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ORIGINAL ARTICLE

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Efficacy of eprinomectin pour-on against *Rhipicephalus* (*Boophilus*) *microplus* on buffaloes

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Abstract A trial was conducted on 12 buffaloes naturally infested with *Rhipicephalus* (*Boophilus*) *microplus* to evaluate the efficacy of eprinomectin pour-on at a dose of 0.5 mg/kg body weight. A reduction in live tick count by 45.94, 63.96, 81.53, 90.54, 98.19 and 100 % was observed on days 3, 5, 7, 10, 14 and 21 post-treatment, respectively. The reinfestation of ticks was not observed up to 42 days of trial period. On the basis of the present trial of eprinomectin pour-on, it can be recommended for use in dairy buffaloes against *Rhipicephalus* (*Boophilus*) *microplus* infestation.

Keywords Buffaloes · *Rhipicephalus* (*Boophilus*) *microplus* · Efficacy · Eprinomectin · Jammu

Introduction

Ticks cause anaemia, damage to hide, decreased milk production and even mortality in heavy infestations (Ram et al. 2004). They also transmit various blood protozoans and cause heavy economic losses to animal owners. Tick, *Rhipicephalus* (*Boophilus*) *microplus* is a common acarine infestation of buffaloes in the Indian subcontinent (Vatsya et al. 2007). Eprinomectin, a second generation macrocyclic lactone produced from *Streptomyces avermitilis*, has been used effectively in the control of endo- and ectoparasites in cattle (Shoop et al. 1996; Aguirre et al. 2005), but there is no published report on its efficacy against *R. microplus* on buffaloes. Therefore, the present trial was conducted to determine the efficacy of eprinomectin pour-on against natural infestation of *R. microplus* on buffaloes at R.S. Pura, Jammu.

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Materials and methods

Twelve buffaloes (aged between 1 and 6 years) naturally infested with *R. microplus* were selected for the trial. The selected animals belonged to the local dairy units of village Chak-siyan, tehsil R.S. Pura of Jammu district. These animals were allocated into two groups (A and B) of six animals each. Animals in group A were treated with eprinomectin pour-on (Indian Immunologicals), at a dose rate of 0.5 mg/kg body weight, along the dorsal midline (from withers to the tail base) while animals in group B were kept as untreated controls.

Tick counts were conducted with the help of owners on days 0, 3, 5, 7, 10, 14 and 21 post treatments (PT) by counting of engorged or partially engorged adult tick numbers on one side of animals. The efficacy of test drug was assessed by comparing the tick numbers in treated and untreated control groups. The per cent efficacy was measured using Abbott's formula (1925) as follows:

$$\text{Efficacy}(\%) = 100 \times \text{C} - \text{T}/\text{C}$$

where T denotes tick counts of treated group and C denotes tick counts of untreated control group.

The treated animals were observed for adverse effects of the drug tested and reappearance of ticks until the end of the trial on day 42 PT. The data recorded were analysed by paired *t* test (Snedecor and Cochran 1967) and a *p* value of <0.05 was considered significant.

Table 1 Efficacy of eprinomectin pour-on against *Rhipicephalus microplus* on buffaloes

Groups	Drug	No. of live ticks (mean ± SE) (days post-treatment)						
		0	3	5	7	10	14	21
A	Eprinomectin	222 ± 31.2	110 ± 25.6* (45.94)	80 ± 13.8* (63.96)	41 ± 10.1* (81.53)	21 ± 4.3* (90.54)	4 ± 3.2* (98.19)	0* (100)
B	Untreated control	196 ± 28.4	216 ± 22.9	226 ± 34.2	242 ± 34.5	256 ± 40.3	230 ± 32.7	271 ± 42.1

Figures in parenthesis denote percent reduction in live tick count

SE standard error

* Significant ($p \leq 0.05$) decrease from day 0 in live tick count in the same row

Results and discussion

The reductions in live tick count in eprinomectin pour-on treated group are presented in Table 1. A comparison of live tick count in the treated and untreated animals showed that eprinomectin pour-on, at a dose rate of 0.5 mg/kg bodyweight caused a reduction in live tick count by 45.94, 63.96, 81.53, 90.54, 98.19 and 100 %, respectively on days 3, 5, 7, 10, 14 and 21 PT. Within group differences in treated group were significant ($p \leq 0.05$) on days 3, 5, 7, 10, 14 and 21 PT. Live tick count in animals of control group showed an intermittent increase during the trial period (Table 1). The animals in control group were treated successfully with eprinomectin pour-on after the end of the trial on day 21. No adverse reaction was observed in any animal, indicating that the tested drug was well tolerated. Ticks did not reappear up to 42 days of trial period. The results of the present trial are in accordance with earlier report on high efficacy of eprinomectin pour-on against *R. microplus* on cattle (Aguirre et al. 2005).

The results of the present trial indicate that eprinomectin pour-on @ 0.5 mg/kg body weight is an effective acaricide against *Rhipicephalus* (*Boophilus*) *microplus* infestation on buffaloes. Its persistent effect up to 7 weeks is another important aspect as in the current scenario most of the available acaricides are becoming ineffective due to development of resistance. It can be recommended for use in dairy buffaloes against *Rhipicephalus* (*Boophilus*) *microplus* infestation, as eprinomectin has an edge over other acaricides, owing to its zero milk withdrawal periods (Alvinerie et al. 1999), and the efficacy is not affected by coat length, rain and weather (Gogolewski et al. 1997). Beside pour-on application is less traumatic to animals than conventional acaricides. However, before use of eprinomectin in dairy buffaloes, there is a need for investigation of the pharmacokinetic behaviour of eprinomectin in buffaloes.

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