

## Prevalence of Theileriosis in sheep in Wasit province

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### Abstract

The present study was arranged between October 2012 to June 2013 in Wasit province. A total of 500 blood samples of sheep were collected: (450 of clinically suspected sheep with theileriosis (359 females and 91 males), and 50 of healthy animals as a control group (35 females and 15 males). Theileria parasite was seen in two forms rod and ring form inside the RBCs in blood smears stained with Giemsa stain. Results of microscopical examination of blood smears show that 22.8 % of suspected animals were infected with Theileriosis with significant differences at ( $p < 0.05$ ), and most of these cases were in chronic forms. The results revealed that there was no effect of sex on the rate of infection, while most of infection was showed among those animal with age equal or more than three years (26.6 %), in addition to the infection was seen concentrated in hot months of study.

**Key words:** Theileriosis, piroplasms, prevalence, blood smears, sheep.

### انتشار داء الثايليريا في الاغنام في محافظة واسط

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### الخلاصة

اجريت الدراسة الحالية خلال الفترة بين شهر تشرين الاول 2012 وحتى شهر حزيران 2013 في مدينة الكوت. تم جمع 500 نموذج دم من 450 (359 اناث و 91 ذكور) من الاغنام المشكوك باصابتها سريريا بداء الثايليريا كما جمع 50 (35 اناث و 15 ذكور) نموذج دم من اغنام سليمة كمجموعة سيطرة. لوحظ الطفيلي عند الفحص بشكلين العصوي والحلقي داخل كريات الدم الحمراء في مسحات الدم المصبوغة بصبغة الكمزا. واطهرت النتائج للفحص المجهرى ان نسبة الاصابة كانت 22.8% في الحيوانات المشكوك بها و 8% في حيوانات السيطرة وبفرق معنوي مهم احصائياً ( $p < 0.05$ ) وكانت معظم الحالات المصابة في الطور المزمن للمرض. اشارت الدراسة الى عدم وجود تأثير للجنس على نسبة الاصابة ، بينما لوحظت معظم الاصابات في الاعمار المساوية والاكبر لعمر الثلاث سنوات (26.2%) ، بالإضافة الى ان الاصابة تركزت في الاشهر الحارة من السنة.  
**الكلمات المفتاحية:** الثايليريا ، البايروبلازما ، انتشار ، المسحات الدموية ، الاغنام.

### Introduction

Piroplasms are tick-transmitted parasitic protozoa parasites divided into two genera *Theileria* and *Babesia*. They are the causative agents of Theileriosis and Babesiosis, respectively (1, 2). Theileriosis occurs over a wide geographic area ranging from Southern Europe and extending to Southern Russia, Middle East, Central Asia, China, India, Northern Africa and Sudan, Eritrea and Mauritania (3, 4, and 5). Ticks belonging to family Ixodidae transmit a wide variety of pathogens to vertebrates ranging from viruses to helminthes, Theileriosis is one of the widespread

transmitted by ticks (6). Small ruminants are affected by *T. lestoquardi*, *T. uilenbergi* and *T. luwenshni* which are very pathogenic, *T. ovis*, *T. seperata*, and *T. reconditte* are lesser (7). Among known *Theileria* parasites of small ruminants, *T. lestoquardi* is highly pathogenic and causes malignant ovine Theileriosis (8,9). The incubation period in infected animals varies from 9-25 days and the severity of the infection is dependent on susceptibility of the animal, virulence of the parasite and the number of sporozoites that were transmitted to the animal during infection (10), the course of infection may

consequently vary from per acute, acute or sub-acute to chronic depending on the interaction between the host and the parasite. The aim of study was to detect the rate of infection of Theileriosis in sheep in Wasit province in addition to study the effect of some factors like age, sex and seasons.

## Materials and methods

The study was conducted during October 2012 to June 2013 in Wasit province. Total of 500 blood samples were collected from 450 (359 females and 91 males) clinically suspected sheep with Theileriosis and 50 (35 females and 15 males) of healthy animals as a control group. The ages of target sheep were divided into four categories which were, less than six months (<6mns), from 6 month to one year (6mns-1y), from one year to 3 years (1y-3y) and equal or more than 3years ( $\geq 3y$ ). Two milliliter (2 ml) of blood was drawn from ear vein for each suspected and healthy animals by disposable syringe, and then collected in EDTA tubes. Thin and thick smears were prepared immediately from each sample for microscopically examination. Staining slide was examined microscopically under highly power (100 $\times$ ), to detect the parasite within the RBCs. of infected animals. Zigzag method of examination was used in order to covering all slides' fields. The laboratory processes were done in laboratory of parasitology, College of Veterinary Medicine, AL-Qadisiya University.

## Results

### Diagnostic features of *Theileria* spp. stained with Giemsa stain:

*Theileria* parasite were seen in two forms rod and ring inside the RBCs with blue to violet color and the back ground of RBCs appears as a pink when examined under high power lens (100x) of light microscopic (Fig.1).

**1-Prevalence of Theileriosis in sheep according to suspected cases.** The results showed that among 450 Theileriosis suspected cases were examined microscopically, 103(22.8% ) gave a positive result, and in other hand 4(8 % ) cases out of 50 of healthy control were positive also, with significant at ( $p < 0.05$ ) (Table 1).

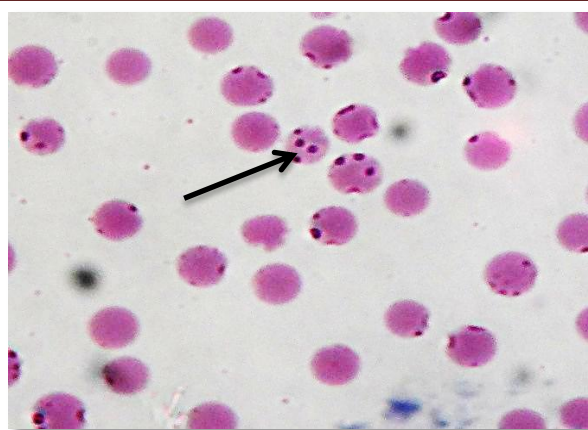


Fig.(1): *Theileria* spp. inside sheep red blood cells (100 $\times$ )

Table(1) Microscopical positive cases of Theileriosis.

Examined cases	Examined No.	Positive No.	%
Suspected	450	103	22.8A
Control	50	4	8B
Total	500	107	21.4

Different letters refers to significant differences at ( $p < 0.05$ ).

**2-Prevalence of Theileriosis cases according to age.** The results were show that the majority cases (26.6 %) were seen among sheep within the older animals in age group of equal or more than 3years ( $\geq 3y$ ) (Table 2).

Table(2) Microscopical positive cases according to age.

Age	Examined No.	Positive No.	%
<6mns	70	11	15.7A
6mns-1y	160	34	21.2A
1y-3y	175	46	26.2A
$\geq 3y$	45	12	26.6A
Total	450	103	22.8

Similar letters refers to the non-significant differences at ( $p < 0.05$ ).

**3-Prevalence of Theileriosis cases according to the sex.** Regarding to sex the males and females were given the same results nearly . (23 %) and (22.8 %) respectively (Table 3).

Table (3): Microscopical positive cases according to animal sex.

Sex	Examined No.	Positive No.	%
Male	91	21	23 A
Female	359	82	22.8 A
Total	450	103	22.8

Similar letters refers to the non-significant differences at ( $p < 0.05$ ).

**4-Prevalence of Theileriosis cases according to months of study.** The highest percentage,(32.7 %) , (32 %) was seen in May in addition to April which also revealed nearly percentage while the lowest (7 %) was in February so there is significant difference at ( $p<0.05$ ) (Table 4).

**Table (4): microscopically positive cases according to the month of study**

Month	Examined No.	Positive No.	%
October	53	14	26.4A
November	51	12	23.5A
December	48	9	18.7AB
January	52	5	9.6B
February	43	3	7B
March	47	10	21.2A
April	53	17	32A
May	55	18	32.7A
June	48	15	31.2A
Total	450	103	22.8

Similar letters refers to the non-significant differences among species while different letters refers to significant differences at ( $p<0.05$ ).

## Discussion

The present study showed that, 103 (22.8 %) were positive for Theileriosis by microscopic examination among suspected cases. This result indicate distribution of *Theileria* among sheep in the study area, so there is significant difference at ( $p<0.05$ ) was seen. The rate of infection of this study was nearly similar to some other local studies like the study of (11,12), when they reported that the rate of infection of sheep Theileriosis in Mosul and Duhok were 19.5 % and 24.8 % respectively . But it was lowest than the result 33.82 % which record by (13) in Baghdad in goats, whereas higher than the rate of infection in study of (14) when he reported that 7.5 % only of sheep and goats was suffering from Theileriosis in Mosul province. The studies in neighboring countries also recorded different result included 8.6 % and 11.9 % in Iran (15,16), 15.5 % in Turkey (17) and 5-24 % in Saudi Arabia (18). The difference in above result may be attributing to the differences of the climates conditions in which these studies were current, numbers of tested animals or methods of examinations in addition to the experience of examination. Also microscope

examination in carrier cattle detected only (6.25 %) infected with *Theileria* by (19).Related to the age and its effect on infection the current study mention that there is low rate of infection (15.7 %) was seen in lambs with age under six months (<6mns) while highest infection occur in age from one year to three years (1y-3y) and equal or more than three years ( $\geq 3y$ ) with same percentage nearly (26.2%, 26.6 %), there is no significant differences was recorded, this correspond with (20) who reported low prevalence parasite in lambs below six months of age and also these results are in agreement with the findings of (21, 22) when they recorded that the prevalence of *Theileria* was higher in sheep with age 2-3 years (89.47%) and lower prevalence of infection in sheep with one year age group (41.53%). (12), also said that the high rate of infection occur in age above three years . The interruption to these result may be due to the passive immunity protection which can induced via colostrum to new born and recovery from acute form of infection and given preimmunity which prevent the challenge of infection . Some studies were disagreement with these above results and pointed to that the infection prevalence and incidence in young animals was higher than the adults (23, 24). Regarding to sex the study showed that the both sexes were given the same results nearly (male 23 %, female 22.8 %), and statistically analysis show no significant differences ( $p>0.05$ ), so this may be due to the same exposure to environmental conditions and vector, this result correspond with (20) when reported that percentage of infection in male was 14.1 % and in female 13.6 % and also this results were agreement with (25), who reported the percentage in male (16.3 %) and female (16.5 %). According to the months, the result in this study was appeared that there were differences in rates of infection with Theileriosis from month to other and referred to that the most infections were concentrated in April (32 %) and May (32.7 %), were as the infection was delicate in coldness February month (7 %), this result can be attributed to the high prevalence of vectors (ticks) throughout April and May because the

suitable environmental conditions for breeding and activation, significant differences at ( $p < 0.05$ ) have been seen. (20), reported that the season play a risk factor in infection with Theileriosis, when he show that the infection was increased during spring and summer months, (6, 26) also referred to that the prevalence of infection with *Theileria* during hot season is more than in cold season.

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