

OCCURRENCE OF MYXOBOLUS PAVLOVSKII — THE PARASITE OF HYPOPHTHALMICHTHYS MOLITRIX AND ARISTICHTHYS NOBILIS IN THE FISH PONDS IN CZECHOSLOVAKIA

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Abstract

Lucký Z.: Occurrence of *Myxobolus pavlovskii* — the Parasite of *Hypophthalmichthys molitrix* and *Aristichthys nobilis* in the Fish Ponds in Czechoslovakia. Acta vet. Brno, 47, 1978: 203–207.

At parasitological examination of the fish reared in the ponds (locality Pohořelice—Velký Dvůr, in the river basin of the river Jihlava) very often and repeatedly the cysts of *Myxobolus pavlovskii* on the gills of the species *Hypophthalmichthys molitrix* and *Aristichthys nobilis* were observed. Small, elongated egg-like cysts up to 1 mm in size were localized in the multilayer epithelium of the fish gills and the spores of the parasite with polar capsules of unequal size and with a large intercapsular projection reached 0.009 to 0.012 mm.

In the fish up to one year of age no parasites were found but in the two-year-old ones the number of cysts attached to the gills (examined 50 % of the gills) reached an intensity of up to 70 % and extensity of 80 %. In the 4-year-old fish the maximum number of the cysts was 237 (examined 25 % of the gills in each fish). The extensity was 100 %.

This parasite is new in the mentioned locality for rearing herbivorous fish and was probably brought with fish imported from Hungary.

Age of fish, gills, cysts, silver carp, bighead carp.

Parasitological examination of the fish reared in the ponds of the locality Pohořelice—Velký Dvůr revealed repeatedly the cysts of *Myxobolus pavlovskii* on the gills of *Hypophthalmichthys molitrix* and *Aristichthys nobilis*. Because of the favourable climatic conditions the above-mentioned locality was selected for breeding of herbivorous fish also for other fish farms, and therefore we decided to study this parasitosis in more detail.

Materials and Methods

During the years 1977 and 1978, total of 187 silver carp aged several weeks to 6 months were examined, further 20 bighead carp aged 2 months, 20 silver carp aged 2 years, 5 silver and 5 bighead carp aged 4 years which were in the group of parent fish.

The cysts of *Myxobolus pavlovskii* were obtained at the parasitological examination. After the examination of the gills the cysts were removed, compressed and the spores of the parasite were elaborated after fixation and staining with methylene blue and Giemsa stain.

Results and Discussion

Examination of 35 elaborated cysts from both silver and bighead carp showed that they contain spores of *Myxobolus pavlovskii*.

The cysts of the parasite are elongated and ellipsoidal, 0.7 to 1 mm long and

0.2—0.5 mm wide. They are localized mostly in the multilayer epithelium of the gill's respiratory folds.

The spores are oval with a thick shell and they are 0.009 to 0.012 mm long, 0.0085—0.009 mm wide and 0.007—0.008 mm thick. The polar capsules are of unequal size. The larger one is 0.004 to 0.006 mm long and 0.002—0.003 mm wide. The smaller one is 0.003—0.0047 mm long and 0.002—0.003 mm wide. The intercapsular projection is very conspicuous. The projection itself, without the thickness of the shell wall, reaches 0.0016—0.0023 mm.

Table 1
Comparative data on *Myxobolus pavlovskii*

Size in mm	Bychovskij et al. (1962)	Present material
Length of the spore	0.0085—0.010	0.009—0.012
Width of the spore	0.0091—0.010	0.0085—0.009
Thickness of the spore	0.006—0.007	0.007—0.008
Length of the larger polar body	0.005—0.006	0.004—0.006
Width of the larger polar body	0.003—0.004	0.003—0.004
Length of the smaller polar body	0.0028—0.0042	0.003—0.0047
Width of the smaller polar body	0.0025—0.003	0.002—0.003
Length of the intercapsular projection	0.0025—0.0042	0.0016—0.0023

This comparative table gives the values from literature as compared to our data.

Characteristic feature of *Myxobolus pavlovskii* is the large intercapsular projection which is larger than 0.0015 mm and widely distributed polar capsules. These signs are very conspicuous also in our material. The smaller size of the intercapsular projection found in our material results probably from different measuring, i. e. without the shell thickness.

Extensivity and intensity of invasions with *Myxobolus pavlovskii* increases with age of the fish. This fact is demonstrated clearly in Table 2.

The negative results of parasitological examination in the silver carp and bighead carp up to 1 year of age made in 207 fish can be explained by the fact that the young fish with low body mass move predominantly under the water surface and do not whirl the water from pond bottom so that they are not easily invaded with the spores from the ground.

The older fish which are usually provided with additional food take it mostly from the bottom and can thus be easily invaded with the spores.

The species *Myxobolus pavlovskii* was brought to the locality Pohořelice—Velký

Table 2
Extensivity and intensity of *Myxobolus pavlovskii* invasion

Species Age	<i>Aristichthys nobilis</i>		
	up to 1 year	up to 2 years	4 years
No. of examined fish	20	20	5
Fish size in mm minimum/mean/maximum	3/46/56	215/226/242	650/710/800
No. of examined gill in each fish	8	4	2
Total No. of cysts <i>M. Pavlovskii</i> minimum/mean/maximum	0	2/15/70	169/193/237
Extensivity of invasion	0	80 %	100 %

Dvůr probably with the imported silver and bighead carp as no specimens of the parasite had been ever detected in the carp or other fish (Lucký and Dyk 1964). No finding of the parasite in Czechoslovakia was reported in the detailed work by Ergens and Lom (1970). The herbivorous fish species have been imported into the south-Moravian region mostly from Hungary; it can be assumed that the parasites localized in the cysts on the fish gills were first transported from the water basin of the river Amur to the fish farms of the USSR (Bauer, Musse-

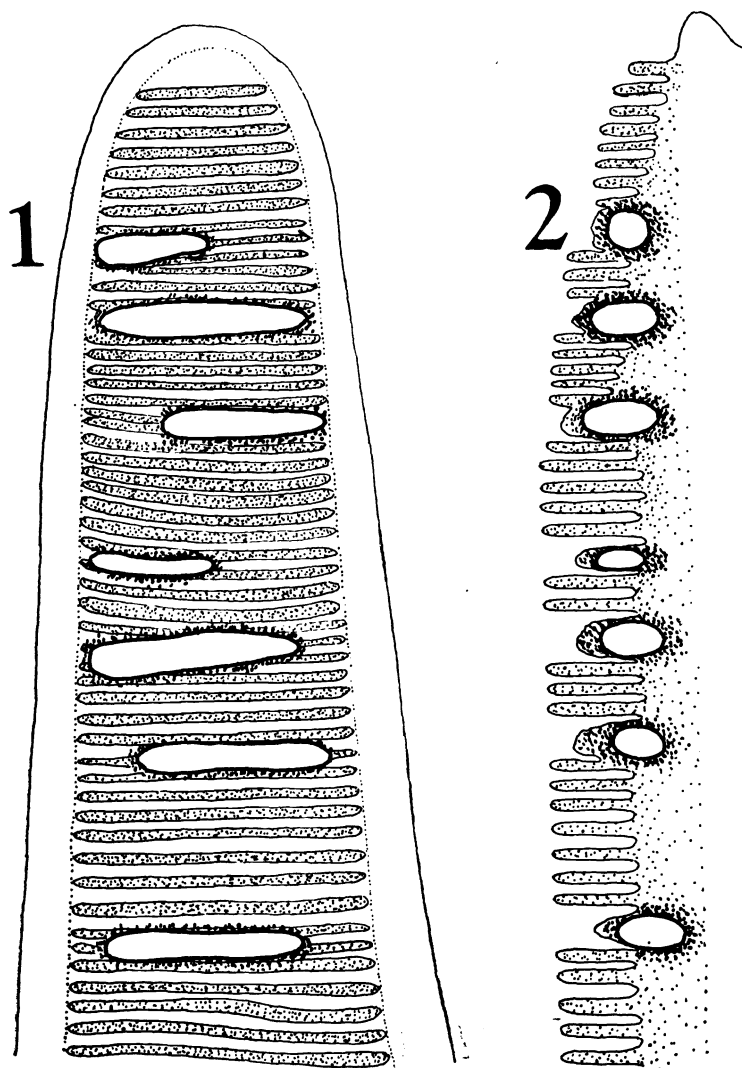


Fig. 1.

The cysts of *Myxobolus pavlovskii* on the gills:

1 — the cysts between the respiratory folds

2 — the cross-sectioned cysts

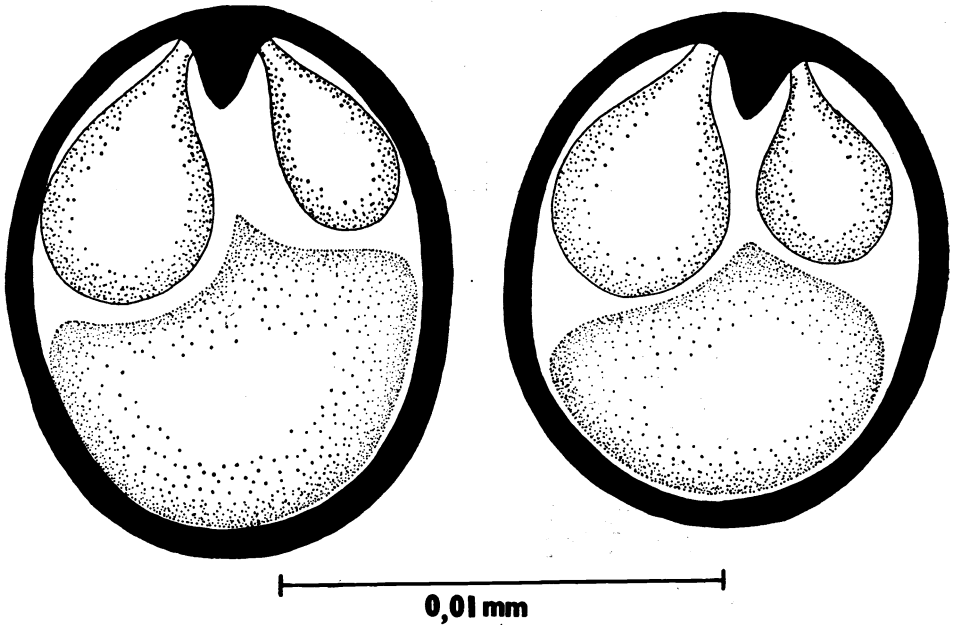


Fig. 2.
The spores of *Myxobolus pavlovskii*.

lius, Strelkov 1969) and later to other states, including Hungary and Czechoslovakia.

In the fish farms of Hungary the occurrence of the parasite is probably very frequent as Molnár and Keresztes (1975) analyzed in detail also the possibilities of its eradication. The up-to-now employed preventive measures proved non-effective.

The species *Myxobolus pavlovskii* does not belong to the dangerous parasites according to the work on pathogenicity of the individual parasites of the herbivorous fish in the USSR (Bauer, Musselius and Strelkov 1969). In our study the pathological changes in the vicinity of the parasites' cysts were not extensive. However, in massively invaded fish (i. e. mostly the parent fish) under certain circumstances (transport, artificial spawning a. o.) respiratory failure can occur. This results from the decreased surface of water-washed respiratory area of the gill folds which are covered with parasitic cysts.

Very small cysts of *Myxobolus pavlovskii* are hardly visible by naked eye and they are usually immersed between the respiratory folds so that a thorough parasitological examination is needed. Therefore the veterinary prevention should be directed to repeated laboratory examinations and follow-up of the occurrence of the *Myxobolus pavlovskii* cysts and by general hygiene measures prevent their massive occurrence.

**Myxobolus pavlovskii cizopasník žaber býložravých ryb
(Hypophthalmichthys molitrix a Aristichthys nobilis) v rybníčních
chovech ČSSR**

Při výzkumu cizopasníků býložravých ryb odchovávaných v rybnících na lokalitě Pohořelice—Velký Dvůr v povodí řeky Jihlavy jsme velmi často a opakovaně zjišťovali na žábrách ryb druhu *Hypophthalmichthys molitrix* a *Aristichthys nobilis* cysty rybomorek druhu *Myxobolus pavlovskii*. Malé, protáhle vejčité cysty velikosti do 1 mm se lokalizovaly ve vícevrstevnatém žaberním epitelu a spory cizopasníka s nestejně velkými pólovými váčky a velkým interkapsulárním výběžkem dosahovaly velikosti 0,009—0,012 mm.

V prvním roce stáří ryb nebyli cizopasníci zjištěni, v druhém roce dosáhl počet cyst na žábrách (při vyšetření 50 % žaber) intenzity až 70 a extensita byla 80 %, u čtyřletých ryb dosáhl maximální počet cyst na žábrách (při vyšetření 25 % žaber) 237. Extensita dosáhla 100 %.

Druh cizopasníka je pro sledovanou oblast, která je střediskem pro odchov býložravých ryb, nový a byl do povodí zavlečen importy býložravých ryb pravděpodobně z MLR.

**Myxobolus pavlovskii жаберный паразит растительноядных рыб
(Hypophthalmichthys molitrix и Aristichthys nobilis)
в прудовом рыбоводстве ЧССР**

В ходе исследования паразитов растительноядных рыб, разводимых в прудах Погоржелице—Велкы Двур в бассейне реки Йиглава, очень часто и несколько раз были на жабрах рыб вида *Hypophthalmichthys molitrix* и *Aristichthys nobilis* выявлены цисты паразитов вида *Myxobolus pavlovskii*. Небольшие, продольноовальные, яйцевидные цисты размером до 1 мм были расположены в многослойном эпителии жабр и споры паразита с мешечками полюсного характера разной величины и с крупным межкapsульным выступом достигали размеров 0,009—0,012 мм.

На первом году жизни рыб паразиты не были установлены, в течение второго года число кист на жабрах (при обследовании 50 % жабр) достигло интенсивности до 70 % и экстенсивность достигала 80 %, максимальное количество кист на жабрах рыб в возрасте четырех лет (при обследовании 25 % жабр) достигло 237 штук. Экстенсивность достигала 100 %.

Вид паразита является для исследуемой области, являющейся центром разведения растительноядных рыб, новым видом и в бассейне появился благодаря импорту растительноядных рыб вероятно из БНР.

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