

Evaluation of biomass and abundance of Percids species using electrofishing, gill netting, seining, trawling, and environmental metabarcoding (eDNA) in three reservoirs

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Introduction

The aim of this study was comparison in biomass and abundance of caught or detected perch species between conventional and eDNA sampling methods within three reservoirs in the Czech Republic.

Materials and Methods

Traditional fish sampling was conducted during summer using gill nets, day and night electrofishing (DE and NE), fry seine nets at day and night (DFS and NFS), and trawls (FT). Benthic and pelagic gillnets with 12 mesh (hereafter standard benthic (SBG) and pelagic gillnets (SPG) and additional gillnets with 70-, 90-, 110-, and 135-mm mesh (hereafter benthic (LBG) and pelagic (LPG) large-mesh gillnets) were used. To follow the eDNA data consistency, the some species determined by the traditional methods were merged into two species pairs such as *Perca fluviatilis*+*Sander lucioperca*.

Discussion

In natural lakes of temperate Europe, habitat generalists such as perch, ruffe, roach, bream and bleak have been found to be the most frequent and abundant species (Argillier et al., 2013). In study of Vasek et al., 2016, they found that perch biomass and its relative importance were higher in deep, less productive, downstream sites.

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References

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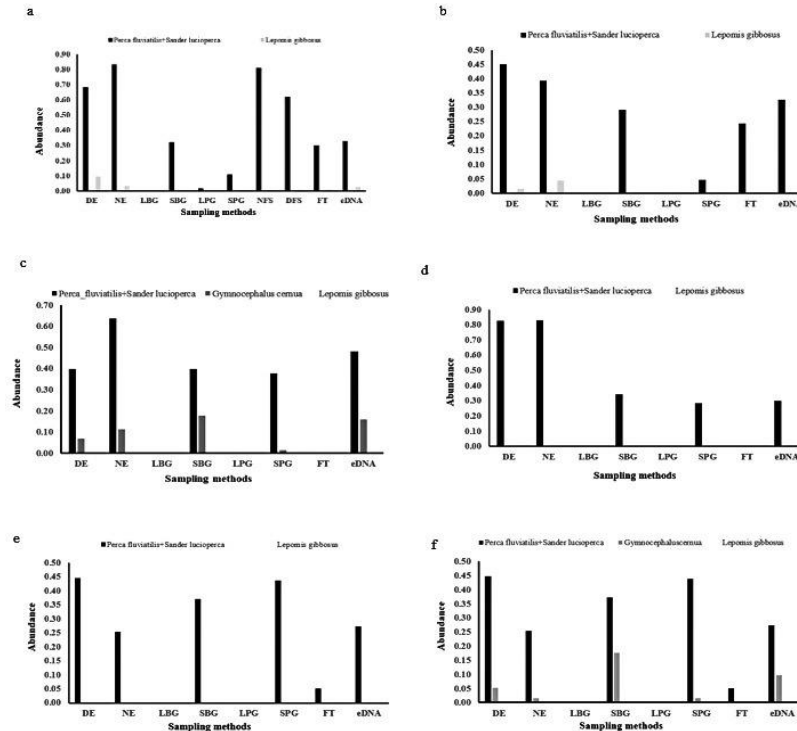


Fig 2. Changes in the abundance (mean CPUE) in the perch species caught or detected in conventional and eDNA sampling methods of the three reservoirs. DE= day electrofishing, NE= night electrofishing, SBG= standard benthic gillnets, SPG= standard pelagic gillnets, LBG= large mesh-size benthic gillnets, LPG= large mesh-size pelagic gillnet, NAS= night-time adult seining, DFS= day-time fry seining, NFS= night-time fry seining, and FT= fry trawl and eDNA.

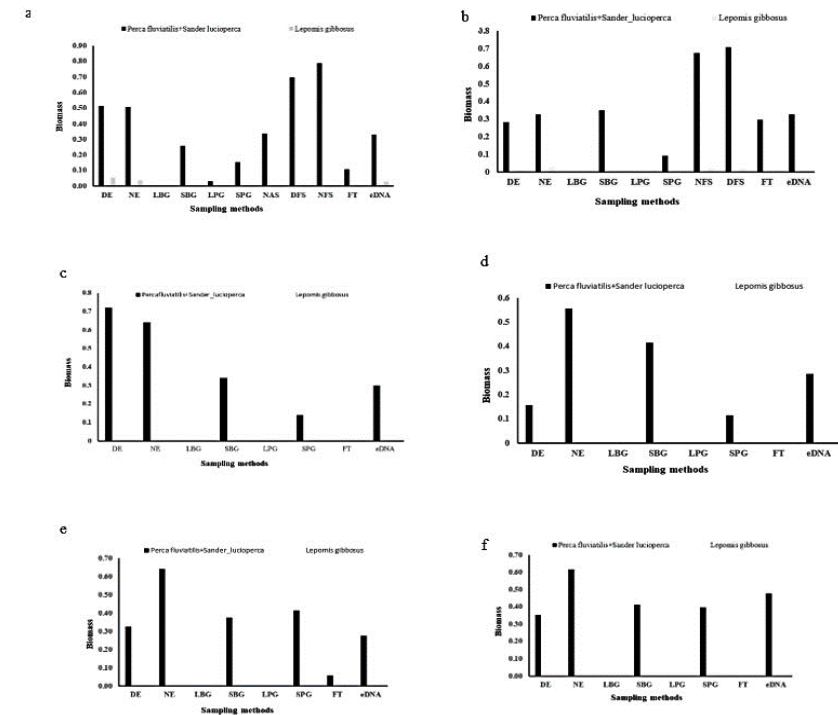


Fig 1. Changes in the biomass (mean BPUE) in the perch species caught or detected in conventional and eDNA sampling methods of the three reservoirs. DE= day electrofishing, NE= night electrofishing, SBG= standard benthic gillnets, SPG= standard pelagic gillnets, LBG= large mesh-size benthic gillnets, LPG= large mesh-size pelagic gillnet, NAS= night-time adult seining, DFS= day-time fry seining, NFS= night-time fry seining, and FT= fry trawl and eDNA.

Results

In Římov reservoir, the highest biomass of *Perca fluviatilis*+*Sander lucioperca* was obtained with NFS and DFS sampling in 2018 and 2019, respectively. The highest biomass of *Perca fluviatilis*+*Sander lucioperca* in the Klíčava reservoir was observed with DE and NE in the 2018 and 2019 sampling times in summer. In the Žlutice reservoir, the highest biomass of *Perca fluviatilis*+*Sander lucioperca* was found using the NE and eDNA methods. Abundance of *Perca fluviatilis*+*Sander lucioperca* was higher in 2018 sampling of Římov Reservoir in NE and NFS, while this trend was higher in 2019 sampling in DE and NFS methods.