

Detection of Ticks Species from Calves Infested with Theileria spp in Tikrit City

Rafal Ali Hamad,

Dr.Omaima Ibrahim Mahmoud ,

Dr.Maher Saber

Department of Microbiology, Collage of Veterinary Medicine,

University of Tikrit, Iraq

rafal-ali@tu.edu.iq

Abstract

The current study was conducted to Recognize species of tick from infested calves in Tikrit city, Iraq . Ticks collected from 50 infested skin of calves suffering from clinical signs of Theileria . which was represented by Enlargement surface lymph nodes, High temperature to 40 C°, losse of appetite , Hard breathing , Cronal opacity , Bloody diarrhea , Weakness , presence of ticks on udder and tail and hind legs .they are preserved with 70% Alcohol in plastic boxes and diagnosed by with the help of professionals working in Natural History Museum/Baghdad University. depending on their morphological feature ticks were detected relying on genital aperture , mouth part . the presence of Coxa II, Coxa III, Coxa IV, accessory shield, anus, adanal shields, anal groove, and sub-anal shields. The ticks were preferentially attached to the posterior part of the udder quarters and thighs it has been concluded that The results showed that the collected ticks Belong to Hyalomma genus and included the species: H.scupense ,H.marginatum ,H.anatolicum

Keywords: Hyalomma spp , Diagnosis ,Calves , Tikrit Iraq.

Introduction

Ticks are considered one of the most important vectors of transmitted diseases in Human and Animal [1]

The tick comes first before the Mosquito which occupies the first place in terms of human health along with

malaria because it is responsible for the transmission of many infectious agents such as Rikrtsia (Anaplsma)

virusis (Tick-bornencephalitis) and even protozoa (Theileria ,babesia) [2] .

Ticks are classified as an Ectoparasite of invertebrates belonging the phylum Arthropoda And its sub family

Chelicerata . ticks are considered a host , and it spends a period of its life on the animals body and feeds on its

blood inside the tick, when infected individuals parasitize on a healthy animal the parasite *Theileria* is transferred to the blood of the animal and after the incubation period of 1-3 weeks inside the body of animals acute symptoms of the disease begin to appear [3]. *Theileria* species infecting livestock and small ruminants are transmitted by ixodida ticks of the Genera *Haemaphysalis*, *Hyalomma*, *Amblyomma*, *Rhipicephalus* transmission sporozites stage to animal by the saliva [4]. *Hyalomma* ticks belongs to family ixodidae, this relatively small genus include approximately 30 major species and many subspecies. They are widely distribution throughout Africa, southern Europe where this genus breed mainly in areas with a desert climate [5]. environmental condition are considered a major factor in epidemiology of infection with blood parasite caused by *Theileria* [6]. previous studies showed that temperature and relative humidity the most important environmental factors that effect on the life cycle of ticks [7].

objective of the study

Diagnosis of the type of tick that carries the parasite

2-Materials and methods ;

Sample collection

10 ticks has been collected from udder and thighs of infected calves from 2-3 months in age suffering from clinical signs of *Theileria* which was represented by Enlargement surface lymph nodes, High temperature to 40 C°, losse of appetite, Hard breathing, Cronal opacity, Bloody diarrhea, Weakness, presence of ticks on udder and tail and hind legs and where the blood of these animals examined. Ticks were collected from September to December 2021 and from different areas of Tikrit city. The sampling procedures followed aseptic criteria by using sterile forceps and sterile containers. then the samples of tiks were transported to the Museum of Natural History / Baghdad University, Iraq to be examined and diagnosed.

Morphological Identification

The ticks were morphologically identified using a light microscope magnification power 4 X [13]. Briefly, ticks were detected relying on genital aperture, mouth parts. The presence of Coxa I, Coxa II, and Coxa III in the ventral part of the ticks was also used to perform the process. There is the dorsal surface that has the festoons. In males, characteristics of ventral surface of *Hyalomma anatolicum* are represented by the

presence of Coxa II, Coxa III, Coxa IV, accessory shield, anus, adanal shields, anal groove, and sub-anal shields.

3-Results ;

The samples of ticks were transported to the Museum of Natural History / Baghdad University, Iraq to be examined and diagnosed. The results showed that the isolated Ticks in the current study were included three species: *H.scupense*, *H.marginatum*, *H.anatolicum*, as shown in figures (1-3)



Figure 1 *Hyalomma .scupense*

Ventral and dorsal side of the tick



Figure 2 *H.anatolicum*

Ventral and dorsal side of tick



Figure 3 *H.marginatum*

Ventral and dorsal side of tick

4-Discussion ;

The results of the current study showed that the ticks collected were from genus *Hyalomma* Which is

considered the effective carrier to tropical bovine theileriosis caused by *Theileria* spp [8] This relatively small

genus includes at least 30 species contain a hard scutum shield covers the rostral dorsal body , each type

of *Hyalomma* differ slightly in shape . as a group is brown in color , the mouth parts known as palpi are

long and contain curved ends (festoons) on the caudal part of the abdomen [9] . The cuticle is covered with a

waxy layer that helps prevent dehydration in hot ,dry environments , it also possess 2 eyes , one on each side

of the scutum , and have longitudinal anal groove posterior to differentiate them from ixodes ticks , [10] This

genus of ticks is found in Asia ,Europe ,North Africa [11] The result of our study agreement with study in

samarra city obtained by [12] diagnosis of genus *Hyalomma* spp . and also agreed with results of [13]

when they found the members of genus *Hyalomma* in Basra city . and in Thi-Qar by [14] the study show hard

ticks and infection with *Theileria annulata* ,genus *Hyalomma* who recorded 5 different species of

H.anatolicum ,*H.marginatum* , *H.turanicum* ,*H.excavatum* ,*Rhipicephalus turanicus*.

Another study in Thi-Qar

conducted the infection with *Theileria annulata* in samples of cattle by [15] and in Mosul city by [16]

Identified in three genus of ticks including *Hyalomma spp.*, *Rhipicephalus spp.*, *Boophilus spp* And the study in southern and Central of Iraq by [17] who recorded *H.anatolicum*. in Kurdistan region ,by [18] diagnosis genus *Hyalomma spp.* In Cattle infected by *Theileria annulata* .

5-Conclusion

Based on the results of the research , The *Hylomma spp* is wide spread in Iraq especially in Tikrit Governorate ,and is the cause of transmission of many pathogens , including *Theileria* .

References

1. Dantas-Torres F, Chomel BB, Otranto D. (2012) Ticks and tick-borne diseases: a one health perspective. *Trends Parasitol* 2012;28:437–46, <http://dx.doi.org/10.1016/j.pt.07.003>
2. Estrada-Peña A, Bouattour A, Camicas JL, Walker AR(2004) Ticks of domestic animals in the Mediterranean Region: a guide to identification of species. Zaragoza: University of Zaragoza;. p. 131
3. Dr. P. Dorny, Dr. M. Madder, Prof. Dr. T. Backeljau , (2008). *Rhipicephalus appendiculatus/zambeziensis* complex from southern and eastern Zambia: genetic and phenotypic diversity related to the associated variation of the epidemiology of bovine theileriosis, Vakgroep Virologie, Parasitologie en Immunologie Faculteit Diergeneeskunde, Universiteit Gent Salisburylaan 133, B-9820 Merelbeke
4. Demessie, Y. and Derso, S. (2015). Tick Borne Hemoparasitic Diseases of Ruminants: A Review. *Adv.Bio. Res.*, 9(4): 210-224.
5. Shubber HWK. 2014 Taxonomic, anatomic, and molecular study of ixodid ticks parasitizing some mammals and birds in the middle and south of Iraq. Ph.D. thesis, College of Education, Al-Qadisiya University, Iraq.
6. Muhanguzi, D.; Matovu, E. and Waiswa, C. (2010). Prevalence and Characterization of *Theileria* and *Babesia* Species in Cattle under Different Husbandry Systems in Western Uganda. *IJAVA* ,2(2):50-60
7. Dantas-Torres, F. (2015). Climate change, biodiversity, ticks and tick- borne diseases: the butterfly effect., *IJPPW*, 4(3): 452-461
8. Telmadarraiy, Z., Moradi, A.R., Vatandoost, H., Mostafavi, E., Oshaghi, M.A ., Zahirnia, A.H., Haeri, A. & Chinikar, S. (2008) Crimean-Congo hemorrhagic fever :a seroepidemiological and molecular survey in Bahar, Hamadan province of Iran. *Asian Journal of Animal and Veterinary Advances*, 3(5): 321–327
9. Ruedisueli FL, Manship B. (2011) Tick identification key .University of Lincoln Web site. <http://webpages.lincoln.ac.uk/fruedisueli/FR->

- webpages/parasitology/Ticks/TT/tick-key/hyalomma_adult.htm. Accessed March 19,
10. Vredevoe L. (2011) .Background information on the biology of ticks. University of California, Davis Web site. [http : /entomology.ucdavis.edu/faculty/rbkimsey/tickbio.html](http://entomology.ucdavis.edu/faculty/rbkimsey/tickbio.html). Accessed March 19,
 11. Estrada-Peña A, Pfäffle M, Baneth G, Kleinerman G, Petney TN. (.2017) Ixodoidea of the Western Palaearctic: A review of available literature for identification of species. Ticks Tick Borne Dis.;8(4):512- 525. doi:10.1016/j.ttbdis.02.013
 12. Mustafa, H. A., Hameed, H. N., & Khalaf, T. M. (2019). Prevalence of Ticks and Lice parasites on a certain number of buffaloes in the district of Samarra/Iraq. Indian Journal of Forensic Medicine & Toxicology, 13(4)
 13. Al-Mayah, S. H., & Hatem, A. N. (2018). Species diversity, prevalences and some ecological aspects of Ectoparasites of buffalo *Bubalus bubalis* in Basrah Province, Iraq. Journal of entomology and zoology studies ,VI , 390,394
 14. [14]Khorshid Hussain, N. (2021). Phenotypic and Molecular Characterization of Some Species of Hard Ticks(Acarina: Ixodidae) Isolated from livestock in Thiqr province. MSc. College Education of Pure Science. Thi-Qar University. 151 p
 15. Abdullah, O.Y. (2021). Diagnostic and physiological study in cattle with Theileriosis infection Thi-Qar Governorate. MSc. College Education of Pure Science. Thi-Qar University.106 p.
 16. Al-Moula EDH, Rahemo ZIF (2004). Taxonomic study on the species of ticks parasitizing some mammals in Nineva Governorate. Al-Rafidain Sci. J. 15(4): 20-25.
 17. Al-Fatlawi, M.A. & Al-Bayati, H. 2019. Phenotypic and phylogenetic study *Hyalomma anatolicum* in Najaf, Iraq. The Iraqi Journal of Veterinary Sciences 32(2): 261-266
 18. Al-Saeed, A. T. M., Omer, L. T., Abdo, J., Habibi, G., Salih, D. A., Seitzer, U., & Ahmed, J. (2010). Epidemiological studies on tropical theileriosis (*Theileria annulata* infection of cattle) in Kurdistan Region, Iraq. Parasitology research, 106(2), 403

الخلاصة

اجريت الدراسة الحالية للتعرف على انواع القراد من العجول المصابة من مدينة تكريت في العراق حيث تم جمع القراد من جلد 50 عجل تظهر عليهم الاعراض السريرية للتليريا والتي تمثلت بتضخم الغدد اللمفاوية السطحية وارتفاع درجة الحرارة الى 40 درجة مئوية وفقدان الشهية وصعوبة التنفس وعتامة العين والاسهال الدموي والضعف العام ووجود القراد على الضرع والذيل والاطراف الخلفية ويتم حفظ القراد

في علب بلاستيكية وكحول بنسبة 70 % حيث تم تشخيص القراد بمساعدة متخصصين يعملون في متحف التاريخ الطبيعى /جامعة بغداد

اوضحت النتائج ان Hyalomma وشمل الانواع H.scupense ,H.marginatum ,H.anatolicum القراد المعزول ينتمي الى جنس

اعتمادا على الخصائص الشكلية كذلك تم الكشف عن القراد بالاعتماد على فتحة الاعضاء التناسلية واجزاء الفم ووجود الاعضاء الحسية

وفتحة الشرج وصفائح ادنال واخدود شرجي ويوجد هذا القراد مرتبط بالجزء الخلفي من اربع الضرع والفخذ Coxa II, Coxa III, Coxa IV