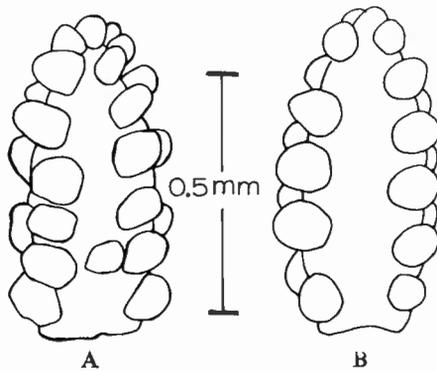


Fig. 3. Typical tentacle of *Asterospicularia randalli* with pinnules expanded. A. oral view. B. aboral view.

**DESCRIPTION:** Colonies usually have 1 to 50 capitula. Most have bases under 5 cm in diameter. However some are almost 15 cm across with a proportionately higher number of capitula. The largest colonies do not have a greater height than most smaller ones, all being under 4 cm tall. Sterile stalks sometimes show external longitudinal grooves or creases below the expanded capitula. Each arises separately from the colony base, not as a branch of an older stalk (Fig. 2).

The monomorphic polyps have 3 rows of 4 to 8 pinnules irregularly arranged along each lateral side of every tentacle (Fig. 3). The outermost row has the greatest number of pinnules. The pinnules of relaxed, preserved specimens are not as expanded as those of living ones in the field, but are finger-shaped, more or less tapering, up to 0.20 mm long and 0.08 mm wide at the base. No pulsation of live polyps is apparent but pinnules, tentacles and polyps rapidly contract when irritated. The polyp can withdraw to expose only a ring of eight highly contracted tentacles but

cannot be completely retracted into the coenenchyme.

No special arrangement of sclerites exists as armament on the polyps, except that the inner sides and tips of tentacles, which are tucked in when contracted, bear the smaller (.013-.021 mm) disc-like rounded sclerites (Fig. 1B) while the aboral, exposed sides of contracted tentacles bear the larger (.05 mm average), spiny stellate sclerites (Fig. 1A). These characteristic asterospiculariid sclerites are the only ones found in the colony base, sterile stalk, coenenchyme, and polyp base. They are inside the lacunae, most of which bear multiples of sclerites.

Zooxanthellae appear to be abundant in the endodermal tissues. They may contribute to the living color which is beige to light pink with paler colony bases.

**ECOLOGY:** Populations of this species were often dominant locally at Cocos Lagoon (southern tip of Guam) and at Shark's Hole (northwestern Guam) with densities up to 24 colonies per m<sup>2</sup>. They are distributed in Guam on the south-eastern windward barrier reef flat, Manell Channel, the patch reefs and eastern lagoon shelf of Cocos Lagoon, and in the depressions of the fringing reef at Shark's Hole. I have found no other populations of *A. randalli* in Guam, throughout the other Mariana Islands, or in Yap.

Many colonies occur at about the level of mean lowest low water, although some are found at depths to 7 m. They are absent from suitable substrata on Cocos leeward barrier reef flat and on extensive shallow fringing reef flats of Guam, possibly because they may require constant circulation of clean, cool (26° to 28°C), well oxygenated water.

All specimens were attached to solid coral rock substrata. Many on the Cocos patch reefs are scattered over long upright skeletons of dead *Acropora formosa* colonies which were probably killed during the extremely low tides of October 1972. Therefore, they may take less than a year to develop into normal-sized colonies with numerous capitula.

**DISCUSSION:** Utinomi's holotype specimen (SMBL-Type No. 65) is the first alcyonarian described as having stellate sclerites. However, similarly shaped sclerites are commonly found in didemnid ascidians and some sponges. In fact, Thomson and Dean (1931) described fragments of probably other specimens of *Asterospicularia* which they called unidentified compound tunicates having zooids with eight tentacles. These specimens can not be found (Verseveldt, pers. comm.).

Utinomi's specimen differs from those of Guam in possessing only one form of sclerite and apparently in having no pinnules on its tentacles. This absence of pinnules is questionable because of his observance of rounded imbedded bodies on the oral surface of the tentacles which could well be contracted pinnules. However, he could not have overlooked the distinct smaller sclerites (Fig. 1B) resembling the flattened discs in many species of Xenidiidae, which are abundant in the tentacles of all of the Guam specimens. This difference of sclerites easily establishes the distinction of this second species.

The oval disc-like sclerites (Fig. 1B) found in *A. randalli* are the same shape and size as those found in many species of the alcyonacean family Xenidiidae. However,

no species of Xenidiidae possesses a second form of sclerite, nor are their sclerites found in the coenenchyme between polyps, nor are their polyps contractile (Roxas, 1933). Therefore the species of *Asterospicularia* cannot be included in Xenidiidae.

The small pinnules occurring on *A. randalli* might be found in additional specimens of *A. laurae* when such are discovered. Their presence de-emphasizes the need of creating a separate family for the genus. Unless intermediate forms can be found, however, this genus cannot be included in the family Alcyoniidae, because of its two unique sclerite types and the presence of more than one sclerite in most coenenchymal lacunae. Therefore, these findings support the recognition of the family Asterospiculariidae and genus *Asterospicularia* with the provision that the diagnosis specify that pinnules may be present on the tentacles and xeniid type disc sclerites may be present.

### Acknowledgements

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