

Tytuł projektu
Uczenie socjalne w obronie przed drapieżnictwem jako element konkurencyjnej przewagi inwazyjnych gatunków ryb nad rodzimymi
Project title
Social learning in anti-predation defence as a competitive advantage of invasive over native fish species
Dyscyplina /Area of science
Nauki biologiczne
PROJECT DESCRIPTION
<p>Project goals</p> <ul style="list-style-type: none"> • (General) To answer the question whether invasive fish are more effective in learning predation risk than native fish • (Specific) To check whether invasive fish are more efficient in within- and cross-species social learning, i.e. to assess predation risk by reception of antipredator responses of nearby individuals <p>Outline</p> <p>Biological invasions represent a worldwide threat to ecosystem functioning and structure and constitute a major issue in the conservation of global biodiversity. In this The PhD we are going to check if social learning plays an important role in the advantage of invasive fish species over native species in minimizing predation risk in their introduced range. The following pairs of the species (alien vs. native) will be tested: <i>Babka gymnotrachelus</i> - <i>Cottus gobio</i>, <i>Proterorhinus semilunaris</i> - <i>Gymnocephalus cernuus</i>, <i>Neogobius melanostomus</i> – <i>Pomatoschistus minutus</i>, <i>Neogobius fluviatilis</i> – <i>Gobio gobio</i>, <i>Perccottus glenii</i> - <i>Perca fluviatilis</i>, <i>Carassius gibelio</i> – <i>Carassius carassius</i>. Each pair represents species co-existing in various European waters (Baltic Sea, flowing and stagnant fresh waters). Experiment will be carried out including two factors: fish species and fish experience. The fish will be tested in one- or two-species pairs, in two variants regarding the specimen experience with predators: naïve / naïve (control), naïve / experienced (treatment). Naïve fish will be those that have no past experience with the predator. The idea is that after the exposure to the stimulus, pairs of naïve fish (control) will not respond to predator odour. But in the treatment with experienced specimens, they will show an alarm response to the predator odour, allowing concomitant naïve specimens to gain experience in assessing anti-predation risk by use of social learning.</p>

Work plan

1. Designing experimental setups.
2. Collecting fish (prey and predators) from various sites in Poland and transporting them to the laboratory.
3. Conducting experiments in laboratory conditions.

Literature

Brown C., Laland K. N. 2003 Social learning in fishes: a review. *Fish and Fisheries* 4, 280-288.

Mathis, A., Chivers, D. P., & Smith, R. J. F. (1996). Cultural transmission of predator recognition in fishes: intraspecific and interspecific learning. *Animal Behaviour* 51, 185-201.

Simberloff, D., Martin, J. L., Genovesi, P., Maris, V., Wardle, D. A., et. al. (9 others) (2013). Impacts of biological invasions: what's what and the way forward. *Trends in ecology & evolution*, 28(1), 58-66.

Wisenden, B. D. (2015). Chemical cues that indicate risk of predation. *Fish Pheromones and Related Cues*, 131-148.

Required initial knowledge and skills of the PhD candidate

- Analytical thinking
- Eager to learn
- Having completed training for persons responsible for performing procedures and experiments on animals (preferred)
- Experience in experimental fish ecology (preferred)
- Knowledge about freshwater fish biology and ecology
- Eager to work hard

Zgłaszający projekt/ Author of the project

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