Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 18389 - 18394
Received 25 April 2021; Accepted 08 May 2021.

Collection and Identification of Tick Species on Goats and Sheep in Dera Ismail Khan, Pakistan

[*1]Muhammad Jamil, [2]Arsalan Khan, [3]Muhammad Zeeshan, [3]Sayed Mubashir Hasan, [3]Atiq Ur Rehman, [4]Muhammad Noman, [5]Ambrina Tariq, [6]Naimat Ullah, [7]Muhammad Rasheed, [7]Mubarik Ali, [8]Abid Hussain, [9]Muhammad Zeeshan ul Haq, [3]Muhammad Fahim ullah Khan

[*1] Pakistan Agriculture Research Council, Arid Zone Research Center, Dera Ismail Khan-29050-Pakistan

[2]Veterinary Research and Disease Investigation Center, Dera Ismail Khan-29050-Pakistan

[3]Faculty of Veterinary and Animal Sciences, Gomal University, Dera Ismail Khan-29050-Pakistan

[4]Department of Epidemiology and Public Health, UVAS, Lahore-42000-Pakistan

[5]Civil Veterinary Hospital CVH, Dera Ismail Khan-29050-Pakistan

[6] Department of Parasitology, Faculty of veterinary science, UVAS, Lahore-42000-Pakistan

[7]Animal science Institute, National Agricultural Research Center, -Islamabad- 54000-Pakistan

[8]PARC Agricultural Research Institutes, National Agricultural Research Center, Islamabad-54000-Pakistan

[9]Department of Clinical medicine and Surgery, University of Agriculture, Faisalabad- 38000-Pakistan

Corresponding Author: **Dr. Muhammad Jamil**

Email: jamilmatrah@gmail.com

ABSTRACT

Ticks are hematophagous ectoparasites of domestic and wild animals. These are the major health problems for human and animals especially livestock industry all over the world. The several tick species have been reported on domestic animals caused huge economic losses to livestock industry. The current study was conducted to check the tick species found on goats and sheep in Dera Ismail Khan (DI Khan) during 2020. A total of 220 animals were examined for tick collection and infestation in DI Khan using random sampling technique. Four species such as Hyalommaanatolicum, Hy. excavatum, Hy. marginatum and Rhipicephalus sanguineus belonging to two genera were collected and identified. The current study results showed that Hylommaanatolicum was dominant species found on both goats and sheep. Female were found more infested with tick species than male. There is need to adopt best management strategy to reduce the tick burden on livestock in the world especially study area.

Keywords: Ticks, Ectoparasites, Prevalence, Domestic animals, Pakistan

INTRODUCTION

Dairy industry plays key role in the economy of various countries including Pakistan. The animals are reared at large and small level to enhance the milk, meat and wool production. The productivity of livestock is decreasing due to various biotic and abiotic factors. Among biotic

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 18389 - 18394
Received 25 April 2021; Accepted 08 May 2021.

factors, pathogens and parasites are the major one that reduce their productivity[1]. Among parasites, ticks are hematophagous ectoparasites of sheep and goats in tropical and subtropical areas of the world including Pakistan[2]. These feed on blood and during feeding inject toxin which cause diseases in their host[3]. It has been reported that more than 80% goat population was recorded infested with tick and tick-borne diseases (TTBDs) such as viral, protozoal and bacterial[4, 5].

The various tick species such as Boophilus spp. Haemaphysalis spp. and Hyalomma spp. had been reported by early researchers in other areas of country except the current area. The most common tick specie, Hyalommaanatolicum was recorded in all types of animals such as goats, sheep, cows and buffaloes in all study areas of country[6, 7]. Several types of pathogens can transmit by these tick species into goat and sheep even in human [8].

The studies related to tick biology, ecology, distribution, epidemiology and taxonomy are play key role in adopting tick management strategies on small as well as large scale at different farms especially in the study area. There is need to check all these mentioned parameters in adopting best management strategy against tick. For this purpose, the current study was conducted to check the tick species found on goats and sheep in the study area.

MATERIAL AND METHODS

Ticks were collected from different body sites (ear, tail, udder) of 200 goats and sheep from May 2020-August 2020. The collected ticks were preserved in glass vial containing 70% ethyl alcohol and brought to laboratory for identification purposes. All information such as date of collection and host and collector name were labeled on the vial or even recorded on the separate sheet. The collected specimens were identified under stereomicroscope by using previously published morphological keys [9].

RESULTS AND DISCUSSION

During the current study, total two hundred twenty (220) ticks were collected from different body sites of animals.Out of 220 ticks, 120 were collected from goats and remaining 100 were collected from sheep during the whole study period. In the current study four species belong to two genera were identified such as Hyalommaanatolicum, Hy. excavatum, Hy. marginatum and Rhipicephalus sanguineus. It was observed thatHy.anatolicumwas the distributed tick species followed by Hy. excavatum, Hy. marginatum and R.sanguineus. Maximum Hyalomma species were collected from goats as compared to sheep (**Table 1**).

The low infestation was recorded on sheep and main reason of low infestation may be presence of wool on sheep body. The wool can prove best protective factor from tick attachment than goat.Our findings are in line with early researchers findings about tick infestation [10,11, 12, 13, 14, 15]. They had identified tick species from other areas of the country. Results of the present study are somewhat similar or different to the studies carried out earlier in other part of the globe. The percentage of tick infestation on sheep and goats is given in figure 1 and 2.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 18389 - 18394
Received 25 April 2021; Accepted 08 May 2021.

Table 1. Tick species, percentage of tick infestation collected from animals (goat and sheep) during the study

Tick species	Sheep	Goat	Percentage tick infestation	Total collected ticks
H.anatolicum	43	56	45%	99
R.sanguineus	10	9	8.63%	19
H. excavatum	31	38	31.37%	69
H. marginatum	16	17	15%	33
Total	**100**	**120**	**100%**	**220**

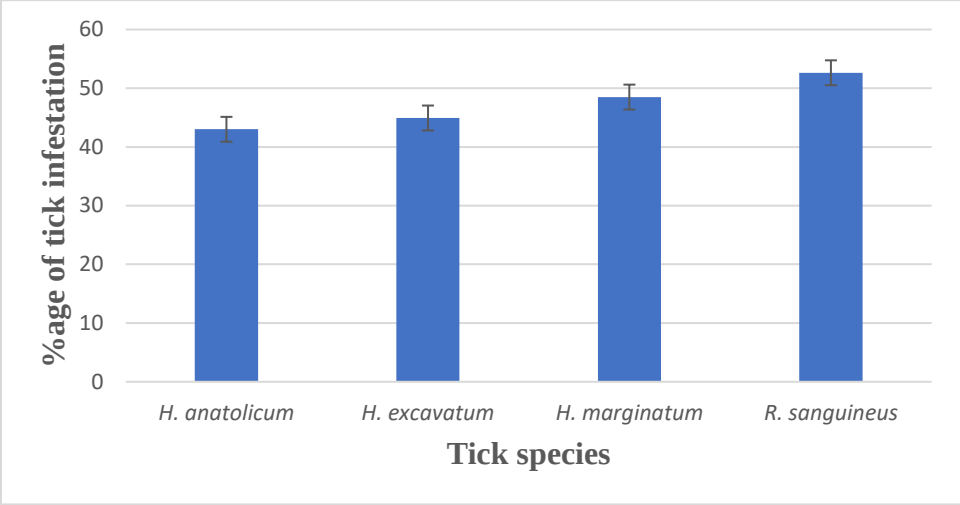

Figure 1. Tick species infestation on sheep

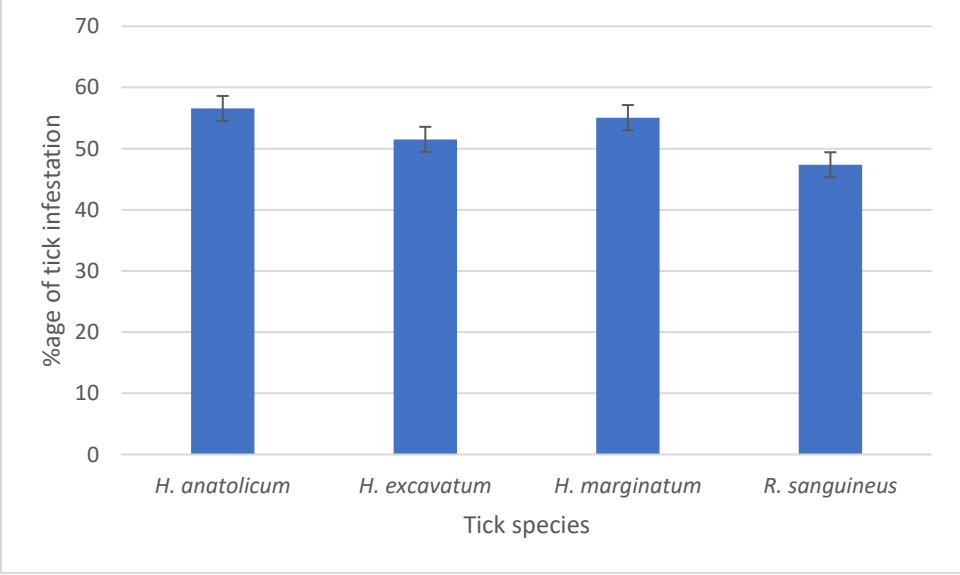

Figure 2. Tick species infestation on goat

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 18389 - 18394
Received 25 April 2021; Accepted 08 May 2021.

The infestation percentage can vary according to environmental factors, age, sex and breed of host. It has been reported in previous studies that tick infestation was recorded more in weak animals than healthy animals. In the current study, the similar observations were noted during tick collection. The percentage of tick infestation can also vary with status of animals like lactation and gestation period etc. The prevalence of tick species in the study area may be due to climatic factors which highly affect the tick abundance [16, 17, 18, 19, 20].

Male animals were carried low number of ticks than female. The young goats and sheep carried high tick population as compared to old one. The similar findings had been investigated by early researchers [21]. The high population of tick has been recorded in summer season as compared to winter in the previous studies [22]. High temperature and low humidity can prove effective for tick growth and development as well as reproduction.

CONCLUSION

Ticks are ectoparasites of domesticated animals and major threat to economy of livestock industry throughout the world including Pakistan. The milk, meat and wool production can reduce during high tick infestation on domestic animals. The prevalence and species infestation can vary with geographical variations. Age, status of animals, sex, breed and seasons are the main factors for tick distribution and survival.

ACKHNOWLEDGEMENT

Authors are highly thankful to the concern institutes.

REFERENCES

1. Noor, J., M. Ahaduzzaman, M.M.A. Hossain, M.A. Hossain, M.S. Sarker and S.A. Rahim. 2016. Prevalence and morphological identification of tick species infestation in goat in Chittagong, Bangladesh. Veterinary Sciences: Research and Reviews, 2(2): 42-46.
2. Biswas, S. 2003. Role of veterinarians in the care and management during harvest of skin in livestock species. In: Proc. National Seminar on Leather Industry in Today's Perspective, Kolkata, India. Pp .62-64.
3. Jongejan, E andG. Ullenberg, 1994. Ticks and Control methods. Revue Scientifique et Technique, 13 (4): 1201-1226.
4. Gilbert, L. 2010. Altitudinal patterns of tick and host abundance: a potential role for climate change in regulating tick-borne diseases? Oecologia, 162: 217–225.
5. Opara, M.N andN.O. Ezeh, 2011. Ixodid ticks of cattle in borno and yobe states of Northeastern Nigeria: breed and coat colour preference. Animal Research International, 8(1): 1359-1365.
6. Islam, M.K., M.A. Alim., N. Tsuji and M.M.H. Mondal, 2006. An investigation into the distribution host, preference and population density of Ixodid ticks affecting domestic animals in Bangladesh. Tropical Animal Health Production, 38: 485-490.
7. Ramzan, M., G. Murtaza, A.S. Sattar, N. Munawar, U. Ullah, A. Ejaz, F. Ayaz, S.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 18389 - 18394
Received 25 April 2021; Accepted 08 May 2021.

Anwar, K. Jameel andF. Kamran, 2021. Techniques forManaging Ticks and Tick-Borne Diseases Under Changing Climate; A review. Egypt. Academic Journal of Biological Sciences (B. Zoology), 13(1):117-128.

8. Apanaskevich, D.A. and I.G. Horak, 2010. The genus Hyalomma Koch, 1844. XI. Redescription of all parasitic stages of H. (Euhyalomma) asiaticumSchulze &Schlottke, (1930) (Acari: Ixodidae) and notes on its biolo. Experimental and Applied Acarology, 52 (2): 207-220.
9. Walker, A.R., A. Bouattour, J.L. Camicas, A. Estrada-Pena, I.G. Horak, A.A. Latif, R.G. Pegram and R.M. Preston, 2014. Ticks of domestic animals in Africa: a guide to identification of species. Edinburgh, UK: Bioscience Reports, 114.
10. Atif, F.A., M.S. Khan, H.J. Iqbal, Z. Ali and S. Ullah, 2012. Prevalence of cattle tick infestation in three districts of the Punjab, Pakistan. Pakistan Journal of Science, 64(1): 49-53.
11. Biu, A.A., J.S. Rabo, J.S. Dawurung andS.I.G. Abubakr, 2012. Survey study on the tick fauna of small ruminants on the University of Maiduguri Research Farm (UMRF), Nigeria. Academia. Arena. 4(3):1-3.
12. Monfared, A.L., M. Mohammad and F.Roohollah, 2015. Prevalence of ixodid ticks on cattle, sheep and goats in Ilam County, Ilam Province, Iranian Journal of Parasites and Diseases, 39(1): 37-40.
13. Mustafa, I., M.K.S. Rana, S. Marghoob, A. Iftikhar, R. Aleem, J. Sadaf, M. Hira, R.G. Shabbier, A. Ghani, T. Mahmood, M. Aslam, M.R. Khan, S. Asif, I.U. Malik, A.B. Muhammad, M.A. Aqeel, M. Qayyum, A. Waqas andH. Ahmed, 2014. Seasonal activity of tick infestation in goats and buffalo of Punjab province (district Sargodha), Pakistan. Kafkas University of Veterinary andFakultesiDergisi, 20 (5): 655-662.
14. Sajid, M.S., Z. Iqbal, M.N. Khan andG. Muhammad, 2009. In vitro and in vivo efficacies of ivermectin and cypermethrin against the cattle tick Hyalommaanatolicumanatolicum (Acari: Ixodidae). Parasitology Research, 105(5): 1133–1138.
15. Sajid, M.S., Z. Iqbal,M.N. Khan, G. Muhammad, G. Needham andM.K. Khan, 2011. Prevalence, associated determinants, and in vivo chemotherapeutic control of hard ticks (Acari: Ixodidae) infesting domestic goats (Capra hircus) of lower Punjab, Pakistan. Parasitology Research, 3(1): 601–609.
16. Ahmed, S., N. Muhammad, W. Abdual, Mansoor and A.A. firdusia, 2012. Investigations into Ixodidae ticks in cattle in Lahore Pakistan. VeterinariaItalainia, 48 (2):185-191.
17. Hassan, R.H andH.H. Al-Zubaidi, 2014. Cattle and buffaloes tick's infestation in Wasit province districts, Iraq Kufa Journal of Veterinary Medicine and Science, 5(1): 31-40.
18. Iqbal, A., M.S. Sajid,M.N. Khan andM.K. Khan, 2013. Frequency distribution of hard ticks (Acari: Ixodidae) infesting bubaline population of district Toba Tek Singh, Punjab, Pakistan. Parasitology Research, 112(4): 535-541.
19. Irshad, N., M. Qayyum, M. Hussain andM.Q. Khan, 2010. Prevalence of tick infestation and theileriosis in sheep and goats. Pakistan Veterinary Journal, 30(3): 178-180.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 18389 - 18394
Received 25 April 2021; Accepted 08 May 2021.

20. Tasawar, Z., S. Nasim and M.H. Lashari, 2014. The prevalence of ixodid ticks on buffaloes at private animal farm Bibipur, Multan. Global Vetterinaria, 12 (2): 154-157.
21. Kadir, M.A., I.K. Zangana and B.H.S. Mustafa, 2012. A study on epidemiology of hard tick (Ixodidae) in sheep in Sulaimani governorate Iraq. Iraqi Journal of Veterinary Science, 26(3): 95-103.
22. Rony, S.A., M.M.H. Mondal,N. Begum, M.A. Islam andS. Affroze, 2010. Epidemiology of ectoparasitic infestations in cattle at Bhawal forest area, Gazipur. Bangladesh Journal of Veterinary and Medicine, 8: 27-33.