



Conference Abstract

Quantitative eDNA estimates show a strong correlation with Northern Pike biomass in a controlled environment

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Abstract

Northern pike, *Esox Lucius*, is one of the most important species for recreational fisheries in Sweden and as a top-predator; it holds an important role in the food web. Despite its ecological and socioeconomic significance, pike is largely neglected in current monitoring programs because it is seldom caught by conventional monitoring methods. As a result, there is not sufficient data for management authorities to employ biologically justified management strategies. To be able to further understand pike ecology and monitor populations, new monitoring methods are needed. Recent developments in environmental DNA (eDNA) has shown the potential to produce (semi-)quantitative estimates of fish biomass. However, the amount of eDNA in water may vary depending on temperature, fish size, age and density, and it is therefore important to first evaluate the effect of biotic and abiotic factors on eDNA biomass relationships. Here, we evaluated the relationship between eDNA concentration and individual biomass of pike by keeping adult fish of varying size (0.75 – 3.41 kg, n = 11) individually in outdoor mesocosms (~7000 L) filled with water from the adjacent Lake Mälaren. Samples were collected by filtering water through a combination of cellulose nitrate and glass microfiber filter membranes. After a comparison of different extraction methods, the eDNA was extracted using Chelex 100 resin, a low-cost and fast method. Samples were subsequently diluted in 1:8 to alleviate

problems from inhibition. A TaqMan assay targeting Cytochrome Oxidase I developed by Olsen et al.(Olsen et al., 2016, 2015) was used to quantify pike eDNA. The results show a strong positive relationship between pike biomass and pike eDNA indicating that the latter represents a promising tool for estimating pike biomass in natural waters.

References:

Olsen, J.B., Lewis, C.J., Massengill, R.L., Dunker, K.J., Wenburg, J.K., 2016. Erratum to: An evaluation of target specificity and sensitivity of three qPCR assay for detecting environmental DNA from Northern Pike (*Esox lucius*). *Conservation Genetics Resources* 8.

Olsen, J.B., Lewis, C.J., Massengill, R.L., Dunker, K.J., Wenburg, J.K., 2015. An evaluation of target specificity and sensitivity of three qPCR assays for detecting environmental DNA from Northern Pike (*Esox lucius*). *Conservation Genetics Resources* 7.

Keywords

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