

# Influence of *Cryptocotyle* spp. metacercariae (Creplin, 1825) on some biochemical parameters of round goby *Neogobius melanostomus* (Pallas, 1814)

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## Abstract

Comparative study of biochemical parameters in muscle tissues of round goby *Neogobius melanostomus* with different intensities of infection with metacercariae of *Cryptocotyle* spp. showed a decrease of catalase, peroxidase, glutathione reductase and cholinesterase activities and an increase of malonaldehyde level in highly infected fish. The results revealed that the high infection resulted in a shift in the prooxidant-antioxidant balance towards intensification of lipid peroxidation and reduction of the antioxidant enzyme activities and disruption of nerve impulse transmission.

## Introduction

The study of mutual adaptations of parasites and their hosts is of undoubted interest for understanding the mechanisms of metabolic reorganisation of two organisms coexisting together for a sufficiently long time. Changes occurring in both organisms can manifest themselves at different levels of biological organisation, including the molecular level. Infection causes biochemical rearrangements of infected tissues and can bring about serious structural and functional changes in organs (Ali and Ansari, 2012; Eissa et al., 2014; Mozhdeganloo and Heidarpour, 2014; Skuratovskaya et al., 2013, 2015).

Trematode metacercariae (*Cryptocotyle* (Creplin, 1825), *Apophallus* (Lühe, 1909), *Paracoenogonimus* (Katsurada, 1914), Diplostomidae (Poirier, 1886)) cause mass infections of marine and freshwater fish and have a great pathogenic

effect on hosts (Solovyev et al., 2010; Izvekova and Tyutin, 2011). Negative effect on homeostasis of the host organism is due to mechanical tissue damage, metabolic and immune system disruption, and is often accompanied by high morbidity and mortality (Goncharov et al., 2017). Trematode metacercariae cause mechanical damage of the musculature through tissue lysis by hydrolytic enzymes, leading to the development of inflammatory processes and changes in protein, carbohydrate and lipid metabolism in fish (Izvekova and Tyutin, 2011). Thus, metacercariae of *Diplostomidae* with high intensity of infections can result in serious diseases and can be especially dangerous for juvenile fish - slowing down the growth rate, damaging visual organs, causing curvature of the spine, tissue destruction and often death (Solovyev et al., 2010). Metacercariae of *Paracoenogonimus ovatus* cause hyperemia and a

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