



Abstract

Genetic Structure and Diversity of Brown Trout (*Salmo trutta* L.) in Portugal [†]

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Abstract: Population genetic studies have been extensively used as tools for the management and conservation of salmonid species and related habitats. The brown trout, *Salmo trutta* (Linnaeus 1758), is one of the most studied species within its family, and is frequently used as a population model. It can have a highly complex and variable life history, often presenting a migratory ecotype (i.e., sea trout), and it is considered an indicator of the quality of aquatic ecosystems. Moreover, it has a high socioeconomic value for commercial and recreational fishing. The destruction or alteration of aquatic habitats, over-exploitation, exotic species and climate change are some of the factors that threaten the sustainability of the species in Portugal. To analyse the genetic structure, gene flow and connectivity patterns among Portuguese brown trout populations, we sampled approximately 392 individuals from 15 sites across the distribution of the species in its national territory. DNA fingerprinting methodologies were carried out to determine the structural differences between populations, using a set of microsatellite loci developed for salmonids. The overall results suggest significant genetic differences between the populations sampled. This study has enabled a breakthrough in understanding the genetic structure of *Salmo trutta* populations in the southern limit of the species' global distribution, assessing the impact of natural and human factors on the genetic structure of its populations, and consequently developing mitigation measures for the effective management and conservation of the species.

Keywords: brown trout; microsatellites; genetic structure; management and conservation



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