**SUSTAINABLE TREATMENT OF MANGE MITE INFESTATION IN GOATS**

**Abstract**

Mange mite infestations, particularly those caused by *Sarcoptes scabiei*, are a significant concern in goat farming due to their severe impact on animal health, productivity, and welfare. These infestations are not only highly contagious among livestock but also zoonotic, posing health risks to humans. Traditional chemical acaricides such as Ivermectin have been widely used for treating mange; however, the emerging need for sustainable and eco-friendly alternatives has led to increased interest in herbal formulations. This study evaluates and compares the long-term efficacy of Ivermectin and a herbal oil-based mixture comprising neem oil, karanj oil, and camphor in the management of *Sarcoptes scabiei* infestation in goats over a period of 10 months. The results suggest that both treatment protocols are highly effective and safe, with the herbal mixture showing promising potential for sustainable mange control in small ruminants.

A long term control of *Sarcoptes scabiei* infestation study was conducted by using the Ivermectin @ 200 µg/kg body weight s/c and herbal mixture ( Neem oil 50 ml+ Karanj oil 50 ml+ Camphor 10 gm) applied on the body for seven consecutive days alongwith supportive therapy against sarcoptic mange in goats. Both the package was found to clear the mites satisfactorily upto 10 months of observations and thus could be a safe and suitable remedy for the disease in goats.

**Introduction**

Mange is a parasitic skin disease primarily caused by mite infestations and is characterized by intense itching, inflammation, scab formation, and in severe cases, extensive hair loss and secondary infections. Among the various types of mange affecting goats, sarcoptic mange caused by *Sarcoptes scabiei* is particularly serious due to its zoonotic potential and high morbidity.

The infestation severely affects the economic returns from goat farming due to reduced weight gain, milk production, fertility issues, and hide damage. Furthermore, if left untreated, mange can lead to death from secondary infections and immune suppression. Conventional treatments rely heavily on chemical acaricides like Ivermectin, which, although effective, may lead to resistance with overuse and raise concerns regarding residues in meat and milk products.

Given the growing emphasis on organic livestock farming and sustainable animal husbandry practices, herbal remedies have gained prominence as alternative treatments. Indigenous knowledge and traditional veterinary practices have identified neem, karanj, and camphor as potential herbal acaricides due to their anti-inflammatory, antiseptic, and antiparasitic properties.

This study explores a sustainable approach to mange treatment by evaluating a herbal formulation and comparing its efficacy with a standard chemical treatment, while also assessing long-term results, safety, and practicality in field conditions.

*Sarcoptes scabiei* born mange is a contagious zoonotic skin disease of livestock and man. It has been controlled by various chemical as well as herbal acaricidal agents for a limited period ( Himons *et al.,* 1989, Periyasamy *et al.,* 2018 andSinha*et al*., 2024). Recurring infection of the mites in goats affects their health and production severely. There has been a longfelt need to evolve a suitable, economical and sustainable treatment of the disease in goats. The present report is an effort to evaluate the efficacy of chemical and herbal treatment package against the mite infestation in goats for a longer duration.

**Materials and methods**

The present study was conducted on 18 goats naturally infested with *Sarcoptes scabiei* mites as confirmed by clinical and skin scraping examination of the lesions for their morphological features (Soulsby, 1982, Sen and Fletcher, 1962). Goats infested with mites were segregated into three groups of six animals in each. Six goats of group I were injected Ivermectin 200 µg/kg body weight and Group II (6) goats were applied with a herbal mixture ( Neem oil 50 ml +karanj oil 50ml +camphor 10 gm ) for seven consecutive days. For local application of the drugs goats were bathed with savlon to remove dirt, crust and scales. Then the mixture was applied on the animals. Group IIIrd (6) goats were kept as infected untreated control throughout the observation period of 10 months. The percentage efficacies of the two acaricides were assessed on 3rd ,7th ,9th , and 11th day as per the method of Srivastava *et al*. (1993).

All the experimental animal used for the trials were kept as far as possible free of erroneous infection other than the ectoparasite by suitable therapeutic management while the reinfection of the mites were cured by repeating the herbal mixture only at 30 days interval. All the goats were maintained on concentrates with sufficient grazing.

**Results and Discussion**

The therapeutic efficacies of Ivermectin and herbal mixture ( Neem oil 50 ml +Karanj oil 50ml +Camphor 10 gm ) were evaluated and presented in the **table 1.**

**Table 1.**

**Percent efficacies of Ivermectin and herbal mixture ( Neem oil 50 ml +karanj oil 50ml +camphor 10 gm )packages against *Sarcoptes scabiei* infestation in goats**

|  |  |  |  |
| --- | --- | --- | --- |
| Groups (No of animals) | Drugs dosage and administration  | Average total pre treatment mite count in 6 cm2 Area. | Average post treatment mite count & percent efficacies on different days. |
| 3rd day  | 7th day  | 9th day  | 11th day  |
| I (6)  | Ivermectin 200 µg/kg body weight + supportive drug as per need | 248.33 ±18.02 | 124.33±9.77 (50.03) | 62.33±5.56(75.08) | -(100) | -(100) |
| II (6) | Herbal mixture ( Neem oil 50 ml +karanj oil 50ml +camphor 10 gm ) + supportive drug as per need | 245.00±14.48 | 143.33±8.39 (41.35) | 87.00± 6.25 (64.48) | 43.50±2.93(82.25) | -(100) |
| III (6) | infected untreated | 243.33±14.47 | 260.00± 13.33 | 361.66±13.23 | 264.16±13.27 | 264.16±13.27 |
| NOTE 1.All the treated animals were kept free from mite infestation by repeating treatment at 30 day interval in herbal mixture ( Neem oil 50 ml +Karanj oil 50ml + Camphor 10 gm )2. Supportive treatment : Liverstimulant, Antidiarrhoel, Appetizers, Vitamins, Haematinics, Antibiotics and other drugs used as and when needed.3. Figures in parentheses indicate the percent efficacies of drugs. |

The results obtained revealed that Ivermectin control package completely cured of sarcoptic mange infected animals on 9th day post treatment (DPT). Almost similar findings have been reported by Rehbein *et al.* (2002) and Sinha *et al.,* 2024 in cattle and dog respectively.

The responses of the goats to the herbal mixture ( Neem oil 50 ml + Karanj oil 50ml + Camphor 10 gm ) showed improvement from 3rd day post treatment, reddening and irritation of the affected skin was reduced. Marked improvement in overall condition of the skin with hair growth and shining was seen seventh DPT. Goats became negative for mites or their eggs on 11th day post treatment. The usefulness of herbalmixture ( Neem oil 50 ml +karanj oil 50ml +camphor 10 gm )as a good ectoparasiticidal agent have also been reported by and Sinha *et al.,* 2024 in pigs. Azeem *et al* 2023 and Souza *et al* 2017also reported the use of neem as ectoparasite control.

Repeated application of both the specific and supportive drugs in mange affected animals kept all the treated animals free from *S. scabiei* infection upto 10 months which showed that the packages were quite safe and suitable remedy for mange in goats.

The findings of this study confirm the high efficacy of both Ivermectin and the herbal oil mixture in controlling *Sarcoptes scabiei* infestation in goats. Ivermectin, being a systemic macrocyclic lactone, acts rapidly by disrupting neurotransmission in parasites. Its proven efficacy in mange control has been documented across various species including cattle and dogs (Rehbein et al., 2002; Sinha et al., 2024).

However, over-reliance on chemical acaricides has its downsides:

Potential development of drug resistance

Residual toxicity in animal products

Environmental concerns due to chemical runoff

In contrast, herbal treatments offer several advantages:

1. Eco-Friendly: Neem and karanj oils are biodegradable and non-toxic to the environment.

2. Safety: These oils pose minimal risk of toxicity to animals and humans.

3. Availability: Readily accessible in many rural and semi-urban areas of India.

4. Multifunctionality: Provide not just acaricidal action, but also anti-inflammatory, antibacterial, and wound-healing benefits.

Studies such as Peryasamy et al. (2018) have also validated the use of neem-based treatments in camels, and Sinha *et al.* (2024) observed similar outcomes in pigs.

The herbal oil mixture in this study was highly effective and sustained its efficacy over a 10-month period with monthly reapplication. No reinfestation occurred in the treated groups, highlighting the preventive potential of the formulation.

**Conclusion**

This study demonstrates that both Ivermectin and a herbal mixture of neem oil, karanj oil, and camphor are highly effective in managing sarcoptic mange in goats. While Ivermectin offers faster relief, the herbal remedy emerges as a sustainable, cost-effective, and safe alternative, especially suitable for organic and smallholder farming systems. The herbal package, when applied at regular intervals, maintains long-term protection and contributes to better animal welfare and productivity.

The present study effectively highlights that both conventional (Ivermectin) and alternative (herbal oil-based) treatment protocols are capable of managing sarcoptic mange infestations in goats with high efficacy. Ivermectin, due to its systemic mode of action and rapid onset, demonstrated faster symptomatic relief and quicker clinical recovery. However, the repeated use of chemical acaricides raises legitimate concerns regarding drug resistance, residue accumulation in animal products, and environmental contamination, all of which have long-term implications for sustainable livestock production and food safety.

On the other hand, the herbal formulation comprising neem oil, karanj oil, and camphor provided a comprehensive and environmentally safe treatment option. Although the herbal treatment exhibited a slightly slower onset of action compared to Ivermectin, it ultimately achieved complete clinical and parasitological recovery by day 11. Moreover, its ability to prevent reinfestation over a 10-month observation period underscores its potential not only as a therapeutic agent but also as a prophylactic measure in endemic areas.

The broader significance of this research lies in its contribution to sustainable veterinary practices. The use of readily available, cost-effective, and eco-friendly plant-based resources aligns with the principles of One Health by reducing chemical inputs and promoting animal welfare without compromising efficacy. This is especially relevant for resource-poor farmers, organic producers, and remote communities where access to commercial pharmaceuticals may be limited or economically burdensome.

Based on the findings, the following key recommendations can be drawn:

\* \*Integration of Herbal Therapies\*: The herbal oil mixture can be adopted as part of an integrated parasite management strategy, especially in organic and backyard goat farming systems.

\* \*Regular Application\*: Monthly reapplication of the herbal mixture is advised to sustain protective effects and minimize the risk of reinfection.

\* \*Further Research\*: Additional large-scale studies should be undertaken to evaluate the efficacy of the herbal formulation across different breeds, climatic conditions, and mite species, along with its impact on production parameters like milk yield and growth rates.

\* \*Extension and Awareness Programs\*: Farmers and veterinary practitioners should be educated on the preparation, application, and benefits of herbal treatments to encourage widespread adoption.

In conclusion, the herbal mixture offers a promising, practical, and sustainable alternative to conventional acaricides. Its dual role in treatment and prevention, coupled with its safety profile and affordability, makes it a valuable tool in the long-term management of mange mite infestations in goats. Embracing such indigenous and eco-conscious solutions is pivotal to achieving resilient and responsible animal husbandry in the face of growing environmental and public health challenges.

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