



Barcoding for species assignment in commercial marine fish in Senegal: Interest for ecological research and fisheries management in West Africa

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Abstract

Species identification is central to the development of sound fisheries management, and this effort can be supported by molecular techniques. Barcoding approaches are based on short diagnostic sequences of DNA that offer a simple, rapid and inexpensive means for species assignment. It can assist fisheries management by improving the knowledge in multiple aspects, which include e.g. quotas monitoring, bycatch, recruitment and ecological relationships. We analyzed eight commercially exploited fish species caught during the ECOAO scientific survey carried out off the South coast of Senegal (*Caranx rhonchus*, *Engraulis encrasicolus*, *Pagellus bellottii*, *Pomadasys jubelini*, *Pomatomus saltatrix*, *Sardina pilchardus*, *Sphyræna guachancho* and *Trachurus trachurus*). We extracted the DNA and sequenced the cytochrome 'b' gene for all specimens, and compared the results to all publicly available data for these genera. To explore potential cases of cryptic species or taxonomic ambiguities, we used the GMYC algorithm (General Mixed Yule Coalescent Model) that uses genetic data to delimit independently evolving lineages (e.g. distinct species). In most cases, the results showed an assignment to the correct species (e.g. *E. encrasicolus*, *P. bellottii*, *P. saltatrix*, *S. pilchardus*). However, we identified cases of misidentification (i.e. *Trachurus trachurus* vs. *T. trecae*), and cases of ambiguities (*Pomadasys jubelini* vs. *P. perotaei*), suggesting the need for taxonomic assessment. Finally, we detected some potential cases of cryptic species along the West coast of Africa (e.g. *Caranx rhonchus*, *P. saltatrix*). Finally, we found one case of overestimation of the number of species (e.g. *Sphyræna* spp.). This first survey applied to Senegal commercial fish shows that barcoding approaches can represent a powerful tool for species assignment. This illustrates the utility of DNA barcoding in biodiversity assessment as well as for traceability of fishing product exported outside Senegal.

Keywords: Genetics, biodiversity, DNA, GMYC algorithm, taxonomic assessment, Senegal.



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