

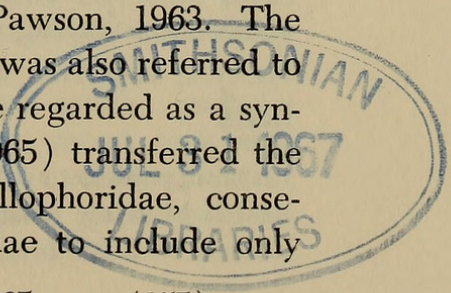
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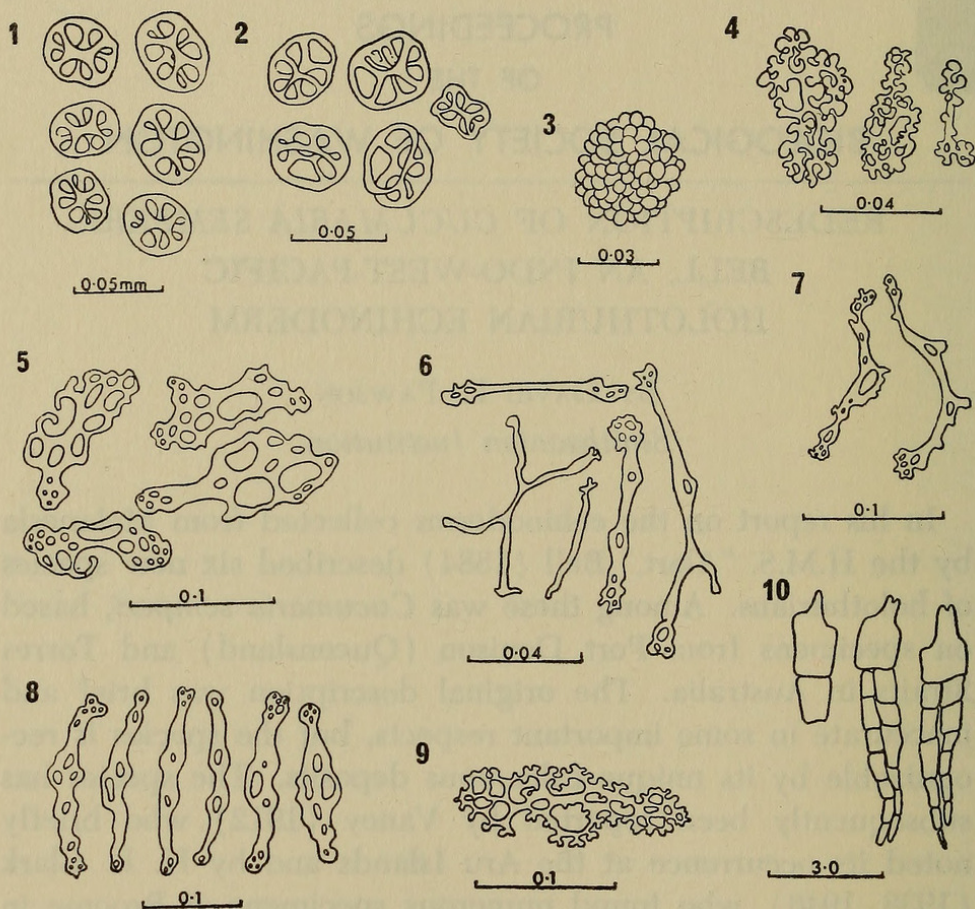
REDESCRIPTION OF *CUCUMARIA SEMPERI*
BELL, AN INDO-WEST-PACIFIC
HOLOTHURIAN ECHINODERM

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In his report on the echinoderms collected from Melanesia by the H.M.S. "Alert," Bell (1884) described six new species of holothurians. Among these was *Cucumaria semperi*, based on specimens from Port Denison (Queensland) and Torres Straits in Australia. The original description was brief and inaccurate in some important respects, but the species is recognizable by its unique calcareous deposits. The species has subsequently been reported by Vaney (1912) who briefly noted its occurrence at the Aru Islands and by H. L. Clark (1938, 1946), who found numerous specimens at Broome in northwestern Australia.

In a revision of the family Cucumariidae Panning (1949) referred *C. semperi* to the genus *Heterothyone*, subfamily Thyoninae. Pawson (1963) found that the calcareous ring of *H. alba* (Hutton) from New Zealand, the type-species of *Heterothyone*, is of a completely different type from that of *C. semperi*. In *H. alba* the ring is composed of ten solid pieces, and in *C. semperi* it is composed of a mosaic of numerous pieces. This difference necessitated the transfer of *H. alba* (and thus also *Heterothyone*) to the subfamily Colochirinae. However, *C. semperi* was retained in the subfamily Thyoninae and referred to the genus *Hemithyone* Pawson, 1963. The Indian species *C. pigra* Koehler and Vaney was also referred to *Hemithyone* by Pawson (1963), but is here regarded as a synonym of *H. semperi*. Pawson and Fell (1965) transferred the subfamily Thyoninae to the family Phyllophoridae, consequently restricting the family Cucumariidae to include only





FIGS. 1-10. *Hemithyone semperi*. 1, normal deposits from body wall; 2, deformed deposits from body wall; 3, spherical rosettes; 4, small rosettes; 5, plates from tube feet; 6, smaller tentacle rods from tentacle; 7, larger rods from tentacle; 8, rods from tube feet; 9, large rosette; 10, one radial and two interradial pieces of calcareous ring.

those soft-bodied holothurians which lack long posterior processes on the calcareous ring.

When these nomenclatural changes were made, I had had no opportunity to examine specimens of *H. semperi*, but later I was able to examine all the British Museum holdings of *H. semperi* including the type series. A revised description of the species, together with new data on its distribution, is given here.

I am grateful to Miss Ailsa M. Clark, Curator of Echinoderms at the British Museum (Natural History), for allowing me access to the collections of holothurians at that institution.

Family PHYLLOPHORIDAE Östergren, 1907, emend.

Pawson and Fell, 1965

Subfamily THYONINAE Panning, 1949

Hemithyone Pawson, 1963

Diagnosis: Calcareous deposits of body wall circular to oval bodies with two sets of transverse and longitudinal bars, one set on each side of deposit. Average greatest length of body wall deposits 0.4 mm. Tentacles with minute rods and rosettes. Tube feet with plates and perforated rods.

Type-species: *Cucumaria semperi* Bell, 1884.

Remarks: As I regard *Cucumaria pigra* Koehler & Vaney a synonym of *C. semperi*, *Hemithyone* is monotypic. It is readily distinguishable from other genera in the subfamily Thyoninae by its calcareous deposits.

Hemithyone semperi (Bell)

Cucumaria semperi Bell, 1884, p. 147, pl. 9, Fig. A; Theel, 1886, p. 104; Vaney, 1912, p. 290; Clark, 1938, p. 445; 1946, p. 388.

Cucumaria pigra Koehler & Vaney, 1908, p. 38, pl. 3, Figs. 13-16.

Heterothyone semperi: Panning, 1949, p. 464.

Heterothyone pigra: Panning, 1949, p. 464.

Hemithyone semperi: Pawson, 1963, p. 28.

Hemithyone pigra: Pawson, 1963, p. 28.

Material examined: 14 specimens in the British Museum from the following localities: Port Denison, Queensland, "Alert" Collection, 2 specimens (SYNTYPES) 81.10.26.43-45; Torres Straits, "Alert" Collection, 4 specimens (SYNTYPES), 82.2.22.116; Gulf of Manaar, Rameswaram, S. India, collected by E. Thurston, 1 specimen, 1888.11.15.13; Cape Boileau, northern Australia, collected by Mrs. B. Grey, 1 specimen, 1938.4.3.4; off La Grange, northwestern Australia, 19°15'S, 120°10'E, collected by Mrs. B. Grey, 6 specimens, 1938.4.3.5-7.

Description: Body elongate, fusiform, sometimes U-shaped, total length 23-50 mm. Tube feet strongly retractile, generally restricted to double rows in ventral radii; double row arrangement often obscured in contracted material. Dorsal tube feet in double rows in radii, sometimes restricted to radii, but often few to many tube feet also scattered in middorsal interradius. Body approximately pentagonal in cross section. Color in alcohol whitish to light brown, tube feet slightly darker. Introvert translucent pink, stem of tentacles off-white, digits light to dark brown. Tentacles richly branched, ventral pair considerably smaller than others.

Calcareous ring tubular, long. Radials with weak anterior notch for attachment of retractor muscle; posterior projections paired, each composed of several rectangular pieces (Fig. 10). Interradials with short anterior projection; each interradiol made up of two pieces, posterior piece being almost rectangular.

Body wall with immense numbers of calcareous deposits, generally of one type, a circular to oval outer ring with transverse and longitudinal connecting bars. Typical deposit with two bars at right angles on one side of deposit and on other side a central longitudinal bar bearing at each end two oblique transverse bars (Fig. 2). Average greatest length of deposits 0.04 mm.

Tube feet with well-developed end plates. Simple plates with large and small perforations (Fig. 5) near end plates. Perforated rods of average length 0.18 mm with few scattered central perforations and smaller terminal perforations (Fig. 8) also present in feet. Tentacles filled with minute rods and rosettes, latter especially numerous. Rods apparently of two sizes, averaging 0.07 mm and 0.13 mm in total length, often branched, with or without perforations (Figs. 6, 7). Rosettes also of two sizes (Figs. 4, 9), varying greatly in degree of complexity. Some rosettes spherical; (Fig. 3), others resemble flat plates. Rosettes also numerous in bases of tentacles, skin around mouth, and in introvert.

Remarks: Bell (1884) described two specimens of 36 and 25 mm total length. He did not examine the characteristic deposits in the tentacles which are a striking feature of this species. In referring to the deposits in the tube feet, Bell described the rods as “. . . not unlike folding eyeglasses in form . . .” and his illustration of a rod certainly conveys that impression. However, Bell has illustrated a broken rod which showed only two perforations. As shown in Fig. 8, the central portions of some rods do resemble eyeglasses, but complete rods do not.

In the original description of *Cucumaria pigra*, Koehler and Vaney stated that their specimens closely resembled *H. semperi* in most features, differing only in that the deposits of the tube feet did not resemble folding eyeglasses which, as indicated above, was based on an erroneous observation. The illustrations of the deposits of *C. pigra* are closely similar in size and shape to those of *H. semperi*. The type of large elongate plate from the body wall of *C. pigra* was not found in material of *H. semperi* I examined, but a photograph of the deposits from the body wall of a specimen from the original type-series of *H. semperi* kindly given to me by F. W. E. Rowe of the British Museum shows one of these plates. It appears that such plates are rare in the body wall. The calcareous ring of *C. pigra*, as illustrated by Koehler and Vaney, differs in some respects from that of *H. semperi*, the most notable difference being that in the former the ring appears to be composed of rather more numerous and smaller pieces than that of the latter. This difference is probably an artifact of preservation or an inaccurate illustration.

There appears to be no good reason for regarding the two species as distinct, and the unique nature of the calcareous deposits argues most strongly for synonymizing them.

Lectotype: I have selected as the lectotype of *Cucumaria semperi*

Bell the largest specimen (total length 36 mm) of the series of four collected from Torres Straits by the "Alert" (BMNH 82.2.22.116).

Distribution: In Australia *H. semperi* is known from Port Denison and Torres Straits (Bell, 1884), Broome (Clark, 1938), and from Cape Boileau and off La Grange. The species appears to range from Queensland in the east through Torres Strait to the vicinity of Broome in the northwest. It has been found at the Aru Islands in the Arafura Sea (Vaney, 1912), and at India, where it has been collected at Karachi (type-locality of *Cucumaria pigra* Koehler & Vaney) and from the Gulf of Manaar. The known bathymetric range is from low tide level to about 13 meters. Clark (1946) noted that at Broome the species appeared to be most common at a depth of about 13 meters.

LITERATURE CITED

- BELL, F. J. 1884. Echinodermata. Rept. Zool. Coll. Indo-Pacific Ocean Voyage of H.M.S. "Alert," 1881-82, pp. 117-177, pls. 8-17.
- CLARK, H. L. 1938. Echinoderms from Australia. Mem. Mus. Comp. Zool. Harvard 55, viii + 597 pp., 28 pls.
- . 1946. The echinoderm fauna of Australia. Carnegie Inst. Washington Publ. 566, 567 pp.
- KOEHLER, R. AND C. VANEY. 1908. An account of the littoral Holothurioidea collected by the Royal Indian Marine Survey Ship "Investigator." Indian Museum: Calcutta, 54 pp., 3 pls.
- PANNING, A. 1949. Versuch einer Neuordnung der Familie Cucumariidae. Zool. Jb., 78 (4): 404-470, 62 Figs.
- PAWSON, D. L. 1963. The holothurian fauna of Cook Strait, New Zealand. Zool. Publs. Victoria Univ. Wellington 36, 38 pp., 7 pls.
- AND H. B. FELL. 1965. A revised classification of the dendrochirote holothurians. Breviora 214, 7 pp.
- THEEL, H. 1886. Report on the Holothurioidea. Part II. "Challenger" Sci. Results: Zoology 14, part 39, 290 pp., 16 pls.
- VANEY, C. 1912. Holothurien der Aru-Inseln. Abhandl. Senckenb. naturforsch. Gesellsch., 34: 289-91.



Pawson, D L. 1967. "Redescription of *Cucumaria semperi* Bell, an Indo-West-Pacific holothurian echinoderm." *Proceedings of the Biological Society of Washington* 80, 157–161.

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