



Cattle and buffaloes tick's infestation in Wasit province districts , Iraq

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Abstract:

Cattle and buffaloes tick's infestation prevalence were investigated in 4 districts of Wasit province, Iraq during 2012. Out of 164 animals, 63 cattle & 6 buffaloes were infested. Overall prevalence of cattle ticks infestation 91.3% was higher than that of buffaloes 8.7% with significant value P-Value ≤ 0.002 . There was no significant difference P-Value ≥ 0.102 between total prevalence of ticks genera *Rhipicephalus* 48%, *Hyalomma* 38% and 14% *Boophilus* and infested cattle & buffaloes (with exception of *Boophilus*); beside there was no significant difference P-Value ≥ 0.143 between the infested animals in the different 4 districts ; although infestation was highest in Sewara and lowest in Zubydya districts. There was significant differences between the distribution of tick genera and the infested animals among research's months P-Value ≤ 0.002 , 0.009 respectively; the infestation rates were highest in July and lowest in May. 12 species and subspecies of the 3 genera ticks were identified in favor of *Hyalomma* in this study.

Key word: cattle, buffalow, tick, infestation.

اصابة الابقار والجاموس بالقراد في محافظة واسط

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الخلاصة:

اجريت الدراسة لمعرفة نسبة انتشار اصابة الابقار والجاموس بالقراد في اربع مناطق من محافظة واسط ، العراق خلال الاشهر الحارة من عام 2012 . سجلت نسبة انتشار اصابة القراد الكلية للابقار 91.3% وكانت اعلى مما في الجاموس 8.7% بفارق ملحوظ احصائيا P-Value ≤ 0.002 . لم يلاحظ وجود فارق احصائي P-Value ≥ 0.102 بين نسب انتشار القراد الكلية *Rhipicephalus* 48% و *Hyalomma* 38% و *Boophilus* 14% على الابقار و الجاموس المصاب ، كما لم يلاحظ وجود فارق احصائي P-Value ≥ 0.143 بين اعداد ونسب انتشار الاصابة في الحيوانات المصابة المسجلة في المناطق الاربعة المختلفة من المحافظة على الرغم من تأشير اعلى و اقل نسبة اصابة في مدينتي الصويرة والزبيدية على التوالي. وجدت فروقات ملحوظة احصائيا بين اعداد اجناس القراد ونسب انتشار الاصابة للحيوانات الموزعة على اشهر البحث حيث سجلت اعلى اصابة في شهر تموز وأدناها في ايار . تم تشخيص 12 نوع و نويح لأجناس القراد الثلاثة ولصالح جنس القراد *Hyalomma* اثناء فترة هذه الدراسة .

Introduction:

The arthropods contain over 80% of all known animal species and occupy almost every-known habitat. As a result of their activity, arthropod ectoparasites may have a variety of direct and indirect effects on their hosts ⁽¹⁾. Tick and Tick Born Disease (TBD) are widely distributed throughout the world particularly in tropical and subtropical countries, which cause a tremendous economic importance in live stock production ⁽²⁾.

Production losses due to ticks and tick-borne diseases (TTBDs) around the globe have been estimated at US\$ 13.9 to US\$ 18.7 billion annually leaving world's 80% cattle at risk ⁽³⁾; the direct effects of ticks have great economic importance since tick bite marks diminishes up to 20–30% of the value of skins and hides ⁽⁴⁾. In severely tick infested young cattle, sometimes ticks have been found in the oral cavity as well as in the stomach. They reach here as a result of constant licking induced by irritation ⁽⁵⁾.

Since ⁽⁶⁾, ⁽⁷⁾, ⁽⁸⁾ and ⁽⁹⁾, when introduced their report to the government of Iraq, generally several surveys have also been carried out on the distribution of tick species on livestock in different regions of the country but with lack of such studies dealing with buffalo ectoparasites as have been noticed by the authors.

The animal population estimated in Iraq is more than 2.55 million heads of Cattle, 7.72 million sheep, 1.47 million goat, 285 thousands Buffaloes, 58 thousands Camels and 100 million Birds; with national livestock production of 50 thousand tons of meat, 750 thousand tons of milk and 300 million eggs ⁽¹⁰⁾; Waist province estimated numbers of animals, such as cows, buffaloes, sheep, goats, and camels, according to the full agricultural count 2001, stood at 147656, 797, 550449, 122982, 2606 heads respectively ⁽¹¹⁾.

Buffaloes in Iraq has been neglected for along times and affected by many factors that lead to severe decline in population and production; For instance Buffalo Population in Wasit province represents 5%, 6.3%, 2.1% in years 1981, 2001, and 2006 respectively ⁽¹²⁾.

Therefore, the objectives of this study were to (1) determine the prevalence of buffalo and cattle tick's infestations in Wasit province, eastern Iraq, during hot months of the year 2012, (2) and to classify the ticks species collected, and (3) to aware the farmer on the significant role of the direct and indirect effect of ticks.

Materials and methods:

During hot months of year 2012, 164 animals (134 cows and 30 buffaloes) were examined for ectoparasites. From May to September, farmers herds of buffaloes and cows were selected randomly in the 4 districts regions Sewara, Shuhimiya, Zubaydia and Azizia; The animals were examined and ticks collected from each animal then were placed in glass vials (2X10 cm) containing 70% ethanol. Each vial was labeled with the name of the host and date of collection. the ticks were handled and identified In the laboratory of parasitology, College of Veterinary Medicine, University of Diyala. Statistical analysis tests were performed using Minitab 11 & IBM SPSS 20 program soft ware packages.

Tick identification :

Few of Recovered adult arthropods & larvae were cleared in boiled 10% NaOH_(aq); or lactophenol for different times periods at room temperature; mounted in between slide and cover slip by Canada balsam, which placed in 40c° oven for few days to harden mounting medium; then morphologically identified after using valid references such as ⁽¹³⁾; ^(14 a, 15 b); ⁽¹⁶⁾; ⁽¹⁷⁾; ⁽¹⁸⁾.

Results:

Waist average weather by month (Temperature, and precipitation

parameters) ⁽¹⁹⁾, is presented in fig. (1);
 Waist, total area 17,153 km², (Geographic

coordinates: 33.16, 45.91
 latitude/longitude).



Fig. (1): climate diagram - Wasit.

Out of 164 examined animals , 69 (42.1%) were infested .According to hosts, cattle were highly infested (total n=63 ; prevalence=91.3% and mean=4.27 ± 0.99

than buffaloes (total n=6 ; prevalence= 8.7% and mean = 0.4 ± 0.19) with significant P-Value ≤ 0.002 by t-test ;table(1), fig.(2).

Table (1) :Shows № of examined , infested animals & ticks genera within 4 cities.

№ & (%) of infested animals with tick genera of						№ &(%) of infested		№ &(%) of examined		Districts
<i>Rhipicephalus</i>		<i>Boophilus</i>		<i>Hyalomma</i>		buffalo	cattle	buffalo	cattle	
buffalo	cattle	buffalo	cattle	buffalo	cattle					
3 (4.4)	19 (27.5)	0	6 (8.9)	2 (2.9)	12 (17.4)	5 (7.2)	37 (53.6)	25 (15.2)	66 (40.2)	Sewara
1 (1.5)	3 (4.4)	0	2 (2.9)	0	5 (7.2)	1 (1.5)	10 (14.5)	5 (3.1)	33 (20.1)	Azizia
0	3 (4.4)	0	2 (2.9)	0	2 (2.9)	0	7 (10.1)	0	18 (11)	Zubydia
0	4 (5.8)	0	0	0	5 (7.2)	0	9 (13.04)	0	17 (10.4)	Shuhimiya
4 (5.9)	29 (42.1)	0	10 (14.7)	2 (2.9)	24 (34.7)	6 (8.7)	63 (91.3)	30 (18.3)	134 (81.7)	Total

Results according to infested animals species in the 4 districts revealed that, cattle had highest infestation $n=19$ (27.5 %) with *Rhipicephalus* ticks , $n =12$ (17.4%) with *Hyalomma* ticks , and $n=6$ (8.9%) with *Boophilus* ticks , while buffaloes had highest infestation $n=3$ (4.4%) with *Rhipicephalus* and $n=2$ (2.9 %) with *Hyalomma* in Sewara city ; followed by cattle $n= 5$ (7.2%) with *Hyalomma* in both Azizia and Shuhimiya , while cattle $n= 4$ (5.8 %) with *Rhipicephalus* in Shuhimiya ; buffaloes showed lowest infestation $n=1$ (1.5 %) with *Rhipicephalus* ticks in Azizia . Zubydia finally recorded lowest infestation $n= 7$ (10.1%) among wasit different districts of the study.

According to total numbers of infested animals species with genera of ticks results revealed generally that $n = 26$ (*Hyalomma* 38 %) , $n =10$ (*Boophilus* 14%) and $n = 33$ (*Rhipicephalus* 48%) ; cattle had highest $n = 29$ (42.1%) with *Rhipicephalus* then $n = 24$ (34.7 %) with *Hyalomma* followed by $n= 10$ (14.7%) with *Boophilus* ;while buffaloes highest $n = 4$ (5.9%) with *Rhipicephalus*, then $n =2$ (2.9%) with *Hyalomma* ticks ; table (1) and fig. (2, 3, 6) .There was One-way ANOVA non significant difference P-Value ≥ 0.102 between infested cattle and buffaloes by different tick genera ; beside there was T-Test non significant difference P-Value ≥ 0.143 between the infested cattle and buffaloes in the different districts.

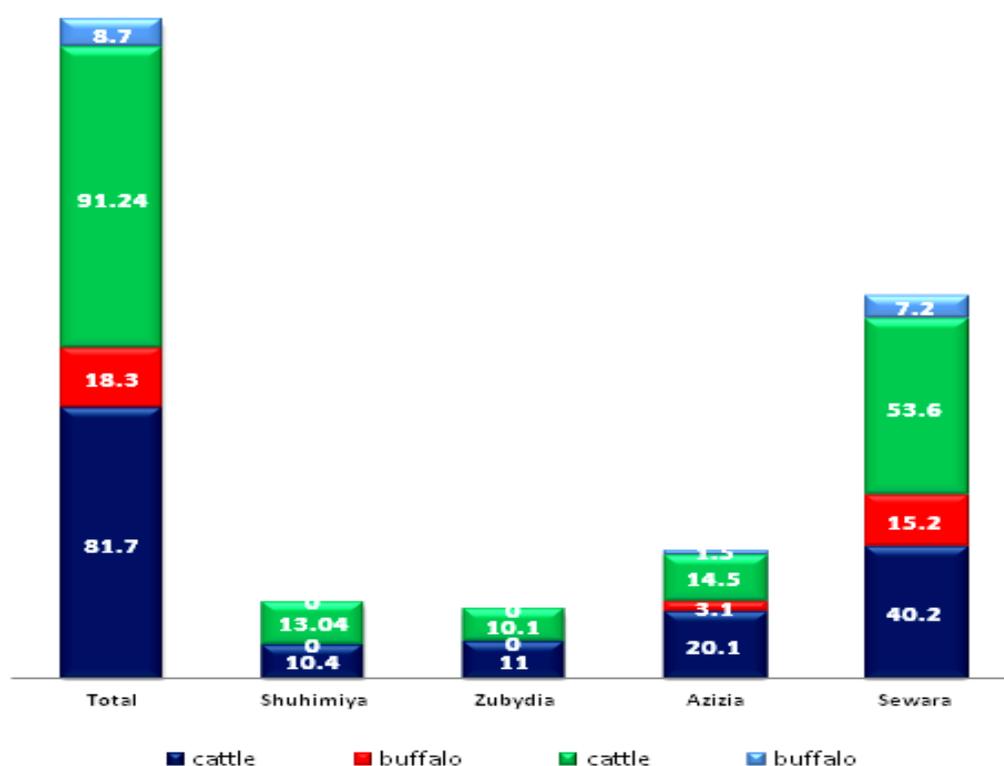


Fig.(2):shows shows % of infested animals within 4 cities.

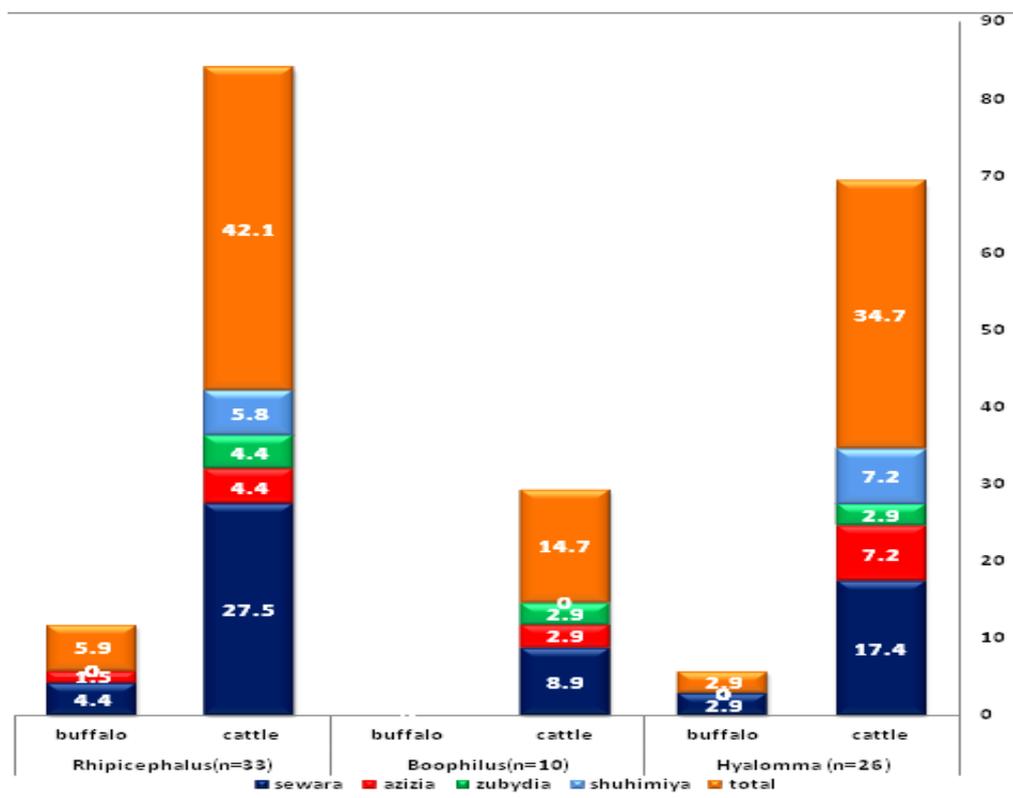


Fig.(3): shows % of infested animals with ticks genera within 4 cities.

Results revealed that according to distribution of infested animals species within different months of research, the infestation was highest in July then August, $n = 25(36.2\%)$, $n = 21(30.4)$ respectively, while lowest infestation $n=6$ (8.7%) in May; table(2) and fig.(4-5). There was T-Test statistically significant difference $P\text{-Value} \leq 0.002$ between the distribution of the different tick genera that infests cattle and buffaloes among different months of the research; and also there was One-way ANOVA statistically significant difference $P\text{-Value} \leq 0.009$ between distribution of infested cattle and buffaloes by the different tick genera among months.

All cattle and buffaloes (with exception of genus *Boophilus*) in the study were

infested with 3 genera (*Hyalomma* 38%, *Rhipicephalus* 48% and *Boophilus* 14%); 12 species and subspecies were recorded and identified in favour of *Hyalomma* from May to September months of the study; *H. anatolicum anatolicum* Koch, 1844; *H. anatolicum excavatum* Koch, 1844; *H. asiaticum siaticum* Schulze and Schlottko, 1929; *H. marginatum marginatum* Koch, 1844; *Hyalomma marginatum turanicum* Pomerantzev 1946; *Hyalomma detritum* Schulze 1919; *Hyalomma impeltatum* Schulze and Schlottko, 1930; *Rhipicephalus turanicus* Pomerantzev, 1940; *R. bursa* Canestrini and Fanzago, 1877; *R. sanguineus* Latreille, 1806; *Boophilus annulatus* Say, 1821.

Table (2): shows № of infested animals with ticks genera within months.

sum	№ of infested animals with						month
	Rhip.		Boo.		Hya.		
	buffalo	cattle	buffalo	cattle	buffalo	cattle	
6	1	1	0	0	0	4	may
10	2	3	0	3	0	2	June
25	0	15	0	1	2	7	July
21	1	6	0	5	0	9	august
7	0	4	0	1	0	2	sept.
69	4	29	0	10	2	24	total

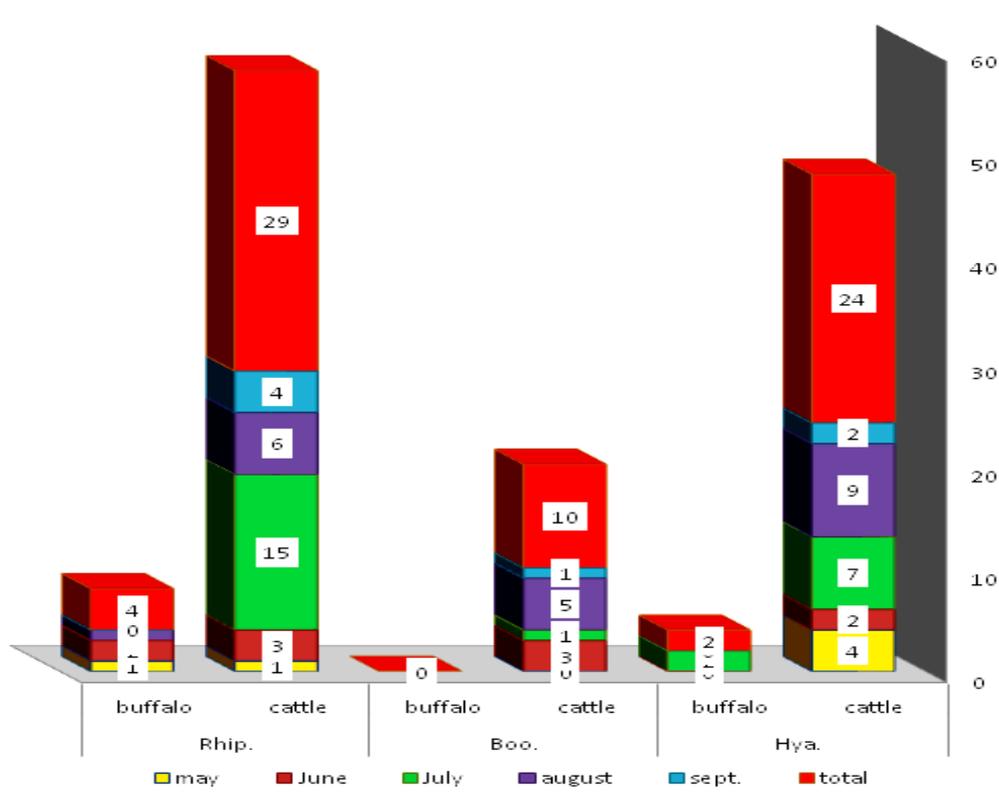


Fig.(4): shows numbers of infested animals with ticks genera and within months.

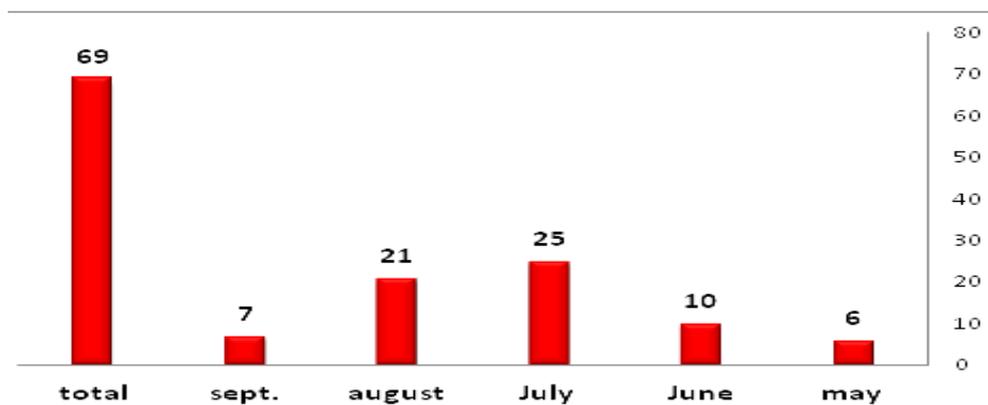


Fig.(5): shows sum of infested animals within months.

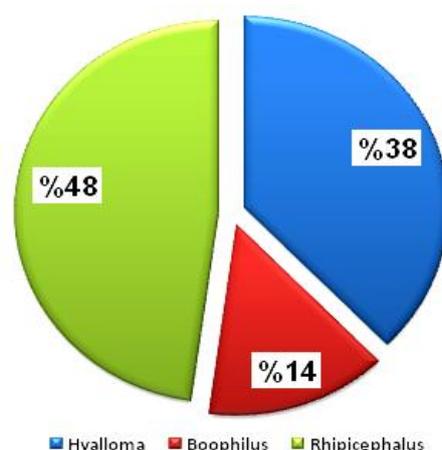


Fig. (6): No. & % of infested animals with ticks genera.

Discussion:

It was concluded that the total prevalence of ectoparasites in cows (91.3%) was higher than in buffaloes (8.7%) with significant P-Value ≤ 0.002 in our study, it could be due to differences in feeding habits and hygienic habitats of the two species⁽²⁰⁾; And could be also as suggested by⁽²¹⁾, resistance to infestation observed, that the water buffalo is somewhat less suitable than the bovine as a host for *R. microplus* ticks; A possible explanation could be the thick skin of the buffalo that reduces the ability of these ticks to attach because of their short hypostome, as inflammatory reactions observed in this work, the buffalo immune system appears to be more reactive than that of the bovine to tick saliva allergenic

components. Under natural conditions, an additional constraint for tick infestation of buffaloes might be associated to their habit of spending considerable time immersed in water or rolling in the mud, which constitutes a natural means of controlling ectoparasites.

There was non significant difference P-Value ≥ 0.102 between infested cattle and buffaloes by different tick genera; beside there was non significant difference P-Value ≥ 0.143 between the infested cattle and buffaloes in the different cities; Although results revealed that, cattle had highest infestation (27.5%) with *Rhipicephalus* ticks, (17.4%) with *Hyalomma* ticks, and (8.9%) with *Boophilus* ticks, while buffaloes had

highest infestation (4.4%) with *Rhipicephalus* and (2.9 %) with *Hyalomma* in Sewara city ; followed by cattle (7.2%) with *Hyalomma* in both Azizia and Shuhimiya , while cattle (5.8 %) with *Rhipicephalus* in Shuhimiya ; these non significant variation in tick prevalence in different areas can be attributed to a variety of factors like geo climatic conditions, association and life style of different species of animals, awareness/ education of the farmers and farm management practices⁽²²⁾ .

According to total numbers of infested cattle and buffaloes with genera of ticks *Hyalomma* (38 %), *Boophilus* (14%) and *Rhipicephalus* (48%) (with exception of genus *Boophilus* in buffaloes) in our results , disagreed with⁽²³⁾ , in that cattle and sheep in Baghdad encountered tick genera of (*Hyalomma* 70%, *Rhipicephalus* 25% and *Boophilus* 5%), this diversity could be attributed to the climatic conditions in Wasit which had low mean temp. degree with somewhat high precipitation (water vapor) among months April , May , July , August , September if compared with Baghdad climate ; and also disagreed with both⁽²⁴⁾ , who stated that in the frontier region of Peshawar, Pakistan, water buffaloes were found to be parasitized by ticks of the genera *Boophilus* sp., *Hyalomma* sp. And *Rhipicephalus* sp., with percentages of parasitized animals of 53%, 31% and 24% , and with⁽²²⁾, (1993) who found that, ticks of the genus *Hyalomma* were the most prevalent in cattle and buffalo, followed by those belonging to *Boophilus* in Faisalabad (Pakistan). ; all these ticks diversity more likely due to geo climatic conditions differences.

Results revealed that; There was significant difference P-Value ≤ 0.002 between the distribution of the different tick genera that infests cattle and buffaloes among different months of the research; and also there was significant difference P-Value ≤ 0.009 between distribution of

infested cattle and buffaloes by the different tick genera among months i.e. The infestation was highest in July then August, (36.2%), (30.4%) respectively, while lowest infestation (8.7%) in May. These findings generally agreed with⁽²⁵⁾ , who recorded that in Pakistan, The high prevalence rate during (May-July) may be attributed to hot and humid during these months; and with⁽²⁶⁾ , consideration as prevalence of tick's infestation is influenced by temperature, rainfall and relative humidity; that Hot and humid season favors the propagation and multiplication of ticks

All cattle and buffaloes (with exception of genus *Boophilus*) in this study were infested with 12 species and subspecies ; they were recorded and identified in favour of *Hyalomma* from May to September hot months of the study; these results agreed with⁽⁹⁾ ;While disagreed with⁽²⁷⁾ result's in Basrah , by our records which showed that *Rhipicephalus turanicus*; *R. bursa*; *R. sanguineus*; were found to infest cattle and buffaloes in Wasit's districts .

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