

## Taxonomy and Prevalence of Hard Tick Species on Small Ruminants (Goats and Sheep) in Pakistan

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### ABSTRACT

Ticks are very dangerous ectoparasites of large and small domestic and wild animals throughout the globe. Tick infestation is the most serious threat to animal health, resulting in significant economic losses in many countries. The current research work was planned to collect, and identify the tick species found on goats and sheep. Four tick species i.e. *Hyalomma anatolicum*, *Hyalomma dromedarii*, *Dermacentor marginatus* and *Haemaphysalis punctata* were identified. Prevalence rate wise data showed *Hyalomma anatolicum* (60.50%) followed by *Hy. dromedarii* (15.50%), *Dermacentor marginatus* (13.00%) and *Haemaphysalis punctata* (11.00%). Sex wise data showed that female hosts were more loaded with ticks than male, and young carried more ticks than old. Highest infestation was recorded on goats than sheep. The current study concluded that *Hyalomma* spp. are widely distributed and need to control them in the whole country especially study area.

**Keywords:** Ticks; Domestic animals; Small ruminants; Prevalence percentage; *Hyalomma* spp.

### INTRODUCTION

Ticks are the obligate arthropods of livestock which affect their productivity in the world including Pakistan. Ticks considered important

vector of various viral, protozoal and bacterial diseases to animals, humans, birds and reptiles (Alam et al., 2013, Tasawar et al., 2014; & Jamil et al., 2022).

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Ticks are ectoparasites that feed on both wild and domesticated animals' blood. Ticks are mostly found in the tropical and subtropical areas of the globe. This creature is distributed in Asia, Africa, America and Australia etc. This eight-legged arthropod causes severe economic losses in livestock (Ghosh et al., 2007; Irshad et al., 2010; & Ullah et al., 2022).

Several tick species such as *Argas abdussalami*, *A. persicus*, *Rhipicephalus evertsi evertsi*, *Rhi. microplus*, *Amblyomma gemma*, *A. variegatum*, *A. pomposum*, *Dermacentor marginatus*, *Hyalomma truncatum*, *Hy. anatolicum*, *Hy. marginatus* and many others have been identified as carriers of diseases in animals as well as in humans (Khalil et al., 2018; Zulfiqar et al., 2012; & Ramzan et al., 2020a). Rocky Mountain Spotted Fever, Crimean-Congo Hemorrhagic Fever (CCHF), and Babesiosis are all examples of infectious diseases. More than 53 tick species have reported from Pakistan (Ramzan et al., 2018, 2021) and still need to conduct surveys for tick collection, identification and determination of their prevalence on large as well as small ruminants. By keeping in view, the importance of the study, the current research work was performed or conducted to collect, identify and determine tick prevalence on small ruminants. The recent results will help the farmers or herdsmen as well as coming researchers in managing ticks and tick-borne diseases in the country especially current study areas.

## MATERIALS AND METHODS

A cross sectional and experimental study was conducted to collect, identify and determine tick prevalence on goats and sheep in Multan. For this purposes, 200 ticks were collected from different body parts of goats and sheep

and collection was done in plastic vials. The collected specimens were shifted to laboratory and identify to species level under stereomicroscope by using published morphological keys of tick (Walker et al., 2014). The data (age, sex, location) were collected in the whole study and statistically analyzed.

## RESULTS AND DISCUSSION

Ticks are blood feeding small ectoparasites creature of vertebrates all over the world, particularly humans, mammals, reptiles and birds throughout the world. They are cosmopolitan in distribution and feed on all types of living things either terrestrial as well as aquatic, but are most common in tropical regions and subtropical regions with warm and humid climates conducive to metamorphosis. Tropical and subtropical climatic conditions have recorded most suitable for tick growth, development, migration as well as reproduction (Rajput et al., 2006; & Ramzan et al., 2019, 2021).

In the present study, four species belong to three genera were identified. Names of identified species are *Hyalomma anatolicum*, *Hy. dromedarii*, *Dermacentor marginatus* and *Haemaphysalis punctata*. The prevalence rate of *Hyalomma anatolicum*, *Hy. dromedarii*, *Dermacentor marginatus* and *Haemaphysalis punctata* was 60.50, 15.50, 13.00 and 11.00%, respectively. Among identified tick species, *Hy. anatolicum* was dominant species with highest prevalence rate while *Hae. punctata* with least prevalence rate as given in table 1. Jamil et al. (2021a,b), Sultana et al. (2015) and Abbas et al. (2014) had reported the similar results about species infestation.

**Table1. Number of ticks species with prevalence percentage captured from goats and sheep**

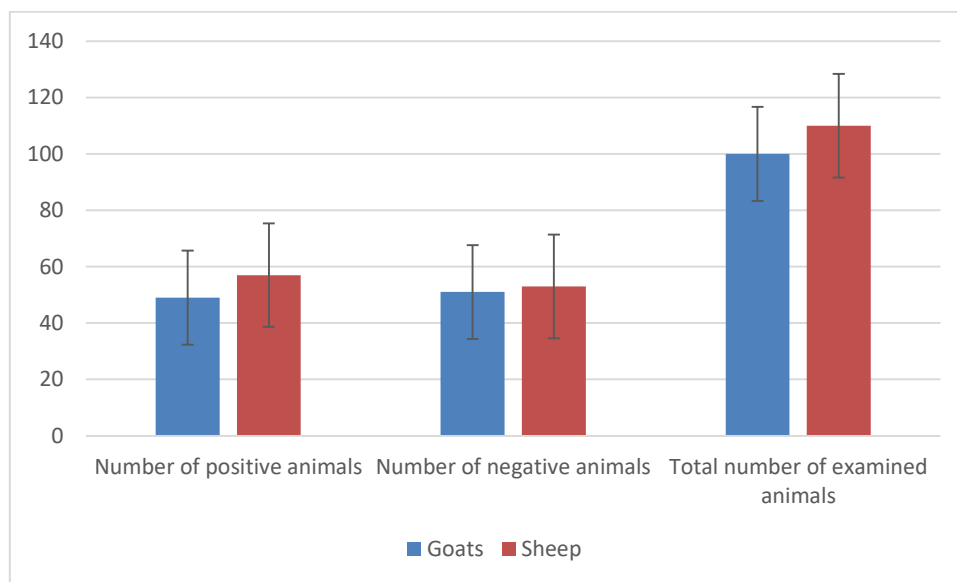
Tick species	Goats	Sheep	Prevalence (%)
<i>Hyalomma anatolicum</i>	69	52	60.50
<i>Hyalomma dromedarii</i>	0.0	31	15.50
<i>Dermacentor marginatus</i>	26	0.00	13.00
<i>Haemaphysalis punctata</i>	No	22	11.00
Total	95	105	100.00

**Table2. Tick species collected from examined animals**

Tick species	Goats	Sheep
<i>Hyalomma anatolicum</i>	Yes	Yes
<i>Hyalomma dromedarii</i>	No	Yes
<i>Dermacentor marginatus</i>	Yes	No
<i>Haemaphysalis punctata</i>	No	Yes

*Hy. dromedarii* was collected from sheep not from goats while *D. marginatus* collected from goats not from sheep as given in table 2. It was also recorded that female hosts were highly infested with tick burden when compared to male. The similar results have been reported by many other researchers in the world (Manan et al., 2007; Asma et al., 2014; &

Ramzan et al., 2019). Female hosts become more vulnerable for tick attack due to weak immune system. It was also reported that among 100 goats and 110 sheep which screened during the study, 49 and 57 were recorded positive to tick attach, respectively as shown by figure 1.

**Figure1. Number of positive and negative animals in the study area**

### CONCLUSION

Ticks are the ectoparasites which becoming serious risk for livestock and humans in the globe including Pakistan. The population of ticks is high in Pakistan because climatic conditions of the country are favorable for tick distribution, migration, growth and development. Many species of ticks are existing in the country. Among them, *Hyalomma anatolicum* is widely spread tick species.

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### Conflict of interest

Authors show no conflict of interest.

### Author Contribution

All authors contributed equally to establishing the topic of the research and design experiment.

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