



CAPRINE LEPTOSPIROSIS – A SERO PREVALENCE STUDY*

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Abstract

A seroprevalence study was carried out in goats in Thrissur district of Kerala in the month of October 2011, in view of leptospirosis outbreak in the state. A total of 22 serum samples (18 from apparently healthy animals and four from aborted animals) were collected. All the serum samples were screened for leptospirosis by Microscopic Agglutination Test (MAT) using a battery of nine serovars of *Leptospira interrogans* viz., *Australis*, *Autumnalis*, *Canicola*, *Grippotyphosa*, *Hebdomadis*, *Icterohaemorrhagiae*, *Javanica*, *Pomona* and *Pyrogenes*. In the present study eight animals (36.36 %) were found to be seropositive for leptospirosis with *Autumnalis* (50 %) as the most prevalent serovar affecting goats, being involved in five cases followed by *Pomona* (25 %), *Australis* (12.5 %) and *Grippotyphosa* (12.5 %). Paired sera revealed a fourfold increase in titre in two of the aborted animals thus confirming leptospiral abortion. The animals were found seronegative to *Canicola*, *Hebdomadis*, *Icterohaemorrhagiae*, *Javanica*, and *Pyrogenes*. The MAT titres were in the range of 1 in 100 to 1 in 400.

Keywords: Caprine, leptospirosis, seroprevalence

Leptospirosis has emerged as an important zoonotic disease affecting all

mammals. The disease is of considerable economic importance in livestock due to manifestations like abortion, infertility and decreased production. More than 250 serovars of *Leptospira interrogans* have been identified (WHO, 2007). When compared to other domestic species, goats are known to be less susceptible to leptospirosis (Leon-Vizcaino *et al.*, 1987). In India, the prevalence of leptospirosis in goats has been reported by many workers (Sivaseelan *et al.*, 2003; Balakrishnan *et al.*, 2008 and Meenakshisundaram and Chellapandian, 2010). The present study was carried out to assess the seroprevalence of leptospirosis in goats in Thrissur district of Kerala.

Materials and Methods

In the present study, a total of 22 serum samples (18 from apparently healthy animals and four from aborted animals) were collected from a goat farm in Thrissur, in the month of October 2011. All the serum samples were subjected to MAT, the gold standard test using a battery of nine serovars of *Leptospira interrogans* viz., *Australis*, *Autumnalis*, *Canicola*, *Grippotyphosa*, *Hebdomadis*, *Icterohaemorrhagiae*, *Javanica*, *Pomona* and *Pyrogenes* for the detection of leptospiral agglutinins as per the method described (OIE, 2008). Briefly, 30 µl of 1 in 50 diluted serum

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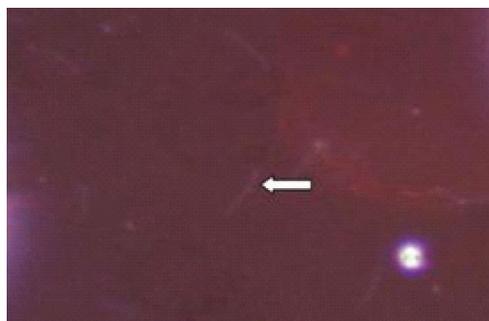
was mixed with 30 μ l of five day old cultures. They were incubated at 37 °C for 2 hours and visualized under dark field microscopy. A reduction in 50 per cent motility of leptospires when compared to control or the presence of agglutinating bodies was considered as positive.

Further, quantitative assay was carried out in 96 well microtitre plates against the reacting serovars of leptospires. All the 96 wells were filled with 30 μ l PBS. In the first well of each row, 30 μ l of 1 in 50 diluted serum samples were added and mixed well. Then, serial double fold dilution was made up to eight wells. From the 8th well, 30 μ l was discarded. A constant volume of 30 μ l of a particular serovar with a density of 2×10^8 per ml was added in each row and incubated at 37 °C for two to four hours. All the final dilution mixtures (100, 200, 400, 800, 1600, 3200, 6400, 12800) were observed under dark field microscope and the results were recorded. The reciprocal of the highest dilution of the serum which showed 50 per cent agglutination or 50 per cent reduction in the number of free leptospires in comparison to control was considered as the respective titre.

Results and Discussion

Out of the 22 animals screened, a total of eight animals (36.36 %) were found to be seropositive for leptospirosis which is higher in comparison to other studies conducted in South India (Meenakshisundaram and Chellapandian, 2010). The agglutinated leptospires are demonstrated in the figure. Autumnalis was found to be the most prevalent serovar affecting goats in Thrissur, which is in

contrary to the findings of Meenakshisundaram and Chellapandian (2010) who reported Pomona (2.11 %) as the most prevalent serovar among goats in Tamilnadu. Similar findings were observed by Natarajaseenivasan and Ratnam (1997) and Balakrishnan *et al.* (2008). The prevalence of other serovars were in the order Pomona (25 %), Australis (12.5 %) and Grippotyphosa (12.5 %). Paired sera collected from four aborted animals revealed a fourfold increase in titre in two animals thus confirming the leptospiral abortions. The animals were found seronegative to Canicola, Hebdomadis, Icterohaemorrhagiae, Javanica, and Pyrogenes as against the findings of several other workers who reported the presence of Canicola, Hebdomadis, and Icterohaemorrhagiae in goats (Sivaseelan *et al.*, 2005 and Meenakshisundaram and Chellapandian, 2010). The variation in the prevalence of serovars in different parts of India might be due to differences in the seasons and climatic conditions of the regions. This study may not be representative as the sample size is very low and collected from a single farm. According to OIE, 2008 MAT can be employed as a useful screening test, if the samples are collected from at least 10 animals or 10 per cent of the herd, whichever is the greatest. The leptospiral abortions in goats and presence of leptospiral antibodies suggest the implementation of appropriate control measures in the region. Further, seroprevalence study can be expanded to different regions in Kerala to identify the most prevalent serovar associated with goats in Kerala.



MAT Negative



MAT Positive

Fig. Dark field visualization of agglutination of leptospires in MAT (450X)

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References

- Balakrishnan, G., Govindarajan, R., Meenambigai, T.V., Jayakumar, V and Murali Manohar, B. 2008. Seroprevalence of Leptospirosis among domestic animals in Andhra Pradesh. *Indian Vet. J.*, **85**:551-552.
- Leon-Vizcaino, L., Mendoza, M.H. and Garrido, F. 1987. Incidence of abortions caused by leptospirosis in sheep and goats in Spain. *Comp. Immunol. Microbiol. Infect. Dis.*, **10**: 149-153.
- Meenakshisundaram, A and Chellapandian, M. 2010. Sero-prevalence of Leptospirosis in small ruminants in Virudhunagar District of Tamil Nadu. *Tamil Nadu J. Vet & Anim. Sci.*, **6**: 136-137.
- Natarajaseenivasan, K. and Ratnam, S. 1997. Sero-prevalence of Leptospiral infection in an agricultural based village in Tamil Nadu. *Cheiron*, **26**: 80-82.
- Office International-des-Epizooties. 2008. Leptospirosis In: *Manual of diagnostic tests and vaccines for terrestrial animals*, 6th edn. Paris.
- Sivaseelan, S., Uma Rani, R. and Kathiresan, D. 2003. Sero-prevalence of Leptospirosis in sheep and goats in Madurai District-Tamil Nadu. *Indian Vet. J.*, **80**:375- 376.
- Sivaseelan, S., Uma Rani, R. and Kathiresan, D. 2005. Surveillance of the diseases of sheep and goats. *Indian Vet. J.*, **82**:246 247.
- World health organization. 2007. *Leptospira In: Leptospirosis, Laboratory manual*.

