

INVESTIGATION OF SOME TICK SPECIES OF CATTLE AND BUFFALOES IN ISMAILIA GOVERNORATE

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Abstract

This study was carried out on 5515 adult tick individuals. They were randomly collected from native, cross breed cows, buffaloes and Friesian cows as well as their calves from private farms in Ismailia Governorate during cold (October 1999 to February 2000) and hot (April 2000 to August 2000) seasons. Identification of tick individuals during cold season revealed that 81% were belonging to *Boophilus annulatus*, 1.6% were related to *Hyalomma dromedarii* and 17.4% were of *Hyalomma anatolicum*. In the hot season, 22.7% were belonging to *B. annulatus*, 43.7% to *H. dromedarii* and 33.5% were related to *H. anatolicum*. The veterinary importance of such species of ticks was discussed.

INTRODUCTION

Members of the Family *Ixodidae* are large blood-sucking Acarina, among which are hard ticks. There are 11 genera of such ticks of veterinary importance. During sucking blood, ticks may cause many injuries to their hosts, as well as, they may transmit various protozoal diseases to the parasitized animal. Ticks attach themselves to different parts on the animal body, as eye lids, ears, under the tail region and around testis and udder. Among the most important protozoa in which ticks play an essential role in their transmission are *Babesia*, *Theileria* and *Anaplasma* spp. These protozoal infections constitute major problems that threaten our livestock, especially cattle, buffaloes and camels. Infected animal becomes weak emaciated and may die due to severe infestation. In addition, tick bite may predispose the host to be attacked by blowflies, screw-worm and biting flies, as well, ticks may cause tick paralysis and tick toxicosis due to toxins secreted by certain species of ticks. Among the most important *Ixodidae* species are *Boophilus* spp. and *Hyalomma* spp.

Boophilus spp. are the most important ticks that affect domestic cattle in the middle east, Mediterranean basin and humid West Africa (Fisher and Say, 1989). They play an essential role in transmitting *Babesia* spp. As well, *Hyalomma* spp. are moderately large ticks. They are important vectors in the transmission of *Theileria* spp. to

both cattle and camel (Magda El-Refaii *et al.*, 1998).

The aim of the present study was to give a spotlight on the important tick species parasitizing cows, buffaloes and calves in Ismailia Governorate.

MATERIALS AND METHODS

Tick individuals were collected from private farms that had problems of tick infestation during two seasonal periods, from October 1999 to February 2000 (cold season) and from April 2000 to August 2000 (hot season) from different villages in Ismailia Governorate.

Individuals of 1216 adult ticks were randomly collected during the cold season from 16, 13, 18, 6, 3, 3 and 6 infested native and cross breed cows, buffaloes, Friesian, native and cross breed calves and buffalo calves, respectively. Also, individuals of 4299 adult ticks were randomly collected during the hot season from the same species of animals of 20, 8, 6, 12, 4, 5, and 3 respectively.

Tick individuals of each animal were carefully collected in glass jar by special forceps from predilection sites of each animal and preserved in 70% ethanol. These ticks were then identified according to Hoogstraal and Kaiser (1958) and Soulsby (1982). The results were statistically analysed according to SPSS Win. Version 8.

RESULTS

A total of 5515 adult tick species were collected. Table 1 shows that, out of 5515, 1216 tick could be collected during the cold season. Examination of 741 tick individuals out of 1216 revealed that 600 (81%) were belonging to *Boophilus annulatus*, 12 (1.6%) were related to *Hyalomma dromedarii* and 129 (17.4%) were of *Hyalomma anatolicum*.

In the hot season, Table 2 reveals that, out of the 5515, 4299 tick individuals formerly collected, were differentiated. Examination of 1253 individuals out of 4299, revealed that, 285 (22.7%) were belonging to *Boophilus annulatus*, 548 (43.7%) were related to *Hyalomma dromedarii* and 420 (33.5%) were of *Hyalomma anatolicum*.

Examination of adult individuals of ticks revealed the presence of dorsal scutum covering the whole dorsum of males and only small portion behind the head of females,

as well, the mouth parts were terminal and visible from above. These are the characteristic features of hard ticks.

Identification of *Boophilus annulatus* spp. (Figs. 1, 2 and 3) showed that it belonged to Genus *Boophilis*, Family *Ixodidae*, Suborder *Ixodoidea*, Order *Acarina*, Class *Arachnida*. They appeared having short mouth parts, the male had no tail appendage, conscutum was small, yellowish in colour and internal organs could be easily seen, as well, festoons were absent and eyes were present but difficult to be seen.

Identification of *Hyalomma dromedarii* adult male and female spp. (Fig. 4, 5 and 6) showed that they belonged to Genus *Hyalomma*, Family *Ixodidae*, Suborder *Ixodoidea*, Order *Acarina*, Class *Arachnida*. They were characterised by being bont-legged ticks (legs were banded), they possessed long mouth parts and the scutum was longer than wider. As well, punctuations were few, large ones were scattered throughout the scutal surface. The cervical grooves diverged posteriorly and continued with the posterolateral grooves. The genital operculum was narrow and V-shaped, also the hypostome was with dentation.

Identification of *Hyalomma anatolicum* adult male and female spp. (Figs. 7, 8 and 9) showed that they belonged to Genus *Hyalomma*, Family *Ixodidae*, Suborder *Ixodoidea*, Order *Acarina*, Class *Arachnida*. They were characterized by having banded legs and long mouth parts. Eyes were present and beady. Few punctuations were in the middle of scutum and festoons were absent. The lateral grooves were short and did not reach to the mid third of scutal surface. The cervical grooves were shallow and short. Also, coxa I was bifid and internal spur was wider than external one. The genital operculum was small, short and located between coax I and II.

DISCUSSION

Ticks are obligatory blood sucking ectoparasites of most vertebrates. They transmit a large number and a variety of infectious agents. The most important protozoa that can be transmitted by ticks are: *Theileria*, *Babesia* and *Anaplasma* spp. The developmental stages of *Theileria camelensis* infecting camel were detected in the gut and salivary glands of *Hyalomma dromedarii* (Magda El-Refaii *et al.*, 1998). The most prevalent tick species infesting cows and buffaloes encountered during this study in Ismailia Governorate were *Boophilus annulatus*, *Hyalomma dromedarii* and *Hyalomma anatolicum*. *Boophilus annulatus* is the specific vector of red water fever to cattle and buf-

Table 1. The effect of cold season on the mean value of the total number, types and percentage of tick infestation in cattle and buffaloes in Ismailia.

Animal species	Total number of infected animals	Number of examined tick samples	Numbers and types of tick			Total tick burdens	Number of ticks per animal
			<i>Boophilus annulatus</i>	<i>Hyalomma dromedarii</i>	<i>Hyalomma anatolicum</i>		
Native cow	16	265	191	--	74	370	23.12±2.2
Cross breed cow	13	140	125	--	15	256	19.69±2.86
Buffaloes	18	118	66	12	40	198	11.0±0.93
Friesian cow	6	80	80	--	--	116	19.33±1.17
Native calves	3	36	36	--	--	89	29.5±1.8
Cross breed calves	3	35	35	--	--	82	27.33±1.4
Buffalo calves	6	67	67	--	--	105	17.5±1.78
Total	65	741	600 (81%)	12 (1.6%)	129 (17.4%)	1216	

Table 2. The effect of hot season on the mean value of the total number, types and percentage of tick infestation in cattle and buffaloes in Ismailia.

Animal species	Total number of infected animals	Number of examined tick samples	Numbers and types of tick			Total tick burdens	Number of ticks per animal
			<i>Boophilus annulatus</i>	<i>Hyalomma dromedarii</i>	<i>Hyalomma anatolicum</i>		
Native cow	20	413	110	134	169	1446	72.3±5.3
Cross breed cow	8	190	46	109	35	618	77.25±4.2
Buffaloes	6	120	30	35	55	289	48.16±3.1
Friesian cow	12	247	45	147	55	985	82.08±3.50
Native calves	4	109	17	52	40	421	105.25±5.52
Cross breed calves	5	114	25	23	66	392	78.4±5.2
Buffalo calves	3	60	12	48	-	148	49.33±2.2
Total	58	1253	285 (22.7%)	548 (43.7%)	420 (33.5%)	4299	



Fig. 1. Adult male *Boophilus annulatus* spp.



Fig. 2. Adult female *Boophilus annulatus* spp.



Fig. 1. Anterior part of adult *Boophilus annulatus* spp. showing the short mouth parts.



Fig. 4. Adult male *Hyalomma dromedarii* spp.



Fig. 5. Adult engorged female *Hyalomma dromedarii* spp.



Fig. 6. Anterior part of adult male *Hyalomma dromedarii* spp. showing the long mouth parts.



Fig. 7. Adult male *Hyalomma anatolicum*.

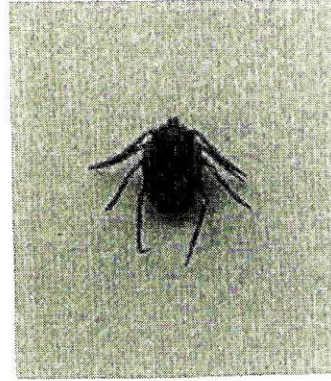


Fig. 8. Adult female *Hyalomma anatolicum* spp.



Fig. 6. Anterior part of adult *Hyalomma anatolicum*. showing long mouth parts.

faloes in Egypt, whereas *Hyalomma dromedarii* are vectors of Egyptian fever to cattle.

In Egypt, Eisa *et al.* (1999), found that *Hyalomma* spp. infesting sheep and cattle can transmit Rift Valley Fever. In the Merck Vet. Manual (1991), it was stated that *Boophilus annulatus* was recorded in the Mediterranean area, and *Hyalomma* spp. was found infesting camels and other livestock in Egypt. It was also stated that, *Hyalomma anatolicum* was localized and abundant on the banks of River Nile and its Delta.

Regarding the distribution of different tick species in Ismailia Governorate during cold and hot seasons, both adult cows and buffaloes, as well as their calves, were found to be infested with all recovered tick species, but with different susceptibility. This may be attributed to the meteorological conditions, crowding, animal breed and/or nutritional condition (Soulsby, 1982). In addition, the geographical position in Ismailia Governorate, being a semi-desert, has an effect of the breed of ticks.

During cold season, animals showed high degree of infestation with *Boophilus annulatus* more than *H. dromedarii* and *H. anatolicum* (81%, 1.6% and 17.4%, respectively). This may explain that this species is more adapted to the cold weather in Ismailia Governorate, than the other two species, thus, the transmission of *Babesia* spp. among its animals. Fischer and Say (1989) stated that the one-host cycle as *Boophilus* was completed in the cold season (November - February) to ensure the survival of the different developmental stages.

In the present study, both *H. dromedarii* and *H. anatolicum* were more abundant than *Boophilus* during the hot season (43.7%, 33.5% and 22.7%, respectively). These species are much adapted to the desert and semi-desert areas which are available in Ismailia Governorate, thus, transmission of *Theileria* species to cattle and camels distributed there. Fisher and Say (1989) agreed that *Hyalomma* was active during the hot season (April - October). They stated that, the fall temperature in winter checked the development of *Hyalomma* at the engorged nymph stage. Then, the infected nymph became quiescent, dropped off the animal and began development again in the following spring.

From the above studies, due to the different species of ticks encountered, it must be borne in mind that control of these ticks off the animals depends largely on the species of ticks to be controlled. We have at first to differentiate between, one- two- or three-host ticks. Accordingly, further survey studies on the piroplasmic diseases endemic among livestock in this Egyptian area are needed.

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استبيان أنواع القراد التى تصيب الأبقار والجاموس بمحافظة الإسماعيلية

أحمد أنور وهبة ، ماجدة عبد الحى الرفاعى ، ماجدة صبرى شبانة ، محمد كمال مرسى

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أجريت هذه الدراسة لاستبيان أنواع القراد المختلفة التى تصيب الأبقار والجاموس بمحافظة الإسماعيلية. تم تجميع ٥٥١٥ فرداً من القراد البالغ من الأبقار المحلى والخليط والجاموس والفريزيان وكذلك من عجول هذه الحيوانات. وقد تمت هذه الدراسة خلال الموسم البارد (أكتوبر ١٩٩٩ إلى فبراير ٢٠٠٠) وكذلك الموسم الحار (إبريل ٢٠٠٠ إلى أغسطس ٢٠٠٠). تم تصنيف القراد ووجد أن ٨١٪ من نوع يوفيلس أنيوليتس، ١٦،٦٪ هيالوما دروميديارى و ١٧،٤٪ هيالوما أناتوليكم وذلك خلال الموسم البارد، فى حين أن ٢٢،٧٪ من القراد كان من نوع يوفيلس أنيوليتس، ٤٣،٧٪ من نوع هيالوما دروميديارى و ٣٣،٥٪ ينتمى إلى نوع هيالوما أناتوليكم وذلك خلال الموسم الحار. وقد تم مناقشة الأهمية الصحية لهذه الأنواع من القراد وأثرها على الأبقار والجاموس.