# First report of endosymbionts in *Dreissena polymorpha* from the brackish Curonian Lagoon, SE Baltic Sea*

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**Abstract**

We report the first results of a parasitological study of *Dreissena polymorpha* (zebra mussels) from the brackish Curonian Lagoon, SE Baltic Sea. Zebra mussels were collected monthly from May to October 2011 from a site near the mouth of the River Nemunas. Three types of endosymbionts were found in the mantle

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cavity and visceral mass of the molluscs during dissections, i.e. the commensal ciliate *Conchophthirus acuminatus* and parasitic ciliate *Ophryoglena* sp., and rarely encountered, unidentified nematodes. The abundances of *C. acuminatus* and *Ophryoglena* sp. were positively associated with host shell length and water temperature, but no effect of water salinity was detected. As the endosymbionts are either highly host-specific to zebra mussels (*C. acuminatus* and *Ophryoglena* sp.) or are probably free-living organisms that inadvertently infect the molluscs (nematodes), we conclude that the presence of *D. polymorpha* in the Curonian Lagoon does not pose any serious parasitological risk to native biota. We emphasize, however, that this conclusion should be treated with caution as it is based on a study conducted only at a single location. Our work extends the currently scarce records of *D. polymorpha* parasites and commensals from brackish waters, and adds to a better understanding of the ecological impact this highly invasive mollusc causes in the areas it has invaded.

## 1. Introduction

The Ponto-Caspian zebra mussel, *Dreissena polymorpha* (Pallas 1771), is one of the most successful and best-studied suspension-feeding invaders, capable of colonizing both fresh and brackish water bodies. Its life history and biological traits (e.g. living in clumps, and non-selective suspension-feeding) determine its dominance over other invertebrates, enabling it to become highly abundant and impacting when introduced into a new aquatic ecosystem (Karatayev et al. 2002).

However, being a powerful filter-feeder, the zebra mussel can greatly reduce algal biomass and negate or mask the ever increasing effects of nutrient pulses (Karatayev et al. 2002, Dzialowski & Jessie 2009). Several studies have, therefore, addressed the potential use of zebra mussels in water quality remediation (e.g. Reeders & Bij de Vaate 1990, Orlova et al. 2004, Elliott et al. 2008, Stybel et al. 2009, Goedkoop et al. 2011) or sewage sludge treatment (Mackie & Wright 1994). These issues are particularly relevant to large transitional ecosystems, such as the Baltic Seas brackish lagoons, with well-pronounced, anthropogenic eutrophication.

When considering the pros and cons of zebra mussel cultivation for water quality improvement, it is important to identify and assess all possible ecological risks the species may pose. One of the negative ecological effects of the zebra mussel is associated with its ability to host a diverse range of endosymbionts, including potentially pathogenic parasites of fish and waterfowl (Molloy et al. 1997, Karatayev et al. 2000a, Mastitsky 2004, 2005, Mastitsky & Gagarin 2004, Mastitsky & Samoilenko 2005, Mastitsky & Veres 2010). Increased abundances of such parasites hosted by *D. polymorpha* in invaded water bodies have repeatedly been documented in Europe (Molloy et al. 1997, Mastitsky 2005, Mastitsky & Veres 2010).