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Infectivity of Hyalomma Ticks for Theileria annulata Using 18s rRNA PCR

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Abstract : Among the ixodid ticks, species of genus Hyalomma are of prime importance as they can survive in harsh conditions better than those of other species. Similarly, among various tick-borne pathogens, Theileria (T.) annulata, the causative agent of tropical theileriosis in large ruminants, is responsible for reduced productivity and ultimately substantial economic losses due to morbidity and mortality. The present study was planned to screening of vector ticks through molecular techniques for determination of tick-borne theileriosis in district Toba Tek Singh (T. T. Singh), Punjab, Pakistan. For this purpose, among the collected ticks (n = 2252) from livestock and their microclimate, Hyalomma spp. were subjected to dissection for procurement of salivary glands (SGs) and formation of pool (averaged 8 acini in each pool). Each pool of acini was used for DNA extraction, quantification and primer-specific amplification of 18S rRNA of Theileria (T.) annulata. The amplicons were electrophoresed using 1.8% agarose gel following by imaging to identify the band specific for T. annulata. For confirmation, the positive amplicons were subjected to sequencing, BLAST analysis and homology search using NCBI software. The number of Theileria-infected acini was significantly higher ($P < 0.05$) in female ticks vs male ticks, infesting ticks vs questing ticks and riverine-collected vs non-riverine collected. The data provides first attempt to quantify the vectoral capacity of ixodid ticks in Pakistan for T. annulata which can be helpful in estimation of risk analysis of theileriosis to the domestic livestock population of the country.

Keywords : Hyalomma anatolicum, ixodids, PCR, Theileria annulata
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