

School of Doctoral Studies in Biological Sciences
University of South Bohemia in České Budějovice
Faculty of Science

Species-specific schooling behaviour of fish in the freshwater pelagic habitat: an observational study

RNDr. Thesis
Mgr. Michaela Holubová

České Budějovice
2020

Holubová, M. 2020. Species-specific schooling behaviour of fish in the freshwater pelagic habitat: an observational study. RNDr. Thesis - 11 p. Faculty of Science, University of South Bohemia in České Budějovice, CzechRepublic.

Annotation

This study handles the problematics of schooling behaviour in the pelagic habitat of a temperate freshwater reservoir by the means of underwater visual survey via underwater camera. UVC proved to be a great tool for obtaining behavioural patterns which are rather poorly studied in the pelagic zone. Four species were identified as school forming. Naturally, schooling tendency varied in between species mostly due to proneness to predation, increasing with vulnerability to a predator. Heterospecific schools were quite common, particularly in vulnerable species sharing a space and food niche with species less attractive to predators.

Declaration [in Czech]

Prohlašuji, že svoji rigorózní práci jsem vypracoval/a samostatně pouze s použitím pramenů a literatury uvedených v seznamu citované literatury.

Prohlašuji, že v souladu s § 47b zákona č. 111/1998 Sb. v platném znění souhlasím se zveřejněním své rigorózní práce, a to [v nezkrácené podobě – v úpravě vzniklé vypuštěním vyznačených částí archivovaných Přírodovědeckou fakultou] elektronickou cestou ve veřejně přístupné části databáze STAG provozované Jihočeskou univerzitou v Českých Budějovicích na jejích internetových stránkách, a to se zachováním mého autorského práva k odevzdanému textu této kvalifikační práce. Souhlasím dále s tím, aby toutéž elektronickou cestou byly v souladu s uvedeným ustanovením zákona č. 111/1998 Sb. zveřejněny posudky školitele a oponentů práce i záznam o průběhu a výsledku obhajoby kvalifikační práce. Rovněž souhlasím s porovnáním textu mé kvalifikační práce s databází kvalifikačních prací Theses.cz provozovanou Národním registrem vysokoškolských kvalifikačních prací a systémem na odhalování plagiátů.

V Českých Budějovicích 29.6.2020

Mgr. Michaela Holubová

Author agreement

The thesis is based on the paper:

Michaela Holubová, Petr Blabolil, Martin Čech, Mojmír Vašek, Jiří Peterka. Species-specific schooling behaviour of fish in the freshwater pelagic habitat: an observational study. *Journal of Fish Biology*, 2020, 1-11 DOI: 10.1111/jfb.14326, Impact Factor: 2.038, 5-Year Impact Factor: 1.924.

I, the undersigned, declare that Michaela Holubová had a major contribution to the article. She participated at collection of data in field, conducted the statistical analyses, contributed significantly to the interpretation of the results and made major contribution to the text of the manuscript.

RNDr. Jiří Peterka, Ph.D.

Michaela Holubová, Petr Blabolil, Martin Čech, Mojmír Vašek, Jiří Peterka.

Full title: Species-specific schooling behaviour of fish in the freshwater pelagic habitat: an observational study.

ABSTRACT

Social living of animals is a broadly occurring phenomenon, although poorly studied in freshwater systems, fish schooling behaviour is an excellent example. The composition of fish schools, species-specific schooling tendencies and preferences of adult fish were studied in the pelagic habitat of the Římov Reservoir, Czech Republic. Video recordings captured over a total of 34 days (16 h per day) in the clear water period of three seasons were analysed. From four species identified as school-forming species – bream, bleak, roach and perch, 40% of the individuals observed formed schools of 3–36 individuals. Although conspecific schools prevailed, 20% of individuals formed heterospecific schools, except bleak that schooled strictly with conspecifics. Schools were composed of individuals of similar body size and life strategy. Heterospecific schools were significantly larger than conspecific schools and showed uneven proportion among species, that is, one species being more abundant when the school dimension increased. Probability of encounter in bleak was lowest and proved highest inclination for schooling. Gregarianism levels depended on species morphology and body size, with larger and morphologically advanced fish tending less to sociability. This indicates that the antipredator function of schooling behaviour is intensified with increasing vulnerability of the species.

The thesis cannot be presented here in its full version due to copyright issues. The article has been published in Journal of Fish Biology. The full thesis is also available at University of South Bohemia in České Budějovice, Faculty of Science.