

## ***Distichopora vervoorti*, a new shallow-water stylasterid coral (Cnidaria: Hydrozoa: Stylasteridae) from Bali, Indonesia**

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**Key words:** Stylasteridae; *Distichopora*; Bali; Indonesia; new species.

A new species of stylasterid coral, *Distichopora vervoorti*, is described from shallow water off Bali, Indonesia. Although similar to *D. irregularis* in having meandering pore rows, it differs from that species in colony and branch shape, coenosteal colour, and expression of the ampullae.

### **Introduction**

During an exploratory dive at Nusa Lembongan (by BWH), an island off Bali, a relatively dense population of a branching coral was encountered in July 1997 and revisited in May 1998. The corals were scattered over a gently inclining slope and clustered in patches underneath overhanging ridges. Those on the slope had their branches growing upward with the blunt branch tips following the predominant direction of the strong cold water current. Those hanging underneath elongate ridges were sheltered and showed branches that were relatively thin, longer and more loose in arrangement. The growth form of this species resembles that of some branching scleractinians, but closer examination revealed the lack of anthozoan polyps. Instead, they possess rows of small pores on the corallum surface, typical of the stylasterid genus *Distichopora*. Because of its distinctive morphology and habitat preference, we consider it to be an undescribed species.

### **Species Account**

Class Hydrozoa

Order Filifera Kühn, 1913

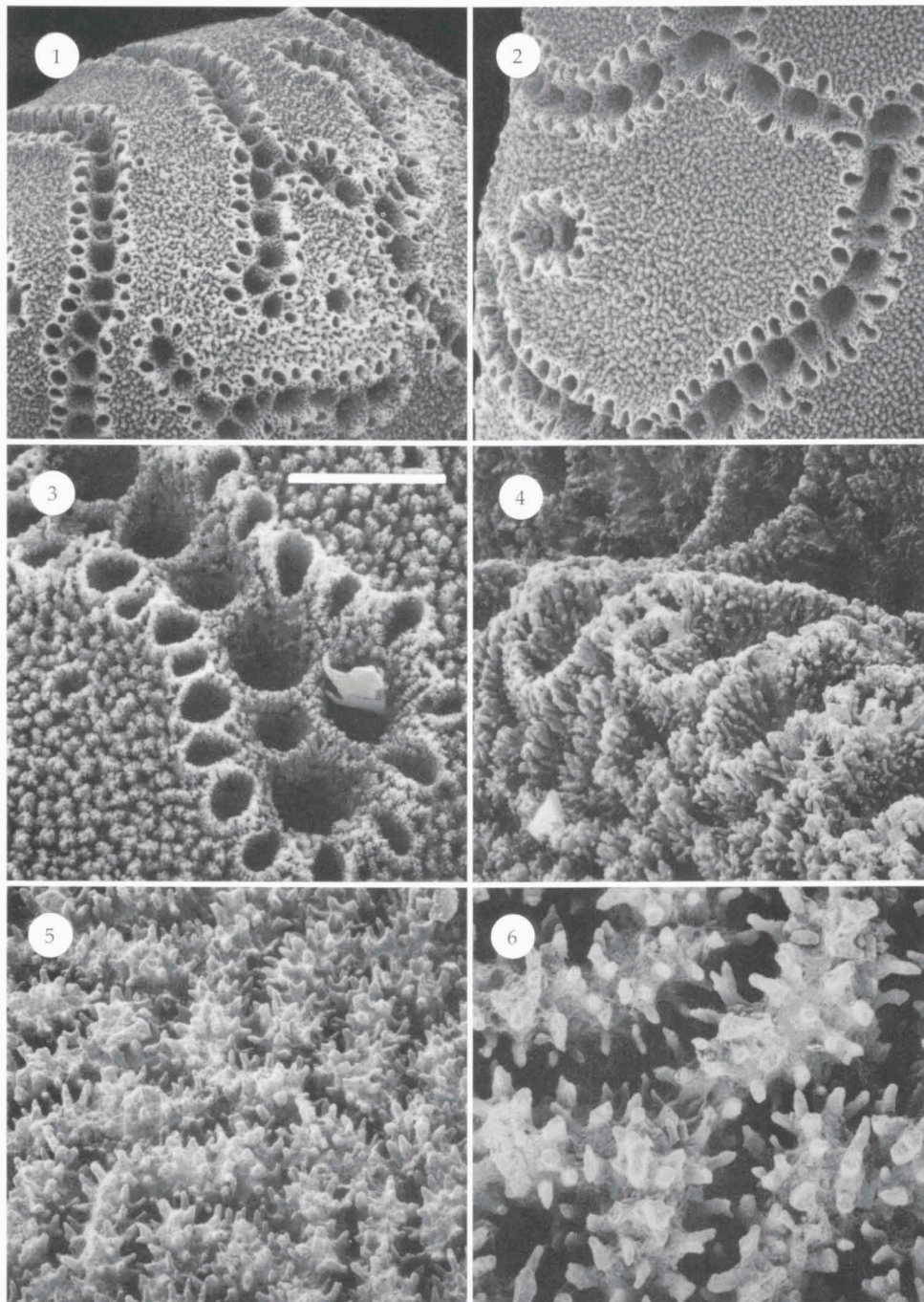
Superfamily Hydractinoidea Bouillon, 1978

Family Stylasteridae Gray, 1847

Genus *Distichopora* Lamarck, 1816

*Distichopora vervoorti* spec. nov.  
(figs. 1-17)

"Bali red coral" Hoeksema, 1997: 16 (coloured fig.).



Figs. 1-6. *Distichopora vervoorti* spec. nov., holotype ♂: 1-2, meandering pore rows near branch tip. 3, pore row, with an isolated efferent pore to left. 4, several contiguous, slightly raised dactylopores. 5-6, reticulate-granular coenosteal texture. Scale = 1.5 mm for fig. 1; 1.2 mm for fig. 2; 0.5 mm for fig. 3; 150  $\mu\text{m}$  for fig. 4; 100  $\mu\text{m}$  for fig. 5; and 50  $\mu\text{m}$  for fig. 6.

Material.— Holotype: One colony, RMNH 23976, fragments and two SEM stubs (schizoholotypes) USNM 100000. Paratypes: 30 colonies and 28 fragments RMNH 24006, five colonies and two fragments USNM 100001.

Type Locality.— Tanjung Taal (Blue Corner): 115°27'00"E 8°39'30"S, Nusa Lemongan (Lombok Strait), Bali, Indonesia. The population occurred in a 1 km long area on a slope at 15-20 m depth.

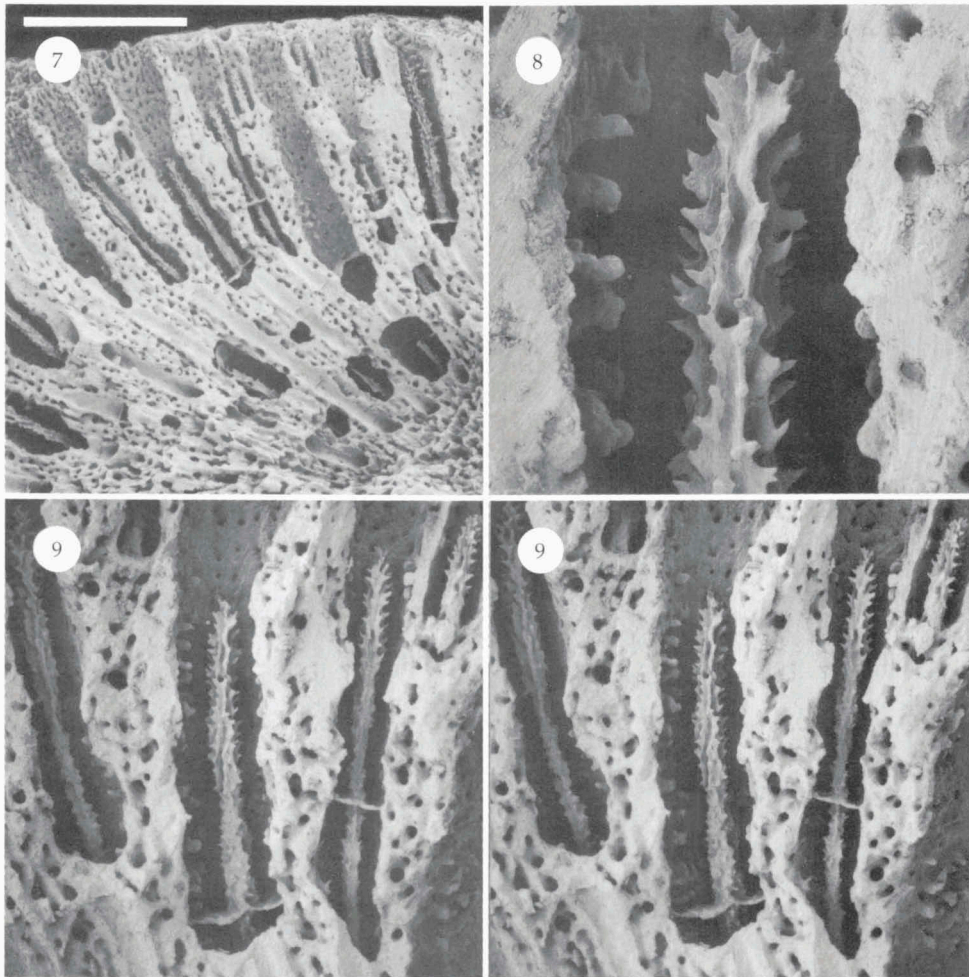
Description.— Corallum bushy, the holotype consisting of about 35 knobby, blunt-tipped branches, most of which originate from a common basal coenosteum that is partially covered by epibionts, which originally, in the field, produced the impression of multiple, disjunct colonies. Holotypic colony (Fig. 11) about 8.5 cm in diameter and 7.5 cm in height. Branches thick (5-15 mm in diameter), cylindrical to elliptical in cross section (not flattened), usually bifurcating and rarely anastomosing. Coenosteum reticulate-granular in texture, composed of relatively short coenosteal strips 35-50  $\mu\text{m}$  in width, separated by deep coenosteal slits 11-16  $\mu\text{m}$  in width. Strips bear elongate granules (spines) up to 15  $\mu\text{m}$  in height and 4  $\mu\text{m}$  in diameter. Coenosteum quite porous, easily cut with a saw or drill.

Well-defined, elongate pore rows meander over coenosteal surface of all branches, usually bifurcating and rejoining one another in T- or Y-shaped junctions. Pore rows of substantial length are formed, but the shortest consisting of one isolated gastropore surrounded by six or seven dactylopores; pore rows usually about 0.7 mm in width. Gastropores closely-spaced and circular to slightly elliptical in outline and up to 0.29 mm in diameter, although newly formed pores only 0.15 mm in diameter. Dactylopores also closely-spaced (6-7/mm) and teardrop-shaped, the smaller apex adjacent to the gastropore row. Dactylopores about 40  $\mu\text{m}$  in greater diameter and 11  $\mu\text{m}$  in lesser diameter, flush with the coenosteal surface in older branches, but the outer rims usually being slightly elevated as much as 40  $\mu\text{m}$  near branch tips. Dactylostyles absent.

Gastropore tubes elongate (up to 3 mm) and gently curved, containing a diffuse ring palisade consisting of cylindrical to clavate elements up to 60  $\mu\text{m}$  in height and 35  $\mu\text{m}$  in width. Gastrostyles needle-shaped and longitudinally ridged, older styles often exceeding a mm in length and 0.08-0.12 mm in maximum diameter, resulting in H:W ratios of 10-15. Gastrostyles sharply pointed, their ridges bearing sharp, upcurved spines up to 25  $\mu\text{m}$  in length. Because of the length and fragility of the gastrostyles they are invariably stabilized by one or more (one about every 0.7 mm) horizontal tabulae, a tabula about 20  $\mu\text{m}$  in width. Because the tabulae are so widely spaced, usually only one tabula is present per gastropore.

The holotype is a male colony. Male ampullae small (0.30-0.35 mm in internal diameter) and internal, having no surface relief except for their small (70-80  $\mu\text{m}$  diameter), irregularly shaped efferent pore. Male ampullae usually occur in clusters, several dozen contiguous ampullae grouped just below the coenosteal surface.

Female ampullae in the paratypes also occur largely below the coenosteal surface, having an internal diameter of 0.50-0.65 mm. Directly over each female ampulla, the coenosteum is flush or slightly raised for a diameter of about 0.3-0.4 mm, and surrounded by 6-9 small (0.1 mm in diameter) depressions that seem to radiate from the central boss. Each of these depressions usually bears one small (30-40  $\mu\text{m}$  diameter)



Figs. 7-9. *Distichopora vervoorti* spec. nov., holotype ♂: 7, longitudinal fracture revealing several gastrostyles of various lengths. 8, ridged and spined gastrostyle tip surrounded by the diffuse ring palisade. 9, stereo view of several gastrostyles stabilized by tabulae. Scale = 1.2 mm for fig. 7; 0.14 mm for fig. 8; and 0.5 mm for fig. 9.

pore. These small pores are large enough for sperm to enter but not for a planula to escape, and thus are interpreted as sperm afferent pores. Female ampullae are often closely spaced, causing their surrounding cirlet of depressions to be contiguous and sometimes overlapping.

The coenosteal coloration of *D. vervoorti* is variable. The holotype and some of the paratypes are red (carmine to gem ruby). Other paratypes are orange yellow. The branch cores of broken specimens are light in colour, pink or yellow to white. Additional coenosteal colours observed in the field are mauve, lilac, purple, spectrum orange, scarlet, and rose (Figs. 10-15, colours indicated by Smithe, 1975).

Discussion.— Among the 22 recognized species of *Distichopora* (Cairns, 1983, 1991, 1992), nine are endemic to the western Atlantic, and four are confined to peri-





Figs. 10-16. *Distichopora vervoorti* spec. nov.; colours with numeral codes as indicated by Smithe (1975); 10, *Distichopora vervoorti* spec. nov., holotype, coenosteal colour gem ruby (110) to carmine (8). 11-16, specimens in situ at the type locality showing various colour morphs. 11, mauve (75) to lilac (76). 12, spectrum orange (17) to flame scarlet (15) with spinel pink tips (108C). 13, poppy red (108A), true purple (101), to mauve (75). 14, ruby (10) to flame scarlet (15). 15, orange yellow (18) with transparent dactylozooids. 16, rose (9) with transparent dactylozooids and some white-pink gastrozooids.

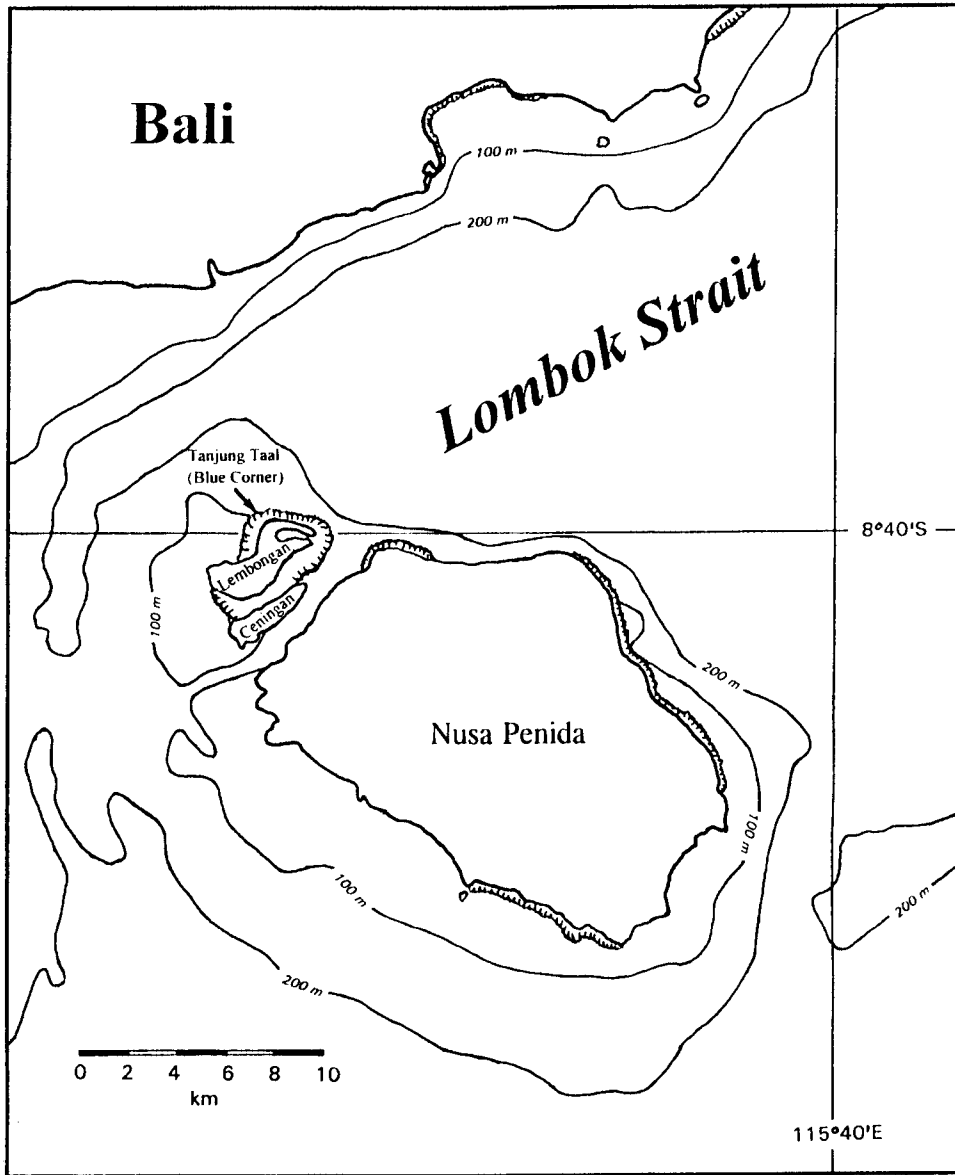


Fig. 17. Map of Nusa Lembongan and Nusa Penida (after Anonymous, 1996a, b), showing the type locality Tanjung Taal (Blue Corner), indicated with an arrow.

pheral regions of the Pacific, including boreal North Pacific, New Zealand, the Galápagos, and the Hawaiian Islands. Of the remaining nine Indo-West Pacific species, three [*D. providentiae* (Hickson & England, 1909); *D. profunda* Hickson & England, 1909; and *D. serpens* Broch, 1942) occur in waters deeper than 100 m. The remaining six shallow-water Indo-West Pacific species (*D. coccinea* Gray, 1860; *D. gracilis* Dana, 1848; *D. irregularis* Moseley, 1879; *D. livida* Tenison Woods, 1879; *D. niti-*

*da* Verrill, 1864; and *D. violacea* (Pallas, 1766)] were meticulously reviewed by Boschma (1959). Among those previously described species, *D. vervoorti* is most similar to *D. irregularis*. Both species are characterized by having meandering pore rows and a similar coenosteal texture. *D. vervoorti* differs, however, in having less flattened (circular), shorter and stubbier branches that bifurcate less frequently; larger diameter, blunt-tipped distal branches; a different coenosteal colour (red, violet, or orange yellow vs light pink or lilac); and completely internal male and female ampullae with little to no surface relief.

*Distichopora vervoorti* might also be confused with *Gyropora africana* Boschma, 1960, a species known only from shallow water off South Africa. Specimens of this species have the same coenosteal colour as the holotype of *D. vervoorti*. Both species have the same colony shape and meandering pore rows, but *G. africana* differs significantly in having short (peripheral) gastropore tubes, whereas those of all species of *Distichopora* are elongate (axial). Furthermore, the gastropore tubes of *Gyropora* lack ring palisades.

Habitat.— Colonies of this species are easily seen and appear to be very common and well exposed on a shallow (15-20 m deep) rocky (volcanic), slightly inclined bottom with elongate, shallow crevices, at a popular dive site called "Blue Corner", Nusa Lembongan (Rock 1996: 50). Nautical maps (Anonymous, 1996a, b) indicate this place to be called "Tanjung Taal" (Cape Taal). Nusa Lembongan and its larger neighbour Nusa Penida are located in Lombok Strait, where water from the northward Bali Sea streams into the Indian Ocean. The corals are apparently adapted to strong currents (up to 7 knots = 13 km/h) and cold water (less than 16°C) due to upwelling.

Etymology.— This species is named in honour of our friend and colleague Prof. Willem Vervoort, who devoted much of his career to the better understanding of Hydrozoa.

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