

## The Seasonal activity of *Rhipicephalus bursa* in Cattle in Amol (Northern Iran)

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**Abstract:** Being pathogen transferring animals, ticks transfer many species of viruses, rickettsiae, bacteria and protozoa to humans and animals especially pure farm animal races and it is a considerable issue in animal husbandry economics. *Rhipicephalus bursa* is one of the hard tick species which has an important role in transferring different diseases to farm animals. The present research studies the seasonal activity changes of *Rhipicephalus bursa* in Amol (northern Iran). The results of this research show that *Rhipicephalus bursa* is one of the common species in this city and its activity in cattle starts with the beginning of the warm months of the year (May) and reaches a peak in midsummer and reaches an ends in the beginning of fall. Moreover, the results of dragging in the involved area is almost compatible with the results of collecting ticks from the body of ruminants and reveal that the activity of the larvae stage activity of *Rhipicephalus bursa* starts in June and continues until September.

**Key words:** *Rhipicephalus bursa* • Seasonal activity • Cattle • Amol

### INTRODUCTION

Problems and diseases arthropods caused for human and timid farm animals can be counted as the worst disasters in history. Although the human knowledge of insects, ticks, mites and the transferred pathogens has increased in the last 20-30 years and achievements which caused arthropods to draw back in some cases have been made in controlling arthropods by doctors and vets, human could not overcome these factors and the transferred diseases completely. Ticks play an important role as a major member of arthropods in this respect [1]. As pathogen transferring animals, ticks transfer many different species of viruses, rickettsiae, bacteria and protozoa to humans and animals especially pure farm animal races and it is a considerable issue in animal husbandry economics [2]. *Rhipicephalus bursa* (Canestrini and Fanzago, 1877) is one of the hard tick species which has an important role in transferring different diseases to animals. This plays a role in transferring anaplasma marginale and babesia bigemum to farm animals and babesia motasi and babesia ovis to sheep. This tick also transfers the protozoon babesia cabali to horses experimentally [3]. Generally, the climatic conditions in have made it possible for different ticks,

parasite species and pathogens to grow well in different parts of this large country [4]. Many researches have been carried out so far on the Fon of farm animals in Iran and Mazandaran. Razavi *et al* showed in a study that only 14.66 percent of the ticks collected from the body of cattle in Amol were of *Rhipicephalus bursa* type [5]. In another study conducted in the kelardasht region (chaloos, Mazandaran provinces), 22.3 percent of the 798 collected ticks belong to the *Rhipicephalus bursa* population [6]. also in another study conducted in the northern provinces of Iran, 4.56 percent of the 1720 collected ticks belong to the *Rhipicephalus bursa* population [7]. The important point concerning the previous researches in Mazandaran is that there is statement on the monthly or seasonal activity of farm animal ticks population although some researches in Iran especially in Azerbaijan Gharbi Province have mentioned the seasonal activity of some common ticks [8-10]. Given that the ecological knowledge of disease transferring factors is an essential and basic issue to fight them [11], the present research studied the seasonal activity changes of *Rhipicephalus bursa*. Clearly, the results of this study can help us how to plan to fight this parasite factor and the diseases it transfers.

## MATERIALS AND METHODS

Amol is 3185 square meter big in the center of Mazandaran Province (northern Iran) and located in a geographical position of 35°59'.41" northern latitude and 52°30'.18" eastern longitude. Therefore, a fairly vast pasture in Amol countryside (Mazandaran) which had the potential for a considerable number of cattle and sheep to graze was chosen. The farm animals were kept in the traditional way and grazed along a radius of five to seven km on the pasture. Sampling in the target area was done from the skin of 130 cattle constantly every month during a year (Oct 2009-Sept 2010). Simultaneous with the animals' body surfaces, dragging was done over an area of 250 square meters in W or Z shape [12-14]. Hence, a white denim blanket of 100 cm at 60 cm was used [15]. Having taken the tick off the blankets or animal skins using forceps, he collected ticks were placed in jars containing 70% alcohol and 5% glycerin according to the features of the animals and the pasture and were then sent to the parasitology laboratory. Ticks were identified then according to the morphological structures mentioned by Estrada-Pena [16].

## RESULTS

The monthly search for adult *Rhipicephalus bursa* for a year from October 2009 to September 2010 was done on the body surface of farm animals (cattle) in Amol. Table 1 shows the number *Rhipicephalus bursa* ticks in cattle for every month in Amol. According to this table, the infestation with the adult *Rhipicephalus bursa* tick in

Table 1: The number of adult *Rhipicephalus bursa* ticks in cattle in the involved geographical area in Amol from October 2009 to September 2010

Month	Cattle infestation (%)	Case	Average number of ticks	Range
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	0	0	0	0
May	20	26	1	2-Jan
June	40	52	2	3-Jan
July	90	117	3	4-Jan
August	90	117	2	4-Jan
September	60	78	2	3-Jan

cattle starts in May and continues until September. The highest average number of adult *Rhipicephalus bursa* in each animal occurred during July and August. No adult tick was separated during fall and winter months. The results also show that the infestation rate (outbreak) with the adults *Rhipicephalus bursa* has increased during the spring and reached a peak in July and August. Then it started to fall and reach a infestation of zero in fall. Diagram 1 shows the average monthly changes of the adult *Rhipicephalus bursa* as well as the cattle infestation rate in the involved area. As it can be seen, the average number of *Rhipicephalus bursa* and the cattle infestation percentage increases by temperature and reaches its peak in midsummer but moves towards zero with the beginning of the fall.

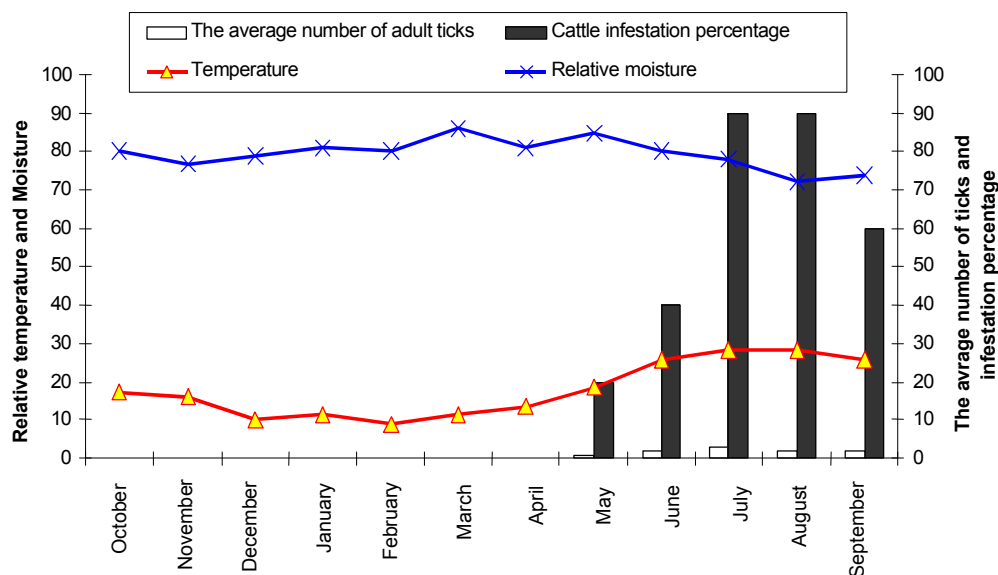


Diagram 1: The monthly frequency of adult *Rhipicephalus bursa* in cattle in amol from October 2009 to September 2010

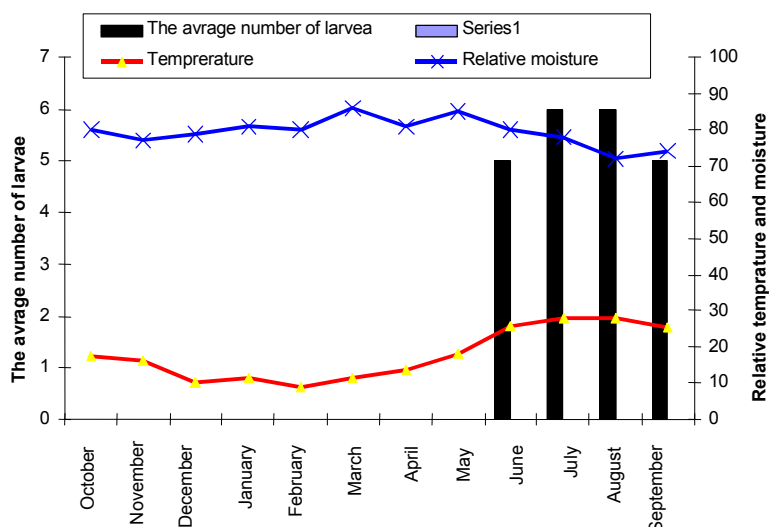


Diagram 2: The result of dragging and the number of larvae in 10 meter of squares of pastuer in amol from october 2009 to september 2010

Simultaneous with sampling the animals' body surface, the activity of the different stages of *Rhipicephalus bursa* tick's life in that pasture was studied through dragging method in the pasture. The results reveal that only the active larvae population of this tick in the pasture starts in June with a rising trend and reach its population peak in July and August and ends in September (Diagram 2).

## DISCUSSION

In this research, the *Rhipicephalus bursa* tick was separated from the body surface of cattle in Amol. Hence, *Rhipicephalus bursa* is one of the common tick species in Amol. The studies carried out before on hard ticks in Iran and Mazandaran indicate that *Rhipicephalus bursa* is active in the coasts of the Caspian Sea and generally in northern and northwestern Iran with regard to its biological features [4, 9, 17, 18]. Rahbari *et al* called this species the most frequent species of *Rhipicephalus* type in Iran [19]. According to Mazlom, Abbasian and Lintzen, this tick is not found in south and southeastern Iran and its population is limited to the northern half the country [4, 17]. Sezavar Keshavarz and Zarif *et al* could not find this tick in their researches in Shiraz and Bushehr [20, 21]. It is interesting to know that both of the mentioned areas are located in the southern half of the country and their findings this confirm Mazlom and Abbasian's results stating the absence of this tick in the southern half. Most *Rhipicephalus* species live in tropical areas and a few of them live in the tropical and hot climate in the eastern and polar areas of the old world [3].

According to Diagram 1, the activity of the adult tick of this species in Amol starts in early spring and reaches its in July and August but starts to fall then. given the fact that most *Rhipicephalus* species like *Rhipicephalus bursa* live in the hot and humid areas of the world and with regard to the ecological conditions of Amol (hot and humid summers), it is expected that the activity of this tick species is limited to the cold months of the year and its activity end in cold months. The results of this research conform to the results of the studies by other researchers to some extent [22]. Papazahaiaidou *et al* showed that the activity of the adult stage ticks of this species in Greece starts in June and continues until August [23]. Also, Yeruham *et al* (1999) showed in a research in Israel that the activity of the adult stage ticks of this species starts in April and ends in July [24].

The results of dragging in the involved area conform to the results of collecting ticks from the body surface of farm animals and show that the activity of the larvae stage tick of *Rhipicephalus* starts in June and continues until September (Diagram 2). Regarding that temperature and the average moisture are high from May to September, the weather is suitable for the activity of this tick; hence, larvae stage activity is also observed.

Finally, we can conclude that the activity of *Rhipicephalus bursa* in Mazandaran is limited to the warm seasons (spring and summer). Given the fact the there is enough temperature (over 20 degrees) and moisture (over 70 percent) in warms seasons, spring and summer, we can thus see a wide appearance of *Rhipicephalus bursa* tick in farm animals.

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