PREVALENCE AND SEASONAL VARIATION IN IXODID TICKS ON BUFFALOES OF MATHURA DISTRICT, UTTAR PRADESH, INDIA

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ABSTRACT
Considering the economic impact of various ticks species on livestock, the present study was projected for epidemiological characterize of common ticks infesting water buffaloes. The present study was conducted between July 2010 and June 2011 period at various locations of Mathura region. A total of 635 water buffaloes were examined randomly. The overall prevalence of ticks infestation among buffaloes alone was found out to be 51.81%. The highest and lowest prevalence was reported in month of September (69.09%) and January (37.74%), respectively. Based on seasonal prevalence, highest tick infestation was found in rainy season (61.14%), followed by summer (50.95%) while lowest in the winter (43.46%). Overall highest age wise prevalence was noticed in the young ones (74.17%) followed by grownups (60.93%) and lowest in adults (36.33%).

Keywords: buffaloes, Bubalus bubalis, prevalence, ticks

INTRODUCTION
Buffalo—the incredible Asian dairy animal, is commonly known as ‘Black Diamond’, for its versatile role in socioeconomic upliftment of its owners from the rural agricultural communities. The major constraints in achieving maximum financial gain from these animals are the diverse disease conditions caused by ecto and endo parasites (Bianchin et al., 2007). A single female engorged tick is responsible for daily loss of 0.5 to 2 ml of blood, 8.9 ml of milk and 1 gram of body weight. Losses attributable to ticks are caused either directly, through tick worry, blood loss, damage to hides and udders, injection of toxins (and loss of body weight gain or indirectly through transmission of disease pathogens, milk yield reduction, stunted growth (FAO, 2004). The global economic losses due to tick infestation has been estimated as 14000 to 18000 million US $ annually in which India has a share of 498.7 million US $ (Minjauw and Mc. Lead, 2003). A large amount of data is available for the ecto and endo parasites of cattle, but when it comes to buffaloes and that too ectoparasites, the...
literature seems restricted to finger tips. Therefore, the present study was undertaken to know the prevalence of ticks in relation to the different month of the year, different seasons of the year, age of the animals, sites of their attachment and identification of ticks up to species level.

MATERIALS AND METHODS

Area of study

Systematic survey on ixodid ticks of buffaloes was undertaken at various locations of Mathura district (Uttar Pradesh, India) during the period from July 2010 to June 2011. The selected areas were visited once a week to determine the seasonal pattern of tick infestation and to observe variation in prevalence of tick infestation with respect of host (age, species) and environmental determinants.

Collection and identification of ixodid ticks

The adult ticks were gently plucked up from the body of the host by hand manipulation or with the aid of blunt pointed forceps without damaging their mouth parts. The specimens were kept in separate plastic containers and the date, host, age, locality and site of collection were entered on the label of each container. These samples were transported to the laboratory for further studies and identification using standard keys (Sen and Fletcher, 1962; Walker et al., 2003).

RESULTS AND DISCUSSION

The overall prevalence of ticks during the study period was found to be 51.81%. The month wise prevalence of ticks throughout the year and the season wise prevalence are given in Graphs 1 and 2, respectively. During the study of age-wise tick infestation, overall maximum percentages of positive cases (74.17%) were noticed in the group I (up to 1 year) followed by 60.93 % in group II (1–3 years) and minimum tick infestation (36.33%) was observed in group III (> 3 years) (Graph 3). During the study period, ixodid ticks belonging — Hyalomma anatolicum anatolicum and Boophilus microplus were recorded both in pure and mixed infestation in different seasons (Figure 1). Hyalomma spp. infestation was observed in 294 buffaloes (46.29%) examined for tick infestation. Pure infestation of Hyalomma spp. was seen in 245 buffaloes (38.58%) and mixed with Boophilus spp. in 49 (7.71%) cases. Pure Boophilus spp. infestation was seen in 84 buffaloes (13.23%). Besides these, H. marginatum issaci and H. dromedarii were also collected from some of the buffaloes. The most common feeding sites for adult ticks were neck, axilla, belly, groin, udder, perineal regions and tail (Figure 2, 3).

During study period, a total of 635 buffaloes were examined from different localities of Mathura district for the presence of ixodid ticks and their prevalence was found out to be 51.81%. Contrary to this, Mishra (1984); Sharma (1984); Kumar (1996) and Vatsya et al. (2007) had earlier reported that prevalence of ixodid ticks in buffaloes to be 61.0%, 33.50% and 38.06% 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., 2012).

Month wise prevalence of ticks in buffaloes was found maximum in September (69.09%) and minimum in the month of January (37.74%). The difference in tick infestation in different month was...
Graph 1. Month wise variation in the prevalence of ticks.

Graph 2. Season wise variation in prevalence of ticks.
may be due to the change in the climatic condition. The present study revealed that the prevalence rate of ticks is highest in rainy season (61.14%) followed by summer (50.95%) and least in winter season (43.46%). Although the animals were infested with ticks throughout the year but their number increased following rains. Thus, rainfall (humidity) seemed to be an important macroclimatic factor influencing seasonal variation in tick infestation (Vatsya et al., 2007). The decrease infestation rates during extreme winters in the month of December, January and February was sup-positively due to the drop in the temperature (13.02°C). At low temperature ticks try to protect themselves by entering in diapauses leading to delayed morphogenesis and reduced behavioural activities (Gray, 1991; Denlinger, 1985).

The infestation rate of ticks was found 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%). Lower rate of tick infestations in adults could be attributed to acquired resistance incidental to repeatedly exposed of host to low grade field infestations during the prolonged growth and development period (Mishra, 1984; Das, 1994).

It is important to note that the cattle are mostly infested with Boophilus spp., while buffaloes are mostly infested with Hyalomma spp. (Papadopoulos et al., 1996; Patel et al., 2012). Buffaloes have less dense hair coat and have access to mud for wallowing which might cause dropping of ticks and hence less infested with Boophilus spp. (Khan, 1986). In present study, four species of ticks were identified as B. microplus, H. a. anatolicum, H. dromedari and H. marginatus issaci. Pure Hyalomma spp. infestation was found to be 38.58% and pure Boophilus species infestation was 5.51%. Aberrant infestation with H. dromedarii (a camel tick) and. H. marginatus issaci (a small ruminant tick) might be attributed to frequent contact of buffaloes and grazing on forest land having free access of camels and small ruminants (Chhabra et al., 1983).
Figure 1. Various species of ticks on buffaloes identified in the present study.
Figure 2. Buffalo calf infested with ticks.

Figure 3. Tail of buffalo infested with ticks.
In conclusion, management practices and animal holdings influence the tick infestations on the body of the host. Evidently, in tropics and sub tropics, distribution of ixodid ticks is mainly governed by the rainfall and precipitation. Effective ixodid tick control strategies ought to be mainly focused upon the seasonal periodicity of the dominant tick species and their susceptibility to the acaricide, based on in vitro testing, to minimize production losses incidental to ixodid tick infestations, besides scientific management of grazing lands and other strategies most suited in the endemic areas of ambient temperature and rainfall request to be evolved.

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