

Efficacy of ivermectin and neem with Karanj oil against natural *Boophilus microplus* infestation in cattle

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Abstract

Single dose of ivermectin subcutaneously @ 200 µg kg⁻¹ body weight showed 100 per cent efficacy against *Boophilus microplus* ticks on day 8 post-treatment in naturally infested cows and remained so up to day 25 of application. A 50:50 mixture spray of neem + karanj oil achieved 97.95 per cent freedom from natural tick infection in cows on day 15 post application suggesting that formulation is a safe alternative to control ticks in field conditions.

Keywords: *Boophilus microplus*, Cattle, Ivermectin, Neem oil, Karanj oil.

Introduction

Ticks affect the health and productivity of cattle by reducing their vitality and besides acting as a source of transmission of variety of infectious agents. Several methods have been advocated to reduce the menace of tick infestations in cattle. A number of synthetic acaricides are currently in use to tackle the tick menace (Khan, 1996; Sinha and Sahai, 1980). The present study is an effort to find out an economical herbal acaricide against natural *Boophilus microplus* infection in cattle.

Materials and Methods

Six milking cows naturally infested with moderate to severe *Boophilus microplus* ticks were selected for the experimental trial using ivermectin @ 200 µg kg⁻¹ body weight by single subcutaneous injection. Another group of six naturally tick infested milch cows were also used for topical application of neem + karanj seed oil (50:50 or 1:1). The oil mixture was sprayed daily for 7 consecutive days with the help of a metal hand sprayer. A third group of six milking cows having similar degree of natural tick infestation was maintained separately as untreated control. All the cattle used for the trial were maintained at farmers houses under rural conditions. The efficacy of the treatments on days 2, 4, 5, 6, 10, 15, 20 and 25 was estimated, as per the method of Srivastava *et al.* (1993) with slight modification. The per cent efficacy of the drugs was determined by the formula:

	No. of ticks on one side of the body before treatment	No. of ticks on one side of the body at 'n'th day of treatment	
% efficacy =	----- x 100		
on 'n'th day	No. of ticks on one side of the body before treatment		

Results and Discussion

The percentage efficacy of ivermectin on day 2 post-treatment was observed to be 49.61, while 80.88 and 98.17 per cent efficacies of the drug were observed on day 4 and 6 post-treatment and 100 per cent efficacy on day 8 post-treatment. Similar effects of ivermectin treatment on different species of ticks have also been reported by Marques *et al.* (1995) and Islam *et al.* (1998).

On the basis of the live and dead counts of tick on the cows treated with neem + karanj seed oil indicated 37.95% efficacy of the drug on day 2 post treatment, while 68.71, 81.86, 91.20, 95.64 and 97.95% recoveries from the infestation were observed on day 4, 6, 8, 10 and 15 post treatment, respectively. Kalakumar *et al.* (2000) and Choudhury (2001) also reported neem oil to be a good tickicidal herbal agent against common Indian tick infesting cattle, buffaloes and other species of animals. In the present study, the karanj oil was added to potentiate the tick killing ability of the two herbal oils together. The product is cheap, available in this region and found to be convenient and economical for use against the common tick infestations.

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Table 1. Effect of ivermectin and neem + karanj seed oil (50:50) against *Boophilus microplus* infestation in cattle

Groups (No. of animals)	Drugs, dosage and adminis- tration	Avg. total pretreatment tick count on one side	Average tick count post treatment on day								
			2	4	6	8	10	15	20	25	
I (6)	Ivermectin @ 1 ml (10 mg)/ 50 kg b.w. S/C	191.83	96.66	36.66	3.50	0.00	0.00	0.00	0.00	0.00	0.00
		±7.89 (49.61)	±5.19 (80.88)	±3.56 (98.17)	±0.34 (100)	±0.00 (100)	±0.00 (100)	±0.00 (100)	±0.00 (100)	±0.00 (100)	±0.00 (100)
II (6)	Neem + Karanj seed oil (50:50) topical, daily for 7 days	187.50	116.23	58.66	34.00	16.50	8.16	3.83			
		±7.48 (37.95)	±6.12 (68.71)	±3.12 (81.86)	±4.28 (91.20)	±1.89 (95.64)	±1.30 (97.95)	±0.47			
III(6)	Untreated control	188.33	194.33	196.66	198.66	202.00	204.66	207.66	210.83	216.33	
		±6.66	±6.67	±10.24	±9.67	±10.02	±11.38	±12.24	±11.19		

Figures in parentheses indicate per cent efficacies.

Group I: Infected and treated; Group II: Infected and treated; Group III: Infected and untreated.

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