Hemiurus communis in Acartia.

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In tow-nettings from Plymouth Sound, June 20th, 1935, *Acartia clausi* were abundant and inside these copepods, emerging from them and free in the water were very large numbers of larval trematodes, easily identified as *Hemiurus communis*. This is not a new record, for this parasite has already been described from the same Copepod in Plymouth waters in May and February (Lebour, 1923), but it has always been rare. In no case have more than two parasitised specimens been seen from these regions, and no seasonal appearance has been noticed. Much has been written about these trematodes which grow in the bodies of copepods until they are of such a large size that they inevitably kill the host and just before it dies emerge from between the joints, if not eaten before this with the copepod, but I think this is the first time that they have been recorded in any quantity at one time. Since my first communication Steuer (1928) has written about the geographical distribution of these hemiurids parasitising copepods and is of the opinion that all those in Northern seas belong to *Hemiurus lühei* and *H. communis*. In the Mediterranean the hemiurids known have not yet been found in copepods but usually in Sagitta, or are found living freely in the sea and these probably belong to *H. rugosus* which lives in the adult state in the pilchard.

Dollfus (1923) summarises the records of trematodes found in copepods, including my own from *Acartia clausi* and agrees with the identification. He discusses the life-cycle of this trematode and of the two hypotheses put forward by workers, that the miracidium emerging from the egg penetrates directly into the copepod, or that another host is required, inclines to the second. He believes that the miracidium enters some mollusc, the cercaria resulting from the redia or sporocyst then penetrating the copepod which in this case would be the intermediate host. In support of this theory he suggests that a curious cercaria, named by him *Cercaria calliostomæ* and found frequently in rediæ in the marine gastropod *Calliostoma conuloides*, belongs to a species of *Hemiurus*. This has a very peculiar form, having a cyst at the hind end of its body and a long tail. This cercaria belongs to the group of *Cercaria cystophora* Way, living both

in fresh and salt water and occurring both in fresh-water and marine gastropods, tectibranchs, pteropods and pectinibranchs. *Cercaria cystophora* is the larva of a *Halipegus*, a genus belonging to the superfamily Hemiurida. There is certainly something in this suggestion.

The occurrence of these worms in quantity as recorded above suggests the emergence of a swarm, or swarms, of cercariæ which might well have come from some bottom mollusc in the Sound, which have risen to the surface waters on emergence from this host and have entered into the numerous Acartias swimming there. In the copepods they would grow, feeding on their body fluid until of so large a size that it was impossible to grow any more inside the host and it would then be time to emerge. Many of these trematodes had the intestine full of a bright pink fluid, probably a result of feeding.

One curious thing seen in the plankton sample was a larva (trocophore) of the worm Polygordius to the outside of which were attached two of these trematodes. These were firmly fixed by their oral suckers, and when kept overnight were still alive and had not let go their hold.

Hemiurus communis is one of the commonest fish trematodes, occurring in many species but especially in gadoids, the young of which feed almost exclusively on copepods. In working on the food of young fishes I found *Acartia clausi* in post-larval *Gadus merlangus* (the whiting) besides several other species. It is probable that very young fishes eat the copepods and quite small specimens are found parasitised by trematodes. In examining six small whiting (25 to 40 mm. long), three were found to contain trematodes. These were *Derogenes varicus*, a form not distantly related to Hemiurus.

It is probable that many trematode parasites enter their hosts when the latter are very young.

LITERATURE.

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