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Determination of pasture infestation with tick larvae

Abstract

Rhipicephalus microplus tick infestations in livestock cause the world's largest ectoparasite problem in tropical and subtropical regions. The fight against ticks must also be carried out taking into account aspects related to the presence of non-parasitic stages in the grass. The integral management of ticks as a control method and the appropriate combination of its components can focus on breaking the balance of these larval populations, which are mainly found in grazing. Basic larval tick population sampling systems have been used for direct manual harvesting from vegetation. The most widely used method has been dragging. The objective of this work is to determine, by means of dragging methods with the flag method, the infestation of the larval stage of ticks, under natural conditions of pasture infestation. The study will be carried out in pastures with an area of 26 hectares, dedicated to grazing, divided into 7 pastures of 3 hectares, where a herd of cattle is exploited. The samples will be obtained crossing the zigzag zone and randomly. In the pastures, transects were drawn along them, the samplings will be carried out during the month of June. From the paddocks reviewed, tick larvae were collected only in two of the 7 reviewed, 91 larvae in one and 6 larvae in another. The larvae were identified as *Rhipicephalus microplus*.

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Introduction

Infestations of the *Rhipicephalus microplus* tick, in cattle, produce the greatest global problem of ectoparasites in tropical and subtropical regions, causing great economic losses in bovine production. The fight against ticks must also be conducted taking into account aspects related to the presence of non-parasitic stages in the grass. The integral management of ticks as a control method and the appropriate combination of its components can focus on breaking the balance of these populations of larvae, which is mainly found in grazing.[1]

In order to establish a control method on the *R. microplus* tick, it is essential to have a program that determines the presence of the phases, both parasitic in the host and non-parasitic in pastures;[2-5] For this, safe and consistent population sampling methods are required. The initial procedure in this program would be to determine the partial population curve of the larval stage of *R. microplus* in the pastures.[6-8]

Basic systems for sampling larval tick populations have been used for direct manual collection of vegetation. The most frequently used method has been dragging.[9] It has been possible to establish that the larval population in the pastures estimated by trawl techniques can be correlated with the parasitic population on the host.[10]

In Mexico, the flag drag technique has been used; however, there are no comparative studies involving different techniques for sampling grasslands infested with the free-living larval stage of *R. microplus*. It is important to point out that ranchers must have a safe, practical, low variability methodology to determine the degree of infestation in pastures, before introducing livestock.[11-14]

The objective of this work is to determine, by dragging methods with the flag method, the infestation of the larval stage of ticks, under natural conditions of pasture infestation.

Materials and methods

The study will be carried out in pastures with an area of 26 hectares, dedicated to grazing, divided into 7 pastures of 3 hectares as averages each, with established grasslands of Mulato, Guinea, and Estrella grass as the predominant ones and among other pastures natural, where a herd of Holstein and Holstein F1 cattle is exploited. The paddocks are fenced with barbed wire, the samples will be obtained by crossing the area in a zigzag and randomly, using the flag method.

Flag technique; consisting of the use of a white cloth of 1.0 m x 90 cm, fixed to the transverse end of a wooden device in the shape of '' T ''. In the paddocks, transects were drawn along their length and width, leaving a corridor of about 50 cm between each transect. The samplings will be carried out during the month of June, at a time when it did not rain in more than 15 consecutive days. The collection of the larvae will be with the help of a magnifying glass and with an adhesive tape, where the larvae will be glued, identifying the tape with the number of the transect traveled, to perform the counting and identification in the laboratory.

Results

The investigation was conducted from June 18 to 24. Of the 7 pastures reviewed, tick larvae were collected only in two (28%), obtaining 91 larvae in one and 6 larvae in another, in the rest no tick larvae were collected (table 1).

Table 1 Findings of larvae in the review of the investigated pastures

Potrero	Larvae quantity	Identification
1	0	-
2	0	-
3	91	*R. microplus*
4 (aéreas del Comedor)	0	-
5 (aéreas del Limón)	0	-
6 (Almacén)	6	*R. microplus*
7 (Finca Vita)	0	-

The larvae were identified as *Rhipicephalus microplus*. The pastures for grazing had a resting time between 3 and 5 months. For tick control in the herd in operation, the rotation of the paddocks was taken into account, taking into account the infested paddocks and

using them strategically to avoid the infestation of the animals and maintain low levels of infestation in the animals.

Conclusions

Two infested pastures of the 7 that were studied were determined, diagnosing the larvae found as *Rhipicephalus microplus*.

Acknowledgments

None.

Conflicts of interest

Authors declare that there is no conflict of interest.

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