



RESEARCH ARTICLE.....

The prevalence of ixodid ticks on buffaloes from eastern region of Lucknow, Uttar Pradesh

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ABSTRACT..... The present study was conducted to investigate the occurrence of ticks on buffalo. The survey was carried out between February 2016 to May 2016 at eastern region of Lucknow, Uttar Pradesh, India. The following genera of ticks belonging to the family ixodidae were recovered from buffaloes, *Hylomma* and *Rhipicephalus* (formerly *Boophilus*). A total of 300 buffaloes were examined out of which 160 were found infested with ticks. The overall prevalence of tick infestation in buffaloes was observed 53.33 per cent. Gender-wise prevalence of ticks showed that infestation was more prevalent in females (56.5%) as compared to male hosts (42.8%). Age-wise prevalence of ticks was also studied and it was observed that the highest prevalence of ticks was in adult (>3yrs) (23.7%) and lowest prevalence (45.7%) was recorded in young buffaloes (1-3yrs).

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INTRODUCTION.....

Buffalo-the incredible Asian dairy animal, is commonly known as 'Black Diamond', for its versatile role in socio-economic up-liftment of its owners from the rural agricultural communities. In general the buffaloes are regarded as more productive, healthier and more useful than the cow, especially poorest "backyard" farmers in Asia. They are the principal source of milk and meat while cattle comprise a second source. In addition to the products of meat and milk buffaloes provide draught power for cultivation of the agricultural lands of many peasants. The major constraints in achieving maximum financial gain from these animals

are the diverse disease conditions caused by ecto. and endo. parasites (Bianchin, 2007). The parasitic infection is the major problem in the livestock sector in which ectoparasitic infestation is among the serious veterinary problems (Colebrook and Wall, 2004). Among the arthropod ecto-parasites, ticks are important and the most common ecto-parasites of mammals, birds and reptiles worldwide (Sonenshine, 1991). In India, tick and tick borne diseases cause an estimated loss of US \$498.7 million (more than 2000crores) per annum (Ghosh *et al.*, 2006 and 2007; Minjauw and McLeod, 2003).

Ticks belong to phylum Arthropoda and class Arachnida. Tick causes detrimental effect to animals via

blood loss/ drain, stress, irritation and despair of immune function (Ghosh *et al.*, 2007). In addition to these effects, ticks are also reason of financial losses in term of reducing hide and skin value up to 20-30 per cent (Biswas, 2003) and economical losses associated with diseases they transmit directly to the hosts.

Ticks infestation also results in decrease in blood biochemical parameters, blood trace elements and mineral levels. There are 899 tick species those parasitize the vertebrates including Argasidae (185 species), Ixodidae (713 species) and Nuttalliellidae (1 species). There are two main groups (families) of ticks Argasidae or argasids, and the Ixodidae or ixodids. Argasid ticks are soft ticks because they do not have hard plates on their bodies while ixodid ticks have hard plates on their body.

Uttar Pradesh is well known for its livestock. The epidemiological conditions of the state aggravate the surplus tick population on them. Systematic survey on ixodid ticks in the area is still lacking, which hampers the tick control management system. Therefore, the present study is designed to survey buffaloes for the tick infestation. The study of distribution pattern of ticks in the different agro-climatic area would provide a basis for evolving strategic and tropical control of ticks and diseases caused by them.

RESEARCH METHODS.....

Study area and period :

The present study was carried out from February-May 2016 to study the prevalence of ticks infesting buffaloes in the eastern region of Lucknow, including areas Mohanlalganj, Kalli, Madhav Kheda, Pachori, Tikra, Merai Kheda, Baans Kheda, Kubhara, Atrouli, Neelmatha and Mau, Ullas kheda, Sabha kheda, Jyati kheda, Bhola kheda.

Materials required :

Vials, KOH, Absolute alcohol, Grades of alcohol (30%, 50%, 70%, 90%), Xylene, Canada balsam, Test tubes and holder, Petri-dish, Cavity block, Slides and Cover slip.

Sample collection :

A total of 300 buffaloes were randomly selected and examined for the infestation by ticks. The selected buffaloes were thoroughly inspected for any tick infestation. A questionnaire was made which include the

various questions related to the survey on buffalo. Age was determined by asking the owner and farm attendant and by visual inspection. Animals were categorized based on age groups (young and adult) and on the basis of their sex. Ticks were collected from the different parts of the body like ear, flank, dewlap and perineum of each buffalo by hand picking. Collected ticks were preserved in vials containing 70 per cent alcohol.

Identification of ticks :

The collected ticks were characterized microscopically on the basis of morphology and permanent slides were prepared according to the standard methods.

Prevalence (%) of ticks was calculated as:

$$P = \frac{\text{Number of hosts infested}}{\text{Number of host observed}} \times 100$$

where, P= Prevalence

RESEARCH FINDINGS AND ANALYSIS.....

The results obtained from the present investigation as well as relevant discussion have been summarized under the following heads :

The overall prevalence of ticks in buffaloes :

A total of 300 buffalo were observed during the study period in which 160 buffalo were observed to be infested with ticks. Overall prevalence was calculated by dividing the number of positive samples by the total sample size, and then multiplied by 100. The prevalence was found to be 53.33 per cent (Table 1). Similar study on prevalence of ticks in buffaloes were done by Kumar (1996) and Vatsya *et al.* (2007) who have reported the prevalence of ixodid ticks in buffaloes to be 61.0 per cent, 33.50 per cent and 38.06 per cent, respectively, from various agro climatic regimes across India. Difference among the results might be due to variation in geographical locations, climatic conditions of the experimental area, region and method of study and selection of samples (Patel *et al.*, 2013).

Table 1 : Overall prevalence of ticks on buffaloes

No. of host examined	No.of host infested	Prevalence (%)
300	160	53.33

Identification of ticks :

A total of 5305 ticks were collected from different body parts of the buffaloes. The ixodid tick species identified were *Rhipicephalus (Boophilus) microplus* and *Hyalomma anatolicum anatolicum*. In the present study the relative infestation rate of tick species on buffaloes showed that *Hyalomma anatolicum anatolicum* is the most abundant tick species 57.02 per cent followed by *Rhipicephalus (Boophilus) microplus* 42.97 per cent (Table 2). Similar finding was done by Ali and Singh (2013) in Punjab, Pakistan in their study in which the *Hyalomma* species were found to have high prevalence at 61 per cent as compared to other species. Faisalabad district showed the highest prevalence for *Hyalomma* species being 43 per cent followed by Jhang at 28 per cent and Khanewal at 29 per cent. *Boophilus* species were the second most prevalent species with an average prevalence of 28 per cent.

Prevalence of ticks in adult and young buffaloes :

Total buffaloes studied were divided into two groups according to their age *i.e.* adult (>3yrs) and young (1-3 yrs.). A total of 229 adult and 71 young buffaloes were examined out of which 128 adult and 32 young buffaloes were found to be infested by ticks. Higher rate of prevalence was observed in adult 55.8 per cent than young 44.2 per cent (Table 3). The similar finding were also reported by Wasihun and Doda (2013); Feseha (1997) and Tessema and Gashaw (2010) but the results were differ from the report of Patel *et al.*(2013) in which they describe that the infestation rate of ticks was found



Fig. 1 : Micrographic picture of *Hyalomma anatolicum anatolicum*

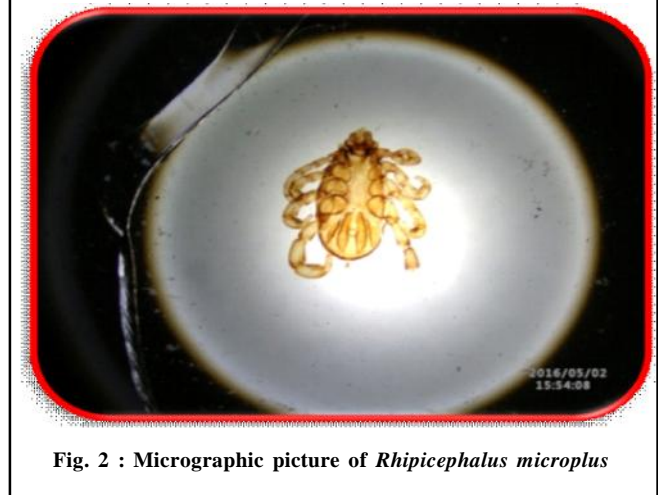


Fig. 2 : Micrographic picture of *Rhipicephalus microplus*

Table 2 : Prevalence of different species of ticks on host					
Prevalence of <i>Hyalomma</i> species			Prevalence of <i>Boophilus</i> species		
Total no.of tick collected	No. of <i>Hyalomma</i> species	Prevalence (%)	Total no.of tick collected	No. of <i>Boophilus</i> species	Prevalence (%)
5305	3025	57.02	5305	2280	42.97

Table 3 : Prevalence of ticks in adult and young buffaloes					
Young buffalo (1-3yrs.)			Adult buffalo (>3yrs.)		
No. of host examined	No. of host infested	Prevalence (%)	No. of host examined	No. of host infested	Prevalence (%)
71	32	45.07	229	128	55.89

Table 4: Prevalence of ticks with respect to gender of buffaloes					
Male			Female		
No. of host examined	No. of host infested	Prevalence (%)	No. of host examined	No. of host infested	Prevalence (%)
70	30	42.8	230	130	56.5

maximum in group I animals consisting of young ones below 1 year of age (74.17%) followed by group II animals consisting of between 1-3 years of age (60.93%) and minimum in group III animals consisting of animals of more than 3 years of age (36.33%).

Prevalence of ticks in male and female buffaloes:

A total of 70 male buffaloes and 230 female buffaloes were examined out of which 30 males and 130 females found to be infested by ticks population. Higher rate of prevalence was observed in females 56.5% followed by males 42.8 per cent (Table 4). Similar finding also reported by Mamun *et al.* (2010) which reported that female buffaloes were more susceptible to tick infestation. Bilkis *et al.* (2007) also reported significantly higher prevalence rate in females (33.47%) than in males (14.28%). Bilkis *et al.* (2007); Kabir *et al.* (2011) and Mamun *et al.* (2010) suggested that higher prevalence rate in female buffaloes may be due to hormonal effects. Lloyd (1983) reported that high levels of prolactin and progesterone hormone make the individual more prone to any infection. Moreover, female buffaloes bear higher stress than males due to pregnancy, lactation and production which makes them more prone to infection (Mamun *et al.*, 2010). The result of the present study had contradiction to the finding of Wasihun and Doda (2013) in Ethiopia, Atif *et al.* (2012) in Punjab state of Pakistan and Rony *et al.* (2010) in Bangladesh

show a higher prevalence of tick infestation in male buffaloes. This could be due to the less attention has been paid by owner towards male in the investigated area and as also due to an hormonal effect mainly, androgen and estrogen which had inhibitory and stimulatory effect on immune response due to which male animals are more prone to ticks than females.

Conclusion :

The tick infestation in buffaloes and other livestock pose a serious damage to the livestock industry and it is a challenging task for the workers to control them.

The results obtain by the present study shows that ticks have preferable host selection. It is also concluded that prevalence of *Hyalomma* species of hard ticks in buffaloes is higher than other species of the ticks. The observation from the present study may contribute to the increased understanding of epidemiology to ticks in the area. This may help in adopting tick control strategies.

During the survey period it was also observed that now-a-day's people paid much attention on controlling of ticks by using different acaricides which minimized the rate of infestation.

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