Babesiosis of small ruminants in Sulaimani city
Kurdistan – Iraq
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Abstract
Babesiosis was studied in sheep and goats in Sulaimani city, Kurdistan -Iraq from June to September 2012. A total of 160 blood samples (135 of sheep and 25 of goats) were collected from different farms. Giemsa stained blood smears were applied to study babesiosis, also ticks were collected from external animals body surfaces. Results of this study showed that Babesia species was recorded among the small ruminants as 92/160 (57.5 %), 76/135 (56.3%) of these from sheep and 16/25 (64%) of goats. Statistically there are no significant differences between sheep and goats infection by Babesia species at (P< 0.05). According to the morphological characters four Babesia species were recorded in the study which was B. ovis, B. motasi, B. foliata, and B. taylori. One species of tick Hyalomma anatolicum was seen.

Key words: Babesiosis, blood smear, tick, small ruminants.

Introduction
Babesiosis is an infection caused by species of tick-borne, intra-erythrocytic and generally host-specific protozoan parasites of the genus Babesia (1). It's a haemoparasitic disease with high economic losses in livestock industry worldwide (2). Ovine babesiosis is the most important hemoparasitic tick-borne disease of small ruminants caused by Babesia ovis, Babesia motasi and Babesia crassa. These parasites are widespread in tropical and subtropical areas of the world (3), and it’s the most important seasonal sheep disease (4).

Babesia ovis is highly pathogenic especially in sheep and causes severe infection which is characterized by fever, anemia, icterus and hemoglobinuria. Mortality rates in susceptible hosts range from 30 to 50% in field infections. The pathogenicity of B. motasi is not high and appears to be moderately virulent. In contrast, B. crassa is considered as being non-pathogenic to small ruminants (5). The most common diagnostic method for identification of piroplasmosis involving Giemsa staining of blood smears (6). Climatic conditions of the country are
conducive to the multiplication and growth of ticks which are most important ectoparasites of livestock both in tropical and sub-tropical countries. Ticks not only cause direct losses by sucking blood of the host animal, but also are responsible for various blood-borne diseases such as tropical theileriosis, anaplasmosis and babesiosis (7). The ultimate consequence is a decline in production of the livestock (8). The present study was taken to investigate the presence of babesiosis in sheep and goats in various farms belong to Sulaimani city, Kurdistan-Iraq to follow the control measures.

Materials and methods
A total of 160 sheep and goats from various private livestock farms of Sulaimani city, Kurdistan-Iraq were selected to investigate the presence of Babesia spp. The study carries out during July, August and September 2012 when large population of ticks were present, which enhance the chance for parasite transmission and increase the infection rate. Blood samples were obtained from jugular vein using sterile syringe, collected in tubes with EDTA, smears were prepared, air dried, fixed with methanol, stained with Giemsa stain and examined under the oil immersion lens of a light microscope (9). The parasites were identified according to the morphological characters described by (10). Collection and study of ticks: Ticks were collected from the external body surface of the animals stored in 70% ethanol and identified by their morphological characteristics as described by (11). Statistical analysis was done by using t-test (SPSS version 15.0 for windows, 2006).

Results
Out of 160 blood samples there was 92 (57.5%) were infected by Babesia spp. as seen in table (1). Which appear 76 (56.3%) and 16 (64%) in sheep and goats respectively as seen in table (2). Statistically there are no significant differences between sheep and goats infection by Babesia species.

<table>
<thead>
<tr>
<th>Table (1): Babesiosis in small ruminants in Sulaimani city 2012.</th>
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<tbody>
<tr>
<td>No. of examined animals</td>
</tr>
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<td>160</td>
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<th>Table (2): Babesiosis in small ruminants according to the animal species in Sulaimani city 2012.</th>
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<tr>
<td>No. of examined sheep</td>
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<td>135</td>
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There was no significant difference in the distribution of Babesia spp. between sheep and goats.

According to the morphological characters of the parasites and their location inside the erythrocytes, the examined blood smears revealed identification of four Babesias species B. motasi Fig. (1) its pyriform in shape; B. ovis Fig. (2) has rounded shape and marginally located inside the erythrocytes; B. foliata Fig. (3) which has rounded shape and centrally located inside the erythrocytes, and

Fig. (1): Babesia motasi ( ) in sheep blood smear. Giemsa stain (X 100)

Fig. (2): Babesia ovis ( ) in sheep blood smear. Giemsa stain (X 100)
Fig (3): *Babesia foliata* (← ) in sheep blood smear. Giemsa stain (X 100)

*B. taylori* Fig. (4) the parasite appears to undergo several fissions, and more than one parasites were present per erythrocyte.

The study identified only one type of ticks, it was the *Hyalomma anatolicum* Fig.(5 a, b & c).

(a) Nymph    (b) Adult Male    (c) Adult Female

Fig.(5 a, b & c): *Hyalomma anatolicum* Nymph, Adult male and Adult female.

**Discussion**

The results of the study showed that 92 (57.5%) of examined blood smears were positive for different *Babesia* species of these, 76 (56.3%) and 16 (64%) were positive in sheep and goats respectively shown in Table (2). The results of the present study correlated to those of (12) and (13), who reported 52.1% and 50.92% of ovine babesiosis, respectively. Regarding other province of Iraq (14) reported that 4% of goats infected with *Babesia motasi* in Duhok-Iraq, and (15) reported 15.42% for different *Babesia* spp. in goats in Mosul - Iraq. In addition, the results obtained by (16) and (17) revealed that the prevalence of babesiosis in Central Anatolia ranged between 17.70% and 27.35% in sheep and between 6.38% and 12.12% in goats based on microscopic evaluation, which are lower than our results. Also (18) found that 23.5% and 14% of sheep and goats in Iran were infected with *B. ovis and B. motasi*, respectively, (19) found the maximum range of infection of *B. motasi* from 15% to 90% in India, and (20) in Pakistan found that *Babesia* infection was 23.46% in sheep and 13.53% in goats. While (21) reported 51.4% of babesiosis in sheep from Kurdistan
province of Iran. In general the distribution of the parasite is correlated with the distribution of tick vector species (22). Babesia species of small ruminants are grouped together, although the susceptibility of sheep and goats to individual hemoparasites is quite different. Two species of Babesia are generally recognized as valid, Babesia motasi and B. ovis, two other parasites have also been described; B. taylori and B. foliate (23). Similar to our result (15) reported four Babesia species in goats in Mosul-Iraq, which were: B. ovis, B. taylori, B. foliata and B. motasi in blood smears.

About the tick samples collected from external body surface of examined animals one type of tick was identified in the study which is Hyalomma anatolicum, which acts as vector for transmission of Babesia species.(24) reported that B. ovis is the most important disease agent, and it is transmitted by Rhipicephalus bursa, R. turanicus and Hyalomma anatolicum excavatum, also (25) reported that Rhipicephalus bursa is the major and dominant vector of B. ovis in Zagros Mountainous area in Iran, as the highest infection rate for B. ovis is reported in this area 58.81%.

References


