العدد 19 تشرين الثاني 2025
No.19 – Nov 2025
المجلة العراقية للبحوث الانسانية والاجتماعية والعلمية
Iraqi Journal of Humanitarian, Social and Scientific Research
Print ISSN 2710-0952 Electronic ISSN2790-1254

Spread of tick infestations on Cows in Dhuluiyah district, Iraq

Nabaa Othman Obaid Al-Hashmawi, and Ashraf Jamal Mahmoud Zangana*

Department of Biology, College of Education For women , Tikrit University, Iraq

dr.ashraf_bio@tu.edu.iq**

Abstract: The study collected 268 tick samples from cattle in various areas of Yathrib district of Salah al-Din Governorate, Iraq, from September 2024 to February 2025. The samples were classified according to the taxonomic standards of the Natural History Museum in Baghdad, revealing the prevalence of species in Hyalomma, H. anatolicum, H. excavatum, H. truncatum, and female Rhipicephalus sp. The impact of environmental factors such as geographic location and seasons on tick prevalence was also evaluated. The results showed that the highest rates of tick infestation were recorded in October 2025, at 25.77%, and the lowest rate in February, at 7.22%. The highest rates of infestation were recorded in the Latwa and Aziz districts, at 13.33%, and the lowest rates were recorded in the city center, at 5%.

Keywords: Prevalence, Ticks, Iraq.

الإصابة بالقراد في الأبقار في قضاء الضلوعية، العراق

نبأ عثمان عبيد الهاشمي، وأشرف جمال محمود زنكنة*
قسم علوم الحياة، كلية التربية للبنات، جامعة تكريت، العراق
dr.ashraf_bio@tu.edu.iq

الملخص:
تم في هذه الدراسة جمع (268) عينة من القراد من الأبقار في مناطق مختلفة من قضاء يثرب التابع لمحافظة صلاح الدين في العراق، خلال المدة من أيلول (سبتمبر) 2024 إلى شباط (فبراير) 2025. جرى تصنيف العينات وفق المعايير التصنيفية المعتمدة في متحف التاريخ الطبيعي في بغداد، وأظهرت النتائج انتشار أنواع تابعة لجنس Hyalomma، شملت H. anatolicum، H. excavatum، H. truncatum، بالإضافة إلى إناث من نوع

Rhipicephalus sp.كما تم تقييم تأثير العوامل البيئية مثل الموقع الجغرافي والفصول على نسبة انتشار القراد. أظهرت النتائج أن أعلى معدلات الإصابة بالقراد سُجلت في شهر تشرين الأول (أكتوبر) 2025 بنسبة (25.77%)، في حين سُجل أدناها في شهر شباط (فبراير) بنسبة (7.22%). وكانت أعلى نسب الإصابة في منطقتي اللطوة والعزيز (13.33%)، بينما كانت أقل النسب في مركز المدينة (.5%)

الكلمات المفتاحية :الانتشار، القراد، العراق.

Introduction

Ticks are small to medium-sized, blood-feeding external parasites. They belong to the phylum Arthropoda and the class Arachnida, and are classified within the order Ixodida, which includes three main families: the hard tick family (Ixodidae), the soft tick family (Argasidae), and a rare family called Nuttalliellidae, found in Africa. Ticks transmit numerous pathogens to vertebrates, including viruses, bacteria, protozoa, and helminths. Ticks are vectors of numerous diseases in humans and animals, directly impacting animal health and the veterinary economy, as they transmit numerous protozoan parasites that lead to deteriorating animal health and reduced productivity (1). There are at least 898 species of ticks, classified into three main families: Argasidae, Ixodidae, and Nuttalliellidae. Hard ticks constitute approximately 80% of these species, while the remaining species, with the exception of one Nuttalliellidae species, belong to the soft tick family Argasidae. Both hard and soft ticks have a nidicolous lifestyle, confined to the nests and caves of their vertebrate hosts, occupying very limited habitats. In contrast, non-nidicolous ticks are free-moving, actively seeking hosts (2).

"Nidicolous" behavior is primarily seen in the Argasidae family, which is susceptible to desiccation and requires a stable and precise climatic environment, such as caves, nests, and homes (3).

Many important factors, such as environmental conditions such as temperature and humidity, influence the reproduction and spread of

hard ticks. Most species are found in tropical and subtropical regions around the world (4), while others are found in temperate or cold climates (5). The study aimed to investigate the incidence of external parasites (tick) in cattle, identify their species, and determine the extent to which various factors (such as sex, months of the year, and geographic location) affect the incidence and prevalence.

Materials and Methods:

Sample Collection Area

268 samples were collected from 60 cows. The collection process took place in various areas of the Yathrib district (Al-Ajiliyyah, Al-Jam'iyah, Al-Faris, Al-Gharir, Al-Buhasan, Al-Aliya, Al-Gharbiyah, Al-Zour, Al-Lattah, and Al-Fayadh) in Salah al-Din Governorate, during the period from September 2024 to March 2025. The samples were placed in sterile plastic bottles containing 70% ethyl alcohol with tight caps, and the samples were examined within 24 hours.

Tick Classification

The tick samples collected in the current study were scientifically classified. The sample classification process was conducted at the Natural History Museum/University of Baghdad.

Results and Discussion

The tick samples collected in the current study were scientifically classified, and the classification was confirmed by experts at the Natural History Museum at University of Baghdad. It was found that the classified species belong to H. anatolicum , H. exacvatum , Rhipicephalus sp. ,(Females) H. truncatum

The results of the current study are consistent with (6) regarding the prevalence of Hyalomma anatolicum and H. anatolicum excavatum. However, this study differs from him by recording the presence of

Rhipicephalus bursa and R. turanicus, which had not been previously observed in Basra Governorate.

These results are also consistent with (7), who found that Hyalomma species were more prevalent than Rhipicephalus species in 12 Iraqi governorates, including Babylon, Kirkuk, Diyala, Erbil, Baghdad, Wasit, Maysan, Najaf, Karbala, Muthanna, Dhi Qar, and Basra. The study is also consistent with the findings of (8), who confirmed that the dominant species within Hyalomma in goats examined in Basra Governorate was H. anatolicum.

In a comprehensive review conducted by AbdulKarim et al. (2023)(8) of research conducted across various regions of Iraq, it was found Hyalomma is the most widespread compared to other tick genera. It was found in most areas of the country with high infection rates and wide diversity, indicating its ability to adapt to different environmental conditions.

The results of this study are also consistent with the findings of Al-Zubaidi et al. (2012) and (6) regarding the dominance of Hyalomma species over other recorded genera in Iraq.

The prevalence and spread of these species are attributed to the suitability of environmental and climatic conditions to their needs, as well as their high adaptability, which explains their prevalence in the Middle East and Africa, in addition to their greater diversity compared to other genera. The variation in the prevalence and prevalence of these species is linked to differences in environmental conditions and multiple hosts, as demonstrated by Abdulkarim and Hatem (2023)(8, 9).

The infestation was distributed across different areas of the infected animal's body, such as the neck, udder, abdomen, extremities, and sensitive areas (genitals) (Table 1).

Table (1) Distribution rate of infection depending on the site of infection and the sex of the animal

Location of injury	Samples No.	Percentage %
Neck	51	%10.5
Udder	169	%34.9
Abdomen	74	%15.3
Extremities	81	%16.7
Sensitive areas	110	%22.7
Total	485	%100

Hatem and Abdulkarim (2023)(8, 9) indicated that tick infestations were distributed across different areas of the animal's body, with larval stages being concentrated mainly in the ears and extremities, while adult stages were distributed from the head to the lower body. These results are consistent with the findings of the current study, as adult ticks were isolated from multiple areas of the infected animal's body. However, the results of this study differ from those reported by Hasson (2016)(6), who indicated that the highest rate of tick infestation was in the ears, followed by the undertail, then the extremities, and finally the lower body.

On the other hand, another study showed that the distribution of tick infestations in cattle in Mosul varies depending on the tick species. The study showed that Rhipicephalus prefers to be found in the ears, back, and armpits, while the distribution of Hyalomma varies according to its species; Hyalomma anatolicum anatolicum showed a preference for the tail and back regions. In the current study, the results showed that the highest rate of tick presence was in the udder region, followed by the extremities, then the sensitive areas. This is attributed to the fact that these areas are rich in blood vessels and their higher temperatures compared to the rest of the body, providing a suitable thermal

environment for tick reproduction and presence, especially during the winter (Mahmoud and Al-Mola 2021). The results of the current study showed no significant differences in tick infestation rates according to the geographical location of the tested animals (Table 2). All samples were collected from Yathrib district of Salah al-Din Governorate, an area characterized by homogeneity of environmental and living conditions. The highest infection rates were recorded during the period from September to February, while no samples were obtained in other months of the year. These results contradict (9) in his study on tick prevalence in cattle in Basra Governorate, where he indicated that the highest infection rates appeared in April, attributing this to the influence of climatic factors such as temperature, solar radiation, dust, and humidity in determining tick abundance. The results of Barwar (2011) also showed that tick appearance typically begins in March, with a gradual increase in numbers during the following months and gradually disappearing in September, emphasizing the crucial role of climatic factors, especially temperature and humidity, in determining the seasonality and spread of parasites. The results of the current study are consistent with those of (10), who indicated that the highest rates of tick infestation were recorded during the period from September to February. He explained that this is related to the type of tick isolated in his study, which belongs to Rhipicephalus spp., as temperature plays a pivotal role in regulating the metabolic processes of this genus, affecting the efficiency of bloodsucking and the length of physiological periods such as pre- and post-ovulation. It is worth noting that average temperatures in Iraq, including Diyala Governorate, have increased by approximately 3°C since the beginning of the twenty-first century compared to previous periods (11). These results are also consistent with what (12) indicated regarding Rhipicephalus spp. and Hyalomma spp., showing that the highest tick counts were recorded during the period from September to February, reflecting the preference of these parasites for hot, dry climatic conditions, although they can be present

in varying numbers throughout most months of the year, as is the case in Basra Governorate.

Table (2): Percentage of infection according to the collection site, collection season and age of the animal

Groups		Examined Samples No.	infecteded Samples No.	Percentage %
Sites of samples	City Center	28	20	%5
	Al-Aliya District	25	15	%6.67
	Al-Fayyadh	30	25	%8.33
	Al-Zour	80	45	%10
	Al-Gharbiya	45	35	%6.67
	Al-Lattawa	60	35	%13.33
	Al-Sharia	35	15	%6.67
	Al-Jam'iya	90	55	%10
	Al-Ajiliyyah	150	75	%5
	Al-Gharir	64	35	%13.33
	Al-Faris	185	85	%8.33
	Al-Bu Hassan	90	45	%6.67
months	September 2024	225	97	%20
	October	265	125	%25.77

	November	142	95	%19.59
	December	90	64	%13.20
	January 2025	85	49	%10.10
	February	75	35	%7.22
age	Younger than 1 year	197	85	%16.67
	From 1 to 5 years	440	220	%58.33
	Over 5 years	245	180	%25
	Cow	882	485	

These results are consistent with those reported by Manan et al.(13), who demonstrated that infection rates are higher in young animals. They attributed this to several factors, including thinner and more sensitive skin, as well as the secretion of skin odors that may be more attractive to ticks. The results of the current study do not agree with those found by Karkar et al. (2017)(14), who demonstrated that tick infection rates are higher in older animals. They attributed this to the fact that this age group moves within wider ranges during grazing, increasing their chances of exposure to infection compared to young animals that typically stay close to their habitats. They also indicated that young animals' consumption of milk from their mothers may provide them with antibodies that contribute to strengthening their immunity and resistance to infection.

References

1. Capinera J. Handbook of vegetable pests: Academic press; 2020.

2. Sharifah N, Heo CC, Ehlers J, Houssaini J, Tappe D. Ticks and tick-borne pathogens in animals and humans in the island nations of Southeast Asia: A review. Acta tropica. 2020;209:105527.
3. Gray J, Dautel H, Estrada-Peña A, Kahl O, Lindgren E. Effects of climate change on ticks and tick-borne diseases in Europe. Interdisciplinary perspectives on infectious diseases. 2009;2009(1):593232.
4. Khan BA, Imran M, Yousaf S. Biology and ecology of ticks of medical and veterinary importance. Veterinary Pathobiology & Public health. 2021:36.
5. Fedonyuk LY, Pryvrotska I, Podobivskyi S, Rujytska OY, Stravskyy YS, Zhyhalyuk S. Ticks of genus Ixodidae: bioecological mechanisms of adaptation to environmental conditions, medical and epidemiological significance. Ukrainian Journal of Ecology. 2020;10(6):236-42.
6. Hasson R. Ectoparasites of farm animals in Diyala province, Iraq. Al-Anbar J Vet Sci. 2016;9(2):9-18.
7. Shanan SM, Abbas SF, Mohammad MK. Ixodid ticks diversity and seasonal dynamic on cattle in North, Middle and South of Iraq. Systematic and Applied Acarology. 2017;22(10):1651-8.
8. AbdulKarim AT, Hatem AN, Al-Mayah SH. A retrospective study of tick fauna of Iraq–checklist. Scientific Reports in Life Sciences. 2023;4(2):35-44.
9. Hatem AN. Prevalence and ecology of the brown dog tick Rhipicephalus sanguineus in domestic mammals in Basrah province, Iraq, with the acaricidal effect of Quercus brantti acorns extract in adults. Iraqi Journal of Agricultural Sciences. 2020;51(6):1670-7.
10. Hasson RH. Tick distribution and infestation among sheep and cattle in Baghdad's south suburb. Kufa Journal For Veterinary Medical Sciences. 2012;3(1):77-90.
11. Naqi NM, Al-Jiboori MH, Al-Madhhachi A-ST. Statistical analysis of extreme weather events in the Diyala River basin, Iraq. Journal of Water and Climate Change. 2021;12(8):3770-85.

12. AL-Mayah SH, Abdul-Karim AT. Epidemiology and seasonal variation of ixodid ticks and Piroplasmida detection in cattle of Basrah province, Iraq. Indian Journal of Forensic Medicine & Toxicology. 2020;14(3):1391-8.
13. Manan A, Khan Z, Ahmad B. Prevalence and identification of ixodid tick genera in frontier region Peshawar. Journal of Agricultural and Biological Science. 2007;2(1):21-5.
14. Kakar M, Khan M, Khan M, Ashraf K, Kakar M, Jan S, et al. Prevalence of tick infestation in different breeds of cattle in Balochistan. JAPS: Journal of Animal & Plant Sciences. 2017;27(3).