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International Journal of Current Research
Vol. 9, Issue, 08, pp.56333-56335, August, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

PREVALENCE OF IXODID TICKS FROM DIFFERENT DOMESTIC ANIMALS OF NORTH KARNATAKA

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ARTICLE INFO

Article History:
Received 28th May, 2017
Received in revised form
14th June, 2017
Accepted 17th July, 2017
Published online 31st August, 2017

Key words:
Ixodid ticks, Hyalomma,
Domestic animal, Infestation.

ABSTRACT

A survey was carried out in four districts of North Karnataka to study the prevalence of Ixodid ticks infesting domestic animals. A total of 621 domestic animals were screened out of which in 360 animals were infested. Out of the five groups of domestic animals the infestation was maximum in Buffalo with 79.04% and minimum in Goats with 44.516%. Amongst the four ticks identified *Hyalomma sp*. dominated with 45.27% of infestation and *Boophilus microplus* with least infestation of 2.2%

Citation: Umashri, Swetha V. Lingashetter and Kadadevaru, G.G. 2017. "Prevalence of Ixodid ticks from different domestic animals of north Karnataka", *International Journal of Current Research*, 9, (08), 56333-56335.

INTRODUCTION

Parasitic diseases are global problem and considered as a major obstacle in the health and product performance of animals. This may be due to endoparasites that live inside the body or ectoparasite such as ticks, mites, flies, fleas, midges etc... which attach the body surface. Among ecto-parasites, ticks are very important and harmful blood sucking external parasites of mammals, birds and reptiles throughout the world (Furman and Loomis, 1984). Ticks belonging to Family Ixodidae (Acari: Ixodida) are obligate haematophagus ecto parasites of human and their cultivated animals and their parasitization of livestock results in reduced milk production, reduced weight, and transmission of pathogenic parasites thus acting as an impediment to the growth of the livestock industry (Chhabra,1992). Tick are confined to the tropical countries of the world, such as India, Pakistan, Bangladesh etc, where environmental conditions are more favourable for both growth and development of the different types of tick species (Ghosh *et al*., 2007). India is predominantly an agricultural country with about 70% of its population dependent on income from agriculture. Farmers are keeping animals for milk, meat, wool, hide and for various form operation. In India cattle and buffaloes are frequently, heavily infested with multispecies of ticks, which not only transmit diseases but also cause extensive damage to the livestock health and production. About 850 tick species have been described all over the world (Vrededoe, 2002) and 108 tick species are known from India (Sanyal and De, 2005).

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Incidence and prevalance of Ixodide ticks on sheep and goats in Karnataka and various other diverse biotops of south India were studied by Jagannath and Lokesh (1988) and Saxena (1997).

MATERIAL AND METHODS

A survey was conducted from the selected locations of North Karnataka. A total of 13 collections were performed from 13 allopatric populations during the period of September, 2016 to January, 2017. The study area for the present investigation, were selected from four different districts of North Karnataka. In Gulbarga district the infestations were observed from Kalburgi ($17^0$19′09.55″ N, $76^0$49′30.82″ E), Nandikur ($17^0$16′30.95″ N, $76^0$48′55.98″ E), Firozabad ($17^0$05′02.79″ N, $76^0$47′28.40″ E), Sirasagi ($17^0$18′26.89″ N, $76^0$46′44.75″ E), Kusnoor ($17^0$18′17.18″ N, $76^0$52′33.42″ E), Kandagol ($17^0$26′18.87″ N, $77^0$03′43.82″ E) , Arankal ($17^0$29′05.81″ N, $77^0$03′44.13″ E) and Udnoor ($17^0$17′32.50″ N, $76^0$47′32.73″ E). The places from Dharwad district included Karnataka University Campus, Dharwad ($15^0$26′29.38″ N $74^0$50′03.44″ E), Navalur village ($15^0$25′57.70″ N, $75^0$02′36.75″ E) and Hubballi($15^0$20′16.86″ N, $75^0$07′49.98″ E). From Adage district observations were made at Gajendragad ($15^0$20′16.86″ N, $75^0$07′49.98″ E), and observations were made at few places from Vijaypur town ($16^0$50′50.24″ N, $75^0$42′55.71″ E) of Vijayapur District.

Collection of samples: Ticks were searched by the hands through body coat and collected manually. They were observed in all the parts of especially around the ears, tails, trunk and legs etc.

Table 1. Rate of Infestation of ticks in different domestic animals of North Karnataka

Name of the Host	Total Number hosts		Percentage infestation
	Screened	Infested	
Cow	38	27	71.05
Ox	50	36	72
Buffalo	105	83	79.04
Goat	155	69	44.516
Sheep	273	145	53.11
Total	621	360	57.97

Table 2. Rate of Infestation of ticks in different domestic animals with different species of ticks of North Karnataka

Name of the Host	Total Number hosts Infested with Ixotid ticks				
	Hosts Screened	*B annulatus*	*B.microplus*	*Hyalomma* sp	*R. haemophysaloides*
Cow	38	8	2	11	6
Ox	50	-	3	28	5
Buffalo	105	-	3	73	7
Goat	155	41		12	16
Sheep	273	32		39	74
Total	621	81	8	163	108
Percentage		22.5	2.2	45.27	30

Boophilus annulatus, *Boophilus microplus*, *Hyalomma* sp. *Rhiphicephalus haemophysaloides*

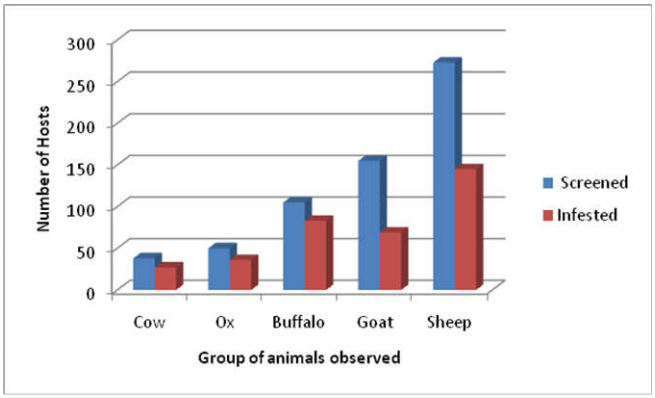

Figure 1. Number of domestic animal Screened and infested

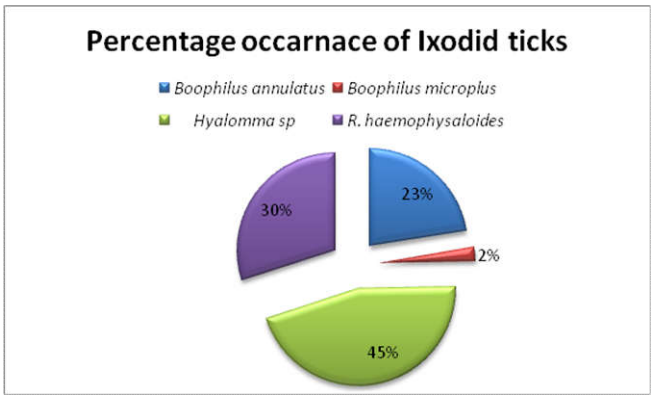

Figure 2.

The collected ticks were preserved in equal volumes of chloroform and 5% Formalin in separate sampling bottles and the sample bottles were labelled with area of collection, types of parasites and date of collection. For identification, the ticks were studied under Leica MZ6 stereo-zoom microscope and photographed using Olympus digital camera.

Identification of Ticks

The preserved specimens were washed with distilled water 3 times in order to remove the preservative (formalin) and the add 3-4ml of KOH in a test tube and boil for about 15 minutes until the ticks appear likely to be transparent. And the ticks were transferred to a clean slide then add DPX (commercially available) and following genus were encountered. The ticks were identified upto generic (genus) level by using identification keys or tick lists Krantz (1940), Sen (1938), Geevarghese *et al.* (1997).

RESULTS AND DISCUSSION

In the present investigation a total of 621 live stocks consisting of about 38 cows, 50 ox, 105 buffaloes, 155 goats and 273 sheep were screened for the possible hard tick infestations from different geographical locations of North Karnataka. It is observed that all the groups of domestic animal are found infested with different species of ticks (Table 1, Figure-1).

After microscopic examination and referring to the available taxonomic keys three ticks were identified up to species level and one up to genus level. The identified ticks are *Boophilus annulatus, Boophilus microplus, Rhiphicephalus haemophysaloides and Hyalomma* sp. As for the host preference and intensity of infestation are concerned, Buffalo was the preferred choice for most of the hard tick species which were collected during the present study with 79.04% followed by Ox and cow with 72 and 71.05% respectively (Table 1) Goats were list infected with 44.516%. Members of the *Hyalomma* species were dominant with highest rate of infestation (45.27%) Table 2. Figure 2 followed by *Rhiphicephalus haemophysaloides Boophilus annulatus, Boophilus microplus* with 30%, 22.5 % and 2.2% respectively (Table 2 & Figure 2). The most common and prevalent species infesting all the groups of the domestic animals observed in the present study are Hyalomma sp and *Rhiphicephalus haemophysaloides*. Hiregoudar and Jagannath (1977) reported occurrence of *R. haemophysaloides* on the domestic animals of Karnataka. Kambale and Hiregoudar (1988) also reported the occurrence of Ixodid ticks from domestic animals of Dharwad. During the study, the most prevalent ecto parasite encountered was *Hyalomma sp.,* which was found to be infesting majority of observed animals (Table). This suggests its ability to infect and enjoy the different host selection unlike the other species. Interestingly, in the present study cow, and buffalo show mixed infestation of three ticks i.e. *B.microplus, Hyalomma sp.* and *R. haemophysaloides.*

Earlier at higher altitudes of Nilgiri hills, Kumar *et al.* (2002) determined the epidemiological significance of Ixodid ticks and recorded *B. microplus,* and *Riphicephalus haemaphysaloides,* from domestic animals. The study provides an information that the domestic animals of North Karnataka region are infested with four different species of ticks belonging to three different genera. Out of the five groups of domestic animals that were screened in the present study maximum infections were observed in Buffalo and Goats showed minimum infection. It is also observed that the regular monitoring and proper hygienic conditions helps to overcome the tick infestation. It is suggested that more such studies are needed in these areas to know many details about the infestation of these parasites in the livestocks.

Acknowledgements

Authors thank Chairman Department of Zoology Karnatak University, Dharwad for the facilities. Special thanks to Mr Sudeep Kairanna, Harsha Neelgund and Manjunath Hosmani for their assistance in preparation of the manuscript. Special thanks to Dr Anand K.J. Dept of Parasitology, Govt Veterinary College, Shimoga for his guidance.

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