MOLECULAR GENETIC CHARACTERIZATION OF EGYPTIAN AND SYRIAN TILAPIA FISH

BY

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B.Sc. Agric. Sc. (Animal Production), Teshreen University, 1996

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ABSTRACT

Mahmoud Moalla Ibrahim. Molecular Genetic Characterization of Egyptian and Syrian Tilapia Fish. Unpublished Master of Science Thesis, Department of Genetics, Faculty of Agriculture, Ain Shams University, 2005.

A comparative study for four Tilapia populations (Egyptian *T.zillii* and *O.aureus* populations denoted as E.T.z and E.O.au; Syrian *T.zillii* and *O.aureus* denoted S.T.z and S.O.au, respectively) was carried out. Biochemical and molecular genetic structure of the relevant populations were investigated using SDS-PAGE and RAPD techniques.

A high degree of similarity was detected within each population, and the similarity values were equal to one when calculated from Tris-soluble protein banding patterns, and ranged from 0.71 to 1 based on alcohol-soluble protein banding patterns. These values ranged from 0.82 to 1 when calculated from water-soluble protein banding patterns. A comparative operation between all protein banding patterns revealed the presence of *T.zillii* population-specific protein markers either in case of Tris or alcohol or water-soluble proteins.

The average similarity values among studied populations based on RAPD analysis were: 0.646, 0.229, 0.32, 0.328, 0.222 and 0.338 between each pair of the following populations: S.T.z with E.T.z, S.T.z with S.O.au, S.T.z with E.O.au, E.T.z with S.O.au, E.T.z with E.O.au and S.O.au with E.O.au respectively. The population-specific DNA markers were detected, and the numbers of polymorphic RAPD amplicons (RAPD markers) were: 14, for S.T.z population; 10, for E.T.z population; 23, for S.O.au population and 28, for E.O.au population. Also, species-specific DNA markers were detected, and their numbers were 24 for *T.zillii* species; and 42 for *O. aureus* species.

The data, which was inferred from molecular markers obtained by **RAPD-PCR** were used to calculate the genetic distances, and showed

that *T. zillii* was distantly related from *O.aureus*. Also, the S.T.z and E.T.z had relatively high level of genetic relationships, but S.O.au and E. O.au had a low level of genetic relationships.

The present study revealed that the RAPD technique is a powerful tool in detecting genetic variations.

Key words: Tilapia, Biochemical markers, SDS-PAGE, RAPD-PCR, Polymorphism, Genetic distance.

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