

Research Article

Prevalence of infection with ticks and theileriosis in cattle and sheep of Shattrra District, Thi-Qar Province, Iraq

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Abstract: The present study was conducted during April to October 2018 to examine infection on the ticks (Acari: Ixodidae) in cattles and sheep in Shattrra District, Thi-Qar Province, south of Iraq. A total of 396 blood samples were collected from livestock. Two species of the hard ticks were identified as *Hyalomma anatolicum* and *H. turanicum* with earlier predominant (64.7 vs. 35.3%). Of these ticks, 116 were female and 210 were males. The monthly infections were higher in June (47.22 and 43.48%) but lower during July (16.67 and 20.00%) in cattle and sheep, respectively. The results revealed that 37.90% (n=83) and 31.07% (n=55) of the samples were positive to Theileriosis.

Keywords: Infectious animals, Theileriosis, Hard ticks. Iraq.

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Introduction

Ticks (Acari: Ixodidae) are ectoparasites of vertebrates, where they suck the blood, and transmit many diseases through the blood. Diseases transmitted by ticks in the livestock such as Theileriosis and Babesiosis cause the losses, and severely affect economy (Robinson et al. 2006). Ticks of the genera *Hyalomma*, *Rhipicephalus*, *Haemaphysalis*, and *Amblyomma* are vectors for *Theileria* (Watts et al. 2016) causing Theileriosis, a common livestock infection, infecting leukocytes and erythrocytes (Jenkins 2018). Some *Theileria* spp. infections are harmless, causing only minimal or no clinical indications, but others can induce fever, anemia, hemoglobinuria, and, in severe cases, death. In general, animals that recover from acute or primary infections are contaminated for a long time and may serve as tick vector reservoirs (Ahmed et al. 2008).

The importance of livestock and their role in achieving food security in Iraq, and the fact that the external parasites infecting agricultural animals play

an important role in reducing the productivity of different animals, this study was conducted to determine the percent of Theileriosis in livestock i.e. cattles and sheep from Shattrra district, Thi-Qar Province in the south of Iraq for 2018 years. As infection with these parasites exacerbate the economic losses of animals due to a decrease in the productivity of milk, meat and wool (Al-Hanshi 2017).

Materials and Methods

Study Areas: The current study was conducted in Thi-Qar Province, southern Iraq, and AL-Shattrra district is one of the largest districts of this province with the adoption of population on agriculture and animal husbandry (Fig. 1).

Tick collection and morphological study: A total of 326 adult hard ticks were collected from 396 cattle and sheep in their different parts of body during April to October 2018. The isolated ticks were counted and put into tubes containing 70% ethanol. Then, the tick's samples were transferred to the Entomology



Fig.1. Map of Thi-Qar Province, showing the district in the current study.

Table 1. The collected hard tick samples from Shattrra district of Thi-Qar Province.

Tick species	Male	%	Female	%	Total	%
<i>Hyalomma anatolicum</i>	145	69.0	66	56.9	211	64.7
<i>H. turanicum</i>	65	31.0	50	43.1	115	35.3
Total	210	64.4	116	35.6	326	100.0
Statistical analysis		$X^2= 4.832^a$	Df=1	Sig=0.028	$P\leq 0.05$	

and Parasitology Lab in the College of Science, University of Thi-Qar. Morphological characterization of ticks was studied using a microscope according to Hoogstraal & Tatchell (1985) and Walker et al. (2013) to their identification and then males and females were separated in each species.

Blood sampling: About 5ml of the blood samples were obtained from the 396 cattle and sheep in the EDTA-containing tubes based on clinical symptoms. The samples were collected from males and females of cattles and sheep with 1-6 year-old. From every sample a thin blood smear was prepared, dried and then fixed in methanol. At the laboratory, the smears were stained with Giemsa and were observed at 1000X for intra-erythrocytic forms of the piroplasms *Theileria*.

Statistical analysis: Statistical analysis was carried using Chi-square (X^2) means and the values at $P<0.05$ were considered as significant.

Results

During the study, a total of 326 of hard tick specimens were collected from different parts of the body of the cattle and sheep in Shattrra district of Thi Qar Province belonging to two species of o *Hyalomma anatolicum* and *H. turanicum* (Ixodidae). *Hyalomma anatolicum* has significantly higher predominant (64.7% (n=211) than *H. turanicum* (35.3% (n=115)). The male ticks were 210 (64.4%) in which that 145 (69.0%) belongs to *H.anatolicum* and 65(31.0%) to *H. turanicum* and in females 66(56.9%) and 50(43.1%) were *H. anatolicum* and *H. turanicum*, respectively (Table 1, Fig. 1). Examination of the blood smears showed that *Theileria annulata* parasite infectious phase piroplasm. Figure 2 shows the ring structure inside red blood cells of the cattles and sheep. Microscopic examination of 219 and 177 the blood smears revealed that 37.90% (n=83) and 31.07% (n=55) of the tested cattle and sheep, respectively, were

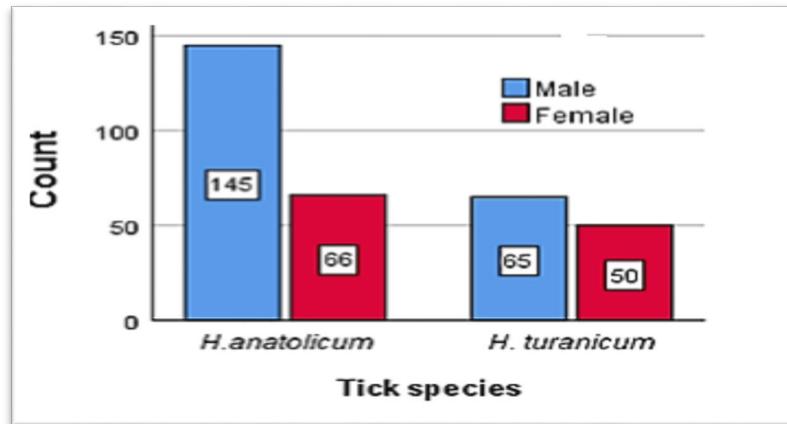


Fig.2. Numbers of *H. annulatus* and *H. turanicum* hard tick (Acari: Ixodidae) collected on Shattra district of Thi-Qar Province.

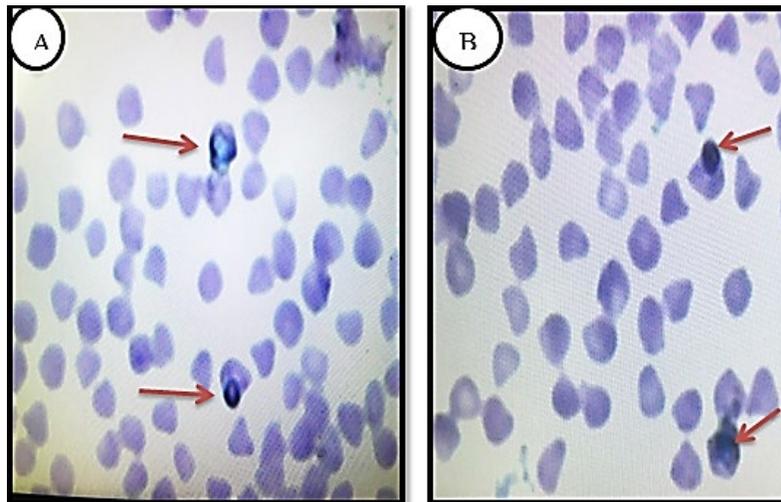


Fig.3. Erythrocytic stage of *Theileria annulata* in cattle and sheep (100X), A: Blood cattle's and B: Blood sheep.

positive for *T. annulata* (Table 2).

Distribution of *T. annulata* in different showed variation between months, and the infected samples were found in 47.22% of cattle and 43.48 % of sheep collected in June, followed by 46.43% of cattles in September, and 34.29% of sheep in April (Fig. 3) i.e. a lower percent's' of 16.67 and 20 were detected in July for cows and sheep, respectively but not significant ($P>0.05$).

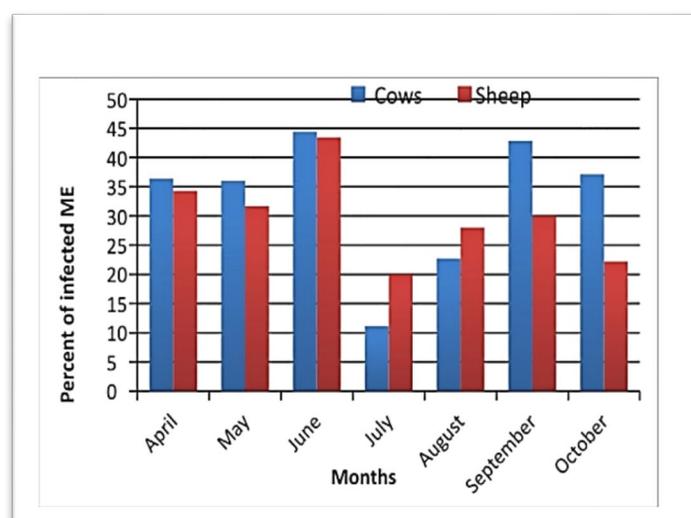
Discussion

Ticks are the main source of diseases in livestock and responsible for massive economic losses either by transmitting diseases through blood or by causing anemia through bloodsucking. Cattle are more susceptible to tick infestation than other animals (Gedilu et al. 2014).

This study showed a relationship between the presence of the hard ticks and infection with *T. annulata*. The genus *Hyalomma* constitutes the largest percent of hard ticks in our study as showed by Khorshid (2021) who recorded 5 different species of *H. anatolicum*, *H. turanicum* *H. excavatum*, *H. marginatum*, *Rhipicephalu turanicus*, with the genus *H. anatolicum* recorded as 58%. Another study conducted in the same province by Abdullah (2021) diagnosed the infection with *T. annulata* in 214 blood samples of cattle. The results of our study were also in agreement with the previous study in southern and central of Iraq (Al-Fatlawi & Al-Bayati 2018) who recorded *H. anatolicum* as the most dominant species. Prevalence of the hard ticks' infestation is affected by many factors, including temperature, annual precipitation, relative humidity and wind. The

Table 2. Distribution Theileriosis in cattle and sheep in Shattrra district using microscopic exam (ME).

Months	Animals					
	Number of cows	Infected	Percent%	Number of sheep	Infected	Percent%
April	55	20	36.36	35	12	34.29
May	25	10	40.00	41	13	31.71
June	36	17	47.22	23	10	43.48
July	18	3	16.67	15	3	20.00
August	22	6	27.27	25	7	28.00
September	28	13	46.43	20	6	30.00
October	35	14	40.00	18	4	22.22
Total	219	83	37.90	177	55	31.07
Total of animals	396					
Total of infected animals	260					
Statistical analysis	X ² =8.551 Df=6 Sig.=0.2 P≤0.05					

**Fig.4.** Distribution Theileriosis in cattle and sheep according to months.

livestock that are reared in the barns without lacking hygiene and poor ventilation, are suspected to infest with tick increases.

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