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Medicinal Plants Used to Control Ectoparasite in Small Ruminants of Maan Tahasil, Dist. Satara, M.S., India.

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Abstract: Traditional plant-based veterinary practices have played a vital role in livestock management, especially in remote regions where access to veterinary services is limited. This study documents the use and effectiveness of indigenous plant-based formulations in controlling ectoparasite in small ruminants within Maan Tahasil of Satara district, Maharashtra state, India. Knowledge of medicinal plants which is transferred across generations, continues to guide livestock keepers in preparing and administering remedies for common health problems. Field evaluations and assessments of social acceptance revealed that formulations derived from *Tinospora cordifolia* (Willd) Hook. F. and Thoms.(Guduchi), *Vitex negundo* L., *Annona squamosa* L. and *Pongamia pinnata* L.Pierre. were effective in reducing tick infestations. Observations indicated that the udder of sheep hosted the highest tick prevalence. Herbal treatments reduced tick occurrence in sheep. The results support the continued relevance of ethno-veterinary knowledge and highlight the potential of plant-based remedies as accessible, effective and sustainable alternatives for primary animal healthcare.

Keywords: Medicinal Plants , ectoparasite, small ruminants, Traditional knowledge.

INTRODUCTION

Traditional plant-based medicinal practices have long played a critical role in the healthcare of livestock in India. Livestock owners, particularly in rural and remote communities, have historically relied on ethno-veterinary knowledge to manage and treat a wide range of animal ailments (Balaji *et al*., 2010). Ethno-veterinary medicine, rooted in practices that date back to the early domestication of livestock, emphasizes healing through the use of plant mixtures and readily available natural ingredients. These formulations enable livestock keepers to diagnose, prevent and treat common disorders based on experience and community-based knowledge systems.The accessibility, affordability and cultural familiarity of herbal remedies contribute to their continued use among farmers (Pradhan *et al*., 2018). The World Health Organization reports that nearly 80% of people in developing countries depend primarily on traditional medicines for managing health problems associated with livestock, demonstrating the global relevance of these practices. Concern over the gradual disappearance of indigenous veterinary knowledge in the early 1980s triggered international efforts to document, validate and preserve ethno-veterinary practices (Jabbar *et al*., 2005).The need for systematic documentation has become more important due to the known side effects associated with many allopathic veterinary drugs and the rising preference for safe, sustainable and cost-effective herbal alternatives. In regions such as Maharashtra, recording local ethno-veterinary practices is essential for the development of innovative, plant-based veterinary therapeutics (Patole, 2021). Such efforts not only safeguard traditional knowledge but also support the scientific evaluation and standardization of herbal remedies.Medicinal plants contain diverse pharmacologically active compounds, each contributing to their therapeutic potential. Several herbs incorporate multiple bioactive components within a single preparation, enhancing the synergistic effectiveness of plant-based formulations (Rastogi *et al*., 2015). Leaves are among the most commonly used plant parts in traditional medicine worldwide, owing to their ease of collection and high concentration of secondary metabolites produced during photosynthesis (Nagayya *et al*., 2017). This biochemical richness often underlies the strong antimicrobial, antiparasitic, and anti-inflammatory activities reported in many ethno-veterinary remedies.Parasitic diseases remain among the most widespread and debilitating health challenges affecting grazing ruminants. Factors such as inadequate nutrition, environmental stress, and concurrent infections increase livestock susceptibility to parasitic outbreaks. Undernourished sheep, for example, exhibit markedly higher mite infestations, making them more vulnerable to mange and related disorders (Hagwane *et al*., 2010). According to Kubra *et al*.

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(2020), parasitic infections significantly hinder productivity by reducing feed conversion efficiency and causing increased morbidity, mortality, and treatment costs.The literature consistently highlights the efficacy of herbal practices in mitigating parasitic burdens and improving animal health, yet comprehensive documentation and scientific validation remain limited in several regions of Maharashtra. Therefore, integrating traditional knowledge with contemporary research is essential for developing reliable, evidence-based plant-derived solutions for livestock healthcare.

MATERIALS AND METHODS

Study Area

The present study was conducted in the Maan block of Satara district, located in the western region of Maharashtra, India. Geographically, the area lies at approximately 17.70° N latitude and 74.54° E longitude. Maan is characterized by semi-arid climatic conditions and forms part of the rain-shadow region of the Western Ghats.Agriculture and livestock rearing are the predominant livelihood activities in the region, and land use is largely shaped by these traditional rural practices. The area receives an average annual rainfall of about 500 mm, most of which occurs during the southwest monsoon season. The mean temperature ranges from 28°C during cooler months to a peak of around 40°C in the summer, reflecting the region's warm and dry climate.The combination of low rainfall, high temperature variability, and dependence on open grazing systems influences livestock health and productivity, making Maan an important area for studying traditional veterinary practices and plant-based remedies.

Study Period and Location

The study was conducted between 2024 and 2025 in the Maan block of Satara district, Maharashtra, India. The region lies in the semi-arid, rain-shadow zone of the Western Ghats and is predominantly dependent on agriculture and livestock rearing.

Data Collection Methods

An extensive field survey was undertaken to document medicinal plant resources traditionally used for livestock healthcare. The study focused on identifying locally practiced treatments, the prevalence of common animal diseases, and preventive measures adopted by livestock keepers.

Ethno-botanical Surveys and Informant Selection

Information was collected through

1. **Direct interviews** with traditional healers,
2. **Focus group discussions (FGDs)** held with livestock keepers, and
3. **Personal interactions** with knowledgeable community members.

Traditional practitioners were selected based on community nominations and their long-standing reputation for treating animal ailments. A total of 70 informants were included, representing diverse age groups and both genders.

Listing of All Formulations Practiced by Local Healers

To document the diversity of ethno-veterinary practices in the study area, all medicinal formulations used by traditional healers for managing livestock ectoparasite were systematically recorded. Information was collected through structured and semi-structured interviews with practitioners who were identified through community nominations and snowball sampling. Each practitioner provided detailed accounts of the plant-based remedies they regularly used, along with the rationale for their application.During the interviews, practitioners described their experiential knowledge related to tick management, including the perceived effectiveness of specific formulations, observations of recovery rates, and long-term outcomes in livestock. Multiple formulations were documented from each practitioner, and all data were compiled to prepare a comprehensive list of remedies practiced across the Maan block.For each reported formulation, details such as plant species, plant parts used, method of preparation, mode and frequency of application, dosage, and the livestock species treated were recorded. Repeated visits were made to cross-verify information and ensure accuracy. The compiled list represents the full spectrum of formulations recognized locally for their effectiveness in minimizing tick populations in livestock.

Documentation of Medicinal Plant Remedies

For each plant-based remedy used against ectoparasite, detailed information was recorded, including:

Healer's demographic details (age, gender, address) 2. Plant species and local names 3. Plant parts used 4. Method of preparation 5. Dosage 6. Route of administration and 7.Duration of treatment.

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All botanical names were verified using standard floras and online plant databases. Information on preparation and application was cross-checked through repeated interviews to ensure reliability and accuracy.

Justification for Using Plants in Herbal Remedies for Parasite Control

The selection of plants for preparing herbal remedies was based on practitioners' empirical knowledge and practical evaluation of plant properties. Traditional healers assessed the suitability and effectiveness of plant species by observing their sensory and functional characteristics in specific treatment contexts. Plants exhibiting attributes such as bitterness, strong or pungent odor, irritant or itching properties, latex production, or oily secretions were frequently identified as effective in reducing ectoparasite infestation. These characteristics are traditionally associated with repellent, insecticidal or antimicrobial activity.Practitioners also relied on repeated field experience observing animal recovery, reduction in parasite load and improvement in overall health to justify the continued use of particular plants. Over generations, such experiential evaluations contributed to the establishment of a localized selection framework that guided the choice of plants for managing ticks and other ectoparasite in livestock.

Table No. 1 :- Formulations for tick control

Sr. No.	Local Name	Scientific name	Method of preparation	Dose & mode of administration
1	Karanj	Pongamia pinnata L.Pierre.	Fresh leaves crushed into a paste and applied to the skin	Spray the formulation once using a hand pump sprayer
	Kadunimb	Azadirachta indica A.Juss.		
	Nirgudi	Vitex negundo L.		
	Sitaphal	Annona squamosa L.		
2	Nirgudi	Vitex negundo L.	Fresh leaves crushed into a paste	Paste rubbed directly onto the skin
	Sitaphal	Annona squamosa L.		
	Dhotra	Datura metal L.		
3	Gulvel	Tinospora cordifolia (Willd) Hook. F. and Thoms.(Guduchi)	Leaves crushed into a fine paste, soaked in 2 L of water overnight, and filtered	Apply the filtered extract uniformly on the animal's body
	Nirgudi	Vitex negundo L.		
	Sitaphal	Annona squamosa L.		
	Karanj	Pongamia pinnata L.Pierre.		

Prioritization of Common Remedies

During focus group discussions, commonly encountered livestock ailments were listed and discussed. Remedies frequently used for **ecto and endoparasites, diarrhoea, wounds and bloat** emerged as the top three priority categories. These were selected for detailed documentation and scientific evaluation.

Prioritization of the Most Effective Formulations

To identify the most effective plant-based formulations for controlling ectoparasite, progressive farmers, experienced livestock owners, and traditional practitioners were organized into focus groups. These groups comprised individuals who had previously benefited from herbal treatments and who possessed practical knowledge of their application. During the focus group discussions, participants evaluated and compared the documented formulations based on their field experience.

Criteria for prioritization included:

1. **Effectiveness in reducing tick infestations**,
2. **Availability and sustainability of plant resources**,
3. **Simplicity and feasibility of preparation and application**, and
4. **Affordability and accessibility for local livestock keepers**.

Based on these criteria, the focus groups collaboratively ranked the formulations. A consolidated list of all medicinal plant-based remedies was prepared, and the top three formulations with the highest potential for minimizing tick populations were selected for detailed documentation and further analysis (Table 1).

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Table No. 2 :- Part-wise Infestation of Ticks on Sheep

Body part	Ear	Eye	Foot	Udder	Tail	Back
Average ticks	7	3	5	5	7	3

Validation and Cross-Verification

The documented formulations were compared with existing ethno veterinary and pharmacological literature to determine their consistency with reported medicinal properties. Cross-verification of plant identity and remedy usage was carried out with the help of local botanists and senior practitioners.

Field-Level Application of the Selected Top Formulation

For field evaluation of the prioritized formulation, only small ruminants exhibiting high levels of tick infestation were selected. Before administering the treatment, baseline tick counts were recorded from specific anatomical regions commonly affected by ectoparasite, including the udder, ears, eyes, tail, feet, and dorsal (back) region.The medicinal plants designated for the formulation were gently crushed and left to soak overnight to facilitate the release of active compounds. The preparation was sieved the following morning, and the filtrate was allowed to stand for approximately ten minutes to enable sedimentation of coarse particles. The clarified herbal extract was then applied uniformly across the animal's body surface using a hand-pump sprayer to ensure thorough coverage.Three days after treatment, tick counts were repeated at the same anatomical sites to assess changes in parasite load. During the study period, routine livestock management practices—such as the application of lime powder and salt-water spraying—were maintained as supportive measures commonly used by farmers.

Table No. 3 :- Efficacy Medicinal plants formulations for control of Ticks in Small Ruminants

Species	Formulations	No. Of Animals	Average number of Tick Population		Efficacy %
			Before Treatment	After Treatment	
Sheep	F-1	30	28	7	75
	F-2	30	32	11	65.5
	F-3	30	28	12	57.1
	Control	30	31	15	51.6

DATA ANALYSE

Qualitative data from interviews and FGDs were analyzed using thematic categorization to identify common patterns in disease occurrence, remedy formulation, and treatment practices. Quantitative observations on ectoparasite prevalence were summarized descriptively.

RESULTS

The prevalence of tick infestation in sheep and goats revealed that the **udder and tail regions of sheep** harbored the highest tick density. Factors contributing to this pattern may include inadequate management practices, breed susceptibility, and poor hygiene conditions. A total of 120 sheep were included in the study, and each animal was assigned to a group corresponding to one of the top-priority herbal formulations selected through focus group discussions. All animals exhibited extensive tick infestation prior to treatment.The application of herbal formulations resulted in a significant reduction in tick load across all groups, demonstrating the effectiveness of plant-based remedies in controlling ectoparasite. The formulations were prepared and applied as follows:

1. **Formulation F-1:** Fresh leaf pastes of **Karanj (***Pongamia pinnata* **L. Pierre)**, **Kadunimb (***Azadirachta indica* **A. Juss.)**, **Sitaphal (***Annona squamosa* **L.)** and **Nirgudi (***Vitex negundo* **L.)** were applied directly to the skin.

2. **Formulation F-2:** A paste of **Nirgudi (***Vitex negundo* **L.)**, **Sitaphal (***Annona squamosa* **L.)**, and **Dhotra (***Datura metel* **L.)** was applied topically.

3. **Formulation F-3:** Leaves of **Nirgudi (***Vitex negundo* **L.)**, **Sitaphal (***Annona squamosa* **L.)**, **Karanj (***Pongamia pinnata* **L.)**, and **Gulvel (***Tinospora cordifolia* **(Willd.) Hook. f. & Thoms.)** were crushed into a fine pulp, soaked in two liters of water overnight, filtered, and the resulting extract was applied to the animals' bodies.

Among the three formulations, **F-1 showed the highest efficacy** in reducing tick infestations, suggesting that the combination of Karanj,

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Kadunimb, Sitaphal and Nirgudi leaves is particularly effective for ectoparasite control in sheep. The results are consistent with previous studies that report ***Azadirachta indica*** and ***Pongamia pinnata*** as possessing strong insecticidal and repellent properties. The topical application of fresh leaf pastes provides both immediate tick removal and longer-lasting protection due to the bioactive compounds present in the leaves.These findings highlight the potential of ethno-veterinary herbal remedies as **effective, low-cost, and environmentally friendly alternatives** to chemical acaricides, especially in regions where veterinary services are limited. In addition, the use of locally available medicinal plants ensures sustainability and accessibility for rural livestock keepers.

DISCUSSIONS

Ethno veterinary remedies have been widely reported as effective in the management of several common animal diseases, particularly in remote areas where access to professional veterinary services is limited. In such settings, livestock owners rely heavily on traditional knowledge to address animal health problems, especially when timely communication with veterinarians is not possible (Kulkarni *et al*., 2014). However, this valuable indigenous knowledge system is gradually declining, as younger generations are increasingly unaware of traditional practices and ways of life.Previous studies indicate that herbal remedies are most commonly prepared in the form of paste, powder, liquid, or used in raw form (Jaykumar *et al*., 2018). Among these, paste and juice preparations are especially prevalent in ethno veterinary practices due to their simplicity and ease of preparation using basic tools such as a pestle and mortar, with or without the addition of water. Despite their widespread use, the seasonal availability of medicinal plants poses a significant limitation. To overcome this constraint, traditional healers have developed various storage techniques to ensure the availability of plant materials during the off-season (Galav *et al*., 2013).It was also observed that treatments are not always species-specific; similar remedies are often administered to different livestock species such as cattle, goats, sheep and horses. In such cases, the dosage is adjusted according to the body weight of the animal rather than the species itself. Overall, ethno veterinary medicine not only plays a crucial role in sustaining livestock health in rural and remote regions but also holds potential as a foundation for future research and development of novel drugs for human medicine.

CONCLUSION

The use of locally available herbal medicines provides a practical and effective solution for managing ectoparasite infestations in small ruminants, particularly for shepherds and livestock owners in remote areas. Ectoparasite infections lead to substantial economic losses due to reduced productivity and increased treatment costs. The medicinal plants used in this study—**Gulvel (***Tinospora cordifolia* **(Willd.) Hook. f. & Thoms.)**,**Kadunimb (***Azadirachta indica* **A. Juss.), Nirgudi (***Vitex negundo* **L.)**, **Sitaphal (***Annona squamosa* **L.)**, and **Karanj (***Pongamia pinnata* **L. Pierre)**—are easily accessible to rural communities. The results demonstrate that these traditional herbal formulations can effectively reduce tick infestations, offering a sustainable, low-cost, and environmentally friendly alternative to conventional chemical acaricides. The integration of ethno-veterinary knowledge into livestock management practices can significantly improve animal health and productivity in rural settings.

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REFERENCES

1. Adsul, Y. D., Mahajan, R. T., & Badgujar, S. B. "Ethnobotanical euphorbian plants of north Maharashtra region." *IOSR J Pharm Biol Sci* 7 (2013): 29-35.
2. Borkataki S. And Goswami P. “Sustainable control of ectoparasite in small ruminants.” *Just Agriculture multidiscplinary e-newsletter* 3.11, (2023)
3. Chandra Sourav, A. Chakrabarty, S. Biswas, C. Guha and S. Sarkar “Validation of Selected Ethno-veterinary Practices through Farmer Participatory Research Approach in Jalpaiguri District of West Bengal.” *International Journal of Bio-resource and Stress Management* 3.4 (2012): 449-454
4. Marathe, V. R. & Deshmukh, M. M. "Ethno-veterinary medicinal plant species of Hadgaon

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Taluka, Nanded District, Maharashtra, India." (2020): 404-410.
5. Deshmukh R. R., V. N. Pardeshi and V.N. Rathod "Ethnoveterinary medicine from Jalana district of Maharashtra state." *Indian journal of traditional knowledge* 10.2 (2011): 344-348.
6. Deva Mohd Adil, Jahangirr Ahmad Magray, Sameer Ahmad Thoker, Sushil Manderia "Use of Plants in the Management of Foot and Mouth Disases in Sheep." *Advances in Zoology and Botany* 10.2 (2022): 37-42.
7. Dhore R. K. and V. S. Undal "Medico-Botanical studies in relation to veterinary medicinal plant from Akola district of Maharashtra." *Interbational journal of current research* 9.11 (2017): 61725-61731.
8. Galav, P., Jain, A., & Katewa, S. S. "Traditional veterinary medicines used by livestock owners of Rajasthan, India." *Indian Journal of Traditional Knowledge* 12.1 (2013): 47-55.
9. Hagawane, S. D., Rajurkar, G. R., & Shinde, S. B. "Ethno-veterinary drug therapy for ear mange in sheep." *Veterinary World* 3.6 (2010): 295.
10. Hema Sayee, R., Gayathri, K., Femina Banu, S., Kowsalya, S., Kokila, M., Nandhini, S., & Senthilkumar, S. "Ethno veterinary medicine: A boon for animal health." *Int J Sci Environ Technol* 5 (2016): 4006-12.
11. Hussain, J. F. and Tynsong, H. "Review: Ethano-zoological study of animal-based medicine used by traditional healers of Northeast India." *Asian Journal of Ethanobiology* 4.1, (2021): 1-22
12. Jayakumar, S., Baskaran, N., Arumugam, R., Sathiskumar, S., & Pugazhenthi, M. "Herbal medicine as a live practice for treating livestock ailments by indigenous people: A case study from the Konar community of Tamil Nadu." *South African Journal of Botany* 118 (2018): 23-32.
13. Khandare Kirankumar "Ethno-Veterinary properties of some plants of Marathwada region, (Maharashtra) India." *International journal for innovative research multidisciplinary field*, 6.5, (2020): 197-200.
14. Kirmani, N. R., Banday, M. T., & Abdullah, M. "Ethno-medicinal plants used by Bakarwals for treatment of livestock." *J. Entomol. Zool. Stud* 8 (2020): 1742-1745.
15. Kubra, S. S., Shereen, M. M., & Shah, A. "A ETHNO-VETERINARY ANTHELMINTICS OF KASHMIR VALLEY." *Animal Science Quarterly* 1.1 (2020): 23-5.
16. Kulkarni, S., Kulkarni, D. K., Deo, A. D., Pande, A. B., & Bhagat, R. L. "Use of ethno-veterinary medicines (EVM) from Vidarbha region (MS) India." *Biosci Discov* 5.2 (2014): 180-6.
17. Sunita, K., Kumar, P., Khan, M. A., Husain, S. A., & Singh, D. K. "Anthelminthic/larvicidal activity of some common medicinal plants." *European Journal of Biological Research* 7.4 (2017).
18. Ramana, M. V. "Ethnomedicinal and ethnoveterinary plants from boath, adilabad district, Andhra Pradesh, India." *Ethnobotanical leaflets* 2008.1 (2008): 46.
19. Menegesha, A. "A review on ethno-veterinary medicine practices and indigenous knowledge." *J Vet Med Anim Sci* 3.1 (2020).
20. Naikade, S. M., & Meshram, M. R. Meshram. "Ethno-Medicinal plants used for jaundice from Konkan region, Maharashtra, India." *International Journal of Pharmaceutical Science Invention* 3.12 (2014): 39-41.
21. Mir, I., Rautela, A., & Nimbalkar, V. "Use of ethno veterinary medicine (EVM) in India for livestock management practices: a review." *Int J Curr Microbiol App Sci* 9 (2020): 3458-3461.
22. Mishra, D. P., Sahu, R. K., Mishra, N., & Behera, A. K. "Herbal treatment for common diseases in ruminants: an overview." (2015): 36-43.
23. Nimbalkar, S. D., Patil, D. S., & Deo, A. D. "Ethnoveterinary practices (EVP) for control of ectoparasite in livestock." *Indian Journal of Traditional Knowledge* 19.2 (2020): 401-405.
24. Panda, T., Mishra, N., Pradhan, B. K., Rout, S. D., Mishra, R. K., & Mohanty, R. B. "Plants used in traditional healthcare of livestock: A case study from Kendrapara district, Odisha, India." *J Med Plants Stud* 5.4 (2017): 175-182.
25. Patil, D. A., & Patil, P. S. "Folk herbal medicine from some tehsils of Buldhana district (Maharashtra) in India." *Journal of Ecobiotechnology* (2011).
26. Patil, D. A., Patil, P. S., Ahirrao, Y. A., Aher, U. P., & Dushing, Y. A. "Ethnobotany of Buldhana district (Maharashtra: India): plants used in veterinary medicine." (2010): 22-34.
27. Patil, H. M., & Patil, S. J. "Ethno-veterinary medicinal preparations of tribals from shirpur tahsil, dhule district, Maharashtra,

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India." *Kathmandu University Journal of Science, engineering and technology* 9.1 (2013): 134-139.
28. Patole, S. N. "Studies On Ethno-Veterinary Uses Of Plants Around Akot Tahsil, Dist. Akola, Maharashtra, India." (2021).
29. Pawar N.B. "Ethno-Veterinary plants of Baglan region from Nashik District, Maharashtra." *International Journal of Research and Analytical Reviews* 7.1 (2020).
30. Pradhan, S., & Mishra, S. "Ethnoveterinary practice: An alternative treatment approach in contemporary India." *The Pharma Innovation Journal* 7.9 (2018): 362-365.
31. Rastogi, S., Pandey, M. K., Prakash, J., Sharma, A., & Singh, G. N. "Veterinary herbal medicines in India." *Pharmacognosy reviews* 9.18 (2015): 155.
32. Raveesha, H. R., & Sudhama, V. N. "Ethnoveterinary practices in Mallenahalli of Chikmagalur taluk, Karnataka." *Journal of Medicinal Plants Studies* 3.1 (2015): 37-41.
33. Rizwan, H., Sajid, M., Shamim, A., Abbas, H., Qudoos, A., Maqbool, M., & Amin, Z. "Sheep parasitism and its control by medicinal plants: A review." *Parasitologists United Journal* 14.2 (2021): 112-121.
34. Salave, A. P., Reddy, P. G., & Diwakar, P. G. "Some unreported ethnobotanical uses from Karanji Ghat Areas of Pathardi Tahasil in Ahmednagar District (MS) India." (2011).
35. Samudra, S. M., & Shinde, H. P. "Studies on ethnomedicinal plant diversity at Daund Tehsil, Pune, Maharashtra." *International research journal of plant science* 12.1 (2021): 1-13.
36. Satapathy, K. B. "Ethnoveterinary practices in Jajpur district of Orissa." (2010): 338-343.
37. Saikia, B., & Borthakur, S. K. "Use of medicinal plants in animal healthcare-A case study from Gohpur, Assam." *Indian J Tradit Knowl* 9.1 (2010): 49-51.
38. Shivamanjunatha M. P. "Medicinal plants used to treat domestic animals." *International of herbal medicine* 9.3 (2021): 65-70
39. Balaji, N. S., & Chakravarthi, P. V. "Ethnoveterinary practices in India-a review." (2010): 549-551.
40. Somkuwar, S. R., Chaudhary, R. R., & Chaturvedi, A. "International Journal of Sciences & Applied Research."
41. Sonawane, M. D. "Ethnobotanical and Ethnomedicinal Studies of Salher and Mulher Forest from District Nashik (Maharashtra)." (2011).
42. Swati K.M., Rana A., Koul V. & Kumar A. "Medicinal plants used in the treatment of animal diseases- A review on veterinary medicine." *Futuristic Trends in Pharmacy & Nursing* Volume 3, Book 1, Part 2, Chapter 2 PP 89-100 (2024).
43. Undhal V.S. and Idhole S.S. "Medicinal plant resources used for traditional Ethno-veterinary phytotherapy in washim district (Maharashtra)." *International Journal of Creative Research Thoughts* 10.2.

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