

Background

Populations of the freshwater isopod *Asellus aquaticus* L. can rapidly become locally differentiated when submersed stonewort (*Chara spp.*) vegetation expands in lakes. In the novel *Chara* habitat isopods become lighter pigmented and smaller than in the ancestral reed habitat.



Aim

To find out if fish (perch) feed selectively on different phenotypes of *Asellus*, and if this selectivity differs between the reed habitat and the *Chara* habitat.

Methods

Laboratory experiments with perch as predator and *Asellus* as prey in aquaria manipulated to mimic the substrates in the reed habitat or the *Chara* habitat.



Figure 2. Setup of prey selection experiment. Four blocks, each containing six aquaria of which three were manipulated to mimic the reed habitat while the other three mimicked the *Chara* habitat.

Results

Remaining isopods were significantly smaller ($p < 0,000$) and lighter pigmented ($p > 0,000$) in the fish aquaria than in the controls, showing that the perch preferred to feed on large dark individuals.

This selective pattern were the same in both substrates.

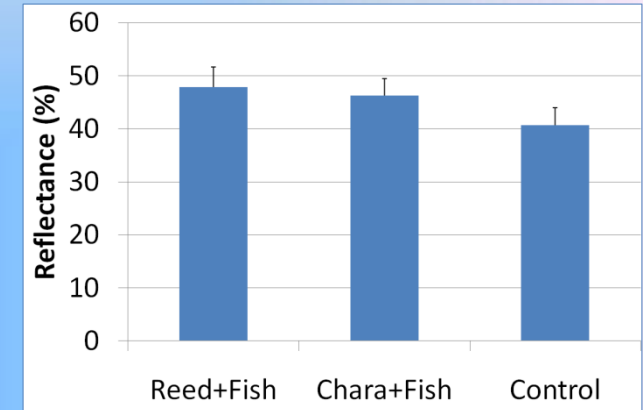


Figure 3. Pigmentation as standardized reflectance (mean + SD) for remaining *Asellus* after prey selection experiment.

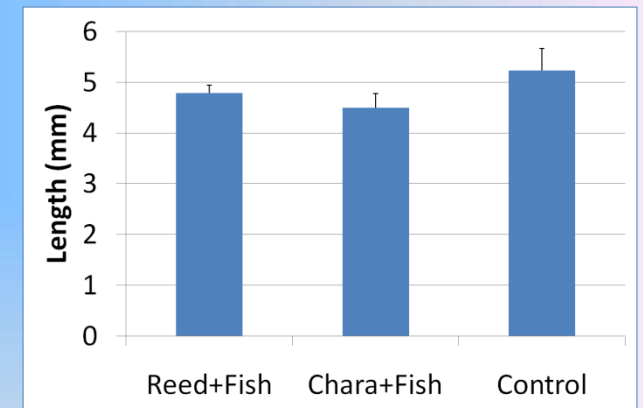


Figure 4. Length (mean + SD) for remaining *Asellus* after prey selection experiment.

Conclusion

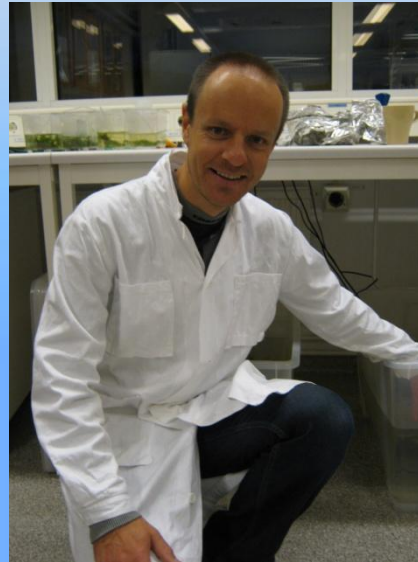
Perch selected larger individuals and individuals with darker pigmentation.

A selective pressure like that would be likely to produce a population of small, lightly colored isopods.

It is therefore likely that predation by visually hunting fish is an important force of natural selection behind the habitat-specific adaptations seen in *Asellus* populations in the novel *Chara* habitat.

Acknowledgement

I want to thank my supervisor Anders Hargeby who has helped me on numerous occasions. I also would like to thank Theres Lyrsten for helping me with field- and lab work..



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Selective predation by perch (*Perca fluviatilis*) on a freshwater isopod, in two macrophyte substrates.



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Final Thesis
Master Programme in Ecology and
the Environment 2010

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