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HETEROPYRAMIS ALCALA AND *THALASSOPHYES FERRARII,* NEW SPECIES OF CLAUSOPHYIDAE (CALYCOPHORAE: SIPHONOPHORAE) FROM THE SOUTH PACIFIC

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Abstract.—Two new species, *Heteropyramis alcala,* and *Thalassophyes ferrarii* are described and compared with the other species of their genera, *Heteropyramis maculata* Moser, 1925, and *Thalassophyes crystallina* Moser, 1925. The material was obtained in the plankton collections made in the South Pacific during the U.S. Antarctic Research Program.

The family *Clausophyidae* Totton and Bargmann, 1965, is characterized by the presence of the somatocyst in both anterior and posterior nectophores. This family includes 5 genera: *Clausophyes,* with two species, *C. ovata* (Kefferstein and Ehlers, 1860), *C. galeata* Lens and van Riemsdijk, 1908; *Chuniphyes,* with two species, *C. multidentata* Lens and van Riemsdijk, 1908; *C. moserae* Totton, 1954; *Crystallophyes* (*C. amigdalina* Moser, 1925); *Heteropyramis* (*H. maculata* Moser, 1925); and *Thalassophyes* (*T. crystallina* Moser, 1925).

The two new Clausophyidae described herein belong to the genera *Heteropyramis* and *Thalassophyes.*

Heteropyramis alcala, new species
Figs. 1–3

Material.—From cruises of R/V *Eltanin* in 1965 and 1966 (see Table 1). Holotype: Polygastric form (nectophore), and eudoxid form (bract + gonophore) from *Eltanin* cruise 25, sta 1697, off Chile, USNM 61064. Paratypes: 1 nectophore, 1 bract, 2 gonophores, from *Eltanin* cruise 16, sta 895, S of New Zealand, USNM 61065.

Etymology.—Named in honor of San Diego de Alcala, patron of the University of San Diego, and the sister city in Spain of San Diego, California.

Description.—Polygastric phase (Fig. 1): The anterior nectophore forms a high pyramid, with a height slightly more than twice its width. It is about 5 mm high and 2.2 mm wide, with 5 ridges. The dorsal and 2 lateral ridges reach the apex of the nectophore, but the 2 ventral ridges only reach a point close to the apex.

The hydroecium is not as deep as in *H. maculata.* It extends up to midlength of the nectophore and is closed by the 2 incomplete ventral ridges which are wider at the inferior part. These ridges have crests of roundish contour at the inferior part.

A series of white triangular spots appear on the lateral ridges and the apex of the nectophore. The ventral ridges and the dorsal ridge have no opaque white spots. In *H. maculata* there are 9 of these spots, one at the apex, another at the

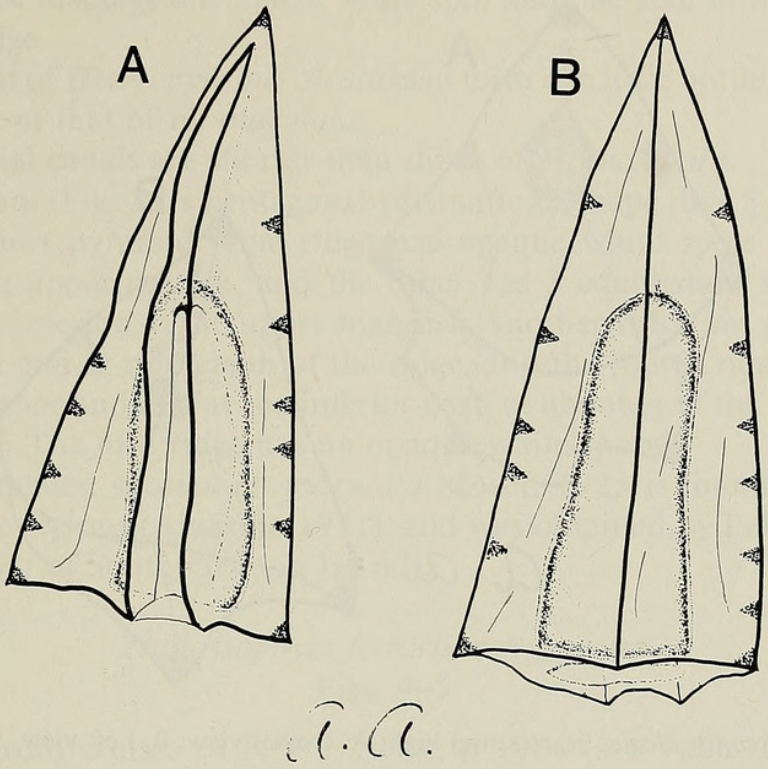

Fig. 1. *Heteropyramis alcala,* nectophore 5 mm high: A, Ventral view; B, Dorsal view.

marginal edge of the lateral ridges, and 2–4 intermediate along those ridges (Totton 1954; Totton and Bargmann 1965).

In *Heteropyramis alcala* the right lateral ridge has 6 opaque white spots, one at the marginal edge, another at midlength of the ridge, 3 about equally spaced between the other 2, and another at midlength of the upper half of the ridge. The left lateral ridge has 7 opaque white spots, one at the marginal inferior corner, another at about midlength of the ridge, and 4 about equally spaced between those 2, plus one at the midpoint of the upper half of the ridge. Another opaque white spot appears at the apex of the nectophore, bringing the total number of opaque white spots to 14.

The nectosac occupies the center of the pyramid, is less than half the width of the nectophore and reaches higher than the midlength of the nectophore. The ostium, opening of the nectosac, is equal in size to the diameter of the nectosac, and the space from the wall of the nectophore to the opening of the nectosac is

Table 1.—Records of *Heteropyramis alcala* in the South Pacific region.

Eltanin cruise	Station	Gear/ tow	Location	Depth	Date	Local time
16	895	MPS[1]	49°17′S, 162°00′E	500–250 m	7 Feb 1965	1110–1124
25	1697	BPS[2]	39°56′S, 85°54′W	1000–500 m	30 Sep 1966	0732–0753
26	1794	BPS	41°58′S, 160°06′E	1000–500 m	7 Dec 1966	1425–1449
26	1803	BPS	47°37′S, 161°49′E	1000–500 m	13 Dec 1966	1052–1112

[1] Multiple plankton sampler.
[2] Bathypelagic plankton sampler.

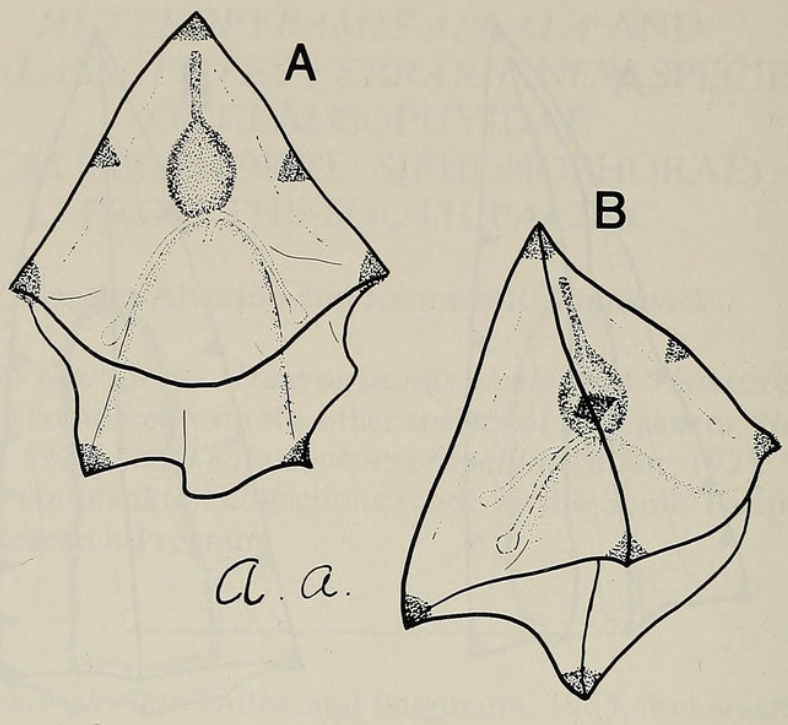

Fig. 2. *Heteropyramis alcala,* bract 3 mm high: A, Dorsal view; B, Left view.

a wide velum. In *H. maculata* the nectosac has a height less than half but more than ⅓ of the nectophore's length.

Eudoxid phase: The bract (Fig. 2) is pyramid-shaped, with 4 triangular sides. It is about 3 mm in height, and 3 mm wide at the base. The ridges of the bract present thin laminar extensions.

White opaque spots in the bract of *Heteropyramis alcala* are distributed as follows: one at the vertex of the bract, one at the base of the ridge of the pyramid, and one at the midlength of each of the 2 ridges which form the dorsal side of the bract. This distribution of the white spots differs from that of *Heteropyramis*

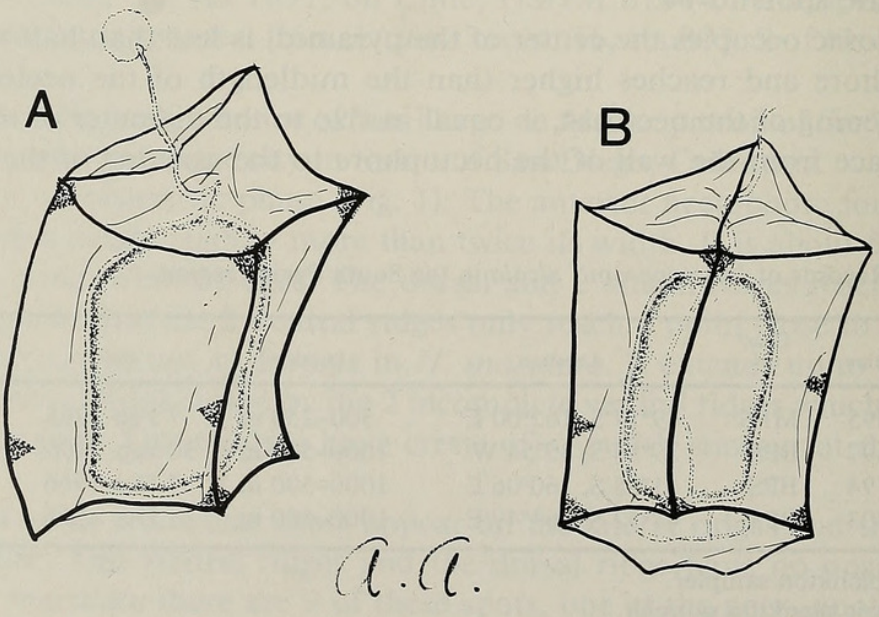

Fig. 3. *Heteropyramis alcala,* gonophore 2.5 mm high: A, Lateral view; B, Dorsal view.

maculata, which displays one apical white spot and one spot at the base of each dorsolateral ridge.

The phylocyst of *Heteropyramis alcala* is in form of a little bottle, quite different from the shape of that of *H. maculata.*

The hydroecial canals are shorter than those of *H. maculata.*

The gonophore (Fig. 3) is pentagonal-prismatic in shape, has 5 ridges, and the top forms a short pyramid. One ridge has opaque white spots at the inferior margin and the upper margin, and the other has 3 equidistant spots along the ridge, from the inferior to the upper margins. Another ridge has one spot at the inferior margin and at midlength of the ridge, and the fourth ridge has one spot at the upper corner and one at the inferior part, at about ¼ of the distance to the inferior margin. The fifth ridge has no opaque white spots.

The closely related species *H. maculata* Moser, 1925 is found mainly in the tropical oceanic regions (Alvariño 1971), and was obtained by Leloup and Hentschel (1938) west of South Georgia Islands.

Thalassophyes ferrarii, new species
Figs. 4–5

Material.—From cruises of R/V *Eltanin* in 1966 (see Table 2). Holotype: 1 superior nectophore and 1 inferior nectophore from *Eltanin* cruise 25, sta 1710, off Chile, USNM 61066. Paratype: 1 superior nectophore and 4 inferior nectophores from *Eltanin* cruise 26, sta 1794, Tasman Sea, USNM 61067.

Table 2.—Records of *Thalassophyes ferrarii* in the South Pacific region.

Eltanin cruise	Station	Gear/ tow	Location	Depth of haul	Date	Local time
25	1710	BPS	42°11′S, 86°03′W	2000–1000 m	5 Oct 1966	2020–2051
26	1794	BPS	41°58′S, 160°06′E	1000–500 m	7 Dec 1966	1425–1449
26	1803	BPS	47°37′S, 161°49′E	1000–500 m	13 Dec 1966	1052–1112

Etymology.—Named for Dr. Frank Ferrari in appreciation of his dedication and encouragement in behalf of plankton studies and his valuable assistance in developing this research.

Description.—Polygastric phase: The superior nectophore (Fig. 4) is about 7 mm high and 2 mm wide, or less than half as wide as its height. It has 5 ridges, all reaching to the apex of the nectophore, and each displaying crests. The crest of the dorsal ridge is the narrowest, and the crests of the ventral ridges the widest; widest at about the posterior third of the nectophore, forming a roundish contour of serrate edges. The lateral ridges have wide crests at the low part of the ridge, close to the ostium, ending at that region in a round edge.

The hydroecium is shallow, reaching less than half the height of the nectophore.

The long narrow nectosac reaches near the top of the nectophore. The space at the lowest part of the nectophore, between the wall of the nectophore and the opening of the nectosac is closed by the velum, which is wide.

In *Thalassophyes crystallina* Moser, 1925, the hydroecium is deep and extends up to more than half the height of the nectophore. The ridges with crests are quite different in *T. crystallina* and *T. ferrarii.* In the former, the crests are narrow or

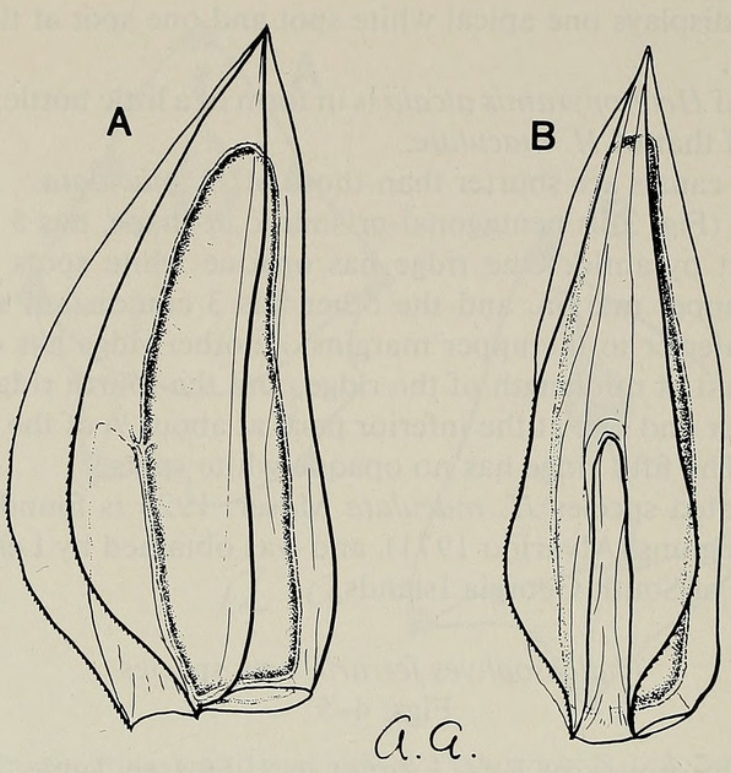

Fig. 4. *Thalassophyes ferrarii,* superior nectophore 7 mm long: A, Lateral view; B, Ventral view.

absent; in the latter they are wide and roundish at the lowest part, presenting serrate edges along the crests of the ventral ridges. The nectosac in *T. crystallina* reaches up to half the height of the nectophore, whereas in *T. ferrarii* it nearly reaches the apex of the nectophore.

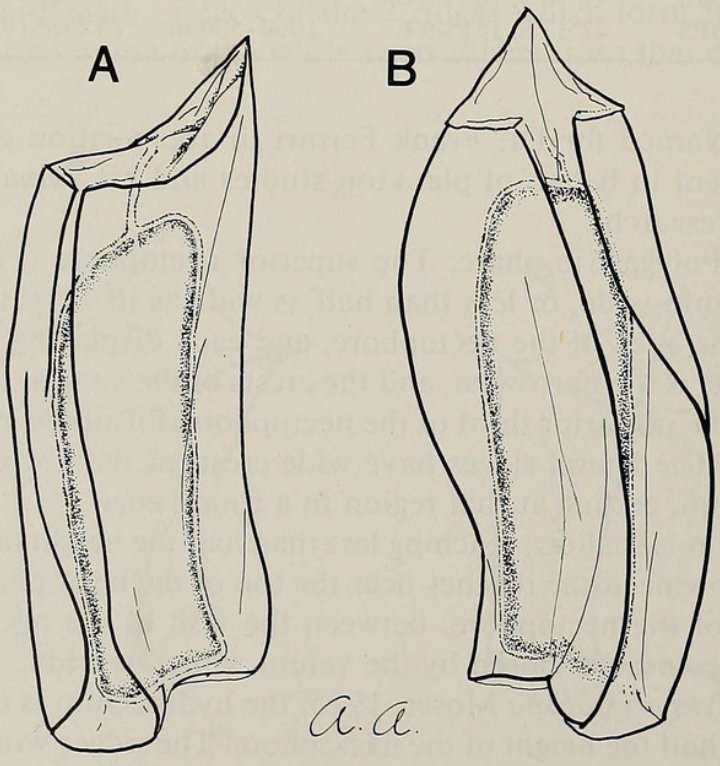

Fig. 5. *Thalassophyes ferrarii,* inferior nectophore 6 mm long: A, Lateral view; B, Ventral view.

The inferior nectophore (Fig. 5) is prismatic with an apical triangular prolongation at the dorsal side. The dorsal ridge has no crest. The lateral ridges develop a wing-like crest at the upper part, diminishing toward the low region, to end with no crest at the ostium level. The ventral ridges are pleated at the top, like two doors or flaps, forming the hydroecial folds, and covering the hydroecial tunnel-like cavity; at the low part, the ridges with crests are united by a round flap extending down from the region of the ostium.

Eudoxid phase: None observed.

The closely related species *T. crystallina* is found mainly in the Antarctic and adjacent regions (Alvariño 1971).

The scarcity and erratic distribution of most of the species of Siphonophorae, Medusae and Chondrophorae is not strange to scholars working on these groups. This peculiar phenomenon, pointed out by Alvariño (1971, 1981), Biggs (1977), Biggs, Bidigare and Smith (1981), and Sears (1953) is due to the particular behavior of these coelenterates. The resulting scattered aggregations of populations, the speed and swimming characteristics enable these animals to avoid capture by plankton nets.

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