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SHORT COMMUNICATION

REDESCRIPTION OF *RHIPICEPHALUS PRAVUS* DONITZ, 1910 (IXODIDA, IXODIDAE) ON SHEEP IN IRAQ

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ABSTRACT

The current investigation was to redescribe the morphology of the species of hard tick, *Rhipicephalus pravus* Dönitz, 1910 (Ixodida, Ixodidae) that was recently recorded from Baghdad Province, central of Iraq. A total of 130 sheep were obtained from the local animal markets in Baghdad Province, throughout the period from May 2022 to November 2023; these sheep were examined for the presence of hard ticks. The current study revealed five sheep infested with *R. pravus* in Baghdad Province. The specimens were deposited in the Iraq Natural History Research Center and Museum-Baghdad University under the number: INHM, 2023: Hard Ticks, No. 1.1. Hard tick-borne pathogens were reviewed, so this species of tick was associated with several pathogens, so it an important species that affects public health and livestock as well. The present description was provided with pictures and illustrations.

Keywords: Hard ticks, Hemorrhagic fever, Livestock, Morphology, Sheep.

INTRODUCTION

Hard ticks have borne many pathogens, like *Rickettsia* sp., *Babesia* sp., *Theleria* sp., and *Anaplasma* sp. (Addo *et al*., 2023), and other pathogens (Makawi *et al*., 2023). Iraq is considered an endemic country for both theileriosis and babesiosis which are transmitted by hard ticks (Hadi and Al Amery, 2012; Makawi and Hadi, 2023). The real-risk disease for both humans and animals that is transmitted by ticks is viral hemorrhagic fever (VHF) (Ergönül *et al*., 2018).

The first description of the species *Rhipicephalus pravus* Dönitz, 1910 was by Donitz in 1910, from buffalo and giraffe on the Masai Steppe in Tanganyika (Walker, 1956). Zumpt (1942) re-described it in many regions of Tanganyika, Kenya, and Abyssinia. Then, Theiler and Robinson (1953) bred the adults in the laboratory, described the larvae and nymphs, and discussed the biology, distribution, and synonyms of the species. *R. pravus* infested many hosts like cattle, sheep, goats, camels, dogs, horses, donkeys, pigs, elephants, and hares (Walker *et al*., 2014). The study aimed to re-describe the morphology of *R. pravus* in a new locality from Iraq.

Specimens' collection

From May 2022 to November 2023, a total of 130 sheep were inspected in order to collect hard ticks from nearby livestock markets in Baghdad Province. We looked at every animal to check for hard ticks in the tail, between the legs, ears, neck, and area around the eyes. Put cotton dipped in 70% alcohol in the tick's position to numb and loosen the mouth's skin-attached parts, then remove it with tweezers (Soulsby, 1982). After being kept in 70% alcohol, the separated ticks were sent to the Iraq Natural History Research Center and Museum (INHM)/University of Baghdad for identification, photography, and drawing by camera Lucida.

Distribution, specimens' information and Re- description

The current study revealed five sheep were infested with *Rhipicephalus pravus* in Baghdad Province, central of Iraq. The specimens of the mentioned species were preserved in the Iraq Natural History Research Center and Museum.

***Rhipicephalus pravus* Dönitz, 1910**

Synonym: *Rhipicephalus* (*Rhipicephalus*) *pravus* Santos Dias, 1955
Habitat: it was found between the host legs.
Date of Collecting: 10.v. 2023.
Host: *Ovis aries* Linnaeus, 1758
Host locality: Baghdad, Iraq.
Museum deposit number: INHM, 2023, Hard Ticks, No. 1.1.

Prior to this, Tahmaz (2021) discovered *R. pravus* in bulk sheep in the northern Iraqi province of Erbil; Al Ebrahemi (2023) rediscovered it in cattle in the central Iraqi province of Al Najaf Al Ashraf. On the other hand, the current study recoded it as a new local from Iraq on the sheep from Baghdad (Map 1). This result agreed with Tamirat (2022), who reviewed a significant abundance of *Rhipicephalus pravus* in the arid and semi-arid areas of Ethiopia, which indicates that it is resistant to drought.

Map (1): Locations of the *Rhipicephalus pravus* in Iraq (Note the colored circles).

The current study stated that this hard tick infests livestock (sheep and cattle) and agrees with Obara *et al*. (2020), who recorded infesting buffalo in Uganda. While Dulacha *et al.* (2023) revealed that the ratio of infested cattle with this species was 49.7% in southern Ethiopia. The current study described the morphology of *R. pravus*, because of the previous recordings were without morphological description. So, this represents additional data for the diversity of hard ticks in Iraq.

Rhipicephalus pravus was similar to *R. appendiculatus* (Walker *et al.*, 2014). The current study describes the similarities in them as for conscutum color, first coxae spurs, accessory adanal plate, spiracle plate areas, and caudal appendage (Tab. 1). The present study describes the differential diagnosis between them in interstitial punctuation distribution, setiferous punctations, apparent cervical fields depression, eyes, adanal plate shape, and posterior grooves (Tab. 2, Pls 1- 3).

Table (1): Similarities between males of *Rhipicephalus pravus* and *Rhipicephalus appendiculatus.*

Features	Description
Conscutum color	Dark
First Coxae spurs	Visible dorsally
Accessory adanal plate	Small
Spiracle plate areas	having sparse setae
Caudal appendage	Narrow in fed males

Table (2): Differential diagnosis between *Rhipicephalus pravus* and *Rhipicephalus appendiculatus.*

Features	***R. pravus***	***R. appendiculatus***
Interstitial punctation distribution	Dense	Sparse
Setiferous punctations	Distinct	Indistinct
Cervical fields depression is apparent	Forming a narrow cervical field	Forming a wide cervical field
Eyes	Distinctly convex	Slightly convex
Adanal plates shape	Narrow trapezoid	Wide trapezoid
Posterior grooves	Deep and with rough texture	Shallow and with wrinkled texture
Lateral grooves type	They extend to the eyes	They not extend to the eyes

Plate (1): Dorsal view of *R. pravus* male. (1: Cervical fields, 2=Eye, 3: Lateral groove, 4: posterior groove, 5: caudal appendage).

Plate (2): Ventral view of *R. pravus*, male. (1: Spiracle plate areas, 2: Adanal plates, 3: Accessory adanal plates).

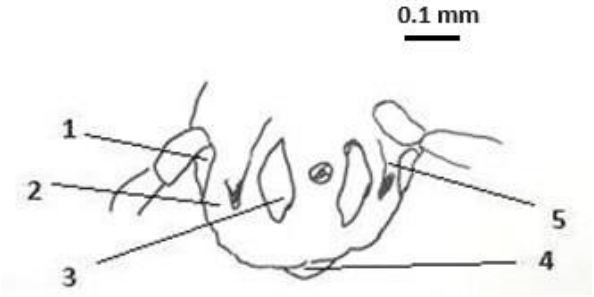

Plate (3): Ventral plates of *R. pravus*, male. Drawing by Camera Lucida in INHM. (1: Spiracle plate, 2: Accessory adanal plates, 3: Spiracle plate areas, 4: Adanal plates, 5: Caudal appendage).

***Rhipicephalus pravus* borne pathogen**

The paralysis syndrome has been studied in detail by Gothe *et al.* (1979) and Gregson (1973), who revealed the species that cause paralysis as *Argas walkerae*, *Dermacentor andersoni*, *Ixodes holocylus* and *Rhipicephalus evertsi evertsi*. Then, Fourei *et al.* (1988) added *Rhipicephalus pravus* to this list because it caused paralysis in Angora goat kids in South Africa. Byaruhanga *et al.* (2021) revealed that *R. pravus* was the vector to transposrt *Theileria parva* in cattle. Mucheka *et al.* (2023) revealed *Rhipicephalus* sp. as a vector to *Theileria* spp., *Rickettsia* spp., *Ehrlichia* spp., *Anaplasma* spp., *Coxiella* spp., and *Babesia* spp. in domestic animals. From the above above-borne pathogen, appears that *R. pravus* was associated with several pathogens, so we consider it an important species that affects public health and livestock as well.

CONCLUSIONS

The current study recorded the species *Rhipicephalus pravus* in sheep in Baghdad as a new local. After it was recorded in Erbil province in northern Iraq and Al Najaf Al Ashraf province in southern Iraq, this indicates that it is resistant to drought, and can survive in many habitats.

Hard tick-borne pathogens were reviewed, so *R. pravus* was associated with several pathogens, so we consider it an important species that affects public health and livestock as well.

CONFLICT OF INTEREST STATEMENT

"There is no conflict of interest regarding the publication of this article".

LITERATURE CITED

Addo, S., Ronald, B., Kevin, Y., Ansah Owusu, J., Behene, E., Opoku Agyeman, P., Bruku, S., Asoala, V., Suzanne, M., Asiedu, J., Kweku, P., Wilson, D., Jose, W. and Samuel, K. 2023. First molecular identification of multiple tick‐borne pathogens in livestock within Kassena‐Nankana, Ghana. *Animal Diseases*, 3(1): 1-15. [CrossRef]

Al Ebrahemi, R. 2023. Molecular and morphological investigation of ticks in cattle in some regions of Al Najaf Al Ashraf Province. Ph. D thesis, Department of Biology, Faculty of Education for Girls, University of Kufa, Iraq, 150pp.

Byaruhanga, C., Akure, P. C., Lubembe, D. M., Sibeko-Matijila, K., Troskie, M., Oosthuizen, M. C., Stoltsz, H. 2021. Molecular detection and characterisation of protozoan and rickettsial pathogens in ticks from cattle in the pastoral area of Karamoja Uganda. *Ticks Tick Borne Disease*, 12(4):101709. [CrossRef]

Dulacha, J., Jiso, R. and Defar, G. 2023. The prevalence of major cattle diseases and the risk factors associated with them in Dhas District, Borana Zone and Southern Ethiopia. *Journal of Animal Sciences Live stook Production*, 7(2): 1-8. [CrossRef]

Ergönül, O., Keske, S., Çeldir, M., Kara, I., Pshenichnaya, N., Abuova, G. 2018. Systematic review and meta-analysis of postexposure prophylaxis for Crimean-Congo hemorrhagic fever virus among healthcare workers. *Emerging Infectious Diseases*, 24 (9): 1642-1648. [CrossRef]

Fourie, L., Horak, G. and Marais, L. 1988. An undescribed *Rhipicephalus* species associated with field paralysis of Angora goats. *Journal of the South African Veterinary Association*, 59 (1): 47 -49. [Click here]

GBIF Secretariat. 2023. GBIF Backbone Taxonomy. Checklist dataset. Accessed via GBIF.org on 2024-5-09. [CrossRef]

Gothe, R., Kunze, K. and Hoogstraal, H. 1979. The mechanisms of pathogenicity in the tick paralyses. Review Article. *Journal of Medical Entomology*, 16: 357-369. [CrossRef]

Gregson, J. D. 1973. Tick paralysis. An appraisal of natural and experimental data. Canadian Department of Agriculture Monograph, 9, 109 pp.

Hadi, A. and Al- Amery, A. 2012. Isolation of *Theileria* and *Babesia* from gut and ovary of hard ticks: *Hyalomma a. anatolicum* in Baghdad. *Diyala Agricultural Sciences Journal*, 4(2): 1-8.

Makawi, Z. and Hadi, A. 2023. Identification of hard ticks from buffalo *Bubalus Bubalis* (Linnaeus, 1758) in Iraq. *Bulletin of Iraq Natural History Museum*, 17(3): 423-434. [CrossRef]

Makawi, Z., Hadi, A. and Khalaf, H. 2023. Molecular identification and phylogenetic-tree analysis of hard ticks from long eared hedgehog *Hemiechinus auritus* (Gmelin, 1770) in Iraq. *Iraqi Journal of Science*, 64 (8): 3822-3830. [CrossRef]

Mucheka, V., Alicia, P. and Samson, M. 2023. Prevalence of tick-borne pathogens in *Rhipicephalus* species infesting domestic animals in Africa: A systematic review and meta-analysis. *Acta Tropica*, 246 (2023) 106994: 1-11. [CrossRef]

Obara, I., Githaka, N., Nijhof, A., Krücken, J., Nanteza, A., Odongo, D., Lubembe, D., Atimnedi, P., Mijele, D., Njeri, A., Mwaura, S., Owido, G., Ahmed, J., Clausen, P. and Bishop, R. 2020. The *Rhipicephalus appendiculatus* tick vector of *Theileria parva* is absent from cape buffalo (*Syncerus caffer*) populations and associated ecosystems in northern Uganda. *Parasitology Research*, 119: 2363-2367. [CrossRef]

Soulsby, E. J. L. 1982. Helminths, arthropods and protozoa of domesticated animals, Seventh edition. Bailliere Tindall, London, UK, 809pp.

Tahmaz, Z. 2021. Investigation of ectoparasites infecting balk sheep in some regions in Erbil Governorate and study of some biochemical variables on animals infected with ticks and mites. M. Sc. thesis in Biology, College of Education for Women, University of Tikrit, Iraq, 75pp.

Tamirat, K. 2022. Geographical distribution of ixodid ticks and tick‑borne pathogens of domestic animals in Ethiopia: a systematic review. *Parasites and Vectors*, 15(108):1-26. [CrossRef]

Theiler, G. and Robinson, B. N. 1953. Ticks in the South African Zoological survey collection. Part VII. Six lesser known African *Rhipicephalids*. *Onderstepoort Journal of Veterinary Research*, 26 (1-2):93-136. [Click here]

Walker, A. R., Bouattour, A., Camicas, J. -L., Estrada-Peña, A., Horak, I. G., Latif, A. A. Pegram, R. G. and Preston, P. M. 2014. Ticks of domestic animals in Africa: a guide to identification of species. The University of Edinburgh, Published by Bioscience Reports, Edinburgh Scotland, U. K., 227pp.

Walker, Jane B. 1956. *Rhipicephalus pravus* Donitz in 1910. *Parasitology*, 46 (3-4): 243-260. [CrossRef]

Zumpt, F. 1942. *Rhipicephalus appendiculatus* Neum. und verwandte Arten. VI. Vorstudie zu einer Revision der Gattung *Rhipicephalus*. *Zeitschrift fur Parasitenkunde Springer*, 12: 538-551. [CrossRef]

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اعادة وصف للقراد *Rhipicephalus pravus* Donitz, 1910 (Ixodida, Ixodidae) على الأغنام في العراق

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الخلاصة

هدف البحث الحالي إلى إعادة الوصف المظهري لنوع القراد الصلب *Rhipicephalus pravus* Dönitz, 1910 (Ixodida, Ixodidae)، الذي تم تسجيله مؤخراً في محافظة بغداد، وسط العراق. فُحِصَ 130 خروفاً من أسواق الحيوانات المحلية في محافظة بغداد، خلال المدة من أيار 2022 إلى تشرين الثاني 2023؛ اذ فُحصَت هذه الأغنام للتأكد من وجود القراد الصلب. كشفت الدراسة الحالية عن إصابة خمسة أغنام بالقراد الصلب نوع *R. pravus* في محافظة بغداد. حُفظَت العينات في مركز بحوث ومتحف التاريخ الطبيعي العراقي- جامعة بغداد بالرقم المتحفي: INHM, 2023: Hard Ticks, No.1.1. جرت مراجعة نواقل الامراض الذي يحمله القراد الصلب، حيث ارتبط هذا النوع من القراد بعدة مسببات مرضية، لذلك نعتبره من الأنواع المهمة التي تؤثر على الصحة العامة والثروة الحيوانية أيضًا. وقد وُصِفَ النوع المذكور مظهريا و تم تصويره ورسمه لتسهيل تشخيصه من قبل الباحثين.