



Universität  
Basel

## Research Project

### Population genetics of *Ponticola kessleri*

#### Project funded by own resources

**Project title** Population genetics of *Ponticola kessleri*

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**Organisation / Research unit**

Departement Umweltwissenschaften

**Project start** 01.01.2014

**Probable end** 30.12.2015

**Status** Completed

We describe the genetic and phenotypic structure of the invasive bighead goby *Ponticola kessleri* in Europe using microsatellites, mitochondrial D-loop sequences, and geometric morphometrics. We track a harbor bighead goby population at the invasion front in the Rhine in Switzerland with high temporal and spatial resolution through two years. Then, we compare the harbor population to local Swiss and distant German populations along the Rhine. We identify a strong pattern of small scale diversity and large scale homogeneity in the microsatellite data. In contrast, mitochondrial markers and body shape are strongly dependent on sampling site.

The observed genetic patterns suggest the presence of a long distance vector for *Ponticola kessleri* and the presence of genotype-specific vectors. We analyze the travel patterns of commercial vessels on the Rhine and find that cargo ships and tankers have the potential to act as such differential vectors. Finally, we confirm the plausibility of commercial freshwater shipping as a vector by presenting information on the use of ballast water by freshwater vessels which we collected through interviews with shipping company representatives.

Together, our experiments present the first high-resolution genetic analysis from the invasion front of an invasive fish population, and substantiate the paramount role of commercial shipping in freshwater fish translocations.

#### Financed by

University funds

Other funds

#### Add publication

#### Published results

3693519, Adrian-Kalchhauser, I.; Hirsch, P. E.; Behrmann-Godel, J.; N'Guyen, A.; Watzlawczyk, S.; Gertzen, S.; Borcharding, J.; Burkhardt-Holm, P., The invasive bighead goby *Ponticola kessleri* displays large-scale genetic similarities and small-scale genetic differentiation in relation to shipping patterns, 0962-1083 ; 1365-294X, Molecular Ecology, Publication: JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

**Add documents**

**Specify cooperation partners**