

Sense-Organs in *Malacobdella*

WHILE examining living specimens of *Malacobdella grossa*, Müll., under a binocular dissecting microscope (the specimen being extended under a glass slide in sea-water in the usual manner), I noticed a pair of minute structures on the head, which, so far as I can trace, do not correspond to anything previously described in this species. Fig. 1, drawn from a living specimen, shows these organs anterior to the cerebral ganglia, which send a small nerve in their direction. They have the appearance of small pits on the dorsal surface, suggestive of sense-organs. They are un-pigmented.

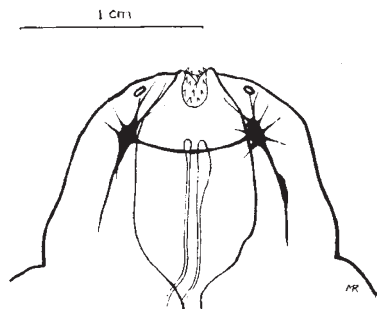


FIG. 1. Head of *Malacobdella grossa*, drawn from life.

I have examined serial sections of a specimen in which these 'organs' were seen during life, but so far have failed to find them; they have, however, been observed on several living specimens. They are more conspicuous in large specimens. If they are sense-organs, the fact is of some interest, since, except for the neuro-epithelial cells, *Malacobdella* has been supposed to be entirely devoid of these^{1,2}. A cephalic slit is present in most Nemerteans in a variety of forms; and a reduced cephalic slit might well present the appearance shown. In some Nemerteans the cephalic slits are mere superficial depressions; and if, as a result of the semi-parasitic habit, these became reduced in *Malacobdella* to a vestige, they might be difficult to trace in preserved specimens, though visible during life.

The specimens were obtained in *Pholas* from the collecting ground known as 'Black Rocks', on the Anglesey shore at the eastern end of the Menai Straits. I can confirm the remarks of Gering³ that the dimensions of *M. grossa* usually given are an understatement. Living specimens measuring 45 mm. long in a state of moderate extension have been obtained here, whereas the largest Kiel specimen observed by Riepen was 22 mm. in length, and the largest Iceland specimen 30 mm. Blanchard⁴ records a maximum length of 40 mm. The frequency here is also high, practically 100 per cent of specimens of *Pholas* being infected, as compared with less than 60 per cent infection recorded by Riepen for the host *Cyprina* at Kiel.

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¹ Riepen, *Z. Wiss. Zool.*, 143; 1933.

² Burger, "Fauna und Flora des Golfes von Neapel", No. 22 1895.

³ Gering, *Z. Wiss. Zool.*, 97; 1911.

⁴ Blanchard, *Ann. Sci. Natur.* (Series 3), Paris; 1845.

Discriminative Ability of a Parasitoid

It has recently been demonstrated¹ that *Trichogramma evanescens* and certain other parasitoids are able to distinguish between healthy hosts and those already parasitised. Hearing cannot enter; sight and touch have been ruled out; and it appears that the sense used is that of smell.

The discriminative ability is much finer than was supposed, as shown by the following experiment. A *Trichogramma* female was allowed to walk upon and to examine a number of host eggs, but not to parasitise them. The parasite was then removed and an equal number of clean hosts placed alternately among the others. A second parasite now introduced avoided the hosts that had been visited by the first, as though they had already been parasitised. The experiment has been performed several times, and there can be no doubt that *Trichogramma* females are able to distinguish clean hosts from those that have previously been merely walked upon by another female of their species, and that they avoid attacking the latter. They seem also to be able to distinguish hosts on which they themselves have walked from those which have been visited by another individual.

One of us (J. L.) is now working on the application of this result to the spatial distribution of *Trichogramma*; and has evidence that the parasites are aware when they are moving over a surface previously walked upon by another parasite.

This result renders intelligible a previous observation¹ on *Collyria calcitrator* and *Ibalia leucospoides*. Both of these parasitoids attack hosts which are buried in plant tissues and are therefore not available for examination. Yet they tend to avoid super-parasitism. Possibly in these cases, too, the parasites are able to detect, on the surface of the wheat or of the wood, chemical traces indicating that another of their species has been there before them.

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¹ Salt, G., *Proc. Roy. Soc.*, B, 114, 455; 1934.

Apus cancriformis in Great Britain

Apus cancriformis has been so rarely recorded in Great Britain that it is of interest to report its occurrence in 1934. Some dried mud was collected from a pond in the New Forest district for the purpose of rearing *Chirocephalus diaphanus*, which was known to occur there. Distilled water was added to the mud on August 9, 1934, and larvæ were first noticed on August 12. These larvæ proved, on examination, to be those of *Apus cancriformis*, and not of the expected *Chirocephalus*. Development proceeded, but many died. One individual measuring about 6 mm. across the carapace and 12 mm. from the anterior margin of the head to the base of the caudal furca was preserved on September 29. Another was exhibited alive at the Linnean Society's reception in October last.

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