

## HOLOTHURIA ANULIFERA, new species.

Plate LXIX, figs. 2, 2a-d.

Size small; general form cylindrical, rather slender. Mouth and anus terminal. Tentacles 20, not large. Dorsal and ventral surfaces well differentiated, the former beset with slender papillæ, forming about six longitudinal, irregular series, the latter with more numerous pedicels in four single series. Body wall rather thin. Deposits: Tables, and small robust rods with knob-like processes, together with incomplete buttons bearing knobs, and very few complete buttons, the small knobby rods being by far the most numerous; these in small circular groups and rings. Tables with a simple annular disk, there being a perforation at the base of each spire support, with often a few additional small perforations; edge spinous. Spire low, as a rule, with four rods, one crossbeam, and the small crown ending in four to eight short, blunt teeth. Comparatively few of the tables have the spire much higher, ending in four teeth and the smooth disk reduced to a simple ring, often without any perforations. Simple and branched supporting rods in papillæ; fenestrated supporting plates in pedicels. Color in alcohol, dorsal surface yellow ocher, lighter about base of pedicels, splashed with small irregular spots of red; ventral surface grayish, more sparsely spotted with red. Length, 55 mm.; width, 8 mm.

*Localities.*—Type (Cat. No. 21213, U.S.N.M.) from Station 3872, Auau Channel, between Maui and Lanai islands, 43 to 32 fathoms, yellow sand, pebbles, coral; bottom temp., 74.6°; 2 specimens. Station 3876, same locality, 28 to 43 fathoms, sand and gravel; 1 specimen.

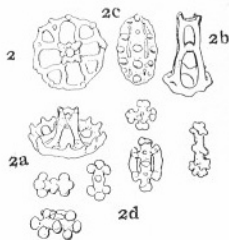
The calcareous ring is rather delicate, but the pieces are of the usual shape. The interradialia are much smaller than the radialia, and each are about equally excavated (in proportion to relative size) on the posterior margin. The anterior margin of radial pieces is deeply incised, while that of the interradial is in the form of a single tooth, as usual. Polian vesicle single. Madreporic canal one, on right side of mesentery, free. Gonad fairly well developed. Cuvierian organs present, apparently in a state of development.

The tables are rather delicate and small. When viewed directly from above or below, the spines of the margin are not so apparent as when the disk is seen from the side, because the teeth are directed upward. The disk has a cruciform central hole, and four peripheral ones at the base of each low spire support. Frequently one or two small accessory perforations are present near one or two of the peripheral holes. The diameter of the disk of this sort of table is about 0.04 to 0.048 mm. The spire commonly terminates in from four to eight teeth, eight when fully complete. Sometimes one or two sides

of the subquadrate crown lacks a crosspiece. Occasionally the crown is more circular. A much rarer form of table is shown in figure 2*b*, Plate LXIX. Here the disk is much reduced and the spire correspondingly elongated. This form is apparently confined to the walls of papillæ and to the center of the groups of rods, where there are commonly three or four. The rest of the calcareous deposits are in the form of small knobby rods or very incomplete buttons with knobs, the principal forms being shown in the figures. They vary in length from 0.02 to 0.038 or 0.04 mm. Rarely there is a complete button 0.05 mm. long. A characteristic feature of these deposits is their accumulation in small circular groups or in small rings. They also form large rings about the base of the ambulacral appendages. A relatively few are scattered between the groups, which are rather close together. The supporting rods of the papillæ are curved with a spinous margin; the tips being a trifle expanded, spinous, and commonly perforated. At the tip of the papillæ the rods become smaller, laterally branched, the branches sometimes joining to inclose meshes. Then the rods resemble very open plates. Very rudimentary terminal plates appear to be sometimes present. The papillæ are further strengthened by the peculiar long-spined, small-disked tables already mentioned. The pedicels (of the ventral surface) have very well developed terminal plates, and in the vicinity of these are numerous bilateral curved elliptical fenestrated supporting plates about 0.13 mm. long and with one or two tiers of holes on either side of the central shaft. The margin is often rough or toothed. The tables in the walls of the pedicels are of the ordinary shape with a smooth margin. None of the slender curved supporting rods found in the papillæ are present in the pedicels, except possibly on the transition area between pedicels and papillæ (lateral).

This species is especially characterized by the form of the tables, and the curiously knobbed, mostly incomplete buttons and rods, arranged in circular groups and rings. It is very perplexing and should probably be ranked in Théel's *Holothuria atra* group<sup>a</sup> along with *grisea*, *inornata*, and others. The deposits, especially the knobbed buttons and rods, are entirely different from those of *atra* or any nearly related form. *Anulifera* is also related to *pervicax*, perhaps more closely than to *atra*.

<sup>a</sup>Challenger Holothurioidea, Pt. 2, p. 213.



2. *Holothuria anulifera*. Disk of table and crown, from above. 2a. Table from side. 2b. Table from wall of papilla, viewed from one side; this type rather uncommon. 2c. A rare form of complete button. 2d. Usual form of incomplete knobbed buttons and knobbed rods,  $\times 200$ .