

**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 Unpublished Master of Science Thesis, Department of Genetics, Faculty of Agriculture, Ain Shams University, 2005.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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CONTENTS

Title	page
I. INTRODUCTION.....	1
II. REVIEW OF LITERATURE.....	4
1. Biochemical genetic characterization.....	4
2. Molecular genetic characterization.....	10
III. MATERIALS AND METHODS.....	20
1. Tilapia Populations.....	20
2. Organs sampling.....	20
3. Protein extraction.....	20
4. Protein electrophoresis.....	21
4. 1. Stock solutions.....	21
4. 1. 1. Gel buffers.....	21
4. 1. 1. A -Resolving gel buffer (4x Tris-HCl/SDS, pH 8.8).....	21
4. 1. 1. B -Stacking gel buffer (4x Tris-HCl/SDS, pH 6.8).....	21
4. 1. 2. Acrylamide stock solution (30 %).....	22
4. 1. 3. Ammonium persulfate stock solution (APS 10 % W/V).....	22
4. 1. 4. Sodium dodecyl sulfate stock solution (SDS 10 % W/V).....	22
4. 1. 5. Electrode buffer (Running buffer).....	22
4. 1. 6. Staining solution.....	23
4. 1. 7. Destaining solution.....	23

II

4. 2. Sample buffers.....	23
4. 2. 1. Protein extraction buffer (Tris buffer).....	23
4. 2. 2. Lan's buffer or SDS sample buffer (2X).....	23
4. 3. Gel preparation.....	24
4. 4. Sample application.....	24
4. 5. Electrophoresis conditions.....	25
4. 6. Staining and destaining operation.....	25
5. DNA extraction and purification.....	25
6. Stock solutions.....	26
6. 1. DNA extraction buffer (STE).....	26
6. 2. Tris-EDTA buffer (TE), pH 8.0.....	27
6. 3. Agarose gel buffer (5x Tris-borate (TBE)), pH 8.0.....	27
6. 4. DNA running buffer (electrode buffer, 1x TBE), pH 8.0.....	27
6. 5. Ethidium bromide dye.....	27
6. 6. Sample loading dye (5 x).....	27
7. Amplification conditions and electrophoresis.....	28
8. Polymerase chain reaction (PCR) conditions.....	28
9. PCR product preparation for electrophoretic separation.....	29
10. Agarose gel preparation.....	29
11. Primers.....	30
12. Gel photographing.....	30
13. Statistical analysis.....	31
IV. RESULTS AND DISCUSSION.....	32

III

-Intra and inter-population variation of Egyptian and Syrian <i>T.zillii</i> and <i>O.aureus</i> populations	32
I. intra-population variation.....	32
I. 1. Intra-population variation based on Tris-soluble muscle proteins.....	32
I. 1. 1. Abbasa location.....	32
I. 1. 1. 1. <i>T.zillii</i> population.....	32
I. 1. 1. 2. <i>O.aureus</i> population.....	32
I. 1. 2. Kalubia location.....	37
I. 1. 2. 1. <i>T.zillii</i> population.....	37
I. 1. 2. 2. <i>O.aureus</i> population.....	37
I. 1. 3. Syrian location (El-ssen farm).....	37
I. 1. 3. 1. <i>T.zillii</i> population.....	37
I. 1. 3. 2. <i>O.aureus</i> population.....	38
I. 2. Intra-population variation based on Alcohol-soluble muscle proteins.....	46
I. 2. 1. Abbasa location.....	46
I. 2. 1. 1. <i>T.zillii</i> population.....	46
I. 2. 1. 2. <i>O.aureus</i> population.....	46
I. 2. 2. Kalubia location.....	46
I. 2. 2. 1. <i>T.zillii</i> population.....	46
I. 2. 2. 2. <i>O.aureus</i> population.....	49
I. 2. 3. Syrian location (El-ssen farm).....	49
I. 2. 3. 1. <i>T.zillii</i> population.....	49

IV

I. 2. 3. 2. <i>O.aureus</i> population.....	52
I. 3. Intra-population variation based on water-soluble muscle proteins.....	54
I. 3. 1. Abbasa location.....	54
I. 3. 1. 1. <i>T.zillii</i> population.....	54
I. 3. 1. 2. <i>O.aureus</i> population.....	55
I. 3. 2. Kalubia location.....	55
I. 3. 2. 1. <i>T.zillii</i> population.....	55
I. 3. 2. 2. <i>O.aureus</i> population.....	60
I. 3. 3. Syrian location (El-ssen farm).....	64
I. 3. 3. 1. <i>T.zillii</i> population.....	64
I. 3. 3. 2. <i>O.aureus</i> population.....	64
II. Inter-species variations and biochemical markers.....	69
RAPD-PCR DNA Markers.....	71
V. SUMMARY	81
VI. REFERENCES	85
ARABIC ABSTRACT	

List of Tables

N°	Title	page
1	Composition of 15 % resolving gel and 3.9 % stacking gel...	24
2	The codes, sequences, and GC per cent contents of primers used during DNA RAPD-PCR.....	30
3	Polymorphisms within <i>T.zillii</i> population of Egyptian Abbasa population inferred from the analysis of SDS-PAGE pattern of Tris soluble muscle proteins.....	34
4	Polymorphisms within <i>O.aureus</i> population of Egyptian Abbasa population inferred from the analysis of SDS-PAGE pattern of Tris soluble muscle proteins.....	36
5	Polymorphisms within <i>T.zillii</i> population of Egyptian Kalubia population inferred from the analysis of SDS-PAGE pattern of Tris soluble muscle proteins.....	39
6	Polymorphisms within <i>O.aureus</i> population of Egyptian Kalubia population inferred from the analysis of SDS-PAGE pattern of Tris soluble muscle proteins.....	41
7	Polymorphisms within <i>T.zillii</i> population of Syrian location inferred from the analysis of SDS-PAGE pattern of Tris soluble muscle proteins.....	43
8	Polymorphisms within <i>O.aureus</i> population of Syrian location inferred from the analysis of SDS-PAGE pattern of Tris soluble muscle proteins.....	45
9	Polymorphisms within <i>T.zillii</i> population of Egyptian Abbasa population inferred from the analysis of SDS-PAGE pattern of alcohol soluble muscle proteins.....	47

10	Polymorphisms within <i>O.aureus</i> population of Egyptian Abbasa location inferred from the analysis of SDS-PAGE pattern of alcohol soluble muscle proteins.....	48
11	Polymorphisms within <i>T.zillii</i> population of Egyptian Kalubia location inferred from the analysis of SDS-PAGE pattern of alcohol soluble muscle proteins.....	50
12	Polymorphisms within <i>O.aureus</i> population of Egyptian Kalubia location inferred from the analysis of SDS-PAGE pattern of alcohol soluble muscle proteins.....	51
13	Polymorphisms within <i>T.zillii</i> population of Syrian location inferred from the analysis of SDS-PAGE pattern of alcohol soluble muscle proteins.....	53
14	Polymorphisms within <i>O.aureus</i> population of Syrian location inferred from the analysis of SDS-PAGE pattern of alcohol soluble muscle proteins.....	54
15	Polymorphisms within <i>T.zillii</i> population of Egyptian Abbasa location inferred from the analysis of SDS-PAGE pattern of water soluble muscle proteins.....	57
16	Polymorphisms within <i>O.aureus</i> population of Egyptian Abbasa location inferred from the analysis of SDS-PAGE pattern of water soluble muscle proteins.....	59
17	Polymorphisms within <i>T.zillii</i> population of Egyptian Kalubia location inferred from the analysis of SDS-PAGE pattern of alcohol soluble muscle proteins.....	61
18	Polymorphisms within <i>O.aureus</i> population of Egyptian Kalubia location inferred from the analysis of SDS-PAGE pattern of water soluble muscle proteins.....	63

19	Polymorphisms within <i>T.zillii</i> population of Syrian location inferred from the analysis of SDS-PAGE pattern of water soluble muscle proteins.....	64
20	Polymorphisms within <i>O.aureus</i> population of Syrian location inferred from the analysis of SDS-PAGE pattern of water soluble muscle proteins.....	67
21	The averages of homogeneity within tilapia populations (<i>O.aureus</i> and <i>T.zillii</i>) from different locations.....	69
22	The similarity indexes between tilapia species (<i>O.aureus</i> and <i>T.zillii</i>) from different locations.....	70
23	Number of amplicons and the number of polymorphic amplicons related to each population and generated by each primer for the four populations.....	75
24	Number of amplicons and the number of polymorphic amplicons related to each species and generated by each primer for the four populations.....	75
25	Comparison between the bulked individuals of the four populations of Tilapia based on RAPD-PCR DNA Markers...	76
26	Average of similarity values between Egyptian and Syrian Tilapia populations.....	78

List of Figures

N°	Title	page
1	SDS-PAGE profile of <i>T.zillii</i> (Egypt-Abbasa), 0.1 M Tris-soluble muscle proteins.....	33
2	SDS-PAGE profile of <i>O.aureus</i> (Egypt-Abbasa), 0.1 M Tris-soluble muscle proteins.....	35
3	SDS-PAGE profile of <i>T.zillii</i> (Egypt-Kalubia), 0.1 M Tris-soluble muscle proteins.....	38
4	SDS-PAGE profile of <i>O.aureus</i> (Egypt-Kalubia), 0.1 M Tris-soluble muscle proteins.....	40
5	SDS-PAGE profile of <i>T.zillii</i> (Syria), 0.1 M Tris-soluble muscle proteins.....	42
6	SDS-PAGE profile of <i>O.aureus</i> (Syria), 0.1 M Tris-soluble muscle proteins.....	44
7	SDS-PAGE profile of <i>T.zillii</i> (Egypt-Abbasa), Alcohol-soluble muscle proteins.....	47
8	SDS-PAGE profile of <i>O.aureus</i> (Egypt-Abbasa), Alcohol-soluble muscle proteins.....	48
9	SDS-PAGE profile of <i>T.zillii</i> (Egypt-Kalubia), Alcohol-soluble muscle proteins.....	50
10	SDS-PAGE profile of <i>T.zillii</i> (Egypt-Kalubia), Alcohol-soluble muscle proteins.....	51
11	SDS-PAGE profile of <i>T.zillii</i> (Syria), Alcohol-soluble muscle proteins.....	52
12	SDS-PAGE profile of <i>O.aureus</i> (Syria), Alcohol-soluble muscle proteins.....	53

13	SDS-PAGE profile of <i>T.zillii</i> (Egypt-Abbasa), water soluble muscle proteins.....	56
14	SDS-PAGE profile of <i>O.aureus</i> (Egypt-Abbasa), water soluble muscle proteins.....	58
15	SDS-PAGE profile of <i>T.zillii</i> (Egypt-Kalubia), water soluble muscle proteins.....	60
16	SDS-PAGE profile of <i>O.aureus</i> (Egypt-Kalubia), water soluble muscle proteins.....	62
17	SDS-PAGE profile of <i>T.zillii</i> (Syria), water-soluble muscle proteins.....	65
18	SDS-PAGE profile of <i>O.aureus</i> (Syria), water-soluble muscle proteins.....	65
19	RAPD patterns of the four applied populations using primers A1, A 3, A 4, A 10, A 17 and A 19	73
20	RAPD patterns of the four applied populations using primers: B 8, C 12, C 13 and C 20	74
21	Dendrogram of genetic relationship among relevant populations based on DNA polymorphisms.....	79