RECORD OF DERMOCYSTIDII BRANCHIALE LEGER, 1914 IN SALMO TRUTTA M. FARIO IN SOUTH BOHEMIA

Dermocystidium branchiale Leger, 1914, which was only supposed to occur in our country (Ergens R., Lom J., Cumulative agents of parasitic diseases of fish, Academia, Praha, 284 pp., 1979, in Czech), was found on gills of Salmo trutta m. fario during studies on parasitic protozoans in fish in South Bohemia.

The systematic position of the genus Dermocystidium is not quite clear. It was previously placed into Hiplocystidae, but at the present time, it is regarded as a fungal organism with an unclear development. The infection with Dermocystidium in fish is manifested by the formation of cysts on gills or skin. Of the species forming cysts on fish gills, D. vejdoskij Jireček, 1939 (Arch. Protistenk., 92: 137–146, 1939) was recorded in pike and D. egregii Červinka et Lom, 1974 (J. Fish Biol. 6: 886–890, 1974) in carp. D. peronii Reichenbach–Klinke, 1949 (Ergens R., Lom J., 1979, which belongs to the skin species, was found on perch.

Some of Dermocystidium species are known to produce a pathogenic effect on their hosts. For example, Hoshina and Sahara (Bull. Japan. Soc. Sci. Fish. 13: 825–829, 1950) observed a marked erosion of the host organism (Cypinurus carpio) and decreased vitality after infection with the skin species D. bei Červinka et al. (J. Fish Biol. 6: 686–696, 1974) reported a mass death of carp fry in some pond systems in South Bohemia, which was caused by D. egregii infection on gills. The unfavourable effect of Dermocystidium species on young fish in breeding farms was described by Győri et al. (Tierztsl. Praxis. 7: 97–105, 1979) and the causative agent was identified as D. branchiale, originally described from Salmo trutta m. fario. Other authors suppose that a species specificity exists in Dermocystidium. For example, Elkan (Nature 164 (4583): 936–940, 1946) as well as Reichenbach–Klinke (Verh. Deutsch. Zool. Mainz, Leipzig, 126–132, 1949) state that in the locality where several fish species live together, only one of them is usually infected by a Dermocystidium species.

Dermocystidium forming cysts on the gills of S. trutta m. fario was described from Northern Ireland by Leger (C. r. Acad. Sci. Paris 188: 897, 1914), who named it Dermocystidium truttae. In the territory of our country, this species was found for the first time on gills of trout from Borovnice brook in South Bohemia in spring 1989. The cysts are white, spherical, measuring 0.5–0.6 mm in diameter. The wall of young cysts is homogeneous and about 0.5 µm thick, whereas in older, mature cysts, it is not very solid and easily ruptures. The inner space of the cyst is not divided by septa at any stage of development, in contrast to, e.g., D. vejdoskij and D. egregii. The cysts are localized in hyprophilous gill epithelium in any part of the gill lamellae. Mature cysts contain a large number of typical spherical spores with mineralized large, refractive inclusion body situated in the centre and pressing the plasma with nucleus towards the periphery of the cell. The size of the bodies is 5–9 µm (Fig. 1). The morphological and characters of the spore masses found by us correspond to the data published by Leger (1914) in the original description of D. branchiale.

Among the examined trout, only 2–3-year-old specimens were found to be infected with Dermocystidium. Mature cysts were encountered only from late April to late June almost in 70% of them, at the intensity of infection 1–5 cysts per fish. No D. branchiale cysts were found on gills of trout examined in other seasons. Only in histological sections through the gills of gills of trout caught at the beginning of March, there occurred early developmental stages of cysts which could not be found in native preparations. Consequently, it may be assumed that the cysts of this parasite occur only at the end of the spring season, when the temperature starts to increase. We tried to verify this relation under laboratory conditions. Trout at the age of 2–3 years, caught in early March, were placed into a plastic tank. The water (100 x 50 x 60 cm) temperature in the tank was the same as in the locality at the time when the fishes were caught (10°C). During first four days the temperature was gradually increased up to 18°C and maintained at this level till the end of the experiment. The first formed cysts appeared in the first half of April, i.e. by 2–3 weeks earlier than in nature, where the water temperature was lower. This indicates that the occurrence of this parasite may be related with regular periodical changes in the temperature of the environment and is limited to a relatively short time. A similar limited occurrence of Dermocystidium was described in other hosts by Elkan (1962) in case of D. petersoi, by Kulakovsky and Straschnik (Sh. Kaban, selsohot, inst., Krasnodar 2: 99–101, 1989) and Garkavi and Danisova (Sh. Kuban, selsohot, inst., Krasnodar 1: 130–146, 1980) in D. kokoskii, and Červinka et al. (1974) in D. egregii. Also other species of Dermocystidium seem to occur only in young fishes, as it was reported by Jireček (1939), in D. vejdoskij, Scheer (Zool. Anz. 7: 192–193, 1952) in D. peronii, and Spanenberg (Z. Binnenfischerei DDR 22: 363–367, 1975) in D. eggeri. As it follows from the literature, the intensity of infection seems to be related with the environment from which the fishes originate. If they are caught in free flows, with a low concentration of potential hosts, as it was the case in trout examined by us, the intensity of infection is usually low (Leger 1914, Scheer D., Z. Fischerei und Hilfswissenschaft. H. 1–7: 125–152, 1967). If the fishes come from the locality where the number of hosts is higher, or even if they are kept in water reservoirs in limited areas, the intensity of infection is usually high. Reichenbach–Klinke (1949) state that the narrower the space in which the fishes live, the stronger is the infection with Dermocystidium.

If a strict host specificity of D. branchiale is demonstrated, then this parasite will represent a special harm for the fish breeding in our country. However, if it is able to infect other salmonid species, it may become an unfavourable agent in intensive cage breeding of rainbow trout.

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