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Evaluation of poly herbal extract from *Azadirachta indica* (Neem) and *Vitex negundo* leaves for the control of ectoparasitic infestation in Bovine

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Abstract

The study was conducted to assess the ectoparasitocidal property of a polyherbal extract prepared by mixing the aqueous extracts of *Azadirachta indica* (Neem) and *Vitex negundo* leaves in the ratio 3:1. Twenty cattle were sprayed with the poly herbal extract all over the body consecutively for 2 days. Tick counts were measured from seven heavily infested areas of body viz., ear pinna, inguinal region, under tail, back region, wither, dewlap and neck and expressed as mean tick count. Before application of the polyherbal extract and 3rd day, 7th day and 21st day post treatment tick counts were measured. Results of the study indicated a significant ($p < 0.05$) reduction in tick count across all body parts as early as day 3 post treatment when compared to the 0th day tick count. The maximum reduction in tick count occurred on day 7 post treatment, with more than 90% reduction in percentage of tick infestation in all regions. Clinical signs like pruritus, scratching, rubbing and alopecia in cattle were also reduced considerably 21 days post treatment. The findings of the study imply that the poly herbal mixture prepared from aqueous extracts of Neem and *V. negundo* has promising effect in reducing the tick infestation. Hence this study accelerates the interest in developing eco-friendly herbal ectoparasitocidal combinations from plants.

Keywords: Polyherbal extract, *Azadirachta indica*, *Vitex negundo*, ticks

Introduction

Ectoparasitic infestation in livestock is a serious problem to be addressed as it deteriorates the health and production potential of animals thereby causing considerable economic loss to farmers. Parasitic infestation further contributes to several diseases as they act as carriers of various haemoparasites, bacteria and viruses, some of which are zoonotic. Arthropods, mainly ticks, fleas, flies and mites represent the most economically important group of cattle ectoparasites because of the direct effect associated with heavy infestations on health and food production^[1]. These parasites leads to poor health, weight loss, reduced milk yield, and damage to skin or fleece, which in severe cases may result in death of the animal. Topical ectoparasitocidal medications are the commonly used treatment modality in animals but recent concerns over resistance development, environmental hazards, and drug residue have prompted a growing interest in alternative therapeutic approaches^[2].

Since ancient times, the usage of plant derived preparations was in vogue to mitigate various ailments in humans and animals. Ease of use and higher potency of synthetic pharmaceuticals paved way for their popularisation and widespread usage including in animals. However, the recent resurgence of interest in eco-friendly and natural remedies has brought herbal medicines back into focus. A number of plant species have demonstrated efficacy in managing ectoparasitic infestations in animals. Typically, herbal formulations derived from multiple plants involve a combination of bioactive compounds such as flavonoids, alkaloids, phenols, saponins, and tannins, each employing a different mechanism of action. This multiplicity reduces the risk of resistance development as well as minimizes the concerns about drug residues in animal products^[3, 4]. Some of the common plants/ plant extracts utilized in various

parts of the globe includes Neem (*Azadirachta indica*), *Zea Mays*, *Lemon grass*, *Allium cepa*, *Melaleuca alternifolia*, *Curcuma longa*, *Melia dubia*, *Annona squamosa*, *Carica papaya*, *Nicotiana tabacum*, and *Aloe ferox* that has recorded promising efficacy [5].

Azadirachta indica, commonly known as Neem tree belongs to the family Meliaceae, is a native to the Indian subcontinent and to parts of Southeast Asia. Its fruits and seeds are the source of neem oil. Herbal formulations containing various parts of Neem have been found quite useful and efficacious against ectoparasites such as nymphal ticks, fleas, lice and mites. Also a variety of potent botanical pesticides has been derived from Neem [6]. *Vitex negundo*, commonly known as five-leaved chaste tree or the Chinese chaste tree, is a medicinal plant traditionally used in Ayurveda, Siddha, and Unani medicine to treat a variety of ailments as inflammation, pain, fever, and skin diseases. It is a small tree or shrub belonging to the family Verbenaceae, commonly found in tropical and subtropical regions [7]. In a study conducted in dogs, the leaf extract of *V. negundo* has been found to be effective against *Boophilus* tick infestation [8]. In view of this, the present study was undertaken to assess the ectoparasitocidal property of a polyherbal extract prepared out of Neem and *V. negundo* leaves in cattle.

Materials and Methods

1. Polyherbal extract preparation

Fresh leaves of Neem and *V. negundo* were collected locally and cleaned thoroughly in water. About 2 kg each of Neem and *V. negundo* leaves were soaked in 4 Litres of warm water separately and kept overnight. The aqueous extract or the

supernatant thus formed was strained and collected in bottles. These individual crude extracts of Neem and *V. negundo* were mixed freshly in the ratio 3:1 as per requirement and used for spraying on the body of the animals [9].

2. Study area and design

Study was conducted in Karadavalasa, Nidagallu and Balagudaba villages of Parvathipuram Manyam district of Andhra Pradesh, India during the period of January 2024 to May 2025. Twenty cases of tick infestation in cattle were selected randomly irrespective of age, sex and breed. The tick infested animals were sprayed with the poly herbal extract all over the body consecutively for 2 days.

Acaricidal potency of the poly herbal extract was assessed based on the reduction in tick count post treatment in comparison with pre-treatment counts. Tick counts were measured from seven heavily infested areas of body viz., ear pinna, inguinal region, under tail, back region, wither, dewlap and neck and expressed as mean tick count. Before application of the polyherbal extract and 3rd day, 7th day and 21st day post treatment tick counts were also measured. Clinical signs like pruritus, scratching, rubbing, alopecia were also noted in tick infested cattle before treatment as well as 21 days post treatment [10].

3. Statistical analysis

The results are expressed as mean $\pm$ standard error mean (SEM). Statistical analysis was done using repeated measures one-way Analysis of variance (ANOVA) and paired t tests on the day wise tick count data with level of significance at $p < 0.05$.

Table 1: Mean tick count and Percentage reduction of tick infestation in various body parts

Tick infested body part	Tick Count			
	Before Treatment	After Treatment		
	0 th day	3 rd Day	7 th Day	21 st Day
Ear pinna	31.6 $\pm$ 6.49 ^a	7.2 $\pm$ 1.62 ^b (77.2%)	2.5 $\pm$ 0.92 ^c (92.1%)	7.6 $\pm$ 1.76 ^b (75.9%)
Inguinal region	44.5 $\pm$ 6.39 ^a	7.8 $\pm$ 1.55 ^b (82.5%)	1.4 $\pm$ 0.54 ^c (96.9%)	8.1 $\pm$ 1.79 ^b (81.8%)
Under tail	26.3 $\pm$ 4.47 ^a	5.5 $\pm$ 1.45 ^b (79.1%)	1.7 $\pm$ 0.63 ^c (93.5%)	6.1 $\pm$ 1.69 ^b (76.8%)
Back region	35.4 $\pm$ 5.94 ^a	6.3 $\pm$ 1.84 ^b (82.2%)	1.9 $\pm$ 0.57 ^c (94.6%)	7 $\pm$ 2.06 ^b (80.2%)
Wither	33.8 $\pm$ 8.45 ^a	6.5 $\pm$ 2.18 ^b (80.8%)	1.1 $\pm$ 0.43 ^c (96.7%)	10 $\pm$ 1.63 ^d (70.4%)
Dewlap	76.3 $\pm$ 9.00 ^a	13.3 $\pm$ 2.39 ^b (82.6%)	3.4 $\pm$ 1.00 ^c (95.5%)	9.7 $\pm$ 1.98 ^b (87.3%)
Neck	69.4 $\pm$ 10.95 ^a	12.8 $\pm$ 2.85 ^b (81.6%)	3.8 $\pm$ 1.42 ^c (94.5%)	6.5 $\pm$ 1.49 ^d (90.6%)
Mean tick count	45.33 $\pm$ 7.38 ^a	8.64 $\pm$ 1.98 ^b (80.86%)	2.26 $\pm$ 0.79 ^c (94.82%)	7.86 $\pm$ 1.77 ^b (80.43%)

Values bearing different superscripts between columns differ statistically with level of significant at $p < 0.05$. The percentage reduction in tick count is given in brackets as compared to 0th day value.

Results and Discussion

Acaricidal property of the poly herbal extract prepared out of aqueous extracts of Neem and *V. negundo* was assessed in this study. This was done by calculating the reduction in tick count and percentage of infestation in cattle on 3rd, 7th and 21st days after spraying the polyherbal extract for two consecutive days. Tick counts were measured from seven heavily infested areas of body of twenty cattle viz., ear pinna, inguinal region, under tail, back region, wither, dewlap and neck and expressed as mean tick count.

Results of the study indicated a significant ($p < 0.05$) reduction in tick count across all body parts as early as day 3 post treatment when compared to the 0th day tick count. The mean tick count and percentage reduction of tick infestation in various body parts are presented in Table 1. The mean tick

count was significantly reduced to 8.64 $\pm$ 1.98 on day 3 and 2.26 $\pm$ 0.79 on day 7 as compared to 0th day, where a mean tick count of 45.33 $\pm$ 7.38 was recorded. Whereas on day 21 the mean tick count noted was 7.86 $\pm$ 1.77. This shows that the residual effect of polyherbal extract might start to decrease by day 21 which leads to a rebound in tick count. The maximum reduction in tick count occurred on day 7 post treatment, with more than 90% reduction in percentage of tick infestation in all regions. Clinical signs like pruritus, scratching, rubbing, alopecia in cattle were also reduced considerably 21 days post treatment.

A. Indica or Neem is proven to possess ectoparasitocidal phytochemicals in its various parts, especially in seeds and leaves. Herbal combinations containing *A. indica* have been found potent against ectoparasites such as nymphal ticks, fleas, lice and mites [6]. Banerjee *et al.*, 2014 [13] found out that the aqueous extract of *A. indica* adversely affects the maturation of parasite oocytes, the oviposition and the reproductive potential in ectoparasites of fishes. The study conducted by Neeru Bala and Sonu Gabba., 2015 [8] showed

that the leaf extract of *V. negundo* was effective against *Boophilus* tick infestation in dogs. They stated that the exposure to 1000 ppm of the crude leaf extract for 48 hours resulted in 60% mortality of ticks and 80% mortality of termites. In another study conducted by Nilesh Jawalkar and Sureshchandra Zambare., 2020 ^[11], leaf extracts of *V. negundo* have shown varying levels of insecticidal potential against *Sitophilus granaries*, an insect pest affecting stored grains. The phytochemical screening of *V. negundo* revealed the presence of alkaloids, steroids, flavonoids, amino acids, phenols, quinones and starch ^[12] which may contribute to its insecticidal or acaricidal property. The results of this study also correlate with the above findings by various authors supporting the insecticidal and ectoparasitocidal properties of Neem and *V. negundo*. Polyherbal extract prepared by mixing the two leaf extracts might have created a synergistic combination of phytochemicals contributing to the efficacy of the extract, which needs validation through further studies.

Conclusion

Ectoparasitic menace in large animals especially tick infestation is a challenging issue for livestock farmers as it leads to severe economic loss by affecting the health and production potential of the animals. This study conducted in cattle concluded that the spraying of a poly herbal mixture prepared from aqueous extracts of *A. indica* (Neem) and *V. negundo* showed promising effect in reducing the tick infestation. There was significant reduction in tick count and also alleviation of clinical signs of parasitic infestation was noticed in cattle. Hence this study accelerates the interest in resurgence of eco-friendly herbal ectoparasitocidal combinations from plants.

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Conflict of Interest

Not available

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References

- Pérez de León AA, Mitchell RD 3rd, Watson DW. Ectoparasites of cattle. Vet Clin North Am Food Anim Pract. 2020;36(1):173-185. DOI:10.1016/j.cvfa.2019.12.004.
- Adenubi OT, Fasina F, McGaw L, Eloff J, Naidoo V. Plant extracts to control ticks of veterinary and medical importance: a review. S Afr J Bot. 2016;105:178-193.
- Dehuri M. Plant-based remedies for controlling ectoparasite infestations. J Ayurvedic Herbal Med. 2025;11:23-24.
- Fierascu R, Fierascu I, Dinu-Pirvu C, Fierascu I, Paunescu A. The application of essential oils as a next-generation of pesticides: recent developments and future perspectives. Journal of Biosciences. 2020;75:183-204.
- Strothmann AL, Berne ME, Capella GA, de Moura MQ, da Silva Terto WD, da Costa CM, et al. Antiparasitic treatment using herbs and spices: a review of the literature of the phytotherapy. Braz J Vet Med. 2022;44:e004722.
- Azeem S, Akbar H, Ahmad L, Ashraf M, Puvanendiran S. When used in animals, a neem (*Azadirachta indica*)-based ectoparasiticide performs better than a synthetic one. Journal of the Hellenic Veterinary Medical Society. 2023;73(4):4833-4840. doi:10.12681/jhvms.27963.
- Gandhimathi R, Karthick Raja D, Chandru Ganesh S, Praveen RS, Sivi Hirthikha GR, Vijey Aanandhi M. A review of phytochemical and pharmacological activities of *Vitex negundo*. Int J Res Phy Pharmacol. 2023;13(1):1-6.
- Bala N, Gabba S. Testing the insecticidal activity of the crude extracts of *Vitex negundo* L against two adult insects *Boophilus microplus* and *Coptotermes heimi*. International Journal of Scientific Research. 2015;4(5):322-324.
- Polyherbal eco-friendly technology can combat tick infestation among dairy animal. Department of Science and Technology, Government of India.
- Bhikane AU, Jadhav RK, Jadhav AS, Khillare BS, Ghadge RS. Acaricidal potency of polyherbal spray against *Rhipicephalus microplus* and *Hyalomma anatolicum* infestation in cattle. J Parasit Dis. 2018;42(1):34-38.
- Jawalkar N, Zambare S. Bioinsecticidal activity of *Vitex negundo* L (Family: Verbenaceae) leaf extracts against *Sitophilus granarius* L in stored maize grains. Journal of Entomology and Zoology Studies. 2020;8(2):1532-1538.
- Rose CM, Cathrine L. Preliminary phytochemical screening and antibacterial activity on *Vitex negundo*. International Journal of Current Pharmaceutical Research. 2011;3(2):99-101.
- Banerjee A, Manna S, Saha SK. Effect of aqueous extract of *Azadirachta indica* A Juss (neem) leaf on oocyte maturation, oviposition, reproductive potentials and embryonic development of a freshwater fish ectoparasite *Argulus bengalensis*; 2014.

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