

## Abstract

Brown trout *Salmo trutta L.* is a fish species with high socio-economic value, which is favourable among anglers and a successful invader worldwide. The aim of this thesis is to explore environmental factors affecting body growth and survival of brown trout with emphasis on density dependent selection in juvenile life stages. This thesis is specifically focused on: (1) effect of population density on growth and survival with respect to a dynamic of a local group of individuals (papers **I** and **II**); (2) effect of inter-individual differences in behaviour on the relationship between individuals life-history traits and available resources (papers **III** and **IV**); (3) link between demo-genetic structure of population and growth and mortality rates of individuals (papers **V**, **VI** and **VII**).

Datasets for this thesis were collected during a long-term mark-recapture study on wild brown trout population (2005-2011) in the catchment of the Otava River in Šumava National Park (Czech Republic) and a set of field and laboratory studies conducted on wild populations in streams on west coast of Sweden.

In accordance with some previous studies, this thesis showed that growth of juvenile brown trout is negatively affected by population density. Nonetheless, this thesis reveals that the negative effect of density dependent growth can be mitigated by familiarity with environment and towards conspecifics within a local group. This thesis also demonstrates that consistent inter-individual differences in activity can be linked to differences in growth rate, mortality and dispersal. The consistent behavioural types (animal personalities) described here, affect the way in which individuals utilize resources and they can, for example, affect propensity for egg eating during autumn spawning season. This thesis shows, with an example of a small migratory connected mountain watershed that differences in growth and survival rate associate with a demo-genetic structure of subpopulations within a metapopulation.

Relationships between behaviour, environment and life-history traits reported in this study were tested on several populations of brown trout in Europe, and they highlight the importance of local adaptations for productivity of brown trout populations. Specific findings of this thesis can be applied in management and conservation of populations of brown trout but also other species of stream dwelling freshwater fish.