



Association of genetic polymorphism in growth related gene with body weight and length in farm populations of rainbow trout (*Oncorhynchus mykiss*)

Nazari S.^{1*}; Pourkazemi M.²; Najjar Lashgari S.³; Sepahdari A.²

1-Shahid Motahary Cold-water Fishes Genetic and Breeding Research Center, Iranian Fisheries Sciences Research Institute, Agricultural Research, Education and Extension Organization (AREEO), Yasouj, Iran

2-Iranian Fisheries Sciences Research Institute (IFSRI), Agricultural Research, Education and Extension Organization (AREEO), Tehran, Iran

3-Cold-water Fishes Research Center, Iranian Fisheries Sciences Research Institute, Agricultural Research, Education and Extension Organization (AREEO), Tonekabon, Iran

*Corresponding author's email: sajadnazari13@gmail.com

Abstract:

The polymorphism of growth hormone receptor (GHR) gene as a candidate gene for quantitative traits in the rainbow trout (*Oncorhynchus mykiss*) was investigated and genetic association studies between GHR polymorphisms with quantitative traits were performed. In total, 350 bloodstocks of rainbow trout from six farms including three provinces were selected and tagged and then were raised at the ponds. Genome extracted based on standard method and then individuals randomly selected for molecular analysis. Statistical analyses including linkage disequilibrium (LD), association between genotypes and four quantitative traits including body weight (BW), total length (TL) body length (BL) and body height (BH) were conducted using General Linear Model (GLM) with software SPSS 21.0. Two single nucleotide polymorphisms (SNPs: $T>C$; $C>A$) in intron 2 and 3 regions of the GHR gene in rainbow trout were determined by DNA sequence analyzing and PCR-SSCP techniques. The assessment results demonstrated that these two SNPs are synonymous. In addition, association test implied that the haplotypes of SNPs are not related with the length and body weight ($P>0.05$), and no statistically significant association was detected between the SNP and growth trait parameters.

Keywords: growth hormone receptor (GHR) gene, *Oncorhynchus mykiss*, Single Nucleotide Polymorphism (SNP), growth trait, Marker assisted selection