



TAXONOMY OF PARASITIC TICKS OF GENUS *RHIPICEPHALUS* (*BOOPHILUS*) (IXODIDA: IXODIDAE) FROM AURANGABAD DISTRICT OF MAHARASHTRA INDIA

Sushama Paikade

Department of Zoology, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad-431004

Ramrao Chavan*

Department of Zoology, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad-431004 *Corresponding Author

ABSTRACT The present communication is regarding the taxonomy study of parasitic ticks of Genus *Rhipicephalus* (*Boophilus*) from Aurangabad district of Maharashtra, India. The study was carried out on ectoparasitic ticks of milch cattles of Aurangabad district from June-2015 to May-2016. The three species of genus such as *Rhipicephalus* (*Boophilus*) *decoloratus*, *Rhipicephalus* (*Boophilus*) *microplus* and *Rhipicephalus* (*Boophilus*) *sanguineus* were identified as per the keys and description given by Wall R. and Shearer D. (1997), Soulsby E. J. I. (1982).

KEYWORDS : Taxonomy, Subgenus *Boophilus*, Genus *Rhipicephalus*, Ectoparasites, ticks, Aurangabad.

INTRODUCTION

Ticks belonging to Phylum Arthropoda, Class Arachnida, subclass Acari, and family Ixodidae, Subgenus *Boophilus*. (Paikade S. and Chavan R. 2019). The arthropods contain over 80% of all known animal species and occupy almost every-known habitat. As a result of their activity, arthropod ectoparasites may have a variety of direct and indirect effects on their hosts (Wall R. and Shearer D. 1997). Ectoparasites including lice, ticks, mites, etc. play an important role in the transmission of certain pathogens (Lomms Ec. 1986). Approximately 900 tick species have been described, divided among the Ixodidae, Argasidae, and Nuttalliellidae, of which about 10% of Ixodidae and Argasidae families are of clinical significance (Jongejan F and G. Uilenberg 2004). Ticks which usually attack cattle are *Boophilus* spp., *Haemaphysalis* spp., *Rhipicephalus* spp., *Hyalomma* spp., *Amblyomma* spp., *Derma-centor* spp., (Hoogstraal et al. 1966). The Indian ticks were taken up for research as in 1758 by Linnaeus. The most comprehensive study of Indian ticks was done by Sharif M. (1928), Later Hoogstraal and his co-workers (1962-1971) made extensive studies on Ixodida and till date, approximately 107 species and 12 genera have been known from India (Mattyse J. G. 1946).

The genus *Rhipicephalus* comprises approximately 70 species (Jongejan F and Uilenberg G. 1994). The objectives of the study were to collect and identify the different species of *Rhipicephalus* (*Boophilus*) genus from Aurangabad district of Maharashtra India.

MATERIALS AND METHODS

The present study was conducted in Aurangabad district, Maharashtra India during June 2015-May 2016. The parasites are collected by random sampling method in which 1-6 cattles were thoroughly investigated. Ticks were collected from the individual cattle by hand picking or using forcep and preserved in 70% alcohol in clean, well-stopper glass vials which were labeled properly. Morphology of ticks was studied in laboratory under stereomicroscope and identify on the basis of morphological characters such as mouthparts, ornamentation, coxa spur, presence of festoon punctation distribution, leg coloration, genital aperture and basis of capituli using the key and description given by (Wall R. and Sherer D 1997), (Urquhart G. M., Armour J. Duncan et al 1996) and (Soulsby E. J. L 1982).

RESULTS AND DISCUSSION

During present study three species belonging to genus *Rhipicephalus* (*Boophilus*) were reported such as *Rhipicephalus* (*Boophilus*) *decoloratus*, *Rhipicephalus* (*Boophilus*) *microplus*, and *Rhipicephalus* (*Boophilus*) *sanguineus*.

TAXONOMY

Phylum : Arthropoda.
Class : Arachnida.
Subclass : Acari.
Order : Ixodida.
Family : Ixodidae.
Genus : *Rhipicephalus*.
Subgenus : *Boophilus*.

Key to the subgenus of *Boophilus*

1. Very short mouthparts; eyes are present but not distinct.
2. Festoons are absent; caudal appendages present in males.
3. Well developed adanal shield and accessory plates in males

Description

Mouthparts are very short, No pale rings are present on legs and legs are slender. Conscutum is present in male (scutum in female), Eyes are present but not distinct. Festoons are absent in male and females; Spiracular plates are large, the ventral plates are present only in males, indistinct anal grooves, fourth coxae are normal in size, and first coxae have small paired spurs. These species some characters was described by (Ali A. A. Naji, Al-emran, et al 2014.)

Key to the Genus of *Rhipicephalus*

1. Anal groove surrounding the anus posteriorly.
2. Mouthparts are medium in size; Scutum is usually brown in colour.
3. Palp and Hypostome are short, Eyes are present.
4. Festoon present; Males with coxae 4 are of normal size.
5. Pair of adanal shield and accessory plates are present
6. Ventral plates are near to anus in males; basis capituli is hexagonal in shape.

Description

Anal grooves are surrounding the anus posteriorly; mouthparts are short to medium size, lateral margins of basis capituli has hexagonal in shape; pale ring is absent on legs; legs are slender; pulvilli are always present; conscutum present in males (scutum present in females); eyes are present which are flats; festoons are present in males, ventral plates are present only in males, coxae 4 are normal in size in males; large and equal paired of spur present on coxae I. this species was described by (Jongejan F. And Uilenberg G. (1994) with above characters, and some of the characters described by (Ali A. A. Naji, Al-emran, et al 2014).

Keys for species of *Boophilus* subgenus

1. Caudal appendage present..... 2
2. A. on its Hypostome 3+3 columns of teeth. Protuberance bearing setae on the inner margin of palp article I.....*decoloratus*.
- B. 4+4 columns of teeth on its hypostome. No protuberance bearing setae on the inner margin of palp article I.....*microplus*.

Fig.1. *Rhipicephalus* (*Boophilus*) *decoloratus* (Koch, 1844)

Description

The *Rhipicephalus* (*Boophilus*) *decoloratus* is also known as "The blue tick" because of the colour of engorged female (Walker A. R., Bouattour A., Camicas J.-L et al 2003). The mouthparts are short and the dentition on the Hypostome is arranged in two columns, each consisting 3+3 dentition; protuberance bearing setae on the inner margin of palp article I; The basis capituli is hexagonal in shape. There

are numerous fine hairs on the conscutum of males (scutum of females); eyes are indistinct, and in the female two distinct grooves divide the scutum into a central yellow area and two lateral areas that are reddish-brown in colour. Festoons are absent. A small caudal appendage is present on the males; The tips of the adanal and accessory adanal plates can be seen from dorsal side beyond the posterior margin of the conscutum. The engorged female is blue in colour.

Fig.2. *Rhipicephalus (Boophilus) microplus* (Canestrini, 1888)

Description

The *Rhipicephalus (Boophilus) microplus* is known as the "The cattle tick." (Wall R and Shearer D. 1997). The *R. microplus* is slightly larger in size than that of the *R. decoloratus* but they are otherwise very similar in characters. The dentition on the Hypostome is arranged in two columns each row consist of four denticles that is 4+4. A small caudal process is present on the males and the internal spur on the adanal plates is approximately as long as the external spur and is not as prominent as that of *R. decoloratus*. The cornua are distinct.

Keys for species of *Rhipicephalus* genus

1. Mouthparts are small.
2. Internal margins of adanal shields is curved and broad, eyes are large and slightly convex, posteromedium and paramedial grooves are deep spiracle is comma shaped.*sanguineus*.

Fig.3. *Rhipicephalus sanguineus* (Latreille, 1806) (brown dog tick)

Description

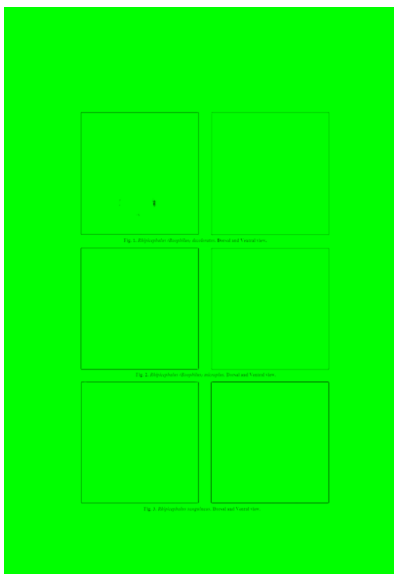
The *Rhipicephalus sanguineus* is also known as "The kennel tick" or "The pan-tropical dog tick." (Walker A. R., Bouattour A., Camicas J.-L et al 2003) Mouthparts are short, conscutum is reddish brown in colour, eyes are slightly convex in the females, anterior spur of coxae I is not visible dorsally, adanal shield is curved and broad in shape, Caudal appendages are bulges. Lateral grooves are distinct, posteromedial grooves are present, paramedial grooves are small, and spiracle plate is comma shaped. This species was also described by (Walker A. R., Bouattour A., Camicas J.-L et al 2003) In additional characters of this species were reported such as adanal shields have Sub-triangular shape rounded posteriorly, Subanal shields are absent, spiracular plates have long tails which are narrow less than the width of the adjacent festoon in *sanguineus* such characters are described by (Hend A. A. mAbdullah, Amal EI- Molla FayeZ A. et al 2016).

CONCLUSION

During present study three species belonging to genus *Rhipicephalus* such as *Rhipicephalus (Boophilus) decoloratus*, *Rhipicephalus (Boophilus) microplus*, *Rhipicephalus sanguineus* were first time reported in Aurangabad district M. S. India.

ACKNOWLEDGMENT

Authors are thankful to Professor and Head, Department of Zoology, Dr. Babasaheb Ambedkar Marathwada University Aurangabad for providing necessary laboratory facilities.



REFERENCES

1. Ali A. A. Naji, Al-Emarah, Ghazi Y. Al Amura, M. F. A. Suzan, A. A. Al-Azizz, A. A. Hassan, Detection of Ectoparasites Between Domesticated Animals in Basrah city/southern Iraq, 2014, J. of International Academic Research for multidisciplinary. ISSN: 2320-5-83, Volume2, Issue 7, August 2014.
2. Hend H. A. M. Abdullah, Amal E-Molla, FayeZ A. Salib Nesreen A. T. Allam, Alaa A. Ghazy and Sobhy Abdel-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, 2016, Veterinary World, EISSN: 2231-0916. Available at www.veterinaryworld.org/Vol.9/October-2016/9.pdf.
3. Jongejan F., and Uilenberg G., Ticks and control methods, 1994, Rev. sci. tech. Off. int. Epiz., 1994, 13 (4), 1201-1226.
4. Jongejan, F and G. Uilenberg. The Global importance of ticks. 2004, Parasitology, 129s: 3-14.
5. Loomis Ec., Ectoparasites of cattle, 1986, Vet. Clin. North America, 2:299-321.
6. Mattysse, J. G., Cattle lice: Their biology and control. 1946, Cornell Univ. Agric Exp. Station. Bull., 832.
7. Paikade S. and Chavan R. Studies on taxonomy of parasitic ticks genus *Hyalomma* (Ixodida: Ixodidae) from Aurangabad district M. S. India. 2019, International Journal of Entomology Research, ISSN:2455-4758, pp 27-30.
8. Soulsby E.J.I Helminthes, Arthropod and Protozoa of Domesticated animals, 1982,7th edition Bailliere Tindall London, 1982, pp 456-475.
9. Urquhart, G.M., Armour, J. Duncan, J. L. Dunn, A. M. and Jennings, F. W. Veterinary Parasitology, 1996, 2nd ed., chandler, E. A. Gaskell. C. J. and Gaskell, R. M. [eds], Black well science Ltd., UK, pp.18-201.
11. Walker A. R., Bouattour A., Camicas J.-L., Estrada-Pena A., Horak I. G., Latif A. A., et al., 2003, Ticks of Domestic Animals in Africa: a Guide to Identification of Species, ISBN 0-9545173-0-X.