

Studies of *Chilodonella Cyprini* Sin. (*Piscicola*) Infection (Chilodonellidae, Chilodonella) In the Preajba Valley River Basin (Romania)

Goga Ionelia Claudia^{1*}, Mititelu-Ionuș Oana², Tîmburescu Constanța³

¹The Oltenia Museum Craiova, Section of Natural Sciences, Street Popa Șapcă, No.8, 200416

²University of Craiova, Geography Department, Street A. I. Cuza, No.13, 200585, Craiova, Romania

³L.S.V.S.A Sanitary Veterinary Direction Dolj, Craiova, Romania

E-Mail: ioneliagoga@yahoo.com, oana_ionus@yahoo.com, ctimburescu@yahoo.co.uk

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Abstract: Through a series of researches and field sampling within the Preajba River Basin, in 2011, we identified the *Chilodonella cyprini* parasite in carp (*Cyprinus carpio*), this parasite, being the most frequent and dangerous ectoparasite of the ciliated protozoa. The presence of the parasite in tegument level was revealed by cleaning the scales and microscopic visualization.

Keywords: *Chilodonella cyprini*, ectoparasite, chilodonellosis, lakes, Preajba Valley

INTRODUCTION

The researches were carried out during the period 2008-2014 (through observations and ichthyological gathering information) along the Preajba Valley lakes, located in Dolj county, 6 km South of Craiova, at the contact between Getic Piedmond and Oltenia Plain, formed by the main water course represented by Preajba River having a length of 9,6 km and its tributary on the right, Bătrâna River with a length of 6,8 km whose riverbed has a pronounced drop in water level due to the evaporation process^[1]. During the period 1976-1979, touristic facilities were made, barring this small tributary of the Jiu, and by this intervention on the minor riverbed of the watercourse, the lakes were created which were provided with dams (to separate the lakes basins) and surface spillways. The total area of the ten reservoirs of the Preajba Valley is 28 ha, being in a continuous reduction due to clogging with vegetal detritus, but also to the excessive development of palustral macrophytes^[2]. The evolution in time of the lakes is shown in the results of the researches carried out during 2008-2014 (through observations and ichthyological gathering information)^[3,4,5,6], have revealed the fact that due to anthropogenic impact and intense eutrophication phenomena there are ten anthropic lakes in the area with varying surface and depth, respectively nine along the Preajba and one along the Bătrâna Valleys (Fig. 1). The purpose of the observations made during the years of study on the lake complex was to identify possible parasitosis in the fish collected from the lacustral ecosystems in the Preajba river basin (The law 5/2000 on Protected Areas Act in Dolj County, Preajba-Făcăi Lake Complex^[16]).

*Corresponding E-mail: ioneliagoga@yahoo.com

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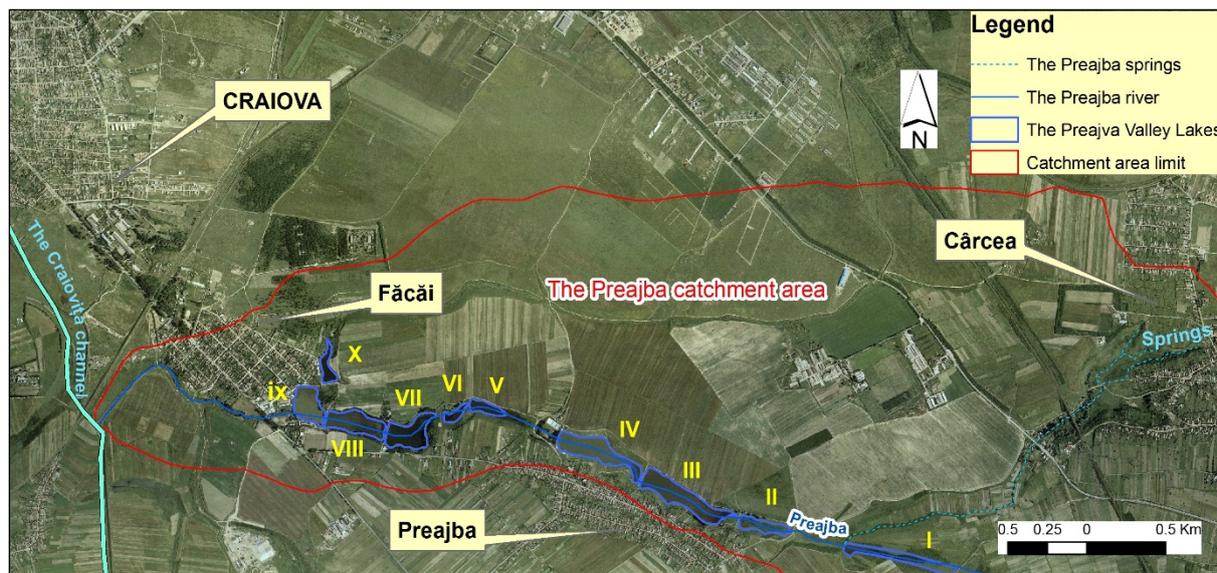


Figure 1. The Preajba River basin: springs, streams and lakes (GIS processing after ortophotos, 2009)

In May 2011 we identified the *Chilodonella cyprini* (Chlamyodontida Order, Chilodonellidae Family, *Chilodonella* Genus) parasite in carp (*Cyprinus carpio*), being the most frequent and dangerous ectoparasite of the ciliated protozoa. It is found at all species of freshwater fish, a cosmopolitan form, infesting the tegument and gills and it causes of the disease called chilodonellosis [7]. Like other parasitoses, chylodonellosis is characterized by a poor specificity. The disease sets in the cold season, late winter early spring, when the fish are stressed and weakened over the winter time. This is a favourable substrate for developing of the parasite [8]. The disease may be secondary, affecting the weakened bodies affected by the primary agents, complicating the disorders caused by primary agents. Infusions agents cause tegument irritation in the form of grey-blue spots and abundant mucus secretion [9].

MATERIAL AND METHOD

In May 2011, during the sampling of biological probes from the 10 lakes using a 25 mm mesh net, we suspected a possible parasitosis due to the abnormal movement of fish at the surface of the water but also their agglomeration in the spill area surplus water from lakes. The parasite was identified from the samples obtained from the ihtiological samples in Lake IX located on the main water course represented by Preajba River, at 7 large specimens (approximately 300 g) of *Cyprinus carpio*. The biological sample taken was transported for the parasitological examination at the Dolj Veterinary Sanitary Department, in a plastic container, together with the lake water sample, to determine the quality parameters. Examination of the tegument, fins and gills was first performed with the hand magnifying glass (X 10) after the fish had been pithing, and with a lamella cleaned the mucus from the wounded areas (Fig. 2), placing it in a Petri box with physiological serum, for microscopic exam. Thin fresh cut lamellar samples were performed which were viewed at the Olympus BX 43 optical microscope with the lens 10X, 20X, 40X, ocular WHN 10X / 22. In the microscope range of view, at least three parasites, coming from the tegumentary and gills, could be revealed. The gills did not show macroscopic signs of disease, although the specialty literature reminds that their dystrophy increases the sensitivity of the fish to the disease [10].



Figure 2. Tegumentary rash for the fresh samples (Photo by Goga, 2011)

RESULTS

Most Ph. Ciliophora are free, but there are some parasitic life forms. Specific here is relatively short cilia in, at least, one stage of the biological cycle. Parasitic ciliates, with extracellular life, feed on mucus and epithelial desquamations of the host through cytostomy or/and pinocytosis. There are always 2 types of nuclei (macro and micronucleus), and asexual reproduction is done by transverse binary fission. Transmission of parasitosis occurs indirectly by ingestion of trophozoites or cysts, or directly through body contact of fish ^[15].

The *Chilodonella* genus has the ovoid body, flattened dorsal-cervical, with the convex dorsal surface and the flat ventral. Free species of *Chilodonella* is met in fresh water (*C. fluviatilis*; *C. uncinata*), others can live in freshwater and salty water (*C. cucullus*); *C. caudata* is found in still water, and *C. uncinata* is a polysaprobe species. There are *Chilodonella* species living in the psamic environment of beaches, which is characterized by a long space-time continuity. *Chilodonella* species that support 44°C or even 58°C are also known in thermal springs ^[11,12].

Species of the genus *Chilodonella*, such as *C. longipharynx*, *C. hyalina*, *C. rotunda*, are ectocomial on amphipods of the genus *Orchestia* or *Talorchestia*, and others are ectoparasites. The last ones can temporarily detach from their host, having the same cycle as the free forms they derive from.

Chilodonella cyprini ^[13,14] is an ectoparasite on the tegument and gills of cyprinid fish; with sizes: 50 - 70 μm X 30 - 40 μm (other stages encountered 35μm X 15μm). Fixed on fish gills and in tegument ulcerations, it has binary reproduction as other free species of the genus. In the absence of the host's body, ciliate dies in 12-24 hours. Parasitosis was reported without clinical signs of disease. Haemorrhagic spots of infection, supported by increased mucus, have been noticed in the skin. Every springtime, amateur fishermen in the area suspected the presence of these ciliophoric parasites in large fish, which showed little scales-free spots of the tegument and they were stirred up to the surface of the water. After observations we could say that the parasite did rectilinear movements in the view range of the microscope. Inter-positively positioned a large elongated large macronucleus and two round micronuclei and cytoparamenes could be observed (Figs. 3 a, b).

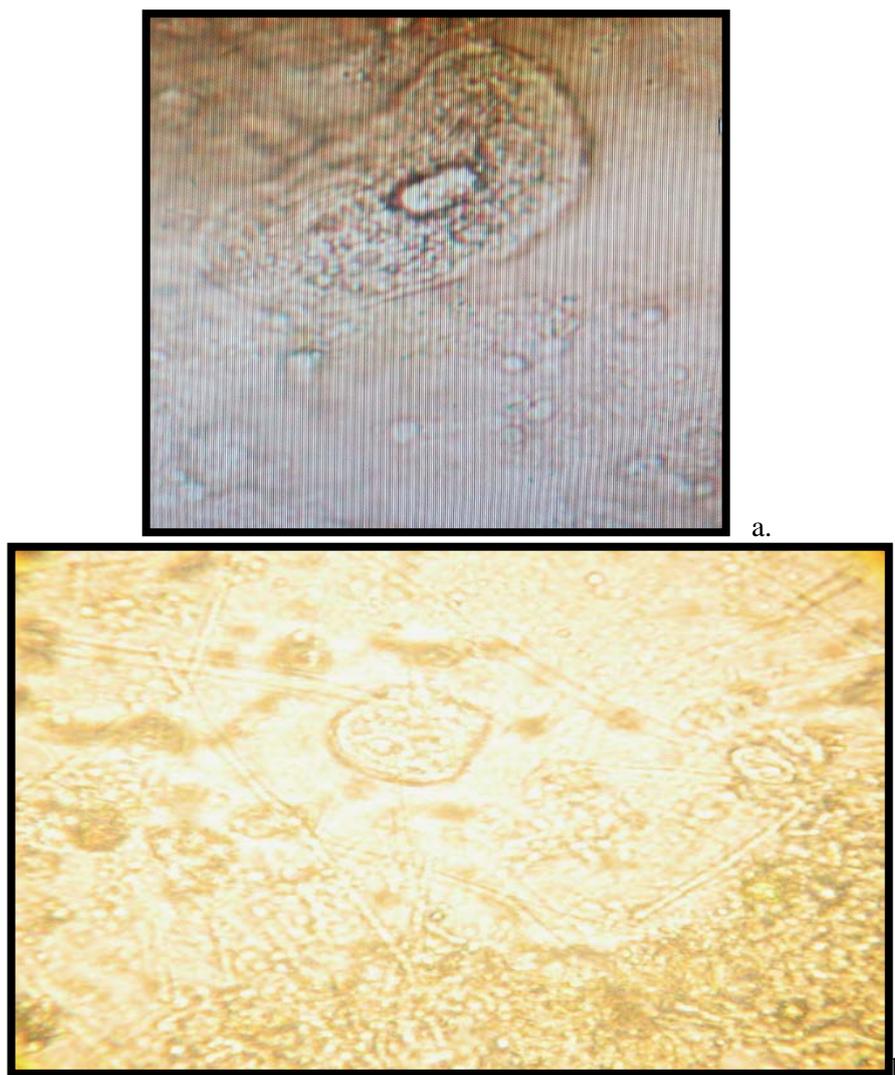


Figure 3. *Chilodonella cyprini* macro și micronucleus (a); Citofaringe to optical microscope Olympus BX 43 with lens 10X ocular WHN 10X/22 (b) (Photos by Goga, 2011)

CONCLUSION

The gravity of this parasite in the case of a large scale infestation is big, in our case the fact that this pool is not overpopulated, has caused the disease to develop subclinically and thus the mortality is not present. The parasite was identified in the ischiotic samples taken from the Lake IX, located on the main water course represented by Preajba River, in 7 large specimens (approximately 300g) of *Cyprinus carpio*.

Parasitosis was reported without clinical signs of disease. Haemorrhagic focuses of infection, supported by increased amounts of mucus, have been noticed in the tegument, where infusors produce ulcers in the form of gray-blue spots.

Every spring, amateur fishermen in the area are suspecting the presence of these ciliated parasites in large-size fish which were seen agitated swimming up at the surface of the water. The fact they were stressed and weakened over the winter is a favorable substrate for the development of the parasite. Transmission of parasitosis occurs indirectly by ingestion of trophosites or cysts, or directly through body contact of fish.

DISCUSSIONS

In this river basin system, where water goes from one lake to another, through flood and surface dischargers, controlling sick fish is difficult to achieve.

The rectilinear movements of the *Chilodonella cyprini* parasite in the view range of the microscope allowed the visualization of a large, slightly elongated macronucleus, two round micronuclei and

cytoparillons. Several measures recommended for the Hunting and Fishing Agency Dolj that administer these lakes are: making winter holes in the ice layer the air to penetrate in, removing snow on small portions the light to penetrate through, knowing that in the presence of light the parasites die slowly. The only recommended antiparasitic treatment is lime (chalk) chloride 1mg/l water.

REFERENCES

- [1] Ionuș O., Goga C. and Avram M., 2014, Morphological and morphometric analysis of the Preajba Valley Lakes (Dolj county, Romania), Lakes, reservoirs and ponds, 8(2):68-8.1.
- [2] Mititelu-Ionuș O. and Avram M., 2016. Spatial and temporal dynamics of human pressure within the Preajba catchment area, Romania. Forum Geografic, XV(1), 34-44. doi: 10.5775/fg.2016.070.i.
- [3] Goga I. C., 2009, Boli parazitare semnalate la peștii dulcicoli din bazinul hidrografic Valea Preajba, Simpozionul Internațional “Diversitatea, valorificarea rațională și protecția lumii animale”, Academia de Științe a Moldovei. Institutul de Zoologie. Chișinău, Edit. Știința, 256- 260.
- [4] Goga I. C., 2010, The mycosis generated by *Saprolegnia parasitica* in the fresh-water fish of the Cyprinidae family, Oltenia. Studii și comunicări. Științele Naturii, Muzeul Olteniei Craiova, 26(2): 161-164.
- [5] Goga I. C. and Țimbușescu C., 2011, Ichthyophthirius multifiliis infection at *Carassius gibelio* from the small reservoirs within the Preajba Valley, Oltenia. Studii și comunicări. Științele Naturii, Muzeul Olteniei Craiova, 27(2): 129-132.
- [6] Goga I. C. and Codreanu – Bălcescu D., 2011, The trematode *Clinostomum complanatum* (Platyhelminthes: Digenea) identified at the perch from the small reservoirs along the Preajba river, Oltenia. Studii și comunicări. Științele Naturii, Muzeul Olteniei Craiova, 27(1): 115-118.
- [7] Bănărescu, P., 1964, Fauna R. P. R. Pisces, Osteichthyes, Edit. Academiei R. P. R, București, 195-216, 225-247, 561-647, 691-813, 866-872, 866-872, 897-909.
- [8] Schäperclaus, W., 1979, Fischkrankheiten, Akademik Verlag Berlin, 1-2: 1-510, 512-943.
- [9] Vulpe V., 2007, Paraziți și parazitoze ale peștilor dulcicoli. Iași, Edit. Ștef, Galați, 237 pp.
- [10] Munteanu Gabriela and Bogatu D., 2008, Tratat de ihtiopatologie. Edit. Excelsior Art, Timișoara, 827 pp.
- [11] Cojocaru, C. D., 2006, Studiul ihtioparazitofaunei Banatului, Teză de doctorat, Facultatea de Medicină Veterinară, Timișoara, 614 pp.
- [12] Dăscălescu, P. and Costea M., 2014, Bolile peștilor de acvacultură (Metode de diagnostic, tratament și biosecuritate), Edit. Coral Sanivet, București, 431 pp.
- [13] Moroff, 1902, is the author of the species *Chilodonella cyprini* (Moroff, 1902)
- [14] Strand, 1928, Miscelanea nomenclatorica zoological et paleontologica. Archiv für Naturgeschichte, Abteilung A. Berlin, 92: 30-75.
- [15] Oțel V., and Constantin Gh., 1989, Ghid ihtiopatologic pentru piscicultura din Delta Dunării, Bucureștii Noi, București, 153 pp.
- [16] *** 2000. Legea 5/2000 privind regimul ariilor protejate din județul Dolj (Complexul Lacustru Preajba-Făcăi.