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ORIGINAL ARTICLE

A Survey for Some Kinds of Livestock's Ticks in Dhi-Qar and AL-Muthanna Governorates/Iraq

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ABSTRACT

In this study, a survey was conducted to determine the types and the prevalence of ticks parasitizing livestock in south of Iraq, namely Dhi-Qar and AL-Muthanna governorates. The study continued for five months, from the beginning of October 2021 until the end of February 2022. During this period, samples were collected from sheep, cows, buffaloes and camels from different regions within the tow mentioned governorates.

The results recorded the presence of six species of ticks infecting livestock, all of which belongs to the genus Hyalomma, where the type H.anatolicum had the highest infection prevalence, which was (32.87%). While the rest species recorded as the follows H.marginatum (20.17%), H.excavatum (18.99%), H.dromedarii (18.89%), H.scupense (8.00%), and H.truncatum (1.06%) as the latter recorded the lowest prevalence among the diagnosed species.

The total infection rate was 59.65% (346 out of 580), and according to the governorate, The highest infection prevalence was in Dhi-Qar, which recorded about (61.75%), while AL-Muthanna recorded (57.08%), for animal type, the highest rate recorded in camels (77.14%), while buffalos recorded the lowest rate (47.85%), of the five months, October recorded the highest infection prevalence that was (77.5%), while January recorded the lowest infection prevalence that was (32.2%).

Keywords: Livestoks Ticks, Dhi-Qar, AL-Muthanna

INTRODUCTION

Ticks are a blood-sucking arthropods that have a great impact on both medical and veterinary fields all over the world. After mosquito, ticks occupies the second line vectors of pathogenic microorganisms (1). It is found in all over the world and affected by climatic changes (2). Ticks are obligate parasites that feed on blood of vertebrates (3). The researcher in the source (4) mentioned that, ticks are external parasites feeding on blood, ticks play an important role in human and veterinary medicine, as they transmit a wide variety of pathogenic bacteria, viruses, protozoa, and intestinal worms (5). And those diseases that transmitted by ticks are always increasing around the world (6)

In addition to its health damages, there are a lot of economic losses caused by ticks, that is happen either by transmitting pathogens, like bacteria, fungi, viruses or other parasites and causing diseases, or through physical effects, as they causes a great damages to animal's skin, the economic losses resulting from that including, decrease in milk production, decrease the animal's weight and bad quality of leather (7), so these parasites have a great threat to human and animal health (8).

The importance of livestock has been noted to improve the economy of different countries, especially in human food as an essential nutritional resource (9), and because diseases that transmitted by ticks spread in nearly 80% of livestock, so the parasitic ticks are the most important problems that hindering the recovery of this effective economic resource.

MATERIALS AND METHODS

A survey was performed in order to investigate the types of ticks and their prevalence in the mentioned study area, which included each of the tow governorates Dhi-Qar and AL-Muthanna during the period from the beginning of October 2021 to the end of February 2022.

The area of the study was divided in to two main sectors, the first one is Dhi-Qar which is located on (350 km) south of Baghdad, including its five main districts with their sub-districts. The second region is Al-Muthanna governorate, also located south of Baghdad approximately (270 km) away, including most of the governorate's regions. Visits were performed periodically to these regions in order to search for ticks infections in their livestock.

During the study, 580 livestock were examined, including (157 cows. 143 Sheep, 140 buffaloes, and 140 camels). Ticks were collected from infected animals and from different parts including (head, back, the udder, under the tail, the abdomen, the genitals, and between legs).

Samples were collected manually according to the following method (10), a piece of medical cotton moistened with alcohol were used to facilitate the pulling of ticks from animal's skin. The ticks then placed in a sterile plastic tubes containing (70%) ethyl alcohol. Samples information was written down on these tubes such as: the collection place, The date, and type of host from which the sample was taken.

Then, samples were transferred to the lab and examined by Stereoscopic microscope, the genus and the species of each tick were determined based on many different morphological characteristics such as, (scutum, mouth parts, festoones, legs Color, presence & absence of anal groove, capitulum, presence & absence of eyes, & the shape and length of first iliac) all of these characteristics were mentioned in taxonomic keys of ticks that developed by (11) and (12), in addition to the taxonomic keys developed by (13), (14), and (15). The diagnosis was confirmed with specimens kept in Iraq Natural History Museum/Baghdad University.

RESULTS

During the study six species of ticks were isolated from included livestock, and all isolated ticks belongs to the genus Hyalomma. Where the species H.anatolicum infects cows, sheep, buffalos and camels, H.excavatum infects cows, sheep and camels, H.marginatum infects sheep, cows, camels and buffalos, H.scupense infects cows, buffalos and camels, H.truncatum infects sheep and camels, finally the species H.dromedarii affects cows, buffalos and camels. Plate (1).

The total infection rate was about 59.65%. Where camels recorded the highest infection rate (77.14%), followed by cows (58.59%), then sheep (55.24%), while the lowest infection rate recorded in buffalos (to 47.85%). Table (1).

During the current study we found that, the species H.anatolicum recorded the highest prevalence that was (32.87%), followed by H.marginatum (20.17%), then H.excavatum (18.99%), while H.dromedarii recorded (18.89%), and H.scupense recorded (8.00%), finally the species H.truncatum which is recorded the lowest prevalence (1.06%). Figure (1).

According to table (2), Dhi-Qar recorded the highest infection rate that reached (61.75%), while Al-Muthanna recorded an infection rate of (57.08%).

We also concluded that the temperature had a clear impact on livestock infections with ticks. Since through October when the temperature was between (37-22 °C), the highest infection rate were recorded (77.5%). While through January when the

temperature was (24-7 °C), the lowest infection rate were recorded, which was (32.2%). Table (3) and Figure (2).

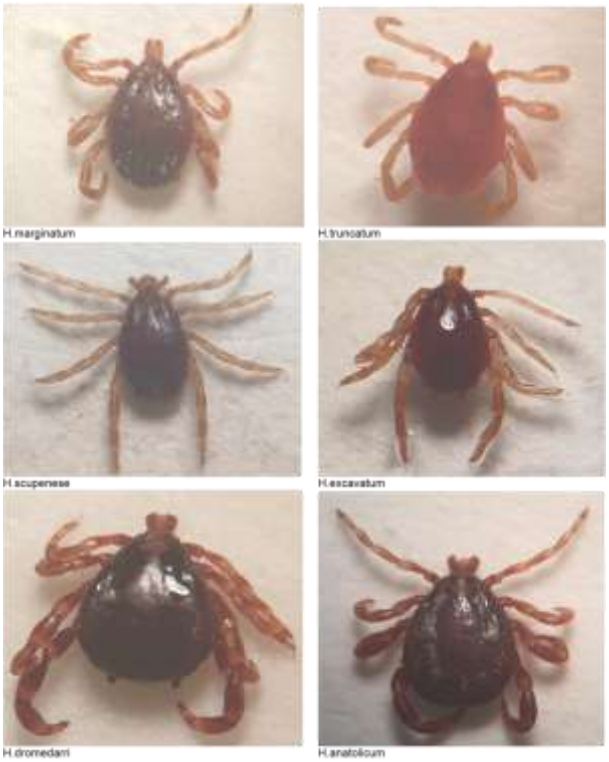

Plate 1: the species of isolated ticks

Table 1: number and types of tested animals, numbers of infected animals and infection rate

Livestock type	Number of tested animals	Number of infected animals	Infection rate %
camels	140	108	77.14
cows	157	92	58.59
sheep	143	79	55.24
buffalos	140	67	47.85
average	580	346	59.65

Table 2: the differences in infection rate according to governorate

The governorate	Number of tested animals	Number of infected animals	Infection rate %
Dhi-Qar	319	197	61.75
Al-Muthanna	261	149	57.08
average	580	346	59.65

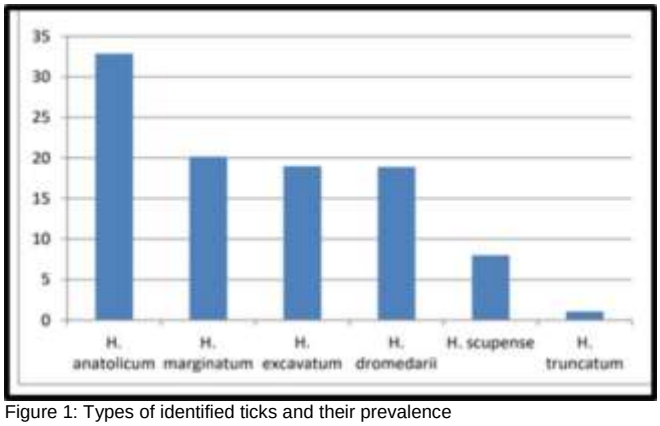

Figure 1: Types of identified ticks and their prevalence

Table 3: the differences in infection rate according to months

Months	Number of tested animals	Number of infected animals	Infection Percentage %
October	120	93	77.5
November	117	78	66.7
December	108	63	58.3
January	118	38	32.2
February	117	74	63.2
average	580	346	59.65

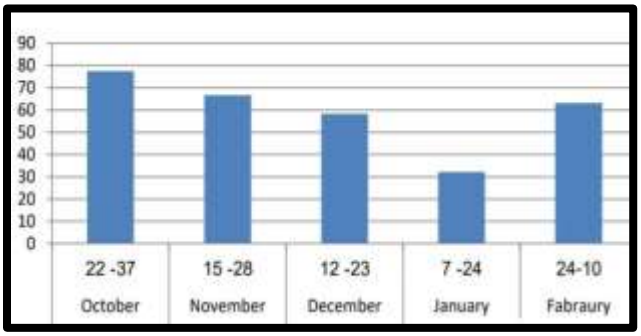

Figure 2: the relationship between temperature and infection rate over period of study

DISCUSSION

The results showed the presence of six species ticks parasitizing livestock, of Dhi-Qar and AL-Muthanna governorates. Also showed that all isolated species belongs to the same genus Hyalomma spp. The members of this genus distinguished by their hardness and the capacity to resist different circumstances, that enables them to survive in harsh environments, where also there is no enough hosts to parasitize (16) the members of this genus also have an adaptation strategies against bad climates such as hot, cold, and humid, they could parasitize a diverse of hosts, and resist some antibiotics (17), so all these reasons make it the most available genus.

The results above consistent with that has been obtained by (18), when three types of ticks were diagnosed to parasitize buffalos in Samarra city and all of which belongs to the genus Hyalomma spp. And consistent with (19) in Jordan when all examined camels was infected with the genus Hyalomma .Also agreed with results of (20) when they found that, members of the genus Hyalomma were the most dominant external parasites that affect buffalos in Basra city.

But does not agree with (21) when three genera ticks were found to affect animals in Basra, which was Hyalomma, Rhipicephalus, and Boophilus, also does not agree with (22), when two genera (Amblyomma and Boophilus) were recorded to affect sheep in middle of Iraq, as well as the results of (23) in southwestern Ethiopia, in this study a three genera of parasitic ticks were isolated from sheep, cows, and goats, which was Boophilus, Amblyomma, and Rhipicephalus, also differs from results of (24) in Lebanon when four genera of ticks affecting domestic ruminants were recorded: (Dermacentor, Haemaphysalis, Rhipicephalus, and Hyalomma).

The infection rate of our study was 59.7%. This result is corresponding to the percentage of a previous study (25) that was 58.4%, the mentioned study have been done to detect types of ticks that affect wild animals, and their relationship with Rickettsial infections in Pakistan. The infection rate of our study is less than the rate of the following studies, first: the search (26) which was done about ticks infections in domestic and wild mammals in AL-Riyadh/KSA, when the infection rate was 65.5%, second: the search (27) on buffalos and cows in west of Azerbaijan, when the infection rate was relatively high 95.2%, third: the search (23) in southwestern Ethiopia on sheep, cows, and goats, which recorded also high infection rate reached 95.2%, forth the search (28) that have been done on cows, and the infection rate was 72.9%. And

more than the rates recorded by both researches (29) and (30), which was 24.46%, 36.9% respectively, the first research have been done on goats ticks infections in Baghdad, while the last done on livestock in Erbil/Kurdistan-Iraqi. Our result also differs from the infection rate recorded by (31) in Magi/Ethiopia which was 16%.

The highest infection rate found with camels, it reached 77.1%, this is may be due to the fact that, these animals spend most of their life in remote deserts and semi-deserts regions, where there is little or no health and veterinary services. In addition to their travelling, that makes control operations more difficult. As well as lack of hygiene caring in the places where camels are located, and these opened places typically distinguished by ticks abundance.

Camels recorded 97% in a highest infection rate of the study (32), which have been done in Mecca, Jeddah, and Taif /KSA. In another previous study (26), camels recorded 85.20% that is also represent the highest infection rate, but our result is higher than what recorded by (33) in southern Algeria, when the infection rate of camels was 61.4%, also higher than the percentage recorded by (34) which was 60.96% in camels imported from Sudan to Egypt. Another previous study in UAE (35), camels recorded 98%, a percentage more than our study results.

The species H.anatolicum found to infect all kinds of animals (sheep, cows, buffalos, and camels), with a highest frequency among the diagnosed species 32.87%. It is may be due to the variety of hosts on which this species could parasitize, and these hosts extended over a large areas from North Africa to the central Sudan, Middle East, southern Europe, China, Russia, and India, so it is one of the most important economic species (36) (37).

This is agrees with the results of (38), during this study a survey in which 12 Iraqi governorates were included, as the highest prevalence recorded by the specie H.anatolicum that reached to 41.72%. It is also consistent with (22) in a study of wild animals in central Iraq, when he confirmed that H.anatolicum was the most prevalent among recorded species, and the results of (39) in Najaf, Babylon, and Diwaniyah cities as H.anatolicum recorded the most frequent species isolated from buffalos with a rate of 57.28%. But differs from the results of (31), when R.annulatus was the predominant species isolated from cows in Erbil/Iraq, with a percentage of 50%.

We observed that there is a variation in infection rates according to different months. Since October recorded the highest rate of 77.5%, when the average temperature in this month was (37-22 °C), these temperatures as well as the moderate humidity, both could provide a suitable environment for spreading of parasitic ticks among livestock, it was said that the climatic conditions including temperature, rain, and humidity have a significant impact on the ticks viability and their life cycle (40). We confirmed this in our study, through the data obtained from Meteorological Department, as being noted that changes in temperature affect the activity of ticks and their infection rate of livestock, this is also confirmed by researcher (41) as he noted that ticks infection of ruminants in Dohuk city differs according to different months of year.

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