Polymorphisms in the promoter region of the LGB gene in Sarda goat

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1. Introduction

In goats, two single nucleotide polymorphisms (SNPs) have been found in the promoter region of the β-lactoglobulin gene (LGB), located at -341 (T→C) and -60 (C→T) positions.

2. Message

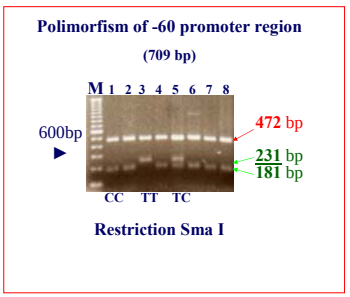
The aim of this research was to assess allele frequencies of the described SNPs in the Sarda goat, the haplotype distribution and to evaluate the correlation between genotype and milk traits.

3. Methods

Blood samples were collected from 220 lactating Sarda goats and genotyped by PCR-RFLP. Daily milk yield was measured from all the animals. Data was analysed by GenePop software for Hardy-Weinberg (HW) equilibrium and allele frequencies, while the EH software was used to asses haplotype distribution. Analysis of variance was performed in order to highlight correlations between LGB genotype and milk yield.

4. Results

The population was in HW equilibrium for both the SNPs. Allele frequencies at -341 nt were: T=0.86, C=0.14, while the most frequent genotype was TT (74.42%) and the least frequent was CC (2.66%). Allele frequencies at -60 nt were: C=0.80, T=0.20, the most frequent genotype was CC (65.78%); the least frequent genotype was TT (5.98%). Three of the inferred haplotypes (Table 1) showed a frequency >0.05, the most frequent was -341T/-60C. The estimated frequencies of these haplotypes were similar to the expected ones, indicating linkage equilibrium. Statistical analysis did not show significant differences for milk yield and composition between genotypes.



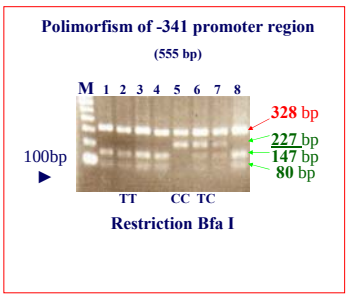


Table 1

Allele at locus		Haplotype Frequency	
-341	-60	Independent	w/Association
T	T	0.173	0.201
T	C	0.686	0.658
C	T	0.028	0.000
C	C	0.113	0.141

5. Conclusions

High genetic variability was revealed in the promoter region of β-lactoglobulin gene. Since no correlations were found between these SNPs and milk traits, in Sarda goat, it is possible to use the LGB variations as genetic markers without selecting against milk yeld and milk composition.