

Freia ampulla, the Flask-Animalcule.

By Prof. KARL MÖBIUS.

One of the largest and finest Infusoria of Kiel Bay is *Freia ampulla*, O. F. Müll., the flask-animalcule. When full-grown and completely extended it is nearly 1 millim. long and 0.1 millim. broad, so that it is perceptible even with the naked eye. It resides in a flask-shaped capsule with a convex bottom, a short neck, and the margins of the aperture bent outward. This capsule is transparent, brownish yellow or somewhat bluish, and consists of a chitinous substance which is insoluble in potash. The greater part of the extended animal is cylindrical. Its posterior extremity is attached to the bottom of the capsule, while the anterior portion can reach far beyond the aperture of the capsule, and is divided into two lanceolate lobes, the bases of which are united to form a half-funnel, in the bottom of which the mouth is situated. The edge of these funnel-lobes is covered with combs of cilia or pectinellæ, the united bases of which cross the edge-line nearly at right angles. The pectinella-fringes of the two funnel-lobes run spirally down the funnel as far as the mouth.

When the animalcule has extended itself and separated the funnel-lobes it sets a portion or the whole of its pectinellæ in motion, and thus produces currents which carry smaller Infusoria, unicellular Algæ, or granules of indigo or carmine mixed with the water into the cavity of the mouth. When the latter is filled it opens inwards and allows the food, in the form of a rounded ball, to pass into the œsophagus, which may be recognized as a longitudinally-striated canal behind the mouth, in the middle of the fore part of the body. From the œsophagus the food-balls pass into the soft endosarc of the middle and hind body; many food-balls are also pushed up forward even into the endosarc of the funnel-lobes. The indigestible parts are expelled at the base of the left funnel-lobe. Several fecal balls usually collect to the left of and somewhat behind the bottom of the funnel, in a canal, a sort of rectum, and escape quickly one after the other.

The soft endosarc is covered with a firmer layer of ectosarc, which consists of long streaks beset with greenish-brown granules. These streaks act like muscular fibres. When they contract, the hind-body becomes thicker and applied to the bottom of the capsule, while the fore-body with the funnel-lobes folded together passes down below the aperture of the capsule. *Freia ampulla* usually retracts itself quickly into the capsule, and only slowly extends itself again.

In the middle and hinder parts of the body there is a light necklace-like cord, which is coloured red by solution of carmine. This is the *nucleus*.

In many capsules there is, at the side of the hind-body of a perfectly developed individual, a young animal without funnel-lobes, nearly uniformly rounded off anteriorly and posteriorly, and produced by fission from the body of the parent animal. This, when it

is still connected with its parent only by a slender cord, stretches the fore part of the body out of the capsule, tears itself free, and swims away, carried along by fine cilia which cover the whole body in close longitudinal series. At the anterior extremity rudiments of pectinellæ already show themselves, and a slight notch is the beginning of the formation of the funnel-lobes. After the young animal has swum about freely for a time it attaches itself to some firm support and secretes the material of the capsule as a transparent mass, thicker behind than before, where it is not yet turned out as in mature individuals.—*Schriften naturw. Ver. für Schleswig-Holstein*, Bd. vi. Heft 1 (Kiel, 1885).

On Adamsia palliata. By M. FAUROT.

The constant association of *Adamsia palliata* and *Eupagurus Prideauxi* has long been known without having been made the object of any special investigation. This association is equally for the benefit of both animals—abundant and well-prepared food for the *Adamsia*, the mouth of which is placed behind the foot-jaws and chelæ of its associate, and a shelter adapted to the peculiar structure of the *Eupagurus*, the ambulatory legs of which, extending far at the sides and remarkably active, could not move easily with a dwelling which was not so exactly fitted to the form of the animal. Thus *Eupaguri* captured in the open sea and destitute of *Adamsiæ* present, attached to the extremity of their abdomen, gasteropod shells, which are always of very small dimensions, so as not to interfere with the movements of the ambulatory feet. Hence when these animals live separated from their habitual associate they are imperfectly sheltered.

Another proof of the peculiar function of the *Adamsia* is that in the association of two adult individuals the size of the Actinia is always in relation to that of the crustacean, while the shell is most frequently of very small dimensions. The latter therefore serves chiefly as the common point of fixation of the two creatures.

Whatever may be the deformation presented by the adult *Adamsia*, its anatomical structure is morphologically the same as that of other Actiniæ. It more particularly approaches that of *Sagartia parastitica* (*Adamsia Rondeletii*, Carus), the foot of which likewise secretes a layer of mucus which acquires a membranous consistency. The two species are furnished with six pairs of large primary septa and six secondary, equally remarkable for their breadth; the former are provided with sexual glands throughout their whole extent, and advance much beyond the other folds towards the middle of the gastric cavity. In both the *acontia* originate at the base of the folds, immediately below the reproductive organs. Their origin thus constitutes an excellent mark to indicate the base of the column. This enables us to assert that in *Adamsia* the foot is all



Möbius, Karl August. 1885. "Freia ampulla, the flask-animalcule." *The Annals and magazine of natural history; zoology, botany, and geology* 16, 154–155.
<https://doi.org/10.1080/00222938509459861>.

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