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Serological Evidence of anti-Leptospira Antibodies in Goats in Various Agro Climatic Zones of India

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Abstract—Leptospirosis is an infectious disease which causes reproductive disorders in goats and is considered as one of the important factors responsible for hampering the productivity of Indian goat husbandry. Microscopic Agglutination Test (MAT) was employed in the present study to detect anti-leptospira antibodies in suspected serum samples of goats. The caprine sera analyzed in the present study were collected from different states of India representing twelve agro-climatic zones. Out of 2075 caprine sera screened, we found agglutinins against various leptospiral serovars in 371 goats (seropositivity 17.88%).The present study indicates proclivity of leptospiral serovars to thrive in specific agro-climatic zones of India (Spatial Variation). The serovar Icterohaemorrhagiae was predominantly reported from sera collected from landlocked regions of Northern India (Upper and Middle Gangetic plains, Western and Eastern Himalayan region, Western dry region, Central and southern plateau and Hills). This lack of serovar diversity observed in landlocked regions is in stark contrast to the serovar epidemiology observed in peninsular and coastal belts of India (Gujarat, West and East coast plains and hills). The peninsular and coastal belts were bastions for a wide diversity of serovars such as Javanica, Australis, Autumnalis, Hardjoprajitno, Pyrogenes, Hebdomadis, Pomona and Djasiman which were encountered along with Icterohaemorrhagiae and Grippotyphosa. The vast majority of caprine sera screened from Andaman and Nicobar Islands, an archipelago located in Bay of Bengal, were positive for serovar Pyrogenes whereas serovars Icterohaemorrhagiae and Grippotyphosa which were predominantly reported from mainland India were restricted to a few positive sera samples. Thus, our study clearly suggests differences in geographic distribution of leptospiral serovars between agro-climatic zones. All the caprine sera subjected to MAT were further (n = 2075) screened using recombinant LipL41 based Latex Agglutination Test. The sensitivity of rLipL41 based LAT for 371 MAT positive sera was 88.40% and the specificity with 1704 MAT negative sera was 94.40%. Further, Kappa value of 0.828 for rLipL41 based LAT indicates high agreement with MAT. The results obtained with LipL41 based LAT indicates that this test has direct field applicability in resource poor settings as it yielded high sensitivity and specificity for detection of anti-Leptospira antibodies in serum samples from goats.