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## Relative Abundance of the Tick Species Parasitizing Cows in Faisalabad, Pakistan

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### ABSTRACT

Ticks are blood-feeding ectoparasites of livestock and human. Ticks can cause directly as well as indirectly losses to humans and animals all over the world. The current study was conducted to determine the abundance of tick infestation and identification of tick species in Faisalabad during 2020. Three tick species were collected belong to three genera; *Hyalomma anatolicum* (44.88%), *Rhipicephalus microplus* (30.77%) and *Haemaphysalis sulcata* (24.33%). Among identified tick species, *Hyalomma anatolicum* was the dominant species (44.88%) followed by *Rhipicephalus microplus* (30.77%) and *Haemaphysalis sulcata* (24.33%). Female animals were highly infested with tick species than male. Young animals carried a greater number of ticks as compared to old or adults animals. Among examined animals, 54.14% and 45.85% animals were recorded positive and negative for tick infestation, respectively.

### INTRODUCTION

Ticks, which feed on the blood of human, animals, birds, and reptiles, have an epidemic spread in tropical and subtropical areas (Vesco *et al.*, 2011) of the world. Ticks are mostly found all over the world, including Asia, Europe, Australia, America, and Africa (Singh and Rath, 2013; Elghali and Hassan, 2012; Lohmeyer *et al.*, 2011; Kamau, 2011; Rjeibi *et al.*, 2016). Ticks can either directly affect their hosts by causing tick-related stress, anemia, allergy, irritation, weight loss, and paralysis, or indirectly by transmitting a variety of pathogenic microorganisms such as viruses, bacteria, protozoa, fungi, and spirochetes (Ramzan *et al.*, 2018). Tick-borne diseases cause significant health issues as well as production and economic losses, primarily in subtropical and tropical areas. Ticks belong to four main families *i.e.* Ixodidae, Argasidae, Laelaptidae, and Nuttalliellidae (Anderson and Magnarelli, 2008; Ramzan *et al.*, 2020b). The first two families have large tick species and becoming threat for human, animals and other biological fauna (Ramzan *et al.*, 2020a; Rahman *et al.*, 2022).

The climate and environmental conditions have a significant impact on ticks and tick-borne pathogens. Biotic and abiotic factors, climatic niche characterization, and tick-pathogen interactions all play an important role in tick distribution across the globe (Jamil *et al.*, 2021b). Many tick species have been reported by many researchers in Pakistan. The species belong to nine important genera such as *Hyalomma*, *Amblyomma*, *Rhipicephalus*, *Ixodes*, *Argas*, *Dermacentor*, *Haemaphysalis*, *Rhipicephalus*, and *Ornithodoros* (Ramzan *et al.*, 2020b). According to the reports of early as well as many previous researchers, *Hyalomma* spp. have widely distributed in domestic and wild animals of study areas of Pakistan (Ramzan *et al.*, 2019, 2021; Jamil *et al.*, 2021a; Ullah *et al.*, 2022).

There was a need to collect and identify tick species which found on animals and losing their productivity. For keeping in view, the importance of study, the current research work was conducted in district of Faisalabad, Pakistan.

#### MATERIALS AND METHODS

A survey was conducted to collect and identify the tick species found on cows from March 2020 to August 2020 in Faisalabad, Pakistan. A total 900 tick specimens were collected from 700 cows with the help of forceps and brought to parasitology laboratory for identification and identified to species under stereomicroscope. Age, and sex of the examined cows were recorded during the whole study period. Ticks were identified to species level by using morphological keys (Walker *et al.*, 2014).

#### RESULTS AND DISCUSSION

A total 900 tick specimens were collected from 700 cows in the study area. Three tick species belonging to three genera were identified. The identified tick species were *Hyalomma anatolicum*, *Rhipicephalus microplus* and *Haemaphysalis sulcata*. Among identified species, *Hy. anatolicum* (44.88%) was the dominant species followed by *R. Microplus* (30.77%) and *Hae. sulcata* (24.33%) as shown in Table 1. A study was conducted in district Multan by Ramzan *et al.*, (2019), they reported three hard tick species such as *Hyalomma anatolicum*, *Rhipicephalus sanguineus* and *Hyalomma marginatum*. The last species is not collected in the current study. The absence of this species in the study is due to variation in the area. our results related to tick prevalence are almost similar to previous studies (Ramzan *et al.*, 2021; Rehman *et al.*, 2017). The little variations are due to variations in geographical areas and years of collection and identification.

Among the examined animals, 54.14% were found infested by ticks (Table 2).

It was also observed that female and old/adults cows were highly infested with tick species as compared to male and young animals. Age-wise tick abundance is given in the Table 4 while the sex ratio of ticks is in Table 5. The findings of Tsai *et al.* (2011) and KhaliL *et al.* (2018) related to age and sex are in line with the current study findings.

Tick infestation was high in female cows than male. Our findings are in line with the previous researcher findings (Kabir *et al.*, 2011; Abera *et al.*, 2010).

**Table 1.** Identified and relative abundance of tick species found on cows in study area.

Tick species	Number (%) of ticks	Abundance
<i>Hyalomma anatolicum</i>	404	44.88
<i>Rhipicephalus microplus</i>	277	30.77
<i>Haemaphysalis sulcata</i>	219	24.33
Total	900	100%

**Table 2.** Percentage of tick-infested and non-infested cows in study area

Host	No. examined cow	No. (%) positive cows	No. negative cow	Abundance
Cows	700	379 (54.14)	321	54.14

**Table 3.** Tick burden in examined cows.

Host	Range of tick burden		Average
Cow	Minimum	Maximum	
	21	37	40.21

**Table 4.** Age wise tick abundance in the study are

Tick species	Number (%) of ticks collected	Abundance
Young	376 (41.77)	41.77
Adult	524 (58.22)	58.22

**Table 5.** Sex ratio of the collected ticks.

Tick species	Male	Female	Sex ratio	Abundance
<i>Hy. anatolicum</i>	190	214	2.30:2	44.88
<i>R. microplus</i>	108	169	5.8:7	30.77
<i>Hae. sulcata</i>	87	132	1.67:4	24.33
Total	385	515		100%

## Conclusion

The current study emphasizes the importance of effective tick control measures. Ticks are not only a potential disease vector, but they also have an effect on animal growth and reproduction. Many tick species are found in different areas of Pakistan and among identified species *Hyalomma* spp. especially *Hyalomma anatolicum* are at the highest/top position. There is a need to control them by adopting different tick management strategies and promoting crossbreed animals.

**Conflict of interest:** Authors declare no conflict of interest.

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