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# BRAIN MYXOBOLIASIS OF COMMON CARP

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## Abstract

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The common carp (*Cyprinus carpio*) originating from Serbian fish ponds was examined for presence of *Myxobolus encephalicus*. The spores of *M. encephalicus* were present in blood vessels and meningeal layers. Its presence has been noted in 32-days old carp fingerlings, where in brain blood vessels predominate plasmodium parasites shape. Although, plasmodium does not effect blood vessels obturation as it is in the spore's case, clinical signs which were similar to those in trout, occurred in the 15-30 days old carps. Fingerlings growth rate and conversion ranged normally. Blood test results in fingerlings with high number of spores in brain had similar values to those in unaffected fingerlings. The morbidity percentage was higher for carps up to the one-month old cultured in the ponds serving for older carp winter storage.

*Key words: Myxobolus encephalicus*, carp, Myxosporea, parasitoses

## Introduction

For many years whirling disease have been present in trout fingerlings. Name of mentioned disease derive from clinical sings of infected fish. Whirling disease was particularly present during the trout (*Onychorhynchus mykiss*) cultivated in earth fish ponds, while rearing in artificial hatcheries, concrete and plastic fish ponds, and ponds where water supply for spawning fish and fingerlings is separated, disease occurrence is reduced. In natural waters whirling disease is described by Hristovski and Stojanovski (2005) in the brown trout (*Salmo trutta* - morpha *fario*) and the Ohrid trout (*Salmo letnica*). Brain myxoboliasis of common carp was described for the first time during the 1980's in Czechoslovakia, Bulgaria, Germany and Yugoslavia (Dycova et al., 1986). There are few investigations dealing with brain myxoboliasis, apart from recent articles by Antychowicz and Reichert (2005) and Dayoub et al. (2007).

## Materials and Methods

The subject of the investigation was myxosporidia detection in carps. In this paper, brain myxoboliasis of one-two months old common carp fingerlings caused by *Myxobolus encephalicus* is described.

Investigations were conducted in the northern Serbia (Vojvodina province) in 15 fish ponds during the period 2007-2009.

All investigated fish ponds provide water from

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channel network, rivers Tisa, Tamis, and Danube, and wells.

Methods that have been used were clinical observations, light microscopy and classical pathohistology with H&E stain.

## Results and Discussion

Presence of *M. encephalicus* was detected in one-two month old common carp fingerlings in 12 fish ponds. All fish ponds that provide water from channels or rivers had infected fish, while fish ponds with water from wells were free of disease.

Infection intensity and number of *M. encephalicus* carriers differed among ponds. It has been noted that the most serious infections and the majority of infected fingerlings were from ponds where they reared with older fish, ponds with natural spawning, and ponds which served for older carp winter storage. Infection intensity ranged 8 %–100 % (Table 1).

*M. encephalicus* presence has been noted in 32-days old carp fingerlings, where in brain blood vessels predominate plasmodium parasites shape. Carp fingerlings with heavy infection display locomotory disturbances manifested by whirling or circling move-

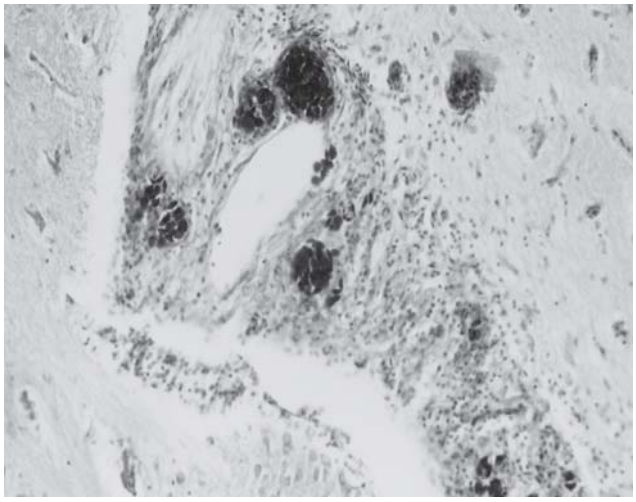

**Fig. 1. Cross section of brain vessels containing spores of *M. encephalicus.* H&E**

**Table 1**
**Infection intensity in Serbian fish ponds**

| Fish ponds | I | II | III | IV | V | VI | VII | VIII | IX | X | XI | XII |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intensity, % | 16 | 23 | 12 | 40 | 8 | 63 | 100 | 85 | 65 | 28 | 19 | 78 |

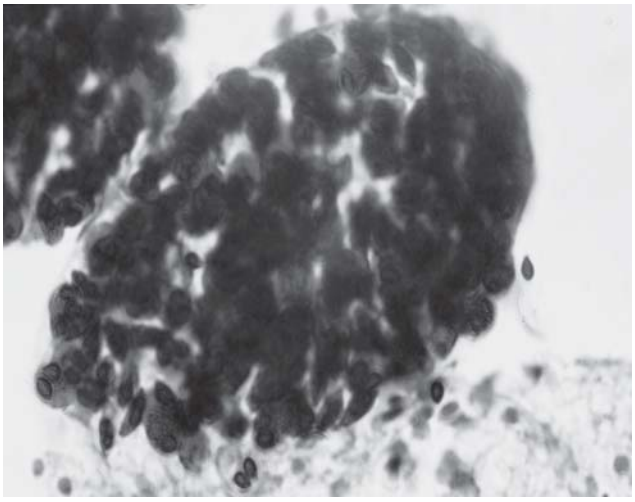

**Fig. 2. Section through a brain vessel containing mature spores of *M. encephalicus.* H&E, × 1000**

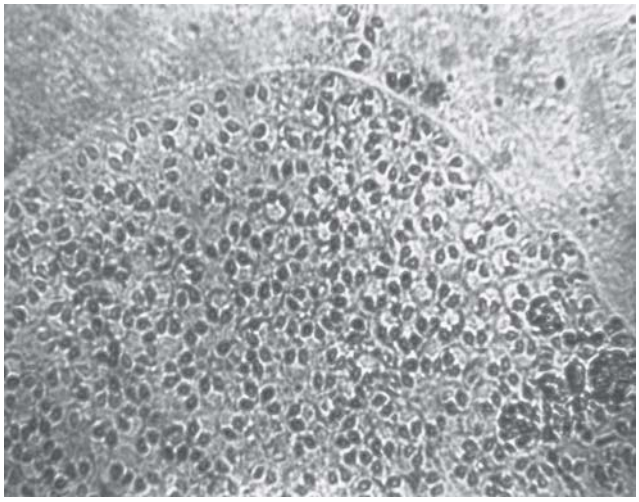

**Fig. 3. Fresh spore of *Myxobolus encephalicus* isolated from brain tissue**

ments or by swimming immediately beneath the water surface. Affected fish are sometimes emaciated, with deeply sunken eyes. Microscopic observation of compressed samples of brain tissue reveals small or large groups of spores (Figures 1, 2 and 3.). According to our investigations spores show constant values: spore length 7.5 -9.5 μm, mostly (9.2 μm), spore width 7.5 -8.3 μm, (8.3 μm), polar capsule length 4.2 -5.2 μm and polar capsule width 2.5 -3.3 μm.

Fingerlings growth rate and conversion ranged normally. Blood test results in fingerlings with high number of spores present in brain had similar values to those in unaffected fingerlings.

## Conclusions

It is necessary to station fish hatcheries and ponds for one-month old fingerlings rearing in area provided with water from wells.

Natural spawning of fish is not convenient for more intensive common carp production.

It is recommended to rear carp fingerlings of the same age group. During the winter, fish ponds bottom soil should be dried up and frozen.

After 3-5 years of exploitation, the surface layer of the soil from ponds should be removed.

During ponds preparation it is recommended use rotary ploughs.

For fish ponds disinfection, burnt lime (1000 kg/ha) or hydrated lime (2000 kg/ha) should be applied.

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