



Conference Abstract

# How many Non-Indigenous Species occurring in the Mediterranean Sea can actually be identified through environmental DNA? A gap analysis of NIS DNA barcodes in the reference libraries

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## Abstract

The Mediterranean Sea is known for hosting a high diversity of species, with more than 17,000 reported marine species, one fifth which are endemic. Moreover, the number of non-indigenous species (NIS) in the Mediterranean Sea is recently reported to be increasing. The monitoring and the distribution of NIS is a key requirement for the conservation and management of the ecosystems, as also foreseen by the regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species. A promising innovative approach for the identification of species and biodiversity is the use of molecular tools (DNA barcoding and metabarcoding). Combined with environmental DNA (eDNA) extracted from environmental samples like water or sediment, traces of species can be identified. Currently, the main limitation in the use of molecular tools (DNA barcoding and metabarcoding, eDNA) for species identification is the incompleteness of the DNA barcode reference databases. We assessed the extent of gaps in DNA barcode reference libraries, using the most updated inventory of 666 confirmed alien species

occurring in the Mediterranean Sea. Also, the availability of primers for the amplification process was investigated. 32.58% of these species lack DNA barcodes in the reference libraries. Also, 70% of the retrieved NIS in the DNA barcode libraries lack the public availability of the primers used for the amplification process.

The results of this study allow us to direct scientific efforts towards specific taxonomic groups in order to complete the NIS DNA barcode reference libraries and enable effective application of eDNA in investigations of the occurrence and the distribution of NIS in the Mediterranean Sea, and in the first sighting of still unknown NIS.

## **Keywords**

Gap Analysis, DNA metabarcoding, DNA Barcode, Environmental DNA, eDNA, Molecular Tools, Non-Indigenous Species, NIS, Mediterranean Sea, Biomonitoring.

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