Tick infestation on sheep, goat, horse and wild hare in Tamil Nadu

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Abstract The prevalence of tick infestation and their predilection sites on sheep, goat, horse and wild hare were studied at various places of Tamil Nadu, India. The prevalence of tick infestation in Madras red sheep, Tellicherry goat and horse was 77.11, 78.21 and 13.33%, respectively. Sheep were heavily infested with *Haemaphysalis bispinosa* followed by *Hyalomma isaaci*, *Rhipicephalus haemaphysaloides* and *H. anatolicum*. The ticks from goats were identified as *H. bispinosa*, *R. haemaphysaloides*, *H. isaaci* and *R. sanguineus*. Horses were infested with *Otobius megnini* and *R. sanguineus*. The ticks on wild hare (*Lepus nigricollis*) were identified as *R. haemaphysaloides* and *H. bispinosa*. Wild hare acts as a source of infestation to the sheep and goats since these animals shared the same field.

Keywords Sheep · Goat · Horse · Wild hare · Survey · Tick · *Haemaphysalis bispinosa* · *Rhipicephalus haemaphysaloides* · *Hyalomma isaaci* · *H. anatolicum* · *Otobius megnini* · *R. sanguineus*

Introduction

Ticks are important parasites of both domestic and wild ungulates. Ticks are responsible for transmission of tick-borne diseases, tick worry, metabolic debilitation, tick toxicosis and secondary infections (Hart 1990) and considered as second vector in the world after mosquito in disease transmission (Kiss et al. 2012). Ticks transmit pathogenic organisms like viruses, rickettsiae, bacteria, spirochetes and protozoans in human and livestock (Jongejan and Uilenberg 2004; Alessandra and Santo 2012). Incidence and prevalence of ixodid ticks on sheep and goat was reported in South India (Prakasana and Ramanai 2007; Soundararajan et al. 2014). This paper deals with the prevalence and predilection site of the ticks on sheep, goat, horse and wild hare in Tamil Nadu.

Materials and methods

A total of 436 (249 Madras red sheep, 156 Tellicherry goat, 30 horse and one wild hare) animals were examined for the presence of ticks at Livestock Research Station at Katupakkam, private goat farm at Vilangadu village, Tiruvannamalai district and private stud farm and private owner at Chennai, Tamil Nadu. Sheep and goats were maintained under semi-intensive system. Sheep were reared under mud floor, and the goats were reared on wooden reapered slated floor. The ticks were collected, counted and preserved in 70% ethanol for identification. The ticks were identified as per the descriptions of Soulsby (1982) and Walker et al. (2003). Data recorded included the age and sex of the animal, site of predilection, prevalence rate and tick intensity. Chi-square test was used for comparison of binary variables.

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Results and discussion

The overall tick infestation in different animals in the present study was 73.17% (317/436).

Sheep

The overall prevalence of ticks in sheep was 77.11% (Table 1). This is similar to that of Abunna et al. (2012) in Ethiopia. *Haemaphysalis bispinosa* (77.11%) was the most abundantly encountered tick followed by *Hyalomma isaaci* (11.65%), *Rhipicephalus haemaphysaloides* (3.21%) and *H. anatolicum* (1.20%). Latha et al. (2004) and Prakasan and Ramanai (2007) also reported that the *H. bispinosa* was the most common ticks in Tamil Nadu and Kerala.

Females were heavily infested than the males. Among the different age groups of animals, the adult animals were heavily infested followed by lambs and hogget. This is similar to that of Yacob et al. (2008) and Yakhchali and Hosseine (2006). In this study, ticks were observed mostly on the ears of sheep (79.17%) (Fig. 1). It was observed that *H. bispinosa* ticks were found mostly (77.11%) on the ears and also on eyelids, face, shoulder region and testis whereas, *R. haemaphysaloides* were found (3.21%) only on anus and tail. *H. isaaci* ticks were collected mostly from vulva, anus and tail. *Hyalomma anatolicum* ticks were found only on vulva. Similar findings were reported by Latha et al. (2004).

Goat

Out of 156 goats, 122 goats were infested with ticks and the overall prevalence of tick infestation was 78.21%. The ticks were identified as *H. bispinosa*, *R. haemaphysaloides* and *H. isaaci*. Soundararajan et al. (2014) also reported 72.73% prevalence of tick infestation (100% for *H. bispinosa*, 7.29% for *H. isaaci*, 3.13% for *R. haemaphysaloides* and 2.08% for *H. anatolicum*) on goats maintained under stall fed condition at Tamil Nadu.

Out of 122 goats infested with ticks, one Tellicherry goat was infested with four numbers of *Rhipicephalus*

Fig. 1 Ticks on the inner ear of sheep

sanguineus ticks. Ticks were found only on the ears of the goat. Similarly, Ganjali et al. (2014) reported *R. sanguineus* (21.26%) was the predominant tick species on goat in Iran. In southern India, goats were mostly infested with *H. bispinosa*, *H. inermis*, *R. haemaphysaloides*, *H. anatolicum*, *H. isaaci*, and *Amblyomma testudinarum* (Latha et al. 2004; Prakasan and Ramanai 2007; Soundararajan et al. 2014). Presence of *R. sanguineus* on goat in this study may be due to the presence of three mongrel dogs in this goat farm from which the goat might have been infested.

Horse

In the present study, 13.33% (4/30) of horses were infested with ticks. Out of four infested horses, three thorough bred horses were infested with *Otobius megnini* and 15 years old non-descript mare was infested with *R. sanguineus*. *Otobius megnini* was observed only in the ear canal, whereas *R. sanguineus* was noticed on the face, ear and neck region. The horses infested with *O. megnini* showed dried dirty crusted brown secretions and shaking of head. Horse infested with *R. sanguineus* showed debility and anemia. Diyes and Rajakaruna (2016) observed 41.1% of larval and 59.6% of nymphal stages of *O. megnini* in the ear of horses in Sri Lanka.

Table 1 Overall prevalence of tick infestation in sheep

Variables	Category	Number of examined animals	Number of infested animals (%)	Chi square test (χ^2)
Sex	Sheep	249	192 (77.11)	10.41**
	Male	64	40 (62.50)	
	Female	185	152 (82.16)	
Age	Lambs	78	45 (57.69)	30.83**
	Hogget	11	6 (54.55)	
	Adult	160	141 (88.13)	

** $p < 0.01$ highly significant

Fig. 2 Ticks on the neck of wild hare

Wild hare

A total number of 123 ticks were collected from various parts of the body of wild hare (*Lepus nigricollis*). The ticks were found mostly around the neck, ear and dorsal surface of the body (Fig. 2). The ticks were identified as *R. haemaphysaloides* (59.35%, 73/123) and *H. bispinosa* (40.65%, 50/123).

Occurrence of *R. haemaphysaloides* and *H. bispinosa* on wild hare in this study which is in agreement with that of Zheng et al. (2011) who observed the presence of *Ixodes sinensis*, *R. haemaphysaloides* and *H. longicornis* on hare at China. Similarly, Shubber et al. (2014) reported 81.25% of wild hare (*Lepus capensis*) infested with *Rhipicephalus turanicus* and *R. leporis* in Iraq and Lia et al. (2010) observed *H. marginatum* on Corsican hares (*Lepus corsicanus*) at Italy.

The same tick species (*R. haemaphysaloides* and *H. bispinosa*) were also observed and collected from sheep and goat for the past 5 years repeatedly and even after treatment with acaricides at Livestock Research Station, Kattupakkam. This indicates that the wild hare acts as a source of infestation for the sheep and goats since these animals shared the same field.

Conclusion

From this study, it was concluded that sheep was heavily infested with *H. bispinosa* followed by *H. isaaci*, *R. haemaphysaloides* and *Hyalomma anatolicum*. Ticks were seen mostly on the ears followed by vulva and anus. Occurrence of *R. sanguineus* was reported as a rare case on the ear of Tellicherry goat and horse in Tamil Nadu, India. Wild hare (*L. nigricollis*) were infested with *R. haemaphysaloides* and *H. bispinosa*.

Author's contribution CS collected and identified the ticks, and prepared the manuscript. KN assisted in literature collection, typing and preparation of manuscript. SM assisted in collection of ticks from wild hare and collection of literature. MAP assisted in collection of ticks from goat and collection of literature.

Compliance with ethical standards

Conflict of interest The authors declare that there are no conflicts of interest.

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