

THELOHANELLUS HOVORKAI - IN FEMALE FISH AND CARP FINGERLINGS

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THELOHANELLUS HOVORKAI-KOD ŽENKI I MLADI ŠARANA

Abstrakt

Telohaneloza je obolenje šaranskih riba koje se klinički uočava na perajima i krljuštima (*Thelohanellus nikolskii*) i svim drugim tkivima a naročito u centralnom nervnom sistemu (*Thelohanellus hovorkai*). Na prisustvo parazita *Thelohanellus nikolskii* pregledani su mladunci i matične ribe šarana (*Cyprinus carpio*) koji potiču sa ribnjaka u Srbiji. Prisustvo ovog parazita zabeleženo je kod mladunaca šarana starijih od 90 dana i kod matica šarana. Intenzitet infekcije razlikovao se u zavisnosti od ribnjaka na kojima je obolenje utvrđeno. Ustanovljeno je da su najintenzivnije infekcije kao i najveći broj inficiranih jedinki poticali sa ribnjaka gde su gajeni sa starijim kategorijama, jezera sa prirodnim mrestom, i objekata koji su služili kao skladištbeni prostor tokom zimskog perioda. Spore *Thelohanellus hovorkai* nađene su na škragama, koži, muskulaturi, jetri, slezini, bubrezima, crevu, žučnom i vazdušnom mehuru, kičmenoj moždini i mozgu gde je bio prisutan najveći broj parazita. Spore su bile obavijene mukofilnim omotačem. Prosečne veličine spora *T. hovorkai* iznosile su: dužina spore 20-21 μm, širina spore 14 μm, dužina polarne kapsule 12.5-14 μm, širina polarne kapsule 11.5-12.5 μm, dužina spore sa sluzavim omotačem 22.5-25 μm i širina spore sa sluzavim omotačem 14.5-17.5 μm.

Dijagnostika ovog obolenja vezana je za detekciju spora čija se veličina razlikuje u opisima istraživača kod riba iz otvorenih voda i šaranskih riba gajenih u akvakulturi. Da bi utvrdili da li je u pitanju možda druga vrsta ili podvrsta parazita to možemo učiniti primenom molekularnih tehnika koje pokušavamo da uvedemo u dijagnostiku. Obolenje se manifestuje poremećajima u centralnom nervnom sistemu, malokrvnosti i slabijem napredovanju mladunaca a naročito kada se dijagnostikuje veći broj spora u tkivima riba. Specifične terapijske mere nisu poznate ali opšte preventivne mere vezane za pripremu objekata za gajenje mladunaca šarana daju povoljne rezultate.

Predmet istraživanja je bio detekcija miksosporidija kod šarana. U ovom radu, opisana je telohaneloza kod jednogodišnje mlađi i matičnih jedinki šarana uzrokovana sa parazitom *Thelohanellus hovorkai*. Istraživanja su sprovedena u severnom delu Srbije (Vojvodina) na 15 ribnjaka u razdoblju 2007-2010. Svi ispitivani ribnjaci snabdevaju se vodom iz mreže kanala, reka Tisa, Tamiš, i Dunava, i bunara. Metode koje su korišćene su klinička posmatranja, svetlosna mikroskopija i klasična patohistologija s H & E bojenjem.

Ono što se pokazalo veoma bitno jeste da prirodni mrest riba nije pogodan za intenzivniju proizvodnju šarana i da se preporučuje gajenje mladunaca samo ako su iste starosne grupe. Tokom zime, ribnjačko tlo treba isušiti i izamrznuti a nakon 3-5 godina eksploatacije, površinski sloj tla od ribnjaka treba ukloniti. Tokom pripreme ribnjaka preporučuje se korišćenje rotacionih plugova a za dezinfekciju ribnjaka treba koristiti gašeni (1000 kg / ha) ili negašeni kreč (2000 kg / ha).

Ključne reči: telohaneloza, šaranske ribe, *Thelohanellus hovorkai*, spore

INTRODUCTION

Telohanelosis is disease of cyprinids that are clinically observed in the fins and scales (*Thelohanellus nikolskii*) and all other tissues and especially in the central nervous system (*Thelohanellus hovorkai*). The biology and histopathology of *Thelohanellus hovorkai* was described by Molnar and Kovacs-Gayer (1986) and Ćirković (1986). Its pathology was described by Yokoyama *et al.* (1998) who found severe haemorrhages on the body surface of the affected common carp and designated disease as "haemorrhages telohanellosis". Diagnosis of this disease is related to the detection of spores, whose size varies according to researches descriptions in fish from open water and carp fish raised in aquaculture. Application of molecular techniques can help in diagnosis and can determine whether the parasite correspond to this species or another species or subspecies Anderson *et al.* (2000). Disease is manifested by disturbances in the central nervous system, anemia and absence of progressin of fingerlings when are diagnosed numerous spores in the tissues of fish. Beside some investigations Yokoyama *et al.* (1999) efficacious therapeutic measures are not known but the general preventive measures related to the preparation of facilities for the cultivation of carp fingerlings give favorable results.

MATERIALS AND METHODS

The subject of the investigation was myxosporidia detection in carps. In this paper, telohanellosis of one-year old common carp fingerlings and spawning carp fish caused by *Thelohanellus hovorkai* is described.

Investigations were conducted in the northern Serbia (Vojvodina province) in 15 fish ponds during the period 2007-2009. All investigated fish ponds are provided by water from channel network, rivers Tisa, Tamiš, and Danube, and wells. Methods that have been used were clinical observations, light microscopy and classical pathohistology with H&E stain.

RESULTS AND DISSCUTION

Presence of *Thelohanellus hovorkai* was detected in common carp fingerlings older than 90 days and female carp fish. Infection intensity and number of *T. hovorkai* carriers differed among ponds. It has been noted that the most serious infections and the majority of infected fingerlings were from ponds where they were reared with older fish, ponds with natural spawning, and ponds which served for older carp winter storage.

The spores of *T. hovorkai* were present in gills, skin, muscules, liver, spleen, kidneys, intestines, bile and swim bladder, spinal cord and brain where were present the highest number of spores (Fig. 4). Spores were rounded by mucoid layer (Fig. 3.)

Microscopic observation of compressed samples of brain tissue reveals small or large groups of spores (Fig. 1., 2.). According to our investigations spores show next values: spore length 20-21 μm , spore width 14 μm , polar capsule length 12.5-14 μm polar capsule width 11.5-12.5 μm , spore length with mucal layer 22.5-25 μm , spore width with mucal layer 14.5-17.5 μm .

Disease was manifested with disturbances in central nervous system, anemia, and absence of fingerlings progression especially when higher number of spores is diagnosed.

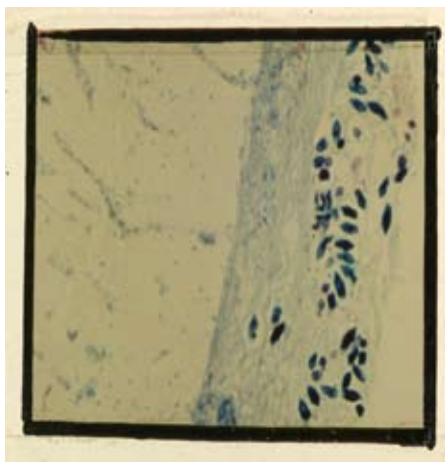


Figure 1. Spores of *T. hovorkai* in brain

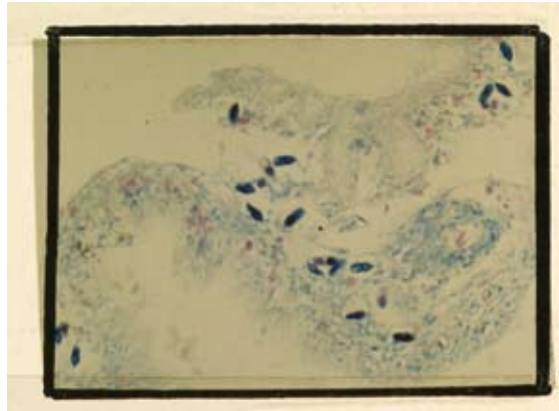


Figure 2. *T. hovorkai* spores



Figure 3. Fresh spores of *T. hovorkai*

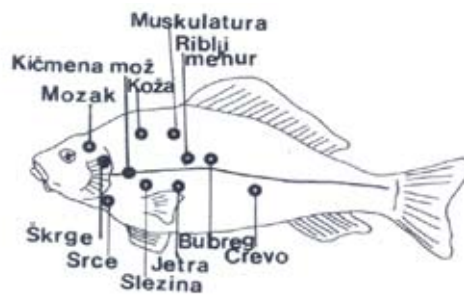


Figure 4. Organs where spores of *T. hovorkai* were detected

CONCLUSIONS

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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