



Abstract

# Contribution to the Conservation Genetics of an Endangered Fish, Endemic to the Spanish Mediterranean Coast: The Spanish Toothcarp, *Apricaphanius iberus* (Valenciennes, 1846) †

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**Abstract:** The Spanish toothcarp, *Apricaphanius iberus* (Valenciennes, 1846), is a small, endangered fish species, endemic to the coastal waters, interior lakes and salt marshes of the Spanish Mediterranean coast. Anthropogenic-driven factors such as agricultural exploitation and urbanization have progressively degraded its natural habitats, fragmentating its populations and driving the Spanish toothcarp to the brink of extinction. In this study, we aimed to improve our understanding of the Spanish toothcarp's genetic diversity and population structure using single-nucleotide polymorphisms (SNPs) to conduct a genetic analysis of 101 individuals from 12 of its populations along the Mediterranean coast of the Iberian Peninsula. We analyzed the phylogenetic relationships and genetic structure of its populations, as well as their migration rates. Our results showed that the genetic diversity values were similar and relatively moderate across populations, except the northernmost population, Aiguamolls (Girona), which was the most genetically differentiated, although the individuals belonging to this population presented the lowest amount of genetic differentiation among each other. Significant migration was not detected and  $F_{ST}$  values were fairly high between populations, indicating levels of differentiation and genetic isolation that were attributable to fragmentation. One of the northernmost populations, Albuixech (Valencia), and the southernmost population, Adra (Almería), comprised a sister group, possibly indicating Adra's factitious origin. The results from our study enabled us to define eight Operational Conservation Units (OCUs) that should be implemented into current and future conservation programs aimed at keeping the Spanish toothcarp from disappearing completely from the wild.

**Keywords:** *Apricaphanius iberus*; endangered species; conservation genetics; fragmented populations; single nucleotide polymorphisms (SNPs); Operational Conservation Units (OCUs)



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