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Effect of Flumethrin for Tick Control in Indigenous Bullocks

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ABSTRACT

Ticks infestation is commonly observed in livestock of tropical and subtropical countries. Tick infestation affect the performance and health of animals by spreading tick borne diseases like Babesiosis, Anaplosmosis, Theileriosis etc. Therefore, to control ticks various acaricides are used as spray, injection, topical application and tank dips. Topical application is effortless and economical for farmers to pour on top back line of the animal from poll to tail. In this regard animal health cum vaccination camps were organized in three villages. Heavily tick infested bullocks were screened and selected. Fifteen tick infested bullocks (Killari or Deoni) from each village were observed for number of ticks per square inch at heavily infested areas of the animal such as neck region, below tail and groin region. Flumethrin 1 per cent (50 ml/animal) was used for topical application from poll to tail on back of the animal. The observations were made after 30 days of application. Results revealed that the mean tick number significantly reduced from 14.44 to 1.31 per square inch respectively, before and after topical application. It can be concluded that, topical application of flumethrin is effortless and economically feasible to control ticks. Hence, flumethrin 1 per cent can be used effectively to control tick population in Killari or Deoni bullocks for a period of twenty to thirty days.

Key Words: Ticks, Killari bullocks, Flumethrin, Ectoparasite.

INTRODUCTION

Infestation of animals with ectoparasites especially ticks and lice are common problem noticed in rural area. Ticks have an adverse impact on growth of animal's and are potential transmitter of tick borne diseases. Tick bite causes irritation, inflammation hypersensitivity and reduce feed intake and affect the performance of animals. The major tick borne diseases, which have particularly severe effect on cattle, according to the tick vector species: *Boophilus* species are vectors of *Babesia* and *Anaplasma* species *cause Babesiosis and Anaplasmosis in livestock. Hyalomma* species are responsible for the transmission of the protozoan *Theileria annulata* which causes Theileriosis (McCosker, 1979). Therefore, ticks are responsible for indirect losses due to reduction in growth and production, high mortality and also direct losses caused by their attachment to animal hides, blood sucking activity, leading to wound, udder damage, weakness, and death of calves. Some particular tick species are also responsible for paralysis or sweating sickness in livestock due to the injection of potent toxins by ticks that affect nervous system (De Castro, 1997). *The acaricides are most convenient and effective ways to reduce production losses from tick parasitosis and tick-borne pathogens* (Walker, 2014). There are different classes of acaricides, among which the most commonly available and recommended (George *et al,* 2004) are organophosphates (Chlorphenvinphos, Coumaphos, Diazinon, Dioxathion) and Carbamates (Carbaryl): these compounds are generally effective at low concentrations and are stable in dip tanks. Pyrethroids, mainly synthetic Pyrethroids: highly effective group of acaricides (Permethrin, Decamethrin, Deltamethrin, Cyhalothrin, Cyfluthrin and Flumethrin). Pyrethroids typically show prolonged residual activity (atleast 7–10 d) but Amidines (Amitraz) showing less prolonged residual activity (4–5 d).

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Conventional organophosphate, carbamate, and pyrethroid insecticides generally are inexpensive and delivery of chemical pesticides can be effective in reducing tick numbers within localized areas. Less toxic alternatives, including the synthetic pyrethroids can be effective at lower doses than organophosphate and carbamate compounds, at least over the short term. To control ectoparasites, hand picking of large insects like ticks was common practice done by farmers in rural area, whereas, with assistance of professionals spraying of pesticides like Cypermethrin which was recommended for animal use and also use of subcutaneous injections like Ivermectin to control both ecto and endoparasites was practiced in rural area. Demerits are chances of poisoning of animals when sprayed with pesticides, higher cost of ivermectin injection and veterinary aid, which is not affordable for the livestock farmers. Failure to control ticks and tick borne diseases effectively was a major factor limiting livestock growth and production. Hence, an attempt was made to use topical application (Flumethrin 1% w/v) of ectoparasiticide to control of ticks in indigenous bullocks.

MATERIALS AND METHODS

Three villages (Narbola, Tengli and Gauwara) of Kalburgi district, Karnataka were selected for screening of ticks in bullocks. Since, lack of awareness among farmers to control ticks in livestock, vaccination cum health checkup camps was organized in each village. Vaccination against food and mouth disease (FMD)/ Hemorrhagic septicemia (HS)/Black quarter (BQ) was organized and screened for tick infested animals. Fifteen heavily tick infested bullocks (Killari or Deoni) were selected in each village. The efficiency of topical ectoparasiticide was tested by counting ticks manually per square inch on heavily infested areas such groin region, below tail and neck region. Topical application of flumethrin @1% poured on top line of tick infested animals from poll to tail (50ml/ animal). After thirty days of topical application of flumethrin, again the number of ticks in the affected area of particular animal was recorded. The observed and recorded data were subjected to paired‘t’ test to compare the mean values of number of ticks before and after topical application to check the efficiency of ectoparasiticide to control ticks in Killari or Deoni bullocks.

RESULTS AND DISCUSSION

Most recent research on reducing ticks has focused on the targeted delivery of chemical insecticides to particular hosts. The mean tick number per square inch at heavily infested area before and after topical application of Flumethrin 1% was significantly reduced from 14.44 and 1.31 respectively (Table 1) and the same was graphically presented in Fig.1. The number of ticks per square inch in heavily infected areas was recorded and observed values before topical application of flumethrin 1% ranged from 8 to 21, 6 to 8, and 9 to 22 ticks per square inch at neck, below tail and at groin region respectively. Whereas upon flumethrin topical application the number of ticks in heavily infested area after 30 days ranged from 1 to 2, 1 to 1, 1 to 2 ticks per square inch at neck region, below tail and groin region respectively. The per cent of tick infested before and after was represented in Fig 2.

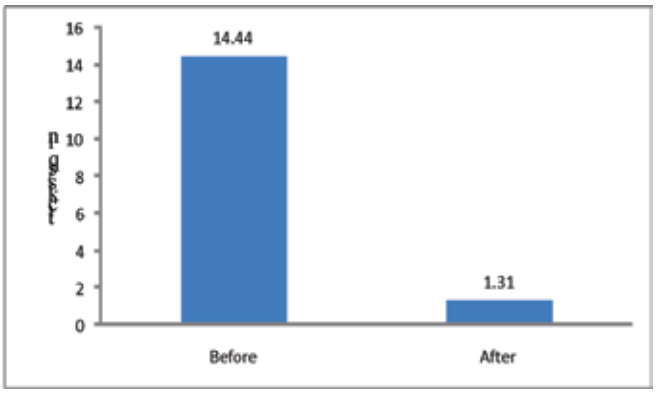

Fig.1 Mean tick number per square inch before and after topical application of flumethrin

The results revealed that flumethrin 1 per cent applied topically provided full protection against ticks for the duration of 20-30 d. This might be due to the rapid cuticular penetration and accumulation of permethrin in arthropod tissue generally contributes to a rapid killing of ticks. Therefore, permethrin

Table 1. Ticks recorded before and after topical application of flumethrin 1%

Sr. No	Area of ticks infestation (no./sq.in)	Number of observations	Before application	After application
1	Below tail	5	7	1
2	Neck region	10	12.3	1.1
3	Groin region	30	16.4	1.4
	Mean		14.44a	1.31b
	Variance		20.48	0.22
	SD		4.53	0.47
	SE		0.67	0.07

application usually provides a strong immediate killing effect after initial arthropod exposure. As most permethrin or permethrin-associated combinations have label indications that offer both immediate and persistent efficacy against ticks over approximately one month following initial treatment. The duration of the preventive efficacy may be 4 weeks or in some cases even 5 weeks after a single topical administration (Dumont *et al,*2015).

Dumont *et al* (2015) reported that the combination of 50.48 % permethrin and 6.76 % fipronil in a laboratory challenge had efficacy of 94.4 % and 100 % against R. sanguineus, 100 % against I. ricinus, and more than 99 % against adult D. reticulatus tiks two days after treatment.

Permethrin killed adult Dermacentor reticulatus ticks and also killed 100 % of unfed nymphs and larvae within 48 h after topical administration and also impaired the embryonic development of eggs from exposed adult female ticks (Buczek *et al,* 2015). Similarly, Lorenz and Peters (1994) reported that a single spot-on administration of permethrin resulted in killing efficacy between 88 to 92 per cent against adult R. sanguineus, 86 to 90 per cent against adult I. dammini – now I. scapularis and 87 to 99.5 per cent against adult I. ricinus for a period of 28 d.

CONCLUSION

Topical application of ectoparasiticide was found to be effective to treat animals individually to control ticks population and consequently prevent tick borne diseases in indigenous bullocks. This technology can be adopted by farmers without any aid from professionals. It is simple, effortless, and economically feasible to improve growth and health of animals. Hence, every single topical application of flumethrin 1 per cent was effective to control ticks for the duration of thirty days in indigenous bullocks.

REFERENCES

Buczek A, Lachowska-Kotowska P, Bartosik K. (2015). The effect of synthetic pyrethroids on the attachment and host-feeding behaviour in Dermacentor reticulatus females (Ixodida: Amblyommidae). *Parasit Vectors* **8**:366.

De-Castro JJ. (1997). Sustainable tick and tick-borne disease control in livestock improvement in developing countries. *Vet Parasitol*. **71**:77–97.

Dumont P, Chester TS, Gale B, Soll M, Fourie JJ, Beugnet F. (2015). Acaricidal efficacy of a new combination of fipronil and permethrin against Ixodes ricinus and Rhipicephalus sanguineus ticks. *Parasit Vectors*. **8**:51.

George JE, Pound JM, Davey RB. (2004). Chemical control of ticks on cattle and the resistance of these parasites to acaricides. *Parasitology* **129**: 353–66.

Lorenz JA, Peters LJ. (1994). Defend Exspot, insecticide for dogs: Professional Services Department, Mallinkrodt Veterinary. 1–17.

McCosker PJ. (1979). Global aspects of the management and control of ticks of veterinary importance. *Recent Adv Acarol*. **2**: 45–53.

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