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The Effect of Herbal Treatment against Tick

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Abstract- The present study was done with the use of effective herbal plant extracts against ticks to estimate the acaricidal activity. Two herbal plant i.e. *Azadirachta indica* (Neem) and *Allium sativum* (Garlic) were used as an extract against different species of ticks (*Hyalomma anatolicum, Boophilus microplus and Rhiphicephalus*) which were highly reactive to ticks mortality. In the present study, when *Allium sativum* plant extracts were used it showed 100 % tick mortality within 43 minutes and *Azadirachta indica* showed 100 % tick mortality within 30 minutes The combination of both the plant extracts showed 100 % tick mortality within 20 minutes.

***Keywords*:** Extract, *Azadirachta indica*, *Allium sativum* and ticks etc.

I. INTRODUCTION

A parasitic disease is considered as a major problem and obstacle in the health and product performance of animals. These may be due to endo-parasites that live inside the body or ecto parasites such as ticks, mites, flies, fleas, midges, etc., which attack the body surface. Among ecto-parasites, ticks are very important and harmful blood sucking external parasites of mammals, birds and reptiles throughout the world [1].

Ticks diet consist blood and only blood that's why it is called blood suckers and also called carrier because ticks have a ability to transmit diseases to humans and animals. Ticks are attached to the body surface for a blood meal and may cause itchness and serious physical damages to livestock, Included are tick worry, irritation, unrest, and weight loss due to infection of ticks. The direct injury to hides due to tick bites, loss of blood due to the feeding of ticks [2].

The effects of ticks include inflammation, itching and swelling at the bite site, anaemia, irritation and tick worry leading to reduced feed intake, emaciation and development of wounds that may serve as sites for secondary infection. Ticks damage the skin and reducing hide quality and creating scope for the secondary source of infection [2]. Herbal remedies for parasite infestations are just part of a holistic program to keep livestock healthy. The application of acaricides by the use of dipping tanks, spray races, hand-spraying and hand-dressing is probably the most effective method to control ticks and the diseases they transmit. Despite their widespread use, acaricides have some deleterious effects. Development of acaricide resistance in ticks is reported worldwide, wherever acaricides are in use [3]. Unwanted effects of acaricides on the environment can never be overlooked. Some acaricides tend to accumulate in livestock products and pose health hazards to the consumer [4]. The use of tickicide for control of tick populations is serious problem which causes environmental pollution and disturbs the non-targeted species [5]. This condition creates the need for alternative tick control methods with lesser problems to the environment. One of the commonly cited advantages that may result from the use of botanicals for tick control is their biodegradability [6]. Botanical pesticides are eco-friendly, economic, target-specific and biodegradable. Their greatest strength is their specificity as most are essentially nontoxic and non-pathogenic to animals and humans. Botanical insecticides such as Azadirachtin are often effective alternatives to organophosphates or other neurotoxins for pest control due to multiple modes of action. These include toxicity, antifeedant and anti-oviposition effects [7].

II. MATERIALS AND METHODS

Experimental plants: following plants were used
1. *Azadirachta indica* (Neem) - Leaves, 2. *Allium sativum (*Garlic) - Bulbs.
Collection of medicinal plant: Selected plant materials i.e. leaves of *Azadirchta indica* were collected from the botanical garden of Govt. Holkar science college in poly bags and brought to lab and their botanical identity were established. Bulbs of *Allium sativum* were brought from market and were also identified at the Department of Botany, Govt. Holkar Science College, Indore (M.P.) which were further processed for preparation of plant extracts.

Collection of ticks: Different species of hard ticks like *Hyalomma anatolicum anatolicum, Boophilus microplus and Rhiphicephalus evertsi* were used for evaluation of acaricidal activity. Ticks were removed and collected from the body surface of goat infected with ticks and identified by book of Soulsby [8]. Ticks were maintained in the laboratory at room temperature (25°C) in the Department of Zoology, Govt. Holkar Science College, Indore (M.P.).

Soxhlet extraction: Soxhlet extraction for preparation of plant extracts by ([6].

Antiacaricidal activity tests: Four different groups of test animals were prepared for testing the antiacaricidal activity for experimental purpose. Each group contains 10 ticks. The group -1 was taken as control, while remaining 3 groups were taken as experimental groups. The aqueous plant extract (10mg/ml) was used for antiacaricidal activity. Distilled water was used for control and plant extract was used on the experimental animal. The time noticed when 100% mortality was done.

III. RESULTS

Ethanolic plant extracts of *Azadirachta indica* and *Allium sativum* were prepared for their acaricidal property against different species of ticks (*Hyalomma anatolicum, Boophilus microplus and Rhiphicephalus*) which were highly reactive to ticks mortality. Total 4 group were used for experimental work in which group 1 was control and group 2, 3 & 4 were experimental group. Each group contains 10 ticks of different species. The time taken for 100% mortality in each group were recorded in table (1) and presented by graph (2).

The results indicated that *Allium sativum* extract showed ticks mortality within 43 minutes, *Azadirachta indica* extract showed within 30 minutes and, while the combination of both the plant extracts showed highest rate of mortality within 20 minutes.

Table 1: Acaricidal activity of plant extracts on ticks mortality in minutes at 10 mg/ml dose concentration

Groups	Plant extracts	Dose concentration (mg/ml)	Time of 100% mortality (in minutes)
Group 1 (Control)	-	Distilled water	-
Group 2	*Allium sativum*	10 mg/ml	43±1.05
Group 3	*Azadirachta indica*	10 mg/ml	30±1.12
Group 4	*Azadirachta indica & Allium sativum*	10 mg/ml	20±1.25

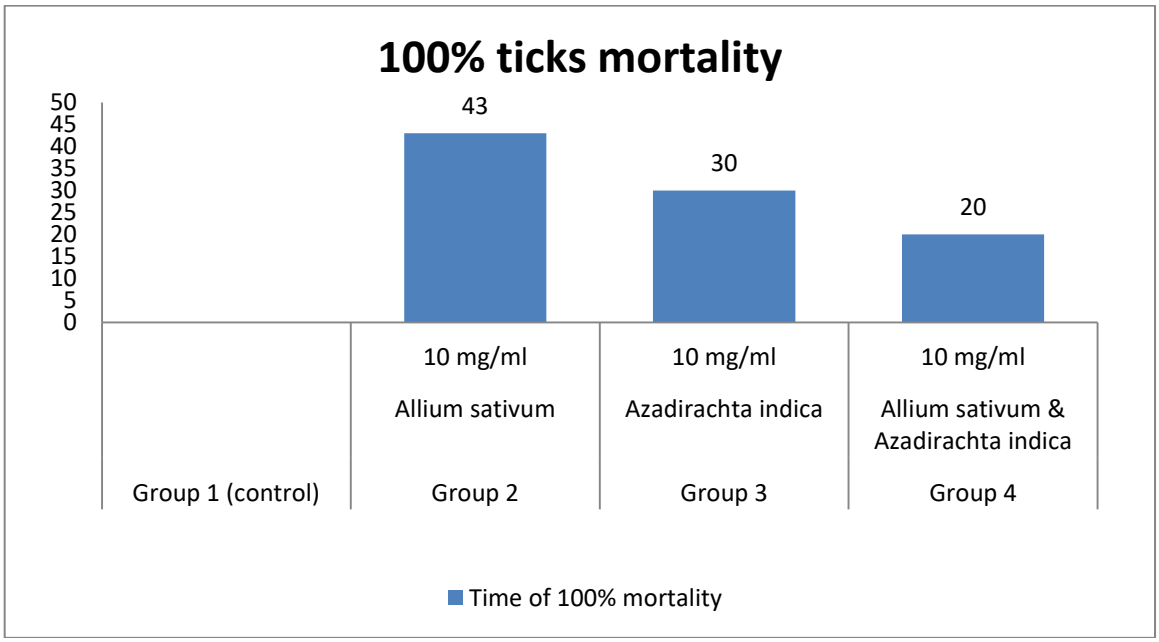

Figure 1: Ticks mortality in minutes after spraying the ethanolic plant extracts.

IV. DISCUSSION

In the present study, 100 % mortality recorded within 20 minutes in group 4, in which combined plant extracts (*Azadirachta indica & Allium sativum*) were used. In group 2 *Allium sativum* showed mortality within 43 minutes & in group 3 *Azadirachta indica* showed mortality within 30 minutes.

Liang and Chen [6]) studied one of the commonly cited advantages that may result from the use of botanicals for tick control is their biodegradability. Magano [9] studied the anti-tick properties of the root extract of *Senna italica* subsp. Arachoides against adults of *Hyalomma marginatum rufipes.* Parte [10] observed that the plants extract combination shows high rate of mortality in

minimum seconds as compared to single plant extract. The combination of all 5 different plants extract shows 100% mortality occurs within 32 seconds. Five different plants i.e. *Azadirachta indica*, *Mangifera indica*, *Polyalthia longifolia*, *Annona squamosa*, *Ficus benghalensis* were studied against the cattle tick and observe the mortality.

Regassaa [11] observed the use of herbal preparations for tick control in western Ethiopia. Preparations of *Capsicum* spp., *E. obovalifolia*, *S. incanum* and *F. brachypoda* were found to have 30–100 % killing effects. Subsequently, *in vivo* treatment trials of these preparations were conducted using indigenous *Bos indicus* cattle naturally infested with ticks. Results indicate that treatments at the rate of once per day for 5 consecutive days with the latexes of *E. obovalifolia* and *F. brachypoda* can reduce tick burdens by up to 70 % on cattle.

V. CONCLUSION

The present findings suggest that plant extracts of *Azadirachta indica*, *Allium* contain biologically active compound which possesses a potentially vital antiacaricidal effect on ticks. Thus, these plant extracts offers significant promise for combating parasitic infection on animals.

REFERENCES

[1]. Sanelson, J.T., "Animal ectoparasites and diseases vector causing major reduction in world food supplies," FAO Plant Protection Bulletin,**1975.**

[2]. Latif, A. and Jongejan, F., "The wide use of acaricide for the control of livestock diseases in Africa needs a reappraisal," Institute of Tropical medicine, Anturerp, Belgium, **2002.**

[3]. Regassa, A. and Castro, D. J.,"Tick resistance to acaricides in western Ethiopia,"Tropical Animal Health and Production, **25: 69–74,1993.**

[4]. Palmer, W. A., Dingle, J. H. P. and Heat, A. B., "Residue of chlordimeformin bovine tissues and milk following application by a hand spray," Australian Journal of Experimental Agriculture and Animal Husbandry, **17: 380–384,1977.**

[5]. Boeke, S.J., Baumgart, I.R., Loon, J.J.A., Huis, A., Dicke, M. and Kossou, D.K., "Toxicity and repellence of African plants traditionally used for the protection of stored cowpea against Callosobruchus maculatus, " J. Stored. Prod. Res, **40: 423-438,2004.**

[6]. Liang, G.M., Chen, W. and Liu, T.X.,"Effects of three neem based insecticides on diamondback moth (Lepidoptera: Plutellidae) , " Crop Protection, **22: 333-40, 2003.**

[7]. Sutherland, J.P., Baharally, V. and Permaul, D., "Use of the botanical insecticide, neem to control the small rice stinkbug *Oebalus poecilus* (Hemiptera: Pentatomidae) in Guyana Entomotropica, " **17(1): 97–101,(2002).**

[8]. Soulsby, E.J.L. Helminthes,"Arthopods and protozoa of domesticated animals (monnig) Philadelphia, "lea & febiger,**1968.**

[9]. Magano S.R., Thembo K.M., Ndlovu S.M., Makhubela N. F. H., "The anti-tick properties of the root extract of *Senna italica* subsp. arachoides, " African Journal of Biotechnology, **Vol. 7 (4): 476- 481,2008.**

[10]. Parte, S.G., Patil, R.D., Patil, M.A., Patel N.S. and Chavan J.A., "Utilization of herbals for the managements of cattle ticks, " Int.J.Curr. Microbiol. App.Sci, **3 (10) : 228-232, 2014.**

[11]. Regassa, A. "The use of herbal preparations for tick control in western Ethiopia , " Journal of the South African Veterinary Association, **71(4): 240–243,2000.**

