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Short Communication

A Survey on Ticks Parasites in Domestic Animals of Villupuram District, South India

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Abstract

A survey was carried out to investigate the occurrence tick species (Acari: Ixodidae) infesting domestic animals in Villupuram district from March to February 2011. A total of 212 cats, 63 dogs, 235 goats and 120 buffalo were examined for ticks. Ticks were collected from the host animals and it is examined for species identification. The ticks classified into five genera and 14 species were recorded throughout the study period.

Keywords: Ticks, domestic animal, Villupuram District, South India.

Introduction

The ticks have worldwide distribution and their species diversity is greatest in tropical and subtropical regions. Ixodid ticks are obligatory blood-sucking that require an animal host to survive and reproduce. Ticks can be a nuisance; their bites can cause irritation and, in the case of some ticks, paralysis. Severe infestations on animals can cause anemia, weight loss, and even death from the consumption of large quantities of blood. Ticks and tick-borne diseases affect animal and human health worldwide and are the cause of significant economic losses. They are currently considered to be second only to mosquitoes as vectors of human infectious diseases in the world. It has been reported that 80% of 1,200 million cattle are at risk for TTBDs causing a global annual loss of US$7,000 million[1].

Ticks can also transmit many human and animal disease pathogens, which include viruses, bacteria, rickettsiae, and protozoa. The impact of ticks on human economy merits special consideration as they affect the health of man and his domestic wealth directly and indirectly. Although widely recognized as pets, ticks are best known for their notorious vector status. Despite their medical and veterinary importance, ticks remained as an unstudied group in India till 1928. The pioneering work of Sharif which resulted in the publication of an identification key to Ixotidticks formed the basis for subsequent studies on varies aspects of Indian tick fauna[2]. Checklists of Indian ticks were prepared by Sen, Jagannath*et al.*, Miranpuri and Naithani and Geevargheseet *al.*[3-6] based on collections made from several parts of the country. Incidence and prevalence of ixodid ticks on sheep and goats in Karnataka and various other diverse biotopes of South India and were studied by Jagannath and Lokesh and Saxena[7,8]. Prevalence of ixotid ticks in Tamil Nadu was reported by Kumar *et al.*[9]. Studies made by Lathaet *al.*[10] on the seasonal activity of ticks disclosed moderate tick burdens in small ruminants and Haemaphysalisbispinosa as the most common tick species in Tamil Nadu.

Studies of tick distribution and diversity are important in building up knowledge about tick borne disease. The effect of temperature and humidity on the existence and biodiversity of ticks has been well identified, and well understood that different species have specific requirements for development and reproduction.

There are no published data on Ixodid ticks and tick-borne diseases among domestic animals in Villupuram District. In addition, there is no documentation about species diversity and geographic distribution of ticks infesting domestic animals in this province. It is important to understand the ecological requirements of ticks for this study area. The main aim of this study was to identify species compositions of livestock in different areas of Villupuram.

Material and Methods

Study Area: The Villupuram district are located at a latitudes and longitudes of (79° 32' E and 11° 57' N) which is situated at the foothills of the eastern slope of the Western Ghats. The study area divided into 4 sites which include namely Kallakurichi, Thindivanam, Vanur and Gingee area. The temperature is moderate; the maximum and minimum temperatures being 38°C and 21°C respectively. The town gets its rainfall from the northeast monsoon in winter and the southwest monsoon in summer. The average annual rainfall is 1070 mm. Agriculture is the backbone of Villupuram district was selected as one of the major collection sites were made for the examination of cattle, goats and their associated fauna of ticks in grazing field. These locations were selected according to availability of animals in abundance and difference in climate, too.

Tick collection: A total of 750 domestic animals comprising 250 cattle, 120 buffaloes, 235 goats, 85cats and 62 dogs were examined for ticks using forceps and brush. The collected adult ticks were preserved in70% alcohol in glass vials with recording of location, host, and date until the species determination.The ticks were brought to the laboratory and it is mounted with Hoyer's medium. Ticks identified under a stereomicroscope according to identification keys Walker *et al.*, Estrada-Pena *et al.* and Geevargheseet *al*.[11,12,6]. Shannon- weiner index was used to analyse the diversity and population density of individual species and with respect to host animals.

Results and Discussion

In the present study, a total of 630 domestic animals belonging to 14 species from Villupuram districts were examined. They were collected from Cat, Dog, Buffalo, Goat and cow were the animals found infested by different species of ticks. Dogs(64.44%) and buffalo (58.06) had the maximum rate of tick infestation while cat revealed the minimum (33.92%) in table 1. Cat, dog, Goat, Buffalo and Cow were the animals found infested by different species of ticks (table 2).

A total of 425 adult ticks grouped into 5 genera and 14 species were collected. The species recovered were *Haemaphysalis Bispinosa, H.Canestrini, H. kinneari, H.intermedia, H. turturis, Boophilusannulatus, B.microplus, Hyalommatruncatum, H. anatolicum, H.hussaini, Amblyommapersicus, A. robertsi, Rhipicephalussanguineus, R. evertsi.* The above 14 species categoriaed under a single family, Ixodidae.

The prevalence of Ixodid ticks on domestic animals of several other Indian states like Assam, Karnataka and TamilNadu was already reported by Miranpuri and Singh, Jagannath*et al*., Kumar *et al.* and Latha*et al*.[13,14,9,10]. Thus the results of the present study also confirm Ixodid ticks as the predominant parasites of domestic animals of India.

Table-1
Total rate of the tick infestation on different domestic animal

Total No. of host			
Name of the host	**Observed**	**Infested**	**Percentage of Infestation (%)**
Cat	56	19	33.92
Dog	135	87	64.44
Goat	267	112	41.94
Buffalo	124	72	58.06
Cow	168	59	35.11

Ticks are important ectoparasites that parasitize terrestrial vertebrates and transmit pathogens that affect animal populations thereby playing a vital role in the economy of livestock industry. Animal ticks have been reported from all over the world and the various species in domestic ruminants have been identified In India, the cost of TTBDs in the livestock industry has been estimated around US$ 498.7 million per year[15]. There were more than 10 genera of ticks collected from different animals in different size scale of farms, from village-level small to large organized farms. Including the 2 species identified in Taiwan, *R. microplus*and *R. haemaphysaloides*, 7 genera of hard ticks and 3 genera of soft ticks were collected from cattle in India. In Pakistan, there were 5 genus of ticks has been recorded, with at least 3 genus infesting ruminants, and the tick infestation prevalence was more in cattle (28.2%), followed by sheep, buffaloes and goats[16]. A higher prevalence of bovine tick infestation (1076/1475; 72.9%) was reported from another study in the districts, Layyah and Muzaffargarh, of lower Punjab, Pakistan[17]. The eighteen species of ticks species were collected on domestic animals in Kerala state by Prakasan and Ramani[18].

Table-2
Species of ticks associated with host animals

Genus	Species	Host
Haemaphysalis	*H.Bispinosa*	Cat, Dog, Buffalo, Cow
	H.Canestrini	Buffalo ,Dog, goats
	H. kinneari	Dog, Cat, goats
	H.intermedia	Cat, goats, Cow
	H. turturis	Dog, Buffalo, Cow
Boophilus	*B.annulatus*	Cat,Dog, goats
	B.microplus	Goats, Cow
Hyalomma	*H.truncatum*	Dog, Buffalo
	H. anatolicum	Buffalo, Cow
	H.hussaini	Cat ,Dog, Buffalo
Amblyomma	*A. persicus*	Dog, Buffalo
	A. robertsi	Buffalo
Rhipicephalus	*R. sanguineus*	Cat,Dog, goats, Cow
	R. evertsi	Buffalo,Cat, Cow

Conclusion

The present study discusses the results of a survey carried out on the species diversity of the Ixodid ticks infesting the domestic animals of Villupuram district. Dogs (64.44%) and buffalo (58.06) had the maximum rate of tick infestation while cat revealed the minimum level.

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