



Short Note

Field efficacy of Amitraz against ticks in cattle

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Abstract

A single treatment with an aqueous emulsion of Amitraz (12.5%) provided 100% protection against ticks in the animals up to 28 days post treatment. Further the treatment of the surrounding environment prolonged the re-infestation period to 50 days post treatment and reduced the tick numbers significantly.

Key words: Amitraz, ticks, cattle, efficacy, environment.

Ticks are widely distributed and are responsible for causing severe losses as they result in tick worry, blood loss, damage to hides, mortality or morbidity. Indiscriminate use of acaricides against ticks has resulted in resistance against some common and least toxic chemicals like pyrethroid preparations *viz* deltamethrin and cypermethrin (Sinha *et al.*, 2010). Further the reoccurrence of tick infestation is the main problem due to neglected treatment of sheds, bedding and fomites, because the female ticks generally lay their eggs in the cracks and crevices in the walls of the animal sheds (Muhammad *et al.*, 2008). Chemicals such as pyrethroid are commonly and repeatedly used to control ectoparasites in cattle, sheep and goat in Himachal Pradesh. The increase in numbers of crossbred, tick-susceptible cattle population in the state has necessitated the use of alternative acaricides. Amitraz, a valuable veterinary product, is effective against strains of ticks resistant to other chemical classes of ixodocides and it possesses sufficient persistence on hair and wool to control all

stages of parasitic ticks (Patent No. US7906130 B2, 2011).

Various authors have demonstrated the effectiveness of amitraz against ticks and mange mites on camels and lice and mange in pigs (Lal *et al.*, 1996 and Sena *et al.*, 1999). The present trial was aimed at testing the efficacy of amitraz 12.5% (Tactic, MD), against tick species on dairy animals in district Kullu. The impact of treating the shed along with the treatment of animals in terms of tick number and reinfestation time was also studied. The cattle naturally infested with ticks were selected and divided in to three groups of 9 animals each. The animals of first group (G1) were thoroughly wetted with an aqueous emulsion of Amitraz (12.5%) with the help of a hand sprayer. In second group (G2), in addition to the treatment given to the first group, the drug Amitraz was applied to the surrounding environment (walls, roofs, windows etc.) after general repair of cracks and crevices in the animal shed. The third group (G3) served as the control

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group.

The ticks attached to both the ear lobes of the animals were counted on Day 0 (pretreatment) and on Day 3rd, 7th, 14th, 21st, 28th, 35th, 40th and 50th post-treatment, to assess the efficacy of the drug. The trial was discontinued when the tick counts on the treated groups started to increase. The percentage of efficacy was determined by using the formula:

$$\text{Per cent efficacy} = \frac{\text{No. of ticks pretreatment} - \text{No. of ticks post treatment}}{\text{No. of ticks before treatment}} \times 100$$

The animals under study were housed in semi pucca or kutcha sheds, were not let out for grazing and kept in the courtyards during the day time. All the animals were heavily infested with ticks before the application of the test acaricide. Data were analyzed using standard statistical procedure as described by Gomez and Gomez (1984) and software INSTAT.

The data in Table 1 summarize the total tick counts on the treated and control groups, and the percentage control achieved by the test acaricide. Tick species identified during this trial were of *Boophilus* species. From day 3 onwards 100 % control was achieved and this was maintained up to 28 days post treatment in both group I and group II. On day 35 post-treatment 6 out of the 9 treated animals of group I were re infested with ticks where as no reinfestation in the animals of group II was observed on day 35th and 40th post treatment. The animals of group I had also

significantly fewer ($P < 0.05$) ticks than the control group on day 35th. Contrary to our findings, George *et al.* (1998) have reported 99% efficacy of Amitraz against *Boophilus microplus* only for 14 days post treatment where as Mekonnen (2001) has reported 100% control of ticks from day 3 to day 21 after the application of Amitraz. Similar to our findings, Gupta *et al.* (1988) has also reported 100% efficacy of Amitraz (0.025%) against bovine ticks from second day post treatment but observed reinfestation from 11th day onwards. Amitraz at 750 ppm was reported to be 100, 80 and 75% effective against larvae, nymphs and adults, respectively, of *Hyalomma anatolicum anatolicum* ticks in rabbit conferring residual protection for 13-28 days. The mean tick count in group II was significantly ($P < 0.05$) lower than group I as well as group III even on day 50 post treatment. These results show that a single treatment with an aqueous emulsion of amitraz, provided effective protection against ticks in the animals of this area up to 28 days in the post treatment period, despite the heavy infestations present at the commencement of the trial and the continued exposure of the animals of group I to reinfestation during the course of the trial. Further, the treatment of the surrounding environment prolonged the re infestation period up to 50 days as well as reduced the tick population. This can be attributed to the fact that

Table 1. Evaluation of efficacy of acaricide- Amitraz (12.5%) on cattle

Group	Pretreatment Mean no. of ticks	Post treatment Mean no. of ticks (Per cent efficacy)							Period of re- infestation in days
		3 rd day	7 th day	14 th day	28 th day	35 th day	40 th day	50 th day	
G1 (Animal treatment only)	99 ±3.88	0 (100)	0 (100)	0 (100)	0 (100)	24.55 ±7.42 (75.2)	62.44 ±11.87 (39.50)	89.00 ±5.81 (10.10)	35
G2 (Animal treatment +Surrounding treatment)	92.55 ±7.59	0 (100)	0 (100)	0 (100)	0 (100)	0 (100)	0 (100)	13.66 ±2.81 (85.2)	50
G3 Control	98 ±5.65	99.33 ±6.33	101.44 ±6.2	115.66 ±2.37	117.11 ±3.97	113.55 ±2.92	117.22 ±2.92	121.77 ±1.83	

* Values in parenthesis indicate the per cent efficacy

repair of the shed followed by application of acaricides is quite effective in reducing the tick burden on the animals (Muhammad *et al.*, 2008), since the female ticks generally lay their eggs in the cracks and crevices in the walls of the animal sheds. Gharbi *et al.* (2011) have also reported that the barn environment influences the presence and size of the domestic vector tick population. Prior to this trial, pyrethroid acaricides were used on the animals under study by most of the owners but the drugs

were not applied to the surroundings at all. These heavy infestations probably resulted from resistance to pyrethroid acaricides that had previously been used on these animals. It can be concluded that using acaricides for treatment adjunct with spraying animal environment with the insecticides is the better protocol for controlling ticks as it prevents re infestation from the environment and leads to effective prevention of tick infections in cattle.

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