

Abstract

Hybridization as an Emerging Threat to Iberian Freshwater Ichthyofauna[†]

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Abstract

In the Iberian Peninsula, the rapid expansion of the invasive species *Alburnus alburnus* (bleak) has intensified its contact with several endemic cyprinid species, raising concerns about hybridization, introgression, and the loss of genetic diversity. Despite increasing evidence of hybridization, data remain limited for many Iberian River basins, where endemic species persist in fragmented and vulnerable habitats. The aim of this study is to assess the extent and spatial distribution of hybridization between the bleak and the following native cyprinid species, *Anaecypris hispanica* (jarabugo), *Iberochondrostoma lemmingii* (pardilla), *Pseudochondrostoma willkommii* (Guadiana nase), and *Squalius alburnoides* (calandino), across several rivers within the Guadalquivir Basin. To this end, Sanger sequencing will be performed on the mitochondrial cytochrome *b* gene (maternal lineage; approximately 1000 base pairs (bp)) and the nuclear β -actin gene (paternal lineage; approximately 950 bp) from individuals of all endemic species and the bleak. Parental species and putative hybrids were initially identified in the field using diagnostic morphological and meristic characters, including number of rays in the anal fin morphology, mouth position, and the number of lateral line scales. Molecular analyses will include haplotype network reconstruction and phylogenetic tree inference to evaluate relationships among individuals from different species and to assess lineage divergence. The results will allow us to: (1) detect hybrids between the bleak and endemic cyprinids, (2) identify hybridization events among endemic cyprinid species, and (3) evaluate the correspondence between diagnostic morphological and meristic traits and the molecular identification of hybrid individuals. Overall, these findings will provide key information for the conservation management of endangered Iberian freshwater fishes in the context of invasive species expansion and global change.

Keywords: intergeneric hybrids; invasive species; bleak; native freshwater fish



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