

**PARASITE HOST INTERACTION BETWEEN THE FRESHWATER PEARL
MUSSEL (*MARGARITIFERA MARGARITIFERA*) AND BROWN TROUT
(*SALMO TRUTTA*) – THE IMPACT FROM GLOCHIDIA LARVAE ON THE
HOST**

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Opponent är Professor Dr. Jürgen Geist, School of Life Sciences, Technical University of Munich, Tyskland

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Abstract

Parasites can modulate the physiology and behavior of the hosts to enhance their chances to complete their life cycle. The numerous freshwater bivalves of the order Unionoida all have a parasitic larval stage, known as glochidia, parasitizing fish hosts. The freshwater pearl mussel *Margaritifera margaritifera* is a host specialist and their glochidia can only metamorphose on salmonid fish (Salmonidae), and in Europe the glochidia has only been shown to develop into juvenile mussels on Atlantic salmon *Salmo salar* and brown trout *S. trutta*. In this thesis, the interaction between the parasitic freshwater pearl mussel and its salmonid host, the brown trout have been studied in five papers. The overall aim was both to investigate if host behavior can increase the risk of being infected by glochidia (paper I), to what extent glochidia infection alters the behavior and physiology of the host (paper II, III and IV) and finally how infection in a natural stream correlates with movement patterns, growth, and habitat use (paper V). My results show that more active trout had an increased risk of being infected, competitive ability decreased with elevated infection intensity, prey handling time were longer for infected fish and growth rate was lower in infected fish. Standard and maximum metabolic rate as well as levels of hematocrit was elevated in infected fish compared to non-infected fish. In a natural stream infected fish was smaller than non-infected fish, utilized different habitats, and covered larger areas than non-infected fish suggesting that they are inferior competitor and not able to defend a territory. In summary, all the results suggest that the glochidia infection is a burden to the fish host that will prevent the individual to compete for resources on equal terms as non-infected fish. These patterns have also been seen in previous studies performed in laboratory with hatchery reared and artificially infected fish. The glochidia is a potent parasite, and at high numbers, they cause a disease state to its host. The symptoms can be seen both physiological and behavioral but subdued behavioral symptoms seem to be seen only when the infection intensity is high. I would like to see more studies investigating behavioral and physiological effects from glochidia infections on the fish host. In my future work with propagating freshwater pearl mussels, I will have the opportunity to test new hypothesis derived from this thesis.