

*Hemipholis.*

*Hemipholis*, Agas., MS.; Lym., Ill. Cat. Mus. Comp. Zool., No. i., 1865.

Disk, above, covered with rounded, rather thick scales, and with large united radial shields; below, naked. Disk slightly indented, at the base of each arm. Teeth. No tooth papillæ. Mouth angle extremely narrow, with a tooth at the apex, and a small papilla at the outer corner. Side mouth shields touching each other, so as to form a continuous ring round the mouth. Three short, tapering arm spines. Two genital openings, beginning outside the mouth shields.

This genus, scarcely to be separated by external characters from some species of *Amphiura* that are naked below, presents considerable differences in the skeleton. In the first place, there is no genital scale, but only a genital plate, with a clubbed outer end and a strongly curved slender shaft. The mouth frames are much larger than in *Amphiura* with prolonged wings, and a small but well-marked single peristomial plate.

The arm bones are wider, with thicker wings and a less marked forward projection of the upper surface. Their lower surface presents an immense canal (Pl. XL. fig. 9, *t*), which rises in the substance of the bone like a high, wide arch, and changes the usual position of the articulating peg (6). (See Plate XL. figs. 8-12.)

*Hemipholis cordifera*, known long ago by the description of Bosc, is plentiful in the harbour of Charleston, S.C., where it was collected by Professor Agassiz in 1852, and was carefully examined in the living state by the late Professor H. J. Clark. Besides the peculiarities already noted in the skeleton, the tentacles are papillose (Pl. XLIV. figs. 13, *r*, 14, 15). The papillæ, as well as the tip of the tentacle itself, are imperforate, as appears in the section (fig. 14). The centre, however, is hollow, and contains a long spiral, like a half partition, which is apparently muscular and doubtless aids in retraction. Fig. 13 gives an excellent picture of a part of the under side of the living animal. Between the points of the teeth, in three of the interbrachial spaces, may be seen a white line, which is the edge of the mouth sphincter. The females were then (January) full of eggs, one of which (fig. 16) is shown considerably magnified.

The species is, I suspect, viviparous, as I found minute young, clinging to the arms and disk of the adult. One of these, having a disk but half a millimetre in diameter (Pl. XL. fig. 12) displayed only the six primary back plates (*g*, *g'*), and the beginning of one interbrachial. There were as yet no radial shields, although the arms had already ten joints. It was not until the disk was 1 mm. across that the beginnings of radial shields were visible (fig. 11, *l*). Besides these there were not only the primary plates (*g*, *g'*) but one brachial and three interbrachial. It thus appears that radial shields, so nearly universal among Ophiurans, are not special plates, but entirely homologous with other disk scales, and by no means the first to appear.