Abstract. — A new species of Conopora is described from off Queensland, Australia, the first known unattached stylasterid. It always occurs in a symbiotic relationship with a polynoid polychaete, which determines the colony morphology. Conopora adeta is also the first deep-water stylasterid reported from off Australia (398 m) and the ninth record of a stylasterid from the Australian region.

Of the approximately 225 valid species of Stylasteridae (Cairns 1983b, 1986a,b), almost all are firmly attached, arborescent (uniplanar or bushy) colonies. The exceptions are the three species of Stylantheca, which are encrusting; and the two species of Errinopsis, which form fenestrate flabella that have multiple attachment sites to the substrate. The species described herein differs from all other stylasterids in that it is not attached to a substrate. Instead, the colony stands erect by forming a massive globose base that is stabilized by three to six dense, robust branches that radiate outward from it. Aside from the basal branches, branching is minimal, relegated primarily to very short, nonbifurcating branches originating from the U-shaped polychaete tube that serves as a substitute for the main stem of the colony.

Class Hydrozoa Owen, 1843
Subclass Athecatae Hincks, 1868
Order Filifera Kuhn, 1913
Superfamily Hydractinioidea Bouillon, 1978
Family Stylasteridae Gray, 1847
Conopora Moseley, 1879

Diagnosis. — Colonies usually flabellate but sometimes bushy when modified by a commensal polychaete. Coenosteum linear-imbricate with broad, flat platelets (Group A) or reticulate-granular (Group B); nematopores often present. Gastropore double-chambered, the larger upper chamber separated from the lower thinner one by a slightly constricted aperture. Gastro- and dactylostyles and gastrozoid tentacles absent. Female ampullae superficial; male ampullae both superficial and internal, often positioned near cyclosystems, with their different pores opening into a cyclosystem or adjacent to one. Type species: Conopora tenuis Moseley, 1879 (= C. laevis (Studer, 1878)), by monotypy.

Discussion. — Cairns (1983b) divided Conopora into two groups: Group A, having delicate branches with sympodially arranged cyclosystems and linear-imbricate coenosteum, including three Recent species; and Group B, having robust branches with randomly arranged cyclosystems and reticulate-granular coenosteum, including one Recent and one fossil species. Conopora adeta belongs to Group A.

Conopora adeta, new species
Figs. 1–15

Description. — Each colony consists of a globose mass 8–12 mm in diameter with a flat to slightly convex base from which 3–6 dense, robust branches project horizontal to substrate. Largest colony examined (the holotype) 32.5 × 28.7 mm in diameter, in-
Figs. 1–6. *Conopora adeta* (1, Holotype; 2–6, paratypes, all from F.R.V. *Soela* 25): 1, Holotype colony, oblique side view showing ascending polychaete tubes and basal stabilizing branches, ×2.2; 2, Side view of female colony showing porosity of worm tube, ×2.2; 3, 4, Opposing side views of a colony with tall ascending polychaete tubes, left tube of fig. 3 completely open, ×2.3; 5, 6, Basal view of two colonies showing robust radiating branches, ×2.2, ×2.3, respectively.
cluding branches, and 21.0 mm tall. Globular mass permeated by a commensal polychaete, which also forms a porous U-shaped tube above the mass with parallel vertical elements (see Remarks). Large basal branches up to 5 mm in diameter and 8–12 mm long, sometimes clavate. Shorter branches, up to 6 mm long and 1.5 mm in diameter and bearing only 3–5 cyclosystems, occur on upper part of globose mass, project from ascending polychaete tubes, and occasionally occur on upper part of basal branches. Each basal branch also usually bears one apical cyclosystem. Smooth base of colony also lacks cyclosystems.

Cyclosystems sympodially arranged, round (0.75–0.90 mm in diameter), and usually flush with coenosteum. Based on 32 cyclosystems, there is a range of 12–17 dactylapore per cyclosystem, mean = 14.19 (σ =1.21), and mode of 15. Diastemas not present.

Upper chamber of gastropore tube cylindrical to very slightly tapered, about 0.5 mm in height and diameter. Aperture to lower chamber not constricted. Lower chamber slightly greater in diameter than upper and about 0.35 mm deep. Low, longitudinal carinae about 25 μm wide present in lower chamber (Fig. 10). Dactylotomes about 77 μm wide; pseudosepta of equal width and slightly convex.

Female ampullae massive, elongate hemispheres about 1.45 × 1.25 mm in diameter. Female efferent pores about 0.35 mm in diameter. Male ampullae also elongate and superficial but significantly smaller (e.g., 1.0 × 0.71 mm) and with less relief. Male efferent pores round, 50–60 μm in diameter, and in a lateral position. Some cyclosystems surrounded by 4 or 5 male ampullae, all of which have their efferent pores adjacent to the cyclosystem (Fig. 15). Ampullae also scattered over worm tube coenosteum.

Remarks.—All ten specimens examined lived in association with a commensal polychaete, an undescribed genus and species of polynoid (pers. comm., M. Pettibone 1986), which creates a tubular cavity in the stylasterid's globose mass, the cavity consisting of an upward spiral of two or three horizontal revolutions. The tube emerges from the mass apically and induces the coral to form the characteristic U-shaped highly porous tube alluded to in the description. The vertical elements of the tube are up to 14 mm tall and about 3.5 mm in diameter. In two specimens, one of the vertical elements was bifurcate. In several cases the cavity also emerged from the side or base of the spherical mass with a pore diameter of 1.2–1.5 mm.

In two specimens a small aplacophoran mollusk inhabited the upper section of the polychaete tube.

Of the ten specimens available for study, all had smooth bases without evidence of former attachment. Nonetheless, it is hypothesized that each colony was originally attached to a substrate via planula settlement, as is the case for all stylasterids, but in C. adeta the substrate is assumed to have been small (e.g., a sand grain or a small mollusk shell) and that the coral quickly overgrew it. The symbiotic polychaete probably also became associated with the coral early in ontogeny. Because the hypothesized original substrate was small and not capable of supporting an arborescent colony, it is suggested that the colony stabilized itself by producing robust radiating branches from the basal globular mass. The adaptive value of an unattached colony is not clear. It is unlikely that the polychaete can move the colony to a different site or that the colony is ever transported any distance. This unusual adaptation may simply be the result of the lack of an adequately firm substrate and may even represent a form of a species that is normally attached when the proper substrate is available. Symbiosis with polynoid polychaetes that form similar globular cavities in attached stylasterid colonies is not rare (e.g., Stenohelia concinna Boschma, 1964, Stenohelia ro-
Figs. 7–11. *Conopora adeta*, paratypes from F.R.V. *Soela* 25: 7, Longitudinal section and top view of two cyclosystems, stereo pair, ×32; 8, 9, Cyclosystems, ×49, ×63, respectively; 10, Longitudinal section of lower gastropore chamber of specimen in fig. 7, ×109; 11, Coenostal platelets, ×345.
Figs. 12–15. *Conopora adela*, paratypes from F.R.V. *Soela* 25: 12. Several pseudosepta and adjacent coenosteal strip, ×123; 13. Two male ampullae and coenosteal strips, ×44; 14. Two female ampullae, each with a large efferent pore, stereo pair, ×26; 15. A cyclosystem surrounded by four male ampullae, each with an efferent pore adjacent to the cyclosystem, stereo pair, ×27.
Discussion.—There are only four previously described Recent species of Conopora (Cairns 1983b). Conopora adeta clearly belongs to Group A (sensu Cairns 1983b) because of its sympodially arranged cyclosystems and delicate branches with linear-imbricate coenosteum. This group includes three other species: C. major Hickson and England, 1905 (Banda and Celebes Seas, 204–1901 m); C. verrucosa (Studer, 1878) (Antarctic and Subantarctic, 216–2544 m; see C. pauciseptata of Cairns, 1983a); and C. laevis (Studer, 1878) (New Zealand, Kermadec Islands, 110–951 m; see Cairns 1983b:490). Conopora adeta is distinguished from all three species by its unattached growth mode, smaller cyclosystems, and higher number of dactylopores per cyclosystem. All four species have commensal polychaetes, broad imbricate platelets, and similarly shaped gastropore chambers.

Eight species of stylasterids have been previously reported from off Australia (Boschma 1957): Distichopora violacea (Pallas, 1766); D. nitida Verrill, 1864; D. concinna Gray, 1860; Stylaster granulosus Milne Edwards and Haime, 1850; S. sanguineus Milne Edwards and Haime, 1850; S. gracilis Milne Edwards and Haime, 1850; S. incomplethus (Tenison-Woods, 1883); and the Miocene S. mooraboolensis (Hall, 1893). Conopora adeta is the first species reported from relatively deep water off Australia.

Etymology.—The specific name is from the Greek adetos, meaning “free,” “loose,” and “unbound,” in reference to the unattached growth mode of this species.

Types.—Holotype: male, N.T.M. (Northern Territories Museum) C5385. —Paratypes: 4 specimens, USNM 76299; 5 specimens, N.T.M. C5386.

Type locality.—F.R.V. Soela 25: 20°46.2'S, 152°51.8'E (Marion Plateau, off MacKay, Queensland, Australia), 398–399 m, 22 Nov 1985.

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Literature Cited


Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560.