

## The Prevalence of Ixodid Ticks on Buffaloes at Private Animal Farm Bibipur, Multan

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**Abstract:** During the present study 200 buffaloes were examined for the prevalence of ixodid ticks at private buffalo farm Bibipur, Multan. The following genera of ticks belonging to the family Ixodidae were recovered from buffaloes, *Hyalomma*, *Rhipicephalus* (formerly *Boophilus*), *Rhipicephalus*, *Ixodes* and *Amblyomma*. Out of 200 animals 105 were infested showing an overall prevalence of 52.5%. Gender-wise prevalence of ticks showed that infestation was more prevalent in males (85%) as compared to female hosts (43.33%). Age-wise prevalence of ticks was also studied and it was observed that the highest prevalence of ticks was in age group of 1-36 months (23.7%) and lowest prevalence (2.5%) was recorded in age group of 37-72 months.

**Key words:** Prevalence • Age • Sex • Buffaloes • Ticks

### INTRODUCTION

Agro-based Pakistan has 769.0 million livestock of which 30.8 million are buffaloes [1]. About 98% of buffaloes are raised by small farmers owning less than two hectares of land and less than five buffaloes [2]. In general, the water buffalo is regarded as more productive, healthier and more useful than the cow, especially for the poorest “backyard” farmers in Asia [3]. Buffaloes are the principal source of milk and meat production in Pakistan while cattle comprise a second source. More than 71% of milk in Pakistan is obtained from dairy buffalo’s availability per capita being 155.6 L/year [1].

In addition to the products of meat and milk buffaloes provide draught power for cultivation of the agricultural lands of many peasants. Skins and hides are also important components of the livestock sector in generating foreign export earnings. Livestock, the back bone of Pakistan’s agriculture economy, is at risk of decline in production due to number of ecto- and endo-parasites. Pakistan is usually hot and humid except in winter and the climatic condition of Pakistan is very favorable to a wide variety of parasites such ticks [4]. Tick infestation is one of the major veterinary problems affecting livestock industries in many parts of the world

[5]. Estimates of the amount of blood removed vary according to the species under consideration. A single adult female tick may remove 0.5-2.0 ml of blood [6].

Ectoparasites including lice, ticks, mites etc. play an important role in the transmission of certain pathogens [7]. The ectoparasites are known to cause heavy economic losses to livestock industry due to their usual habit of blood sucking, which adversely affects the economic production. Among ecto-parasites, ticks have been recognized as the notorious threat due to severe irritation, allergy and toxicosis[8].

They have been incriminated as voracious bloodsuckers, causing heavy blood losses resulting in lowered productivity and mortality [8]. An adult female tick can cause blood loss that can result in reduction in live weight gain of cattle [6]. Tick-borne diseases are considered as a major constraint on productivity. *Hyalomma* ticks, as vectors of tropical theileriosis are widespread in North Africa, southern Europe, Middle East, Central Asia and China [9].

The situation of ticks and tick-borne diseases in livestock has been partially documented in Pakistan by number of authors [10,11], but these studies regarding the ticks genera are fragmented and not yet done in Multan area. The present study was designed to

investigate the overall prevalence of ticks, relationship between sex and age of host and ticks in buffaloes which help in control of various tick borne diseases transmitted by ticks in Multan district of Punjab province, Pakistan.

## MATERIALS AND METHODS

**Study Area and Sampling:** The present study was carried out to examine the prevalence of ticks infesting buffaloes at Bibipur, area of Multan district which is located 16km north to Multan. Morphological study for identification of species of ticks was conducted in the laboratory of Parasitology as methods given by Horak [12], Institute of Pure and Applied Biology, B. Z. University, Multan.

**Sample Collection and Preservation:** The present study was conducted from September 2009 to August 2010. A total of 200 buffaloes were tagged and examined monthly for collection of ticks. The selected buffaloes were thoroughly investigated by close inspection, parting the hairs against their natural direction for the detection of ticks. Age was determined by asking the owner and farm attendant and by visual inspection and also by dentition whenever possible. Animals were categorized based on age groups (= 1-36 months), (> 36-72months), (73-108 months), (109-144 months) and (>144 months).

Ticks were collected from the different parts of the body like head, neck, ear, legs, belly, tail and underarms of each buffalo by hand picking. When required, small hairbrush dipped in ethanol was used for the collection of ticks. Collected ticks were preserved in vials containing 5% formalin and labeled.

**Identification of Ticks:** The ticks were identified based on morphological and structural differences of the adult ticks with the help of dissecting (4X) and compound (10X) microscope. The grouping of the genus was made according to the keys and descriptions given by Horak[12] and permanent slides were prepared according to the methods developed by Cable [13]. Prevalence of ticks was calculated as

$$P = \frac{\text{No of hosts observed}}{\text{No of hosts infested}} \times 100 \quad P = \text{prevalence}$$

**Statistical Analysis:** The data was analyzed using Statistical Package Minitab Version 11.5 for Windows 2000. Chi-square test was used to determine relationship between sex and age of host and ticks.

## RESULTS AND DISCUSSION

### The Overall Prevalence of Ticks in Buffaloes:

During the present study a total of 200 buffaloes were examined of which 105 animals were found to be infested with different genera of ticks. The present study revealed that mixed infestation of six tick genera were recovered i.e. *Ixodes*, *Hyalomma*, *Amblyomma*, *Rhipicephalus* and *Boophilus*. The overall prevalence was 52.5%. Similar finding were reported by other scientists in Pakistan and other countries. Durrani[14] reported 66.7% of tick's prevalence in district Lahore. Manan [15] reported 13.37 % of the total observed farm animals were found tick infested with highest infestation in cattle 20.4% followed by sheep 12.8%, goat 12.1%, buffalo 11.3% and donkey 6.4%. The most commonly prevalent ticks were belonging to genus *Rhipicephalus* (formerly *Boophilus*) (46.1%) followed by *Hyalomma* 31.25%, *Rhipicephalus* 17.93% and *Amblyomma* 4.61% in frontier region of Peshawar. Ronyl [16] reported 64.07% cattle were infested with different species of ticks in Bangladesh.

Kabir [17] reported *Boophilus microplus* 25%, *Rhipicephalus sanguineus* 13.68% and *Haemaphysalis bispinosa* 12.63% in buffaloes in Bangladesh. Islam [18] reported *Boophilus microplus* 42.4% *Hyalomma bispinosa* 12.0% and *Rhipicephalus sanguineus* 10.8% in buffaloes in Bangladesh.

Torina[19] recorded *R. sanguineus* 19.3% in buffaloes in Italy. Shahardar[20] found *Boophilus*, *Haemaphysalis*, *Hyalomma*, *Amblyomma*, *Nosoma* and *Rhipicephalus* in bovine farm animals at 40%, 16.96%, 20.14%, 10.22%, 4.56% and 1.96% concentration respectively at Maharashtra, India.

The findings of present study differ with the previous findings of some other scientists. Higher prevalence (75.1%) in buffaloes was reported by Sajid[21] in lower Punjab, Pakistan. Lower prevalence was recorded 11.3%, 25.64%, in Peshawar [15]. The differences between the results of present and earlier study might be due to variation in the geographical locations climatic conditions [18].

**Relationship Between Sex and Ticks in Buffaloes:** It was observed that the prevalence of ticks was significantly ( $P < 0.05$ ) higher (85%) in males than females 43.33% (Table 1). Male buffaloes were more susceptible to tick infestation as compared to females. Sex of the hosts plays an important role in the tick's infestation.

Table 1: Relationship between sex and ticks in buffaloes

Name of Parasite	Male Hosts			Female Hosts		
	No. of hosts examined	No. of hosts infested	Prevalence (%)	No. of hosts examined	No. of hosts infested	Prevalence (%)
<i>Ixodes</i>	180	88	48.9	20	17	85
<i>Hylomma</i>						
<i>Amblyomma</i>						
<i>Rhiphicephalus</i>						
<i>Boophilus</i>						

Table 2: Relationship between age and ticks in buffaloes

Name of parasite	No. of hosts examined	Age groups (months)				
	200	1-36 (n=38)	37-72 (n=40)	73-108 (n=57)	109-144 (n=33)	>144 (n=32)
<i>Ixodes</i>		29(76.23%)	16(40.0%)	24(42.1%)	19(57.57%)	17(53.12%)
<i>Hylomma</i>						
<i>Amblyomma</i>						
<i>Rhiphicephalus</i>						
<i>Boophilus</i>						
<i>Argaas</i>						

Although, the exact cause of higher prevalence of tick infestation in male buffalo cannot be explained but it may be hypothesized that some hormonal influences may be associated with this phenomenon.

Bilbo and Nelson [22] reported that such differential prevalence of parasite may be due to stimulatory effects of estrogen and inhibitory effect of androgens on immune responses. Moreover these factors could be responsible for the higher prevalence of ticks in males than female's buffalo during the present study.

Relationship between age and ticks genera in buffaloes

Table 2 indicates the infestation rate across different age groups. Prevalence of tick was significantly ( $P < 0.05$ ) higher in young buffalo 1-36 months (23.7%) and lowest prevalence (2.5%) was recorded in adult age group of 37-72 months. The similar findings were reported by Kabir [17] who reported the more tick infestation in young buffalo than adults.

It is very difficult to explain exactly the frequent occurrence of tick infestation in younger age animals. It may be due low immunity in this age group. Moreover, ticks are voracious blood sucker for their survived and reproduction which may be responsible for higher prevalence of tick infestation in young buffaloes.

In conclusion, the present study indicated that sex and age of hosts are essential factors which influence the prevalence of tick infection in buffaloes in Multan.

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#### REFERENCES

1. Anonymous, 2010. Economic Survey of Pakistan. Ministry of Finance, Govt. of Pakistan.
2. Mudgal, V.D., 1992. Buffalo Meat. In: Encyclopedia of Food Science Technology and Nutrition. Academic Press, London, UK, pp: 521.
3. Bhat, N.P., 1999. Buffaloes. In: Payne, W.J.A., Wilson, T.R. (Eds.), An Introduction to Animal Husbandry in the Tropics. Blackwell Science Oxford (Oxfordshire), UK, pp: 815.
4. Razzak, A. and H. Shaikh, 1969. A survey on the prevalence of ticks on cattle in East Pakistan. Pakistan Journal of Veterinary Science, 3: 54-60.
5. Hourrigan, J.L., 1979. Spread and detection of *Psoroptic scabies* of cattle in the United States. Journal of American Veterinary Association, 175: 1278-1280.
6. Pegram, R.G. and H.G.B. Chizyuka, 1990. The impact of natural infestation of ticks in Zambia on the productivity of cattle and implications of tick control strategies in Africa. Parasitologia, 32: 165-176.
7. Loomis, E.C., 1986. Ectoparasites of cattle. Veterinary Clinics of North America, 2: 299-321.
8. Niyonzema, A. and H.H. Kiltz, 1986. Control of ticks and tick-borne diseases in Burundi. Australian Centre for International Agricultural Research, 17: 16-17.
9. Preston, P.M., 2001. Theileriosis. In: The Encyclopedia of Arthropod-transmitted Infections, Service, M. W. (ed.), CAB International, London, UK.

10. Sajid, M.S., Z. Iqbal, M.N. Khan, G. Muhamamd and M.U. Iqbal, 2007. Effect of *Hyalomma* Ticks (Acari: Ixodidae) on milk production of dairy buffaloes (*Bos bubalus bubalis*) of Punjab (Pakistan). Italian Journal of Animal Science, 6: 939-941.
11. Sajid, M.S., Z. Iqbal, M.N. Khan, G. Muhammad and M.K. Khan, 2009. Prevalence and associated risk factors for bovine tick infestation in two districts of lower Punjab, Pakistan. Prev. Vet. Med., 92: 386-391.
12. Horak, I.G., J.L. Camicas and J.E. Kierans, 2002. The Argasidae, Ixodidae and Nuttalliellidae (Acari: Ixodida): a world list of valid tick names. Experimental and Applied Acarology, 28: 27-54.
13. Cable, R.M., 1985. An Illustrated Laboratory Manual of Parasitology, 5<sup>th</sup> Ed. Surjeet Publication, Dhli, India.
14. Durrani, A.Z., A.R. Shakoori and N. Kamal, 2008. Bionomics of *Hyalommaticks* in three districts of Punjab, Pakistan. Journal of animal and Plant Sciences, 18: 17-23.
15. Manan, A., Z. Khan, B. Ahmed and Abdullah, 2007. Prevalence and identification of ixodid tick genera in frontier region, Peshawar. Journal of Agriculture and Biological Sciences, 2: 21-25.
16. Rony, S.A., M.M.H. Mondal, N. Begum, M.A. Islam and S. Affroze, 2010. Epidemiology of ectoparasitic infestations in cattle at Bhawal forest area, Gazipur. Bangladesh Journal of Veterinary Medicine, 8: 27-33.
17. Kabir, M.H.B., M.M.H. Mondal, M. Eliyas, M.A. Mannan, M.A. Hashem, N.C. Debnath, O.F. Miazi, C. Mohiuddin, M.A. Kashem, M.R. Islam and M.F. Elahi, 2011. An epidemiological survey on investigation of tick infestation in cattle at Chittagong District, Bangladesh. African Journal of Microbiology Research, 5: 346-352.
18. Islam, M.K., M.A. Alim, N. Tsuji and M.M. 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.
19. Torina, A., C. Khoury, S. Caracappa and M. Maroli, 2006. Ticks infesting livestock on farms in Western Sicily, Italy. Experimental and Applied Acarology, 38: 75-86.
20. Shahardar, R.A., S.M. Niphadkar, V.S. Narsapur and M.L. Gante, 1998. Ixodid ticks of cattle and buffaloes in coastal Distt. of Konkan region Maharashtra. Indian Veterinary Journal, 75: 503-506.
21. Sajid, M.S., I. Iqbal, M.N. Khan and G. Muhammad, 2008. Point prevalence of hard ticks (Ixodids) infesting domestic ruminants of lower Punjab, Pakistan. International Journal of Agriculture and Biology, 10: 349-351.
22. Bilbo, S.D. and R.J. Nelson, 2001. Sex steroid hormones enhance immune function in male and female Hamsters. American Journal of Physiology, Regulatory Integrative and Comparative Physiology, 280: 207-213.