

THE MICOSIS GENERATED BY *SAPROLEGNIA PARASITICA* IN THE FRESH-WATER FISH OF THE CYPRINIDAE FAMILY

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Abstract. It is presented a parasitary disease induced by a superficial fungus characteristic to Cyprinidae species – *Pseudorasbora parva* (TEMMINK & SCHLEGEL, 1848), and *Carassius auratus gibelio* (BLOCH, 1782), living in the small basins along the Preajba Valley, that appeared after damming a small tributary of the Jiu River. During 2010, there have been taken sporadic samples, starting with March, in order to obtain the ichthyologic material necessary for performing parasitological studies.

Keywords: The Preajba Valley, small basins, superficial mycosis, saprolegniosis

Rezumat. Micoza provocată de *Saprolegnia parasitica* la pești dulcicoli din familia Cyprinidae. Este prezentată o boală parazitată provocată de o ciupercă superficială, întâlnită la speciile de cyprinidae: *Pseudorasbora parva* (TEMMINK & SCHLEGEL, 1848) și *Carassius auratus gibelio* (BLOCH, 1782), din lacurile mici de baraj care s-au format pe cursul râului Valea Preajba, un mic afluent al Jiului. Pe parcursul anului 2010 s-au realizat recoltări sporadice, începând cu luna martie, în scopul obținerii materialului ihtiologic necesar studiilor parazitologice.

Cuvinte cheie: Valea Preajba, lacuri mici de baraj, micoză superficială, saprolegnioză.

INTRODUCTION

In the present paper it is described a superficial mycotic disease that appears at the surface of the body, on tegument, fins, and gills, at two fish species belonging to the family Cyprinidae – *Pseudorasbora parva* (TEMMINK & SCHLEGEL, 1848), and *Carassius auratus gibelio* (BLOCH 1782) which inhabit a special category of ecosystems. There are also rendered the etiology and pathology of the disease, as well as prophylaxis and treatment measures known in the specialized literature (MUNTEANU & BOGATU, 2008).

MATERIAL AND METHODS

The samples were gathered by means of seasonal sporadic fishing in the basins built along the Preajba Valley starting with March. We used fishing cages the diameter of the holes reaching 20-60 mm and fishing dips. The specimens affected by the disease were captured relatively easy taking into account they got closer to the edge of the basin and moved with difficulty. The collected material was determined and examined from ichthyopathological point of view; we performed the clinic and parasitological examination in the parasitology laboratory of the S.V.D. Dolj.

The parasitological examination was performed for identifying the ecto- and endoparasites. The identification of the ectoparasites (on the skin, fins, gills, and eye balls), was made both directly (native preparation microscope slide-lamella), as well as by fixation, staining, and microscopic examination of the preparations. There were examined samples from the surface of the skin, fins, and gills or squash preparations (by squashing between special lamellae), which were then examined in an obscure camera. The identification of ichthyoparasitic fungus was directly achieved through a macroscopic examination, the extramatrical hyphae around the caudal peduncle displaying the aspect of a dirty-white cotton fabric, followed by the microscopic examination of the preparations.

RESULTS AND DISCUSSIONS

The 13 studied small basins are located between Cârcea and Făcăi settlements, 6 km from Craiova. They were built along the Preajba Valley River and the Bătrâna Valley stream (CIOBOIU, 1999). From the geographic point of view, they are located within the plain area and they appeared through the damming of a small tributary of the Jiu River. The seasonal fishing performed during the field trips allowed us to identify 12 fish species belonging to two orders and four families (BĂNĂRESCU, 1964).

Order Cypriniformes

Family Cyprinidae

Cyprinus carpio LINNAEUS 1758

Carassius gibelio (BLOCH 1782)

Alburnus alburnus (LINNAEUS 1758)

Pseudorasbora parva (TEMMINK & SCHLEGEL 1848)

Rutilus rutilus (LINNAEUS 1758)

Scardinius erythrophthalmus (LINNAEUS 1758)

Abramis brama (LINNAEUS 1758)

Family Cobitidae

Cobitis taenia LINNAEUS 1758*Misgurnus fossilis* (LINNAEUS 1758)

Order Perciformes

Family Percidae

Perca fluviatilis LINNAEUS 1758*Sander lucioperca* (LINNAEUS 1758)

Family Centrarchidae

Lepomis gibbosus (LINNAEUS 1758)

In 2009, out of the 12 species living in the basins, two were affected by parasites, respectively *Perca fluviatilis* L. 1758 and *Cyprinus carpio* L. 1758, the etiological agents of these parasitoses being the crustacean *Argulus foliaceus* L. 1758 in the case of carp and the nematode *Eustrongylides excisus* JÄGERSKIÖLD 1909 for the perch (GOGA, 2009, 2009a).

For the correlations between the structure of fish populations and water chemistry as an indicator of the quality of the basins, there were taken water samples that were analysed in the laboratory of the EPA Dolj. The obtained data allowed us to draw certain preliminary conclusions regarding fish communities and their link with the water quality of the basins. The analysis of the main physical-chemical indicators revealed that the water of the basins is characteristic to the eutrophic ecosystems (CIOBOIU & BREZEANU, 2002). Of the 12 identified fish species, mycosis was signalled only at two of them – *Pseudorasbora parva* (TEMMINK & SCHLEGEL 1848) and *Carassius gibelio* (BLOCH 1782), the etiologic agent of this parasitosis being the fungus *Saprolegnia parasitica*.

The weakened fish, affected by saprolegniosis, were collected with the dip as they were passively swimming at the surface of the water and displayed hypoxia symptoms.

Saprolegniosis is a mycotic disease common to all piscicultural fresh water basins. This disease appears more often when water does not have the corresponding quality and it is rich in decomposing organic substances. The presence of mycosis around the caudal peduncle and the ulceration (Figs. 1; 2), as well as the small tegument lesions (Fig. 3) are induced inclusively by the disturbance of the protective layer of mucus, which make the fish more susceptible to fungal infestation. Such lesions can be also affected by a bacterial infection (VULPE, 2007). The fungus affects the organs weakened by the primary agents, amplifying the disturbances provoked by them.

The diagnosis of mycosis was mainly achieved by means of a clinic examination, visual observation of the external mycelium, smears curreted from the tegument and examination at an optic microscope at a magnification of 10x. The thick extrametrical fungal hyphae with a 20µm diameter emphasize a mature zoosporangium and formed zoospores, which is much thicker than the rest of the hypha (OȚEL & CONSTANTIN, 1989). The zoospores are set free in water and when they get in contact with the organic substratum (inclusively at fish), they germinate forming a new mycelium (Figs. 4, 5). The mycosis spreads in water, through the contact between sick and healthy fish. Another factor favouring the starting of the epizooty is the temperature, which is lower than the optimum temperature for these species.

In order to prevent saprolegniosis, specialized literature recommends the improvement of water quality within these piscicultural basins, as well as the control of other possible diseases that may induce a predisposition to fungal infestation. In case the disease has already started, the dead fish specimens or those displaying lesions have to be fished and burnt. The fish specimens that have superficial lesions can be treated through bathing with disinfecting substances such as the malachite green 0.1 mg/l 4-6h, copper sulphate, potassium permanganate, salt. In less severe cases, the disease may be cured without treatment – there must be used a strong water flow in the pool, a change of the water pH, and avoidance of the accumulation of organic substances.

CONCLUSIONS

Research was performed on the fish living in the 13 basins located along the Preaja Valley River;

The ichthyocoenoses from the Preajba Valley catchment area are made up of 12 native fish species belonging to two orders and four families;

The parasitological examinations led to the identification of a superficial mycosis;

From the point of view of the organic location, the extrametrical hyphae from the caudal peduncle region and the ventral fin displayed the aspect of a dirty-white cotton fabric.

The evolution of this mycosis was favoured by certain epidemiological factors, such as immunity, conditioned by water quality, and temperature as a main factor contributing to the appearance of mycosis;

This mycosis evolved subclinically; in the future, it is necessary to seasonally monitor these basins in order to identify new parasites and thus, limit the damages that may occur in time.



Figure 1. The erosion of the epidermis provoked by the fungus.
Figura 1. Erodarea epidermei de către ciupercă.

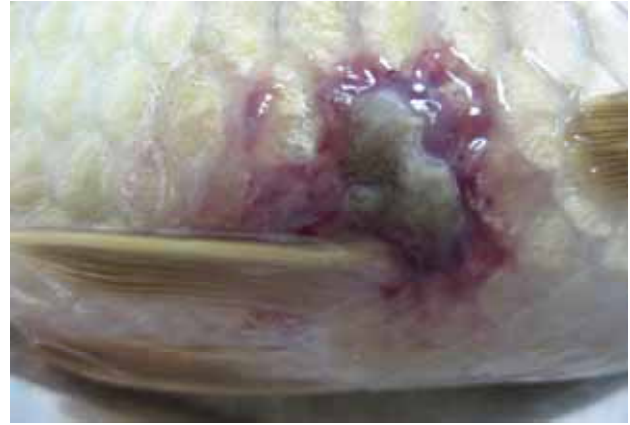


Figure 2. Lesions on the tegument of a crucian carp (*Carassius gibelio* (BLOCH 1782) provoked by *Saprolegnia parasitica*.
Figura 2. Leziuni pe tegumentul unui caras (*Carassius gibelio* (BLOCH 1782), provocate de *Saprolegnia parasitica*.



Figure 3. Mycelium of *Saprolegnia sp* on the tegument of a crucian carp.
Figura 3. Miceliu de *Saprolegnia parasitica* pe tegumentul unui caras.

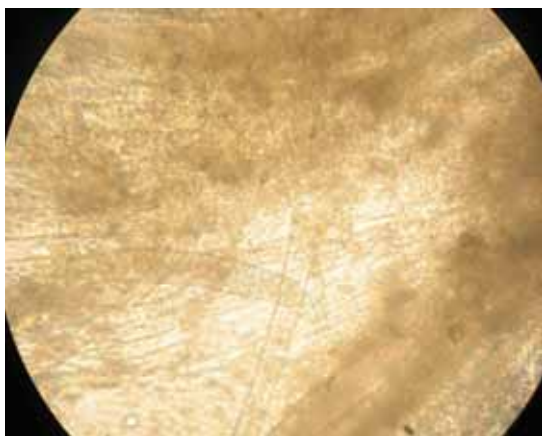


Figure 4. Mature zoosporangium with zoospores.
Figura 4. Zoosporange matur cu zoopori.



Figure 5. Mature zoosporangium with zoospores (smear from tegument curette).
Figura 5. Zoosporange matur cu zoopori (frotiu din raclat tegumentar).

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