Pseudocrypthelia, a new genus of Stylasterine coral (Coelesterata: Hydrozoa) from the Indonesian region

Stephen D. Cairns

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

ABSTRACT

A new genus, Pseudocrypthelia, is described to receive Cryptohelia pachypoma Hickson and England, 1905, a species known only from deep water off Halmahera, Indonesia. It clearly does not belong to the genus Calyptopora, as previously suggested, and differs from Cryptophelia by having rudimentary gastrostyles. The gastrostyles of P. pachypoma are morphologically unique among the Stylasterina and are hypothesized to represent an independent acquisition of the structure and thus are considered to be analogous, not homologous, to other stylasterine gastrostyles.

A table of characters is given for Calyptopora, Pseudocrypthelia, and Cryptophelia.

INTRODUCTION

Originally described as a Cryptothelia by Hickson and England (1905), C. pachypoma was later transferred to Calyptopora by Boschma (1968a). In a recent examination of the type-specimens of C. pachypoma, topotypic specimens of Calyptopora reticulata (Cairns, 1983a), and types of various other Cryptothelia (Cairns, 1983b), it became apparent that C. pachypoma belongs to neither Calyptopora nor Cryptophelia. It represents a discrete monotypic genus but has close affinities to Cryptophelia.

SYSTEMATIC DESCRIPTION

Pseudocrypthelia new genus

Cryptothelia: Boschma, 1956: F100 (in part).

Diagnosis.—Colonies small, delicate, and primarily uniplanar. Coenosteal texture linear-imbricate. Nematopores round and slightly raised, occurring on pseudosepta, ampullae, coenosteal surface, and even within the gastropore. Cyclosystems unifacial, each covered by a massive fixed lid. Gastropore tube a double chamber. Small, rudimentary gastrostyle present; dactylostyles absent. Ampullae contained in lids of cyclosystem.

Discussion.—Hickson and England (1905) originally described C. pachypoma as a Cryptothelia because of its obvious resemblance to other species of that genus; however, they failed to describe the distinct gastrostyles on their specimens. Boschma (1968a) reexamined the type-specimens, noticed the gastrostyles, and transferred it to his recently described genus Calyptopora. According to Boschma (1968b), in addition to sharing the possession of
gastrostyles, both *C. pachypoma* and *Calyptopora* were similar in having cyclostrom lids and randomly arranged nematopore pits.

Table 1 lists the characters of the three genera—*Calyptopora*, *Pseudocrypthelia*, and *Crypthelia*—based on detailed examination using scanning electron microscopy. There are few characters in common between *Calyptopora* and *Pseudocrypthelia* but many between the latter and *Crypthelia*. The most significant character uniting *Calyptopora* and *Pseudocrypthelia*—their common possession of gastrostyles—is not considered to be an homologous similarity because of the great difference in the form of the styles. The style of *Pseudocrypthelia* is unique among the 16 genera of Stylasterina that have styles. It is triangular in shape with a very low H:W ratio and has very rudimentary spines. It is assumed to be of independent origin and therefore analogous, not homologous, to the style of *Calyptopora*. The other two characters that Boschma used to assign *C. pachypoma* to *Calyptopora*, cyclostrom lids and nematopore pits, are shared by all three genera, and those lids and pits of *Pseudocrypthelia* and *Crypthelia* are structurally more similar. Furthermore, *Calyptopora* has distinct dactylostyles whereas *P. pachypoma* and *Crypthelia* have none.

*Pseudocrypthelia* is most similar to *Crypthelia*, differing primarily by the presence of gastrostyles. Traditionally, the presence or absence of gastrostyles has been used as one of the most conservative generic level characters in the Stylasterina and that differentiation is maintained here. Other characters differentiating the two genera are that *Pseudocrypthelia* has a linear-imbricate coenosteum inside the gastropore, relatively short dactylostomes, and nematopores scattered randomly over the coenosteum as well as regularly arranged on the pseudosepta. Characters unique to *Pseudocrypthelia* include its unusual gastrostyle, a combination of presence of gastrostyles and absence of dactylostyles, and typical coenosteal texture within the gastropore.

<table>
<thead>
<tr>
<th>Character</th>
<th><em>Calyptopora</em></th>
<th><em>Pseudocrypthelia</em></th>
<th><em>Crypthelia</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Colony Shape</td>
<td>Large; massive base</td>
<td>Small, delicate; narrow base</td>
<td>Small, delicate; narrow base</td>
</tr>
<tr>
<td>Branches</td>
<td>Often anastomotic, carinate</td>
<td>Not anastomotic, not carinate</td>
<td>Not anastomotic, not carinate</td>
</tr>
<tr>
<td>Coenosteal Texture</td>
<td>Reticulate-Granular</td>
<td>Linear-Imbricate</td>
<td>Linear-Imbricate</td>
</tr>
<tr>
<td>Nematopores</td>
<td>Irregularly perforate mounds</td>
<td>Circularly perforate mounds</td>
<td>Circularly perforate, low</td>
</tr>
<tr>
<td></td>
<td>randomly distributed</td>
<td>as well as randomly</td>
<td>mounds or flush pores usually</td>
</tr>
<tr>
<td>Cyclosystem orientation</td>
<td>Unifacial to sympodial</td>
<td>Exclusively unifacial</td>
<td>Exclusively unifacial</td>
</tr>
<tr>
<td>Cyclosystem Lid</td>
<td>Formed of enlarged pseudo-septa; present or absent; often &gt;1 per cyclosystem</td>
<td>A discrete, massive structure; always present; always 1 per cyclosystem</td>
<td>A discrete, massive structure; always present; rarely &gt;1 per cyclosystem</td>
</tr>
<tr>
<td>Pseudosepta</td>
<td>Convex upper surface</td>
<td>Concave upper surface</td>
<td>Concave upper surface</td>
</tr>
<tr>
<td>Dactylostomes</td>
<td>Short</td>
<td>Short</td>
<td>Long</td>
</tr>
<tr>
<td>Gastropore Tube</td>
<td>Constricted, with a diffuse</td>
<td>Double chamber; upper</td>
<td>Double chamber; upper</td>
</tr>
<tr>
<td></td>
<td>ring palisade</td>
<td>chamber linear-imbricate</td>
<td>chamber usually smooth</td>
</tr>
<tr>
<td>Gastrostyles</td>
<td>Lanceolate; ridged, with fused</td>
<td>Triangular mound; not ridged;</td>
<td>Not present</td>
</tr>
<tr>
<td></td>
<td>spines; medium H:W</td>
<td>individualized spines; low H:W</td>
<td></td>
</tr>
<tr>
<td>Dactylostyles</td>
<td>Present (Cairns, 1983a)</td>
<td>Absent</td>
<td>Absent</td>
</tr>
<tr>
<td>Ampullae</td>
<td>Scattered over coenosteum</td>
<td>Concentrated in lid</td>
<td>Concentrated in lid</td>
</tr>
<tr>
<td>Gastrozooid tentacles</td>
<td>Present</td>
<td>Unknown, presumed absent</td>
<td>Absent</td>
</tr>
</tbody>
</table>
In a preliminary phylogenetic analysis of the stylasterine genera (Cairns, in press), those genera with cyclosystems, but lacking gastrostyles (i.e., Conopora, Crypthelia, and Astya), and Pseudocrypthelia are grouped as the most highly derived genera. They are strongly differentiated from the lesser derived genera (i.e., those with cyclosystems and gastrostyles, including Calyptopora) by the loss of dactylostyles, loss of gastrozoid tentacles, round nematopores, loss of gastrostyle, linear-imbricate coenosteal texture, and a double-chambered gastropore. Pseudocrypthelia is hypothesized to be an offshoot from Crypthelia in which a rudimentary gastrostyle has independently developed. This would explain why the style is so different from those of other stylasterines.

Occurrence. — Recent: Indonesia, 1089 m.  
Type-Species. — Crypthelia pachypoma Hickson and England, 1905.

**Pseudocrypthelia pachypoma** (Hickson and England, 1905)  
Plates 1-3

*Crypthelia pachypoma*: Boschma, 1953: 167; 1956: F100, fig 82, 1b; 1957: 35-36.  

Description.—Colonies up to 22 mm tall, 32 mm broad, and 2.5 mm in basal branch diameter. Coenosteal strips frequently bifurcate and reanastomose; their width is generally between 60-65 μm. Platelets composing the strips are equally broad and occur with a frequency of about 70-75 per millimeter. Four or five concentric coenosteal strips occur within the upper chamber of the gastropore. These strips join *en chevron* beneath the cyclosystem lid and continue to carpet the lower surface of the lid. Nematopores, present as small apically perforated mounds, occur regularly, one on the upper outer edge of each pseudoseptum and along the edge of the lid; they occur irregularly on the ampullae, within the upper gastropore chamber, and on the posterior branch surface. They are 30-35 μm in diameter and usually raised 15-45 μm above the coenosteal surface.

Cyclosystems slightly elliptical in cross section, the greater axis about 1.2 mm long. Thirteen to 19 dactylopores per cyclosystem, average = 16.1 (σ = 1.46), mode = 16 (Boschma, 1968b). Pseudosepta wedge-shaped and concave above. Dactylotomes extend only one-fourth to one-third the distance to the aperture separating the two gastropore chambers. Upper chamber about 0.62 mm in diameter (measured from the inner edges of opposing pseudosepta), narrowing to a round aperture of about one-third that diameter deeper in the pore. This aperture is the opening to the lower gastropore chamber. The lower chamber is flattened, about 0.40 mm in diameter, and envelops the lower part of the upper chamber. In the center of the lower chamber is a rudimentary gastrostyle, which projects slightly above the aperture between the two chambers. Gastrostyles are about 0.15 mm in height and basal diameter (H:W = 1) and composed of individualized, pointed spines, which are themselves covered by irregular, angular deposits of calcium carbonate.

One to three hemispherical male ampullae occur on each lid, each ampulla measuring about 0.75 mm in diameter. Terminal cyclosystems usually have no ampullae; they become better developed away from the branch tip. Efferent ducts were not observed. Female colonies were not available for study.  
The tissue of *P. pachypoma* was not available for study.

Material examined.—The types.  
Types.—Hickson and England (1905) based their original description of *C. pachypoma* on four syntypes; however, as Boschma (1968a: 107) correctly pointed out, one of these specimens is clearly different from the description and the other three specimens. He suggested that it was probably *C. platypoma*. Boschma (1968b) illustrated the other three syntypes. Because the types represent a mixed lot, I designate Hickson and England’s figured specimen as lectotype (Boschma’s 1968b: pl. 1, figs. 2, 4-5) and the
other three specimens as paralectotypes, only two of which are conspecific. All specimens are deposited at the Zoologisch Museum, Amsterdam (Coel. 7394).

Distribution.—Boschma’s (1957) record of *C. pachypoma* from the Galapagos is unfounded. These specimens from Albatross station 2818, tentatively identified by W. K. Fisher as *C. pachypoma*, were examined and found to be typical *Cryptelia*, i.e., lacking gastrostyles. The only known locality for this species is therefore Siboga station 150: O°06′ N, 129°07.2′ E (Jilolo Passage, east of Halmahera, Indonesia), 1089 m. Unfortunately, even this locality was queried by Hickson and England (1905) as a possible station error.

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REFERENCES


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Institute of Taxonomic Zoology (Zoological Museum), University of Amsterdam, P.O. Box 20125, 1000 HC Amsterdam, The Netherlands.
Plate 1. Paralectotype of *P. pachypoma*: A, cyclosystem with 18 dactylopores, × 50, stereo pair; B-C, same cyclosystem from different angles showing ampullae and nematopores, × 63; D-E, cyclosystems with lids removed revealing coenosteal texture and nematopores inside upper gastropore chamber, × 90, × 60, respectively.
Plate 2. Paralectotype of *P. pachypoma*: A-B, enlargements of nematopores on edges of pseudosepta, \( \times 160, \times 500 \), respectively; C-E, progressive enlargements of linear-imbricate coenosteal texture, \( \times 225, \times 475, \times 1350 \), respectively; F, tip of gastrostyle illustrated in plate 3, \( \times 1800 \).
Plate 3. Paralectotype of *P. pachypoma*: A, longitudinal fracture of a cyclosystem revealing gastropore tube, internal coenosteal texture, and gastrostyle, ×82, stereo pair; B, gastrostyle of previous figure, ×360, stereo pair.