

Abstract

The study focus on the molecular taxonomy and morphometrical diversity of Rainbow Trout (*Oncorhynchus mykiss*) and Brown Trout (*Salmo trutta*) in Swat River and the local ponds in Khyber Pakhtunkhwa, Pakistan. Sixteen trout (8 wild, 8 farmed) were subjected to the measurement of the main morphometric parameters such as Total Length (TL), Body Depth (BD) and Total weight (TW). Statistical variations were found wherein the farmed trout were smaller than the wild trout. Genetic analysis was done by extraction of DNA followed by the amplification of the COI and cyt-b genes through PCR. The initial findings indicate that there is a significant genetic difference among trout populations. In this study, genetic and morphometric analysis is recommended in the context of sustainable aquaculture and conservation of trout species in Pakistan. Future studies will include genetic sequencing and phylogenetic study to improve identification of species and knowledge on genetic diversity.