NRAMP1 gene in goat: nucleotide sequencing and polymorphism analysis

M. Pazzola, G.M. Vacca, M.L. Dettori, V. Carcangiu, M.C. Mura and G. Dettori

Dipartimento di Biologia Animale, via Vienna 2, 07100 Sassari, Italy

1. Introduction

NRAMP1 gene is an important intracellular bacterial resistance candidate and in cattle and water buffalo its polymorphism at the 3'UTR region was associated with natural resistance against some diseases.

2. Message

The aim was to investigate nucleotide sequence and polymorphism of NRAMP1 gene in the goat.

3. Methods

Primers were designed from the bovine sequence (GenBank: BTU12862). Three fragments were PCR-amplified from goat genomic DNA, corresponding to exons 2 and 10 (codifying structural domains) and exon 15, containing the 3'UTR. PCR products of 200 goats belonging to five breeds (Sarda, Saanen, Nubian, Maltese, Alpine) were analysed by SSCP (single strand conformation polymorphism).

4. Results

Exon 2 sequence analysis (BioEdit software) revealed some nucleotide changes in goat, when compared to the bovine sequence: C11T, C12A, G20C, A67G. The sequence of goat exon 10 showed differences from bovine: G16A, C40A, A55G, C66A, A72C. Exon 15 sequence analysis revealed the presence of a (GT)16 repetition. Alignment of the first 210 nucleotides of goat and bovine exon 15 revealed the following differences: C63T, A80G, A94G, G115A, A143G, G151A, G152C, T165C, A199G. The SSCP analysis of exons 2 and 10 revealed the absence of variations, while analysis of exon 15 showed different conformational patterns, which may be due to the polymorphism of the detected microsatellite.

Positions of base changes in exon 2

Positions of changes	Bos taurus BTU12862	Capra hircus
11	C	T
12	C	A
20	G	C
67	A	G

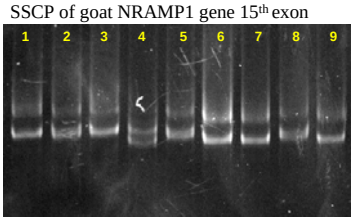
Positions of base changes exon 10

Positions of changes	Bos taurus BTU12862	Capra hircus
16	G	A
40	C	A
55	A	G
66	C	A
72	A	C

Positions of base changes in exon 15

Positions of changes	Bos taurus BTU12862	Capra hircus
63	C	T
80	A	G
94	A	G
115	G	A
143	A	G
151	G	A
152	G	C
165	T	C
199	A	G

SSCP of goat NRAMP1 gene 15th exon



Lane 1 Saanen
Lane 2-3 Nubian
Lane 4-5 Maltese
Lane 6-7 Alpine
Lane 8-9 Sarda

5. Conclusions

This data may be useful in the evaluation and utilisation of NRAMP1 in resistance to intracellular infections in goat.