

Usually both openings are either four-lobed or cross-slit—that is, the lobes are triangular, and fit together so closely as to reduce the apertures to four narrow slits, radiating from a point so as to form a cross (Pl. XX. fig. 1). In the genus *Culeolus* (belonging to the sub-family Bolteninæ), however, the apertures have each less than four lobes, the branchial being triangular and the atrial bilabiate.

The shape of the body varies greatly, more than in any other family; ranging from the squat blister-like *Styela grossularia* to the long pedunculated *Boltenia*, and including a number of irregular and curious forms such as the species of *Microcosmus*.

The condition of the test is also variable, and can hardly be said to characterise the family. In the majority of the species, however, and in the most typical forms (those belonging to the Cynthinæ), the test is leathery, comparatively thin, but tough and roughened on the outer surface. In some species (e.g., *Boltenia pachydermatina*, *Culeolus wyville-thomsoni*, &c.) it is thick and cartilaginous, while in a few remaining cases (e.g., *Culeolus perlucidus*) it is thin and membranous.

The mantle is very muscular in the majority of the Cynthiidæ, and in its most highly developed condition consists of three layers of muscle fibres—an outer longitudinal and an inner longitudinal separated by a middle circular. In most cases, however, the inner layer is absent, and there are only the two well-developed layers, the outer longitudinal and the inner circular crossing at right angles.

In *Culeolus murrayi* and most of the other Bolteninæ they do not form continuous layers, consequently the musculature has the appearance of an open network formed by the longitudinal and circular bundles of fibres.

In some Cynthiidæ (e.g., *Styela oblonga*) the musculature is very feeble, and is reduced to a few faint longitudinal bundles, while in *Styela flava* (Pl. XX. fig. 3) the arrangement of the fibres appears to be quite irregular, and no trace of longitudinal and circular layers can be made out.

The branchial sac has longitudinal folds, and in typical members of the sub-family Cynthinæ they are very large, and sometimes numerous (at least twenty-four in *Cynthia grandis* according to Heller).¹ In the Styelinæ the folds are reduced in number and simplified. The typical number in this sub-family is eight, four on each side; this number is never exceeded, but is sometimes much reduced, as in *Styela grossularia*, van Beneden, where there is only a single fold.

In *Culeolus* and *Fungulus* the whole sac is much simplified by the absence of the system of fine longitudinal or interstigmatic vessels. In all the other Cynthiidæ the stigmata are straight, and are arranged in regular transverse rows.

The tentacles are compound in the sub-families Bolteninæ and Cynthinæ and resemble those of the Molgulidæ, but in the Styelinæ they are simple and filiform as in the Ascidiidæ.