Ain Shams University
Faculty of Science

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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Abbreviations

A: Adenine

AFLP: Amplified Fragment Length Polymorphism

Bp: Base Pair

C: Cytosine

DNA: Deoxyribonucleic Acid

dNTPs: Deoxynucleotide Triphosphates

***Eco*RI:** Endonuclease

***Eco*RV**: Endonuclease

EDTA: Ethylenediaminetetraacetic Acid

FAO: Food and Agriculture Organization

G: Guanine

MAS: Marker-Assisted Selection

***Mse*I:** Endonuclease

PCR: Polymerase Chain Reaction

QTL: Quantitative Trait Locus

RAPD: Randomly Amplified Polymorphic DNA

***Ras*I**: Endonuclease

RFLP: Restriction Fragment Length Polymorphisms

SNP: Single Nucleotide Polymorphism

SSCP: Single-Stranded Conformation Polymorphism

T: Thymine

TBE: Trisborat EDTA buffer

***Tru1*I**: Endonuclease

***α-LA**:* α-Lactalbumin

***αs1-CN**:* αs1-Casein

***αs2-CN**:* αs2-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.

Researcher Name: Esraa Aly Mohamed Aly Balabel

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 *αS1-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 *Tru1*I 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.