Effects of *Rhipicephalus microplus* (Acari: Ixodidae) on Milk Production of Cow of Khyber Pakhtunkhwa, Pakistan

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Abstract: The present study was carried out to determine the ticks *Rhipicephalus microplus* as cause of milk production output. During this study 384 samples of ticks were isolated from buffaloes and cows of various farm houses of Khyber pakhtunkhwa. Ticks were identified on the basis of their morphological features. After that milk production of infested buffaloes and cows were observed and recorded in liters, ANOVAs was applied to analyze the data recorded and it was concluded that the milk production of most of the infested cows was reduced. In infested Sahiwal and Walaeti cows the milk production was decreased by an amount of 1-2 liters as compared to uninfested ones while in the infested Red Sindhi, Dhani and Sahiwal milk yield was decreased by an amount of 0.5 liters as compared to the others ones.

Key words: Cow · Infestation · Ticks

INTRODUCTION

Progressive economic losses to livestock industry is caused due to parasitic diseases which are responsible for lower level of productivity in affected animals [1]. Ticks are ectoparasites of mammal’s bird and reptiles they are obligate, blood sucking arcanides ticks are vector of number of disease including Therelichiosis, Anaplasmosis, Bebesioses, Typhus, Enrlrichiosis, etc [2]. Ticks have haemotophagous mode of nutrition, their blood sucking habit is rapacious so they impoverishes the hosts due to their requirement of lot of blood for rapid development. Due to heavy infestation of ticks, cattle takes more feed for fulfillment of requirement of parasite, then it effects the retarded growth of young ones, they may remain internally weak stunted, thin and production of milk in dairy cows became greatly reduced [3] as compare to winter during the summer ticks prevalence higher [4] more than one genera of ticks were fed on the livestock species. In cattle’s and buffalos, genus *Hyalomma* most prevalent followed by those belonging to *Rhipicephalus* (formerly *Boophilus*) [5].

Highest tick infestation of ticks is found in cattle’s about 20.4%, *Rhipicephalus* (formerly *Boophilus*) having 46.1% infestation including ticks species *Hyalomma* 31.25%, *Rhipicephalus* 17.93%, *Amblyomma* 4.61% reported by [6]. Tick had borne disease effect the cattle improvement of meat and milk production in Italy Sicily [7]. The Genus *Rhipicephalus* (formerly *Boophilus*) hard ticks found in Australia, America, Asia and Africa. Now a day’s *Rhipicephalus* (formerly *Boophilus*) are included in *Rhipicephalus*, are enormously important for the livestock industry in the world. *Rhipicephalus* (formerly *Boophilus*) specie are one host hard ticks affected mainly cattle including buffaloes, cows, antelopes, deer, sheep’s, goat and horses. Birds cats dogs and humans do not affected by *Rhipicephalus* (formerly *Boophilus*). Some important species of *Rhipicephalus* (formerly *Boophilus*) are *Rhipicephalus microplus* is called cattle ticks also called as blue ticks. *Rhipicephalus annulatus* called as American cattle ticks and *Rhipicephalus decoloratus*. It causes the significant economic loses to the livestock industry in turn of production of meat, death of affected animals, decreased m milk yield and damaged hide [8].

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Direct and indirect effect of *R. microplus* on cattle production, direct effect of *R. microplus* are weight loss, damage of leather and irritation, indirect transmission of tick borne pathogens and myasis at the point of bite [9]. *Rhipicephalus (Boophilus) microplus* are the ectoparasites of cattle found the increase infestation of water buffalos by Estrada-Pena et al., [10]. The aim of the research work was to find out the possible solution of milk production in cow and for the removal of ticks too.

**MATERIALS AND METHODS**

**Study Animals:** Cattle found in the study area were infested animals. One hundred and 50 cattle out of 200 of cows and oxen were infested by ticks. Infested cattle were purposively selected based on the accessibility and owner’s willingness to cooperate for this study and examined for the distribution and abundance of ticks and effects of ticks on the milk yield of infested animals. All cattle sampled for this study were kept under extensive management system.

**Study Design:** Study was conducted to scrutinize and investigate the prominent effects of tick on the milk production of infested cows and also the distribution and seasonal abundance of ticks on cows and oxen was studied.

**Sample Treatment:** Tick specimens were collected from the different body parts of cows without damaging their mouthparts using forceps picking them form cow [11] and preserved in 70% ethyl alcohol. Complete verification was maintained for each tick specimen for their source regarding species of the host. Permanent whole mounts of the ticks were prepared following [11]. For identification and morphological characterization of ticks was carried out using a stereoscopic microscope according to the keys given by Kaiser [10] and separate *Rhipicephalus microplus* species.

**Data Analysis:** The data collected from each study animal were recorded properly in a format prepared for this purpose. These data were uploaded into Microsoft Excel 2007 computer program. Using statistical methods tables were arranged. ANOVA was used as a statistical method for making and arranging the data in tables.

**RESULTS**

A total of 200 cows and oxen were investigated for tick infestation in the dairy farms of Khyber pakhtunkhwa. A total of 150 cows and oxen were infested by ticks. *Rhipicephalus microplus* was mostly recorded on infested cows. In male adult animals maximum number of *R. microplus* was recorded i.e. 783 followed by younger ones on which number of *R. microplus* recorded was 213. In young cow’s number of *R. microplus* recorded was 200 while in adult female cows number of tick recorded was 150 ticks.

**Trends Towards Rise in Parasitism**

**Trends Towards Decrease in Milk Production:** A total of 384 samples of ticks were isolated from infested cows and oxen and they were studied, investigated and identified up to specie level. Ticks were studied on the basis of their morphological features and most of the ticks that were recorded belonged to genera *Rhipicephalus* and species *microplus*. Effects of this tick on the infested cows and oxen were investigated and studied and also influences of *R. microplus* on the milk production of cows of KPK were investigated. Results are shown in the tables. In table 3 data about the milk production of cows is scrutinized and investigated. From table 3 it can be shown that infested...
cows yielded less milk as compared to uninfested ones. In infested Sahiwal and Walaeeti cows, the milk production was decreased by an amount of 1-2 liters as compared to uninfested ones while in the infested Red Sindhi, Dhani and Sahiwal milk yield was decreased by an amount of 0.5 liters as compared to the normal ones. Table 2 gives information about the number of *R. microplus* on each animal from March to December. In the months of July and August maximum number of ticks was recorded on younger cows while on adult female cows maximum number of ticks were recorded during the month of September. In male adults maximum number of ticks was recorded during the month of August and in young ones maximum number of ticks were investigated during the month of July.

**DISCUSSION**

The distribution of ticks within a particular habitat depends on many environmental and climatic factors such as atmospheric temperature, annual rainfall and relative humidity (RH), altitude, host vegetation and cover availability[12]. The population of *R. microplus* was mostly consisted of adults, juveniles and calves, adults were more abundant followed by juveniles, more markedly than calves [12].

Ticks comprise a group of arthropods that can be found on cattle and reptiles. These ticks are not usually dangerous to human beings, although they can bite humans, family pets and cattle, but can carry several diseases that can infect humans, such as relapsing fever and western equine encephalitis virus [14]. The results of the present study which was conducted on cows and oxen revealed that most of the cows and oxen were infested by *Rhipicephalus microplus*. These cows and oxen were infected by many diseases such as decreased body weight, tick bite wounds, severe irritation and alopecia [13]. This is in agreement with the studies of Sajid et al. [13] who reported the effects of different ticks on the milk production of local Sahiwal and European breed cows.

Seasonal prevalence of ticks was very much higher during the summer in younger animals and early autumn maximum number of ticks were recorded on male adults, young ones and female adults according to Raad Hammodi Hasson [15], who noted that Prevalence of ticks was higher during the summer season and it is affected by a biotic factors, especially temperature, relative humidity (RH) and rainfall, which are the principal regulators of the longevity and survival of the different stages of the ticks’ life cycle.

Ticks were distributed in different parts of the body of cows and oxen such as ear, ventral abdomen, mammary glands, udder and groin base of the horn, neck, tail and anal area region. Several factors such as interaction between tick species, time and season, host density and inaccessibility for grooming determine the attachment site of ticks [16]. The most prominent effects of ticks on cows that were studied were that on milk production of infested cows. In infested Sahiwal and Walaeeti cows the milk production was decreased by an amount of 1-2 liters as compared to uninfested ones while in the infested Red Sindhi, Dhani and Sahiwal milk yield was decreased by an amount of 0.5 liters as compared to the normal ones. This is in agreement with the studies of Sajid et al. [13] who investigated and reported the effects of different ticks on the milk production of local Sahiwal and European breed cows.

**CONCLUSION**

It was concluded that most of the infested cows were affected by decreased body condition, tick bite wounds, severe irritation and alopecia and also milk yield of most of the infested cows was reduced. *R. microplus* was mostly investigated on the infested cows. This tick was mostly distributed on different organs of infested cows.

**REFERENCES**


