

wider peduncular process, which usually, but not always, corresponds with a sinus or notch in the lower border of the orifice. The former kind may be termed "truncate" and the latter "pedunculate opercula."

2. *Structure*.—Some are composed of a continuous rigid, chitinous substance, but in the majority of cases the operculum is constituted of a thinner or stronger membrane, supported by a thickened chitinous border, to which are often added lateral rods or processes, or a more or less complicated framework; and they may be divided into;—

- a. *Complete*.—In which the chitinous rim is continuous all round including the lower border.
- b. *Incomplete*.—When the lower border remains membranous or is continuous, without distinct interruption, with the membranous endocyst of the zoecium.

3. *Articulation of the Opercula*.—The mode in which the opercula are articulated varies very considerably. In those cases in which the zoecia are completely calcified, as in the *ESCHARINA* generally, the operculum is directly articulated or attached to the sides of the orifice, usually at points near its inferior border, but sometimes higher up. The articulation is effected by an elastic fibrous ligament as it may be termed, which is generally inserted into a notch in the border of the operculum, but in some few cases into a projecting process, which corresponds to an incision in the border of the orifice on either side.

4. *Opercular Muscles*.—The motions of the operculum in the opening and closing of the orifice are effected by two pairs of muscles, ocluser and retractor, of which the former are the more important; these muscles are sometimes inserted with the intervention of a long slender tendon and sometimes immediately. The points and mode of attachment should be carefully noticed.

B. The other more important chitinous elements are the avicularian mandibles and vibracular setæ.

1. *Mandibles*.—These, like the opercula, exhibit very great variety of form, and not unfrequently several forms co-exist in one and the same species. But except in size, in which they often present greater differences than do the opercula, the characters of each particular type will be found remarkably constant.

Like the avicularia of which they form part, the mandibles may be divided into those adapted for a prehensile purpose, and those which form merely a movable lid to the cup or receptacle upon which they are seated.

In one division of the genus *Cellepora* (but only in those belonging to the southern hemisphere), in which the lower border of the orifice is straight and entire, the avicularian mandibles always present a slender process rising from the middle of the base, occasionally furnished with short hairs, to which I have applied the term *columella*.