

Original Article

Molecular identification of two tilapia species of the genus *Oreochromis* from Shat Alarab River

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**Abstract:** In the current study, the two species of Tilapia, including *Oreochromis niloticus* and *O. aureus*, collected from Shat Alarab River in the Basrah region, South of Iraq, were identified using the nuclear *sox3* gene to confirm their genetic matching. They have been recorded since 2007 in the middle part of Shat Alarab River, Iraq based on morphometric characters; however, there is no evidence to prove how these two species were introduced into the Iraqi inland waters. After collection, morphological characteristics of specimens, including meristic measurement, were counted to identify the two species. Then, their phylogenetic relationship with other available genes from different geographical regions was constructed using maximum likelihood and neighbor-joining algorithms. The results revealed that both species did not belong to a common ancestor. Furthermore, the results confirmed that *ScanTab* existed in *O. niloticus*, but it was not found in *O. aureus*, showing they are probably not taxonomically related.

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**Introduction**

Tilapia fishes of *Oreochromis niloticus* and *O. aureus* belong to the Cichlidae family and are alien fish in Iraqi inland water. Cichlid fish are tropical and can survive in warm water (Anene, 1998; Radkhah and Eagderi, 2021; Jalili et al., 2022). They can tolerate temperatures around 25-30°C but cannot survive at temperatures less than 13°C (Yousef and Goda, 1996). They were recorded in Iraqi water first in Al Musayib (Saleh, 2007). It was thought these species were accidentally introduced into Iraqi water by fish farmers who brought them from outside Iraq for cultivation. The origin of tilapia is East Africa (Tesfaye et al., 2021), but many species taxa reach 3,000 species distributed in the Middle East, Sri Lanka, Madagascar, and south of India (Snoeks, 2000; Turner et al., 2001). Tilapia has been vastly distributed outside its original geographical area (Philippart et al., 1982). The reproductive strategy of these fish species allowed them to distribute and live successfully in the

water bodies that inhabit them. They are multispawner over the years and nurse their larvae in their mouth to protect them from enemies (King, 1994). *Oreochromis niloticus* is considered a commercial fish in Africa for its use in cultivation farms, and it is the source of protein for many African countries (Durr and Gonzalez, 2002).

Phylogenetic trees of some species belong cichlids were studied; for example, more than thirty tilapia species were investigated using mitochondrial DNA by Nagl et al. (2001) and Klett and Meyer (2002). *Oreochromis* sp. was at the top of the list and was analyzed from the African model (Dunz and Schliewen, 2013). *Oreochromis* species have an evolutionary pattern called adaptive radiations, which means the ability to produce rapid diversity from common ancestors, especially when the organisms are subjected to various environmental pressures. More than 1,650 species are found in the cichlid family (Fishbase, 2023).

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