

Cyclohelia lamellata, New Genus and Species of Stylasteridae (Cnidaria: Hydrozoa) from the Bering Sea¹

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ABSTRACT: A new genus and species of Stylasteridae is described, *Cyclohelia lamellata*, based on one specimen from 550 m off the Pribilof Islands, Bering Sea. The species is unusual in having a lamellate growth form and unique in having elliptical dactylopore spines that are rimmed on all sides. The genus is hypothesized to be most closely related to *Distichopora* and *Sporadopora*. *Cyclohelia lamellata* is one of the most northerly records of a stylasterid in the Pacific Ocean.

IN 1985, A DEEP-WATER crab fisherman, Michael Lake, snagged two stylasterid corals on his crab nets at a depth of about 550 m off the Pribilof Islands. He gave them to Alan Kohn of the University of Washington, who, in turn, sent them to me for identification. One specimen was *Crypthelia trophostega* Fisher, 1938, but the other specimen was unusual in that it was lamellate in growth form, and it could not be placed in any of the stylasterid genera. During the 5 yr since that specimen was collected, no additional specimens have become available. Therefore, a new genus and species is described based on this single specimen.

Stylasterid morphological terminology and methods of study are summarized in Cairns (1983).

Genus Cyclohelia Cairns, n. genus

DIAGNOSIS: Gastro- and dactylopores uniformly distributed on corallum faces and edges; no coordination between types of pores. Corallum a robust, solid lamella with smaller lamellae at right angles to it. Coenosteal texture reticulate-granular. Gastropores flush with coenosteum; dactylopore tubes elongate (axial). Gastrostyles ridged and quite elongate; no tabulae. Dactylopore spines circular to elliptical, enclosed by a thin wall for

entire perimeter; no dactylostyles. Ampullae primarily internal.

TYPE SPECIES: *Cyclohelia lamellata*, n. sp., here designated.

ETYMOLOGY: The name *Cyclohelia* is a combination of *cyclos* (Greek for "circle") and *helios* (Greek for "sun"), *helia* being a common suffix in stylasterid generic names and herein interpreted to refer to the gastropores. The combination thus implies "having circular gastropores." Gender: feminine.

DISCUSSION: Among the ca. 250 species of stylasterids, virtually all species have a branching growth form. The exceptions are the three species constituting the genus *Stylantheca*, which are encrusting; and two species that form solid platelike lamella: *Distichopora anceps* Cairns, 1978, and *Errinopora nanneca* Fisher, 1938. The solid, lamellar growth form was interpreted as a character of subgeneric importance by Cairns (1978), forming the basis of the subgenus *Haplomerismos*, but of only intraspecific value by Fisher (1938), because specimens of *Errinopora nanneca* occurred in both the branching and lamellar growth form. For this reason, the lamellate growth form of *Cyclohelia* is not necessarily considered to be diagnostic of the genus, but nonetheless important to note. The lamellar growth form of *C. lamellata* is identical to that of *Errinopora nanneca*, and both species are found in the North Pacific at approximately the same depths, but

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Cyclohelia differs in having axial gastro- and dactylopores; having long, needle-shaped, longitudinally ridged gastrostyles; having internal ampullae; having ring palisades; having differently shaped dactylopore spines; and in lacking dactylostyles.

The affinities of *Cyclohelia* are closer to the genera *Sporadopora* and *Distichopora*, which are morphologically (Cairns 1983) and phylogenetically (Cairns 1984, 1987) similar to one another. *Cyclohelia* is similar to *Sporadopora* in having long, axial gastro- and dactylopores; having internal ampullae; having long, longitudinally ridged gastrostyles; in lacking coordination of gastro- and dactylopores; and in lacking dactylostyles. *Sporadopora*, however, differs in having circular, flush dactylopore spines; having a branching colony; and in lacking ring palisades. A re-examination of the type specimens of *Sporadopora mortenseni* Broch, 1942, however, revealed that many of its dactylopores are slightly elevated and some are elliptical to horseshoe-shaped, a characteristic that increases its resemblance to *Cyclohelia*, which has circular to elliptical dactylopore spines with distinct walls surrounding all sides.

Cyclohelia resembles *Distichopora* in having long, axial dactylo- and gastropores; having long, longitudinally ridged, needle-shaped gastrostyles; having elliptical dactylopore spines; and in lacking dactylostyles. One species in particular, *D. anceps*, is the most similar, in having internal ampullae and a lamellar (bilobate) growth form. *Distichopora* differs from *Cyclohelia* in the coordination of its gastro- and dactylopores into pore rows that usually occur on branch edges and the shape of its dactylopore spines, which are usually rimmed on only three sides, being flush on the side adjacent to the gastropore.

Another species, *Distichopora providentiae* (Hickson & England, 1909), known only from Providence Island in the Indian Ocean (229 m), must also be discussed in the context of comparisons. The gastropores of *D. providentiae* are only loosely arranged in pore rows on branch edges (Boschma 1959) and also occur on branch faces in little apparent order (Cairns 1983: fig. 16H). Hickson and England (1909:350) originally placed the species in

Sporadopora, but noted its resemblance to *Distichopora*, suggesting a sister-group relationship, which was later supported by phylogenetic analysis (Cairns 1984). Broch (1942:27) emphatically placed the species in *Distichopora*, and Boschma (1959:164) tentatively agreed. Cairns (1983:436, 471) also placed it in *Distichopora*, but suggested that it was transitional between *Distichopora* and *Sporadopora*. The seemingly random arrangement of gastro- and dactylopores on branch faces of *D. providentiae* does resemble that of *Cyclohelia*, but *D. providentiae* differs in having poorly defined pore rows on branch edges; having horseshoe-shaped dactylopore spines rimmed on only three edges; having a branching growth form; and in lacking ring palisades.

Cyclohelia is distinguished from other stylasterid genera by a combination of five increasingly exclusive characters: lack of coordination of gastro- and dactylopores (shared with 11 of the 23 stylasterid genera [see Cairns, in press]); elongate, axial gastro- and dactylopore tubes (shared with only five other genera: *Distichopora*, *Sporadopora*, *Lepidopora*, *Pliobothrus*, and *Adelopora*); needle-shaped, longitudinally ridged gastrostyles (shared only with *Distichopora* and *Sporadopora*); lamellate growth form (shared only with one species of *Distichopora* and one species of *Errinopora*); and its circular to elliptical dactylopore spines that are rimmed on all sides, the walls being apically serrate (a character unique to *Cyclohelia*). Its ring palisade also distinguishes *Cyclohelia* from *Sporadopora* and *Distichopora*, but nonetheless it is considered to be phylogenetically close to those genera.

Cyclonelia lamellata Cairns, n. sp.

Figures 1a-g, 2a-g

DESCRIPTION: Corallum of holotype 7.0 cm tall and 9.5 cm broad, with a basal encrustation 3.7 × 1.8 cm in diam. Corallum primarily uniplanar, the main lamella sinuous, as well as having 2 smaller lamellae originating at right angles to the main one. Distal part of lamellae 4-5 mm thick; basal lamella about 15 mm thick. Reticulate-

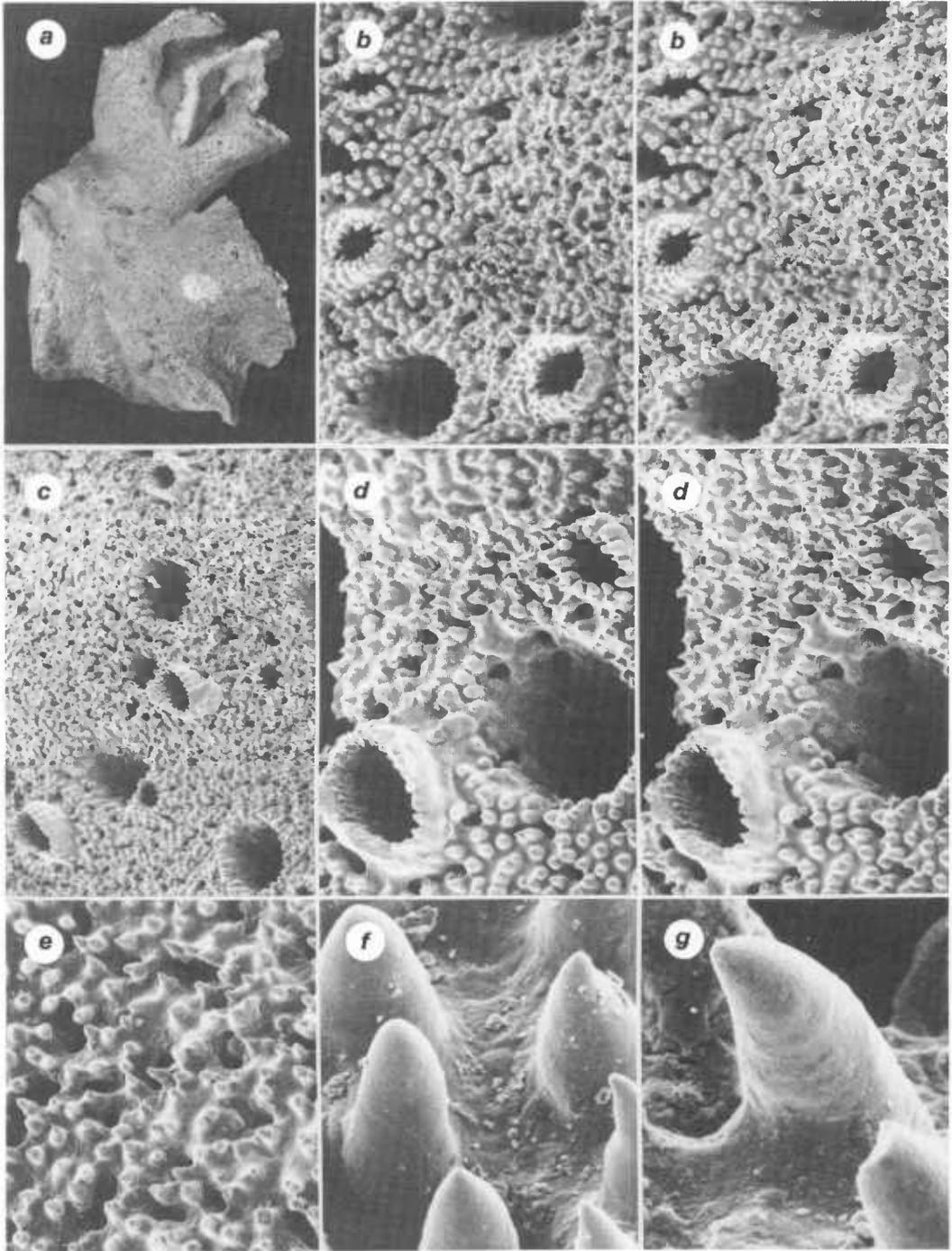


FIGURE 1. *Cyclotella lamellata*, holotype, USNM 85077: *a*, holotype colony (base to left), $\times 0.63$; *b-d*, coenosteum, illustrating circular flush gastropores and elliptical dactyloporic spines, female efferent pore present in center of figure *b*, $\times 36.5$, $\times 23.5$, $\times 54.5$, respectively (*b* and *d* are stereo pairs); *e-g*, reticulate-spinose coenosteal texture, $\times 87$, $\times 155$, $\times 1135$, respectively.

granular coenosteum reddish-orange, with a white central core and slightly less pigmented coenosteum overlying each ampulla. Coenosteal strips 73–140 μm wide, bordered by relatively broad but discontinuous slits 25–30 μm wide. Coenosteal strips covered with robust, smooth, pointed granules up to 33 μm tall and 21 μm in basal diameter. Coenosteum between granules smooth. Nematopores absent.

Gastro- and dactylopores occur abundantly and uniformly on corallum faces and edges, lacking any coordination between pore type. Gastropores circular, flush with coenosteum, and variable in diam.: ranging from 0.16 to 0.39 mm in diam., the two size classes often occurring adjacent to one another. Gastropore tubes long (up to 2.8 mm deep in thick lamellae), cylindrical, and sometimes curved to follow axis of lamella. Diffuse ring palisade present in vicinity of gastrostyle tip and slightly above it, composed of tall, blunt, cylindrical elements up to 0.11 mm tall and 0.03 mm in diam. Gastrostyle needle-shaped, its tip usually easily visible in oral view in an undamaged gastropore. Illustrated gastrostyle (Figure 2c) 1.24 mm long and 0.085 mm in diam. (exclusive of spines) for a H : W ratio of 14.6; however, gastrostyles in thicker lamellae have ratios as high as 29. Despite high H : W ratios, tabulae are lacking. Gastrostyles longitudinally ridged, the ridges bearing distally inclined, slender spines up to 60 μm long and about 7 μm in diam.

Dactylopore spines circular to elliptical in shape: the former characteristic of small, developing dactylopore spines (e.g., 0.10 mm in diam.), the latter of larger, fully developed dactylopore spines (e.g., 0.35 \times 0.21 mm in diam.). Upper surface of elliptical dactylopore spines usually convex such that lateral edges of dactylopore spines are higher than the vertices of the ellipse. For example, a typical, well-developed, elliptical dactylopore spine (Figure 2e) might have lateral edges 0.18 mm tall but edges only 0.13 mm tall at its vertices. Outer wall of dactylopore spines smooth and vertical; upper edges serrate, composed of a row of robust spinules similar in size and shape to coenosteal granules.

Female ampullae large, closely packed, ellipsoidal cavities that occur primarily within

coenosteum but sometimes rise as much as 0.2 mm above coenosteal level as low, less-pigmented bulges. Internal greater diam. of ampullae 1.0–1.1 mm and lesser diam. about 0.8 mm, the greater diam. parallel with coenosteal surface. Efferent pores rarely observed, but occur apically on ampullae as a spongy coenosteal area about 0.11 mm in diam. (Figure 1b). Male ampullae unknown.

DISTRIBUTION: *Cyclohelix lamellata* is known only from the type locality off the Pribilof Islands (ca. 57° N, 170° W). Together with *Crypthelia trophostega* Fisher, 1938, with which it was collected, it represents the third most northerly record of a stylasterid in the North Pacific. The highest-latitude North Pacific stylasterid record is that of *Stylaster campyleca* (Fisher, 1938) from 58° 17' N in the Gulf of Alaska, and the second most northerly record is of *Errina latifundata* from 58° 02' N, in the Sea of Okhotsk (Naumov 1960). Several stylasterids are known from higher northern latitudes in the North Atlantic (Broch, 1914), as far as 66° 18' N (Arctic Circle) off Iceland.

ETYMOLOGY: The species name *lamellata* (Latin for "having lamellae") refers to the platelike lamellae characteristic of the colonies of this species.

TYPE MATERIAL: Holotype: 1 female colony and SEM stub 435, USNM 85077.

TYPE LOCALITY: "Tangled in crab nets at about 1800' (550 m) off Pribilof Islands," Bering Sea.

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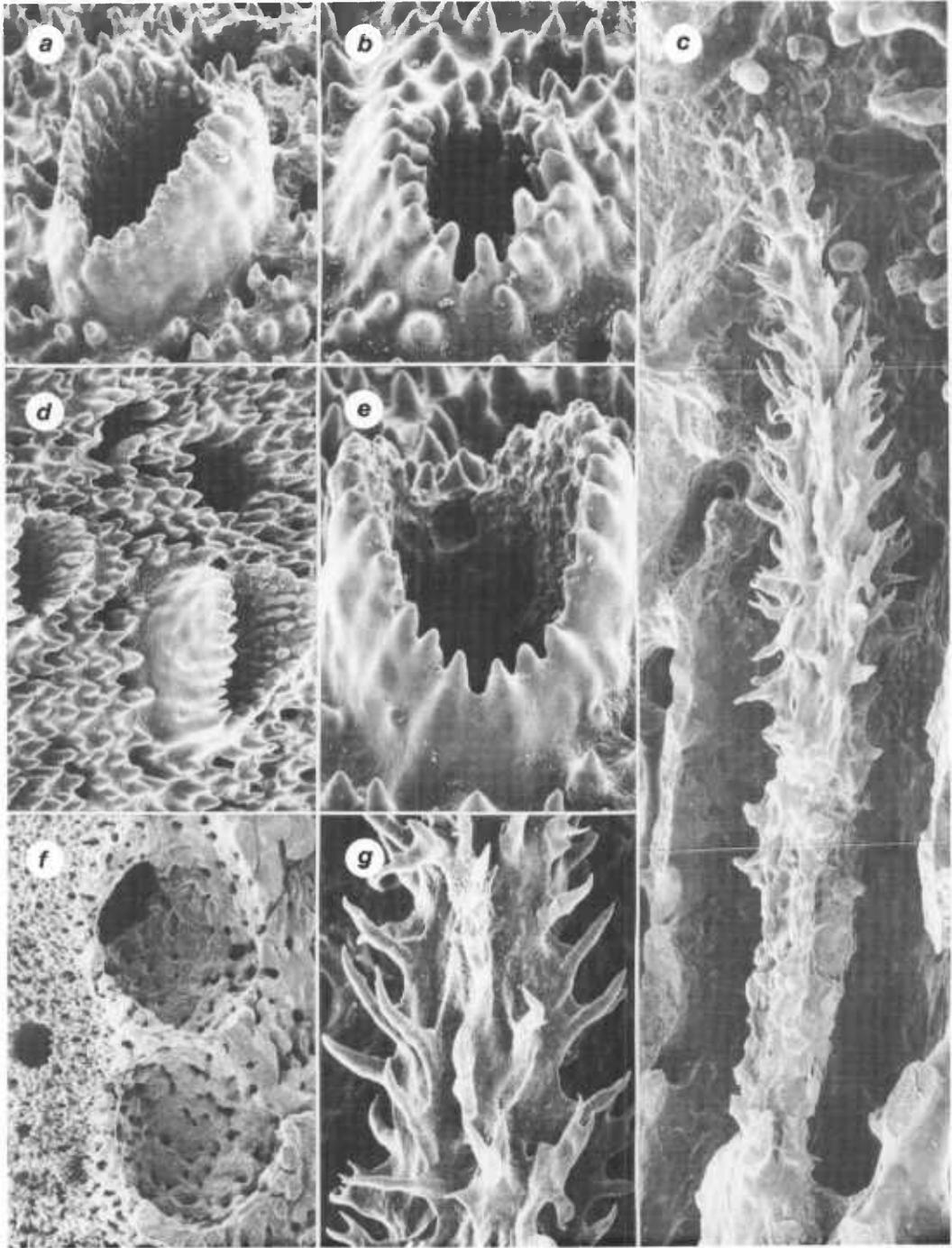


FIGURE 2. *Cyclohelia lamellata*, holotype, USNM 85077: *a-b, d-e*, various developmental stages of elliptical dactylopor spines (note serrate upper edges), $\times 92$, $\times 135$, $\times 69$, $\times 140$, respectively; *c, g*, gastrostyle and diffuse ring palisade, $\times 155$, $\times 300$, respectively; *f*, two adjacent internal female ampullae (coenosteal surface to left), $\times 25$.

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