



Prevalence of Hard Ticks on Cattles in An-Najaf Province, Iraq

Rafal Haider Al-Ebrahemi¹ and Malak Majid Almusawi²

Department of Biology, Faculty of Education for Girls, University of Kufa, Najaf, Iraq.

¹Corresponding E-mail: hydrfl9@gmail.com.

ABSTRACT

The current study was conducted in An-Najaf province during the period from March 2022 to August 2022, to identify hard ticks spread among the cattle's (sheep, goats, cows and buffaloes). Two genera of hard ticks were recorded: *Hyalomma* & *Rhipicephalus*. The highest infestation rate was in sheep (41%), while the lowest infestation rate was in buffaloes (12%). July was the highest infestation rate of cattle (80%), as high temperatures had an effect on the increase in the spread of ticks and the infestation of cattle's.

Keywords: Tick, Al-Haydariyya, Al-Barakiyah and Al-Issa, *Hyalomma* & *Rhipicephalus*.

INTRODUCTION

Ticks are ectoparasitic arthropods, all of them feed on vertebrates' blood. They can attack many different hosts, including mammals, birds, reptiles, and amphibians. Blood-sucking ticks ectoparasitize on cattle; causing transmission of various infectious agents (1). There are three families of living ticks: the argasidae (soft ticks), ixodidae (hard ticks) and nuttalliellidae (nuttalliellid ticks). The family ixodidae, the hard ticks, comprises Metastriata and Prostriata with a total of 702 currently recognized species whereas the argasidae comprises 193 described species and the Nuttalliellidae has just one known species (2). The family of Ixodidae has known a hard tick because they present dorsal plate or scutum. There is a remarkable sexual dimorphism, and the posterior border of opisthosoma can be divided into sclerotized structures called festoons (3). The hard ticks have a life cycle that includes stages, including the egg, larva, nymph, and then adult, and it is considered adults of both sexes, and also both larvae and nymphs are blood feeders, and the blood meal of the tick is essential for the maturation and laying of eggs (4).

MATERIALS & METHODS

Tick Samples Collection & Identification: About 468 hard tick samples were collected from tick-infested cattles (43 sheep, 31 goats, 40 cows & 11 buffaloes), in the period from March 2022 to August 2022. After confirmation of ticks' infestation with the help of a veterinarians, the ticks were collected from four areas of the animal's body (head, ear, penis, twist, inguinal, rear udder, hook & tail). Fine tip tweezers & medical cotton impregnated with alcohol were used for gathering and picking up ticks from the animal's body, considering caution to avoid ticks damage. Ticks were placed in clean sterile plastic tubes containing 70% ethanol. These tubes were labelled (date and place of sample collection, the host from which the sample was taken). Instructions for collecting hard ticks from cattle by (5). Then, the samples were transferred to the Insects & Parasitology Laboratory at the Faculty of Education for Girls/ University of Kufa. Tick samples were phenotypically examined via dissecting microscope with a magnification of 4X. To confirm the diagnosis, some samples were sent to the Research Center of Natural History Museum/ University of Baghdad, & diagnosis was documented by Prof. Dr. Afkar Muslim Hadi/ Head of Vertebrate Department/ Iraq Natural History Research Center & Museum. The hard ticks' phenotype was studied using a dissecting microscope with a magnification power 4X. Classification at genus &

species levels were established according to their morphological features such as the mouth parts, the scutum, color of the legs, the festoons, presence or absence of the grooves, number of posterior ridges, shape of end adanal plates (6,7).

RESULTS & DISCUSSION

In this study, about 468 samples of hard ticks were collected from naturally infested hosts (sheep-goats- cows- buffaloes) from various places in Najaf province. The tick samples were taxonomic keys-aid diagnosed (7) in the Entomology Lab. for postgraduate studies of Dept. of Biology/ Faculty of Education for Girls/ University of Kufa, using a dissecting microscope with a power of 4X magnification. Also phenotypic diagnosis has been confirmed by the Iraq Natural History Research Center & Museum , the current study found Two genera of Hard ticks (as shown in Fig.1) *Hyalomma* (54.4%) & *Rhipicephalus* (45.4%), including 5 species & 3 species respectively.

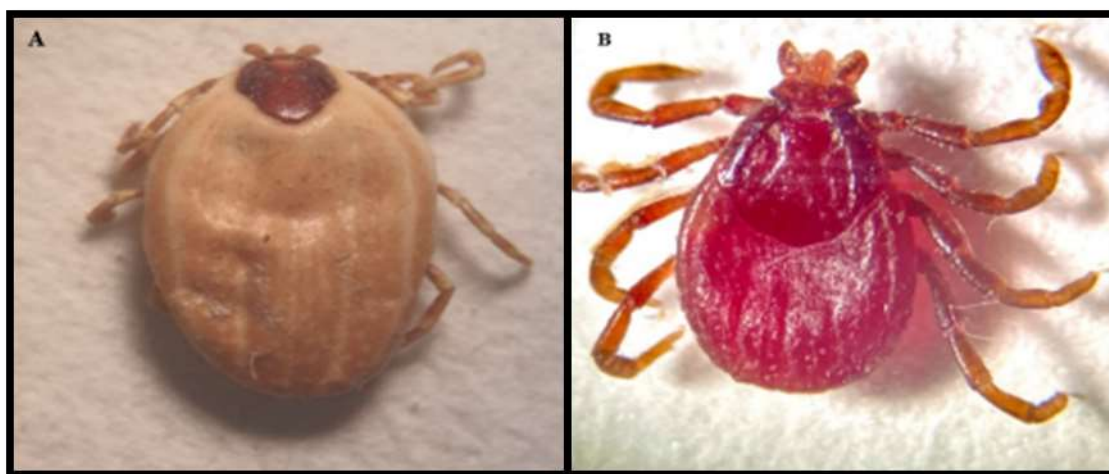


Fig. (1): A/ *Hyalomma* spp. Female Dorsal View. B/ *Rhipicephalus* spp. Female Dorsal View.

Table (1): Hard ticks' Frequency in Cattle's Aaccording to Study Months.

Months	No. of hard ticks in the hosts								Total	
	Sheep		Goats		Cows		Buffaloes			
	N	%	N	%	N	%	N	%	N	%
March	0	0.0	64	73.6	0	0.0	0	0.0	64	13.7
April	0	0.0	18	20.7	26	19.3	0	0.0	44	9.4
May	56	29.5	5	5.7	0	0.0	0	0.0	61	13.0
June	37	19.5	0	0.0	9	6.7	36	64.3	82	17.5
July	75	39.5	0	0.0	20	14.8	20	35.7	115	24.6
August	22	11.6	0	0.0	80	59.3	0	0.0	102	21.8
Total	190	41	87	19	135	29	56	12	468	100
Statistical value	$\chi^2 = 665.43$ p-value=0.0001 *									

*Significant differences at p-value <0.05.

According to table (1), a significant statistical difference appeared based on study months. Hard ticks' rates on sheep were the highest; contrariwise to buffaloes. This may be returns to the large numbers of sheep in barns as well as of lack of sanitation and good ventilation inside the barns. Also, buffalo skin and its behavior in rubbing the body against the walls may reduce tick infestation. This result agreed with a study's findings by (8), sheep and goats were more severely affected than cattle (36.76, 22.15, and 3.53% infestation, respectively) in Southwest of Iran. Also with what was found by (9) that the infestation was high in sheep and less in buffaloes. (10) also recorded that 70% of sheep in Diwaniyah province were infested with ticks recorded 80% of the cases sheep in central and southern Iraq (11). It was also found that the proportion of (12) 67% of the livestock in the province of Najaf Infested with hard ticks.

Table (2): Hard ticks' frequency in cattle's according to study areas.

Hosts	No. of hard ticks in study areas						Total		Statistical value $\chi^2 = 85.959^*$
	Al-Haydariya		Al- Barakiya		Al-Issa				
	N	%	N	%	N	%	N	%	
Sheep	22	11.6	0	0.0	168	88.4	190	100	
Goats	23	26.4	64	73.6	0	0.0	87	100	
Cows	135	100	0	0.0	0	0.0	135	100	
Buffaloes	56	100	0	0.0	0	0.0	56	100	
Total	236	50.4	64	13.7	168	35.9	468	100	

***Significant differences at p-value <0.05.**

As a result of this table, Al-Haydaria region has highest tick infestation rate (50.4%), while the lowest rate was in Al-Barakiyah region (13.7%). This result has a significant statistically difference ($\chi^2 = 685.959$). The reason for the high infestation rate in the Al-Haydariya area may be due to the lack of prevention methods used in it, the lack of use of pesticides to combat ticks, as well as the lack of private veterinary clinics concerned with animal health and the lack of awareness of breeders. As for the decrease in infestation in the Al-Issa and Al-Barakiya areas, due to the use of pesticides and different methods of prevention in addition to the presence of a veterinary hospital and private clinics concerned with animal health, through which it is provided educate them about animal welfare

Table (3): Hard tick Genera on the Infested Hosts.

Hosts	Genus				Total		Statistical value
	<i>Hyalomma spp.</i>		<i>Rhipicephalus spp.</i>				
	N	%	N	%	N	%	
Sheep	38	20.0	152	80.0	190	100	$\chi^2 = 288.743$ p-value=0.0001 *
Goats	18	20.7	69	79.3	87	100	
Cows	135	100	0	0.0	135	100	
Buffaloes	56	100	0	0.0	56	100	
Total	247	52.8	221	47.2	468	100	

***Significant differences at p-value <0.05.**

Table (3) shows a high percentage of *Hyalomma*, which recorded 52.8%, followed by *Rhipicephalus* which accounted for 47.2% with a significant statistical difference. $\chi^2 = 288.743$. The above table showed a high infestation of *Hyalomma spp.* Perhaps this is due to the fact that *Hyalomma* predominates may be related to their capacity to tolerate the hot, dry environment with few hiding places (13), and diversity of hosts that parasitize it, and resistance to some insecticides (14). Other studies found that the hard ticks which parasitize livestock cattle in Iran (15), and in Wasit governorate (16) were either *Hyalomma* or *Rhipicephalus*. Another study done by (9) appeared recording 5 species of *Hyalomma* and one species of *Rhipicephalus* in Thi-Qar province. In study done by (17) in Balochistan, Pakistan recorded two genera of the ticks were *Hyalomma* and *Rhipicephalus*. Infestation of *Hyalomma* species was higher than that of *Rhipicephalus* species. This study agreed with (18) as they indicated to diagnosis of three species of ticks that parasitize on buffaloes in Samarra, all of them are of the genus *Hyalomma spp.* (19) in Najaf province found *Rhipicephalus sanguineus* were lived on sheep and goat's percentage (7.85) %. study done by(8) showed spread of the species *Hyalomma spp.* & *Rhipicephalu spp.* in the west of Iran. Other studies recorded infestations with otherwise hard ticks: *Boophilus* & *Amblyomma* were conducted on sheep in the central regions of Iraq (11). In south- eastern Uganda, the predominant tick species on cattles were *Rhipicephalus appendiculatus*, *Amblyomma variegatum*, *Rhipicephalus evertsi* & *Rhipicephalus microplus*. (20). Six species of ticks from the genus *Hyalomma* were found on the infected animals, in Thi-Qar and Al-Muthanna Provinces/Iraq (21).

Table (4): Hard ticks' Frequency Distribution on the Infested Hosts Body Regions.

Hosts body regions	Hosts								Total	
	Sheep		Goats		Cows		Buffaloes			
	N	%	N	%	N	%	N	%	N	%
Ear	44	23.2	38	43.7	0	0	14	25.0	96	20.5
Inguinal	0	0	0	0	66	48.9	0	0	66	14.1
Hook	0	0	0	0	26	19.3	0	0	26	5.6
Penis	0	0	0	0	0	0	42	75.0	42	9.0
Rear udder	0	0	0	0	16	11.9	0	0	16	3.4
Tail	0	0	0	0	27	20.0	0	0	27	5.8
Twist	146	76.8	49	56.3	0	0	0	0	195	41.7
Total	190	100	87	100	135	100	56	100	468	100
Statistical value	$\chi^2 = 834.139^*$ p-value=0.0001									

*Significant differences at p-value <0.05.

Table (4) shows total of hard tick samples 468 parasitizing cattle were collected from different body regions of the host. The results of the statistical analysis were significant differences among infestation rates of cattle hard ticks according to different parts of the body. ($\chi^2 = 834.139$, p-value = 0.0001). The figure above shows a high rate of infestation according to body region in sheep & cow, the reason for the high rate of infestation may be in the areas (twist) and (inguinal) because some ticks are opportunistic feeders on several different hosts, many will target a specific host, & a large number of the research showed animals tick infestations in several body regions, particularly the udder, perineum, and hind limbs. According to these findings, hard ticks' infestation rates attach more frequently in the hind limbs and udder because these areas are close to the ground (22). Perhaps the reason for ticks preferring the udder area or twist, it is one of the areas close to the surface of the earth, so ticks infect these areas when the animal lies down or sleeps on the ground. In the ear region, the presence of blood vessels closes to the surface of the skin, which provides high supply to the region in addition to the thinness of the skin layers (23). This result agreed with result by (16) which recorded high infestation in perineal region and udder region and lower infestation in ear, testis & neck. This study disagreed with what was found by (24) when they recorded the highest incidence of infestation in the ear region by 85% and the lowest incidence in the lists region by 5.1%, and there was no infestation in the chest region. These percentages were disagreeing with what was found by (25), where it was recorded that the percentage of Infestation in sheep in the head region is 13.3%, the tail region 3% and the udder 03%.

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