ARPHA Conference Abstracts 8: e179320
doi: 10.3897/aca.8.e179320

OPEN ACCESS

Conference Abstract

A comparative study of pelagic and benthic resource use by invasive gibel carp (*Carassius gibelio*) and native crucian carp (*Carassius carassius*)

Yevdokiia Stepanyshyna[‡,§], Kiran Thomas[‡,§], Pankaj Avinash Gorule[‡], Marek Šmejkal[‡]

‡ Institute of Hydrobiology,Biology Centre of the Czech Academy of Sciences, České Budějovice, Czech Republic
§ Faculty of Sciences, University of South Bohemia, České Budějovice, Czech Republic

Corresponding author: Yevdokiia Stepanyshyna (yevdokiia.stepanyshyna@hbu.cas.cz)

Received: 21 Nov 2025 | Published: 30 Dec 2025

Citation: Stepanyshyna Y, Thomas K, Gorule P, Šmejkal M (2025) A comparative study of pelagic and benthic resource use by invasive gibel carp (*Carassius gibelio*) and native crucian carp (*Carassius carassius*). ARPHA Conference Abstracts 8: e179320. https://doi.org/10.3897/aca.8.e179320

Abstract

The efficient exploitation of available food resources is important for the prosperity and survival of any species. It influences not only growth and reproduction, but also the competitiveness of a species in the ecosystem. The native crucian carp (*Carassius carassius*) is currently considered critically endangered in the Czech Republic, primarily due to competitive pressure from the invasive gibel carp (*Carassius gibelio*). The underlying mechanisms driving this strong interspecific interaction are still poorly understood. This study explores differences in pelagic and benthic foraging between these two species under contrasting environmental conditions (clear vs. turbid water), using controlled laboratory experiments. To identify species-specific differences in foraging efficiency as determined by prey type and size, we conducted manipulative predation experiments using model prey organisms consisting of two size classes of Daphnia galeata and larvae of *Chironomus plumosus*. The results demonstrated that gibel carp exhibited significantly higher prey capture rates than native crucian carp in both pelagic and benthic prey types, suggesting a greater potential to exploit and successfully utilize available food resources. The invasive gibel carp also displayed higher levels of activity and boldness, supporting its propensity for more aggressive

© Stepanyshyna Y et al. This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

exploitation of the environment. Such superior foraging efficiency of invasive gibel carp may be a major factor contributing to the decline of crucian carp populations in small water bodies where both species co-occur.

Keywords

interspecific competition, competitive exclusion, invasive alien species, biodiversity conservation, resource competition

Presenting author

Yevdokiia Stepanyshyna

Presented at

International Conference: "The Fish of Muddy Waters"

Funding program

The study was supported by project Interreg Austria-Czechia 2021–2027 [ATCZ00180 – Living Treasures].

Conflicts of interest

The authors have declared that no competing interests exist.