

OCCURRENCE OF *LAMPROGLENA PULCHELLA* (NORDMANN, 1832) (COPEPODA: LERNAEIDAE) IN SOME CYPRINID FISH FROM OHRID LAKE (MACEDONIA)

Dijana BLAZHEKOVIKJ - DIMOVSKA^{1*}, Stojmir STOJANOVSKI

¹University "St. Kliment Ohridski", Faculty of Biotechnical Sciences, Bitola, Macedonia

²Hydrobiological Institute, Ohrid, Macedonia

*Corresponding author e-mail: dijana.blazekovic@uklo.edu.mk

Abstract

The representatives of the class Copepoda are of great importance in fish pathology. *Lamproglena pulchella* (Nordmann, 1832) (Copepoda: Lernaeidae) is an ectoparasite of many cyprinid fish, widespread in Europe up to the Aral Sea. During the long-term investigations of 12 species of cyprinid fish from the Lake Ohrid, a total of 7 specimens of *Lamproglena pulchella* was found in 5 fish from 4 fish species: *Rutilus ohridanus*, *Squalius squalus*, *Scardinius knezevici* and *Chondrostoma ohridanus*.

Only fresh fish were subjected to routine parasitological examinations, dissection, and observation methods. Parasite identification was performed morphologically, based on the character of their maxilla, maxilliped, antennae, legs and uropods, using a referent key for determination. The 3 parasite specimens were found in two samples of *Rutilus ohridanus*, followed by 2 parasite specimens in *Squalius squalus* and one specimen in *Scardinius knezevici* and *Chondrostoma ohridanus*, each.

These parasites attach to gills and general body surfaces by their maxilla and maxilliped, causing wounds that become the spots of secondary infection by microbes. The damage caused by this parasite is more pronounced in aquaculture systems.

We did not find many parasites, but considering the potential danger that *Lamproglena pulchella* poses to the fish health, we point out the need to monitor infestations with this parasite and take preventive measures so that the parasite does not spread massively among fish in Lake Ohrid and to prevent its introduction into other waters in Macedonia.

The record of *Lamproglena pulchella* in all four cyprinid fish in the present study is considered as the first from the Ohrid Lake. At the same time, *Rutilus ohridanus*, *Scardinius knezevici* and *Chondrostoma ohridanus* represent new hosts for this parasite, worldwide.

Keywords: *Lamproglena pulchella*, cyprinid fish, Ohrid Lake.

Introduction

The representatives of the class Copepoda are of great importance in fish pathology. The species of the genus *Lamproglena* represent the widespread pathogenic aquatic parasites in fresh and marine-water fish, causing an external infestation of the gills of wild and farmed fish, called lamproglenosis (Elsaied & Elsheikha, 2009). *Lamproglena pulchella* (Nordmann, 1832) (Copepoda: Lernaeidae) is an ectoparasite of many cyprinid fish, widespread from Western Europe to the Aral Sea. There are more than 40 species in the genus *Lamproglena*.

Lamproglena pulchella is one of the most common and pathogenic species from this genus. This parasite species is found in *Chondrostoma nasus* by Jirsa *et al.* (2006, 2011), as well as, in *Leuciscus cephalus* by Jirsa *et al.* (2006) caught in rivers in Austria. The parasite is also determined in the gills of *L. cephalus* in Serbia (Cakic, 1992) and in *Scardinius erythrophthalmus* in Turkey (Korkut, 2022).

This parasite is previously found in Macedonia at Prespa nase (*Chondrostoma prespense*) from the Prespa Lake (Stojanovski *et al.* 2013).

Material and methods

The fish material of 12 species of cyprinid fish was collected from Ohrid Lake. The fish samples were placed in plastic tanks with water and immediately transferred to the Department of Fish Diseases at the Hydrobiological Institute - Ohrid.

Only fresh fish were subjected to routine parasitological examinations, dissection, and observation methods. Parasite identification was performed morphologically, based on the character of their maxilla, maxilliped, antennae, legs, and uropods, using a referent key (Bauer, 1987) for determination.

Results and discussion

During the long-term investigations of 12 species of cyprinid fish from the Ohrid Lake, a total of 7 specimens of *Lamproglena pulchella* was found in 5 fish from 4 fish species: *Rutilus ohridanus* (Ohrid roach), *Squalius squalus* (chub), *Scardinius knezevici* (Ohrid rudd) and *Chondrostoma ohridanus* (Ohrid nase). The 3 parasite specimens were found in two samples of *Rutilus ohridanus*, followed by 2 parasite specimens in *Squalius squalus* and one specimen in *Scardinius knezevici* and *Chondrostoma ohridanus*, each (Figure 1).

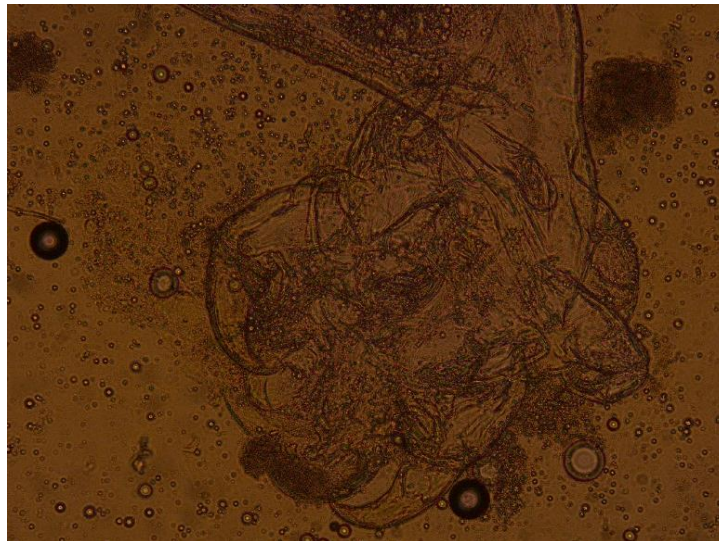


Fig.1, 2. *Lamproglena pulchella* from Ohrid roach (*Rutilus ohridanus*) from Ohrid Lake (original photo)

Kingdom ANIMALIA
 Phylum ARTHROPODA
 Subphylum CRUSTACEA
 Superclass OLIGOSTRACA
 Class COPEPODA
 Superorder PODOPLEA
 Order CYCLOPOIDA
 Suborder CYCLOPIDA
 Family LERNAEIDAE
 Subfamily LAMPROGLENINAE
 Genus LAMPROGLENA
 Species *LAMPROGLENA PULCHELLA* Nordman, 1832

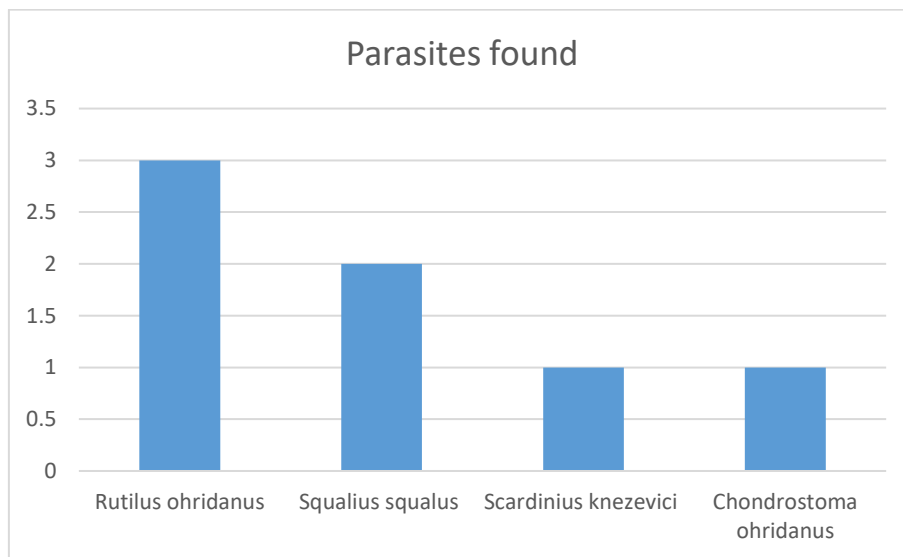


Figure 3. Infestation with *Lamproglena pulchella* in fish species from Ohrid Lake

Lamproglena pulchella is a large parasite (4 - 5 mm long, 0,8 mm wide). The body is violin-shaped, with clear segment boundaries. It comprises a long uniseriate chain of eggs containing up to 20 eggs per sac. Female body of genus *Lamproglena* is divided into cephalothorax, a long sub-cylindrical thoracic neck and more or less distinct trunk like posterior section. Maxilliped is robust, armed with 3 claws. Segments of I, II, and V pair of legs are narrow, short and form the “neck”. Parts of the V pair of legs are in the form of small growths with a spine. The abdomen is long, with the same length as the other segments. Caudal branches are curved like pinches.

These parasites attach to gills and general body surfaces by their maxilla and maxilliped, causing wounds that become the spots of secondary infection by microbes. The damage caused by this parasite is more pronounced in aquaculture systems. In the genus *Lamproglena*, as well as in *Lernaea*, only the adult females are gill parasites of fish (Fahmy *et al.* 2019).

Maxillae are characteristically prehensile and thus provide an efficient tool for attachment to the host tissue. The species of the genus *Lamproglena* are among the most economically important fish parasites. They can directly affect wild and farmed fish. During the past 30-40 years, pathogenic infestations caused by these parasites have escalated. Their impact can range from mild pathological damage to stress-induced mortality in individual fish, to epizootic problems.

The record of *Lamproglena pulchella* in all four cyprinid fish in the present study is considered as the first from Ohrid Lake. At the same time, *Rutilus ohridanus*, *Scardinius knezevici* and *Chondrostoma ohridanus* represent new hosts for this parasite, worldwide.

Conclusion

During the long-term investigations we did not find many parasites, but considering the potential danger that *Lamproglena pulchella* poses to the fish health, we point out the need to monitor infestations with this parasite and take preventive measures so that the parasite does not spread massively among fish in Ohrid Lake and to prevent its introduction into other waters in Macedonia. The record of *Lamproglena pulchella* in all four cyprinid fish in the present study is considered as the first from the Ohrid Lake. At the same time, *Rutilus ohridanus*, *Scardinius knezevici* and *Chondrostoma ohridanus* represent new hosts for this parasite, worldwide.

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