

Map 6. Distribution of Errina (E.) gracilis (circles) and Errinopora cestoporina (squares).

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, 21A-21G

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

Errina gracilis; Boschma, 1966b, p. 109 (part: part of BANZARE sta. 30).--Boschma and Lowe, 1969, p. 15, pl. 5, map 1.

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

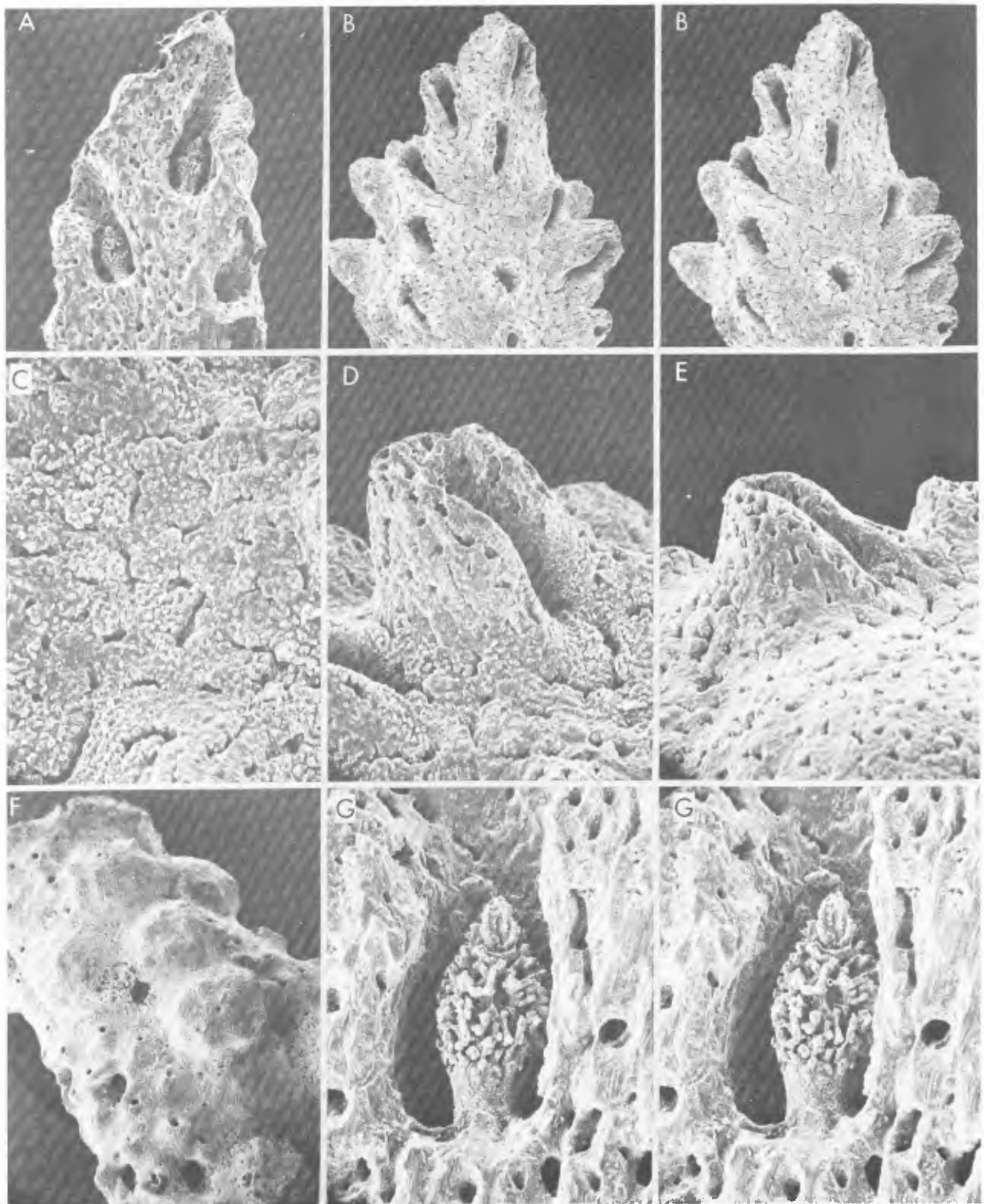


Fig. 21. Paratypes of *Errina* (*E.*) *boschmai*, n. sp. A, *Eltanin* sta. 993, longitudinal section of branch tip revealing gastrostyles, x26; B, *Eltanin* sta. 418, branch tip, x36, stereo pair; C, same specimen, coenosteal texture, x143, D, E, same specimen, dactylopore spines, x114, x93, respectively; F, *Eltanin* sta. 415, branch segment bearing ampullae, x16; G, *Eltanin* sta. 993, gastrostyle, x107, stereo pair.

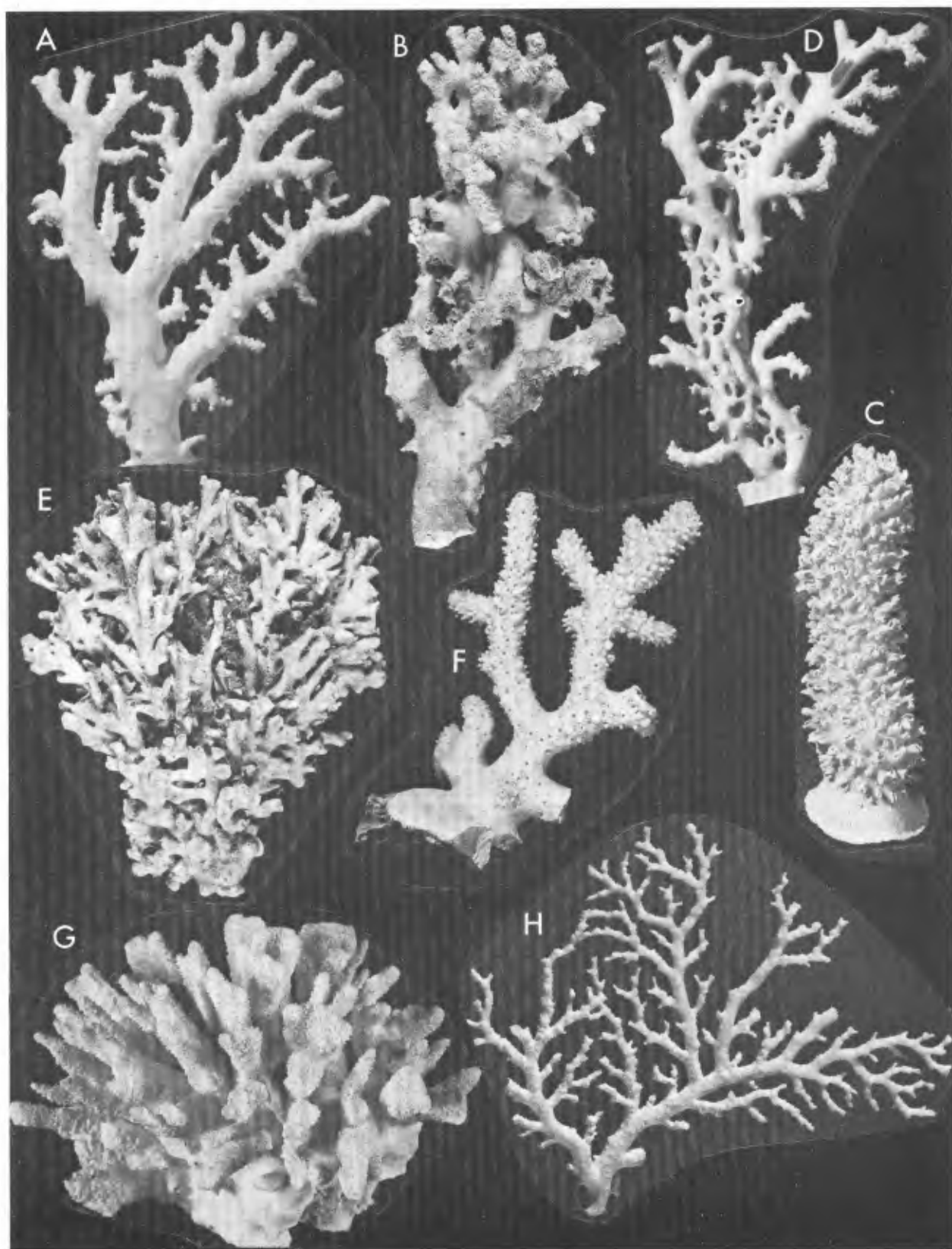


Map 7. Distribution of *Errina* (*E.*) *boschmai* (circles), *E.* (*E.*) *cheilopora* (squares), and *E.* (*I.*) *echinata* (triangles).

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 interdigitation 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 coenosteal 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 21G) 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 μ m 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 arranged 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. Boschma, 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 59919; sta. 732, USNM 52628; sta. 1536, USNM 59918. *Islas Orcadas* sta. 575-11, USNM 59914; sta. 575-12, USNM 59917; sta. 575-17, USNM 59920; sta. 575-34, USNM 59913; sta. 575-90, USNM 59915; sta. 575-91, USNM 59916; sta. 575-102, USNM 59921. *Hero* sta. 731-1884, USNM 59911; sta. 731-1940, USNM 59912. *Edisto* sta. 38-21, USNM 52625. *EW* sta. 66-6, USNM 52624. Type-locality: 61°25'S, 56°30'W (off South Shetland Islands), 300 m.

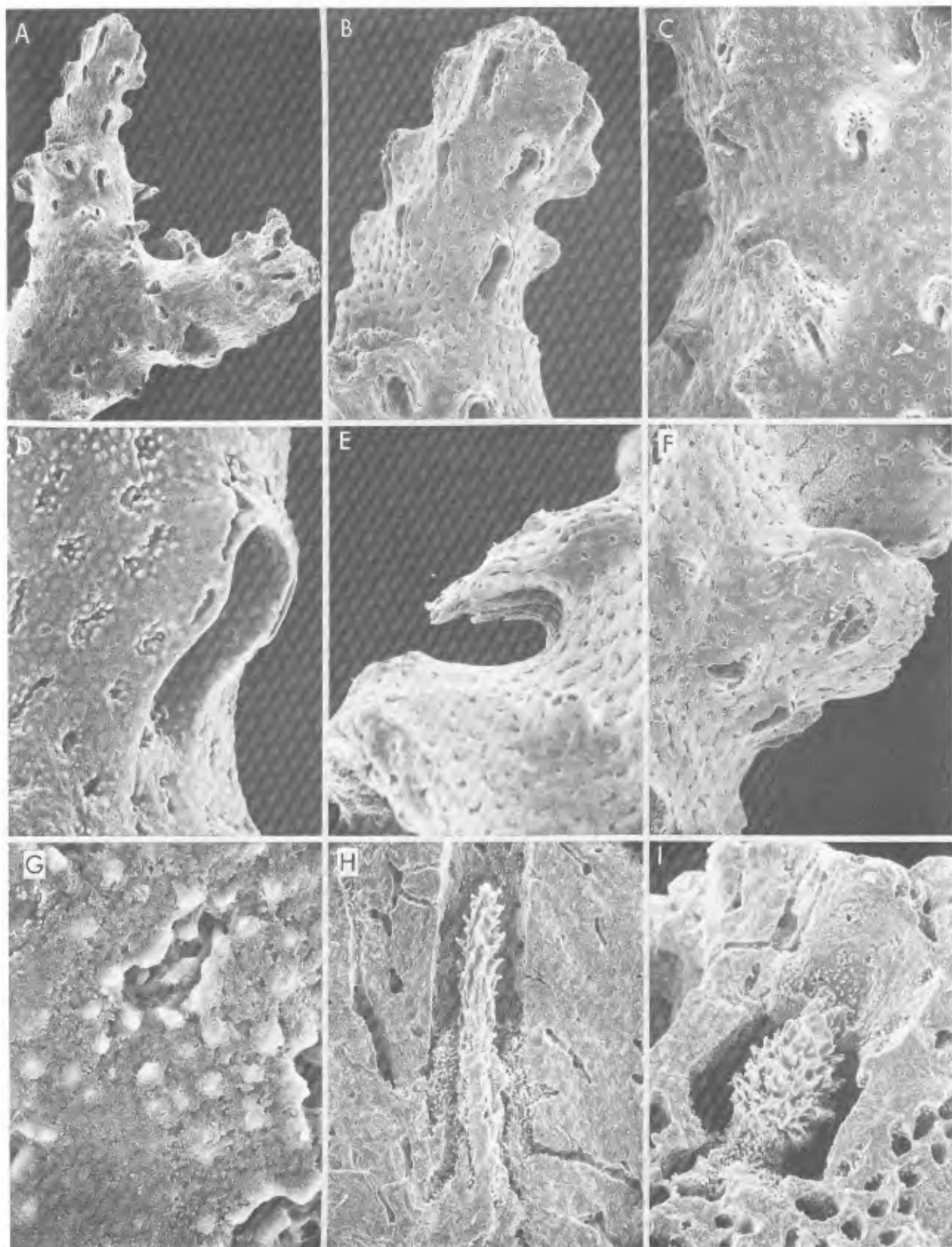
Distribution. Off South Shetland Islands; off South Georgia; off Mac. Robertson Land, Antarctica (Map 7). Depth: 100-659 m.

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. This 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 μ m wide, of variable length, and delimit coenosteal strips 50-70 μ m in width. Low, blunt granules 5-7 μ m 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

Fig. 22. A, *Errina* (*E.*) *cheilopora*, n. sp., holotype, *Eltanin* sta. 1975, USNM 59906, xl.78; B, C, *Errina* (*I.*) *echinata* Moseley: B, *Eltanin* sta. 1593, USNM 59945, x0.38; C, *Eltanin* sta. 1592, small specimen with bare base, USNM 59944, x2.83; D, E, *Errina* (*I.*) *labiata* Moseley: D, *Burton Island* sta. 592-3, USNM 59987, x0.90; E, *Eltanin* sta. 1924, unusually densely branched corallum, USNM 59950, x0.63; F, G, *Errina* (*I.*) *lowei*, n. sp.: F, holotype, *Eltanin* sta. 1536, USNM 60140, xl.84; G, paratype, WH 1976, specimen with unusually flattened branches, ZIZM, x0.95; H, *Errina* (*I.*) *fascicularis*, n. sp., holotype, *Eltanin* sta. 1423, USNM 60149, xl.53.



they appear as subsurface white lines on a pink background.

Gastropores are round, 0.22-0.33 mm in diameter; gastrostyle 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. Gastrostyles 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 gastrostyles 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 'poros' (Greek: hole), 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 fragments), USNM 59907; sta. 1414 (1 fragment), USNM 59909; sta. 1851 (14 fragments), USNM 59910. Type-locality: 54°30'S, 150°00'E (off Macquarie Island), 443-549 m.

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

Subgenus *Inferiolabiata* Broch, 1951

Diagnosis. 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)

Figs. 22B, 22C, 24A-24H, 25A, 25B

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 echinata; Boschma, 1957, p. 53.-- Boschma and Lowe, 1969, p. 15, pl. 5, map 2.

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 coenosteum 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 spines, x54; 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.

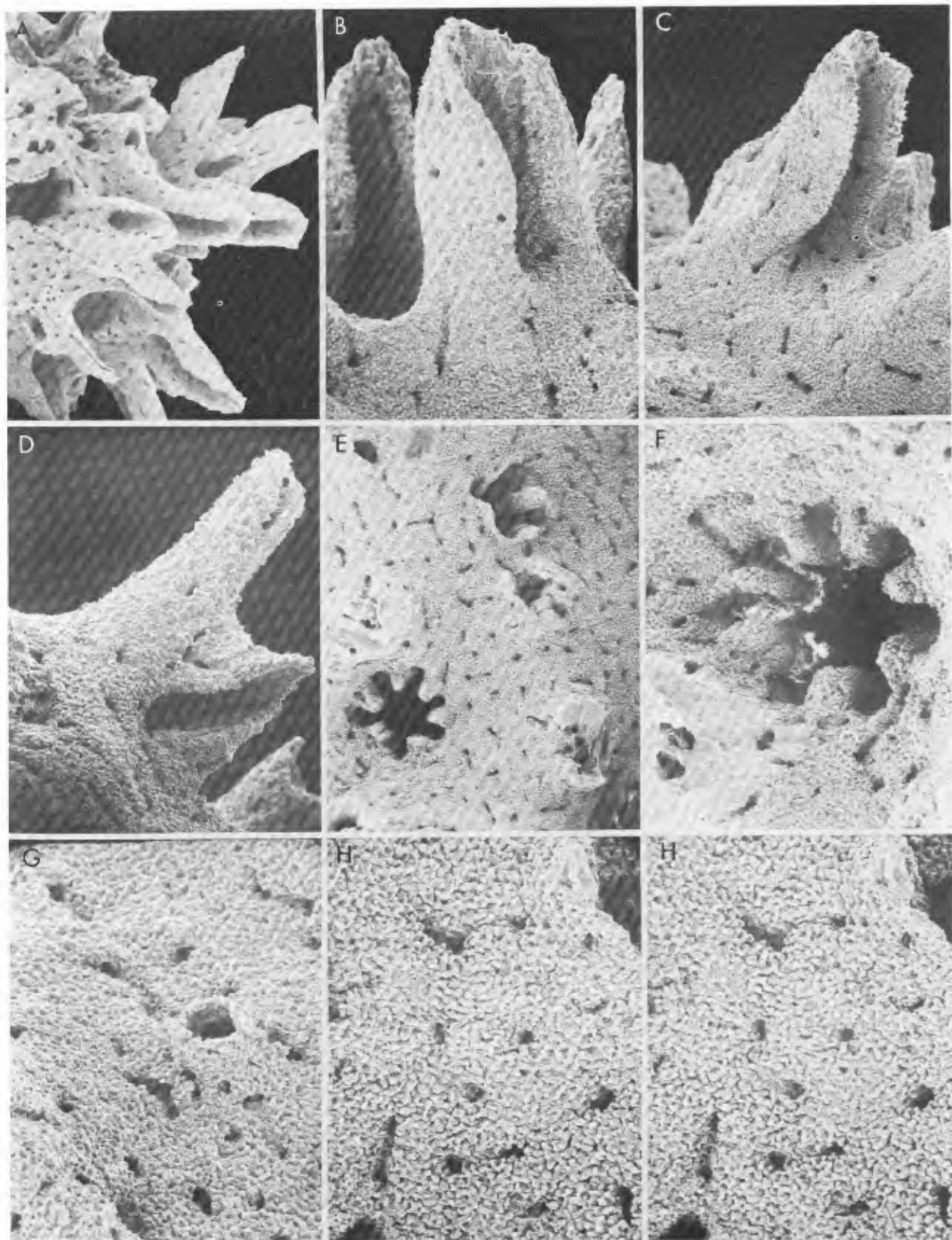


Fig. 24. *Errina* (*I.*) *echinata* Moseley from Eltanin sta. 1593. A, dactylopore spines viewed from above, x16; B-D, dactylopore spines, x50, x37, x57, respectively; E, F, stellate gastropores, x29, x54, respectively; G, small dactylopore, x79; H, coenosteal texture, x86, stereo pair.

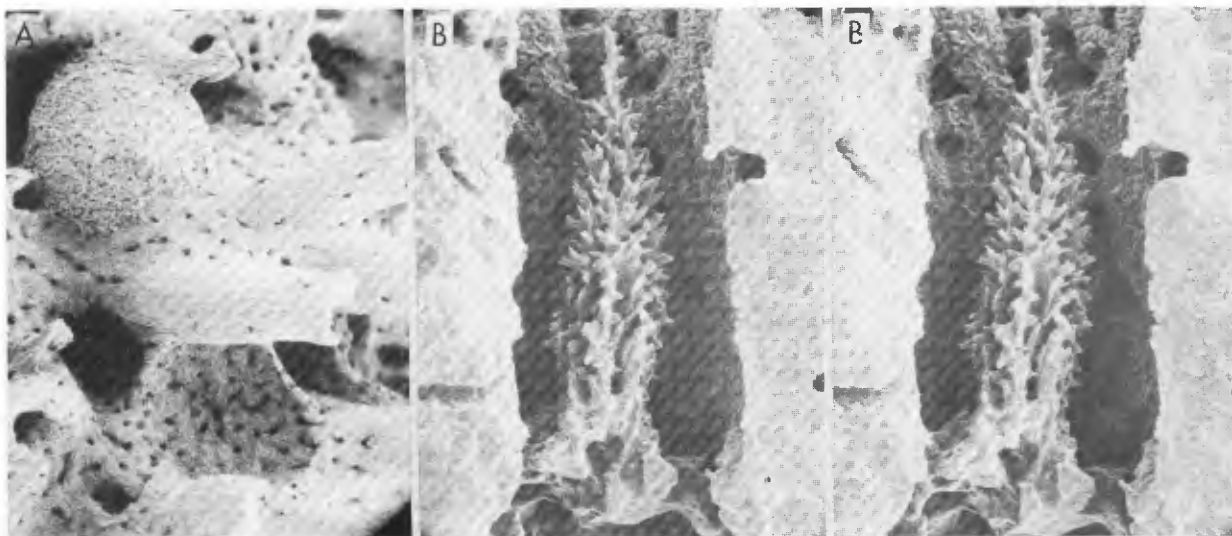


Fig. 25. *Errina (I.) echinata* Moseley from Eltanin sta. 1593. A, dactylopore spines and ruptured and intact ampullae, x21; B, gastrostyle, x64, stereo pair.

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 μ m in diameter.

Gastropores are numerous, large (0.41-0.68 mm in diameter), and round to stellate, both shapes occurring in the same colony. The stellate gastropores have one to seven distinct grooves around the edge of the pore and superficially resemble cyclo systems. They differ from cyclo systems in that the grooves are in continuous communication with the gastropore for their entire lengths and serve the function of channelizing the gastrozoid tentacles, not of separating dactylozooids. The gastrostyle is tall and slender, dwarfed by the spacious gastropore 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 tall, often branched spines (up to 50 μ m high) arranged in 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 [1964d] 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.

Material examined. Eltanin sta. 1592, USNM 59944; sta. 1593, USNM 59945. Challenger sta. 320 (holotype). Other material: *Spinipora echinata* reported by Hickson and England [1909], BM 1950.1.11.101.

Types. Holotype: Challenger sta. 320, BM 1880.11.25.174, 196. No other types. Type-locality: 37°17'S, 53°52'W (off Rio de la Plata, Uruguay). Depth 1097 m.

Distribution. Known only from off Uruguay and off Burdwood Bank (Map 7); 357-1647 m.

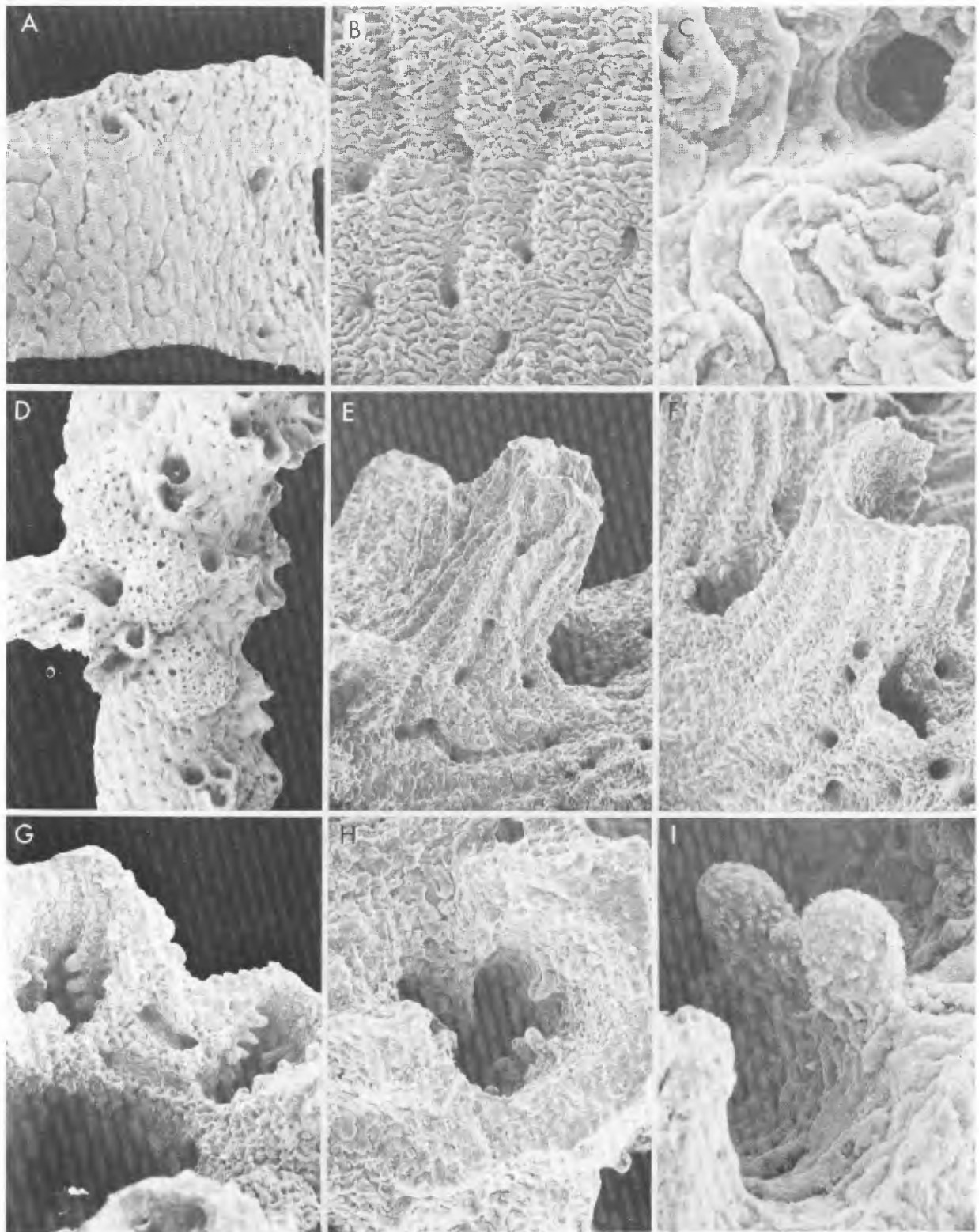


Fig. 26. *Errina (I.) labiata* Moseley. A-C, Eltanin sta. 2021, branch segment showing coenosteal texture composed of imbricated platelets, shallow coenosteal canals, and coenosteal pores, x17, x86, x430, respectively; D, same station, branch segment with ampullae and dactylopore spines, x16; E, F, Eltanin 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.

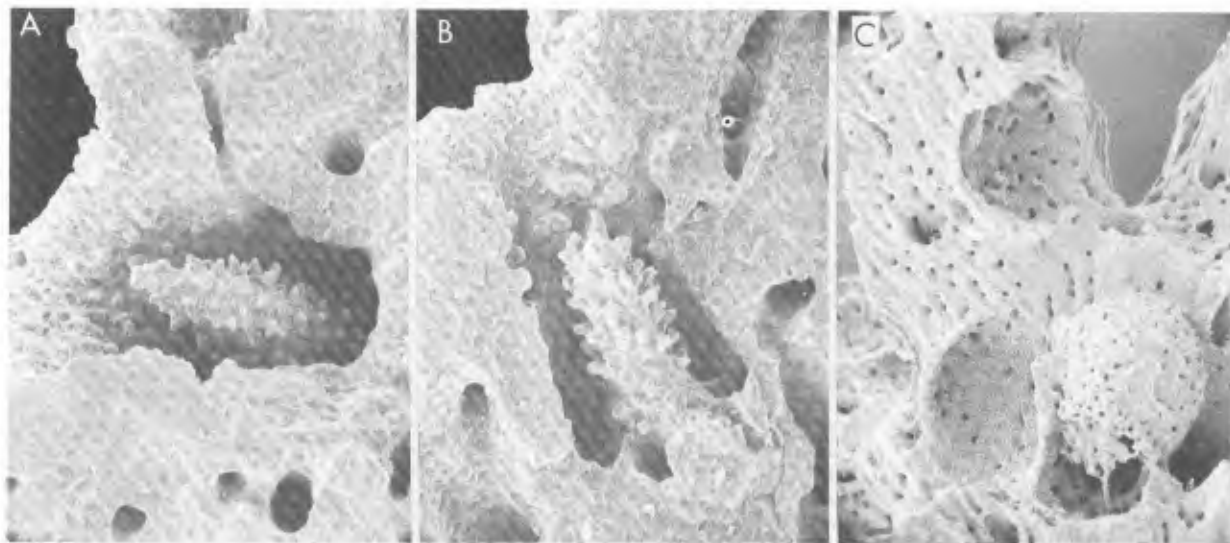


Fig. 27. *Errina* (*Inferiolabiata*) *labiata* Moseley. A, B, Eltanin sta. 2092, gastrostyles, both $\times 93$; C, same station, ruptured and intact ampullae, $\times 19$.

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, 1892, 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.

Errina (*Inferiolabiata*) *labiata*; Broch, 1951b, p. 125.--Boschma, 1963a, pp. 337, 338.

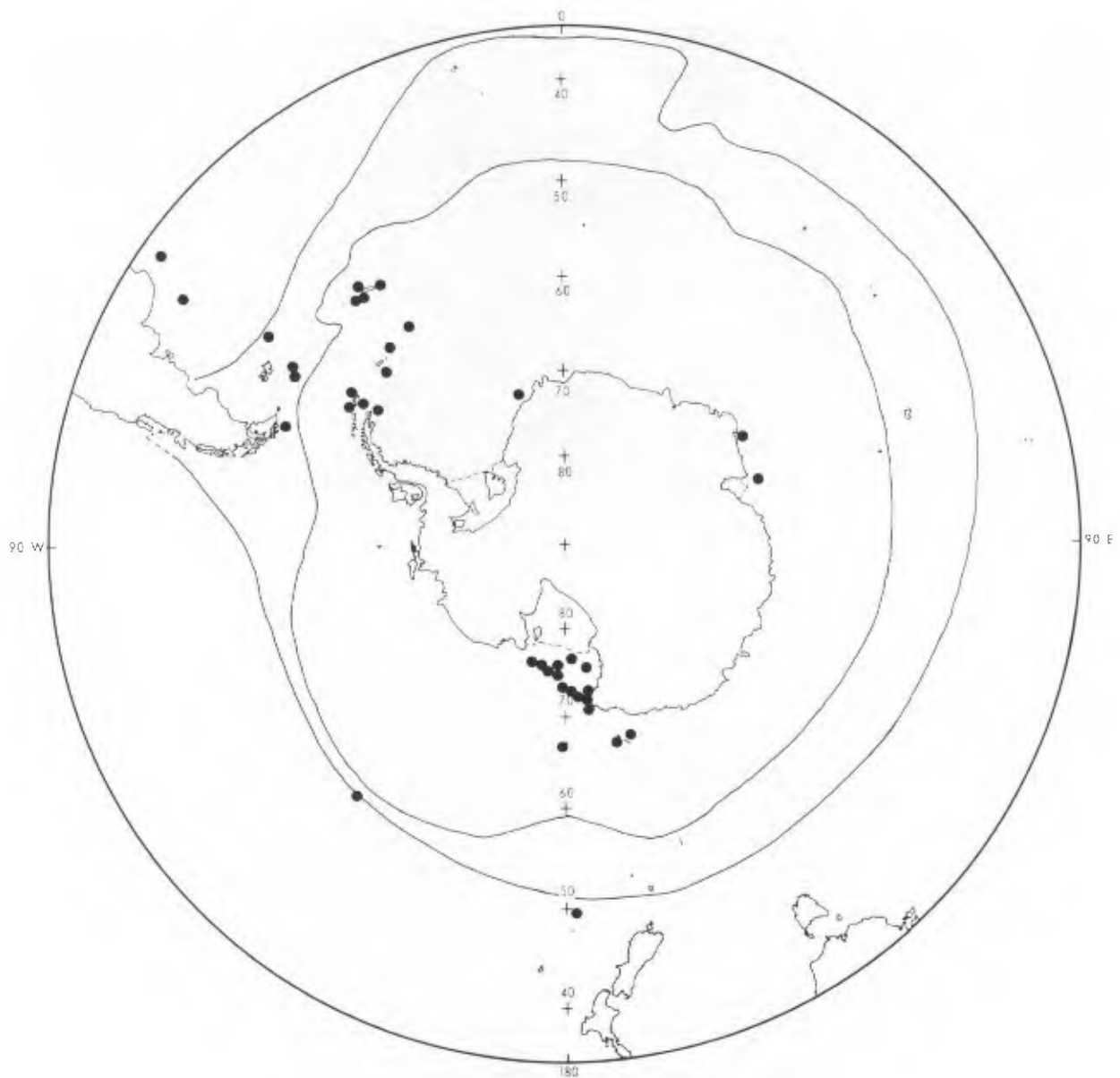
Not *Errina* (*Inferiolabiata*) *labiata*; Lowe, 1967, pp. 68-72, pl. 5, figs. a-b (description and figures based on *E. lowei*).

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



Map 8. Distribution of *Errina (I.) labiata*.

1-3] illustrated a variety of gastropore 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 distal-most 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 of six cases examined the symbiotic polynoid polychaete was *Polyeunoa laevis* McIntosh. No other species of polychaete is known to associate with *E. labiata*, and *P. laevis* has only 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 Río 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 [1964d] 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 validly from only two locations.

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

Material examined. Eltanin sta. 377, USNM 60080; sta. 499, USNM 59969; sta. 684, USNM 59982; sta. 740, USNM 60083; sta. 993, USNM 59967; sta. 1067, USNM 59979; sta. 1081, USNM 52658; sta. 1089, USNM 52665; sta. 1536, USNM 59964; sta. 1593, USNM 59963; sta. 1691, USNM 59981; sta. 1851, USNM 59972; sta. 1870, USNM 59954; sta. 1873, USNM 59980; sta. 1875, USNM 59976; sta. 1878, USNM 59975; sta. 1924, USNM 59950; sta. 1925, USNM 59974; sta. 1931, USNM 59978; sta. 1933, USNM 59965; sta. 1946, USNM 59970; sta. 1995, USNM 59947; sta. 1996, USNM 59948; sta. 1997, USNM 59956; sta. 2005, USNM 59973; sta. 2007, USNM 59966; sta. 2021, USNM 59968; sta. 2022, USNM 59977; sta. 2026, USNM 59949; sta. 2080, USNM 59953; sta. 2081, USNM 59962; sta.

2092, USNM 59951; sta. 2093, USNM 59958; sta. 2095, USNM 59946; sta. 2097, USNM 59952; sta. 2119, USNM 59984; sta. 2123, USNM 59955; sta. 2143, USNM 60087; sta. 5765, USNM 60079.

Islas Orcadas sta. 575-8, USNM 60082; sta. 575-11, USNM 59959; sta. 575-12, USNM 59986; sta. 575-17, USNM 59960; sta. 575-34, USNM 59961; sta. 575-35, USNM 59985. **Atka** sta. 23, USNM 59957. **Burton Island** sta. 592-3, USNM 59987. **Edisto** sta. 14, TD-2, USNM 59988. **EW** sta. 66-32, USNM 52660; sta. 66-35, USNM 53410. **Vema** sta. 17-65, USNM 52667. **WH** sta. 329/71, ZIZM. **NZOI** sta. A-449, A-454, A-455, A-463, A-464, A-465, A-521, A-526, A-527, D-216, E-207, E-212b (all deposited at the NZOI). **BANZARE** sta. 30, RMNH; sta. 34, RMNH. **Challenger** sta. 320 (types). Other material: **Challenger** sta. 135, BM 1880.11.25.170, 171 (not *E. labiata*).

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 syntypes. 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 Río de la Plata, Uruguay), 1097 m.

Distribution. Widely distributed in Antarctic and Subantarctic (Map 8), including off southeast South America, Scotia Ridge, Ross Sea, Scott Island, Balleny Islands, Antipodes 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) lowei*, n. sp.
Figs. 22F, 22G, 28A-28G

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

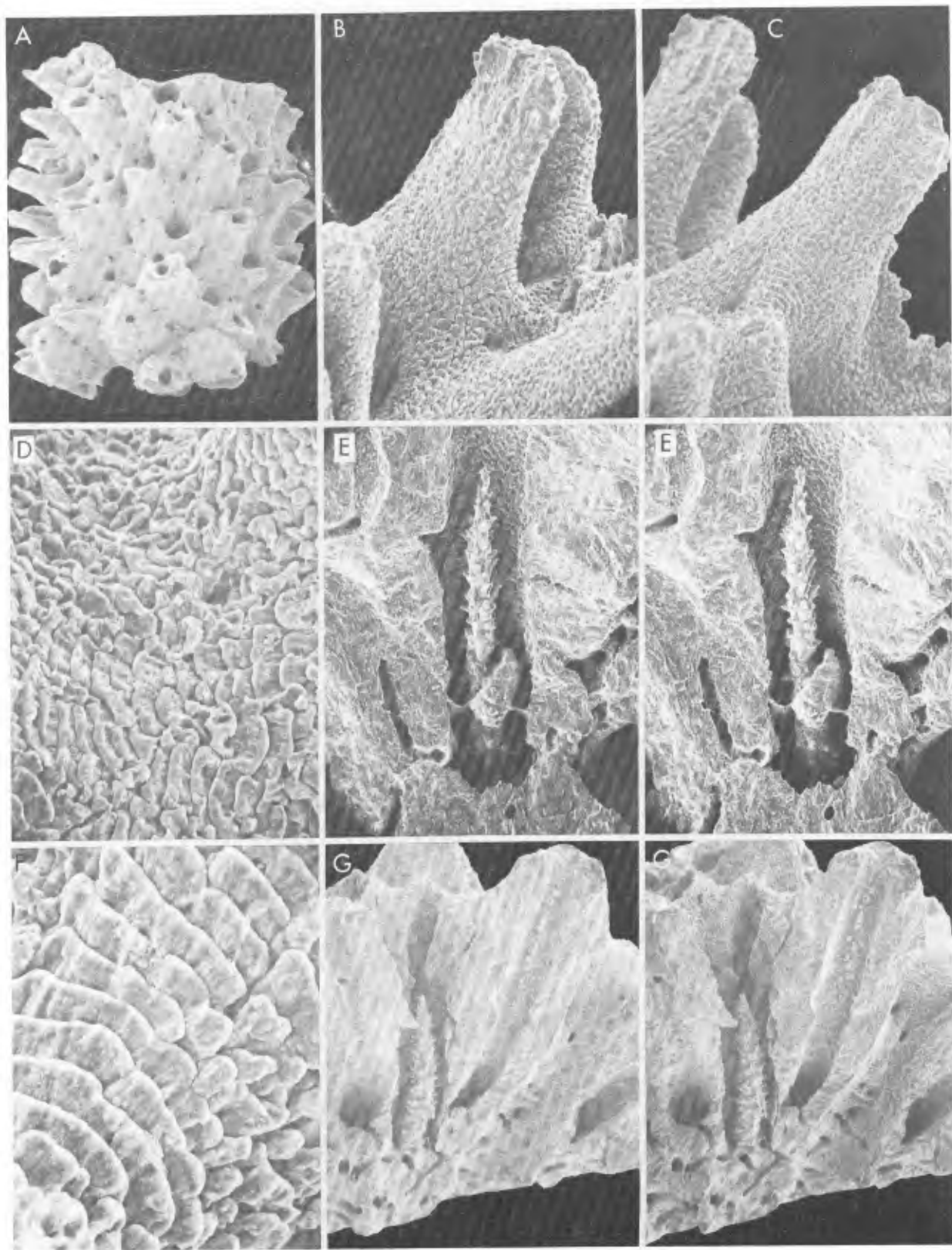
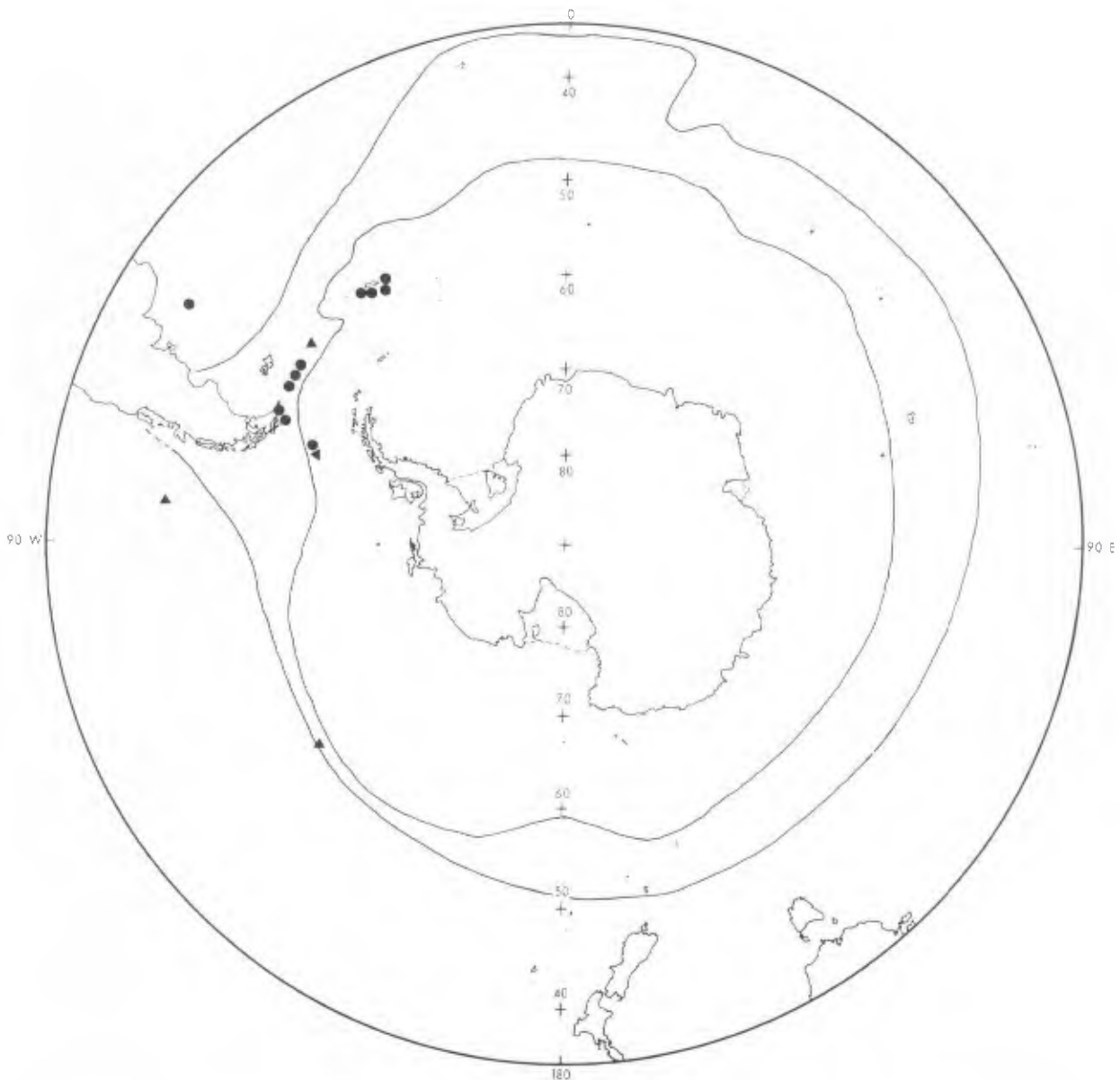


Fig. 28. Paratypes of *Errina* (*I.*) *lowei*, n. sp. A, *Eltanin* sta. 684, branch segment bearing several male ampullae toward base, x16; B, C, same specimen, dactylopore spines, both x56; D, F, same specimen, coenosteal texture, x214, x429, respectively; E, *Islas Orcadas* sta. 575-35, gastrostyle, x57, stereo pair; G, *Islas Orcadas* sta. 575-91, gastrostyle and rudimentary dactylostyle in upper right, x36, stereo pair.



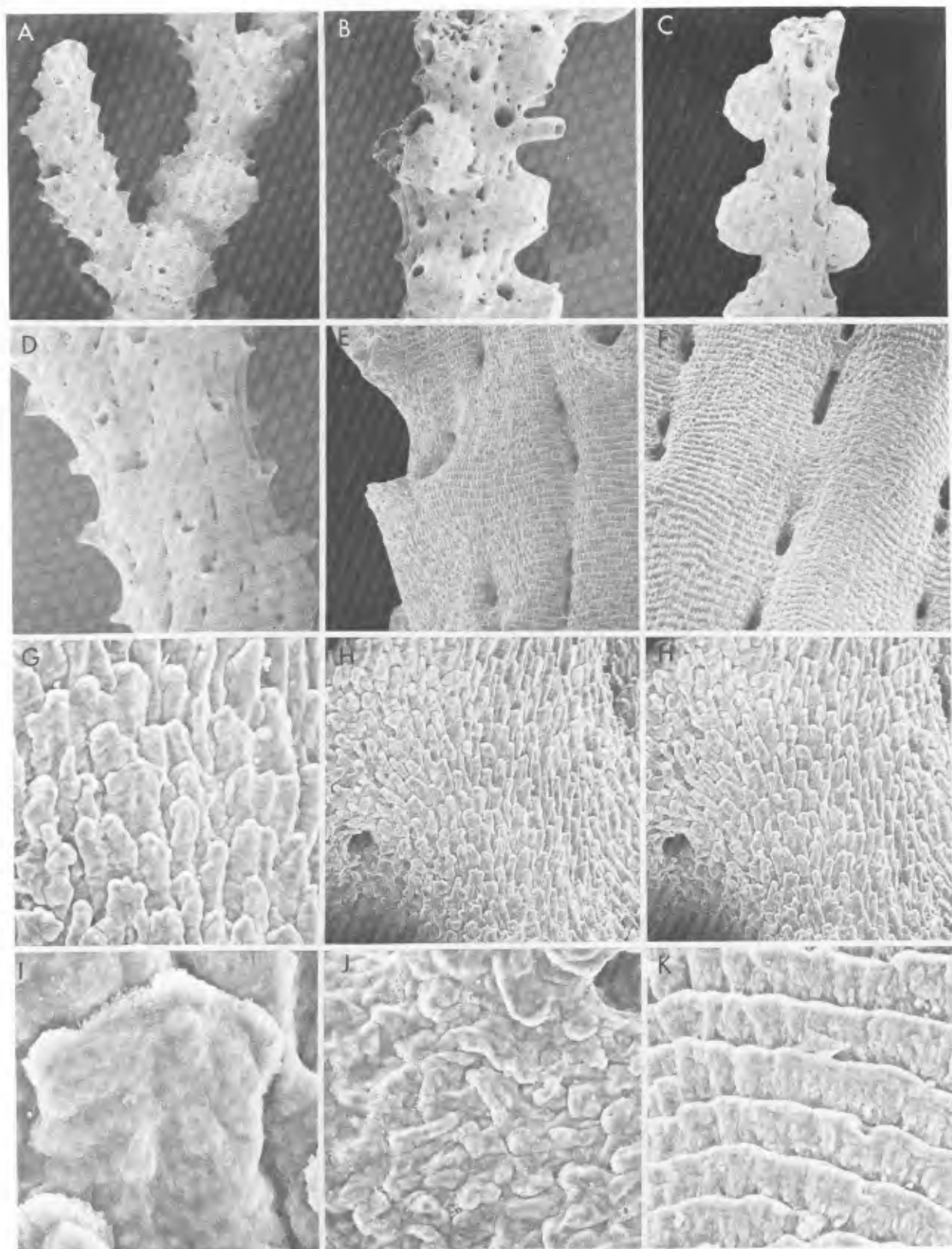
Map 9. Distribution of Errina (I.) lowei (circles) and Adelopora pseudothyron (triangles).

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 plate-

lets. 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), mammiform, 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.

Types. Holotype: *Eltanin* sta. 1536, USNM 60140. Paratypes: *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. 575-35, USNM 59940; sta. 575-82, USNM 59943; sta. 575-91, USNM 59937.

Hero sta. 715-895, USNM 59941. *Vema* sta. 17-59, USNM 52666. Type-locality: 54°29'S, 39°22'W (west of South Georgia), 659-686 m.

Distribution. Off Bahía Blanca, Argentina; off Tierra del Fuego; off Burdwood Bank; off South Georgia; Drake Passage (Map 9). Depth: 250-960 m.

18. *Errina* (*Inferiolabiata*)
fascicularis, n. sp.

Figs. 22H, 29A-29K, 30A-30E

Description. Colonies are delicate and flabellate, 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 μ m 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 deeply 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 μ m wide) (Figures 29G and 29I) 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

Fig. 29. Paratypes of *Errina* (*E.*) *fascicularis*, n. sp. A, *Eltanin* sta. 1423, branch segment with ampullae, x13; B, C, *Eltanin* sta. 684, branch segment with ampullae, x15, x13, respectively; D, *Eltanin* sta. 1423, branch segment, x23; E, same station, lower gastropore lip from side and coenosteal texture, x55; F, same station, several coenosteal cords, x120; G-J, same station, aspects of coenosteal texture, x321, x129, x1285, x314, respectively (Figure 29H is a stereo pair); K, *Eltanin* sta. 684, coenosteal texture, x357.

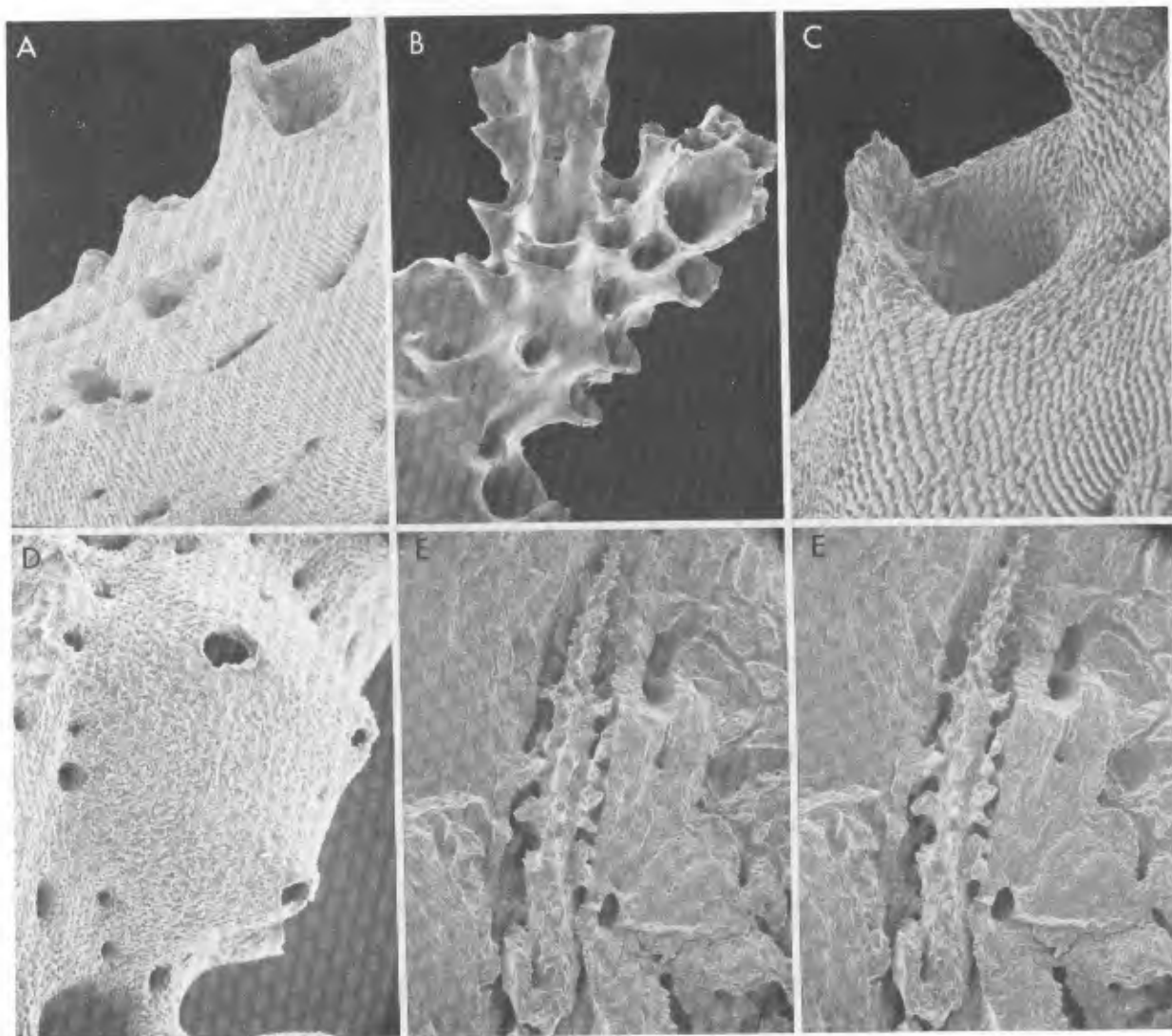
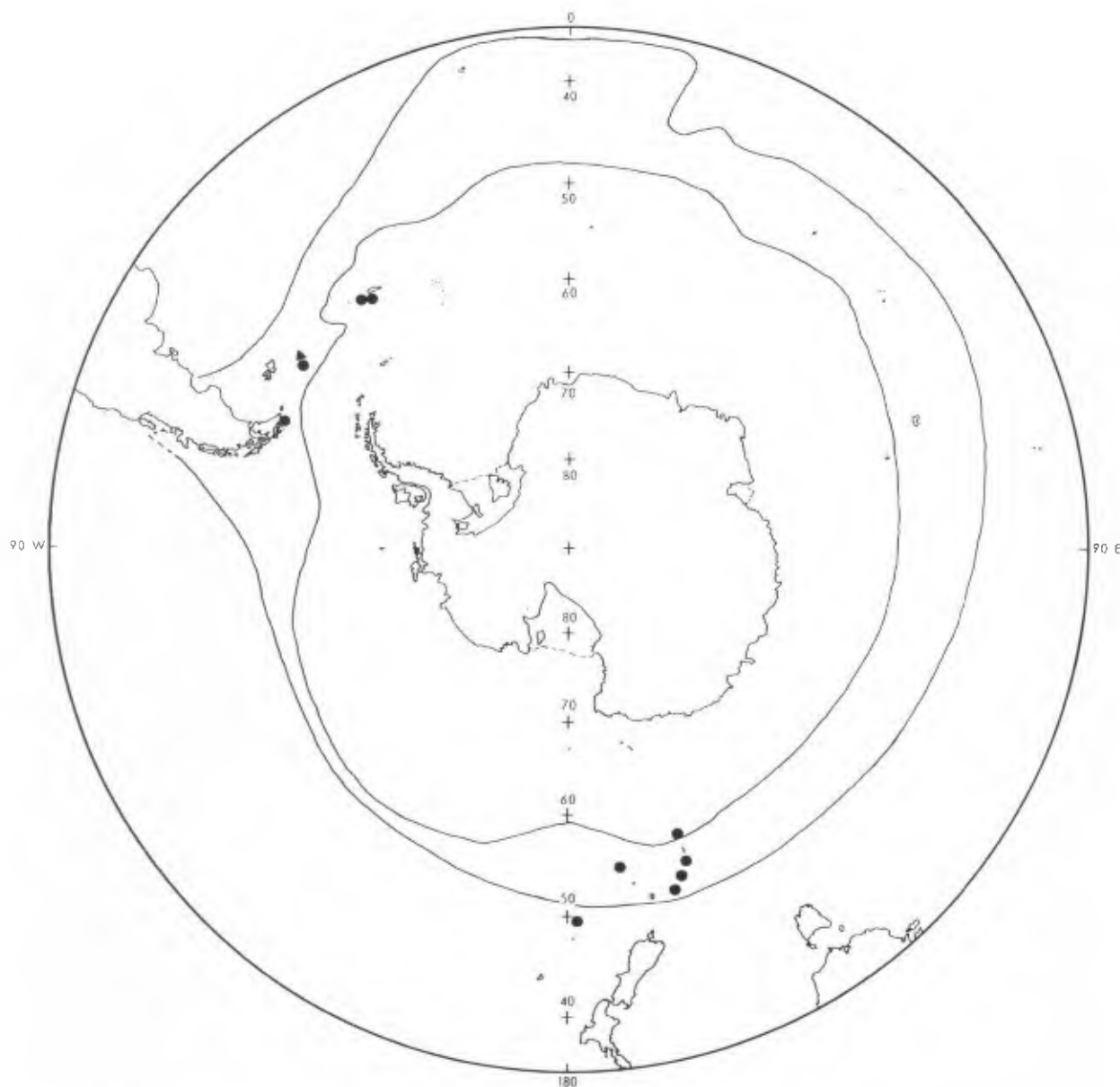


Fig. 30. Paratypes of *Errina* (*I.*) *fascicularis*, n. sp. A, *Eltanin* sta. 1423, branch segment with dactylopore spines and one gastropore lip, x52; B, *Eltanin* sta. 1416, branch tip with extremely smooth texture, x29; C, lower gastropore lip of Figure 30A, x107; D, *Eltanin* sta. 684, multipored ampulla, x54; E, *Eltanin* sta. 1423, gastrostyle, x54, stereo pair.

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.



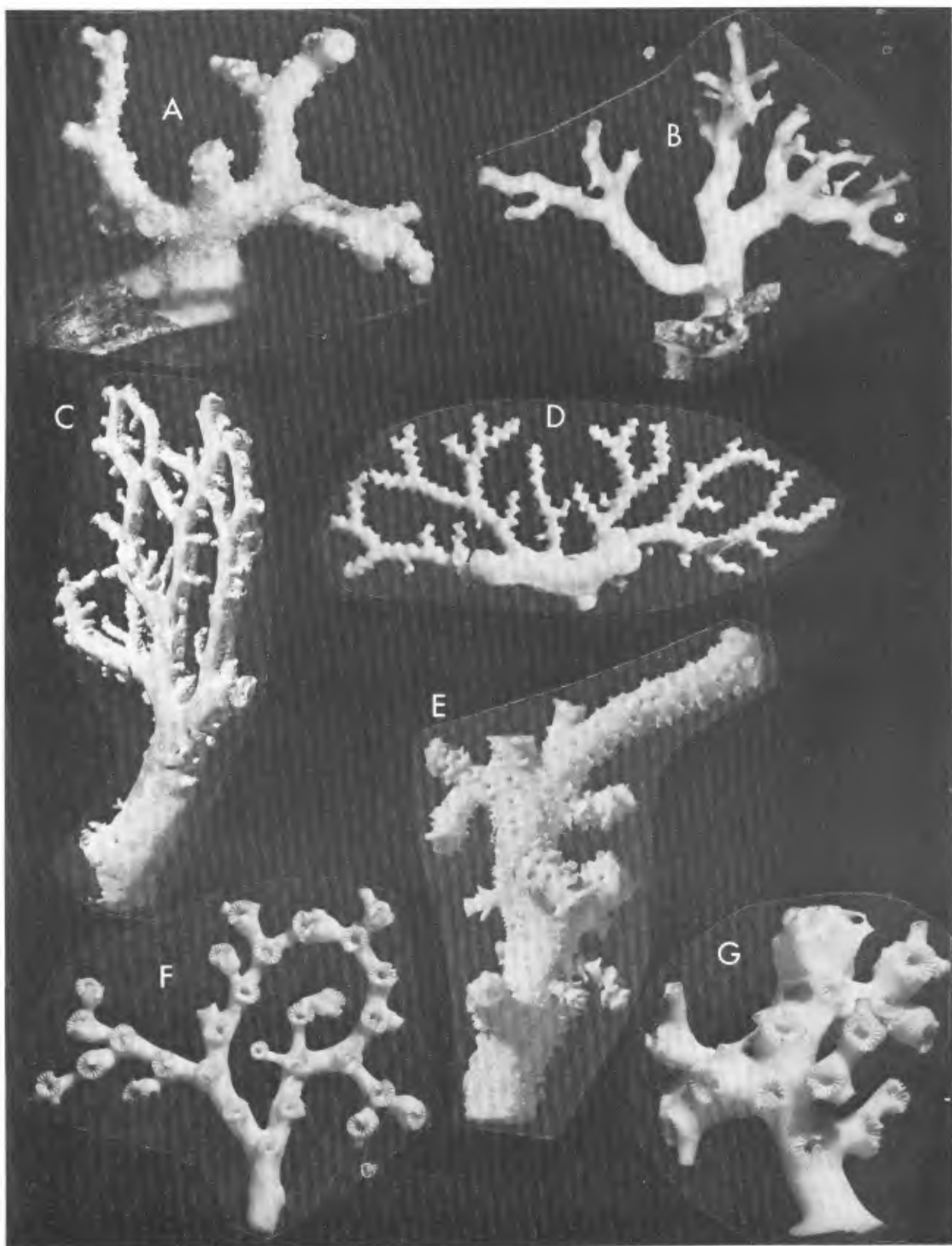
Map 10. Distribution of *Errina* (*I.*) *fascicularis* (circles) and '*Errina*' *cyclopora* (triangle).

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, *Polyeunoa 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.

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 60115; sta. 1412, USNM 60146; 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 60114. Type-locality: 56°21'S, 158°28'E (Hjort Seamount), 1574-1693 m.

Distribution. Off Tierra del Fuego; off Burdwood Bank; off South Georgia; Macquarie Ridge; off Antipodes Islands (Map 10). Depth: 540-2010 m.

Incertae Sedis

19. '*Errina*' *cyclopora*, n. sp. Figs. 31A, 32A-32G

Description. Coralla are small with irregular, sparse branches producing an arborescent 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,

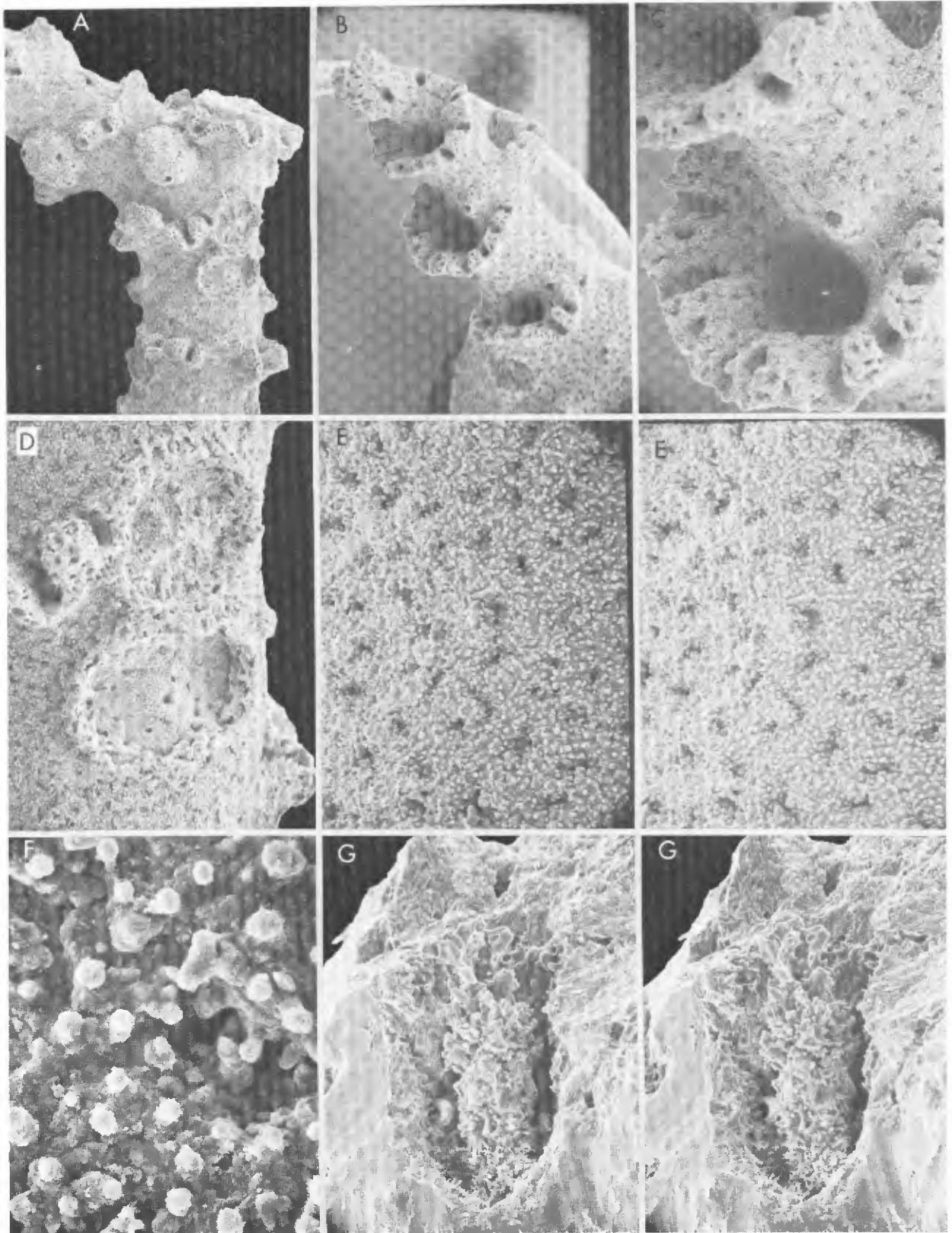
and always white. Irregularly shaped coenosteal pores 20-25 μ m in diameter penetrate the surface in an irregular reticulate pattern, bordering ill-defined coenosteal strips 50-80 μ m wide. Dense concentrations of tall, slender granules 5-7 μ m wide and up to 16 μ m tall cover the surface. In addition to the coenosteal 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 μ m in height. The middle third has a coarser ornamentation of thicker and taller spines, and the distal third bears broad projections up to 35 μ m tall and 21 μ m 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,

Fig. 31. A, '*Errina*' *cyclopora*, n. sp., holotype, *Eltanin* sta. 1592, USNM 60190, x3.22; B, *Adelopora pseudothyron* Cairns, holotype, *Eltanin* sta. 254, USNM 60198, x1.64; C, D, *Conopora pauciseptata* Broch: C, *Eltanin* sta. 1414, USNM 52621, x0.72; D, *Edisto* sta. 14-TD2, USNM 52617, x1.34; E, *Errinopora cestoporina*, n. sp., holotype, *Eltanin* sta. 1593, USNM 60188, x1.91; F, *Crypthelia fragilis*, n. sp., holotype, *Eltanin* sta. 17-5, USNM 60206, x3.09; G, *Crypthelia formosa*, n. sp., holotype, *Eltanin* sta. 1592, USNM 60207, x2.88.



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 cyclo-systems (at least on distal branches) allies it to the Stylasterinae, but the other randomly placed dactylopore spines and their shape and the presence of gastrostyles but no dactylostyles (a combination not found in the Stylasterinae) suggest a placement in the Errininae. The dactylopore spines are very similar to those of *Errina* (*Errina*); however, their orientation is that of *E. (Inferiolabiata)*. 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 dactylopores arranged in pseudocyclo-systems.

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 gastropore; *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 (Inferiolabiata) 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 (Inferiolabiata)*, and *Errinopora* and a level of dactylopore-gastropore coordination tending toward, and perhaps transitional with the Stylasterinae. 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 gastropore.

Material examined. Types.

Types. Holotype; *Eltanin* sta. 1592, USNM 60190. Paratypes: *Eltanin* sta. 1592, USNM 60139, BM 1981.6.11.2, RMNH Coel. 14.109; *Vema* sta. 17-61, USNM 60138. Type-locality: 54°43'S, 55°30'W (Scotia Ridge, east of Burdwood Bank), 1647-2044 m.

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 gastro-pores variable, ranging from complete lack of coordination to highly coordinated pseudocyclo-systems. 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).

Errinopora n. sp. Boschma and Lowe, 1969, p. 15, pl. 5, map 4 (part: not *Vema* sta. 17-53).

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 μ m in diameter arranged in a reticulate pattern; however, the granules are coarser, lower in relief, and angular, 6-21 μ m in diameter. *Errinopora cestoporina* also has small, irregularly perforated mounds 0.13-0.20 mm in diameter, differing from those of '*E. cyclo-*

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 pseudocyclo-systems, 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); G, gastrostyle, x143, stereo pair.

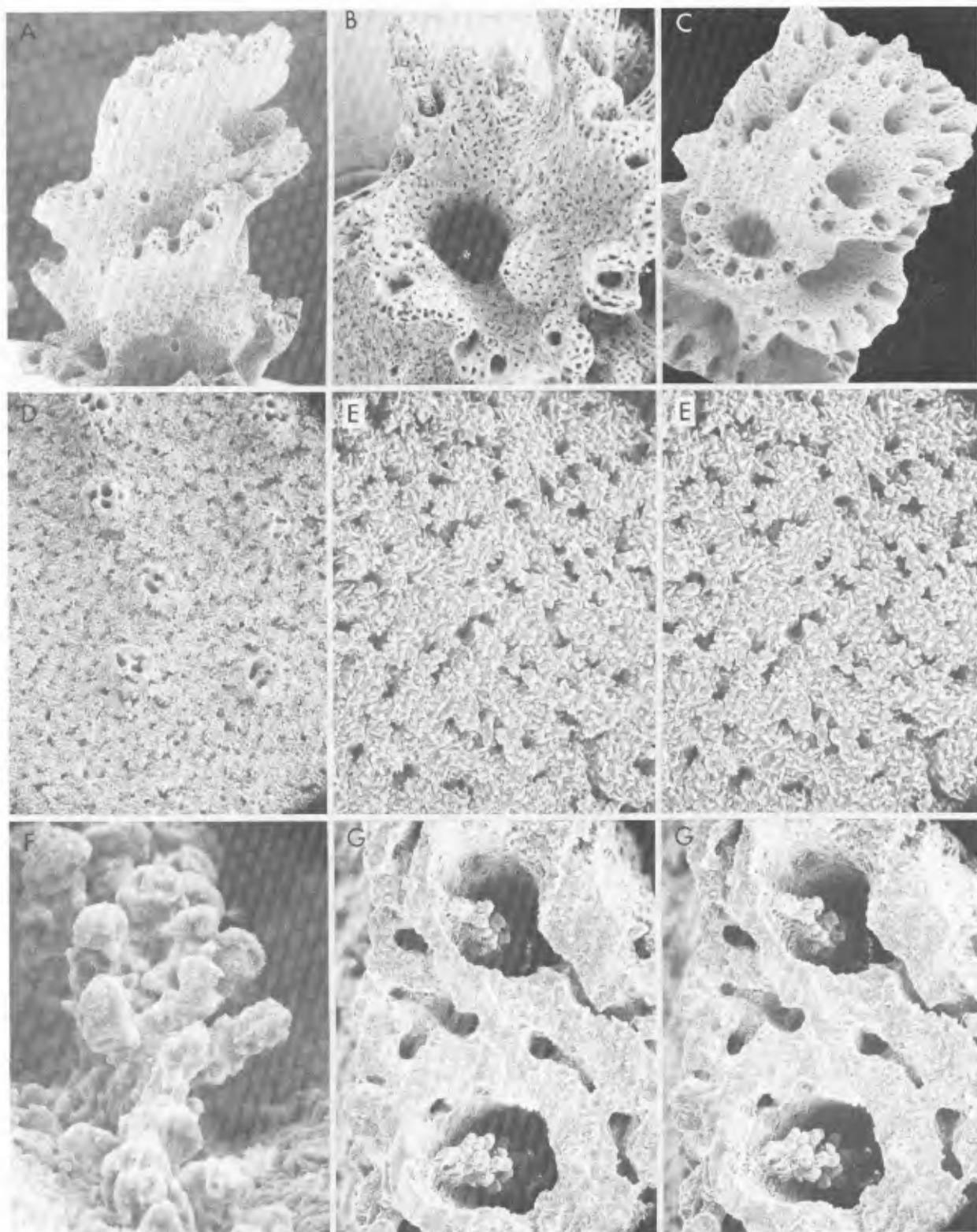


Fig. 33. Paratypes of *Errinopora cestoporina*, n. sp. from Eltanin sta. 1593. A, branch tip, x16; B, C, dactylopores arranged around gastropores, conical ampulla in Figure 33B, x23, x16, respectively; D, small perforated mounds, x43; E, coenosteal texture, x107, stereo pair; F, G, dactylostyles, x589, x129, respectively (Figure 33G is a stereo pair).

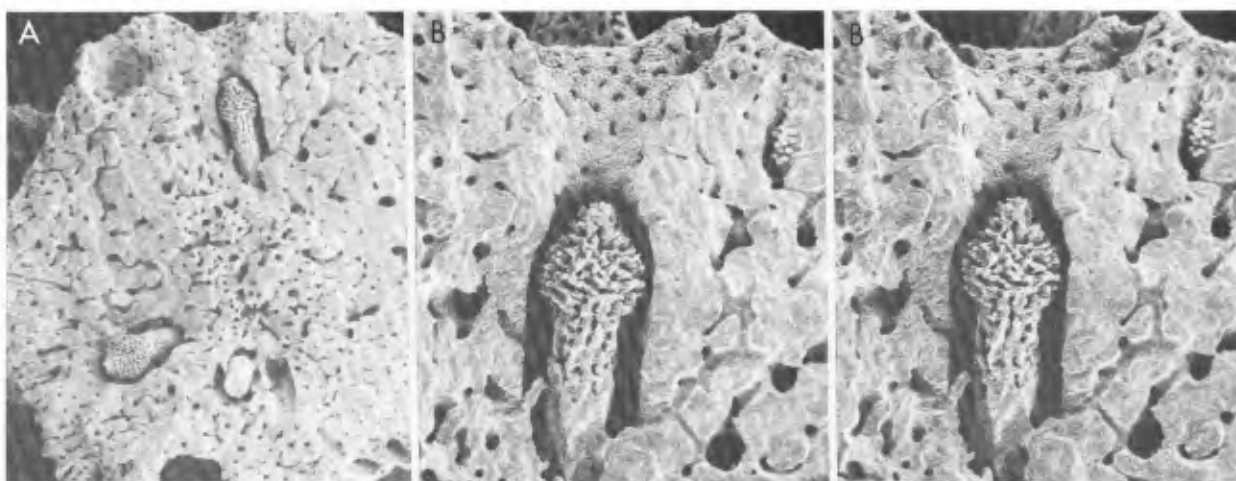


Fig. 34. Paratypes of *Errinopora cestoporina*, n. sp. from *Eltanin* sta. 1593. A, cross section of branch revealing two gastrostyles and ampullae, x16; B, same specimen, gastrostyle, dactylostyle in upper right, x43, stereo pair.

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

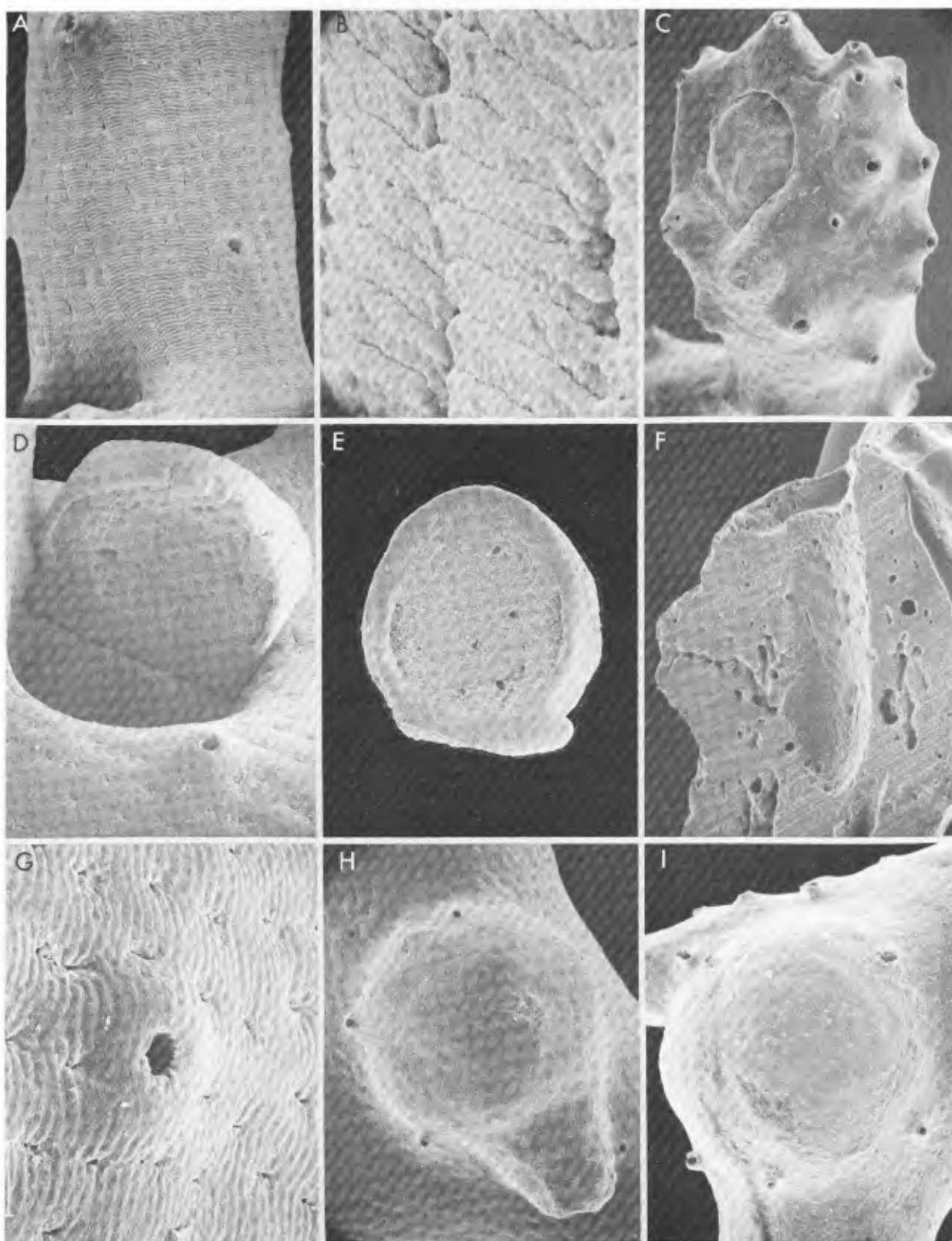
Gastropores are round, 0.30-0.55 mm in diameter. Gastrostyles are robust, composed of a cylindrical basal main shaft supporting an expanded, highly ornamented head. The basal main shaft is composed of a bundle of fused longitudinal cords, each about 30 μm wide. The head is composed of tall, blunt spines 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 coenosteum, 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 pseudocyclostyles are found on basal branches.

There are six valid species in the genus *Errinopora*: *E. pourtalesii* (Dall, 1884); *E. styliifera* (Broch, 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 dactylo-pore 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 dactylo-pore 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 dactylo-pores beneath each gastropore.

Material examined. Types.

Types. Holotype: *Eltanin* sta. 1593, USNM 60188. Paratypes: *Eltanin* sta. 740, USNM 52654, 52655, BM 1981.6.11.7; sta. 1593, USNM 60141. Type-locality: 54°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 dactylo-pores not arranged in cyclostyles. Gastropores at branch tips and axils, each gastropore covered by a hinged operculum.

Genus *Adelopora* Cairns, 1982

Diagnosis. Colonies arborescent, flabellate, or bushy. Coenosteum composed of thin longitudinal strips bearing rows of imbricated platelets. Gastropores flush with the coenosteum; dactylo-pores small perforated tubercles. Gastropores and dactylo-pores

without styles. Type-species: *Adelopora pseudothyron* Cairns, 1982, by original designation.

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 μ m 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. Dactylo-pore tubercles about 0.1 mm in diameter, 0.02-0.15 mm tall. Apical perforations of dactylo-pores 23-35 μ m 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 μ m; gastropore nematocysts rod shaped, 11.2-14.1 x 2.9-4.2 μ m.

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

Material examined. Types.

Types. Holotype: *Eltanin* sta. 254, USNM 60198. Paratypes: *Eltanin* sta. 254, USNM 60128, BM 1981.8.1.1, RMNH Coel. 14.114, ROMCN-B 102; sta. 1343, USNM 60131; sta. 1345, USNM 60132; sta. 1521, USNM 60130; sta. 25-325, USNM 60129; sta. 25-326, USNM 60133. Type-locality: 59°49'S, 68°52'W (seamount in Drake Passage), 512-622 m.

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.

Fig. 35. Paratypes of *Adelopora pseudothyron* Cairns. A, *Eltanin* sta. 254, branch segment, x71; B, same specimen, coenosteal texture, x715; C, *Eltanin* sta. 25-326, branch tip with closed operculum, x47; D, *Eltanin* sta. 254, operculum in open position, x114; E, same specimen, detached operculum, left nub broken off, x102; F, same station, longitudinal section of gastropore tube, x50; G, same station, low dactylo-pore mound and worn coenosteal platelets, x297; H, same station, ampulla with lateral extension, x43; I, *Eltanin* sta. 25-326, hemispherical ampulla, x43.

Subfamily STYLASTERINAE Gray, 1847

Diagnosis. Gastropores and dactylopores arranged in distinct cyclo systems.

Genus Conopora Moseley, 1879

Diagnosis. Colonies arborescent, flabellate, or bushy. Cyclo systems arranged sympodially or randomly on branches. Coenosteal surface composed of imbricated platelets. Gastropore tube constricted into two chambers. Gastrostyles and dactylostyles absent. Nematopores usually present. Type-species: Conopora tenuis Moseley, 1879 (= Stylaster laevis Studer, 1878), by monotypy.

22. Conopora pauciseptata Broch, 1951
Figs. 31C, 31D, 36A-36G

Conopora pauciseptata Broch, 1951a, pp. 41-44, pl. 4, figs. 1, 2, text figs. 8-11.-- Boschma, 1957, p. 39; 1966b, pp. 113-116, 117, pl. 1, figs. 1-5, 9-11, text figs. 3, 4.--Lowe, 1967, pp. 43-49, pl. 2, figs. c-e, text figs. 5.--Boschma and Lowe, 1969, p. 15 (part: not Vema sta. 15-128), pl. 5, map 3.

Description. Colonies are large, robust, and primarily uniplanar. The largest colony is 12 cm tall and 5.5 cm broad, with a basal branch diameter of 1.5 cm; however, smaller, delicate colonies or broken end branches are more commonly collected. Distal branches are round in cross section and about 1 mm in diameter. Intermediate- to large-sized branches are elliptical in cross section, the greater axis of the ellipse being oriented perpendicular to the flabellar plane. Branch anastomosis is rare in small colonies but common in large, robust coralla. Colonies are attached by a broad encrusting base to objects such as brachiopod shells, bivalve shells, barnacle valves, rocks, and other stylasterines.

The coenosteum is composed primarily of parallel, longitudinal, flat cords 70-130 μ m wide. The cords, which frequently bifurcate and rejoin one another, are best developed on slender distal branches. The grooves between the cords are deeply incised, are about 7 μ m wide, and periodically have elongate coenosteal slits, which penetrate the branch. Occasionally, especially in large-diameter branches, this regular, longitudinally striate texture degenerates into a more random reticulate pattern or somewhat obliquely oriented coenosteal cords. The microarchitecture of the cord coenosteum is that of broad imbricated platelets, approximately 56-61 occurring per millimeter. The free edge of each platelet is usually continuous across the cord from groove to groove, but it is sometimes dissected into several pieces. The

orientation of the leading edges is inconsistent; within each cord the direction of imbrication changes periodically. Branch coenosteum, worm tubes, and pseudosepta are covered by numerous large, round nematopores, 40-55 μ m in diameter. Most nematopores are slightly raised on mounds about 25 μ m high, but some are flush with the coenosteum. The density of nematopores varies greatly, ranging from very dense (Figure 36F) to sparse. There are no coenosteal granules.

Cyclo systems are round, 0.8-2.0 mm in diameter. On distal branches the cyclo systems occur in a compact sympodial arrangement on the two lateral edges of the branch. As the branch thickens and the sympodial pattern is lost, the cyclo systems become flush with and gradually sunken below the level of the coenosteum, resulting in two lines of closely spaced cyclo systems on either side of the branch. The only exception to this general rule occurs in those specimens from South Georgia, which have cyclo systems equally distributed on all sides of some branches of some colonies, as in Allopora. Away from the branch tip, cyclo systems begin to develop adcauline diastemas, which become progressively wider with greater distance from the branch tip. These diastemas reduce the number of dactylopores per cyclo system by coenosteum infilling. The extreme case is a cyclo system of only one or two dactylopores (Figure 36D). Because the distance from the branch tip influences diastema width and dactylopore number, only the relatively complete distal and penultimate cyclo systems were chosen for dactylopore counts. On the basis of 29 distal cyclo systems the range of dactylopores per cyclo system is 8-15, with an average of 10.41 ($\sigma = 1.50$) and mode of 10.5. The total range of dactylopores per cyclo system is 1-15. Dactylopores are about 78 μ m wide and extend about 45% of the distance to the base of the gastropore. Pseudosepta are triangular with blunt inner apices and broad outer edges measuring 1-3 times the width of a dactylopores.

Gastropores are round, about 0.4 mm in diameter, and open into a hemispherical chamber of slightly greater diameter. Below this chamber is a smaller, flattened cavity separated from the upper chamber by a constricted aperture of variable diameter. Sometimes this aperture is closed by a thin dissepiment, completely sealing off the lower cavity. The gastropore tube is 1.5-1.8 mm deep, the lower cavity composing 15-30% of this length.

Female ampullae are superficial with gradually sloping edges, are 0.61-1.30 mm in diameter, and occur on both the anterior and the posterior sides of the colony. Male ampullae are internal, 0.50-0.65 mm in internal diameter, and release their sperm via a narrow efferent duct which, when the gono-

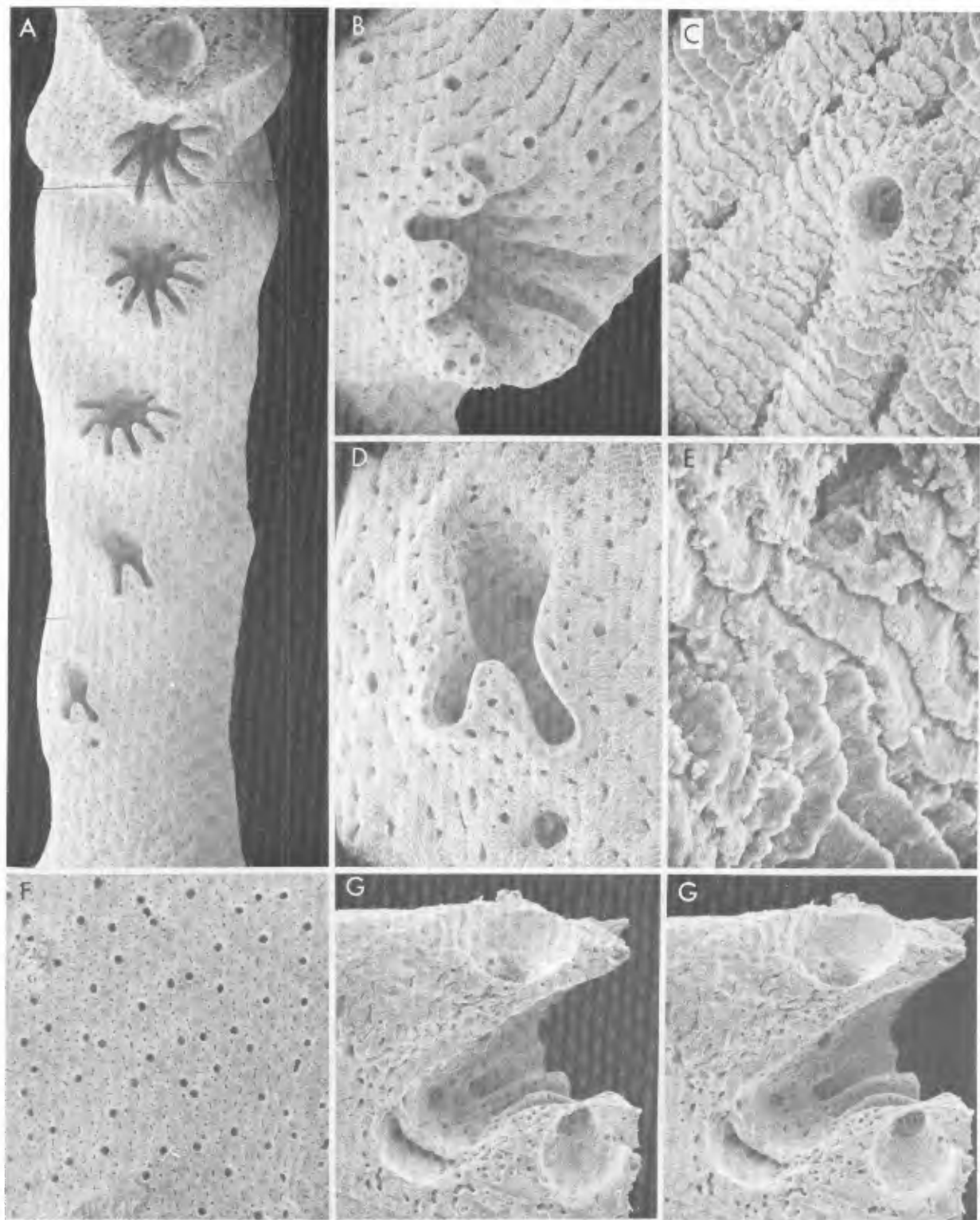


Fig. 36. *Conopora pauciseptata* Broch. A, Edisto sta. 14-2, branch segment showing reduction in number of dactylopores per cyclostyle from distal tip proximally, x15; B, Vema sta. 17-61, branch segment with cyclostyle and nematopores, x50; C, E, same specimen, coenosteal texture and nematopore, x214, x536, respectively; D, most reduced cyclostyle of Figure 36A, x 54; F, Eltanin sta. 1089, branch segment with numerous nematopores, x17; G, same specimen, longitudinal section of cyclostyle with two ampullae 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. *Conopora pauciseptata* 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, often considerably larger than the branch to which it is attached. The tubes are found on both the anterior and the posterior sides and sometimes on both sides of the same branch. Two species of polynoids have been identified from *C. pauciseptata*: *Malmgreniella dicirra* Hartman and *Harmathoe magellanica* (McIntosh).

Discussion. Boschma [1966b] and Lowe [1967] have compared *C. pauciseptata* to the three other recent species in the genus: *C. tenuis* Moseley, 1879; *C. major* Hickson and England, 1905; and *C. dura* Hickson and England, 1909. More recently, Zibrowius [1981] has indicated that *Conopora laevis* (Studer, 1878) is a senior synonym of *C. tenuis* and that *Stylaster verrucosa* Studer, 1878, is also a *Conopora*. Both of these species occur in the vicinity of New Zealand and differ from *C. pauciseptata* primarily in the expression of their nematopores. Nematopores of *C. verrucosa* are very tall, producing a warty texture; those of *C. pauciseptata* are moderately raised; and nematopores of *C. laevis* are missing.

Material examined. Eltanin sta. 377, USNM 52616; sta. 494, USNM 60046; sta. 556, USNM 60029; sta. 678, USNM 60205; sta. 684, USNM 60045; sta. 740, USNM 52618; sta. 992, USNM 52711; sta. 993, USNM 60030; sta. 1081, USNM 60047; sta. 1088, USNM 52620; sta. 1089, USNM 52619; sta. 21-282, USNM 60041; sta. 21-283, USNM 60042; sta. 1345, USNM 60038; sta. 1411, USNM 60037; sta. 1412, USNM 60039; sta. 1414, USNM 52621, 52622; sta. 1423, USNM 60043; sta. 1521, USNM 60034; sta. 1536, USNM 60033; sta. 1545, USNM 60040; sta. 1592, USNM 60036; sta. 1593, USNM 60203; sta. 1851, USNM 60035; sta. 1852, USNM 60044; sta. 1981, USNM 60031; sta. 1991, USNM 60032. Islas Orcadas sta. 575-91, USNM 60048. Edisto sta. 14, TD-2, USNM 52617. Vema sta. 15-PD10, USNM 60204; sta. 17-53, USNM 52623; sta. 17-54, USNM 60050; sta. 17-57, USNM 60049; sta. 17-61, USNM 60052; sta. 17-64, USNM 60051. NZOI sta. A-745, D-176, F-81 (all deposited at the NZOI). BANZARE sta. 34, RMNH.

Types. Holotype: Discovery sta. 2493 (originally described from one worn basal fragment). Deposition unknown. Type-locality: 42°03.9'S, 0° 3.5'E (Discovery Seamount), 472 m.

Distribution. Widely distributed in Antarctic and Subantarctic (Map 11) but not from Ross Sea. Depth: 216-2355 m. Boschma and Lowe's [1969] record of *C. pauciseptata* from

5845 m in the Argentine Basin (Vema station 15-128, USNM 52715) is based on a correctly identified specimen, but the validity of the station number is strongly questioned. The depth is more than twice the depth of any other stylasterine coral.

Genus *Crypthelia* Milne Edwards and Haime, 1849

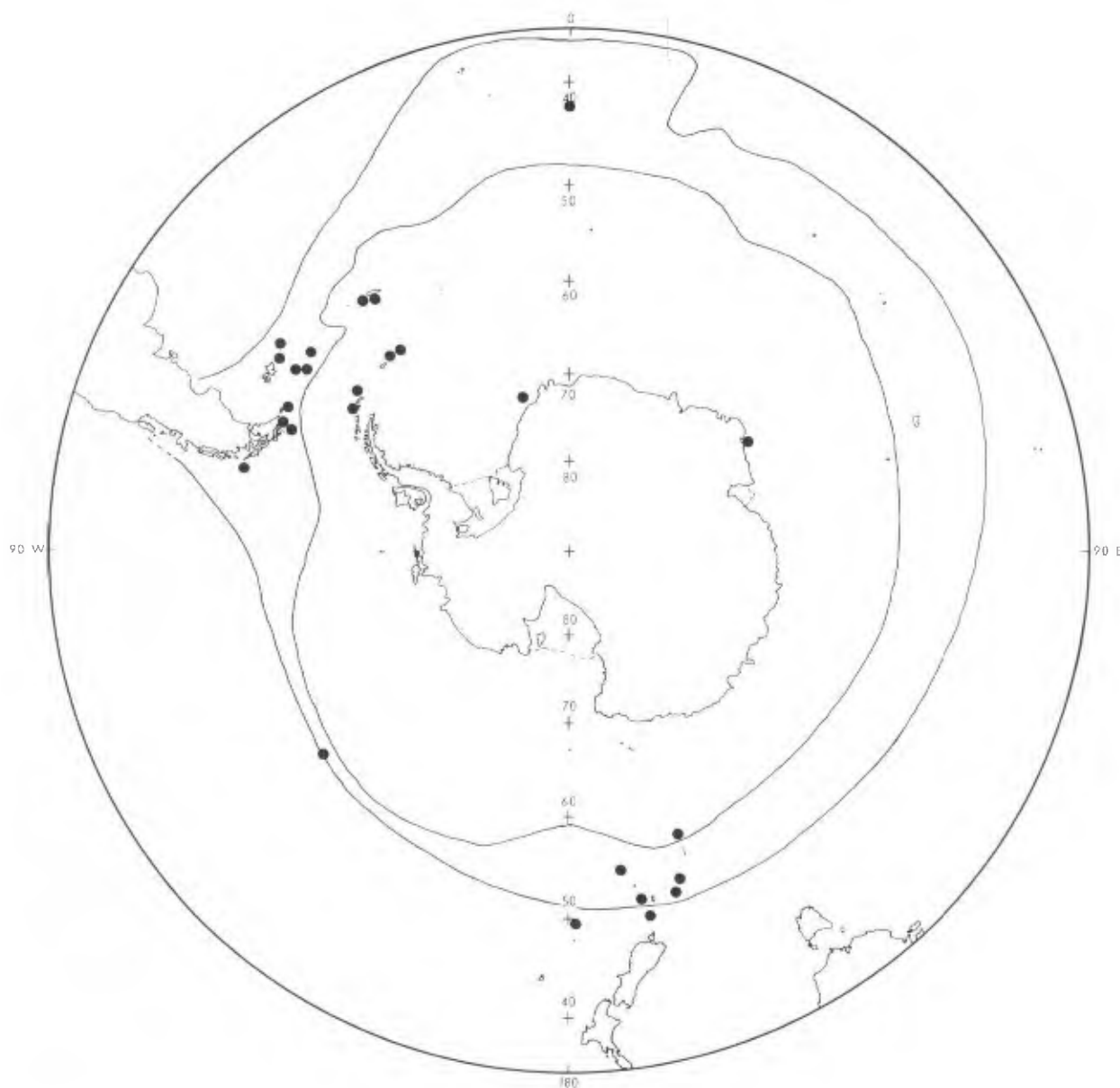
Diagnosis. Colonies delicate and flabellate. Cyclo systems all on anterior side, each gastropore partially or completely covered by overhanging fixed lid. Coenosteum texture composed of narrow parallel cords bearing succession of imbricated platelets. Gastropore divided into two chambers separated by a constricted aperture. No gastrostyles or dactylostyles. Type-species: *Crypthelia pudica* Milne Edwards and Haime, 1849, by monotypy.

23. *Crypthelia fragilis*, n. sp.
Figs. 31F, 37A-37G, 38A-38C

Description. Colonies are small, delicate, and flabellate. The largest colony is 2.7 cm tall and 2.5 cm broad, with a basal branch diameter of 1.7 mm. Distal branches are about 0.45 mm in diameter but support cyclo systems up to 3 times their diameter. Branches are round in cross section and sometimes anastomose. Dichotomous branching occurs distal to almost every cyclo system; however, one branch of the dichotomy is often aborted as a short nub. Distal branches usually produce a sympodial pattern of budding.

The coenosteum is white and composed of parallel, convex cords. The cords are variable in width, ranging from 50 to 100 μ m; the thin grooves between the cords are 6-9 μ m wide. Within these grooves, slitlike coenosteal pores periodically penetrate the branch. The microarchitecture of the cord is composed of small imbricated platelets, arranged in irregular rows across the cord. Each platelet is about 11 μ m wide and about 20 μ m long, such that about 55-60 rows occur per millimeter. The free edges of the platelets are directed anteriorly. Adjacent platelets are often fused into groups of two to three, and 4-11 platelets occur in each row across a cord. There are no granules.

Cyclo systems are round to slightly elliptical, 1.4-1.8 mm in diameter. All cyclo systems are on the anterior side and raised slightly above the branch about 0.5 mm on low, flared pedicles. From a sample of 31 cyclo systems, the range of dactylo pores per cyclo system is 13-18, with an average of 15.71 ($\sigma = 1.13$) and mode of 15. Dactylo tomes are 75-90 μ m wide and extend about halfway to the base of the gastropore. Pseudosepta are triangular, their widest part



Map 11. Distribution of Conopora pauciseptata.

being up to 0.2 mm at the outer edge of the cyclo-system. 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 cyclo-system is greatly enlarged into a fixed lid of variable size, which covers between one quarter and three quarters of the cyclo-system. The width of the lid varies between 0.28 and 0.90 mm and is slightly concave above. Round nematopores, 40-50 μ m in diameter, are scattered over the pseudosepta and

lids. In some cyclo-systems the nematopores are regularly arranged, one on the outer, upper edge of each pseudoseptum (Figure 38B), whereas in other cyclo-systems 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 μ m high) and envelops the lower half of the larger hemispherical chamber.

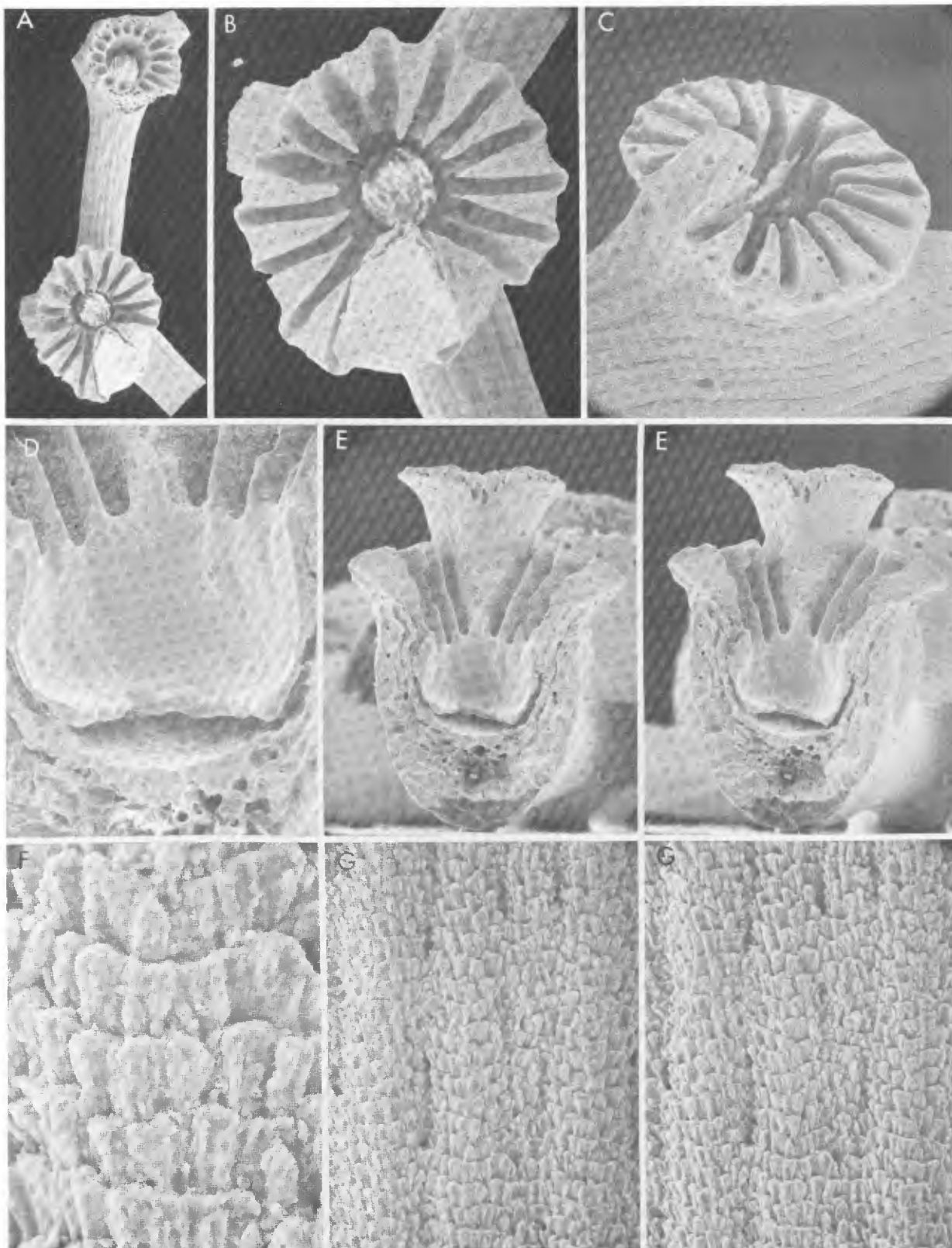


Fig. 37. Paratypes of *Crypthelia fragilis*, n. sp. from Eltanin sta. 17-5. A, branch segment with two cyclo systems, x16; B, C, cyclo systems, x36, x39, respectively; D, E, longitudinal section of a cyclo system, x82, x32, respectively, (Figure 37E is a stereo pair); F, G, coenosteal texture, x715, x214, respectively (Figure 37G is a stereo pair).

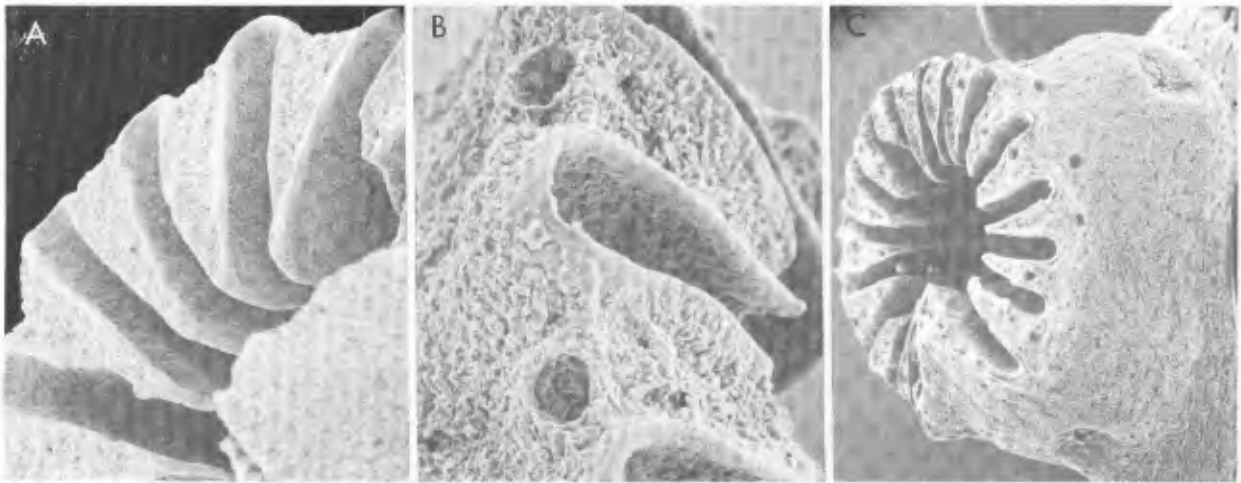


Fig. 38. Paratypes of *Crypthelia fragilis*, n. sp. from Eltanin sta. 17-5. A, pseudo-septa of a cyclo-system, x79; B, nematopores on outer edges of pseudo-septa, x179; C, cyclo-system with two ampullae, both with apical depressions and pores, x32.

Large hemispherical ampullae, 0.9-1.4 mm in diameter, occur at nearly every cyclo-system located within the fixed lid. Part of the ampullar cavity extends into the lid structure. Often there are one or two more ampullae per cyclo-system located on the sides of the cyclo-system 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 (efferent duct) about 50 μ m in diameter.

Discussion. *Crypthelia fragilis* can be distinguished from the other 12 described species of *Crypthelia* by its delicate colony form, relatively small cyclo-systems, 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 cyclo-system 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 Río 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.

Types. Holotype: Eltanin sta. 17-5, USNM 60206. Paratypes: Eltanin sta. 17-5, USNM 60089, BM 1981.6.11.9, RMNH Coel. 14.113; sta. 1412, USNM 60092; sta. 1852, USNM 60091; sta. 1991, USNM 60090. Type-locality: 52°10'S, 142°10'W (Pacific-Antarctic Ridge), 2305-2329 m.

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.
Figs. 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 cyclo-systems of considerably greater diameter. Dichotomous branching occurs at every cyclo-system, but one arm is often aborted as a short cylindrical nub.

The branch coenosteum is composed of convex, sometimes ridged, parallel cords 60-100 μ m 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-

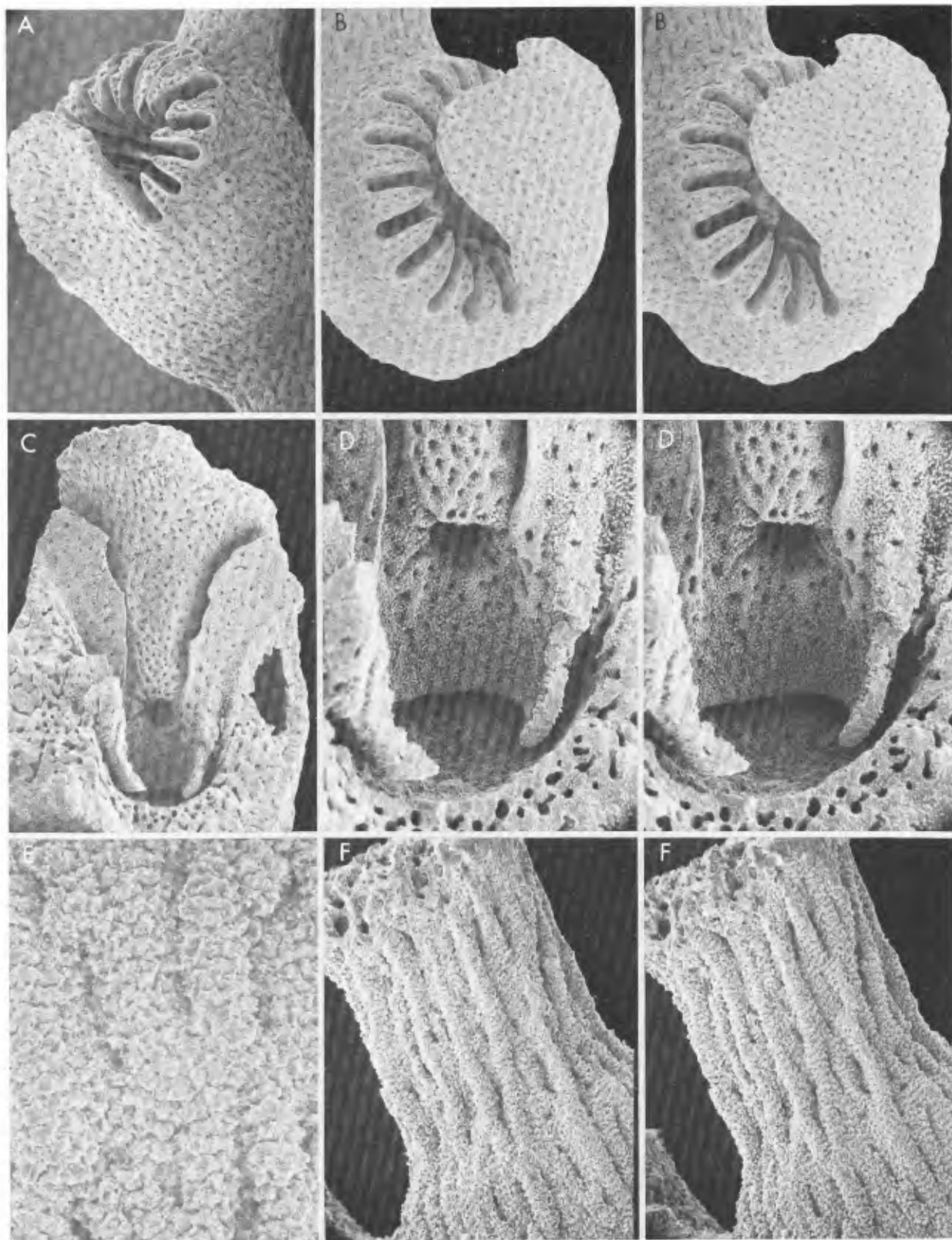


Fig. 39. Paratypes of *Crypthelia formosa*, n. sp. from Eltanin sta. 1592. A, cyclo-system and ampulla, x25; B, cyclo-system with a broad lid, x26, stereo pair; C, D, longitudinal section of cyclo-system, pore in center leads to ampulla in lid and is probably the efferent duct, x26, x59, respectively (Figure 39D is a stereo pair); E, F, coenosteal texture, x214, x107, respectively (Figure 39F is a stereo pair).

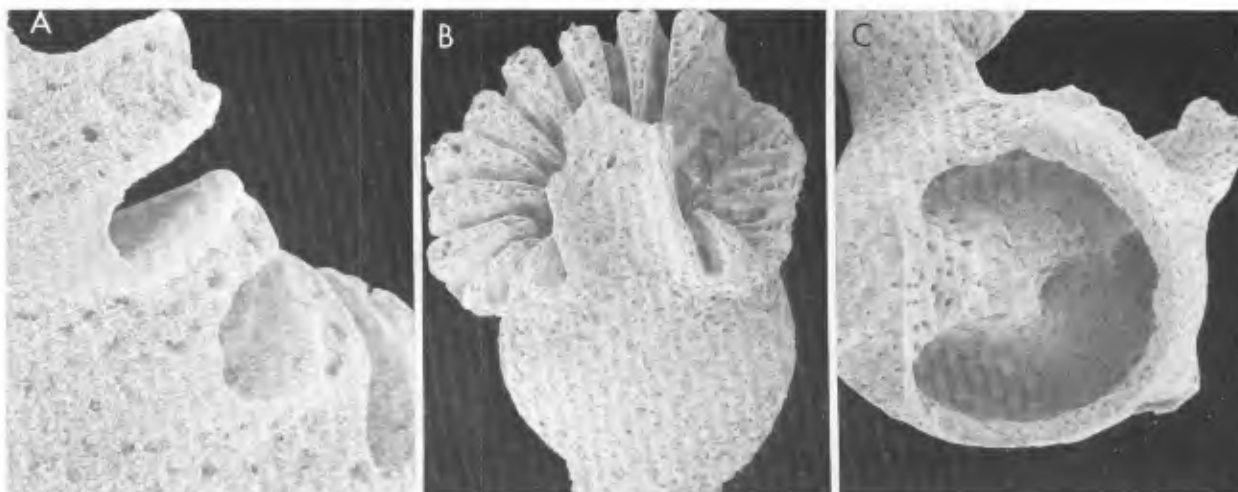


Fig. 40. Paratypes of *Crypthelia formosa*, n. sp. A, Eltanin sta. 1592, pseudosepta of cyclosystem, x89; B, Eltanin sta. 1521, cyclosystem and ampulla, x24; C, Eltanin sta. 1592, cutaway of an ampulla revealing efferent duct at center, x23.

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 coenosteum, 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 coenosteum. 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 ($\sigma = 2.1$) 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 μ m deep and envelops 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 Maldives 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.

Types. Holotype: Eltanin sta. 1592, USNM 60207. Paratypes: Eltanin sta. 1592, USNM 60084, BM 1981.6.11.8, RMNH Coel. 14.108; sta. 1521, USNM 60086; sta. 1536, USNM 60085. Vema sta. 17-54, USNM 60088; sta. 17-61, USNM



Map 12. Distribution of Crypthelia 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].

25. Stylaster densicaulis Moseley, 1879
Figs. 41A, 42A-42I, 43A, 43B

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.

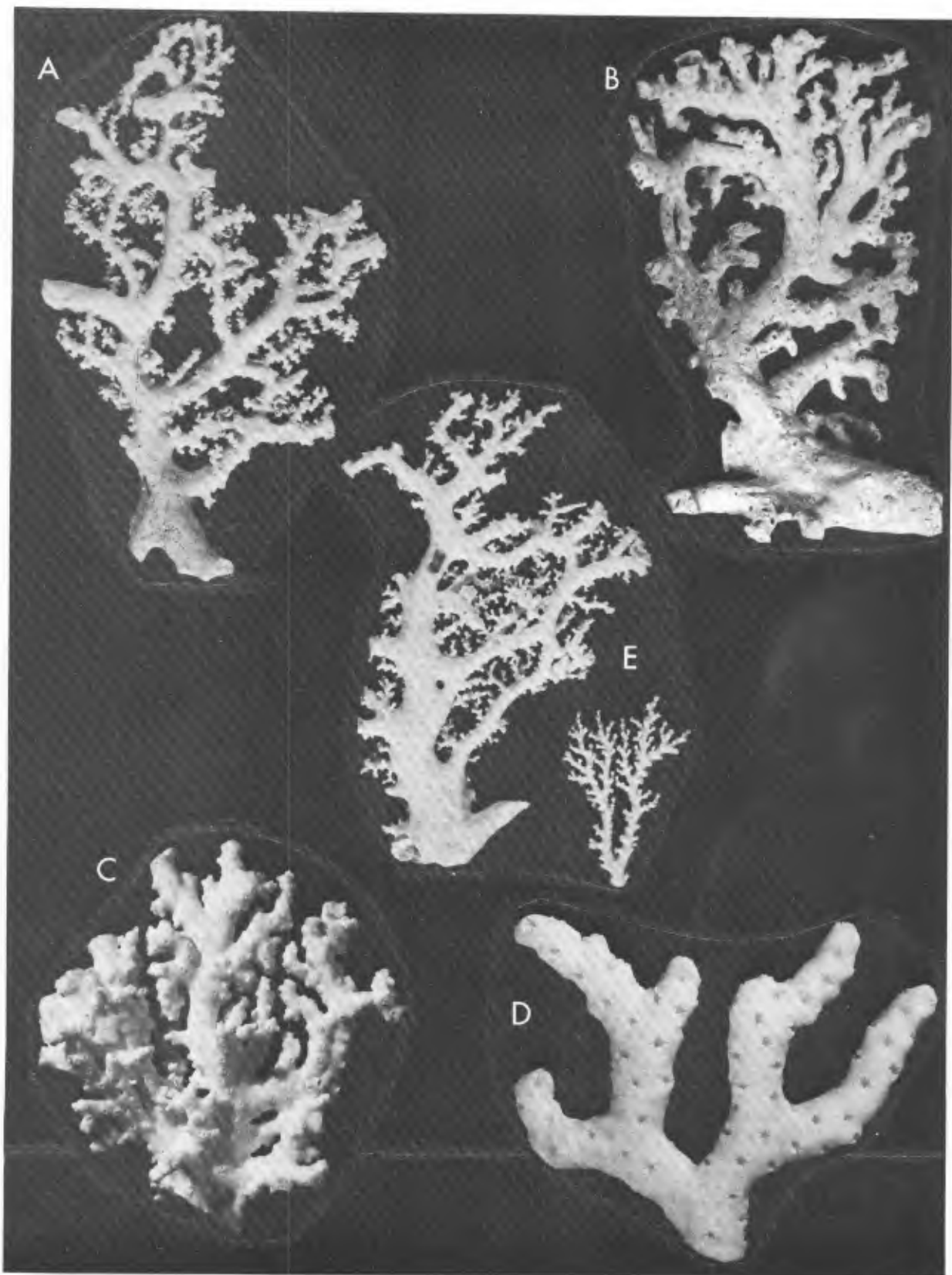


Fig. 41. A, *Stylaster densicaulis* Moseley, Eltanin sta. 1593, USNM 60016, x0.63; B, *Allopورا profunda* Moseley, holotype, Challenger sta. 306, BM 1880.11.25.174, x0.91; C, *Allopورا eguchii* Boschma, Eltanin sta. 1411, USNM 60096, x0.78; D, *Allopورا robusta*, n. sp., holotype, Eltanin sta. 1081, USNM 60200, x2.52; E, *Calyptopora reticulata* Boschma, Eltanin sta. 1851, two branches, USNM 60008, both x0.64.

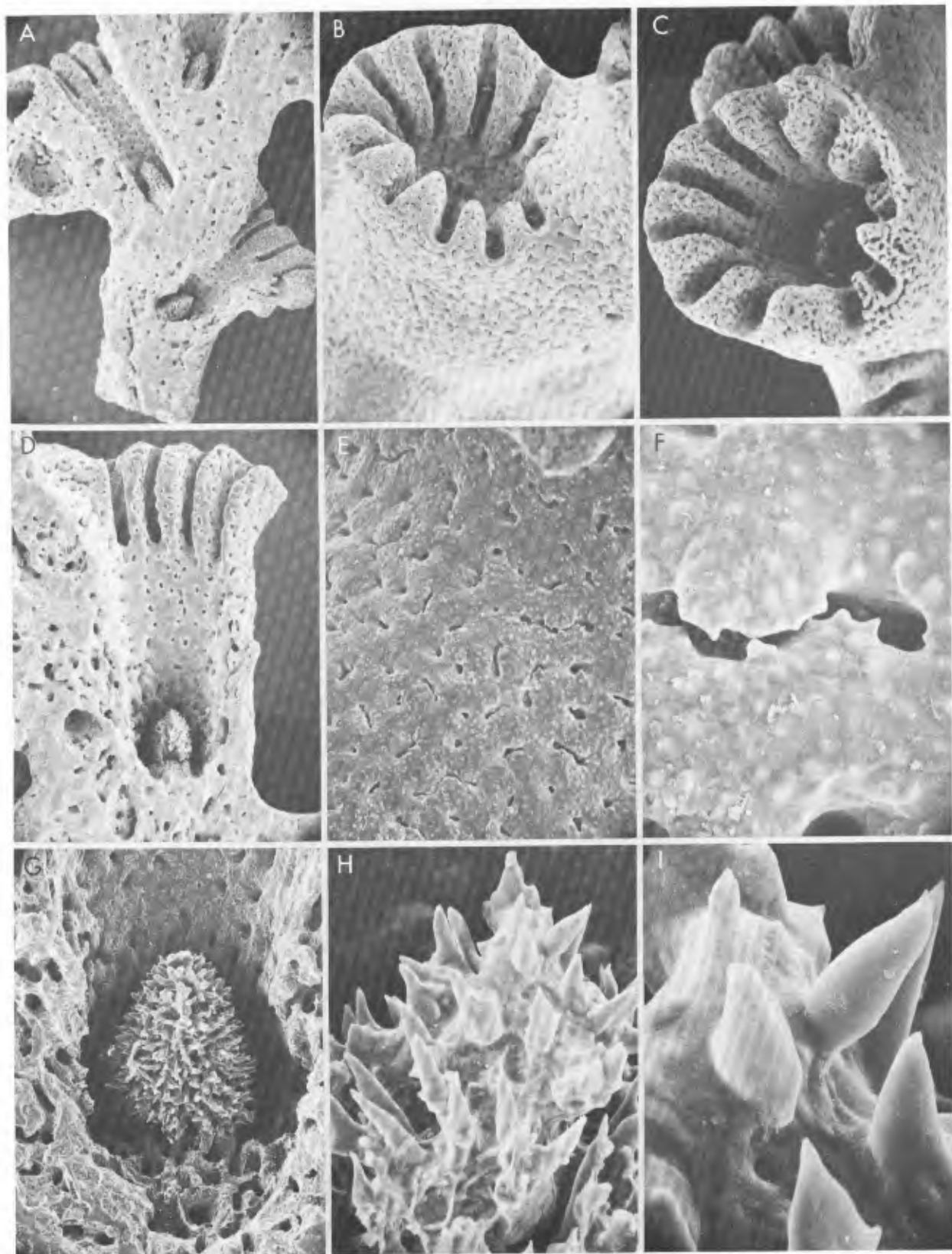


Fig. 42. *Styler densicaulis* Moseley. A, D, Eltanin sta. 740, longitudinal section of branch revealing several gastrostyles, x15, x27, respectively; B, C, Eltanin sta. 1593, cyclostyles, x29, x34, respectively; E, F, Eltanin sta. 740, coenosteal texture, x80, x400, respectively; G, Eltanin sta. 970, gastrostyle, x71; H, I, Eltanin sta. 740, gastrostyle, x357, x1071, respectively.

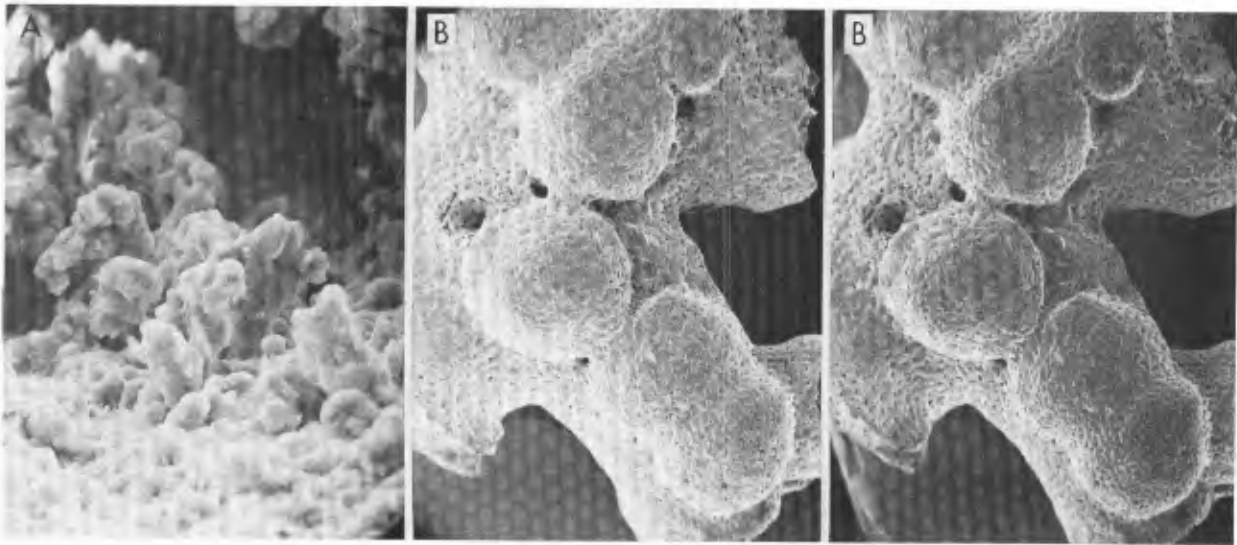


Fig. 43. *Stylaster densicaulis* Moseley. A, Eltanin sta. 1593, dactylostyle, x643; B, Eltanin sta. 740, closely spaced female ampullae, x16, stereo pair.

1, figs. a-c, text figs. 3a-3g.--Boschma and Lowe, 1969, p. 15, pl. 5, map 3. Not *Stylaster densicaulis*; Hickson and England, 1905, p. 12.

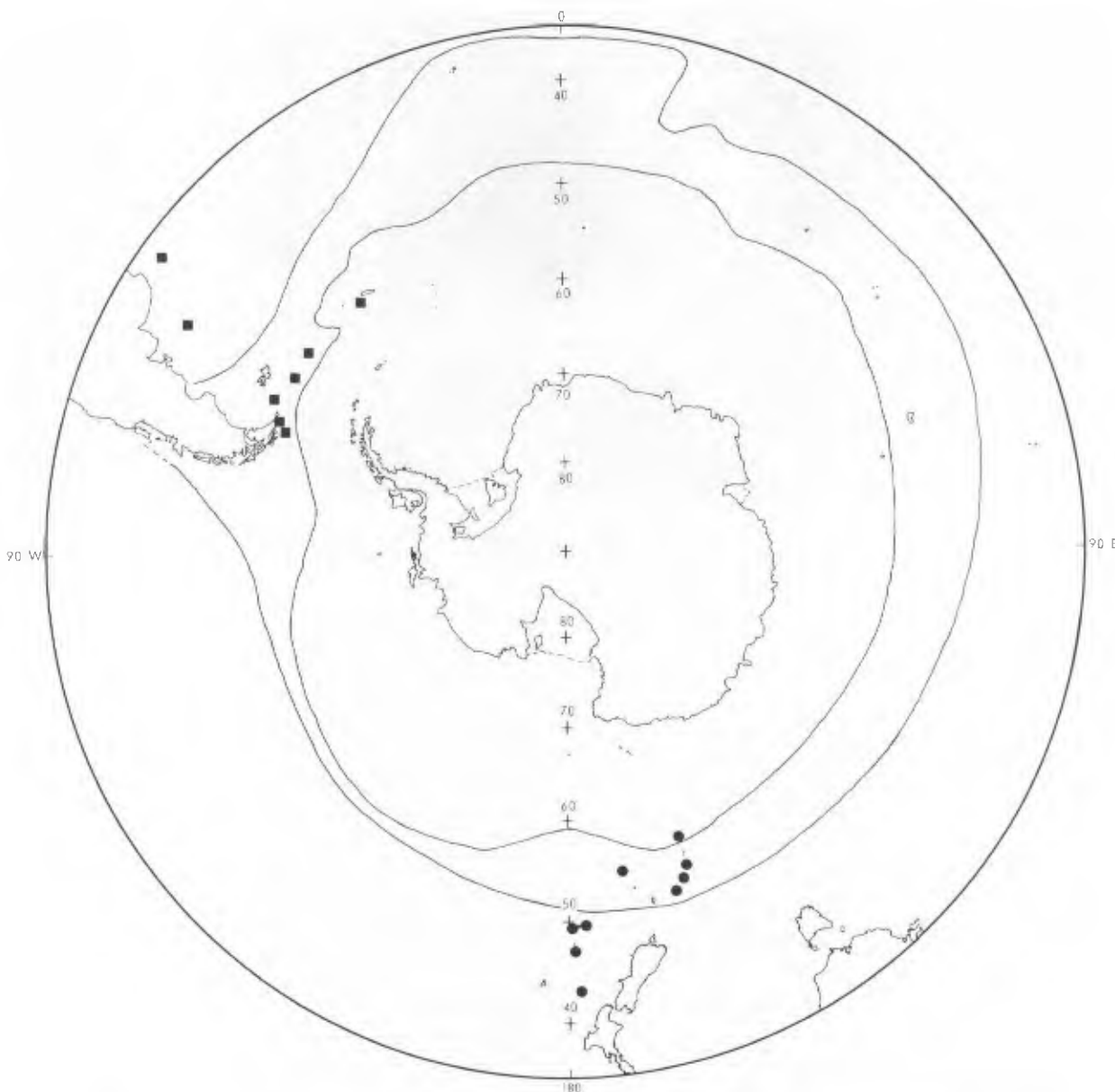
Description. The colony is large, massive, and flabellate, with frequent anastomosis of branches, especially in larger colonies. Distal branches are round in cross section and about 1.5-2.0 mm in diameter. Intermediate-sized branches (e.g., 7.8 x 5.2 mm in diameter) lose the clear-cut sympodial appearance 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 μ m wide, and covered with irregularly scattered, low, blunt granules 5-10 μ m in diameter. Many of the colonies have small round holes, 80-110 μ m 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 pre-

sent 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 ($\sigma = 1.17$) 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. Dactylotomes 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 dactylotomes, 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 μ m tall and 11 μ m 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 μ m in diameter), most of which are arranged in rows, each row corresponding to a dactylotome. 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



Map 13. Distribution of Calyptopora reticulata (circles) and Stylaster densicaulis (squares).

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 55 μ m long and 11 μ m 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