

Research Article



First Pilot Study on the Prevalence of Tick Infestation in Livestock of Tehsil Hajira, Rawalakot, Azad Kashmir

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Abstract | Ticks (Acari: ixodid) are blood imbibing ecto-parasite of wide range of animals. Ticks and tick-borne infections impose major economic threats to the livestock industry throughout the world. The present study reports prevalence of tick in livestock population of Tehsil Hajira of District Rawalakot Azad Kashmir. Through random sampling technique, a total of 1350 animals were scrutinized for tick infestation in 6 villages with an average 225 animals per village from Tehsil Hajira, Rawalakot, Azad Kashmir. The study was piloted from June 2011 to November 2011. The performa was designed to collect the information on routine managemental practices, and customs to be performed by the farmers to their animals. The data were analysed statistically by SAS 2010. The dominant specie of ticks *Hylomma anatolicum anatolicum* was observed on all four species of livestock includes: Cattles (55.45%), Buffaloes (51.03%), Sheep (54.66%) and Goats (48.00%) with an overall prevalence of 51.25% in the study area. The month wise high prevalence observed during the June and July and lower prevalence during the month of November. Sex wise male and age wise young animals were found more infested compared to female and adult animals. It is the first report on tick prevalence from Azad Kashmir. There is a need of improvement and awareness regarding currently practiced tick control measures.

Keywords | Tick, Prevalence, *Hylomma anatolicum*, Livestock, Azad Kashmir

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INTRODUCTION

Ticks (Acari: Ixodid) are active vector, next to mosquitoes (Le Bars, 2009), in disease transmission found in tropical and subtropical (Jongejan and Uilenberg, 1994), region of the world. Tick causes detrimental effect to animals via blood loss/ drain, stress, irritation and despair of immune function (Ghosh et al., 2007). In addition to these effects, ticks are also reason of financial losses in term of reducing hide and skin value up to 20-30% (Biswas, 2003), and economical losses associated with the diseases they transmit directly to the hosts (Garcia, 2003). Due to climatic changes and global warming, ticks have a vectorial potential. The rate of tick infestation are expected to be change which further limit sustainable livestock produc-

tion globally in general and in tropical area particular (Kabir et al., 2011). A sufficient numbers of published data is available on tick prevalence from bordering region of the study area of Azad Kashmir (Irshad et al., 2010; Atif et al., 2012) but not a single study was intended formerly to this study on tick prevalence which may represent tick infestation in the area. The prevalence of tick infestation in livestock is much higher in developing countries (Minjauw and McLeod, 2003). Therefore, present study was designed with the objective to be acquainted with point prevalence of ticks in the livestock population of the Azad Kashmir and moreover interest behind study upon tick was also provide more information about the environmental settings i.e. temperature and humidity to which ticks are prone to be exposed.

Following the methods of (Soulsby, 1982), the tick specimens were mounted and identified using standard morphological tick identification keys (Walker et al., 2003) under stereomicroscope.

STATISTICAL ANALYSIS

All the data collected was analysed statistically by using software package SAS (Version 2010).

RESULTS

During the present survey six villages were visited and a total of 1350 animals viz. 600 goats, 300 sheep, 220 cows and 230 buffaloes were randomly inspected for tick collection. Out of 1350 animals 692/1350 (51.25%) animals were found positive/infested with ticks. From the sampled animals 288/600(48.00%) goats, 164/300(54.66%) sheep, 122/220(55.45%) cattle and 118/230(51.03%) buffaloes were found positive for ticks respectively. off the tick belong to genus *Hylomma* was identified i.e. *Hylomma a. anatolicum* commonly. The seasonal tick infestation during the study was observed in summer season than autumn season (Figure 1). Monthly highest prevalence of tick was during June and July and lowest during November. Sex-wise male animal were frequently infested than female animals. Association of various host and environment related determinants with the prevalence of ticks in livestock population of study area have been shown in Table 1. The overall prevalence in Livestock species, there was non-significant (P.>0.05) association in the present study.

DISCUSSION

Ticks are potential vector of viral bacterial, protozoal and helminths diseases with zoonotic significance in animals

STUDY AREA

The study was piloted from 1st June 2011 to 31st December, 2011 in the six villages naming Nundinaar, Kamorh, Kalah, Draykutti, Numbal and Naka of Tehsil Hajira of district Poonch/Rawalakot of Azad Kashmir lies between longitude 33° 51' 28 North and latitude 73° 45' 39 East. The study area is bounded by Bagh from North, Sudnuti by South, and East by occupied Kashmir (India) and west by Kahuta (Pakistan). Its population according to census 2006 was 0.490 million and its area is 855 km. Average maximum temperature of the year was 21.64°C while minimum 7.20°C. Maximum temperature was recorded in months of June and July while minimum temperature was recorded during December and January (Anonymous, 2011).

SAMPLING TECHNIQUE

For the collection of data a random sampling technique (Thrushfield, 2007) was applied to gathered the data on tick prevalence from six village of the Tehsil Hajira. All the information required like age, sex, breed, managemental conditions, routine medication, and customs were collected on the predesigned proforma.

SPECIMEN COLLECTION

Before collection of ticks animals were restrain properly and their whole body was thoroughly inspected visually for the presence of tick. Tick specimens were collected following the procedure of Ica et al. (2007). After detachment of ticks through forcep from the animal body, they were preserved in 70% ethanol. The bottles were properly labelled and shipped to the Microbiology and Parasitological laboratory, Department of Zoology, Azad Kashmir University, Muzaffarabad, for identification and record of ticks.

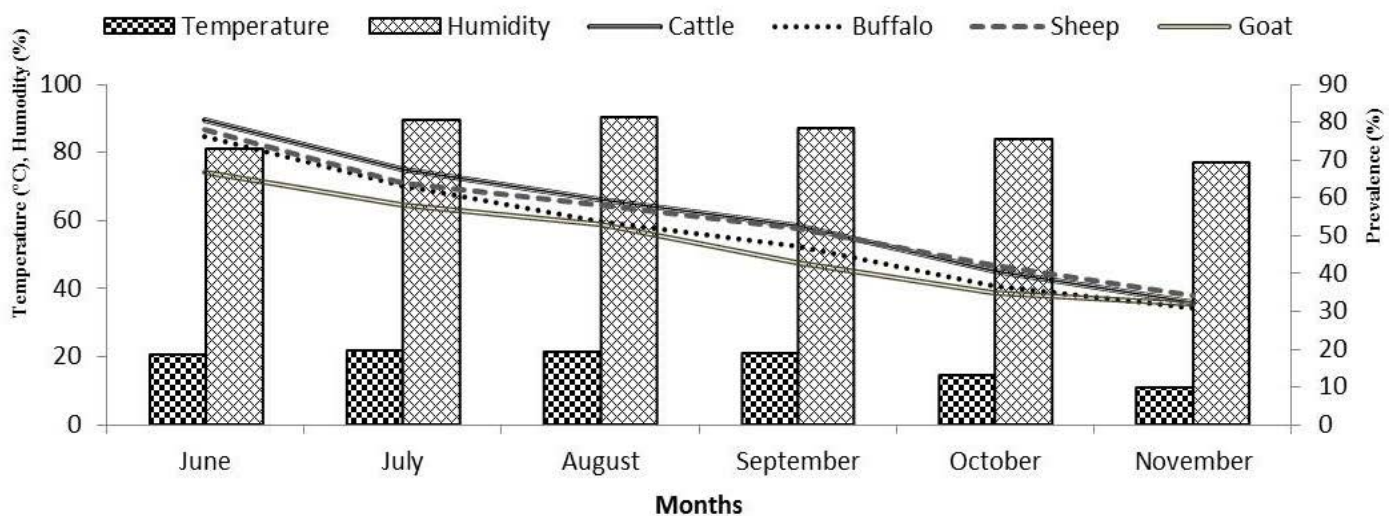


Figure 1: Monthly prevalence of tick infection livestock species in association with metrological data of Tehsil Hajira, Rawalakot, Azad Kashmir

Table 1: Prevalence and host associated features of ticks infesting livestock species of Tehsil, Hajira, Rawalakot, Azad Kashmir

Variables	Levels	Animals Screened	Ticks Positive	Prevalence (%)	Confidence interval 95%		Odds Ratio	P-value
					Lower limit	Upper limit		
Animal Specie	Cattle	220	122	55.45	48.84	61.93	1.16	0.266
	Sheep	300	164	54.66	49.00	60.24	1.14	0.289
	Buffalo	230	118	51.30	44.85	57.73	1.07	0.614
	Goat	600	288	48.00	44.02	52.00	-	-
Cattle								
Age	Young	74	56	75.68	37.21	54.79	1.67	0.024
	Adults	146	66	45.21	45.21	62.79	-	-
Sex	Male	82	60	73.17	40.38	58.02	1.63	0.034
	Female	138	62	44.93	41.98	59.62	-	-
Season	Summer	110	76	69.09	53.45	70.56	1.65	0.027
	Autumn	110	46	41.82	29.44	46.55	-	-
Buffalo								
Age	Young	86	60	69.77	41.86	59.79	1.73	0.019
	Adults	144	58	40.28	40.21	58.14	-	-
Sex	Male	86	58	67.44	40.21	58.14	1.62	0.034
	Female	144	60	41.67	41.86	59.79	-	-
Season	Summer	115	74	64.35	53.73	71.08	1.68	0.027
	Autumn	115	44	38.26	28.92	46.27	-	-
Sheep								
Age	Young	86	68	79.07	34.10	49.12	1.76	0.006
	Adults	214	96	44.86	50.88	65.90	-	-
Sex	Male	102	74	72.55	37.62	52.79	1.60	0.019
	Female	198	90	45.45	47.21	62.38	-	-
Season	Summer	150	100	66.67	53.35	68.22	1.56	0.022
	Autumn	150	64	42.67	31.78	46.65	-	-
Goat								
Age	Young	176	118	67.05	35.40	46.73	1.67	0.001
	Adults	424	170	40.09	53.27	64.60	-	-
Sex	Male	204	128	62.75	38.78	50.22	1.55	0.003
	Female	396	160	40.40	49.78	61.22	-	-
Season	Summer	300	178	59.33	56.09	67.22	1.62	0.021
	Autumn	300	110	36.67	32.71	43.91	-	-

and human (Dantas-Torres, 2008). So in this regard evidence about tick prevalence in any specific area is essential for the planning of control measure towards ticks and tick borne diseases. Due to continuous change in environmental setting, tick borne emerging and re-emerging infections of different causes have been reporting globally. In the present developmental scenario, it is very much necessary to attain information about the ever changing trends of diseases particularly of vector linked which infect livestock and Humans both. Widespread research studies have been piloted on the prevalence of the tick fauna and associated risk factors in numerous part of the world but the study

area is not explored regarding this aspect. This is the first effort to conduct study in the area. Only single species of tick *Hylomma anatolicum* was identified from the examined livestock of the area. The identified species of tick was also reported by (Sajid et al., 2009; 2011; Atif et al., 2012; Biu et al., 2012; Monfared et al., 2013; Mustafa et al., 2014) from other areas. Results of the present study are somewhat similar or different to the studies carried out earlier in other part of the globe (Irshad et al., 2010; Sajid et al., 2011; Ahmed et al., 2012; Monfared et al., 2013; Iqbal et al., 2013; Tasawar et al., 2014; Hassan and Al-Zubaidi, 2014; Mustafa et al., 2014). Several environment related

factors which support tick survival in the specific area including; temperature, humidity, rainfall (Greenfield et al., 2011), vegetation (Gray, 2002), host availability, season (Teel et al., 1996), altitude (Cadenas et al., 2007), breed, age, sex, stage of lactation, gestation period and nutritional status of the animal (Alonso et al., 2007; Yacob et al., 2008), body condition (Rony et al., 2010), method of application of acaricides (Bianchi et al., 2003) and husbandry practices (Sajid et al., 2011), and animal movement (Hassan and Osman, 2003). The reason of higher prevalence of tick in livestock species of the study area could be due to the climate and geography of the study area as the climate variables significantly affect ticks distribution in particular region (Estrada-Pena, 2003). Season plays key role in tick propagation and distribution and it is established that peak tick prevalence has been reported in summer (Rony et al., 2010). From the surrounding part of the study area reports have shown that higher tick prevalence in summer (Durrani and Shakoori, 2009). Present study was carried-out in summer and autumn season depicted higher prevalence in summer when weather conditions were hot and humid that support ticks survival and expanding (Ghosh et al., 2007). Husbandry practices are also correlated with tick richness and distribution. In this situation, mixed grazing of different animal species at same pasture and / or mixed housing provides maximum opportunity for tick to infest large population at a time. In study area, sheds for animals are made of bricks and stones with mud which provides cracks and cervices that suits for nidicolous questing behaviour of ticks (Soulsby, 1982). Result of the current study found that male and young crop of livestock species were more exposed to tick infestation. This could be due to the less attention has been paid by owner towards male in the investigated area and on the other hand hormonal effect mainly, androgen and oestrogen which had inhibitory and stimulatory effect on immune response due to which male animals are more prone to ticks than females (Bilbo and Nelson, 2001). Soft and pliable skin of young animal facilitates tick and prolongs duration of attachment (Sajid et al., 2009; Kabir et al., 2011). In male animals higher prevalence was also reported by (Tasawar et al., 2014). Awareness about the treatment of infested animals and lack of veterinary facilities are the noteworthy reasons for high tick infestation in the area.

CONCLUSION

So it has been concluded that ticks are prevalent in the livestock population of study area and different determinants including age, sex, and season are the risk factors for tick distribution.

RECOMMENDATIONS

On the basis of results of the present study some recom-

mendations are advised for farmers and researchers (a) prophylactic therapy, to their livestock population must be administered at the start of warm season (April-May), (b) young and male animals should especially be attended (c) livestock and dairy development organizations must launch an awareness campaign to the areas for possible threats of tick and ticks borne diseases to the livestock (d) screening of ticks for the detection of pathogen of zoonotic significance using modern biotechnology tools. (e) arrange such kind of study in other areas of Azad Kashmir.

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CONFLICT OF INTEREST

There exist no conflict of interest.

AUTHORS CONTRIBUTION

All the authors have equal contribution for this manuscript.

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