

The anatomy of five bathysciadiid limpets, the type species *Bathysciadium costulatum* (Locard, 1898), *Bathysciadium*.sp. B (off New Zealand), *Bathypelta pacifica* (Dall, 1908), *Bathypelta* sp. A (off New Zealand), and *Bathyalium wareni* n.g., n.sp. (deep East Atlantic Ocean Basins), which all feed on decaying cephalopod beaks, has been investigated by means of semithin serial sectioning and interactive, computer-aided 3Dreconstructions. *Bathyalium wareni* is described as a species new to science based on additional SEM photos of shell and radula. The small to tiny limpets have an oval to circular shell aperture often provided with centrifugal periostracum fringes, being connected to the body by a horse-shoe-shaped shell muscle. The large head shows a large copulatory verge at the right side, a pseudoplicatid gill is placed in the shallow mantle cavity. There is a monotocardian heart and a single, left excretory organ. The hermaphroditic genital system is provided with a receptaculum and contains large, yolky eggs and filiform or spiral sperm, the gonoduct is glandular. The bathysciadiid alimentary tract is largely modified: The oral lappets are provided with distinct cuticularized zones and act as suckers. Jaws are absent, the diagnostic radula is supplied with a single pair of cartilages. The esophageal glands form huge, ramified sacs throughout the animal's body, the epithelium is characterized by strange "pellets". The very large stomach lacks a gastric shield as well as midgut glands. The narrow intestine is looped and occasionally widened, the rectum passes beneath the ventricle. The anterior nervous system is hypoathroid, there are true pedal ganglia, whereas the streptoneurous visceral loop is cordlike. The short cephalic tentacles are smooth, eyes, osphradia, or epipodial tentacles are lacking, statocysts contain single statoliths. Differences between species are found in conditions of shell, protoconch, mantle papilla, copulatory organ, receptaculum openings, oral lappets, and rectal histology. The Bathysciadiidae share several synapomorphies with the Cocculinidae (s. str.), namely the pseudoplicatid gill, a single, left kidney, the hermaphroditic gonad with the single, glandular gonoduct, and the statocysts with single statoliths. Therefore these families are united in a clade Cocculinoidea, which is considered to be highly modified offshoot of early gastropods independent of the likewise "cocculiniform" Lepetelloidea, which should be classified among the Vetigastropoda.