

Tytuł projektu
Rozpoznawanie sygnałów chemicznych informujących o drapieżnictwie jako element konkurencyjne przewagi inwazyjnych gatunków ryb nad rodzimymi
Project title
Detection of chemical predatory cues 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 than native fish in recognizing chemical cues indicating predation risk • (Specific 1) To check whether invasive fish species are responsive to a larger number of cue types indicating predation risk • (Specific 2) To check whether invasive species are more sensitive to cues indicating predation risk. <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 invasive fish species have an advantage over native species in minimizing predation risk in their introduced range through chemical communication. This makes a highly valuable contribution to the current knowledge on mechanisms underlying successful colonization of new environments by the species. Several invasive species as well as their native counterparts from the same prey guild will be used as a model. 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). The project consists of controlled lab experiments. We will test behavioural and physiological responses of the prey fish to various chemical stimuli indicating predation risk, associated with pre-attack (disturbance cue, kairomone) and post-attack (damage-released alarm cue, dietary alarm cue).</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

Ferrari, M. C., Wisenden, B. D., & Chivers, D. P. (2010). Chemical ecology of predator-prey interactions in aquatic ecosystems: a review and prospectus. *Canadian Journal of Zoology*, 88(7), 698-724.

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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Proponowani promotorzy i mentorzy/prospective supervisors

1) promotor główny/ main supervisor

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2) promotor pomocniczy / co-supervisor

Dr Łukasz Jermacz