

Efficacy of herbal composition against ectoparasite infestation in dogs

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ABSTRACT

Welfare of domestic animals is challenged by ectoparasite infestation throughout world. These ticks harbour disease causing pathogens that plays role in impact on public health. Various efforts are being undertaken to develop formulations that are safe to environment and cost effective. The skin lesion due to infestation needs to be controlled and to minimize reinfestation of causative agent's viz., ticks and fleas. The available methods of treatment are predominantly chemical in nature. In this aspect, indigenous veterinary medications can afford sustainable technologies through appropriate scientific intervention. Some of these herbal medications were found to be novel and it is pertinent to explore efficacy of this knowledge through clinical trials. The research study found that five percent herbal composition of an indigenous herbal medication (AHP/PR/ET) had effectively cured tick and flea infestation in naturally infested dogs. The formulation had demonstrated effective control over tick infestation and desired impact was found on seventh day of experimentation. The medication had shown significant ($p < 0.05$) control against flea infestation on seventh day of treatment. The reoccurrence of these parasites were not noticed during 21 day observation period. The skin inflammation due to ectoparasite was found reduced and relieved affected animals from constant irritation. The medication was administered once a day for two days with interval of twenty four hours, enhancing ease of administration. These environment friendly formulations need to be encouraged for protecting animal health and welfare.

Keywords: Dog, Ectoparasite, Tick, Flea, Dermatitis, Indigenous Knowledge, Herb

INTRODUCTION

Ectoparasite infestation is one of the major welfare problems among pet animals. Brown dog ticks originated from Africa [10] are most common parasites affecting dog and prevailing acaricide compounds had varying results [8, 16]. Incidence of flea allergy dermatitis is one of the major welfare challenges among dogs. The high rate of flea infestation in companion animals and likely infestation to humans were shared [7]. The concern of expanding nature of different tick population due to climate change was expressed [4]. The ailments affect health of animal through constant irritation, restlessness and acts as a source of transmission of diseases [12]. They also play an important role as vector hence products that can effectively controlling both ticks, flea's needs to be explored [17]. There is need to address dermatological problems in dogs as the pattern of occurrence is severe in veterinary hospital in India [20]. The major control method adopted by pet owners is through application of pour-on solutions or spray. Acaricide as an important method of control was felt [5]. However, some of these available products cause toxic manifestations and residues in environment [11]. Further, the cost of such medications is on higher side due to lack of alternatives medications. Treatment of ectoparasite infestation has been an integral component of indigenous veterinary system across the country [13]. Hence, it is imperative to identify novel herbal composition from indigenous systems to

overcome many of these challenges [15]. Clinical research experimentation was conducted to evaluate therapeutic efficacy of an indigenous herbal composition against naturally infested ticks and fleas in dog.

MATERIALS AND METHODS

Location and study period

The study was conducted during the period of December 13 to January 14 at Nagpur district, Maharashtra state of India. Animals affected with clinical infestation were selected randomly by discussion with pet owners.

Selection of clinical cases

The experimental animals were selected by clinically evaluating natural infestation and skin lesions such as dermatitis, alopecia and degree of wellness of skin coat. A total of seven dogs observed with such clinical infestation were selected. Among test population, three dogs were adults and remaining four were puppies. These animals belonged to crossbred (Labrador, Pomeranian) and Non-Descript (ND) breed categories. Thus animals were presented for testing the efficacy of indigenous herbal formulation.

Confirmation of ectoparasite infestation

The clinical observation of the collected tick from affected animals revealed the presence of Brown dog tick *Rhipicephalus sanguineus*. The condition of flea allergic dermatitis was noticed and upon examination revealed presence of flea *Ctenocephalides* sp. The mixed nature of infestation was noticed among naturally affected experimental animals.

Application of medication and duration of experimentation

Experimental animals were treated with five percent herbal formulation coded AHP/PR/ET as spray. Application of medication was repeated after 24 hours. The study was conducted for a period 21 days.

Organization of clinical data and statistical analysis

Ectoparasite's count were recorded by combing method and evaluated for acaricidal efficacy. The degree of control over ectoparasite was assessed through changes in tick/flea count and cure achieved during clinical observations [14]. The comparative efficacy was calculated as per the formula, $\text{Efficacy (\%)} = 100 \times (\text{Mean}_{\text{Control}} - \text{Mean}_{\text{Treated}}) / \text{Mean}_{\text{Control}}$ [3]. The results were analysed statistically using *student t test* and interpreted [6]. The criterion of reducing infestation over weekly reinfestation was considered for analysing effectiveness of medication [9].

RESULTS AND DISCUSSION

Clinically infested animals were combed for enumerating number of free ticks and fleas over the body. These free ticks, fleas removed, counted from animal body and recorded as pre-treatment value.

Table 1. Nature of infestation during study period

S No	Count on Day I		Count on Day VII		Count on Day XXI	
	Tick	Flea	Tick	Flea	Tick	Flea
1	0	105	0	10	0	10
2	1	70	0	0	0	0
3	2	70	0	0	0	0
4	2	60	0	5	0	7
5	5	0	0	0	0	0
6	5	0	0	0	0	0
7	0	100	0	50	0	35
$\bar{X} \pm \alpha^*$	2.14 \pm 2.11	57.85 \pm 42.80	0	9.28 \pm 18.35	0	7.42 \pm 12.83
% Efficacy	NA**	NA	100.00	83.94	100.00	87.16

*Mean \pm Standard deviation; **NA-Not Applicable

The five percent herbal composition was sprayed on whole body of affected animal once a day. The treatment was repeated after 24 hours. During experimentation, animals were observed for detachment of fleas/ticks along with any untoward reaction(s). The efficacy was evaluated by counting ticks on seventh day of treatment [1]. Further, in-order to understand any reinfestation, animals were observed on twenty first day of treatment. The convenience of

administration of medication is key factor and it forms important criteria during treatment follow-up among pet owners [2].

It was found from Table 1 that five percent formulation had shown 100 percent efficacy against ticks from seventh day onwards. The reoccurrence of tick infestation was not noticed till 21 days of observation. The weekly attachment rates are important parameter for understanding the role of medication in controlling reinfestation [18].

The study tried to minimize flea infestation in clinical conditions as it cause self-mutilation and severe itching in dogs. It was found that flea count was drastically reduced and medication was found 83.94 per cent effective by seventh day of treatment. The calculated value of t at 5 per cent level of significance was 3.56 at 6 degrees of freedom and table value of $t_{6,0.05}$ was 2.45. The calculated value was found to be higher than table value referring significant impact of herbal formulation AHP/PR/ET as spray. Subsequently the medication had shown 87.16 percent efficacy over flea on 21st day of observation. The experiment provided evidence that medication had controlled flea infestation by seventh day of clinical observation and enhanced nature of protection during study. This may be due to residual effect of the formulation and its protective function on affected sites in experimental animals.

All animals were fully recovered from tick infestation and lesser flea infestation was noticed during trial period. An experiment conducted to control flea allergic dermatitis in dog was observed with recovery in one month duration [19]. The herbal formulation had shown efficacy in a period of 21 days.

CONCLUSION

The herbal formulation had eliminated 100 percent tick infestation and controlled weekly reinfestation. Application of indigenous herbal product had minimized irritation pattern may be due to anti-inflammatory property of ingredients. The clinical study illustrated that herbal composition significantly controlled mixed ectoparasite infestation and helped in healing lesions due to tick, flea allergic dermatitis. The product did not cause any adverse reaction and found effectiveness over a period of twenty one days. This study calls for attention of scientific community in recognizing knowledge holders of indigenous system so as to develop environment friendly formulations to control infestation in animals.

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