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In: **"Ekologiya parasitov presnovodnykh ryb,"**

Author(s) **BAUER O.N. (1959)**

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Chilodonella cyprini (Moroff, 1902)

Like ichthyophthirius, chilodon is characterized by a very weakly-marked specificity. It can be identified on all freshwater fishes, including sturgeon. However, in the latter chilodon is found only on the young (Dubinin, 1952). In the normal commercial water-bodies the parasite is encountered rarely and in single cases. Only with congestion of fish, especially with artificial rearing, do conditions arise contributing to a sharp increase in its numbers. At this intensity, the infection can be so significant that it covers the fish with a continuous layer.

The distribution of chilodon is extremely wide. They range over all the Holarctic. According to the data of Chen Chi-Liu (1955), the parasite has been identified in the pond farms of China, i.e. its area ranges over the Sino-Indian region. It has practical importance only in artificial rearing and aquarium maintenance of fishes.

In the literature are described numerous cases of the death of young trout (Schaperclaus, 1935), fingerling carp (Markevich, 1933; Krasheninnikov, 1939; Golovkov & Abrosov, 1952) and other fishes, reared in ponds, brought about by massive infection with chilodon.

Chilodon parasitizes the body, gills and fins of fishes. The infusoria produce irritation of the integument and strengthened mucous secretion. In connection with this, with a massive infection the surface of the fish is covered with a bluish deposit of mucus. The parasite is fed by protruding the pharynx, furnished with a rod-bearing apparatus, and drawing off with its help the contents of individual cells of the host. Reproduction is accomplished by transverse fission. Sexual processes have not been definitely ascertained, although there are superficial references to the presence of conjugation (Kiernik, 1909; Krasheninnikov, 1939). For a long time the question of the capability for cyst-formation by chilodon remained obscure. A series of authors (Kiernik, 1909; Schaperclaus, 1935) assumed this capability, but sufficiently precise observations on this question were lacking. By us (Bauer & Nikol'skaya, 1957) and also by I.I. Bespalyi (1957), the existence

of cyst-formation in C. cyprini was confirmed. It was established that in the presence of adverse conditions, chiefly during separation from the host, large specimens of chilodon were able to form resting cysts; the latter are able to survive for a prolonged period on the bed of a pond and in open water (fig. 2). After the penetration of cysts into the gill chamber of the fish the membrane of it dissolves and the infusoria change over to a parasitic form of life. Thus, the life cycle of C. cyprini is made up of a parasitic phase, during which asexual reproduction takes place, and possibly also conjugation, and a resting phase, providing survival for the parasite.

Knowledge of the ecology of chilodon is fairly sparse. It was established that the duration of the active state of the parasite external to the fish depends on the temperature. At a low temperature (3 - 5°) individual examples maintain activity up to 24 hours and more. At 20° and above the basic mass of parasites dies within an hour. Its most active division takes place at 5 - 10°. At 20° division practically ceases.

Sunlight also appears to be a factor limiting numbers of childon on fish. Many experiments showed that with irradiation of the aquarium the infectiousness to fish of chilodon was gradually eliminated (Bauer & Nikol'skaya, 1957).

A decisive influence on the numbers of chilodon is the physiological state, and, primarily, the fatness [condition] of the fish. The first to pay attention to this was V. Schaperclaus (1935). He established that especially strongly infected were trout fry which for some kind of reason had not taken food and were distinguished by low fatness. Starvation of the fish more quickly only affects the tissues most distant from the gut, for example the skin. As a result, dying-off of the cells of the skin epithelium ensues. Such dying tissue also appears the most favourable substratum for multiplication of the parasite. Schaperclaus characterizes chilodoniasis as an illness associated with dystrophy.

A.S. Chechina (1952) supported this conclusion extremely convincingly. She established that with more fattened fingerling carp during only the period of wintering there were significantly less parasites than with the less fattened. At the end of wintering on the latter there were 5 times more infusoria than on the well fattened.

We also arrived at much the same conclusions (Strelkov & Bauer, 1957), investigating the infectiousness of chilodon to sea trout fry raised in floating nurseries of the fish-rearing station of Keila-Ioa. On the small fry with a mean weight of 116 mg were found on the average 113 infusoria, and on the large,

weighing 273 mg, only 15 parasites.

The struggle against cholodoniasis in carp wintering ponds must go mainly by means of raising big well-fattened fingerling carp and maintaining their fatness during the winter period. Fingerlings must feed up in the autumn after their placing in the wintering ponds, and also in the spring after the melting of the ice (Shcherbina & Il'in, 1950). In the wintering ponds with comparatively high temperature (4 - 5°), supplementary feeding of fingerlings during the whole winter is recommended. For assurance of feeding of the fingerlings in the wintering ponds, it is possible to produce in them natural food by the method of zonal fertilization (Isakova-Keo, 1952).

Considering the greater increase of winter-hardiness, and a lesser degree of infection by chilodon, of the eastern carp and its hybrids with carp, it is recommended in the northern zone of carp-breeding, and also with cold wintering ponds in the farms of other zones, to breed hybrid forms.

Of great importance in the struggle with chilodoniasis is the passage of fish-planting material through prophylactic baths. The most inexpensive appear to be baths of 5% solution of cooking salt for 5 minutes, recommended by A.K. Shcherbina (1939). Such baths completely kill the infusoria and are easily endured by fingerling and yearling carp.

Considering that the parasite can be recorded in wintering ponds from the source of water supply, experiments were set up on the purification of water from the cysts and vegetative stages of the parasite with the help of sand filters. It was clear that a layer of sand 10-15 cm thick completely restrained it.

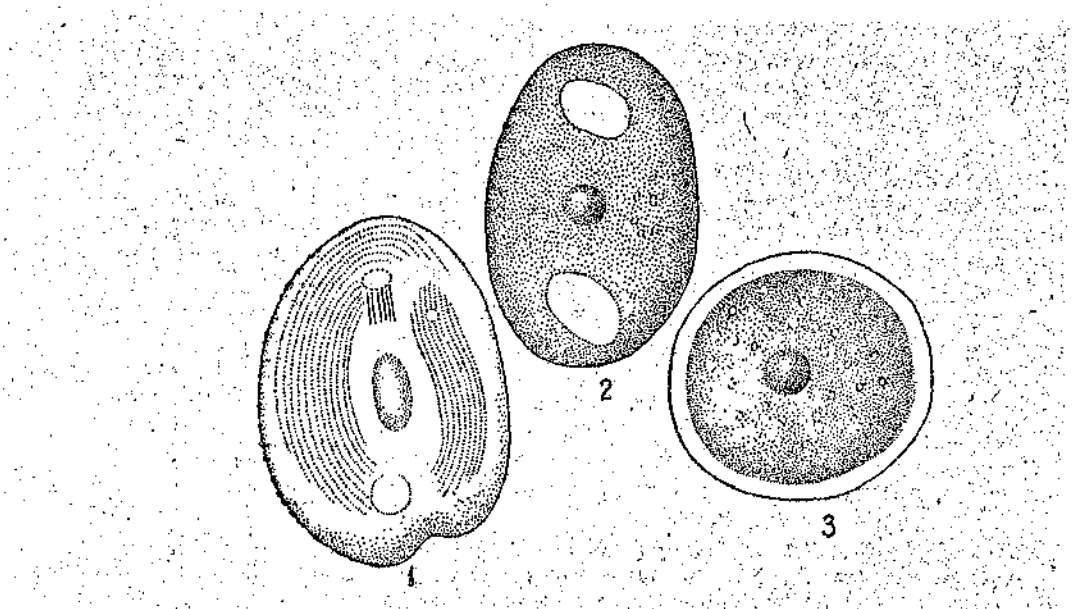

Рис. 2. Chilodonella cyprini
1 — вегетативная фаза (вид снизу); 2 — паразит в стадии инцистирования; 3 — циста. (По Бауеру и Никольской)
1 - vegetative phase (see below); 2 - parasite in the encysting stage; 3 - cyst (acc. to Bauer & Nikol'skaya)

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Notice

Please note that these translations were produced to assist the scientific staff of the FBA (Freshwater Biological Association) in their research. These translations were done by scientific staff with relevant language skills and not by professional translators.