



E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2017; 5(3): 1148-1150
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Received: 10-03-2017
Accepted: 11-04-2017

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First report on morphological characters of *Hyalomma dromedarii* from camel in Bikaner region of Rajasthan

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Abstract

The main purpose of this study was to determine the diversity and intensity of ticks found on camels (*Camelus dromedarius*) and their seasonal population dynamics in Bikaner, Rajasthan India. For this purpose, a total of 350 tick specimens were collected from camels in various regions in and around Bikaner (during 2010-2011). Various morphological characters revealed that all ticks collected from camel were *Hyalomma dromedarii*. The highest seasonal activities occurred in summer season (40.86%) and the ratio of male ticks (56.29%) was more than female ticks (43.71%). Maximum ticks were collected from perineum and chest (54.86%) region of animal.

Keywords: Morphological-identification, *Hyalomma dromedarii*, *Camelus dromedarius*, mounting, Bikaner, seasonal activity

1. Introduction

The camel (*Camelus dromedarius*) is an important animal component of the fragile desert ecosystem. With its unique bio-physiological characteristics, the camel has become an icon of adaptation to challenging ways of living in arid and semi-arid regions. The proverbial "Ship of Desert" earned its epithet on account of its indispensability as a mode of transportation, draught power and subsistence. It is also a source of milk, hair, manure, bones and meat to the societies residing in the poorly resourced arid and semi arid zones.

There are many ticks' species which transmit various haemo-protozoan (*Babesia caballi*, *Theileria equi*, *Theileria annulata*) diseases to camel [1], some time they also cause tick paralysis [2]. The main ixodid tick i.e. *Hyalomma dromedarii* is one of the most common ticks infesting livestock in India and in other tropical countries. Ticks are destructive blood sucking ecto-parasites, found in most of all the countries of the world, but are of greater economic importance in the tropical and sub-Tropical zones [3].

In India this species of tick is found from Andhra Pradesh, Delhi, Gujarat, Himachal Pradesh, Jammu and Kashmir, Orissa, Punjab, Uttar Pradesh and Rajasthan. In the rapidly altering atmosphere of the planet, as a result of exploitation by increasing numbers of humans and domestic animals, the blueprint of tick-host-pathogen interrelationships are frequently modified by alteration in population densities of one or each of three elements in the epidemiological processes of an infectious agent [4]. Information about the epidemiology of tick-borne diseases especially on the transmission dynamics of vector ticks is essential for the elaboration of efficient control strategies [5], but in Rajasthan state of India there is no proper report on the morphological identification of ticks, therefore, the aim of this study was to determine the fauna of ticks found on camels and their seasonal population in camels in Bikaner province of Rajasthan.

2. Material and Methods

2.1 Study areas and Collection of ticks from camels

Ticks were collected from the camels in and around Bikaner city at environmental temperature of 42 °C and 75 per cent relative humidity. About 350 engorged adult ticks were collected from the ground of camel pens, inside city, camel farm, from Bikaner city such as, Choudhary Dharmkanta, Kisan Dharmkanta, Tilak nagar, Industrial area, Nathusar Gate, Near Goga Gate, Vyas colony circle, Pugal Road, Pandit Dharmkanta, inside city and National Research Center on camel in Bikaner during 2010-2011.

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These ticks were predominantly attached near nostrils, hump, tail, in between the foot and at the usual sites of the camels. The ticks were cleaned several times in sterile 1x PBS (pH 7.2).

2.2 Identification of ticks

Morphological features were examined under stereo microscope and identified using the guide to identification of species [6]. Then permanent mounting of adult *H. dromedarii* was prepared. The ticks specimen were softened by boiling it in 10 per cent KOH solution for 2-5 minutes and washed thoroughly in distilled water until KOH was removed. The specimen was transferred to ascending grades of ethanol (50, 70, 80, 90, 95%, Absolute) for 15 minutes for dehydration, passed through carboxylol (1:3, Carboxylic acid: Xylene) and xylene for 5 minutes each for clearance. The specimen was mounted in DPX on slide as a permanent specimen and identified as male and female.

3. Results

Out of 350 ticks collected 153 (43.71%) were female and 197 (56.29%) were male ticks. they are present at different site of animal i.e. External ear (95/27.14%) Perineum and chest (192/54.86%) Shoulder (63/18%). Regarding seasonal variation following trend was noticed i.e. Spring (93/29.06%) Summer (143/40.86%) Autumn (69/19.71%) Winter (45/12.86%). The *H. dromedarii* ticks were identified based on their morphological features as given below and are depicted in figures 1 and 2.

A. In general female *H. dromedarii* showed following character:

Genital structures: genital aperture narrow, triangular in shape (V-shaped); vestibular portion of vagina strongly bulging; preatrial fold of genital aperture flat.

Scutum: yellow to reddish brown in color; pale marbling absent; nearly as broad as long; postero-lateral angles distinct; cervical and lateral grooves deep, extending to posterior margin of scutum; large, deep punctuations sparse, evenly distributed over scutum.

Capitulum: *Basis capituli*: dorsally lateral projections broad and short, absent ventrally; dorsal posterior margin slightly concave; dorsal cornua inconspicuous. *Hypostome*: club-shaped; denticulate portion slightly longer than denticle-free portion.

Legs: *Coxae*: posteromedian and posterolateral spurs of coxa I long, subequal in length or posterolateral spur longer than posteromedian spur, tapering to apices, juxtaposed, posteromedian spur broad with blunt apex; coxae II-IV each with distinct, broadly triangular posterolateral spur, with rounded apex; coxae II-IV each with modest, broadly arcuate, posteromedian spur. Coloration of legs was similar to that of male.

B. In general male *H. dromedarii* showed following character:

Genital structures: adanal plates long, lateral margin markedly convex, anteriomedian margin concave, median projection prominent, posteriomedian margin deeply concave, posterior margin rounded; subanal plates vary in shape and size, usually very large and transversally aligned. Sclerotized plaques present ventrally on median (as tiny sclerite) and paramedian festoons. *Spiracular plate*-dorsal prolongation long, narrow, and clearly distinct from body of plate; perforated portion of prolongation gently curved throughout its length.

Scutum: Yellow to reddish brown in color; pale marbling

absent; broadly oval in shape; widest near mid-length; slight narrowing in region of spiracular plates; cervical and lateral grooves very deep, up to one half to two thirds of length of conscutum; marginal grooves short, furrow-like, extending anteriorly for posterior 1/4th of conscutum; posteromedian groove reaches parma; paramedian grooves well defined; caudal field well defined, laterally demarcated by moderate ridges; large punctuations sparse, mainly on caudal and lateral fields, small punctuations vary in density- usually very sparse, mainly on caudal and lateral fields; parma generally present, narrow, sub-triangular; four distinct festoons.

Capitulum: *Basis capituli*, without lateral projections; dorsal posterior margin angular, deeply concave; cornua modest. *Hypostome*: club-shaped; denticulate portion slightly longer than denticle-free portion.

Legs: *Coxae*: posteromedian and posterolateral spurs of coxa I long, subequal in length or posterolateral spur longer than posteromedian spur, juxtaposed, tapering to apices; coxae II-IV each with distinct, broadly arcuate posterolateral spur; coxae II and III each with modest, very broadly arcuate, posteromedian spur; posteromedian spur on coxa IV distinct, triangular. Ivory-colored enamel band encircles distal portion of each segment of legs; incomplete or complete ivory-colored stripe on dorsal aspects of leg segments.



Fig 1: Male of *Hyalomma dromedarii*



Fig 2: Female of *Hyalomma dromedarii*

4. Discussion

Current investigation is the first report depicting the characters of ticks collected from camel of Bikaner region of Rajasthan state. *H. dromedarii* was established the chief vector responsible for spread of infection among camel population. In the present study all ticks which were collected was *H. dromedarii*, the observed morphological characters are in concordat with Soulsby [7]. Regarding the sex 56.29% of ticks were female, similar finding was noticed by earlier workers [8]. The hard ticks were more common during summer and spring respectively [8,9]. Based on our findings, it is concluded that *H. dromedarii* is dominant tick species in this area, and camel is the most suitable host [10]. Life cycle of this tick can be one host, two host, or three host. Maximum number of tick are found in perineum and chest region, it is may be due to the fact of larger area [11]. The poor husbandry practices of small holder dairy farmers may be a determinant making the animals more prone to tick infestation. This suggests that, to be effective, tick control measures for camels should concentrate on the dominant tick species and their season of abundance [12]. Planned application of acaricide especially at the beginning of wet months might minimize the burden of ticks on the camels [13]. In conclusion further studies on the effect of these species of ticks on the productivity of camels, and determination of the minimum load that affects productivity, are necessary.

5. Conflict of Interest

The authors declare that they have no conflict of interest.

6. Acknowledgements

Thanks are due to The Dean, College of Veterinary and Animal Sciences, Rajasthan University of Veterinary and Animal Sciences (RAJUVAS), Bikaner for the facilities provided.

7. References

- Rathore B, Faridi F, Bargujar J, Ghorui SK, Manohar GS. Isolation of defensin gene from salivary gland of *Hyalomma dromedarii* ticks from *Camelus dromedaries* by polymerase chain reaction. Journal of Camel Practice and research. 2013; 20(1):125-127.
- Rathore B, Faridi F, Bargujar J, Ghorui SK, Manohar GS. Amplification and cloning of Defesin gene isolate from *Hyalomma dromedarii*, a tick infecting camels in Rajasthan. Veterinary Practitioner. 2014; 15(1):33-35.
- Siegmund OH. The Merck Veterinary Manual, 5th edn. U. S. A., 1979, 1600.
- Hoogstral H, Valdez R. Ticks (Ixodoidea) from wild sheep and goats in Iran and medical and veterinary implications, Fieldiana Zoology. 1980; 6:1-16.
- Morzaria S, Katende J, Kairo A, Nene V, Musoke A. New methods for the diagnosis of *Babesia bigemina* infection. Mem Instituto Oswaldo Cruz 1992; 87:201-205.
- Estrada-pena A, Bouattour A, Camicas JL, Walker AR. Ticks of Domestic animals in the Mediterranean Region, 1st ed. University of Zaragoza, Spain, 2004.
- Soulsby ELJ. Helminths, Arthropods and protozoa of domestic animal, 7th edition Elsevier, 2005.
- Fard SRN, Fathi S, Asl EN, Nazhad HA, Kazeroni SS. Hard ticks on one-humped camel (*Camelus dromedarius*) and their seasonal population dynamics in southeast, Iran. Tropical Animal Health Production. 2012; 44:197-200.
- Abdel-Shafy S. Scanning electron microscopy and comparative morphology Of *Hyalomma anatolicum excavatum*, *H. dromedarii* and *H. marginatum marginatum* (Acari: ixodidae) Based on nymphs. Acarologia. 2008; 1(2):3-18.
- Bhatt VS, Tata SN, Lokeshwar RR, Gulabani JK, Guliani JL, Bardhan NK *et al.* The Indian *Hyalomma* Ticks (Ixodoidea: Ixodidae). Thakur Das, Under-Secretary, for the publication and information division, Indian council of agricultural research Krishi Anusandhan Bhavan, New Delhi 110012. 1987, 60.
- Montasser AA. The Camel Tick, *Hyalomma (Hyalomma) dromedarii* Koch, 1844 (Ixodoidea: Ixodidae): Description of the Egg and Redescription of the Larva by Scanning Electron Microscopy. International Journal of Zoological research. 2006; 2(1):14-29.
- Tigani MAE, Mohammed AS. Ticks (Acari: Ixodidae) Infesting Camels in El Butana Area Mid-Central Sudan. Sudan Journal of Veterinary Research. 2010; 25:51-54.
- Abdullah HHAM, El-Molla A, Salib FA, Allam NAT, Ghazy AA, Abdel-Shafy S. Morphological and molecular identification of the brown dog tick *Rhipicephalus sanguineus* and the camel tick *Hyalomma dromedarii* (Acari: Ixodidae) vectors of Rickettsioses in Egypt. Veterinary World, 2016, 1087-1101.