



## DETECTION OF HAEMOPROTOZOA IN CAMEL IN AL-NAJAF PROVINCE, IRAQ

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### ABSTRACT

The study was conducted to estimate the prevalence of the protozoa in camel in Najaf, Iraq. One hundred and sixty samples were taken and examined in the laboratory for detecting the protozoa in the blood samples of camels. The results showed that the prevalence was 56.25%. The study revealed that the camels were infected by four species of blood parasites which were 40 (25%) of *Trypanosoma* spp., 51(31.87%) of *Babesia* spp., 47(29.37%) of *Theileria* spp., 44(27.5%) of *Anaplasma* spp. and mixed infection 53(43.62%) with significant differences ( $P < 0.01$ ). In addition the prevalence of mixed infection to the haemoparasites was higher at <7-8 years 25(62.5%) than <1-2 years 3(7.5%) with significant differences ( $P < 0.01$ ). The prevalence was 30(33.33%) in male, whereas in female it elevated to 23(32.85%). The difference in prevalence due to sex was significant ( $P < 0.05$ ). The results showed that the high prevalence in camel could increase the likelihood of the transmission of blood parasites diseases to other animals. Also it is very important to adopt new methods for camel prevention from protozoan blood infection as well as, the promotion and education to the risk of blood parasites for camel and others animals.

**KEYWORDS:** Prevalence, *Trypanosoma* spp., *Babesia* spp., *Theileria* spp., *Anaplasma* spp., Camel, Najaf, Iraq.

### INTRODUCTION

Camel is an important animal it has been used for produce milk, wool and meat in arid and semi-arid areas as well as it used in transportation in the world (Kamani *et al.*, 2008). Camels have physiological characteristics include; affording the bad conditions of arid regions and hardy animals, these make the animals a wide variety of diseases (Swelum *et al.*, 2014, Karimi *et al.*, 2014). Gastrointestinal and blood parasites are known to affect the health of camels leading to anemia, wasting and death in heavy infection (Mahran, 1989). Trypanosomiasis in camel is protozoal disease caused by *T. evansi* infecting a wide range of animals in tropical and sub-tropical regions of the world (Hilali *et al.*, 2004; Barghash *et al.*, 2014). *Babesia caballi* was first recorded in Sudan, where infected camels animal (Abd-Elmaleck *et al.*, 2014), also in the Egypt, Faham *et al.*, (2015) reported the first infection of *Camelus dromedaries* by *Babesia* sp.

Theileriosis is blood parasitic disease that is very important of animals inducing a variety of clinical appearance ranging from found a subclinical to a fatal disease depending on the host, animal species, age and the species of the microorganism. Tropical theileriosis caused by *Theileria* spp. has a wider distribution extending from North Africa to China (Mukhebi *et al.*, 1992). Anaplasmosis is a tick born disease of domestic animals and ruminants. Fever, progressive anemia, disturbances in the digestive tract, emaciation is the main characteristics of this disease (Radostitis *et al.*, 2000).

The disease distribution is worldwide, especially in a tropical and sub-tropical area as well as in some temperate areas. The disease can lead to economic losses because it occurs sporadically or as outbreaks (Smith, 1996). In Iraq, the disease has wide distribution especially at the north

areas (Alsaad, 2007). The aim of this study was to estimate the prevalence of blood parasites in camel and to evaluate its risk on economic productive.

### MATERIALS & METHODS

#### A study area

This study was carried out during the period between December 2016 and August 2017 on the camel in different areas of AL-Najaf province/ Iraq. The blood samples were collected from 160 camels at different ages ranging from (<1-8 years). These camels were examined for the presence of blood parasites.

#### Blood samples

Blood samples from all camels were collected from the jugular vein of each camel and kept at clean sterile tubes containing ethylene di-aminetetra acetic acid (EDTA) at the morning and transported immediately in an ice pack to the laboratory of the Veterinary Medicine College in Baghdad University for microscopic examination. Data included the animal's name; sex and age for each camel.

#### Examination techniques

About 3-5 ml of blood sample was prepared to use for thick and thin blood smears then air-dried, fixed in absolute methanol, stained with Giemsa-stain and examined microscopically for blood parasites with light microscopy X100 (oil immersion objectives). Haemoparasites were identified based on morphological features described by Soulsby (1982).

#### Statistical Analysis

The Chi-square test ( $\chi^2$ ) was used to determine the significant differences in the prevalence due to the age and sex of the animal. The data were subjected to analysis by using the SPSS program (SPSS, 2008).

**RESULTS**

Camels were infected with four genera of blood parasites including *Trypanosoma*, *Babesia*, *Theileria*, and

*Anaplasma* (figure 1, 2, 3, 4) (Table 1), with a total infection rate of 56.25% (Table 1).

**TABLE 1:** The infection rate of different protozoan blood parasites in camels

Examined No.	Positive No.	Percentage (%)
160	90	56.25

The result showed that the differences due to age were significant ( $P < 0.01$ ). The age group (<7-8) years recorded the highest estimations of prevalence in *Trypanosoma* (55%), *Babesia* (67.5%), *Theileria* (62.5%), *Anaplasma* (50%), and mixed infection (62.5%), while the lowest

estimations of prevalence were detected in the age group (<1-2). The corresponding estimations of the prevalence in the age group (<1-2) were (2.5%), (5%), (5%), (2.5%) and (7.5%) (Table 2).

**TABLE 2:** The infection rate of different protozoan blood parasites in camels according to age

Age	Examined No.	No. of Positive <i>Trypanosoma</i>	No. of Positive <i>Babesia</i>	No. of Positive <i>Theileria</i>	No. of Positive <i>Anaplasma</i>	No. of Positive mixed infection
<1-2	40	1(2.5%)	2(5%)	2(5%)	1(2.5%)	3(7.5%)
<3-4	40	5(12.5%)	10(25%)	10(25%)	8(20%)	10(25%)
<5-6	40	12(30%)	12(30%)	10(25%)	15(37.5%)	15(37.5%)
<7-8	40	22(55%)	27(67.5%)	25(62.5%)	20(50%)	25(62.5%)
Total	160	40(25%)	51(31.87%)	47(29.37%)	44(27.5%)	53(43.62%)

( $P < 0.01$ )

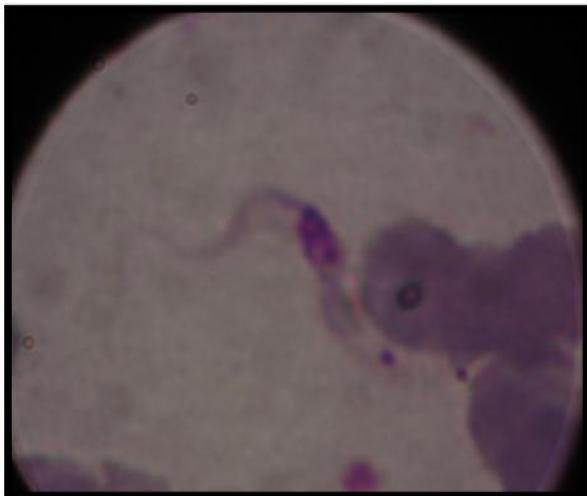
Regarding the sex, results revealed that the differences in prevalence due to sex were significant ( $P < 0.01$ ). All prevalence of *Trypanosoma* (24%), *Babesia* (34.44%), *Theileria* (30%), *Anaplasma* (28.88%) and mixed

infection (33.33%) were significantly ( $P < 0.01$ ) higher in males than the corresponding estimations (25.71%, 27.14%, 28.57%, 25.71%, and 32.85%) in females (Table 3).

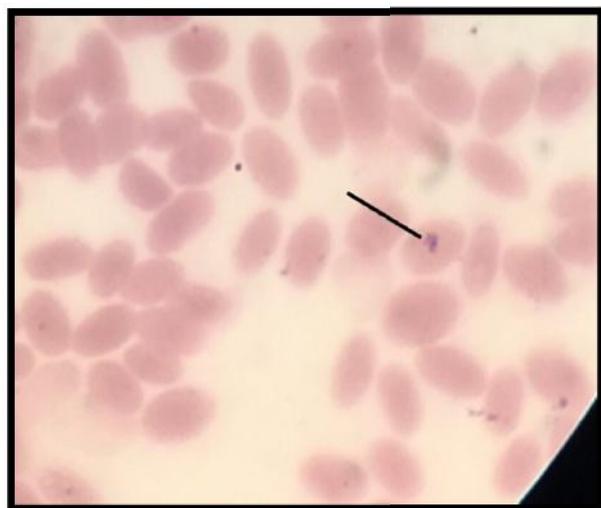
**TABLE 3:** The infection rate of different protozoan blood parasites in camels according to sex

Sex	Examined No.	No. of +ve <i>Trypanosoma</i>	No. of +ve <i>Babesia</i>	No. of +ve <i>Theileria</i>	No. of +ve <i>Anaplasma</i>	No. of +ve mixed infection
Male	90	22(24%)	31(34.44%)	27(30%)	26(28.88%)	30(33.33%)
Female	70	18(25.71%)	19(27.14%)	20(28.57%)	18(25.71%)	23(32.85%)
Total	160	40(25%)	51(31.87%)	47(29.37%)	44(27.5%)	53(43.62%)

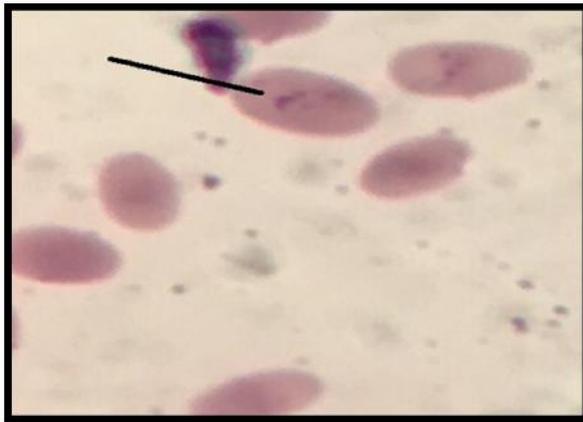
( $P < 0.01$ )



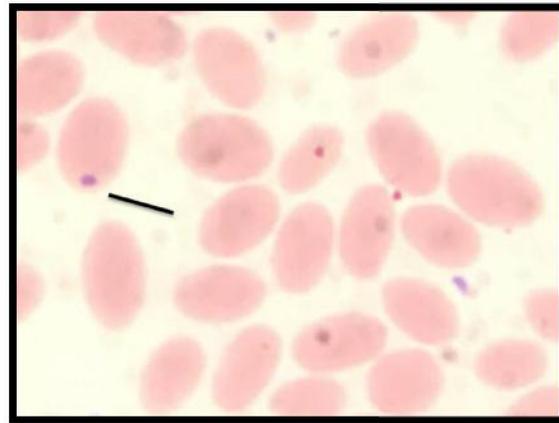
**FIGURE 1:** *Trypanosoma* spp. with Giemsa stain (X100)



**FIGURE 2:** *Babesia* spp. with Giemsa stain (X100)



**FIGURE 3:** *Thieleria* spp. with Giemsa stain (X100)



**FIGURE 4:** *Anaplasma* spp. with Giemsa stain (X100)

## DISCUSSION

The results revealed that out of 160 camels, 90 (56.25%) camels were infected by protozoan blood. The result of the present study is asymptomatic with the result reported by Wakil *et al.* (2016) who recorded 122 (60.4%) in the camels in Maiduguri, Nigeria. However, the result of present study was higher than 14.2% obtained by Joshua *et al.* (2008) and lower than 92.7% recorded by El-Naga and Barghash, (2016). These differences could be attributed to the differences in sample size, breed, location, and method of diagnosis. In the present study, four blood parasites were detected (*Trypanosoma*, *Babesia*, *Theileria*, *Anaplasma*, and mixed infection) with the prevalence of 40 (25%), 51(31.87%), 47(29.37%), 44(27.5%, and 53(43.62%) respectively. Our results in agreement with Wakil *et al.* (2016) who indicated that *Babesia* species 49 (24.3%) have the highest prevalence rates, followed by *Anaplasma* species and *Trypanosoma* species in trade camels in Maiduguri, Northeastern Nigeria. While, these results disagreed with El-Nagal and Barghash (2016) who examined 331 camels for the presence of blood parasites, and found that the highest infection in theileriosis 168 (50.8%), while the lowest infection in Babesiosis 39(11.8%).

In regards the mixed infection in the current study (43.62%) this result disagreed with other results obtained by Joshua *et al.* (2008) and El-Naga and Barghash, (2016) who found percentages were 3(2.7 %) and 65.9% respectively.

Blood parasites infection was detected in all age groups. The trend of infection increased along with the increasing of animal age. The high prevalence rate was detected at (<7-8) years age group. The results of this study are in agreement with El-Naga and Barghash (2016) who found that the highest prevalence rate at a group of 12 X<6 in all detected parasites. This could be attributed to the owners and nomads who preferring to graze the animals of this age group in open fields' because in this age stage, they had a high performance and more activity. The open field increases the risk of infection because animals become more exposed to vector bites.

The prevalence of parasitic was found significantly ( $P<0.01$ ) higher in male camels as compared with the female camels. This result is in agreement with Faham *et al.* (2015) who reported the higher infection was found in

males (36.7%) whereas, (12.24%) in females. On the other hand, this result disagreed with Joshua *et al.* (2008) who recorded the prevalence of 13.2 % in males and 15.6 % in females. Wakil *et al.* (2016) mentioned that the infections are more common among the female camels 73(36.1%) than in the males 49(24.3%). Also, El-Naga and Barghash (2016) found that the infection rate of male 32(35.6%) was significantly ( $P<0.05$ ) less than female (67.2%). The differences could be due to the several effects such as the stress during gestation and milk production which rendering them more susceptible to blood parasites infection (Barghash, 2010; Zayed *et al.*, 2010).

## CONCLUSION

The study demonstrated that Haemoparasitic infections (*Trypanosoma*, *Babesia*, *Theileria* and *Anaplasma*) were found in camel blood which plays important role in the infection of disease among animals herds. In general, the higher prevalence (56.25%) of camels with protozoan parasites in Najaf governorate could be attributed to some environmental conditions, the limiting of veterinary service, and the camel rearing areas which could lead to the major constraints of camel health and production. Accordingly, it should be creating a public awareness to control these parasites.

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