

SEASONAL DYNAMICS OF CARP INFESTATION BY *TRICHODINA NOBILIS* CHEN. 1963 (PERITRICHA, CILIATA) IN TWO FISH-PONDS IN BANAT

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Abstract. Comparison of the fish-pond carp infestation by *Trichodina nobilis* revealed significant seasonal differences in two fish-ponds from Banat. These differences originated from the bimodal seasonal dynamics of *Trichodina*, since the highest values of infestation were observed in Spring and Autumn.

Key words: parasite, bimodal dynamics.

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Introduction

The study of parasitic ciliates of the freshwater fish, and especially those of the fish-pond carp, has not yet been carried out in details in Yugoslavia. Results of similar investigations have been reported from Bulgaria (Golemansky and Grupcheva 1975, Grupcheva and Golemansky 1986), Czech Republic and Slovakia (Ergens and Lom 1970, Lom 1970, Lom and Dykova 1984, 1989), states of the former USSR (Stein 1982, Allamuratov 1986, Majorov and Goncharov 1987, Naumova 1987), Great Britain (McCallum 1982), Germany (Werner 1982, Walter 1988), South Africa (Basson and Van As 1989) and Canada (Poulin 1991). These investigations are of great theoretical and practical importance as Ciliate parasites are the commonest parasites of the fish reared in our country.

Material and methods

Material was collected from the Ečka and Uzdin fish-ponds during the March-October period in 1993. The Ečka fish-pond is situated at the alluvial plain between River Tisza and River Begej, while the Uzdin fish-pond lies along River Tamiš. A total of 346 carps of first year was used for the analysis, 166 of which were mirror carps and 180 scaled cars. From the living samples squash slides were taken and

observed under light microscope (600×) after standard silver impregnation. Difference of infestation was examined by Kruskal-Wallis H test (Sokal and Rohlf 1981).

Results and discussion

The species *Trichodina nobilis* can be observed in the Ečka fish-pond during nearly the whole year (Fig. 1). The largest infestation was observed in Spring (March 36.67%, April 46.15%), and its degree decreased during the year. In May, August

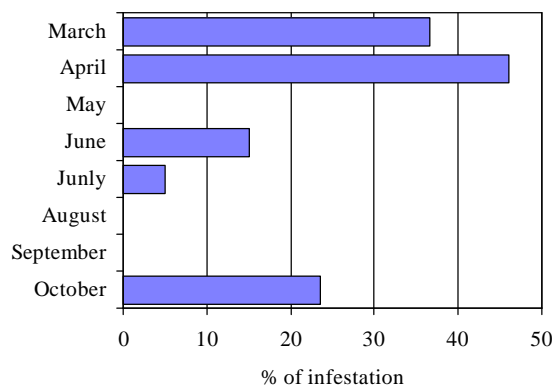


Fig. 1. Seasonal dynamics of infestation rate in the Ečka fish-pond.

and September the parasite was absent, but it appeared again in October (23.81%) when the water temperature was lower.

In the Uzdin fish-pond *Trichodina nobilis* occurred in March at a rate of 14.81%, in April the degree of infestation increased to 25.00%. Similarly to Ečka fish-pond, this parasite was not observed in May. It was present again in July (24.14%). The percentage of infestation fell to 4.17% in August. The species was absent in September, while it performed an abundant appearance (36.36%) in October. Later value was the greatest in this fish-pond (Fig. 2).

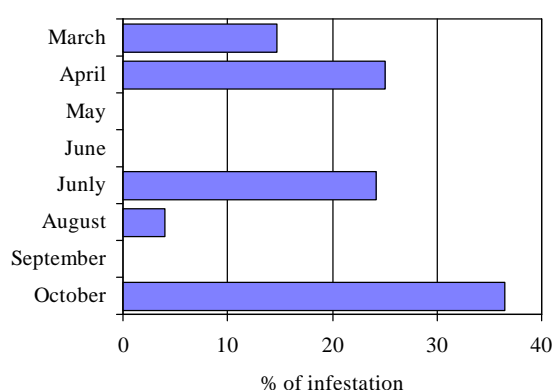


Fig. 2. Seasonal dynamics of infestation rate in the Uzdin fish-pond.

Trichodina nobilis (Fig. 3) occurred in 20% of carp specimens of our fish-ponds during the whole year. It was introduced with grasscarp (*Ctenopharyngodon idella*) from China and the basin of River Amur (Stein 1968). It is obvious that the grasscarp and bighead (*Hypophthalmichthys molitrix*) are not specific hosts for this species (Golemansky and Grupcheva 1975), since *Trichodina nobilis* parasitizes many freshwater fish (Byhovskaya-Pavlovskaya 1964). The total annual infestation of grasscarp and bighead by this species reaches as much as 50% (Golemansky and Grupcheva 1975). This species occurred relatively rarely in our warm fish-ponds where the carp is mainly reared in comparison to Eurasian fish-ponds where mainly herbivore species are reared (Allamuratov 1986). The study of seasonal dynamics of *Trichodina nobilis* showed two maximum values of infestation in Spring and Autumn which points to the fact that this species favours moderate water temperature (7.2-14.8 °C). The explanation of bimodal pattern of seasonal distribution is not yet given, although it is supposed that bimodality occurs due to the better conditions for the fish-pond carp at

higher water temperatures (Halmetoja et al. 1992), i.e. due to the stronger immunological response (Aaltonen et al. 1994). The predominance of fish immunological condition over the role of moderate water temperature for infestation by *Trichodina nobilis* could be supposed from the fact that remarkable percentage of infestation occurred also at the warmest months (Figs 2 and 3), when the habitat conditions were less favourable for fish, too.

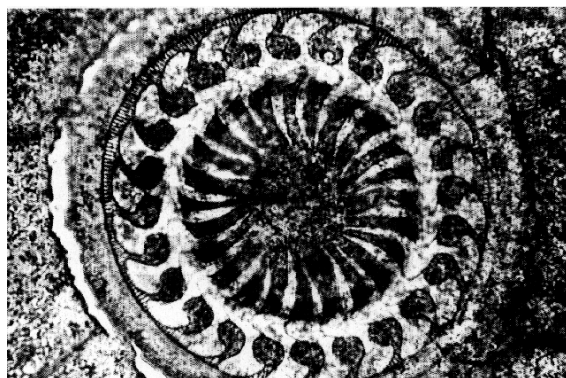


Fig. 3. Oral disk, i.e. the sticking ring of *Trichodina nobilis*, with „cylindrical climbing hooks”.

The comparison of infestation rate by *Trichodina nobilis* in the Ečka and Uzdin fish ponds was made between successive months by Kruskal-Wallis H test. This species occurred during the year in different densities, so the values of Kruskal-Wallis test showed very significant differences between successive months in Ečka fish-pond ($H=38.10$; $df=7$; $p<0.001$), but its oscillation was somewhat smaller in the Uzdin fish-pond and also the significant differences decreased ($H=21.00$; $df=6$; $p<0.05$). In addition, *Trichodina nobilis* showed no preference for either mirror or scaled carp during the year (Nikolić et al. 1996).

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