

GENETIC CHARACTERIZATION OF FISH POPULATIONS AND ITS USE IN LANDSCAPE CONSERVATION IN BOSNIA AND HERZEGOVINA

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Summary

Several years ago a proposal was made to construct hydropower plant with accompanying dam on Neretva river. The proposal gained financial and political support and strong opposition from local citizens' organisations which demand alternative solutions. The results of genetic characterisation of brown trout populations from Neretva and its tributaries gives additional weight to the demands for conservation of this area.

Keywords

brown trout, microsatellite, *mtDNA*, Neretva Canyon, autochthonous populations

Contribution

River Neretva with its tributaries is the largest and most diverse water system belonging to Adriatic Drainage. It provides habitat for large and diverse population of brown trout *Salmo trutta m. fario* L. as well as two salmonid species indigenous in Adriatic drainage only: *Salmo marmoratus* Cuvier and *Salmothymus obtusirostris oxyrhynchus* Heckel [1]. Construction of hydropower plant with accompanying dam on Neretva, which was proposed several years ago, gained strong support in financial and political circles. It would seriously reduce survival chances of these, already vulnerable populations. Beautiful and diversity rich Canyon of Neretva would be obliterated. Local non-governmental organizations supported by scientific community are fighting for preservation of this area.

Brown trout (*Salmo trutta m. fario* L.) is probably the best studied freshwater species in Neretva over the past century. Morphological markers pointed at specific characteristics of local populations. Indigenous gene pool has seriously been threatened over the decades due to stocking with material of foreign origin. Due to geographical pattern it is strongly believed that isolated and uncompromised populations of brown trout may be found in the upper flow of Neretva's tributaries. Molecular markers were applied in an effort to identify uncompromised populations of brown trout and use them for establishment of autochthonous breeding stock [2].

We applied PCR-RFLP of mitochondrial genes ND1 and ND5/6 and three microsatellite loci (Str15, Str543 i Str85) in breeding stocks from three fish farms located in Neretva and four wild populations from Neretva and its tributaries Krupac, Rakitnica and Ljuta [3,4]. Comparative analysis was used in estimation of purity level of wild populations. Dominance of certain microsatellite alleles is pronounced as well as loss of variation in ND5/6 and ND1 regions in wild populations. Also, significant loss of heterozygosity was noted [5,6].

The results of our research strengthen the position of the organizations that demand alternative solution to the construction of dam. In addition, after the first genetic testing of fish farms breeding stocks in 2003 confirmed earlier hypotheses on their allochthonous origin, a

new Law on freshwater fisheries was adopted, which includes provision on obligatory genetic control of material provided for stocking.

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