



Conference Abstract

# Applicability of DNA-based identifications for the WFD-guided monitoring using macroinvertebrates: a large-scale DNA metabarcoding study for implementing routine ecological status assessments in Iberian rivers

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## Abstract

Over the last decade, remarkable improvements have been made in the field of metabarcoding-based tools for routine ecological status assessments. However, important issues are yet to be solved to fulfil the European Water Framework Directive (WFD) requirements and standards. These limitations, which include problems related to e.g. the lack of a complete COI macroinvertebrate barcode database available for the Iberian Peninsula Murria 2020, or the scarce recovery of specific taxa due to DNA extraction and/or PCR amplification bias, are especially difficult to overcome for routine freshwater macroinvertebrate monitoring. For that purpose, a large-scale study is on going to test how metabarcoding data can infer existing macroinvertebrate morphotaxonomy-based biotic indexes and ecological status of Iberian rivers. Freshwater macroinvertebrates were selected as a Biological Quality Element and identified by using both morphological and

metabarcoding approaches. The mitochondrial gene for cytochrome c oxidase subunit I (COI) was used as a DNA Barcode. Taxonomic coverage, taxonomic composition metrics and ecological status obtained from both approaches were analysed. Physical and chemical variables obtained during the routine biomonitoring, as well as other ecological parameters including biodiversity indexes, were also assessed. Multivariate data analysis of these environmental and biotic data obtained from both approaches were compared. Results seem to support the hypothesis Kuntke 2019 that the DNA-metabarcoding approach might deliver similar quality assessments results to the morphological approach, though some refinement must be done at the different steps of the process prior to establish a reliable procedure allowing the alternative use of both methods giving similar results for the ecological status classes marked by the WFD.

## Keywords

DNA-metabarcoding; Benthic macroinvertebrates; COI; Biomonitoring; European Water Framework Directive (WFD); Taxonomic coverage; Taxonomic composition metrics; Ecological status.

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