

First report of *Rhipicephalus deltoideus* from Manipur, India

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Received : 25.08.2021; **Accepted** : 20.09.2021

ABSTRACT

The present paper deals record of a *Rhipicephalus* tick, reported for the first time from Manipur, a new record of India. The species under this genus have usual morphological features viz., having a hard sclerotized scutum which completely cover the dorsal surface of the body in males but present a small shield just behind the capitulum in female, basis capitulum is hexagonal in shape, mouth part anterior in position, eyes if present are located near the lateral margin of the scutum, presence of adanal plate in male, presence of festoons, etc. The present specimen which is reporting as a new record was collected from cattle (*Bos indicus*) from Wakha (24°46'22" N, 93°59'12"E) Imphal East District, Manipur, India. On detailed microscopic observation, the present specimen was found to possess the morphological characters similar to the already known *Rhipicephalus* species, *Rhipicephalus deltoideus* is a first record from India.

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KEY WORDS : *Bos indicus*, Cattle, Manipur, *Rhipicephalus*, Tick, Wakha.

Introduction

Ticks are obligate blood-feeding acarine parasites feeding on the blood of terrestrial vertebrates at some stage of their life cycle. Many species are of considerable interest and clinical importance as vectors of a wide variety of pathogens to both humans and animals¹.

They are members of the phylum Arthropoda, class- Arachnida, order- Acarina. Within the Acari, the suborder Ixodida consists of three families of ticks - Argasidae, Nuttalliellidae and Ixodidae. The systematics of the Ixodida were reviewed. The members of the genus *Rhipicephalus* are characterized by having a hard sclerotized scutum which completely covers the dorsal surface of the body in the males but is merely a smaller shield just behind the capitulum in the females and immature stages, hypostome and palps are short, presence of hexagonal shape basis capituli when viewed dorsally, presence of festoon, mouthparts of all these ticks are anterior in position; their eyes, when present, are near the lateral margin of the scutum, and their spiracles, which are large, are located behind coxae IV, adanal plate is present only in the male. The family

Ixodidae consists of approximately 13 genera of which the genus *Rhipicephalus* is one the largest⁶. The present specimen belonging to the genus *Rhipicephalus* was recovered from the cattle (*Bos indicus*) which are domesticated in the locality of Wakha, Imphal East District, Manipur (India) during the month of July- August, 2020. The purpose of the present study is to explore the tick fauna from different parts of Manipur (India) that remain unexplored for long period so far and for proper cataloguing of the existing ticks, from this region.

Materials and Methods

The tick parasites were collected by hand manually or by large forceps according to the convenience from the body of the cow and kept inside collection bottle containing 70% alcohol and brought to the laboratory. The collected specimens were preserved in 70% ethyl alcohol containing few drops of glycerol. After removing from the preservative, the ticks were placed in water for one hour and were then transferred in a cavity block containing 10% KOH solution and keep in this medium for at least 24 hours until it is suitably cleared. Then the ticks were washed thoroughly in water to remove KOH and were

ACKNOWLEDGEMENTS : The authors are thankful to the Head, Department of Life Sciences, Manipur University for providing necessary laboratory facilities. The authors are also grateful to the colleagues for their valuable support.

Table 1: Comparison of the present specimen with its closest species *Rhipicephalus deltoideus* (Measurements are given in millimeter unless stated)

Characters	<i>Rhipicephalus deltoideus</i>	Present specimen
Capitulum	Broader than long	Broader than long
Basis Capitulum	Over three times as broad as long	Over three times as broad as long
Dimension of Basis Capitulum	0.51mm x 1.68mm	0.088mm x 0.280mm
Lateral angles	Acute	Acute
Cornua	Distinct	Distinct
Porose area	Large, oval, slightly more than their own diameter apart	medium, narrow oval, slightly more than its own diameter apart
Scutum	Longer than broad	Longer than broad
Scutum Dimension	1.97mm x 1.77mm	1.42mm x 1.23mm
Eyes	Located about mid-length of scutum	Located about mid-length of scutum
Genital aperture	Very broadly U-shaped	Broad U-shaped
Number of Festoon	11	11

placed in 5% aqueous solution of glacial acetic acid for 30 minutes. Then, they were transferred to water and kept for 30 minutes to make them free from acid. Then, the specimens were dehydrated by employing the ascending grades of alcohol. They were cleared in cedar wood oil for a minimum of 24 hours and then placed in xylene for one minute before mounting. The ticks were mounted in DPX mountant on a one concavity micro slide. Then, the slide was dried properly for further detail study and storage. Measurements were taken by using an ocular micrometer. Drawings were drawn by using camera lucida⁵.

Observation

Female:

Body is 3.48mm long and 2.10mm width, triangular shape⁶ having a narrow anterior portion, brown in colour. Capitulum broader than long, 0.08mm in length and 0.28mm in width, which is about three times as broad as long. Basis capitulum has an acute lateral angle. Cornua is distinct, porose area is medium in size, narrow oval in

shape and separated by more than their own diameter apart. Palps short, their apices are broadly rounded. Scutum is 1.42mm long and 1.23mm in width which is longer than broad. Posterior margin of the scutum is sinuous. Eyes are located at about mid-length of scutum, flat, edged dorsally by a few setiferous punctations. Cervical field are broad, slightly divergent and depressed, their external margins delimited by non-uniform rows of large setiferous punctation. Some lesser size setiferous punctation are present on the scapular region and medially on the scutum, which is scattered along with fine punctation. Genital aperture is broad U-shaped and located at coxa-II level. Coxa-I spur pairing is large and equal. Lateral grooves with fine punctation are present. Posterior grooves are distinct. Presence of pulvilli. Spiracle is 0.39mm in length and 0.30mm in width, elongated ovate, plano-convex in shape with posterior end more pointed. Spiracular goblets⁵ scattered around middle apparatus. Eleven festoon with well demarcated outline are present at posterior broader region of the body.

Male : Not found.

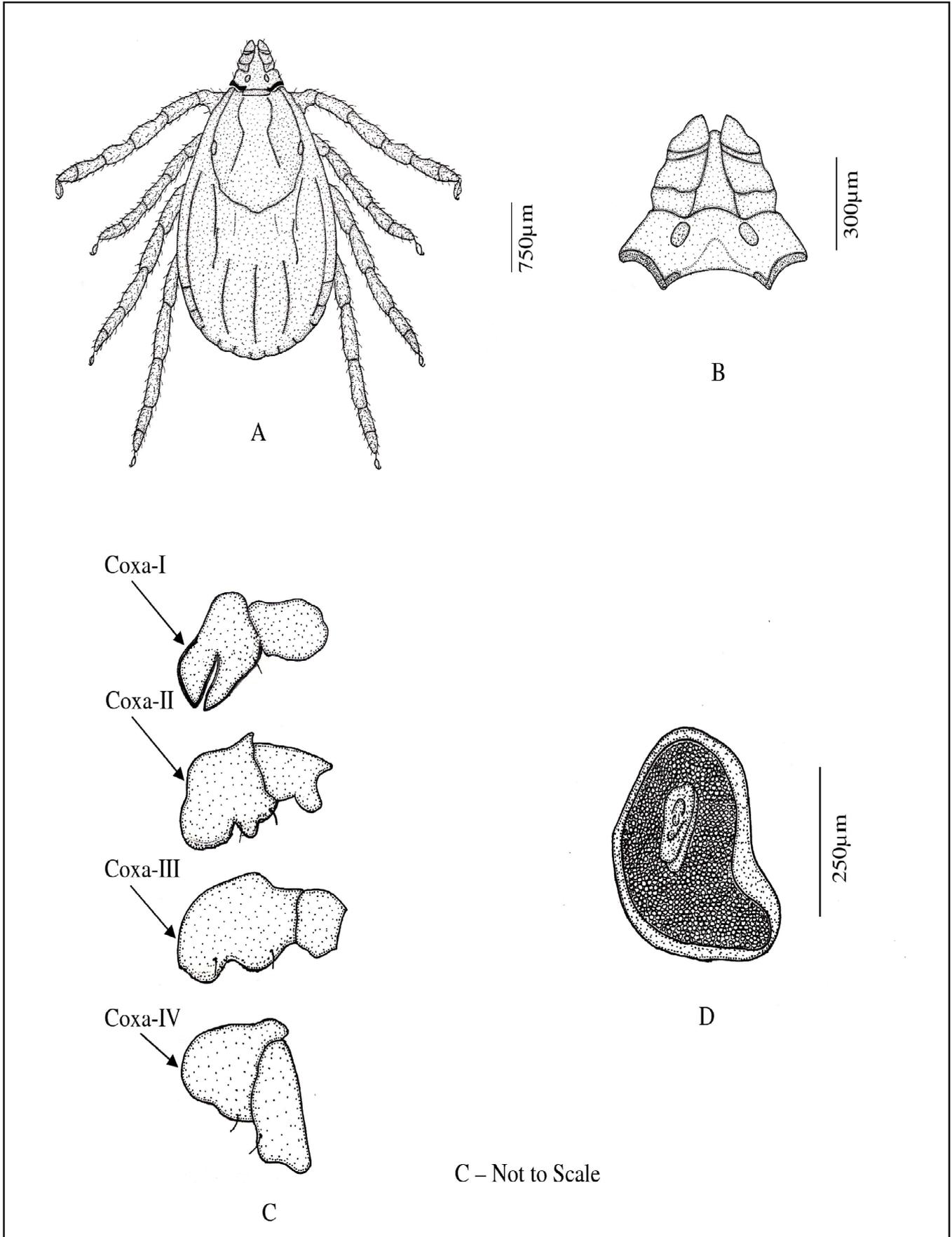


Fig. 1 : *Rhipicephalus deltoideus* female (camera lucida drawing) A. Whole Body (dorsal view), B. Capitulum, C. Coxae, D. Spiracle.

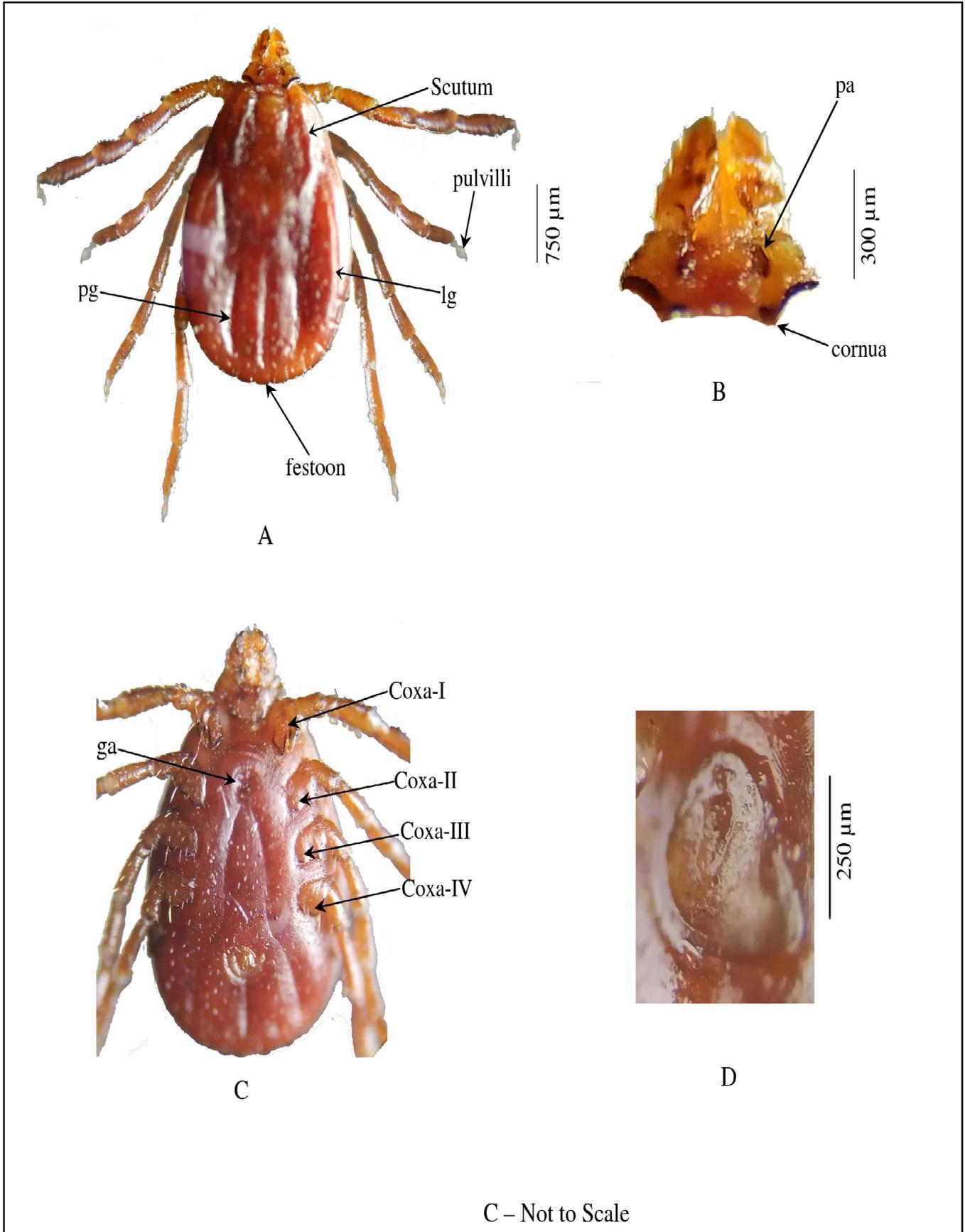


Fig. 2 : *Rhipicephalus deltoides* female (Photomicrograph) A. Whole Body (dorsal view), B. Capitulum, C. Coxae, D. Spiracle.

* Abbreviation : ga - genital aperture : lg - lateral grooves; pg - posterior grooves; ps-porose area.

Result

A detailed morphological analysis of the present *Rhipicephalid* tick lead to the identification of a species under the genus *Rhipicephalus*.

Discussion

The genus *Rhipicephalus* is the largest genera in the family Ixodidae . Species under this genus possess the following morphological features in common: their hypostome and palps are short and their basis capituli is usually hexagonal; they have eyes, festoons and, in the males, adanal plates⁶. The present specimen shows resemblance with *R. deltoideus* (Neumann, 1910) in having hexagonal shape basis capitulum which is three times as broad as long; capitulum broader than long having an acute lateral angles; cornua is distinct; porose area is narrow oval in shape and is separated by a distance of slightly more than its own diameter; scutum is longer than broad; eyes at about mid-length of scutum, flat, edged dorsally by a few large setiferous punctation. Cervical fields broad, slightly divergent, depressed and their external margins demarcated by irregular rows of large setiferous punctations. Smaller setiferous punctuations present on the scapulae and medially on

the scutum, scattered with numerous fine punctations and having a U-shape genital aperture; presence of eleven festoons. Host of *R. deltoideus* which was collected from Lesotho(formerly Basutoland), South Africa remains unknown but the present specimen which was collected from Manipur,India was recovered from *Bos indicus*. The present specimen also shows slight resemblance with *Rhipicephalus arnoldi*^{4,6} in having a triangular shape body with narrow anterior portion; capitulum is broader than long , basis capitulum with acute lateral angle; scutum longer than broad, slightly sinuous posteriorly; eyes almost flat, edged dorsally by one or two setiferous punctations ; genital aperture U-shape; presence of eleven festoons. Considering the relative characteristics features and resemblance, the present specimen is assigned to as *Rhipicephalus deltoideus*, but reporting for the first time from Manipur, India as new record.

Conclusion

Based on the above morpho-taxonomical characteristics observation , the present specimen (*Rhipicephalus deltoideus*) is reported as a new record from Manipur, India with *Bos indicus* as its host.

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