

Mutational and Evolutionary Analysis of Interleukin-2 Gene in Four Pakistani Goat Breeds

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Abstract : Interleukin 2 (IL-2) is a cytokine which is produced by activated T cells, play important role in immune response against antigen. It act in both autocrine and paracrine manner. It can stimulate B cells and various other phagocytic cells like monocytes, lymphokine-activated killer cells and natural killer cells. Acting in autocrine fashion, IL-2 protein plays a crucial role in proliferation of T cells. IL-2 triggers the release of pro and anti-inflammatory cytokines by activating several pathways. In present study, exon 1 of IL-2 gene of four local Pakistani breeds (Dera Din Panah, Beetal, Nachi and Kamori) from two provinces was amplified by using reported Ovine IL-2 primers, yielding PCR product of 501 bp. The sequencing of all samples was done to identify the polymorphisms in amplified region of IL-2 gene. Analysis of sequencing data resulted in identification of one novel nucleotide substitution (T→A) in amplified non-coding region of IL-2 gene. Comparison of IL-2 gene sequence of all four breeds with other goat breeds showed high similarity in sequence. While phylogenetic analysis of our local breeds with other mammals showed that IL-2 is a variable gene which has undergone many substitutions. This high substitution rate can be due to the decreased or increased changed selective pressure. These rapid changes can also lead to the change in function of immune system. This pioneering study of Pakistani goat breeds urge for further studies on immune system of each targeted breed for fully understanding the functional role of IL-2 in goat immunity.

Keywords : interleukin 2, mutational analysis, phylogeny, goat breeds, Pakistan

Conference Title : ICADS 2015 : International Conference on Animal and Dairy Sciences

Conference Location : Berlin, Germany

Conference Dates : May 21-22, 2015