

HIBERNATION IN THE COPEPOD *HALICYCLOPS MAGNICEPS*
(LILLJEBORG, 1853)

BY

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Halicyclops magniceps (Lilljeborg, 1853) is an inhabitant of brackish waters along the European Atlantic coasts from Germany south, and of Algeria (Dussart, 1969). During five years of investigation of a shallow brackish water pool in northern Belgium, we found the species to be the only quantitatively important cyclopoid copepod. It shows a clear yearly cycle, with one prominent peak in summer (Heip, 1973). It appears at the end of April or the beginning of May, and disappears again in October or November. Because a previous investigation, carried out in summer, had shown that copepods do not occur below a depth of 3-4 cm in the sediment, samples were limited to the first five centimeters of the sediment and included a water column of about 10 cm above it.

During the investigation of the vertical distribution of nematodes, which are known to occur at much greater depths, we found *H. magniceps* at a depth of 10 cm in the sediment in three out of five samples taken in December 1973. The animals were all adult females and were apparently in good condition, showing no signs of encystment, a phenomenon which occurs in the copepodite stage of certain freshwater copepods (Dussart, 1967). All three above mentioned samples contained besides the copepod the polychaete *Nereis diversicolor* O. F. Müller, the two other samples contained neither species. As it is known that copepods do not normally occur in the anaerobic layers of the sediment, as the specimens were adults and clearly not encysted, and as the only samples containing the copepods contained the polychaete as well, it seems reasonable to assume that the adult females of *Halicyclops magniceps* hibernate in the burrows of the polychaete *Nereis diversicolor*. These burrows are oxygenated and allow the copepod to occur at much greater depths than would otherwise be expected. No other species of copepod occurred together with *H. magniceps*, which itself was restricted to these deep layers and did not occur in the top layers, where harpacticoid copepods were abundant. It is interesting to note that several other species within the genus *Halicyclops* are known to be permanent inhabitants of the burrows of *Nereis diversicolor*; this is the case for *H. rotundipes* Kiefer, 1935 and *H. incognitus* Herbst, 1962. Both species have been found together on the body surface of *N. diversicolor* in Roscoff (Herbst, 1962) and *H. incognitus* was present in the burrows of the polychaete wherever looked for along the North Norfolk coast (Hamond, 1973). The behaviour of *H. magniceps*, free living as an epibenthic species from spring till autumn, shows how a permanent commensalism could have arisen within this genus. Indeed, *H. incognitus* is closely related to *H. magni-*

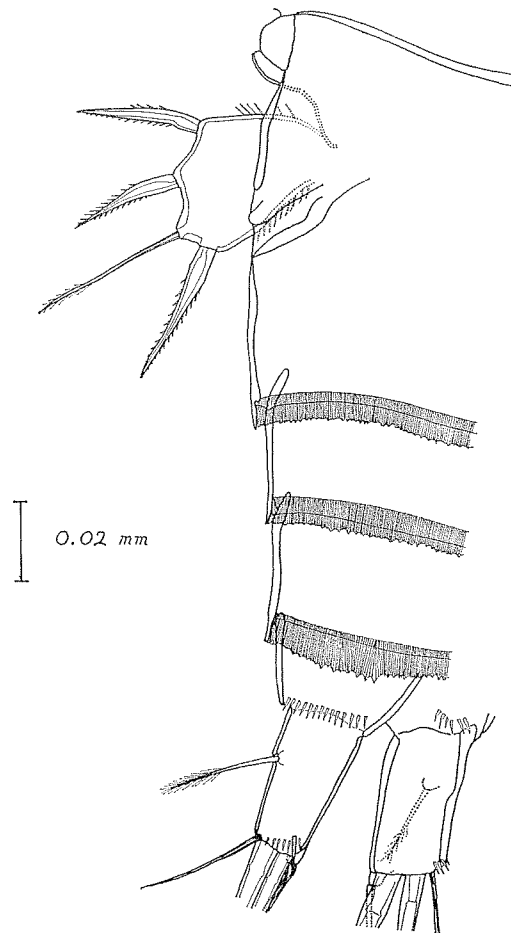


Fig. 1. *Halicyclops magniceps* (Lilljeborg, 1853), urosome.

ceps, the only character which separates females of these species being the presence of a hyaline membrane on the distal dorsal edge of all abdominal segments (see fig. 1) in *H. magniceps*, whereas this membrane is absent on the first and second abdominal segment of the females of *H. incognitus*. Although the spines of the P5 are somewhat larger in our specimens than is shown by Kiefer (1936), these same long spines are present in the specimens described by Gurney (1933) as *H. aequoreus*, which, according to Kiefer (1936) belong to *H. magniceps*.

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