DAIRY CATTLE TICK (*BOOPHILUS MICROPLUS)* CONTROL WITH *AZADIRACHTA INDICA* A. JUSS

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Key words: tick, dairy cattle, *Azadirachta indica*

Introduction

Tick (*Boophilus* spp) is a dairy cattle parasite found in all the Latin America countries and in many others of tropical and subtropical regions and known because of the damages it causes to dairy cattle industry, such as weight loss, reduction of milk production and fertility and stress and losses of leather and rise in the cost of medicaments. Besides, a great economic cost for its control and at the same time, important losses of productivity. For many years this insect has been controlled with chemical insecticides, however, most of them have lost efficiency (Schillhorn van Veen, 1997). There are different plants which have potential properties against ticks, for example grasses (Fernandez-Ruvalcaba *et al*., 2003) and neem (*Azadirachta indica*). According to these authors, neem seeds have components such as azadirachtine, salaninne, melantriol and nimbine that can be responsible for its insect control. Plants are different options to chemical control. For this reason they are now being used more commonly to control different parasites. The objective of this research was to evaluate *Azadirachta indica* and *Melia azedarach* seeds macerates to control dairy cattle ticks.

Materials and methods

Experimental site

This research was carried out in Culiacán, Sinaloa, México, at the Faculty of Agronomy of the Universidad Autonoma of Sinaloa, located 24° 48' N latitude and 107° 24' W longitude. Climate is semriarid, 38 meter above sea level, annual rainfall 670 mm (most of it from June to September) and mean annual temperature 24° (Garcìa, 1987).

Animals

Six different ages crossbred brahaman-brown Swiss animals were chosen for the application of treatments and one as control, all of them with tick infestation.

Treatments and experimental design

Four treatments were evaluated: T1 Chemical, alfacipermetrine 5% (Ultimate™), T2 macerated seed extract from neem (*Azadirachta indica)* and T3. paraíso (*Melia azedarach)* and T4 control.

Seed collect and preparation

Seeds were collected from the trees, coat removed and dried at 60° for 48 h and after that, finely grounded. 350 g of neem grounded seeds were added to 7 L of water. For paraíso, 500 g were added to 9 L of water. Both were left at environment temperature for 24 h and finally sieved.

Application of treatments

Animals were totally watered at the beginning of November 2004.

Samplings

Three samplings were made from November 14 to December 4 2004, using an arbitrary nominal scale: Total infestation = 1, Medium infestation = 2, Low infestation = 3, and No infestation = 4.

Variables analyzed

Variables were tick percent of tick control and average area of skin.

Statistical analysis

Data were analyzed using a $\chi 2$ test ($P<0.05$), SAS (1998).

Results

There were no statistical differences for average area of skin after treatments application (Table 1). For percent of tick control, no differences were found between chemical treatment (T1) and neem (T2). Both were better than the control. T1 was 14.2 and 23% better than T3 and T4, and only 10.04 when comparing to T2 (Table 2). T2 was 4 and 13 % better than T3 and T4.

Table 1. Average area of skin and difference among treatments to control tick.

Treatments	Área m^2	Difference	X^2	P=	Significance
Chemical	8.85 [a]	+ 0.290	0.005	0.945	ns
A.. indica	8.56 [a]				
Chemical	8.85 [a]	- 0.910	0.047	0.828	ns
M. azedarach	9.79 [a]				
A. indica	8.56 [a]	- 1.230	0.082	0.774	ns
M. azedarach	9.79 [a]				
Control	11.21 [a]	+ 2.360	0.278	0.598	ns
Chemical	8.85 [a]				
Control	11.21 [a]	+2.650	0.355	0.551	ns
A. indica	8.56 [a]				
Control	11.21 [a]	+ 1.420	0.096	0.757	ns
M. azedarach	9.79 [a]				

X^2 Test (P<0.05)

Table 2. Percent of tick control and difference among treatments

Treatments	%	Difference (%)	X^2	P=	Significance
Chemical	55.2 [a]	+10.4	3.103	0.078	Ss
A. indica	44.8 [a]				
Chemical	57.1 [a]	+ 14.2	5.714	0.017	*
M. azedarach	42.9 [b]				
A. indica	52.0 [a]	+4.0	0.400	0.527	ns
M. azedarach	48.0 [a]				
Control	61.5 [b]	-23.0	13.846	0.001	**
Chemical	38.5 [a]				
Control	43.5 [b]	-13.0	3.913	0.048	*
A. indica	56.5 [a]				
Control	45.5 [a]	-9.0	1.818	0.178	Ns
M. azedarach	54.5 [a]				

X^2 test (P<0.05)

Discussion

These findings agree with results of parasite control by neem reported by Pietrosemoli *et a*l. (1999) and Benavides *et al*. (2001) in Colombia and Venezuela. Azadirachtine, the main active ingredient for insecticides control is found in the seeds at the higher concentrations. In general neem trees begin seed production when are 3 to 5 years old. Nowadays, thousands of these trees are growing in Sinaloa and as mentioned by Heiden, (1991), producing even 50 k per tree.

Conclusion

A. indica seed macerates might be a good alternative, different to chemical insecticides to control dairy cattle ticks and help to reduce costs.

Acknowledgements

We would like to thank to MR. Guadalupe Rocha Reyes, Director of the Faculty of Agronomy, Universidad Autonoma de Sinaloa for the support given to this research.

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