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Association of Ovine Lymphocyte Antigen (OLA) with the Parasitic Infestation in Kashmiri Sheep Breeds

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Abstract : Background: Geologically Climatic conditions of the state range from sub-tropical (Jammu), temperate (Kashmir) to cold artic (Ladakh) zones, which exerts significant influence on its agro-climatic conditions. Gastrointestinal parasitism is a major problem in sheep production worldwide. Materials and Methods: The present study was to evaluate the resistance status of sheep breeds reared in Kashmir Valley for natural resistance against Haemonchus contortus by natural pasture challenge infection. Ten microsatellite markers were used in the study for evaluation of association of Ovar-MHC with parasitic resistance in association with biochemical and parasitological parameters. Following deworming, 500 animals were subjected to selected contaminated pastures in a vicinity of the livestock farms of SKUAST-K and Sheep Husbandry Kashmir. For each animal about 10-15 ml blood was collected aseptically for molecular and biochemical analysis. Weekly fecal samples (3g) were taken, directly from the rectum of all experimental animals and examined for Fecal egg count (FEC) with modified McMaster technique. Packed cell volume (PCV) was determined within 2-5 h of blood collection, all the biochemical parameters were determined in serum by semi automated analyzer. DNA was extracted from all the blood samples with phenol-chloroform method. Microsatellite analysis was done by denaturing sequencing gel electrophoresis Results: Overall sheep from Bakerwal breed followed by Corriediale breed performed relatively better in the trial; however difference between breeds remained low. Both significant ($P<0.05$) and non-significant differences with respect to resistance against haemonchosis were noted at different intervals in all the parameters.. All the animals were typed for the microsatellites INRA132, OarCP73, DRB1 (U0022), OLA-DQA2, BM1818, TFAP2A, HH56, BM1815, IL-3 and BM-1258. An association study including the effect of FEC, PCV, TSP, SA, LW, and the number of alleles within each marker was done. All microsatellite markers showed degree of heterozygosity of 0.72, 0.72, 0.75, 0.62, 0.84, 0.69, 0.66, 0.65, 0.73 and 0.68 respectively. Significant association between alleles and the parameters measured were only found for the OarCP73, OLA-DQA2 and BM1815 microsatellite marker. Standard alleles of the above markers showed significant effect on the TP, SA and body weight. The three sheep breeds included in the study responded differently to the nematode infection, which may be attributed to their differences in their natural resistance against nematodes. Conclusion: Our data confirms that some markers (OarCP73, OLA-DQA2 and BM1815) within Ovar-MHC are associated with phenotypic parameters of resistance and suggest superiority of Bakerwal sheep breed in natural resistance against Haemonchus contortus.

Keywords : Ovar-Mhc, ovine leukocyte antigen (OLA), sheep, parasitic resistance, Haemonchus contortus, phenotypic & genotypic markers
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