

Population ecology of *Hyalomma anatolicum anatolicum* (Acari: Ixodidae) in cattle of UT of Dadra & Nagar Haveli, India

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Abstract

To determine the population ecology and distribution pattern of *H. anatolicum anatolicum* the present study were conducted in the UT of Dadra & Nagar Haveli during 2016 and 2017. During the study, 1477 cattle were randomly examined for the infestation of *H. a. anatolicum*, age, sex, breed of host and preference site of *H. a. anatolicum* were noted. 3.99 % cattels were found infested with *H. a. anatolicum*, sample means abundance, mean intensity, median intensity and variance to mean ratio were reckoned as 0.20, 8.44, 6.77 and 2.57 respectively. The most preferred site *H. a. anatolicum* on the host body were hind flank followed by thigh, hind leg, belly, back, tail, fore flank, ribs, neck, head, foreleg and shoulder.

Key Words – Cattle, *Hyalomma anatolicum anatolicum*, Population Ecology

The *Hyalomma* transmit a wide range of pathogenic protozoa like *Theileria*, *Anaplasma* and arboviruses to domestic animals. It is a major vector of Crimean-Congo hemorrhagic fever virus (CCHFV) to human. Selected workers have reported the bio ecological aspect of *Hyalomma* in different parts of the India (Geevarghese and Dhanda, 1987 ; Jawale *et al.*, 2012; Devendra *et al.*, 2012; Dhaduk *et al.*, 2013; Patel *et al.*, 2013; Singh and Rath, 2013; Kumar *et al.*, 2014 and Khan *et al.*, 2016). The present study was carried out with the aim to study the bio ecology of the *H. a. anatolicum* in the UT of Dadra & Nagar Haveli.

Materials and Methods

Study was conducted from October 2016 to February 2017 in the Union territory of Dadra & Nagar Haveli (Latitude -20 O 2' 51" N to 20 O 21' 36" N, Longitude- 72 O 54'41"N to 73 O 13'13"N) during routine surveillance under the Integrated Disease Surveillance Programme. During the study, cattle were randomly examined for the *H. a. anatolicum* infestation at different locations of study place. Age, sex, breed of host and preference site of *H. a. anatolicum* on the body of host were noted in a systematic manner. Each cattle were examined and de-ticked using a forceps for a minimum of 10 minutes. All ticks were collected in universal bottles, then preserved in 90% ethyl alcohol and transported to the Laboratory. The taxonomic key of Geevarghese and Danda (*loc cit*) was used to identify tick species.

Results and Discussion

The prevalence of *H. a. anatolicum* was 3.99% in the UT of Dadra & Nagar Haveli with 4.44 %, 3.40 % and 3.92 % infestation rate in adult male, adult female and calf respectively. Total 294 specimens (158 males, 104 females and 32 nymphs) of *H.a. anatolicum* were recovered from the 59 infested hosts. The sample mean abundance, mean intensity, median intensity and variance to mean ratio were reckoned as 0.20, 8.44, 6.77 and 2.57 respectively. The frequency distribution pattern of *H.a. anatolicum* was the positive skew type, in which most of the hosts have a few parasites and most of the parasites occur on a few hosts. The population compositions of *H. a. anatolicum* were male biased (1.5:1). The ticks were widely distributed

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in different parts of the host body, such as hind flank, thigh, hind leg, belly, back, tail, fore flank, ribs, neck, head, shoulder and foreleg. During present investigation the distribution pattern of *H.a. anatolicum* were as follows; hind flank (23.47%), thigh (19.73%), hind leg (13.27%), belly (10.2%), back (9.52%), tail (8.84%), fore flank (5.10%), ribs (3.06%), neck (3.06%), head (1.36%), foreleg (1.36%) and shoulder (1.02%). *H. a. anatolicum* maintains a range of economically important infections transmissible to domestic animals and humans. Trans-stadially, it transmits various protozoa like *Theileria*, *Anaplasma* to cattle and Crimean Congo hemorrhagic fever virus to humans. The literature indicates a total of 27 species of *Hyalomma* are parasitizing the domestic and wild animals in the overall world but only *H.a. anatolicum*, *H. marginatum*, and *H. nitidum* are considered as a vector of CCHFV Geevarghese and Dhanda (*loc cit*). The study on bio ecology of a particular species is very important from the control point of view. The prevalence of *H. a. anatolicum* showed a variation in different geographical locations, climatic conditions of the experiment (Geevarghese and Dhanda, (*loc cit*)). During the present study, a total of 1477 cattle was examined and prevalence of *H. a. anatolicum* was found to be 3.99%. The present study concurs with previous reports of by Jawale *et al.* (*loc cit*) 4.6% and Patel *et al.* (*loc cit*) 5.29 %. Few workers reported high prevalence of *H. a. anatolicum* like Khan *et al.* (*loc cit*) 24.4%, Dhaduk *et al.* (*loc cit*) 23% and Singh & Rath (*loc cit*) 11.4%.

The infestation rate of *H. a. anatolicum* is reported high in male and calf. The high infestation rate in males and calves indicate that male animals and calf are generally neglected and the owners provide the least care to them with occasional use of acaricides. Further, with the popularization of artificial insemination, the males are now considered useless by the farmers. However, Geevarghese and Danda (*loc cit*) reported higher infestation rate of ticks in females than the males and they suggested that the milch animals because of the hormonal stress carry more ticks.

During the present investigation the preferred site of *H.a. anatolicum* on the host

body was hind flank followed by thigh, hind leg, belly, back, tail, fore flank, ribs, neck, head, foreleg and shoulder. The site of predilection of *H. a. anatolicum* is similar to the previous report of Geevarghese and Danda (*loc cit*). The tick distribution on its host is associated with various factors. Some of the important factors that may have some bearing on preferential sites of attachment are: capitalism length, vertebrate skin thickness, air layer micro-climate next to the skin and the animal's grooming ability, crawl of parasite over the body.

Summary

H. a. anatolicum is one of the most important vectors having pathogenic involvement in livestock and human. The results of present investigation indicate that 3.99% cattle were infested with *H. a. anatolicum*. Furthermore, 55% *H. a. anatolicum* were recovered from hind flank, thigh and hind legs. The results of the present investigation may provide a basis for evolving effective preventive and control strategy for the management of tick and tick borne disease in the UT of Dadra & Nagar Haveli.

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References

- Devendra, T.M., Pragma, D.Y. and Akhilesh, C.M. (2012) Detection, Isolation and Confirmation of Crimean-Congo Hemorrhagic Fever Virus in Human, Ticks and Animals in Ahmadabad, India, 2010–2011. *PLOS Negl. Trop. Dis.*, **6(5)**:e1653.
- Dhaduk, K.M., Gandha, K.M., Unadkat, S.V., Makwana, N.R., Parmar, D.V. and Yadav, S. (2013) Outbreak investigation and intervention measures following viral hemorrhagic fever in rural Kutch (Gujarat). *Int. J. Health Allied Sci.*, **2(3)**:186–189
- Geevarghese, G. and Dhanda, V. (1987) The Indian Hyalomma ticks (Ixodoidea: Ixodidae). Indian Council of Agricultural Research, New Delhi. pp-199
- Jawale, C.S., Vinchurkar, A.S., Dama, L.B. and Dama, S.B. (2012) Prevalence of ixodid ticks in post acaricide treated cattle and buffaloes at Sinner district Nashik (M.S) India. *Trends. Parasitol. Res.*, **1(1)**:20-24.
- Khan, V., Zala, D.B. and Joshi, K.M. (2016) Occurrence of

Hyalomma, (Acari: Ixodidae) Koch, 1844 on domestic animal in the Union Territory of Dadra & Nagar Haveli, India. *J. Parasit. Dis.*, **40** (2):543–545

Kumar, K., Balakrishnan, N. and Sharma A.K. (2014) Studies on the Vertical Distribution of Ticks of Domestic Animals and Their Public Health Importance in Nilgiri Hills and Adjoining Areas of Tamil Nadu State (India), *Int. J. Zool.*, 2014: 1-6.

Patel, G., Shanker, D., Jaiswal, A.K., Sudan, V. and Verma, S.K. (2013) Prevalence and seasonal variation in ixodid ticks on cattle of Mathura district, Uttar Pradesh. *J. Parasit. Dis.*, **37**(2):173–176.

Singh, N.K. and Rath, S.S. (2013) Epidemiology of ixodid ticks in cattle population of various agro-climatic zones of Punjab. *Asian Pac. J. Trop. Med.*, **6**:947–951.

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Physiological Variation in Dairy Cows Under Various Housing Types During Summer in Tamil Nadu

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Abstract

To assess the variation in physiological variables on cows under different housing patterns in the four agro-climatic zones of Tamil Nadu viz. North Eastern, North Western, Western and Hilly zone during summer season, physiological parameters of cows such as rectal temperature, pulse rate, respiration rate and skin temperature were recorded under different housing types. During summer season the mean rectal temperature has increased above 38.5°C under all the housing systems except metal sheet roofed housing in Hilly zone. In this study, variation was found in all the physiological variables of cows under different agro-climatic zones during summer.

Key words: housing pattern, physiological variables, summer, dairy cow

The body temperature in *Bos taurus* cattle is influenced by a lower capacity of the animals to redirect blood (which carries heat) from internal organs to the capillary beds in the skin, thus increasing heat dissipation (Finch, 1986). Hence, a study was conducted to assess the variation in physiological variables of cross

bred dairy animals under various housing types during summer in Tamil Nadu.

Materials and Methods

The study was conducted in the four agro-climatic zones of Tamil Nadu viz. North Eastern, North Western, Western and Hilly zone. In total, 30 farmers with at least five cross bred cows were selected from each agro-climatic zone with the major types of housing pattern. Physiological constants such as rectal temperature, respiration rate and pulse rates were recorded between 12.00 noon and 2.00 pm. The rectal temperature (RT) was recorded by a clinical thermometer and the observations were denoted in degrees Celsius (°C). The respiration rate (RR) was recorded by observing the flank movement for one minute and was expressed as breaths per minute (bpm). Pulse rate (PR) of the animals was counted by observing the pulsation of the middle coccygeal artery at the base of the tail and expressed as beats per minute. The peripheral skin temperature at different sites of the experimental animals, viz, head, neck, hump, dorsal, ventral and other regions were recorded with a non-contact infrared thermometer (MINITEMP MT4, Raytek). The collected data

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