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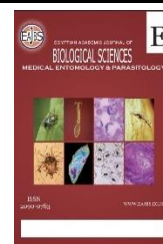
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## Identification of Tick Species on Domesticated Cattle Pakistan

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### ABSTRACT

Ticks are ectoparasites of domestic and wild animals all over the world. These are mostly distributed in tropical and subtropical areas of the world. The current study was conducted to identify tick species found on cattle. Four species (*Hyalomma anatolicum*, *Hy. marginatum*, *Hy. excavatum* and *Rhipicephalus sanguineus*) belonging to two genera were identified. *Hy. anatolicum* (38%) was the dominant species followed by *Rhipicephalus sanguineus* (26%), *Hy. excavatum* (21%) and *Hy. marginatum* (15%). The female tick was recorded in abundance on cattle than a male tick. The highest tick infestation was recorded on udder than other body parts. The current study provides basic knowledge about tick species found in the study area.

### INTRODUCTION

The dairy industry is playing an important role in the economy of various countries including Pakistan. The domesticated animals (goat, sheep, cow and buffaloes) are reared at small and large scale to full fill the requirement of various products such as meat, milk, protein and fatty acid. The productivity is decreasing due to ectoparasites and endoparasites (Sajid *et al.*, 2007). Ticks are ectoparasites and major health problems for humans especially animals. These are causing various viral, bacterial and protozoal diseases directly and indirectly in animals as well as human beings (Karim *et al.*, 2017; Rehman *et al.*, 2017; Jabbar *et al.*, 2015; Khan *et al.*, 2019). These, directly and indirectly, caused damage to animals which affects the skin, wool, milk and meat production of animals (Ghosh *et al.*, 2007; Rahbari *et al.*, 2007).

Three families of tick species i.e., Ixodidae, Argasidae and Nuttallidae have been reported yet. According to an estimation of FAO (1984), more than 80% animal population of the world is highly infested with tick species. The most commonly found tick species are *Hyalomma asiaticum*, *Hy. excavatum*, *Hy. anatolicum*, *Hy. marginatum*, *Haemaphysalis sulcata* and *Rhipicephalus sanguineus* (Ramzan *et al.*, 2021). These species are found on all species of domesticated and wild animals in tropical and subtropical areas of the globe.

The environmental conditions of Pakistan are most favorable for tick growth and development. The migratory and reproductive potential of ticks is high in the country due to warmer climatic conditions. Tick infestation in the study area is increasing resulting in the reduction in animal production (Kabir *et al.*, 2011). In Pakistan, several studies on tick biology, epidemiology and infestation have been conducted by many researchers but not on the proper identification of tick species found on domesticated animals. There is a need to identify tick species that are causing high infestation on animals in Pakistan especially study area. By keeping in view, the importance of the study, the current research was conducted.

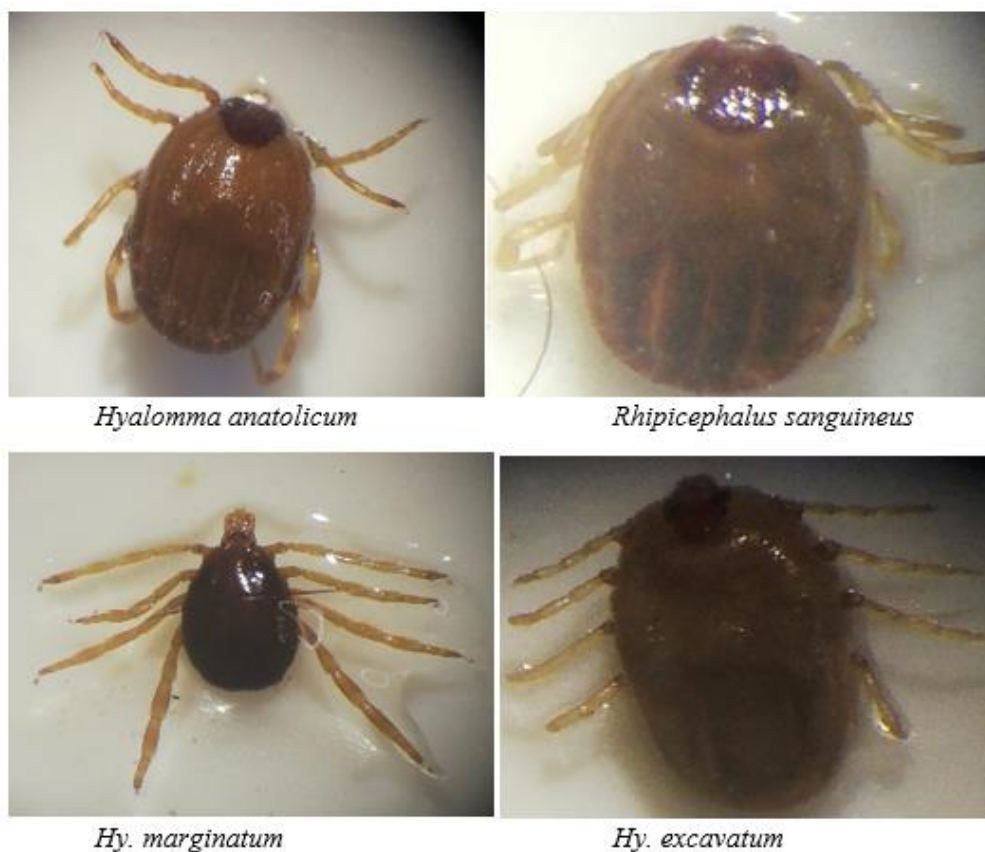
#### MATERIALS AND METHODS

Different farms were selected for tick collection. About 200 ticks were collected from randomly selected cattle (100) from each selected farm with forceps as described by Soulsby (1982). Specimens were

preserved in 70% ethyl alcohol and brought to the Laboratory of the Department of Entomology, University of Agriculture, Faisalabad for identification purposes. Ticks were identified to species level by using the taxonomic identification key (Walker *et al.*, 2007).

#### RESULTS AND DISCUSSION

The data showed that tick infestation is becoming a major health problem for domesticated animals including cattle. In the current study, four tick species such as *Hyalomma anatolicum*, *Hy. marginatum*, *Hy. excavatum* and *Rhipicephalus sanguineus* belonging to two genera were identified (Table 1 and Fig.1). Among identified tick species, *Hyalomma anatolicum* was found in abundance as compared to other species. Similar findings of the abundance of *Hyalomma* species have been documented by early researchers from Turkey, Pakistan and Iran (Aktas *et al.* 2004, Dehaghi *et al.* 2011, Razmi *et al.* 2003, Salim *et al.* 2010).



**Fig. 1.** Identified species on domestic animals.

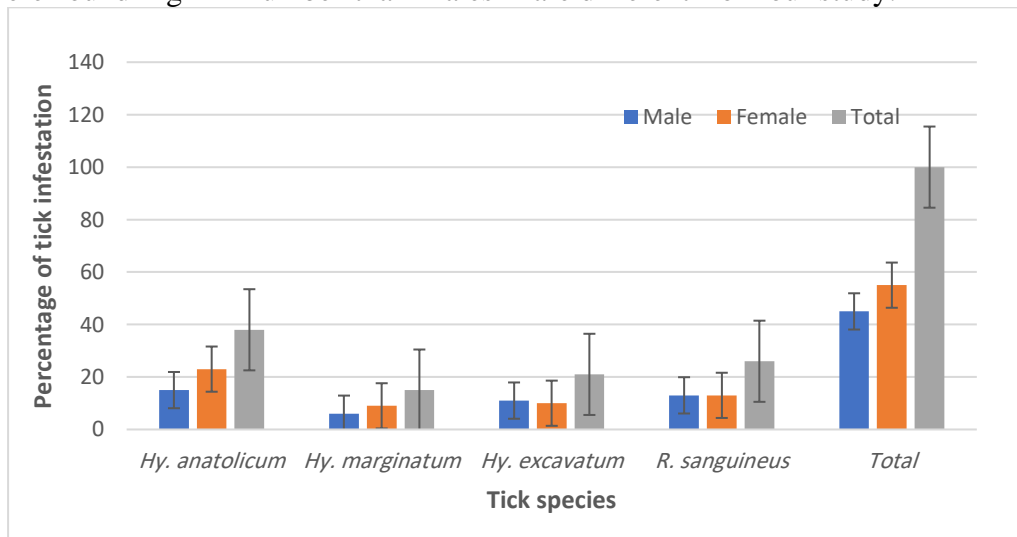
Tick species such as *R. microplus*, *R. haemaphysaloides*, *R. sharifi*, *R. annulatus*, *R. turanicus*, *R. sanguineus*, *Hy. detritum*, *Hy. dromedarii*, *Hy. marginatum toranicum*, *Hy. excavatum*, *Hy. anaticum anaticum*, *Hy. aegyptium*, *Dermacentor marginatus*, *D. raskimensis*, *Haemaphysalis cormupunctata* and *Hae. montgonervi* have been identified from different areas of Pakistan (Khan et al. 1993; Sajid et al., 2008).

**Table 1. Identified tick species found on cows in the study area.**

Tick species	Male	Female	Total
<i>Hyalomma anaticum</i>	15	23	38(38%)
<i>Hyalomma marginatum</i>	6	9	15(15%)
<i>Hyalomma excavatum</i>	11	10	21(21%)
<i>Rhipicephalus sanguineus</i>	13	13	26(26%)
<b>Total</b>	<b>45</b>	<b>55</b>	<b>100</b>

The tropical and subtropical as warmer regions have recorded the most preferable sites for *Hyalomma* abundance and growth (Rahbari *et al.* 2007). The study of other scientists (Dehaghi *et al.* 2011; Salim 2010) showed that *Hy. marginatum* was recorded as the dominant tick species in cows. The abundance of tick species can vary with respect to hosts as well as breed. The female ticks were found high in number than males

(Fig. 2). It was observed that young animals carry a greater number of ticks as compared to old animals. The high infestation of young animals may be due to the soft skin of young animals. Ramzan et al (2008) had reported similar findings while Asma *et al.* (2014) had reported that older animals carry a greater number of ticks as compared to young animals. The findings of Asma *et al.* (2014) are different from our study.



**Fig. 2.** Sex wise percentage of tick infestation

The environmental factors have also affected the distribution and infestation of ticks. The maximum tick population has been recorded in the month of June and July while lowest in December (Stuti *et al.*, 2008; Ramzan *et al.*, 2021). The rainy and summer

season is most important for tick growth and development while winter season is least (Rony *et al.*, 2010; Irshad *et al.*, 2010). It has been reported that due to continuous blood-feeding by a tick during high population, animals become very weak and even death of

animals occur (Iqbal *et al.*, 2013). In the current study, udder was found to be the most infested site of animals followed by tail, ear and chest.

### Conclusion

Ticks are obligatory ectoparasites of domesticated animals which cause a contagious decrease in animals, ultimately affect their growth and development. Tick species are the main threat especially *Hyalomma* spp. in animal production.

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