simplest and least developed forms, and through them must be traced the passage to the Ascidiæ Compositæ.

The relations between these families of Simple Ascidians may, according to our present knowledge, be expressed serially thus :—

MOLGULIDÆ—CYNTHIIDÆ—ASCIDIIDÆ—CLAVELINIDÆ.

Family MOLGULIDÆ.

Body usually free, sometimes fixed, rarely pedunculated.

Test cartilaginous, coriaceous, or membranous, often covered with sand. Branchial aperture, six-lobed; atrial aperture, four-lobed.

Branchial Sac longitudinally folded; internal longitudinal bars not papillated; stigmata more or less curved, usually arranged in spirals.

Tentacles always compound, usually much branched.

Intestine attached to the inner surface of the mantle on the left side.

Renal Sac present, upon the right side of the body.

Genitalia on the inner surface of the mantle, usually developed on both sides.

This is the highest and most complex family of the Ascidiæ Simplices. It is closely allied to the Cynthiidæ, from which it was first distinguished by Lacaze-Duthiers in 1877.[1]

Heller,[2] who had previously divided the Ascidiæ Simplices into families, arranged *Molgula* and its allies under the Cynthiidæ; there can be no doubt, however, that the two groups of genera should be considered as independent families. Lacaze-Duthiers (*loc. cit.*) discusses this question at length, and after pointing out the resemblance between *Cynthia* and *Molgula* he shows clearly the distinctions between the two forms, and establishes and defines the family Molgulidæ.

The most constant and most generally useful characteristic is, as usual, to be found in the configuration of the apertures. The branchial aperture has always six lobes, and the atrial has always four. There are several other external characters, but none are so reliable as these. The animal is usually free, or imbedded in mud or sand; sometimes, however, it is fixed like other Simple Ascidians, and a few of the newly discovered forms are pedunculated.

The outer surface of the test is usually covered by a thick coating of sand grains and shell fragments adhering to long hair-like processes of the test. Some Molgulidæ, however, have perfectly smooth tests with no adhering sand, while on the other hand some of the Cynthiidæ (*e.g.*, *Polycarpa molguloides*) exhibit the delicate hairs and thick sandy coating of a typical *Molgula*.

The branchial sac, like that of the Cynthiidæ, is longitudinally folded; here, however,

[1] Les Ascidies Simples des côtes de France, *Arch. Zool. expér.*, t. vi. p. 457.

[2] Untersuchungen über die Tunicaten des adriatischen und Mittelmeeres, Abth. iii. p. 1.