

PSOLIDIUM PROSTRATUM, NEW SPECIES, FROM
OFF THE EAST COAST OF THE U.S.A.
(ECHINODERMATA: HOLOTHUROIDEA)

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Abstract.—A new species of *Psolidium* is described. It was collected off the North Carolina and South Carolina coasts at depths ranging from 383 to 450 meters. This is the first record of the genus *Psolidium* from the Western North Atlantic.

The genus *Psolidium* Ludwig, 1886, as presently characterized includes approximately 25 species. *Psolidium* is widely distributed in the polar regions and the Pacific Ocean, to depths of approximately 3000 meters. Until now, only a single species, *P. arcuatum* (Herouard, 1912), from off the Azores, was known from the Atlantic Ocean. The present new species is, therefore, the first record of the genus from the Western North Atlantic.

As psolids usually attach themselves to hard substrata, such as rocks, it is obvious that they would be more plentiful in rocky habitats that are usually avoided by research vessels engaged in trawling and dredging. It is thus likely that several species of psolids, and especially *Psolidium*, remain to be discovered in rocky habitats in the Western North Atlantic.

The new species was collected off South Carolina by Texas Instruments Ecological Services during 1977, while undertaking the South Atlantic Benchmark Program for the Bureau of Land Management. An additional specimen collected from off North Carolina was found in the reference collection of the Duke University Marine Laboratory, Beaufort, North Carolina.

Family Psolidae Perrier, 1902

Psolidium Ludwig, 1886

Type-species.—*Psolidium dorsipes* Ludwig, 1886.

Psolidium prostratum, new species

Figs. 1, 2

Diagnosis.—Small species, probably not exceeding 20 mm in total length. Numerous tube feet scattered on dorsal surface. Oral and anal apertures sur-

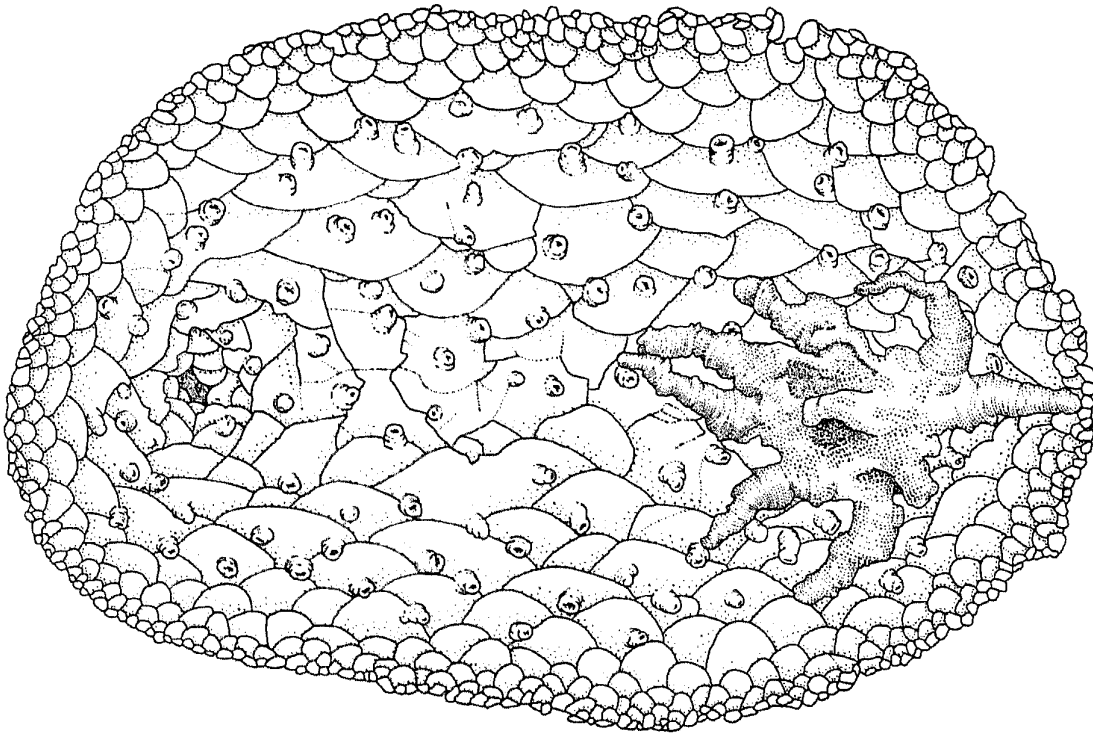


Fig. 1. *Psolidium prostratum*: Holotype, dorsal aspect. Drawing by C. G. Messing.

rounded by numerous scales; no identifiable oral or anal valves. Approximately 12–20 scales between oral and anal apertures. Mid-ventral radius with few (4–5) tube feet. Ossicles in sole exclusively knobbed plates, usually with more than 4 perforations; no cups.

Material examined.—10 specimens and 5 fragments from the following localities: HOLOTYPE.—USNM E20993, 32°20'06"N, 78°11'04"W, 412 meters, 15 February 1977, temperature 17.5°C, salinity 35.2‰, dissolved O₂ 4.9 mg/liter (Sta. 159-2), total length 11.5 mm. PARATYPES.—USNM E20994, same data as Holotype, 2 specimens, 10.5, 3.5 mm; USNM E20995, 32°19'59"N, 78°10'39.06"W, 383 meters, 12 May 1977, temperature 8.79°C, salinity 35.3‰, dissolved O₂ 4.7 mg/liter, 6 specimens and 5 fragments, total length 2–13 mm (Sta. 501-2 to 501-6). Other material: Duke University Marine Laboratory, 34°17.5'N, 75°49.5'W, 450 meters, 13 March 1965, 1 specimen, total length 6 mm.

Description.—Body very flattened, contorted to conform to shape of substrate. Total length 1.5–15 mm. Width approximately 50% of length. Dorsal surface with numerous thin, fragile scales; at least 12–20 scales between oral and anal apertures. Scales smooth, approximately equal-sized, averaging 1 mm in diameter. Scales decrease sharply in size towards ambitus. Tube feet scattered over dorsal surface, at least 100 feet in large specimens; feet emerge between and through dorsal scales (Fig. 2C). Oral and anal apertures similar, oral aperture larger. Both surrounded by numerous scales

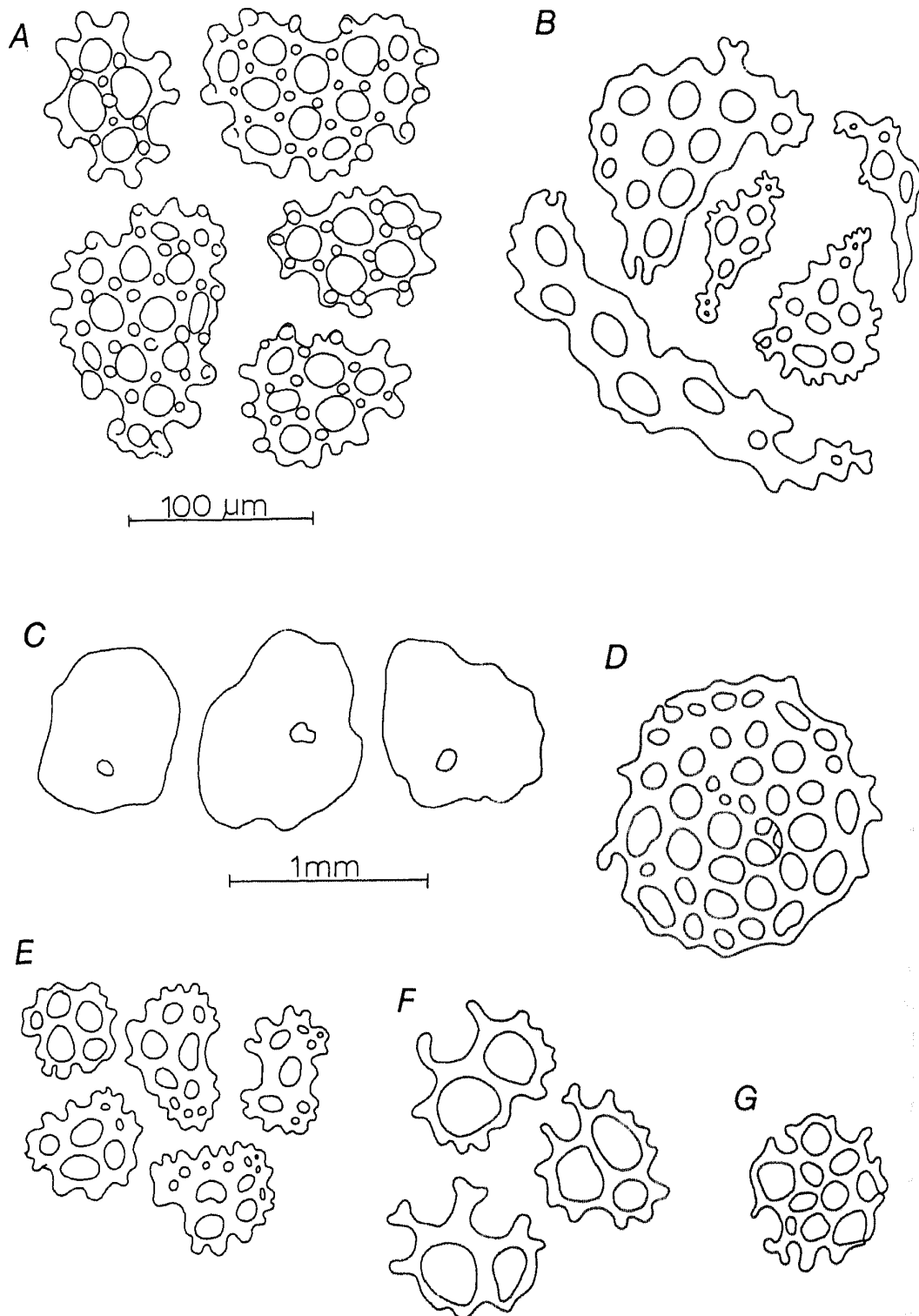


Fig. 2. *Psolidium prostratum*, ossicles: A, Knobbed buttons from sole; B, Perforated plates from tentacles; C, Outline drawings of dorsal plates, showing holes for passage of tube feet; D, Endplate from ventral tube foot; E, Plates from dorsal tube feet; F, Developing buttons from sole of 1.5 mm total length juvenile; G, Endplate from tube foot of 1.5 mm total length juvenile. The scale on Fig. 2A also applies to figs. 2B, D-G.

without regular arrangement. Anal aperture can be pushed outwards on a small anal cone. Boundary between dorsal and ventral surfaces marked by a sharp edge. Sole fragile, transparent, with scattered marginal tube feet. Midventral radius also with scattered tube feet, usually only 4–5 present. Tentacles weakly dendritic in larger specimens. Smaller specimens of less than 12 mm length often with unbranched tentacles; in these, primordial branches often evident. Tentacles 10, white, 2 ventral tentacles smaller than others. Color of body usually white, although in few specimens dorsal scales are light to dark brown.

Ossicles of sole exclusively knobbed buttons of average length 118 μm ; usually there are more than 4 perforations (Fig. 2A). In sole of 1.5 mm long juvenile, ossicles smooth, with few perforations (Fig. 2F). Ventral tube feet with well developed endplates (Fig. 2D), even in juveniles (Fig. 2G). Dorsal feet lack endplates, but contain some curved simple plates, sometimes with a few small knobs (Fig. 2E). Tentacles contain small perforated plates and rods, often curved, of variable size, ranging from approximately 75 μm long to approximately 400 μm long (Fig. 2B).

Ecology.—Specimens were recovered from box core samples, in which they were found attached to pieces of volcanic agglomerate estimated to be between 1 million and 10 million years old. Other faunal elements included *Tharyx* sp., *Thelepus cincinnatus*, and several species of amphipods.

Relationships.—The only other known Atlantic congener, *P. arcuatum* Herouard, has smooth plates in the sole with few perforations. From the eastern Pacific, in the vicinity of Central America, 6 species are known. They differ from *P. prostratum* in the following ways: *P. gracile* Ludwig, 1894, has sole plates with fewer perforations and many fewer knobs. *P. panamense* Ludwig, 1894, has a higher, almost cylindrical body, much less conspicuous dorsal feet, and much larger sole plates. *P. ekmani* Deichmann, 1941, has pearl-like projections dorsally and 4-holed ossicles in the sole. *P. eubullatum* Deichmann, 1941, has heavy buttons and plates ventrally, and the dorsal feet have no ossicles. *P. dorsipes* Ludwig, 1886 and *P. planum* Deichmann, 1941, both have cups in addition to the other ossicles in the sole. The present new species appears to bear no close relationship with other known species in the genus.

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Literature Cited

- Deichmann, E. 1941. The Holothurioidea collected by the *Velero III* during the years 1932 to 1938. Part I, Dendrochirota.—Allan Hancock Pacific Expeditions 8(3):61–194, pls. 10–30.

- Herouard, E. 1912. Holothuries nouvelles des campagnes du yacht *Princesse-Alice*.—Bulletin de l'Institut Océanographique 239:1-9, figs. 1-7.
- Ludwig, H. 1886. Die von G. Cheirchia auf der Fahrt der Kgl. Ital. Corvette "Vettor Pisani" gesammelten Holothurien.—Zoologische Jahrbucher 2:1-36, pls. 1-2.
- . 1894. The Holothurioidea.—Memoirs of the Museum of Comparative Zoology 17(3):1-183, pls. 1-19.

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