THE NEGATIVE IMPACTS AND MONITORING OF INVASIVE TOPMOUTH GUDGEON IN CARP AQUACULTURE PONDS

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RESEARCH BACKGROUND

Invasive species such as topmouth gudgeon (*Pseudorabora parva*) pose a significant threat to the fishpond ecosystems that, through direct and indirect effects, could negatively affect pond ecosystem functioning and, ultimately, fish production.

The expansion and distribution of invasive species are rapid and often unpredictable; therefore, early detection is crucial to prevent further ecosystem destruction and distribution of such species.

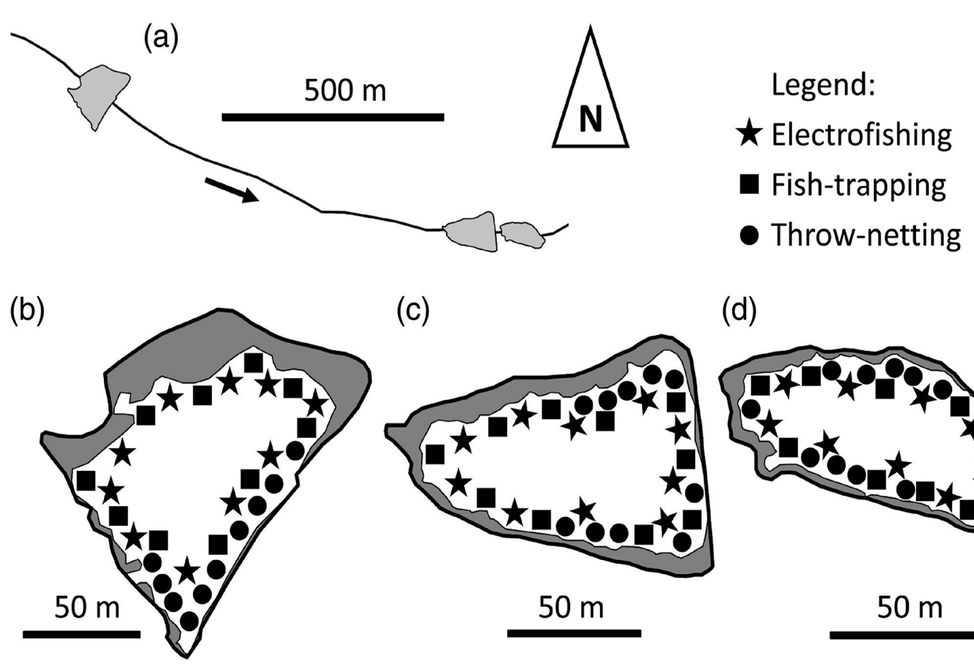
RESEARCH OBJECTIVES

The presented study aimed to (1) assess the impact of topmouth gudgeon on common carp (*Cyprinus carpio*) production and pond functioning and (2) find the most comprehensive sampling methods for population monitoring of this invasive species in ponds.

MATERIAL AND METHODS

The study was conducted in South Bohemia (Czechia) in six ponds (approx. depth of 1m; approx. pond area 1 ha). Three ponds were stocked only with common carp (control), and three (experimental) ponds had both common carp and topmouth gudgeon. Monthly sampling from March to September 2020 focused on zoobenthos, zooplankton, environmental factors, and fish.

Alongside, three methods for population monitoring were tested, electrofishing, fish-trapping and throw-netting, to detect the invasive topmouth gudgeon.

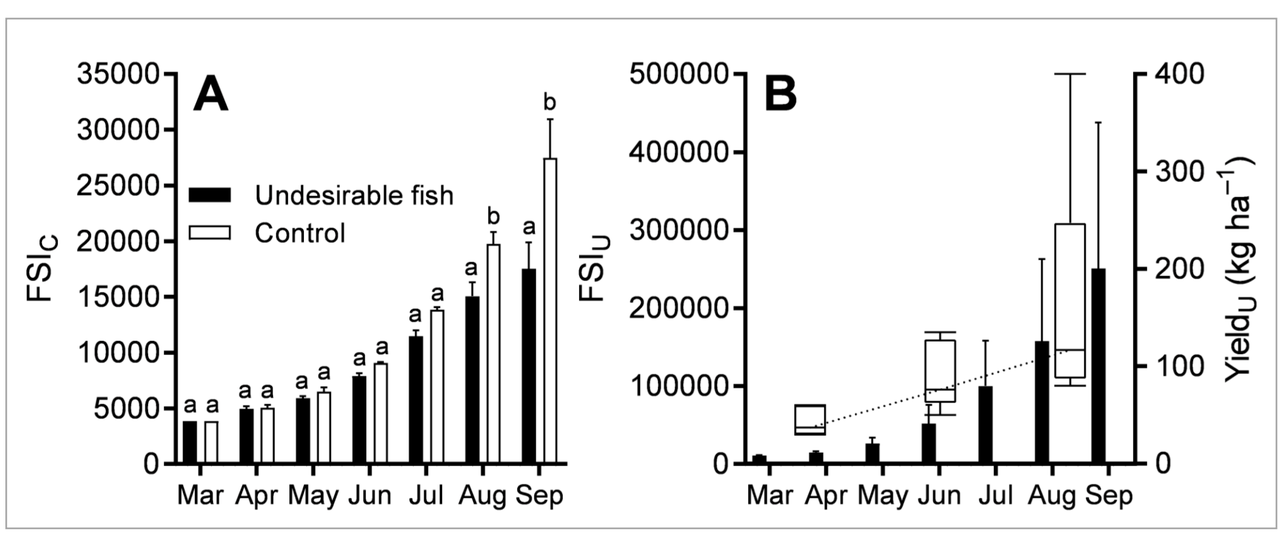


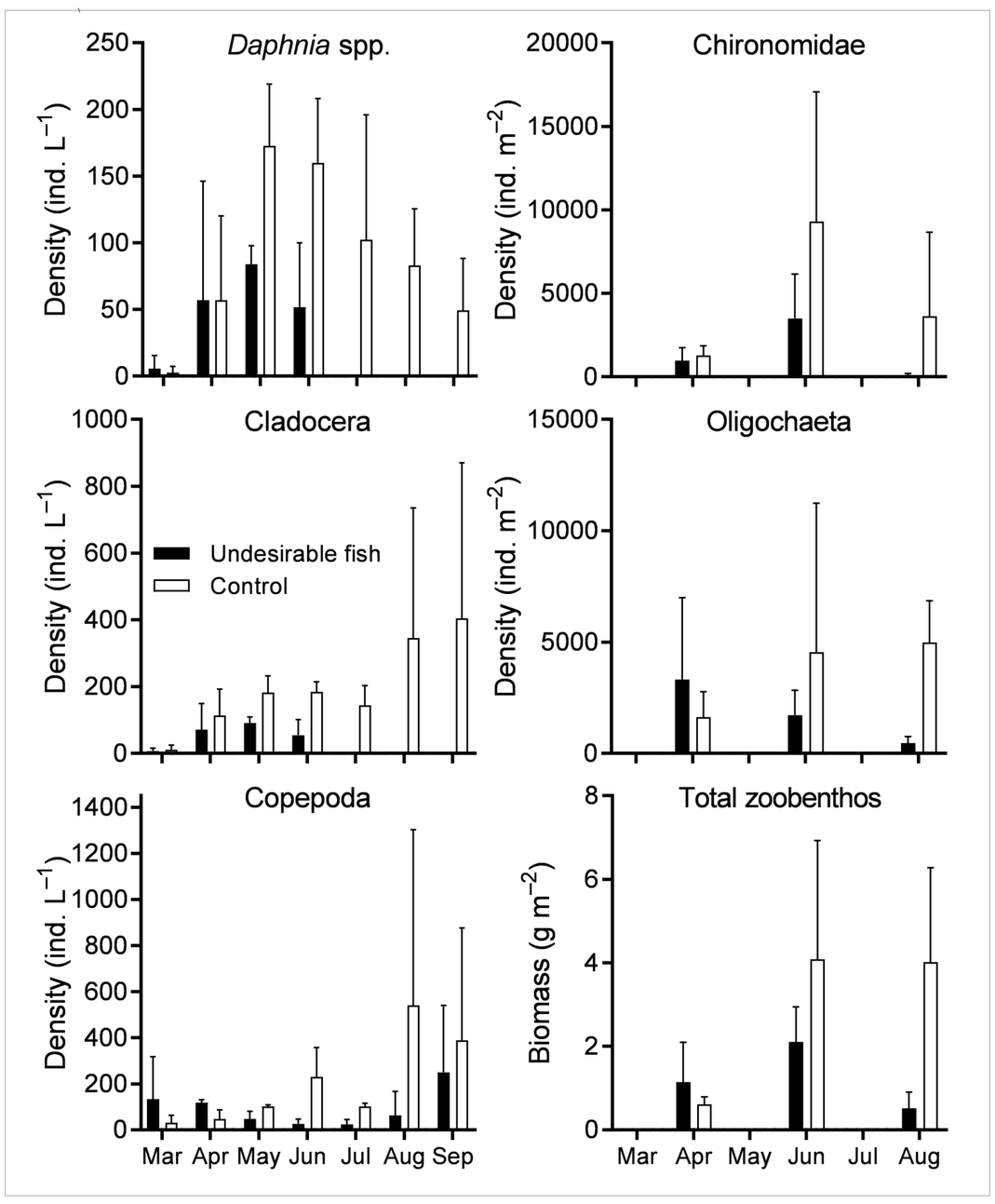
RESULTS AND DISCUSSION

Topmouth gudgeon had **a strong negative impact** on the production of common carp.

In ponds with topmouth gudgeon, common carp had an average final weight of **740 ± 128 g**, compared to **1125 ± 144 g** in ponds without it.

Topmouth gudgeon demonstrated a heavy top-down effect on planktonic crustaceans, especially large *Daphnia* spp., contributing to impaired carp growth and increased zoobenthos consumption.





All monitoring methods detected the presence of topmouth gudgeon, but **fish trapping proved to be the most accurate**. The other two methods, throw-netting and electrofishing, gave biased size distributions and underestimated density.