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Study of genetic variation in populations of *Coptodon zilliii, Oreochromis aureus, and Oreochromis niloticus* in two areas South of Iraq, in Khaur Abdallah and Shatt Al-Arab Mitochondrial Cytochrome b Gene Analysis

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Abstract

This study has a specific goal in mind: Genetic Variation Study Within Populations of *Coptodon zilliii, Oreochromis aureus, and Oreochromis niloticus,* and analysed the partial Cytb gene sequence of mtDNA to determine genetic diversity among these species in the Khaur Abdallah and Shatt Al-Arab in the south of Iraq, where the mitochondrial cytochrome b gene was used. DNA was isolated from 40 specimens of the three species collected from two different sites and examined. The gene size for *Coptodon zilliii,* Oreochromis aureus, and *Oreochromis niloticus* was (439, 326 & 473 bp long (amplified Cytb gene)), respectively. The study found that two haplotypes in Khaur Abdallah and one in the Shatt-Al-Arab river in *Coptodon zilliii* populations, while was found one haplotype in Khaur Abdallah and one in the Shatt-Al-Arab in both *Oreochromis aureus*, and *Oreochromis niloticus* populations by using Software DnaSP v5.1. In each of the species *Oreochromis aureus* and *Oreochromis niloticus*, the research identified two types of unique haplotypes, one in Khaur Abdallah and the other in Shatt-Al-Arab. However, three haplotype patterns for *Coptodon zilliii* populations were discovered: one in the Shatt al-Arab River and two in Khaur Abdallah. Low nucleotide (π) and haplotype diversity (Hd) values were found in both *Oreochromis aureus* and *Oreochromis niloticus* populations in the Shatt Al-Arab river and Khaur Abdallah, indicating low genetic variation among populations for both species in the two regions. However, there was no diversity within the *Oreochromis aureus* population in both Shatt Al-Arab and Khaur Abdallah. The population of *Oreochromis niloticus* has the same indication. Three haplotypes for *Coptodon zilliii* indicate to genetic variance across populations in the Shatt Al-Arab river and Khaur Abdallah regions, although no variety within the *Coptodon zilliii* species was found in the Shatt Al-Arab river. In the Khaur Abdallah district, there was little genetic diversity among them.

Keywords: allozymes, mtDNA, PCR, population genetics, genetic diversity.