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GENETIC POLYMORPHISM STUDY OF SOME QUANTITATIVE TRAIT GENES IN SOME EGYPTIAN SHEEP BREEDS

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*To My Mother, My
Father and My Sister*

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Contents

	Page
List of Tables	iv
List of Figures	v
Abbreviations	vii
Abstract	x
I. Introduction	1
II. Review of literature	3
2-1. Genetic Markers.....	4
2-2. Genetic Polymorphism.....	5
2-3. Molecular Markers Techniques for Polymorphism Detection.....	7
2-3-1. Restriction Fragment Length Polymorphisms (RFLP).....	8
2-3-2. Single-Stranded Conformation Polymorphism (SSCP).....	9
2-3-3. Sequence Analysis.....	10
2-3-4. Amplified Fragment Length Polymorphism (AFLP).....	11
2-3-5. Randomly Amplified Polymorphic DNA (RAPD).....	12
2-3-6. Microsatellites.....	13
2-3-7. Minisatellites.....	14
2-4. Egyptian Sheep.....	14
2-4-1. Sheep milk.....	16

	Page
2-4-2. Genetic Polymorphism of Milk Protein.....	17
III. Materials and Methods.....	19
3-1. Materials.....	19
3-1-1. Animals.....	19
3-1-2. Reagents.....	19
3-1-2-1. DNA Isolation Reagents.....	19
3-1-2-2. Polymerase Chain Reaction (PCR) Reagents.....	20
3-1-2-3. Restriction Fragment Length Polymorphism (RFLP) Reagents.....	20
3-1-2-4. Single Strand Conformation Polymorphism (SSCP) Reagents.....	21
3-1-2-5. Silver Stain Reagent.....	21
3-2. Methods.....	22
3-2-1. DNA Extraction.....	22
3-2-2. Polymerase Chain Reaction (PCR).....	23
3-2-3. Restriction Fragment Length Polymorphism (RFLP).....	24
3-2-4. Single Strand Conformation Polymorphism (SSCP).....	24
3-2-5. Sequence Analysis.....	26

	Page
IV. Results	31
4-1. Whey Protein Genes.....	31
4-1-1. α -Lactalbumin Gene.....	31
4-1-2. β -Lactoglobulin Gene.....	35
4-2. Casein Protein Genes	39
4-2-1. α s1-Casein Gene.....	39
4-2-2. α s2-Casein Gene.....	41
4-2-3. β -Casein Gene.....	48
4-2-4. κ -Casein Gene.....	51
V. Discussion	54
5-1. Genetic Polymorphism of Whey Protein Genes.....	56
5-1-1. α - Lactalbumin Gene.....	56
5-1-2. β -Lactoglobulin Gene.....	59
5-2. Genetic Polymorphism of Casein Protein Genes.....	63
5-2-1. α s1-Casein Gene.....	64
5-2-2. α s2-Casein Gene.....	67
5-2-3. β -Casein Gene.....	69
5-2-4. κ - Casein Gene.....	72
VI. Summary	75
VII. References	78
VIII. Arabic Summary	
Arabic Abstract.....	

List of Tables

	Page
Table (1): The sequences of primers used for PCR and RFLP techniques.....	27
Table (2): The sequences of primers used for SSCP and PCR techniques	28
Table (3): (Cont.): The sequences of primers used for PCR and SSCP techniques.....	29
Table (4): SSCP Conditions for four tested genes.....	30
Table (5): The pattern frequencies of α -lactalbumin gene in the three tested sheep breeds.....	34
Table (6): Genotype and allele frequencies of the β -lactoglobulin gene in the three tested sheep breeds.....	38
Table (7): The pattern frequencies of the α s1-casein gene in the three tested sheep breeds.....	41
Table (8): Genotype and allele frequencies of the α s2-casein gene in the three tested sheep breeds.....	47
Table (9): The pattern frequencies of the β -casein gene in the three tested sheep breeds.....	50

List of Figures

	Page
Figure (1): Agarose gel stained with ethidium bromide showing the PCR product of α -lactalbumin gene.....	32
Figure (2): Two different SSCP patterns of α -lactalbumin gene on 14% silver stained-polyacrylamide gel.....	33
Figure (3): The sequences of two different patterns of α -lactalbumin gene	34
Figure (4): Agarose gel stained with ethidium bromide showing the PCR product of β -lactoglobulin gene.....	35
Figure (5): 12% polyacrylamide gel stained with ethidium bromide showing three genotypes of β -lactoglobulin gene after digestion of PCR products with <i>RsaI</i> restriction enzyme.....	37
Figure (6): Agarose gel stained with ethidium bromide showing the PCR product of α s1-casein gene....	39
Figure (7): 10% silver stained-polyacrylamide gel and chromatogram showing the three SSCP different patterns of α s1-casein gene.....	40
Figure (8): The sequences of two homologous patterns of α s1-casein gene	41
Figure (9): Agarose gel stained with ethidium bromide showing the PCR product of α s2-casein gene...	42

	Page
Figure (10): Agarose gel stained with ethidium bromide and chromatogram showing three different genotypes of α 2-casein gene after digestion of PCR products with <i>Tru</i> II restriction enzyme.....	44
Figure (11): A part of PCR product sequences of two different alleles α 2-casein gene showing the SNP (G/A) and the restriction sites in these two alleles.....	45
Figure (12): Agarose gel stained with ethidium bromide showing the PCR product of β -casein gene...	48
Figure (13): 10% silver stained-polyacrylamide gel and chromatogram showing two SSCP different patterns of β -casein gene.....	49
Figure (14): The sequences of two different patterns of β -casein gene.....	50
Figure (15): Agarose gel stained with ethidium bromide showing the PCR product of κ -casein gene...	51
Figure (16): SSCP pattern of κ -casein gene on 9.25% silver stained-polyacrylamide gel.....	52
Figure (17): The alignment of the published κ -casein sequence with Egyptian sheep κ -casein sequence.....	53

Abbreviations

A: Adenine

AFLP: Amplified Fragment Length Polymorphism

Bp: Base Pair

C: Cytosine

DNA: Deoxyribonucleic Acid

dNTPs: Deoxynucleotide Triphosphates

EcoRI: Endonuclease

EcoRV: Endonuclease

EDTA: Ethylenediaminetetraacetic Acid

FAO: Food and Agriculture Organization

G: Guanine

MAS: Marker-Assisted Selection

MseI: Endonuclease

PCR: Polymerase Chain Reaction

QTL: Quantitative Trait Locus

RAPD: Randomly Amplified Polymorphic DNA

RasI: Endonuclease

RFLP: Restriction Fragment Length Polymorphisms

SNP: Single Nucleotide Polymorphism

SSCP: Single-Stranded Conformation Polymorphism

T: Thymine

TBE: Trisborat EDTA buffer

TruII: Endonuclease

α -LA: α -Lactalbumin

α s1-CN: α s1-Casein

α s2-CN: α s2-Casein

β -CN: β -Casein

β -LG: β -Lactoglobulin

κ -CN: κ -Casein

ABSTRACT

Title: Genetic polymorphism study of some quantitative trait genes in some Egyptian sheep breeds.

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Research place: National Research Centre

The present study was designed to detect the genetic polymorphism of six milk protein genes. The study was applied on three major sheep breeds in Egypt; Rahmani, Barki and Ossimi using PCR-RFLP and PCR-SSCP

SSCP results of the α -*LA* amplified fragments (166-bp) showed two different patterns related to the difference in nucleotide sequences (GC→CT)

Digestion of the resulting amplified fragments of β -*LG* (452-bp) with *RsaI* endonuclease differentiated between three different genotypes AA, AB and BB. The results showed that A allele was higher than B allele.

SSCP results of the α *SI-CN* amplified fragments (223-bp) showed three different patterns; CC< CT< TT. The difference of the patterns was related to a single nucleotide polymorphism (SNP) (T→C) at position 170.

Digestion of the resulting amplified fragments of *αs2-CN* (1300-bp) with *Tru/II* endonuclease differentiated between three different genotypes AA, AG and GG. The results showed that A allele was higher than G allele.

SSCP results of the *β-CN* amplified fragments (299-bp) showed two different patterns, the difference between them resulted from two single nucleotide substitutions A→C and C→T.

SSCP results of *κ-CN* gene showed that all tested sheep animals were monomorphic.

Keywords: Genetic polymorphism, *α*-lactalbumin, *β*-lactoglobulin, *αs1*-casein, *αs2*-casein, *β*-casein, *κ*-casein, Egyptian sheep, RFLP-PCR, SSCP-PCR.