Ichthyophthirius multifiliis INFECTION AT *Carassius gibelio* FROM THE SMALL RESERVOIRS WITHIN THE PREAJBA VALLEY

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Abstract. The present paper renders aspects related to the ichthyophthiriosis provoked by the ciliate *Ichthyophthirius multifiliis* FOUCHET 1876, which was detected at crucian carp *Carassius gibelio* (BLOCH, 1782) in the 9th reservoir, in March 2011; this reservoir belongs to a string of 13 reservoirs built through the damming of the Preajba Valley. The specimens were sampled by means of sporadic fishing with fishing basket, fishing rod, and dip from the basin. Thus, we obtained the ichthyologic material necessary for parasitological studies as fish specimens displayed obvious disorders. The identification of the ectoparasite ciliate was (microscopically) performed on the base of the clinical symptoms and microscopic examination of skin scrapings at the stereomicroscope and optical microscope, in the parasitological laboratory of Dolj Sanitary Veterinary Directorate.

Keywords: Preajba Valley, small basins, ciliate, ichthyophthiriosis.

Rezumat. Infecția cu *Ichthyophthirius multifiliis* la *Carassius gibelio* din lacurile mici de baraj din bazinul Preajba. Lucrarea prezintă ihtioftirioza, o ectoparazitoză cosmopolită provocată de ciliatul *Ichthyophthirius multifiliis* FOUCHET, 1876, depistată la caras *Carassius gibelio* (BLOCH, 1782) în luna martie 2011, în lacul de baraj IX, aparținând salbei de 13 lacuri formate prin bararea râului Valea Preajba. Probele au fost prelevate prin pescuiri sporadice cu setca, undița și ciorpacul din lac, în scopul obținerii materialului ihtiologic necesar cercetărilor parazitologice, peștii manifestând tulburări vizibile. Identificarea ectoparazitului s-a făcut macroscopic, prin examen clinic, şi microscopic, prin studierea raclatului tegumentar, la stereomicroscop şi microscopul optic, în cadrul laboratorului de parazitologie al Direcției Sanitar Veterinare Dolj.

Cuvinte cheie: Valea Preajba**,** lacuri mici de baraj, ciliat, ihtioftirioză.

INTRODUCTION

In 2009, there were initiated research studies in the area of a string of 13 reservoirs located along the Preajba Valley (Dolj County), the purpose of which was to establish the amount of the fish population present in the small basins, as well as to identify possible fish parasites (GOGA, 2009, 2009a; GOGA, 2010). Between 1999 and 2002, there were published data regarding the hydrobiological particularities of certain small eutrophic reservoirs located within the Jiu River hydrographical basin (CIOBOIU, 1999; CIOBOIU & BREZEANU, 2002).

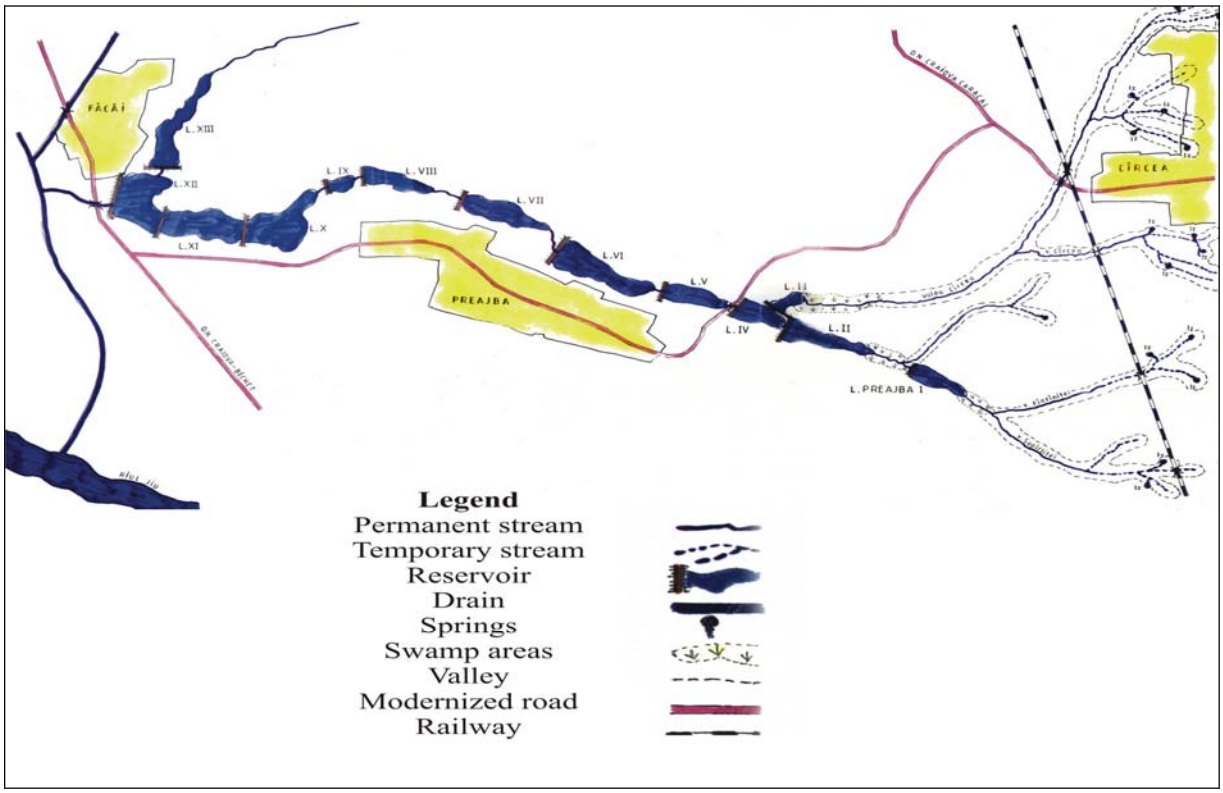

Figure 1. Map rendering the location of the reservoirs. / Figura 1. Harta cu amplasarea în zonă a lacurilor (CIOBOIU, 1999).

Ichthyophthirius multifiliis is an ectoparasite ciliate protozoan that affects numerous fresh water fish species living in stagnant waters or aquariums, no matter their age, and provokes a disease called ichthyophthiriosis. Clinically, the protozoan disease is emphasized by the appearance of some small whitish nodules on the tegument and fins (Fig. 2) and this is why the disease is also known as "white spot disease" (freshwater "Ich"). The parasite undergoes three developmental stages: trophozoite (adult feeding stage), tomont (resistant form, encapsulated dividing stage) and tomite (young, free swimming infective stage).

The aim of the present study was to describe this most common disease to infest freshwater fish, which we found at some specimens of *Carassius gibelio* caught in one of the reservoirs from the Preajba Valley. When describing the disease, we aimed at rendering its ethology and pathology, as well as prophylaxis and treatment measures known from the literature in the field.

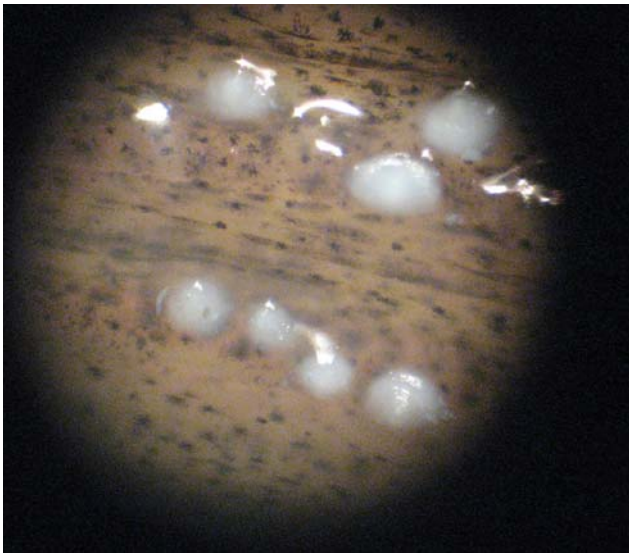

Figure 2. Stereomicroscope view of the nodules with semolina grains aspect at the crucian carp *Carassius gibelio* infested with *Ichthyophthirius multifiliis* (Photo: Claudia Goga). / Figura 2. Vizualizarea la stereomicroscop a nodulilor cu aspect de boabe de griş la caras *Carassius gibelio* infestat cu *Ichthyophthirius multifiliis*.

Figure 3. Nodules on the tegument of a crucian carp *Carassius gibelio* infested with *Ichthyophthirius multifiliis* (Photo: Claudia Goga). / Figura 3. Noduli pe tegument la caras *Carassius gibelio* infestat cu *Ichthyophthirius multifiliis*.

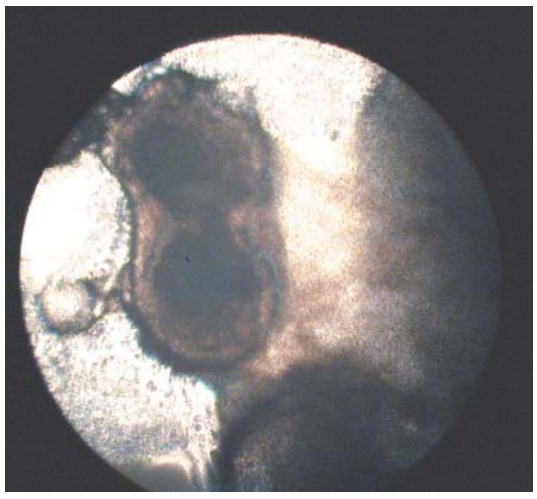

Figure 4. *Ichthyophthirius multifiliis* viewed at the optic microscope during the division process (Photo: Claudia Goga). / Figura 4. *Ichthyophthirius multifiliis* vizualizat la microscopul optic în procesul de diviziune.

MATERIAL AND METHODS

In March 2011, there were sampled specimens representing ichthyologic material from the 13 reservoirs built through the damming of the Preajba Valley River. Many fish species were sampled with the fishing rod and basket from these reservoirs. The ichthyologic material was determined from the taxonomic viewpoint (BĂNĂRESCU, 1964). The 12 species fished in the area belong to two orders and four families (Table 1).

Table 1. Fish species from the reservoirs.
Tabel 1. Speciile de peşti din lacurile de baraj.

Order	Family	Species
Cypriniformes	**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)
	Cobitidae	*Cobitis taenia* LINNAEUS, 1758
		Misgurnus fossilis (LINNAEUS, 1758)
Perciformes	**Percidae**	*Perca fluviatilis* LINNAEUS, 1758 *Sander lucioperca* (LINNAEUS, 1758)
	Centrarchidae	*Lepomis gibbosus* (LINNAEUS, 1758)

Of these 12 species, ten are autochthonous and two are allochthonous acclimatized species (top mouth gudgeon and pumpkinseed) (OȚEL, 2007).

At ten crucian carp specimens from the 9th reservoir (Fig. 1) it was found the "white spot disease" and the ectoparasite ciliated protozoan *Ichthyophthirius multifiliis* was identified.

The examination started with the direct study of the whitish formations with the magnifying and binocular glass. Strictly referring to the parasitological examination, we emphasize that it was achieved for the identification of ecto- and endoparasites following the usual methods that are generally accepted in ichthyoparasitology (MUNTEANU & BOGATU, 2008). The identification of the ectoparasite was achieved on the basis of the general methods of ichthyoparasitological diagnosis, namely macroscopically by means of clinical examination (Fig. 3) and microscopically by means of tegument and fins scrapings, as well as through successive washing of the gills and tegument and view at the optic microscope and stereomicroscope, in the parasitological laboratory of Dolj SVD. At the same time, we preserved the protozoan in containers with 4% formalin (Fig. 5).

Figure 5. Preservation of the protozoan ciliate in a 4% formalin container (Photo: Claudia Goga). / Figura 5. Conservarea protozoarului ciliat în recipient cu formol 4%.

RESULTS AND DISCUSSIONS

Ichthyophthiriosis, also named "semolina stains disease" or "white spot disease", is a severe parasitosis. The oval protozoan covered by short uniform cilia was detected on the tegument and fins of the crucian carp; the nodules were disposed uniformly in the shape of meridians. The pathogen action of the parasite is mechanical, irritating, and despoliating. They feed on cellular detritus and, sometimes, even on erythrocytes.

As disease, it was diagnosed in March 2011 at the crucian carp in the 9th reservoir of the Preajba Valley. Thus, the whitish punctiform nodules of 0.5-1 mm in diameter were mainly spread on the fins and operculum and less on the body; the fish specimens did not have necrotic hotbeds, but they swam heavily at the surface of the water and disturbances were obvious. In case of massive invasions, especially at young fish populations, disturbances are obvious and severe. Fish receptivity to the invasion of *Ichthyophthirius* also depends on the amount of dissolved oxygen. Its decrease (to 3mg/l) induces physiological changes in the organism characteristic to a stress stage, which will surely lead to the decrease of the specimen resistance to the attack of this parasite (VULPE, 2007).

Ichthyophthiriosis appears during all seasons, when water temperature is between 3 and 28^{o}C; however, the maximum intensity is registered during summer, when the parasite rapidly multiplies (OȚEL & CONSTANTIN, 1989).

The infestation of the crucian carp was induced by infesting tomites resulted from the division of the parasite that was previously encysted on different substrata from the water. Once they reach the tegument and fins, they feed on the provoked desquamations during the entire growing period, up to the trophont stage, displaying the aspect of semolina grains on the parasitized tissues and forming small cavities. After the microscopic examination, it was established that the protozoan was at the beginning of its biological cycle, as cysts were undergoing the phase of successive division (Fig. 4). After about 15 days of feeding, adult parasites reach 1mm, become mature and detach from the host body, fall into water and, in a few hours, they transform into cysts in different substrata, thus reaching the resistant, namely the tomont stage.

It is hard to fight against the disease; the prophylactic measures recommended for its prevention by the literature in the field are: compulsory quarantine of the material destined to populate reservoirs, preventive washing in an anti-parasite solution, ensuring an optimum population density, parasitological examination of fish at short time intervals.

The measures recommended by the literature in the field (MUNTEANU & BOGATU, 2008) for fighting against ichthyophthiriosis are: destruction of free swimming stages (tomites) through repeated administration, directly into water, of malachite green in a concentration of 0.1 mg/l water, intensification of the water current within infested basins, as well as reduction of the population density.

CONCLUSIONS

Even if the literature in the field mentions that ichthyophthiriosis appears at numerous fresh water fish species, the investigations developed in the 13 reservoirs allowed the diagnosis of the disease in the 9th reservoir at a single species belonging to Cyprinidae family, namely the crucian carp. The disease appears more often at stagnophil fish species and rarely at reophile species, because they move permanently, fish density is lower and motion may prevent the fastening of tomites and formation of trophonts. Stress may favour the infection with *Ichthyophthirius multifiliis*, as it leads to the decrease of resistance and of the reaction capacity of the body; the disease may evolve rapidly leading even to mortality before the appearance of the characteristic nodules, only a mucus hyper secretion signalling it.

The parasitological control of the disease is difficult to be performed by medicines. It was observed that the treatment with malachite green 2-3 g / 10m^3 water in solution directly dispersed in the infested reservoirs, with a time exposure of 7 h, which also supposes to stop the water current and to ensure aeration, is quite hard to be applied due to its increased toxicity. In severe situations, the treatment is repeated three times in 24 hours.

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