Ross Sea, Macquarie Ridge, îles Crozet, Subantarctic seamounts in South Pacific, and east continental coast of Antarctic. Depth: 218-1226 m; however, most records between 300 and 600 m.

13. **Errina (Errina) boschmai**, n. sp.

*Figs. 11F, 22A-21G*

**Errina (Errina) gracilis**; Lowe, 1967, pp. 64-68, pl. 4, figs. a-c, text figs. 8a-8f.


**Description.** Colonies are large and usually flabellate, with equal branch development outward as well as upward. The largest colony known is 20 x 20 cm with a basal branch diameter of 2.5 cm. Some colonies have an accessory uniplanar fan of branches at a right angle to the main fan, perhaps the result of reorientation after a fall; also, several colonies have a bushy form, perhaps the result of low current velocity or changing current directions. The main branches of a large colony are massive, elliptical in cross section, and often anastomose, reinforcing the...
Paratypes of Errina (E.) boschmai, n. sp. A, Eltanin sta. 993, longitudinal section of branch tip revealing gastrostyles, x26; B, Eltanin sta. 418, branch tip, x36, stereo pair; C, same specimen, coenosteal texture, x143. D, E, same specimen, dactylopore spines, x114, x93, respectively; F, Eltanin sta. 415, branch segment bearing ampullae, x16; G, Eltanin sta. 993, gastrostyle, x107, stereo pair.
Map 7. Distribution of Errina (E.) boschmai (circles), E. (E.) cheilopora (squares), and E. (L.) echinata (triangles).

Planar structure. The terminal branchlets, however, are very slender, often only 1.2-1.5 mm in diameter 2 mm from their tips, and diverge abruptly from branches of much greater diameter. The slender branchlets are round in cross section, forming a complex interdigation of branch tips which do not fuse (Figure 11F). When space is used up in the flabellar plane, these branchlets cease their apical growth and become thicker. Colonies are usually attached to pebble- to cobble-sized stones by nonexpansive bases.

The coenosteum is white to light lavender and very similar in texture to that of E. gracilis: coarse, nonporcelaneous, and covered by coenoskeletal slits in an irregular reticulate arrangement. Also as in E. gracilis, the coenosteum is covered by small circular pores 60-75 μm in diameter, some flush with the surface and others raised on small mounds. These may be small or developing dactylopores. Low, blunt granules 6-8 μm in diameter cover the coenosteum.

Gastropores are round, do not have border-
ing lips, and measure 0.17-0.25 mm in diameter. Gastrostyles are stout and spindle shaped, with a bare basal main shaft, a highly ornamented distal part, and a rather blunt tip. The illustrated gastrostyle (Figure 210) is 0.37 mm tall and 0.16 mm wide, for a H:W ratio of 2.26.

Dactylopore spines are small, rarely taller than 0.45 mm, and 0.17-0.23 mm wide. The proximally oriented slit is 40-75 μm wide. Spines are always uniformly spaced, never clustered, and their slits are very consistently directed toward the base of the colony. There are no accessory dactylopore slits on the dactylopore spines. Dactylopore spines are uniformly distributed on the branchlets but relegated to the anterior or lateral edges of thicker branches.

Ampullae are hemispherical but often altered by one to several small warts, some of which appear to be pores, which give the ampullae a knobby appearance. Ampullae occur on both anterior and posterior sides of branches in about equal numbers. They are usually found intact; very few are ruptured. Those that do rupture produce deep craters. Some branches may be covered with large ampullae a knobby appearance. Ampullae occur in clusters or chains, while other branches may have only a few. Ampullae range from 0.61 to 1.30 mm in diameter. No sexual dimorphism was noted.

Etymology. This species is named in honor of H. Roschka, who made numerous contributions to our knowledge of Stylasterina, including the Antarctic species.

Discussion. Errina boschmai is most similar to E. gracilis, these being the only two Errina (Errina) known from the Antarctic that have a white coenosteum. Von Marenzeller’s figured specimen of E. gracilis [von Marenzeller, 1903, Figure 1] is somewhat atypical in that it is large and yet delicate, resembling typical colonies of E. boschmai. This figure probably led Lowe and Boschma to identify their specimens incorrectly as E. gracilis. The main points of difference between the two species are that E. boschmai (1) usually has a larger corallum, with a massive, dense basal branch and complex interdigitating distal branchlets, (2) has shorter dactylopore spines that are never clustered, (3) has few ruptured ampullae, and (4) never has lower gastropore lips. Furthermore, E. boschmai is not known to have an association with a commensal polychaete.

Material examined. Types. BANZARE sta. 30, RMNH.

Types. Holotype: Eltanin sta. 993, USNM 52626. Paratypes: Eltanin sta. 993, USNM 52690, 52631, BM 1981.6.11.1, RMNH Coel. 14.115; sta. 415, USNM 52627; sta. 418, USNM 52630; sta. 671, USNM 52629; sta. 684, USNM 59519; sta. 732, USNM 52628; sta. 1536, USNM 59518. Islas Orcadas sta. 575-11, USNM 59514; sta. 575-12, USNM 59517; sta. 575-17, USNM 59520; sta. 575-34, USNM 59513; sta. 575-90, USNM 59515; sta. 575-91, USNM 59516; sta. 575-102, USNM 59521. Herco sta. 731-1884, USNM 59511; sta. 731-1940, USNM 59512. Edisto sta. 38-21, USNM 52625. EW sta. 66-6, USNM 52624. Type-locality: 61°25'S, 56°30'E (off South Shetland Islands), 300 m.

Distribution. Off South Shetland Islands; off South Georgia; off Mac. Robertson Land, Antarctica (Map 7). Depth: 100-659 m.

14. Errina (Errina) cheilopora, n. sp.

Figs. 22A, 23A-23I

Description. Colonies are flabellate with dense but rarely anastomosing branching. Colonies are characterized by thick main branches (up to 1 cm in diameter) from which short, slender branchlets (usually less than 1 mm in diameter) arise with no transition in branch diameter. The juxtaposition of thick and thin branches produces a very delicate colony. Thick primary branches are elliptical in cross section, whereas the slender secondary branchlets are usually round in cross section with blunt tips. The largest specimen examined is 4.8 cm tall, but this is a fragment of a larger colony.

The coenosteum is dense and porcelaneous, white to light pink. The larger, primary branches usually have transverse or reticulate striations covering the surface, whereas the tiny branchlets have distinct longitudinal striations composed of rows of parallel coenosteal slits. The slits are 10-15 μm wide, of variable length, and delimit coenosteal strips 50-70 μm in width. Low, blunt granules 5-7 μm in diameter cover the coenosteum but are best preserved near and in the coenosteal slits. The longitudinal slits are most easily seen in the pink specimens, where
they appear as subsurface white lines on a pink background.

Gastropores are round, 0.22-0.33 mm in diameter; gastropore tips are visible from the exterior. Each gastropore is bordered proximally by a large, broad lip. The lip may be up to 0.65 mm across and completely overhang the gastropore, making contact with the adcauline (distal) edge of the pore; however, the lip usually forms a tricornered pocket with its opening directed distally.

Gastropores are variable in shape, ranging from long and slender (H:W = 8.5) to short and fat (H:W = 1.8). Two extremes are illustrated (Figures 23H and 23I). Few gastropores were examined because of the paucity of material and the relatively low frequency of gastropores in the colonies.

Dactylopore spines are low, never composite, and consistently adcauline (proximally directed). Spines are rarely taller than 0.3 mm, typically only 0.10-0.15 mm high, and about 0.15 mm wide, the slits measuring about half that width. Dactylopore spines are uniformly distributed on the branchlets but usually occur only on one side of the larger branches, defining the anterior side. The spines are often greatly reduced, sometimes to low mounds or unrimmed pores, on the anterior side, producing a papillose appearance. There are usually several dactylopore spines on each gastropore lip.

Ampullae are hemispherical bulges 0.49-0.89 mm in diameter.

Discussion. Within the subgenus Errina (Errina) there are only three other forms that have both orange-pink coenosteum and lower gastropore lips, all from off New Zealand: E. rubra Broch, 1942 and E. novaezealandiae 'facies' ramosa and 'facies' dendyi Hickson, 1912. Errina cheilopora differs from E. rubra in having a more delicate corallum with significantly smaller dactylopore spines and larger gastropore lips. In comparison to E. novaezealandiae facies ramosa, it is found in far deeper water, does not have aligned dactylopore spines, and always has prominent gastropore lips. It differs from facies dendyi in having a larger gastropore lip and not having small, rimmed dactylopores.

Etymology. The specific name cheilopora is a combination of 'cheilos' (Greek: lip) and 'poreo' (Greek: pore), referring to the lip occurring beneath each gastropore.

Material examined. Types. Syntype of E. rubra from off 'Cape Maria,' Zoological Museum, Copenhagen.

Types. Holotype: Eltanin sta. 1975, USNM 59906. Paratypes: Eltanin sta. 1975 (3 specimens), USNM 60076, BM 1981.6.11.3; sta. 1411 (14 fragmenta), USNM 59907; sta. 1414 (1 fragmenta), USNM 59909; sta. 1851 (14 fragmenta), USNM 59910. Type-locality: 54º30'S, 150º00'E (off Macquarie Island), 443-549 m.

Distribution. Macquarie Ridge and off Antipodes Islands (Map 7). Depth: 371-659 m.

Subgenus Inferiolabiata Broch, 1951

Description. Grooved dactylopore spines tubular with a truncated top, the slit comparatively wide and spoutlike. Grooved spines predominantly abcauline (slit directed distally) in orientation. Multiple dactylostyles per dactylopore sometimes present.

Type-species: Errina labiata Moseley, 1879, by original designation.

15. Errina (Inferiolabiata) echinata (Moseley, 1879)


Spinipora echinata Moseley, 1879, pp. 447-449, pl. 34, fig. 3, pl. 35, fig. 4, pl. 38; 1881, pp. 55-57, pl. 1, fig. 3, pl. 2, fig. 4, pl. 5.

Errina (Spinipora) echinata; Hickson, 1912a, p. 881, pl. 95, fig. 8.

Not Spinipora echinata; Hickson and England, 1909, p. 352, pl. 44, fig. 8.


Errina (Inferiolabiata) echinata; Boschma, 1963a, p. 338; 1964d, pp. 293, 294, 298.

Description. Colonies are robust and primarily uniplanar, composed of thick, anastomosing branches; however, numerous branches also originate from the anterior side of the plane, producing a somewhat bushy corallum. All branches are round in cross section, tapering gradually to blunt tips 2.5-5.0 mm in diameter. The largest colony examined is 23 cm tall with a basal diameter of 2.5 cm. Small colonies that have not yet branched for the first time (Figure 22C) are up to 2.5 cm tall, 0.55 cm wide, and have a smooth coenosteal devoid of dactylopore spines or gastropores for the basal 3 mm.

Fig. 23. Paratypes of Errina (E.) cheilopora, n. sp. A, B, Eltanin sta. 1975, branch tips, x19, x54, respectively; C, Eltanin sta. 1411, dactylopore spine, x56; D, Eltanin sta. 1975, dactylopore spine, x186; E, F, same station, lower gastropore lip, x71, x68, respectively; G, same station, coenosteal texture, x715; H, same station, gastrostyle, x89; I, Eltanin sta. 1411, gastrostyle, x95.
Fig. 24. Errina (I.) echinata Moseley from Eltanin sta. 1593. A, dactylopore spines viewed from above, x16; B-D, dactylopore spines, x50, x37, x57, respectively; E, F, stellate gastropores, x29, x54, respectively; G, small dactylopore, x79; H, coenoskeletal texture, x86, stereo pair.
The coenosteum is coarse, nonporcelaneous, and always white. Coenosteal slits are discontinuous, usually rather short, often circular, and arranged in a reticulate pattern. The coenosteal strips defined by the slits are rather wide (0.16-0.22 mm) and are densely covered by irregularly shaped granules 5-10 μm in diameter.

Gastro pores are numerous, large (0.41-0.68 mm in diameter), and round to stellate, both shapes occurring in the same colony. The stellate gastro pores have one to seven distinct grooves around the edge of the pore and superficially resemble cyclosystems. They differ from cyclosystems in that the grooves are in continuous communication with the gastro pore for their entire lengths and serve the function of channelizing the gastro zooid tentacles, not of separating dactylozooids. The gastrostyle is tall and slender, dwarfed by the spacious gastro pore tube. The illustrated gastrostyle (Figure 25B) is 0.90 mm tall and 0.21 mm wide for a H:W ratio of 4.3. The style is ornamented from base to tip with four to eight vertical ridges, which run the length of the style.

Dactylopore spines are very large, up to 2.5 mm tall and 0.41-0.55 mm wide, having a slit about 0.22 mm wide. They are thin walled, U shaped in cross section, and usually have a truncated tip. Although most of the spines are distally directed, many are clustered, resulting in miscellaneous orientations of the slits. There is great variation in the size and shape of the dactylopore spines: some have a pointed tip with its pore considerably below the apex; others have a slit for the entire length of the spine; and others have a slit for just a short distal portion. A second, smaller kind of dactylopore occurs with great frequency. These dactylopores do not have grooved spines associated with them and occur as small, elliptical slits (0.12-0.20 mm in diameter) flush with the coenosteum or slightly raised on mounds. These smaller pores often occur on the larger dactylopore spines.

Scattered abundantly over the coenosteum are hemispherical ampullae 1.1-1.3 mm in diameter. They are very thin roofed and are often ruptured, resulting in craters. Smaller ampullae often form in these craters. Ampullae are sometimes clustered. No sexual dimorphism was noted.

Discussion. Hickson and England's [1909] report of E. echinata from Providence, Indian Ocean, was correctly indicated by Boschma [1964] to be a misidentification. The dactylopore spines are much too short to be E. echinata, and its coenosteal texture (imbricated plates) is quite different from that of E. echinata. Discounting this record, E. echinata is known from only one specimen; two additional lots are reported herein.


Distribution. Known only from off Uruguay and off Burdwood Bank (Map 7); 357-1647 m.
Fig. 26. Errina (L.) labiata Moseley. A-C, Eltanin sta. 2021, branch segment showing coenosteal texture composed of imbricated platelets, shallow coenosteal canals, and coenosteal pores, x17, x86, x430, respectively; D, same station, branch segment with ampullae and dactylopore spines, x16; E, F, Eltanin sta. 2092, dactylopore spines, x54, x75, respectively; G, H, same station, dactylopores with several dactylostyles each, x93, x143, respectively; I, same station, dactylostyle pillars, x643.
16. **Errina (Inferiolabiata) labiata**
Moseley, 1879

*Figs. 22D, 22E, 26A-26I, 27A-27C*

**Errina labiata** Moseley, 1879, pp. 443-447, pl. 34, fig. 7, pl. 37, pl. 44, figs. 9-11; 1881, pp. 50-55, 80, pl. 1, fig. 7, pl. 4, pl. 11, figs. 9-11 (part: not *Challenger* sta. 135).--Hickson, 1982, p. 238.--

**Boschma**, 1957, p. 55; 1964d, pp. 287-299, pl. 1, text figs. 1-3; 1966b, pp. 109, 117.--Boschma and Lowe, 1969, p. 15, pl. 5, map 2 (part: mixture of *E. labiata* and *E. lowei*).  

**Errina (Errina) labiata**; Hickson, 1912a, p. 880.

**Errina (Labiata) labiata**; Broch, 1942, p. 39.


Not **Errina (Inferiolabiata) labiata**; Lowe, 1967, pp. 68-72, pl. 5, figs. a-b (description and figures based on *E. lowei*).

**Description.** The form of the corallum is variable, ranging from flabellate to bushy to columnar, the latter form resulting from envelopment of a large commensal polychaete followed by little or no subsequent lateral branching. The invariable presence of the commensal worm has a pronounced effect on the growth form and branching pattern. The polynoid induces branches to elongate, flatten, and anastomose, forming a reticulate tube round to elliptical in cross section and up to 10 cm long. Branches do not otherwise anastomose. Branches are round in cross section, tapering gradually to a blunt tip 2-3 mm in diameter. The largest colony examined is over 15 cm tall with a basal diameter of 2 cm. Colonies are attached by a broad, thin, encrusting base.

The coenosteal texture is unique and distinctive. The coenosteum is covered by a network of thin, shallow coenosteal canals, which delimit irregular rectangular spaces. The larger axes of the rectangles are usually oriented vertically but are sometimes horizontal or oblique. Toward the slender branch tips the canals are invariably longitudinal, with few, if any, transverse connections. Closely spaced along the canals, about every 0.25-0.60 mm, are round coenosteal pores 0.33-0.41 mm in diameter, only slightly smaller in diameter than the width of the canal. This reticulate canal structure is slightly modified on the sides of the dactylopore spines where the coenosteum between canals becomes slightly raised or ridged, giving the spine a ribbed texture. When viewed in greater detail (Figures 26A-26C) the coenosteum is seen to be composed of closely spaced, imbricated platelets, the leading edges usually directed distally. These platelets cover both the canal and the intercanal coenosteum with a frequency of about 40 leading edges per millimeter. There are no granules.

Gastropores are round, 0.28-0.33 mm in diameter, and strongly inclined distally. The pores do not have lips, but often a group of dactylopore spines border the lower edge of the gastropore, producing the equivalent of a lip. Gastrostyles are variable in shape but are generally spindle shaped with a blunt or pointed tip. Boschma [1964b, text figures...
1-3] illustrated a variety of gastrostyle shapes and sizes. The styles are sparsely ornamented from base to tip and bear squat, almost cylindrical spines, up to 35 μm tall and 15 μm in diameter. Blunt projections, similar to dactylostyle pillars in size and shape, occur randomly within the gastropore tube. Styles are up to 1 mm tall and have H:W ratios of 2.7-6.6.

Dactylopore spines are similar in shape to those of E. echinata: thin walled, U shaped in cross section, with an abruptly truncated tip. They are distally directed and often joined at their edges, forming a tier of two to five fused spines that encircle part of the branch. Spines are up to 0.70 mm tall and 0.23 mm wide, the tallest spines occurring on the distalmost branches. Away from the branch tips the dactylopore spines are much shorter, sometimes being reduced to the level of pores flush with the surface. Each dactylopore has one to four (usually three) distinct dactylostyles, structures most easily seen in a damaged dactylopore spine. Each style is composed of 5-10 cylindrical, blunt pillars about 50 μm tall and 20 μm wide, arranged in lines down the inner side of the dactylopore (Figures 26G-26I).
Ampullae are very common, represented by large hemispherical bulges 1.02-1.30 mm in diameter. They are thin roofed and, when ruptured, produce large conspicuous craters. No sexual dimorphism was noted.

Remarks. Errina labiata was the most commonly collected stylasterine in the USARP collections and is one of the three species commonly found in deepwater (300-500 m) assemblages in the Ross Sea, the others being E. (E.) fissurata and E. (E.) laterorifa.

In all six cases examined the symbiotic polychaete was Polydora laevis McIntosh. No other species of polychaete is known to associate with E. labiata, and P. laevis has been found to infest one other stylasterine, E. (I.) fascicularis.

Discussion. It is surprising that the most common Antarctic stylasterine has been validly reported only twice before.

Moseley's original description was based on one specimen and fragments from off Rio de la Plata. His subsequent record [Moseley, 1881] from Tristan da Cunha was erroneous, the specimen clearly belonging to a different subgenus. Lowe's [1967] records are misidentifications, and although Boschma [1966b] devoted an entire paper to this species, he did not add any records. Later Boschma [1966b] correctly reported the second valid occurrence of E. labiata. Boschma and Lowe's [1969] map confuses two species. Therefore, until now, this species was known only from two locations.

Errina (I.) labiata is similar to the genus Errinopora in its possession of dactylostyles and its arrangement of laterally fused dactylospore spines beneath each gastropore, however, it is significantly different in the shape of its dactylospore spines, coenosteal texture, gastropore shape, and the presence of more than one dactylostyle per dactylospore. The subgenus Inferiolabiata, defined by its type-species E. (I.) fascicularis, is therefore generically distinct from Errinopora, despite the presence of dactylostyles in both genera.


Types. Figured type [Moseley, 1881, Plate 1, Fig. 7] of E. labiata deposited at BM (1880.11.25.172). Additional smaller fragments from type-locality also present (both dry and in alcohol), some cataloged as BM 1880.11.25.195. Holotype not specified by Moseley, so all specimens considered syn- types. The figured specimen is the obvious choice for lectotype, but because the type-suite is homogeneous, a lectotype is not designated. Type-locality: 37°17'S, 53°52'W (off Rio de la Plata, Uruguay), 1097 m.

Distribution. Widely distributed in Antarctic and Subantarctic (Map 8), including offshore southeast South America, Scotia Ridge, Ross Sea, Scott Island, Balleny Islands, and probably circumantarctic. Confirmed depth range: 87-2100 m (however, few records outside 300-600 m), the northern records being, in general, the deeper stations.

17. Errina (Inferiolabiata) Lowe, n. sp.

Figs. 22F, 22G, 28A-28C

Errina (Inferiolabiata) labiata: Lowe, 1967, pp. 68-72, pl. 5, figs. a-b, text figs. 9a-9f.

Errina labiata: Boschma and Lowe, 1969, p. 15, pl. 5, map 2 (part).

Description. Colonies are large (up to 15 cm in height), flabellate to bushy in shape, and robust in form. Polychaete-induced corallum deformities do not occur in this species. Branches are round in cross section, do not anastomose, and taper gradually to blunt tips, often measuring up to 5 mm in diameter 2 mm from the tip. However, some delicate colonies have more slender terminal branches, and one unusual colony from WH station 19/76 (Figures 22G), the shallowest station, has flattened terminal branches (e.g., 3 x 12 mm in cross section) caused by a continued fusion of terminal branchlets after
Fig. 28. Paratypes of Errina (I.) lowei, n. sp. A, Eltanin sta. 684, branch segment bearing several male ampullae toward base, x16; B, C, same specimen, dactylopore spines, both x56; D, F, same specimen, coenosteal texture, x214, x429, respectively; E, Islas Orcadas sta. 575-35, gastrostyle, x57, stereo pair; G, Islas Orcadas sta. 575-91, gastrostyle and rudimentary dactylostyle in upper right, x36, stereo pair.
Map 9. Distribution of *Errina (I.) lowei* (circles) and *Adelopora pseudothyron* (triangles).

bifurcation should have occurred. Colonies are attached by a thin, encrusting base.

Coenosteal texture is similar to that of *E. labiata* but much more variable. On large-diameter branches and toward the colony base the coenosteum is covered by a network of coenosteal canals between which are imbricated platelets, as in *E. labiata*. The coenosteum of the remaining branches is smoother and denser. Coenosteal canals are usually not present, and the platelet structure is largely obscured or degenerate. This results in an irregular arrangement of narrower platelets. Approximately 60-70 imbricated platelets occur per millimeter. Round coenosteal pores (possibly reduced dactylopores), 50-60 μm in diameter, punctuate the surface. There are no granules. The coenosteum is always white and slightly porcelaneous.

Gastropores are round, 0.20-0.45 mm in diameter, and inclined distally. Gastrostyles are spindle shaped, gradually attenuating from base to pointed tip. H:W ratios range between 6.2 and 10.2. Short, blunt spines are sparsely scattered over the entire length of the style. Tabulae are often present. The
Illustrated style is 1.13 mm tall and 0.15 mm wide (Figure 28E).

Dactylopore spines are tall (up to 1.02 mm), U shaped in cross section, and invariably oriented with their slits facing distally. The basal portion of the spine is often cylindrical, the slit not extending the entire length of the spine. Spines are uniformly spaced; some clustering and fusion of adjacent spines into tiers occurs. The texture of dactylopore spines is similar to that of the coenosteum and is usually homogeneously smooth; however, some specimens have ribbed spines. Most dactylopores have one feeble dactylostyle, composed of several short, blunt spines arranged in an ill-defined line along the edge opposite the slit (Figure 28G).

Sexual dimorphism in ampullar shape and size occurs. Female ampullae are large (0.95-1.40 mm in diameter), hemispherical, and usually intact. Male ampullae are smaller (0.65-0.85 mm in diameter), laminaform, and each usually has a small pore (efferent duct) at its apex.

Discussion. This species was previously described by Lowe [1967] as E. labiata. Although he included both E. labiata and E. lowei in his material, his description and figured specimens clearly pertain to E. lowei. Errina lowei is similar to E. labiata, especially in some aspects of its coenosteal texture, and they are sometimes found at the same station; however, E. lowei can be distinguished by the following characteristics: (1) colony more robust, no worm-induced deformities; (2) coenosteal texture usually denser, porcelaneous, with less ordered imbricated platelets; (3) dactylopore spines rarely arranged in tiers, and (4) sexual dimorphism of ampullae.

Etymology. This species is named in honor of T. P. Lowe, who did much of the groundwork for this study of the Antarctic Stylasterina.

Material examined. WH sta. 142/71, ZIZM; sta. 19/76, ZIZM. Types. Holotype: Eltanin sta. 1536, USNM 59939; sta. 254, USNM 52656-7, BM 1981.6.11.5, RMNH Coel. 14.112; sta. 678, USNM 52662; sta. 684, USNM 59938; sta. 740, USNM 52664; sta. 1593, USNM 59942. Islas Orcadas sta. 575-95, USNM 59940; sta. 575-82, USNM 59943; sta. 575-91, USNM 59937.

Description. Colonies are delicate and filabellate, with nonanastomosing branches. Cylindrical branches gradually taper to slender tips (0.65 mm in diameter); however, there are also numerous short, small-diameter branches diverging directly from large-diameter branches. The largest specimen examined is 6 cm tall with a basal branch diameter of 9.2 mm. Colonies are attached by a moderately nonexpansive base.

Branches are composed of a fascicular arrangement of parallel, slightly convex cords, each cord 0.25-0.38 mm wide. In larger-diameter branches the cords are distinctly bordered by shallow grooves 20-30 µm wide in which elongate coenosteal pores occur (Figure 29F). In more slender, distal branches the boundaries are more obscure, the grooves being entirely replaced by shorter, sometimes round, aligned coenosteal pores. The coenosteal pores of the grooves extend deep into the branch, preserving the cord boundaries to about one-third the branch diameter, which can be seen in branch cross section. The cord coenosteum is composed of small, distally directed, imbricated platelets, about 40-45 platelets per millimeter. The platelets may be very broad, extending from groove to groove across the cord (Figure 29K), or may be quite slender (about 13 µm wide) (Figures 29G and 29H) and not arranged in continuous series across the cord. Toward the tips of branches the platelet becomes less structured and more irregular (Figures 29H and 29J). The coenosteum is always white, and there are no granules.

Gastropores, 0.22-0.31 mm in diameter, occur primarily at the axils of branches. These gastropores are usually flanked by two triangular lips, one on each side of the flabellar plane. Gastropores occasionally occur on the sides of branches, about one
gastropore for every 30-40 dactylopores. These gastropores are invariably accompanied by a broad abcauline lip (about 0.34-0.47 mm wide). These lips resemble dactylopore spines but are easily distinguished by being almost twice as broad and less conical, almost flat. Gastrostyles are long, slender, and delicate and are rarely exposed by fracture because of their well-protected position, being located at branch axils. The one gastrostyle examined (Figure 30E) measured 1.31 mm tall and 0.12 mm wide, for a H:W ratio of 11; however, the basal two thirds of the style seems to be eroded and was probably no longer in contact with tissue. The distal, well-preserved third of the style (0.43 mm long, 0.07 mm wide) is sparsely ornamented with tall spines arranged in irregular rows. The tip is pointed.

Dactylopore spines are very small (0.15-0.20 mm tall, 0.18-0.25 mm wide) and strongly inclined distally. They are never clustered, and their slits are always directed distally. Dactylopores usually occur on the grooves separating the cords and tend to broaden and deepen the groove just anterior to the spine.
Dactylopore spines are also commonly found on ampullae. There is no anterior or posterior side; the gastropores, dactylopores, and ampullae are found equally on both sides of the flabellum.

There seems to be a size sexual dimorphism with regard to the ampullae. Female ampullae are 0.98-1.10 mm in diameter, and male ampullae are 0.77-0.82 mm in diameter. Both are hemispherical and sometimes occur on terminal branchlets of lesser diameter than the ampullae. From three stations (Eltanin stations 684, 1536, and 1592) the ampullae (male?) were invariably fused into regular binary or trinary systems. Each unit of the system was capped by a pore on a small mound. Otherwise, the ampullae were rarely ruptured.

Remarks. The previous description pertains primarily to the type-lot and specimens from the deeper-water stations. In shallower water (400-800 m) this species is often found in association with a symbiotic polychaete, Polythoe laevis McIntosh. The worm induces the coral to form an elongate cylindrical cavity and, in general, to form a more robust colony. These worm-associated colonies have
thicker branches, more abundant gastropores, wider gastropore lips, and less well developed coenosteal grooves.

This species is strikingly similar to a bryozoan in colony shape and texture.

Discussion. Within the Southern Ocean, this species is most similar to E. labiata but can be distinguished by its distinctive fascicular coenosteum, position of gastropores, and lack of dactylostyles.

Errina fascicularis is remarkably similar to E. horrida Hickson and England, 1905, described from the Philippines at 1089 m. In a detailed comparison of the type-specimen of E. horrida with E. fascicularis the only difference noted were that the former had slightly narrower dactylopore spines, which were often ridged by a distinct, serrated carina.

Etymology. The specific name fascicularis (Latin: bundlelike, fascicular) refers to the distinctive coenosteal structure.

Material examined. Types. Holotype: Eltanin sta. 1423, USNM 60149. Paratypes: Eltanin sta. 1423, USNM 60112; BM 1981.6.11.4, RMNH Coel. 14.110; sta. 684, USNM 60113; sta. 1412, USNM 60146; sta. 1416, USNM 60113; sta. 1416, USNM 60145; sta. 1422, USNM 60144; sta. 1536, USNM 60116; sta. 1592, USNM 60117; sta. 1851, USNM 60119; sta. 1422, USNM 60144; sta. 1536, USNM 60116; sta. 1592, USNM 60117; sta. 1851, USNM 60147; sta. 1991, USNM 60119; sta. 1414, USNM 60113; sta. 1416, USNM 60145; sta. 1422, USNM 60144; sta. 1536, USNM 60116; sta. 1592, USNM 60117; sta. 1851, USNM 60147; sta. 1991, USNM 60119; sta. 2143, USNM 60118. Vema sta. 17-53, USNM 60148; sta. 17-61, USNM 60149. Paratypes: sta. 1423, USNM 60144; sta. 1536, USNM 60116; sta. 1423, USNM 60147; sta. 1592, USNM 60148; sta. 17-5, USNM 60149. Type-locality: 56°21'S, 158°22'E (Hjort Seamount), 1574-1693 m.

Distribution. Off Tierra del Fuego; off Burwood Bank; off South Georgia; Macquarie Ridge; off Antipodes Islands (Map 10).

Depth: 540-2010 m.

Incertae Sedis

19. 'Errina' cyclopora, n. sp.

Description. Coralla are small with irregular, sparse branches producing an arborecent colony. Branches are round, do not anastomose, and taper gradually to slender tips about 0.6 mm in diameter. The largest colony is only 3.1 cm tall and equally broad, with a basal branch diameter of 5.6 mm. The colony is firmly attached by a broad, thick base.

The coenosteum is coarse, nonporcelaneous, and always white. Irregularly shaped coenoskeletal pores 20-25 µm in diameter penetrate the surface in an irregular reticulate pattern, bordering ill-defined coenoskeletal strips 50-80 µm wide. Dense concentrations of tall, slender granules 5-7 µm wide and up to 16 µm tall cover the surface. In addition to the coenoskeletal pores and granules there are small irregularly perforated mounds 0.14-0.23 mm in diameter and of equal height. These mounds are most common toward the base of the colony and sometimes occur with a frequency of four or five per square millimeter. They may function as a defensive structure, such as nematopores.

Gastropores are round, 0.21-0.33 mm in diameter. Gastrostyles are cylindrical and highly ornamented. The illustrated style (Figure 32G) is 0.33 mm tall and 0.11 mm wide, for a H:W ratio of 3.0. The basal third of this style is ornamented with tall, needle-shaped spines about 21 µm in height. The middle third has a coarser ornamentation of thicker and taller spines, and the distal third bears broad projections up to 35 µm tall and 21 µm broad.

Dactylopore spines occur as rounded tubercles with narrow slits, similar to those found in the subgenus Errina (Errina); however, the orientation of the slits is always abcauline. Proximal to each gastropore there are three to eight dactylopore spines fused side to side, forming a crescent lip beneath the pore. Toward the branch tips these fused dactylopore spines almost encircle the gastropore, forming a pseudocyclosystem 0.9-1.1 mm in diameter. The ring of dactylopores is usually interrupted by a diastema on the side toward the branch. Away from the branch tips the pseudocyclosystems progressively degenerate, resulting in straight transverse rows of fused spines located proximal to each gastropore. Dactylopore spines are up to 1.0 mm tall and about 0.18 mm wide, the slit being about 0.08 mm wide. The tallest or most exsert spine is invariably the central spine of the fused crescent, opposite the branch, and may slightly overhang the gastropore. Individual dactylopore spines of similar dimensions are infrequently scattered over the coenosteum. There are no dactylostyles, and there is no anterior-posterior differentiation.

Ampullae are irregularly hemispherical,
0.69-0.90 mm in diameter. Most of the ampullae of the specimens examined were irregularly perforate, and many were completely ruptured. A small mound with a pore at its apex is often found in the craters of the ruptured ampullae.

**Discussion.** The generic placement of this species is problematic. Its incomplete cyclosystems (at least on distal branches) allies it to the Stylosterinidae, but the other randomly placed dactylopore spines and their shape and the presence of gastrostyles but no dactylostyles (a combination not found in the Stylosterinidae) suggest a placement in the Errinidae. The dactylopore spines are very similar to those of *Errina* (Errina); however, their orientation is that of *E. inferiollabiata*. Boschma [1965b] indicated that the shape of the dactylopore spine was the most important character separating these two subgenera, their orientation being secondary. This would imply that *E. cyclopora* belongs to the nominal subgenus; however, no species of this subgenus has consistently distally directed dactylopores or dactylostyles arranged in pseudocyclosystems.

*Errina cyclopora* also has similarities to *Errinopora*, especially *E. cestoporina*. Although obviously different species, they are similar with regard to coenosteal texture, presence of small perforated mounds, and arrangement of dactylopore spines in crescents below each gastrostyle; *E. cyclopora* differs primarily in its lack of dactylostyles. However, as indicated previously in this paper, the presence or absence of dactylostyles is variable in *Errina* (for example, *Errina inferiollabiata* labiata, type-species of the subgenus, has several styles per dactylopore) and therefore may also be variable within *Errinopora*. Clearly, a reevaluation of the generic level characters defining and separating *Errina* sensu lato and *Errinopora* is required. *Errina cyclopora* has characters in common with *Errina* (Errina), *Errina inferiollabiata*, and *Errinopora* and a level of dactylopore-gastrostyle coordination tending toward, and perhaps transitional with the Stylosterinidae. Pending a more detailed examination of the higher classification, and not wishing to introduce a new, perhaps needless, generic name, I have placed this species in the genus *Errina*.

**Etymology.** The specific name *cyclopora* is a combination of *kyklos* (Greek: ring, circle) and *poros* (Greek: hole), referring to the circle of dactylopores that surround each gastrostyle.


**Distribution.** Scotia Ridge, east of Burdwood Bank (Map 10). Depth: 1647-2044 m.

**Genus Errinopora** Fisher, 1931

**Diagnosis.** Colony branches arborescent or platelike. Coenosteal texture reticulate. Coordination between dactylopores and gastrostyles variable, ranging from complete lack of coordination to highly coordinated pseudo-cyclosystems. Dactylopore spines shaped as grooved, rounded tubercles. Gastrostyles and dactylostyles present. Type-species: *Errina pourtalesii* Dall, 1884, by original designation.

20. **Errinopora cestoporina**, n. sp. Figs. 31E, 33A-33G, 34A-34B

*Errinopora cestoporina* Lowe, 1967, pp. 79-83, pl. 6, figs. a-c, text fig. 11 (part: not *Vema* sta. 17-53) (unpublished manuscript name).


**Description.** Coralla are robust and sparsely branched in an irregular manner, producing an arborescent colony. Branches are thick, round in cross section, and do not anastomose. Distal branches are blunt, about 2.8-3.0 mm in diameter. Small-diameter branches sometimes originate from much larger-diameter branches with no transition. The largest colony is 6.5 cm tall with a basal branch diameter of 7.1 mm. Basal attachment is unknown.

The coenosteum is similar to that of *Errina* cyclopora: coarse, white, with irregularly shaped coenosteal pores 20-30 μm in diameter arranged in a reticulate pattern; however, the granules are coarser, lower in relief, and angular, 6-21 μm in diameter. *Errinopora cestoporina* also has small, irregularly perforated mounds 0.13-0.20 mm in diameter, differing from those of *E. cyclo-

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Fig. 32. Paratypes of *Errina* cyclopora, n. sp. from Eltanin sta. 1592. A, branch segment with ruptured and intact ampullae, x15; B, C, distal branch with pseudocyclosystems, x18, x54, respectively; D, ruptured ampulla with a small mound, perhaps another ampulla, forming in crater, x18; E, F, coenosteal texture, x107, x715, respectively. (Figure 32E is a stereo pair); C, gastrostyle, x43, stereo pair.
Fig. 33. Paratypes of Errinopora cestoporina, n. sp. from Eltanin sta. 1593. A, branch tip, x16; B, C, dactylopores arranged around gastropores, conical ampulla in Figure 33B, x25, x16, respectively; D, small perforated mounds, x43; E, coenosteal texture, x107, stereo pair; F, G, dactylostyles, x589, x129, respectively (Figure 33C is a stereo pair).
**Fig. 34.** Paratypes of *Errinopora cestoporina*, n. sp. from *Eltanin* sta. 1593. A, cross section of branch revealing two gastrostyles and ampullae, x16; B, same specimen, gastrostyle, dactylostyle in upper right, x43, stereo pair.

*pora* only in having larger, more distinguishable pores penetrating the mound.

Gastropores are round, 0.30-0.55 mm in diameter. Gastrostyles are robust, composed of a cylindrical basal main shaft supporting an expanded, highly ornamented head. The basal main shaft is composed of a bundle of fused longitudinal cords, each about 30 μm wide. The head is composed of tall, blunt spines linearly arranged on vertical ridges. The tip of the style extends just above a constriction of the gastropore cavity, above which the pore expands as a steep-sided funnel. H:W ratios range from 2.05 to 2.60. One of the illustrated styles (Figure 34B) is 0.77 mm tall and 0.30 mm wide.

Each gastropore is bordered proximally by 5-10 laterally fused dactylopore spines. Some gastropores near the tip of a branch are completely encircled by dactylopore spines, forming a pseudocyclosystem. The tallest spines, up to 1.3 mm tall, are those away from the branch; the spines become progressively shorter toward the branch, and those dactylopores at the branch often do not have any spines at all. Commonly, two to four gastropores will be encircled communally by an oblique tier of 15-20 dactylopore spines. On thicker, basal branches the spines are usually reduced in size, fewer in number, and usually form a short, transverse row of spines along the proximal edge of the pore. Only rarely is a complete circle of spines maintained around an old gastropore.

Dactylopore spines are about 0.28 mm wide with a slit width of about 0.11 mm. Slits are always oriented toward the gastropore, but since the most highly developed dactylopore spines are on the abcauline side of the pore, this results in most of the slits being directed distally. It is rare to find an isolated dactylopore spine not associated with a gastropore. Each dactylopore has a prominent dactylostyle composed of a linear cluster of small pillars running the length of the dactylopore cavity. A well-developed dactylostyle is composed of three to four rows of pillars, all diverging from a median ridge. The pillars are irregularly shaped, granulated cylinders about 32-40 μm tall and 11-14 μm in diameter.

Ampullae are conical in shape, 0.70-0.85 mm in basal diameter, and about 0.55-0.75 mm tall. They occur randomly over the coenosarc, even inside the pseudocyclosystems. They usually bear a small pore at their apex; completely ruptured ampullae were not observed.

Discussion. Species of the genus *Errinopora* are characterized by the arrangement of their gastropores in short to long longitudinal or transverse rows, which are flanked on one or both sides by dactylopore spines. Often, toward the base of the colony, individual gastropores are surrounded by a ring of reduced dactylopores in a pseudocyclosystem. Each species has a slightly different degree of coordination between the dactylopore spines and gastropores: in some species the spines are fused laterally into a long chain; in another species some spines may be fused, and others individualized; in another the spines may all be individualized, forming a circle around the gastropore. *Errinopora cestoporina* has a relatively high degree of coordination, inasmuch as its dactylopores are usually fused into a transverse crescent (very rarely individualized) beneath each
gastropore or short rows of gastropores, and pseudocyclosystems are found on basal branches.

There are six valid species in the genus Errinopora: E. pountseleii (Dall, 1884); E. stylifera (Brock, 1935); E. nannacea Fisher, 1938; E. zarhyncha Fisher, 1938; E. latifundata Naumov, 1960; and E. intervacans Naumov, 1960. Errinopora cestoporina can be distinguished from all of these by four characters: (1) its distinctive coordination of dactylopore spines in a crescent beneath each gastropore, (2) its conical ampullae, (3) its small perforated mounds, and (4) its white color (all other species are salmon red). Errinopora cestoporina is most similar to E. zarhyncha, not in colony shape and size but in its similar dactylopore spines that fuse into chains along the proximal edges of rows of gastropores.

Errinopora cestoporina is the first species in its genus to be reported outside the North Pacific.

Etymology. The specific name cestoporina is a combination of 'cestus' (Latin: girdle, belt), 'porus' (Latin: hole, pore), and the Latin feminine diminutive 'ina,' which refers to the crescent belt of dactylopores beneath each gastropore.

Material examined. Types. Types. Holotype: Eltanin sta. 1593, USNM 60188. Paratypes: Eltanin sta. 740, USNM 52654, 52655, RM 1981.6.11.7; st. 1593, USNM 60141. Type-locality: 34°43'S, 56°37'W (east of Burdwood Bank, Scotia Ridge), 338-357 m.

Distribution. East of Burdwood Bank and off Tierra del Fuego (Map 6). Depth: 359-384 m.

Subfamily ADELOPORINAE Cairns, 1982

Diagnosis. Gastropores and dactylopores not arranged in cyclosystems. Gastropores at branch tips and axils, each gastropore covered by a hinged operculum.

Genus Adelopora Cairns, 1982


21. Adelopora pseudothyron Cairns, 1982

Figs. 31B, 35A-35I

Adelopora pseudothyron Cairns, 1982b, pp. 73-80, figs. 1-22.

Diagnosis. This species described recently by Cairns [1982b], therefore only a brief diagnosis presented here. Corallum uniplanar or slightly bushy; branches sometimes anastomose, forming a reticulate fan. Branches round in cross section; branching axils U shaped. Largest colony 3.8 cm tall, 1 cm in basal branch diameter. Colonies firmly attached by thin, encrusting base. Coenosteum smooth, dense, porcelaneous, white. Coenosteal slits defining longitudinal, parallel strips of coenosteum 53-70 μm wide. Texture of strips composed of rows of imbricated platelets, about 75-90 per mm. Gastropore tube cigar shaped, about 1 mm long, without gastrostyle. Each gastropore covered by freely hinged operculum, articulating with the coenosteum by two short nubs fitting into coenosteal depressions. Operculum generally elliptical with straight articular edge, 0.39-0.58 mm long, 0.35-0.64 mm wide. Dactylopore tubercles about 0.1 mm in diameter, 0.02-0.15 mm tall. Apical perforations of dactylopores 23-35 μm in diameter. Ampullae prominent and hemispherical or hemispherical with short lateral extension (probable efferent duct). Ampullae 1.06-1.22 mm in diameter. Superficial nematocysts oval, 17.2-21.9 x 4.1-5.3 μm; gastropore nematocysts rod shaped, 11.2-14.1 x 2.9-4.2 μm.

Discussion. For a complete discussion, see Cairns [1982b].


Distribution. Known only from four Subantarctic seamounts from the Scotia Ridge, Drake Passage, Chile Rise, and Eltanin fracture zone, South Pacific (Map 9). Depth: 298-915 m.
Subfamily STYLASTERINAE Gray, 1847

Diagnosis. Gastropores and dactylopores arranged in distinct cyclosystems.

Genus Conopora Moseley, 1879

Diagnosis. Colonies arborescent, flabellate, or bushy. Cyclosystems arranged sympodially or randomly on branches. Coenosteal surface composed of imbricated platelets.

Gastrostyles and dactylostyles absent. Gastrostyles and dactylostyles absent. Beters. Conopora tube constricted into two cham-

Gastropore

late, or bushy. Cyclosystems arranged sym-

Stylaster Moseley, 1879 (= Studer, 1878), by monotypy.

Diagnosis. Colonies arborescent, flabellate, or bushy. Cyclosystems arranged sympodially or randomly on branches. Coenosteal surface composed of imbricated platelets.

Gastrostyles and dactylostyles absent. Gastrostyles and dactylostyles absent. Beters. Conopora tube constricted into two cham-

Gastropore

late, or bushy. Cyclosystems arranged sym-

Stylaster Moseley, 1879 (= Studer, 1878), by monotypy.

Diagnosis. Colonies arborescent, flabellate, or bushy. Cyclosystems arranged sympodially or randomly on branches. Coenosteal surface composed of imbricated platelets.

Gastrostyles and dactylostyles absent. Gastrostyles and dactylostyles absent. Beters. Conopora tube constricted into two cham-

Gastropore

late, or bushy. Cyclosystems arranged sym-

Stylaster Moseley, 1879 (= Studer, 1878), by monotypy.
Fig. 36. Conopora pauciseptata Broch. A, Edisto sta. 14-2, branch segment showing reduction in number of dactylopores per cyclosystem from distal tip proximally, x15; B, Vema sta. 17-51, branch segment with cyclosystem and nematopores, x50; C, E, same specimen, coenosteal texture and nematopore, x214, x356, respectively; D, most reduced cyclosystem of Figure 36A, x 54; F, Eltanin sta. 1089, branch segment with numerous nematopores, x17; G, same specimen, longitudinal section of cyclosystem with two ampul-lae leading into gastropore, x29, stereo pair.
phores are ripe, penetrates the surface as a small, irregularly shaped pore about 0.1 mm in diameter on the upper adcauline side of the gastropore tube.

Remarks. Conoporpa pauicieptata is usually associated with a commensal polynoid polychaete, which induces the coral to form a flattened tube about 3.8 x 2.2 mm in diameter on the upper adcauline side of the gastropore. This association with a commensal polynoid polychaete, which induces the coral to form a gastropore tube, has been identified from Conoporpa pauicieptata: Malmgreniella dicirra Hartman and Harmathoe magellanica (McIntosh).

Discussion. Boschma and Lowe [1967] have compared Conoporpa pauicieptata to the three other Recent species in the genus: Conoporpa teuisihooley, 1879; C. major Hickson and England, 1905; and C. dura Hickson and England, 1909. More recently, Zibrowius [1981] has indicated that Conoporpa laevis (Studer, 1878) is a senior synonym of Conoporpa pauicieptata. Zibrowius [1981] has also a. Conoporpa pauicieptata, which induces the coral to form a gastropore tube, has been identified from Conoporpa pauicieptata: Malmgreniella dicirra Hartman and Harmathoe magellanica (McIntosh).

Distribution. Conoporpa pauicieptata is widely distributed in the vicinity of New Zealand and different from Conoporpa pauicieptata, which induces the coral to form a gastropore tube, has been identified from Conoporpa pauicieptata: Malmgreniella dicirra Hartman and Harmathoe magellanica (McIntosh). Conoporpa pauicieptata is usually associated with a commensal polynoid polychaete, which induces the coral to form a gastropore tube, has been identified from Conoporpa pauicieptata: Malmgreniella dicirra Hartman and Harmathoe magellanica (McIntosh).
being up to 0.2 mm at the outer edge of the cyclosystem. Each pseudoseptum tapers to an apex about 0.03 mm wide at the gastropore. The narrow inner edges of the pseudosepta facing the gastropore are straight and vertical, and the upper faces are slightly concave. The most proximal pseudoseptum of each cyclosystem is greatly enlarged into a fixed lid of variable size, which covers between one quarter and three quarters of the cyclosystem. The width of the lid varies between 0.28 and 0.90 mm and is slightly concave above. Round nematopores, 40–50 μm in diameter, are scattered over the pseudosepta and lids. In some cyclosystems the nematopores are regularly arranged, one on the outer, upper edge of each pseudoseptum (Figure 38B), whereas in other cyclosystems they occur on the concave upper faces of the pseudosepta. Gastropores are round, about 0.45–0.50 mm in diameter, and open into a smooth-walled hemispherical chamber about 0.56 mm in diameter (Figure 37D and 37E). This chamber, in turn, opens into another, smaller chamber via a constricted aperture of about 0.35 mm. This basal cavity is broad and flat (only about 40 μm high) and envelops the lower half of the larger hemispherical chamber.
Fig. 37. Paratypes of Cryptphelia fragilis, n. sp. from Eltanin sta. 17-5. A, branch segment with two cyclosystems, x16; B, C, cyclosystems, x36, x39, respectively; D, E, longitudinal section of a cyclosystem, x82, x32, respectively, (Figure 37E is a stereo pair); F, G, coenosteal texture, x715, x214, respectively (Figure 37G is a stereo pair).
Large hemispherical ampullae, 0.9-1.4 mm in diameter, occur at nearly every cyclosystem located within the fixed lid. Part of the ampullar cavity extends into the lid structure. Often there are one or two more ampullae per cyclosystem located on the sides of the cyclosystem adjacent to the two distal branches. In some cases an ampulla, probably one in the ripe condition, has a shallow depression at its lower edge (about 0.30 mm in diameter), which, in turn, has a smaller, irregular pore (effluent duct) about 50 µm in diameter.

Discussion. Crypthelia fragilis can be distinguished from the other 12 described species of Crypthelia by its delicate colony form, relatively small cyclosystems, and the position of its ampullae at the base of the lid. The species most similar to it is C. pudica Milne Edwards and Haime, 1849. These species are similar in most character, except that C. pudica has very prominent ampullae on the cyclosystem lid, not at the base of the lid.

Most species of Crypthelia are known only from northern and equatorial regions. Crypthelia fragilis and C. formosa are the only two species known from such southern latitudes. Moseley's [1876b, 1881, p. 71] record of Crypthelia pudica from off Rio de la Plata is probably the result of station error and was not listed from off Río de la Plata by Moseley [1876a, 1879, 1881, p. 83] in his list of corals collected by the Challenger expedition. Moseley's [1881] C. pudica from Challenger station 171 (north of Kermadec Islands) was previously the southernmost record for the genus.

Etymology. The specific name fragilis (Latin: brittle, fragile) refers to the very delicate nature of the corallum.

Material examined. Types.


Distribution. Pacific-Antarctic Ridge; Macquarie Ridge; off southern Campbell Plateau; and off Antipodes Islands (Map 12). Depth: 1336-2305 m, one of the deepest-living stylasterine corals.

24. Crypthelia formosa, n. sp.

Fig. 31G, 39A-39F, 40A-40C

Description. Colonies are small and flabellate; however, the presence of a commensal polychaete induces a more robust and slightly bushy colony. The largest colony is only 2.3 cm tall and equally broad; the largest basal branch is 3.4 mm in diameter. Branches are round in cross section and do not anastomose. Distal branches are 0.7-1.0 mm in diameter but support cyclosystems of considerably greater diameter. Dichotomous branching occurs at every cyclosystem, but one arm is often aborted as a short cylindrical nub.

The branch coenosteum is composed of convex, sometimes ridged, parallel cords 60-100 µm wide. Cords are bordered by thin, shallow grooves, which bear elongate slits. The coenosteal texture of the cords is composed of coarse, transverse rugae, approximately 65-75 per millimeter. The cord structure degene-
Fig. 39. Paratypes of Cryptthelia formosa, n. sp. from Eltanin sta. 1592. A, cyclosystem and ampulla, x25; B, cyclosystem with a broad lid, x26, stereo pair; C, D, longitudinal section of cyclosystem, pore in center leads to ampulla in lid and is probably the efferent duct, x26, x59, respectively (Figure 39D is a stereo pair); E, F, coenosteal texture, x214, x107, respectively (Figure 39F is a stereo pair).
Fig. 40. Paratypes of Crypthelia formosa, n. sp. A, Eltanin sta. 1592, pseudosepta of cyclosystem, x89; B, Eltanin sta. 1521, cyclosystem and ampulla, x24; C, Eltanin sta. 1592, cutaway of an ampulla revealing efferent duct at center, x23.

Rates into a reticulate pattern near the cyclosystems, including the pseudosepta, lids, and ampullae. There are no granules. Nematopores, 0.06–0.20 mm in diameter, are irregularly scattered over the branch coenosoma, pseudosepta, and cyclosystem lid.

Cyclosystems are round to slightly elliptical, 1.7–2.8 mm in diameter, and either flush with or only slightly raised above the branch coenosoma. Most cyclosystems are on the anterior side; however, some are directed posteriorly, their position probably influenced by a commensal worm. On the basis of 25 cyclosystems, the range of dactylopores per cyclosystem is 11–21, with an average of 16.44 (σ = 2.1) and mode of 17. Dactylotomes are rather consistently 0.10–0.11 mm in diameter and extend about two thirds of the distance to the base of the gastropore. Pseudosepta are triangular with concave upper edges. They are 0.20–0.36 mm wide at the outer edge of the cyclosystem, tapering to about 0.04 mm wide at their inner margins. The most proximal pseudoseptum is greatly enlarged into a fixed lid of variable size, overhanging from one quarter to the entire cyclosystem. The lid may be a narrow concave tongue about 0.60 mm wide or a broad, flat canopy up to 1.3 mm wide. Sometimes one or two other pseudosepta in the cyclosystem, usually including those on the distal (upper) side of the cyclosystem, form additional narrow lids, which often fuse with the main lid over the gastropore.

Gastropores are round, 0.73–0.94 mm in diameter, and open into a slightly swollen, roughly textured chamber. This chamber opens into a smaller flat cavity through a small, circular pore about 0.61–0.69 mm in diameter.

This lower chamber is about 60 μm deep and envelopes the lower half of the upper chamber. Large, irregularly shaped ampullae, 1.6–1.8 mm in diameter, occur at the base of the proximal cyclosystem lid. No ruptured ampullae were noted, but several broken cyclosystems revealed a pore about 0.17 mm in diameter leading from the ampulla to the gastropore, opening just beneath the lower reaches of the enlarged lid pseudoseptum. This, in all probability, is the efferent pore for mature planulae.

Remarks. A commensal polychaete induces a calcareous tube to be formed only on the posterior side of the colony. The flattened worm tube is about 2.9 x 1.2 mm in diameter.

Discussion. The only other species of Crypthelia to have more than one lid per cyclosystem is C. clausa Broch, 1947, known only from the Maldive Islands, Indian Ocean. Aside from this similarity, C. formosa can be distinguished by its nematopores, smaller cyclosystems, fewer dactylopores per cyclosystem, and differently shaped ampullae.

Crypthelia formosa is also similar to C. affinis Moseley, 1879 (as restricted by Boschma [1968a, p. 106]), from the Canary Islands, differing only by its multiple cyclosystem lids, larger cyclosystems, and polychaete symbiosis.

Etymology. The Latin adjective 'formosus,' meaning beautifully formed, is chosen for this handsome species.

Material examined. Types.

Map 12. Distribution of *Cryphelia fragilis* (circles) and *C. formosa* (squares).

60087. Type-locality: 54°43' S, 55°30' W (Scotia Ridge off Burdwood Bank), 1647-2044 m.

**Distribution.** Scotia Ridge from Tierra del Fuego to South Georgia (Map 12). Depth: 483-1841 m.

**Genus Stylaster Gray, 1831**

**Diagnosis.** Colonies arborescent and usually flabellate. Cyclosystems arranged sympodially, directed laterally or anterolaterally. Coenosteal texture reticulate. Both gastrostyles and dactylostyles present. Ampullae usually superficial hemispheres.

Type-species: *Madrepora rosea* Pallas, 1766, by subsequent designation [Milne Edwards and Haime, 1850].


*Stylaster erubescens*; Moseley, 1876b, p. 94.

*Stylaster densicaulis* Moseley, 1879, pp. 449-454, pl. 34, fig. 5, pl. 35, fig. 3, pl. 40; 1881, pp. 57-62, 81, pl. 1, fig. 5, pl. 2, fig. 3, pl. 7.—Boschma, 1953, p. 169; 1957, pp. 4-5.—Lowe, 1967, pp. 32-36, pl.
Fig. 41. A, Stylaster densicaulis Moseley, Eltanin sta. 1593, USNM 60016, x0.63; B, Allopora profunda Moseley, holotype, Challenger sta. 306, BM 1880.11.25.174, x0.91; C, Allopora eguchii Boschma, Eltanin sta. 1411, USNM 60096, x0.78; D, Allopora robusta, n. sp., holotype, Eltanin sta. 1081, USNM 60200, x2.52; E, Calyptopora reticulata Boschma, Eltanin sta. 1851, two branches, USNM 60008, both x0.64.
Fig. 42. Stylaster densicaulis Moseley. A, D, Eltanin sta. 740, longitudinal section of branch revealing several gastrostyles, x15, x27, respectively; B, C, Eltanin sta. 1593, cyclosystems, x29, x34, respectively; E, F, Eltanin sta. 740, coenosteal texture, x80, x400, respectively; G, Eltanin sta. 970, gastrostyle, x71; H, I, Eltanin sta. 740, gastrostyle, x357, x1071, respectively.
Description. The colony is large, massive, and flabellate, with frequent anastomosis of branches, especially in larger colonies. Distal branches are round in cross section and about 1.5-2.0 mm in diameter. Intermediate-sized branches (e.g., 7.8 x 5.2 mm in diameter) lose the clear-cut sympodial appearance by adding coenosteum; these branches are usually elliptical in cross section, the greater axis of the ellipse being perpendicular to the plane of the fan. Large basal branches are usually round in cross section, the largest being 2.8 cm in diameter. Large and intermediate-sized branches often bear a long ridge, rectangular in cross section, on their anterior sides, measuring up to 3.5 mm tall and 4.5 mm wide. The tallest colony examined is 15 cm; the widest, 19 cm.

The coenosteum is smooth, dense, porcelainous, and always white. Short, discontinuous slits dissect the surface into a reticulate maze of coenosteal strips. The strips are flat, 70-90 μm wide, and covered with irregularly scattered, low, blunt granules 5-10 μm in diameter. Many of the colonies have small round holes, 80-110 μm in diameter, scattered irregularly over the coenosteum. The function of these pores is unknown; they may be boreholes of a predator.

Cyclosystems are arranged sympodially on distal branches and are eventually relegated to the anterolateral edges of larger-diameter branches. If a worm tube or a ridge is present on the anterior side, the cyclosystems are positioned closely adjacent to or actually on either side of these structures. Cyclosystems are round to elliptical in cross section, 1.0-1.6 mm in diameter. Only the most distal cyclosystems have a full circle of dactylopores; away from the branch tip those dactylopores adjacent to the branch become filled in, resulting in a diastema. As the branch thickens, the number of dactylopores if further reduced, often to a stage with only two or three dactylopores per cyclosystem. From 26 distal cyclosystems the range of dactylopores per cyclosystem is 9-14 with an average of 11.88 (σ = 1.17) and mode of 12.5. Occasionally, for example, in about 1 in 40 cyclosystems, a cyclosystem will be elongate, housing two gastrostyles surrounded by 17-18 dactylopores. Dactylostyles are 0.09-0.14 mm in diameter and extend 23-30% of the distance to the bottom of the gastropore. The intervening pseudosepta are slightly thicker than the dactylostyles, and usually one or two are considerably thicker than all the others. Dactylostyles are rudimentary, composed of two or three crowded rows of irregularly shaped pillars, each up to 34 μm tall and 11 μm wide.

Gastropores are round, about 0.45-0.65 mm in diameter. The gastropore tube is cylindrical, straight, and deep (up to 2.5 mm long). The tube is perforated by many elliptical pores (e.g., 25-46 μm in diameter), most of which are arranged in rows, each row corresponding to a dactylostyle. The gastrostyle is small, occupying only the basal one fourth to one fifth of the tube. There is a ring of coarse granules around the
lower portion of the gastropore tube, which slightly constricts the tube at the level of the gastrostyle tip. Gastrostyles are cylindrical with rather blunt tips and are about 0.50 mm tall and 0.16 mm wide (H:W ratios between 2.0 and 2.5). Styles are ornamented from base to tip with robust, smooth, pointed spines, up to 35 μm long and 11 μm wide at their bases. These spines sometimes bifurcate, forming a very dense thorny mat completely obscuring the main shaft of the style.

Female ampullae are large (1.3-1.7 mm in diameter) and irregularly globular in shape, usually elongate. They occur on both sides of distal branches, sometimes closely spaced but rarely clustered, and are sometimes slightly undercut around their basal perimeter. Male ampullae are hemispherical, 0.7-1.1 mm in diameter, and often clustered or aligned on branches.

Remarks. Most colonies have an associated commensal polynoid polychaete, Malmgreniella dicirra Hartman, which induces the coral to form a broad, flat tube on its anterior side. The tube may be quite long, up to 3.0 x 5.5