

XIV. *Further Observations on the Anatomy of Macgillivrayia, Cheletropis, and allied genera of pelagic Gasteropoda.* By JOHN DENIS MACDONALD, R.N., Assistant-Surgeon H.M.S.V. 'Torch.' Communicated by Sir WILLIAM BURNETT, K.C.B. &c.

Received February 22,—Read March 22, 1855.

DURING a late voyage from Sydney to Moreton Bay, specimens of *Macgillivrayia*, *Cheletropis*, and a few other genera of minute pelagic Gasteropoda, apparently undescribed, were daily taken in the towing-net, and having embraced this opportunity of determining the actual mode of attachment and connexions of the ciliated arms, at first presumed to be naked branchiæ, I am anxious to append the following remarks to those which I have already made on this interesting subject.

In a former paper I mentioned, more particularly with reference to *Cheletropis Huxleyi*, that the gills were of two kinds, *i. e.* "covered and naked;" the former, corresponding to that of the pectinibranchiate Gasteropoda generally, I have never found absent in any of the genera; but from careful observation of the so-called naked gills of these minute animals, while yet alive in their native element, I am disposed to believe that they are chiefly employed as organs of prehension, and may also assist in natation. When these ciliated appendages are fully extended, the line of cilia is perfectly straight and uninterrupted, so that the frilled border, noticed in the previous account, is a character simply depending on the partial contraction of the longitudinal muscular fibres, a preparatory step to complete retraction of the organs. They have no connexion whatever with the mantle, but encircle the mouth, including the tentacula and eyes, communicating with each other at the base like the segments of a deeply-cleft calyx. In the accompanying figure of *Macgillivrayia*, which has been closely copied from nature, the whole scheme of arrangement is sufficiently well seen. In the specimens of this genus examined, the arms were quite transparent and marked at irregular intervals with transverse streaks of a brownish purple colour.

In the extended form they were several times the length of the shell, and like the arms of a polype, when touched, they rolled themselves up, and started back into the shell with surprising rapidity. They were also exquisitely sensitive, exhibiting short twitching movements when minute atoms suspended in the water came in contact with them.

It will be observed by reference to the figure, that the respiratory siphon is represented as a simple process of the mantle converted into a tube by the apposition of its lateral borders without organic union, which I must confess is at variance with my former views; moreover this process appeared to be much shorter than I had

found it in other examples, of which those at present under consideration may be a variety, if not specifically distinct.

Before the paper already alluded to was written, although I had examined a considerable number of species, I never found more than four arms encircling the head, but I have since discovered six in a single genus with which I had been long familiar by external characters (Plate XVI. fig. 18, representing a member of this genus, shows the arrangement of its ciliated arms, &c.). The operculigerous lobe of the foot is quite cylindrical and of some length, bearing the peculiar operculum on its truncated extremity, the clawed process pointing to the left side. The sucker-disc is very small, presenting an anterior and posterior lobe, such as exist in *Atlanta*, in which they differ only in being lateral.

The two tentacula bear each an ocellus on the outer side near the base, and the ciliated arms, in every respect save number, resemble those of *Macgillivrayia* and its congeners. The clawed operculum is developed from a spiral nucleus situate near the internal or thickened border; it seems to be a weapon of defence, which is wielded with great dexterity by the little animal, which makes skips and jerks by means of its complex foot, after the manner of *Nassa* or *Strombus*.

It may be well to notice here briefly another interesting member of this diminutive tribe of Gasteropoda, very commonly met with in the South Pacific, and having an almost indefinite range. It resembles a miniature *Natica* in many points, including both animal and shell. The shell is few-whorled, with small compressed spine and ventricose mouth; the operculum paucispiral and well-marked with the lines of growth. The foot of the little creature is not unlike a broad and square-toed shoe, receiving or bearing the remainder of the animal and the shell. The shoe-upper, as it were, presents two rounded lateral lobes which lie over the anterior part of the shell, like the mentum of *Natica*.

The little animal creeps on its foot with great rapidity, appearing rather to slide along than progress by a vermicular movement, and by spreading out and hollowing this organ at the surface of the water, by the same instinct which prompts the fresh-water Lymnæad to form a ready boat of its foot, this shell-protected speck buoys up its tiny body, cast abroad, though not lost, in the ocean's immensity.

EXPLANATION OF FIGURES IN PLATE XVI.

- Fig. 16. Front view of *Macgillivrayia pelagica*, with its ciliated arms (*a*) extended and encircling the mouth and tentacula (*b*). *c*. Open canal of respiratory siphon. *d*. The foot.
- Fig. 17. Lateral view of ditto. *a*. Ciliated appendages. *b*. Portion of left tentaculum. *c*. Siphon. *d*. The foot. *e*. Operculum.
- Fig. 18. Enlarged figure of a minute pelagic Gasteropod, presenting six ciliated arms (*a*), similar to those of *Macgillivrayia*. *b*. Tentacula, bearing each an ocellus on the outer side near the base. *c*. Rudimentary creeping disc. *d*. Operculigerous lobe. *e*. Operculum.
- Fig. 19. Two transverse rows of the lingual teeth of this little animal.
- Fig. 20. Front view of shell of ditto.
- Fig. 21. Back view of same.
- Fig. 22. The operculum, with its clawed process (internal surface).
- Fig. 23. Front view of the closed shell of another minute species.
- Fig. 24. Back view of ditto; the retracted arms, the ocelli, and the anterior lobes of the foot, appearing through the transparent wall of the shell*.

* Figures of the above genera were given in the illustrations of the former paper.

Figures.

Figures

