Morphological study of the cattle ticks (Acari: Ixodidae) infesting on sheep in Alnnajaf province-Iraq

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Morphological study of the cattle ticks (Acari: Ixodidae) infesting on sheep in Alnnajaf province-Iraq

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Abstract . Present study was conducted during period (March to September 2018) on the cattle ticks (Acari: Ixodidae) that infested on sheep goat ears in Alnnajaf Province .Two species of hard ticks were identified *Boophilus annulatus* and *Rhipicephalus sanguineus*, the species *B. annulatus* was most predominant than the species *R. sanguineus* at percentages (92.14, 7.85) % respectively . Of these ticks, 105 were female, 38 were males, 124 and 144 were nymph females and males respectively and there were not larva observed. The monthly samples of hard tick *B. annulatus* revealed that higher monthly samples during September, but lower monthly samples during June and July. Results of Scanner Electron Microscope analyses showed more distinguished fine characters of *B. annulatus* that differentiated from *R. sanguineus*, however both species were lived together on sheep and goat.

1. Introduction:-

Ticks are blood- sucking arthropoda that ectoparasitize on cattle, they transmit broad ranges of infectious agents (viruses, bacteria, parasites) therefore they considered most important vectors of diseases for humans [1], [2] and [3]. In Iraq the study of ticks species has become more important because of their relationships with some viral diseases that may be spreading in the future, as well as ticks are responsible for serious economic loses of livestock industry [4]. They are able to attack a wide variety of hosts such as mammals, birds, reptiles and amphibians. In addition, hard ticks are distributed globally throughout the world [1], [3]and[4]. Previous studies on hard ticks species were reported several species in Iraq particularly southern part such as *Hyalomma rufipes*, *H. trancatum, H. dromedarii H.schulzei H. asiaticum H.marginatum H. anatolicum, Boophilus annulatus, Rhipicephalus turanicus ,R.sanguinueus ,Haemaphysalis adleri*.[5,6 and 7].Since there is not enough studies about fine morphological characters of hard ticks in Iraq thus, the present study was conducted to study minute morphological characters based on scanning electron microscope (SEM).

2.Materials and methods:

Present study was carried out on hard ticks of 150 heads of sheep and goat from five different sites during period (March- September) of 2018 from rural areas of Alnnajaf province- Iraq Figure 1. Nymphs and Adults were detached from ears of sheep and goat by means of forceps figure (2). Then isolated ticks were counted and separately preserved in 70% ethanol vails, labelled with the date,

locality and host specificity until identification. Afterwards all minute morphological characters of tick sample were studied precisely. Their identification was carried out depended on morphological characters of the species by means of light microscope which supplied with camera and then by scanning electron microscope (SEM) according to available standard keys (8, 9 and 10). Fifty seven samples of hard ticks from sheep hosts were morphologically examined by means of scanning electron microscope. Statistical analysis of the data was carried out according to the method of Factorial Experiments within Completely Randomized Design (C.R.D) and means were compared by using Least Significant Difference Test (L.S.D) at P= 0.05 % level for showing the significant of results (11).

Figure 1 Five collection sites of present study areas.

Figure (2) Adult hard ticks *B. annulatus* attacked (A) goat and (B) sheep ears in Alnnajaf Province -Iraq

3- Results and Discussion:

During the present study the total number were (411) of tick specimens were collected from rural different sites of Alnnajaf province. Of these ticks, 105 were females, 38 were males, 124 and 144 were nymph females and males respectively and there were not larva observed (table 1).

Table (1) Total hard tick samples were collected from Alnnajaf Province.

SEM analysis Samples	Adults		Nymphs		Larva	Total
	Female	Male	Female	Male		
	3	2	21	31	0	57
Total	105	38	124	144	0	411

All of which belong to the family Ixodidae (hard ticks), the species *B. annulatus* was most predominant with percentage (92.14) % and *R. sanguineus* species was less predominant with percentage (7.85) %. Present study revealed that both species were live together on sheep and goats as hosts figure (3) and Photograph (1and 2).

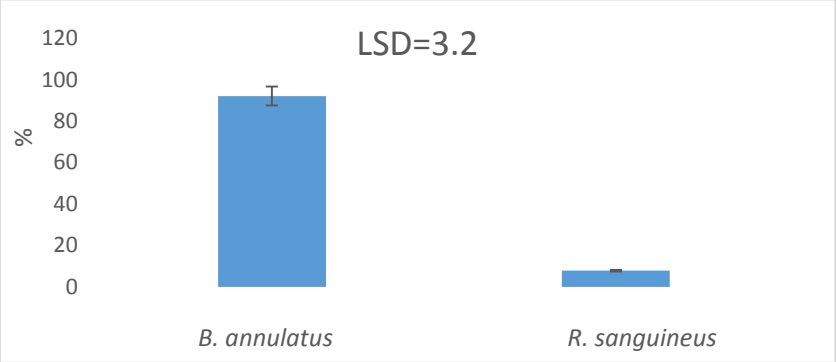
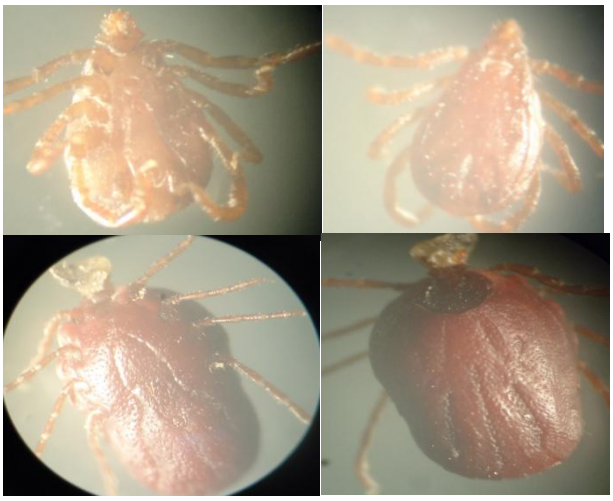


Figure (3) Percentage of both species *B.annulatus* and *R.sanguineus* hard tick (Acari: Ixodidae) collected on Alnnajaf Province-Iraq.



Photograph (1) the adult male (upper) and female (lower) of *B. annulatus* photographed by light microscope (40X).

Photograph (2) the male and female of *R. sanguineus* photographed by light microscope (40 X).

The data at the figure (4) were showed that the monthly samples of hard tick *B. annulatus* revealed which the maximum numbers of samples were collected during September whereas minimum numbers of sample were collected during June and July.

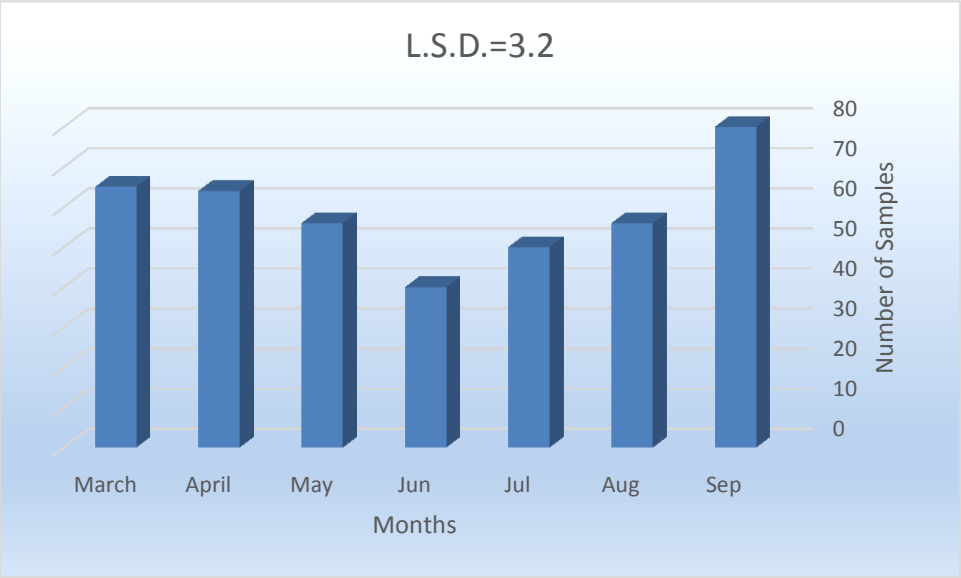


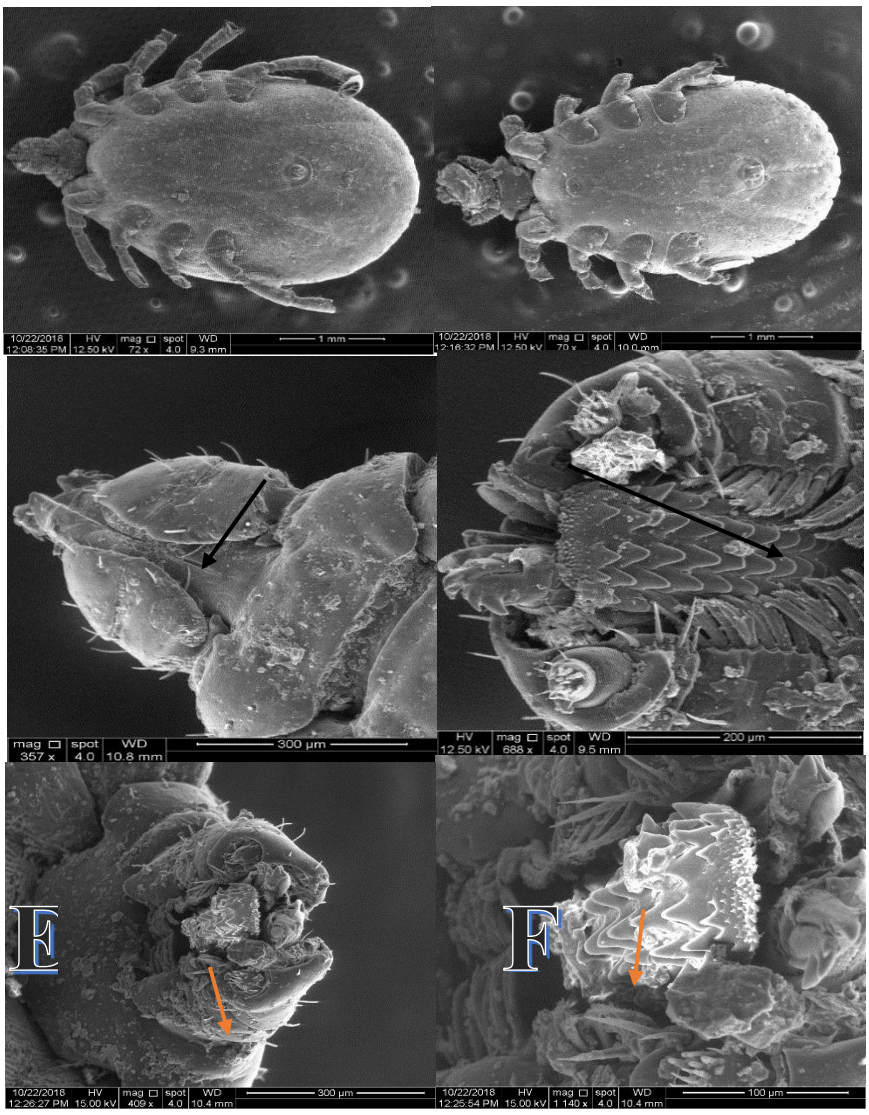
Figure (4) monthly samples of hard tick *B. annulatus* (Acari: Ixodidae) collected on Alnnajaf Province-Iraq.

4- Dissections

Results of present study revealed that body profile of *B. annulatus* was narrow oval with anal groove occurred to form a line posterior to the anus and jointed at posterior to form a point Photograph (3 A,B) . Eyes were present with small size, profile of capituli were hexagonal with straight dorsal posterior margins Photograph (3 C). In females cervical field of scutum was distinct .Columns of teeth on hypostome were ventral surface with number 3+3 dentition Photograph (3 D,E and F).Cornua was absent, the first coxa anterior projection was small and not visible dorsally. Festoon was found in males but in females was lacked.

Present study showed that *B. annulatus* and *R. sanguineus* the only hard ticks were identified. The species *R. sanguineus* was easily recognized by the combination of festoons and bilateral pointed basis capituli and both species were similar but *B. annulatus* lacks festoon in females [12].

Present study revealed that *B. annulatus* was considerably higher number than the *R. sanguineus* on the cattle. This deference might be due to the number of hosts preferred by *B. annulatus* infested sheep and goats [13 and 14]. The species *R. sanguineus* is one of the most important groups because its capacity to transmit serious diseases [15 and 16] and may be interacted with *B. annulatus* species because both species were collected primarily from sheep and goats as well as dogs were coexist together [17 ,18, and 22]. In Iraq there was no recorded arbovirus via ticks and they need further studies to prove that. Recent studies were showed that several pathogens such as *Babesia vogeli*, *Cercopithifilaria* sp. II, *Ehrlichia canis*, *Hepatozoon canis*, *Rickettsia conorii* and *Rickettsia massiliae* might transmit via *R. sanguineus* ticks among dogs, cats and foxes [21, 27 and 23].



Photograph (3) the nymph of *B.annulatus* photographed by Scanning Electron Microscope. (A: Female, B: Male, C: Dorsal side of Capitulum and D Ventral side of Capitulum, E and F Hypostomal dentition 3/3 of adult).

In Alnnajaf Province at which present study had done hard ticks were more abundant started during March to May and then declined in June into July but in September abundance raised at top might be due to variations in temperature and humidity of province Alnnajaf where hot, arid commonly weather conditions might be hard ticks were more adaptation [19 and 20]. The importance of prevailing environmental conditions such as temperature have been mentioned by other research [6, 23, 24, 25 and 26].

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