https://doi.org/10.33451/florafauna.v32i1pp110-120
FLORA AND FAUNA ISSN 2456 - 9364 (Online)
2026 Vol. 32 No.1 PP 110-120 ISSN 0971 - 6920 (Print)

Medicinal plants used in treatment of Livestock diseases by tribal and local people of Vidarbha region (MS), India

Pitambar Humane

Department of Botany,
Dharampeth M. P. Deo Memorial Science College,
NAGPUR-440033 (MAHARASHTRA) INDIA
E-mail : aareenpapa_2004@rediffmail.com

Received **:** 11.03.2026; ***Accepted*** : 08.04.2026

How to cite : Humane P. Medicinal plants used in treatment of Livestock diseases by tribal and local people of Vidarbha region (MS), India. *Flora and Fauna* 2026. 32(1) : 110-120.

ABSTRACT

Livestock rearing forms an integral part of the agrarian economy in the Vidarbha region of Maharashtra, India, where rural and tribal populations rely heavily on cattle, goats, and buffaloes for milk, and meat purposes. The region, characterized by tropical dry deciduous forests and diverse flora, supports a rich repository of traditional knowledge related to ethnoveterinary practices. However, due to limited access to modern veterinary facilities, tribal and local communities continue to depend on medicinal plants for treating a wide variety of livestock ailments. Commonly reported diseases include foot-and-mouth diseases, bloat, wounds, diarrhoea, mastitis, skin infections, and parasitic infestations, which significantly affect animal health and agricultural productivity.

The present study documents the use of medicinal plants in livestock healthcare by the local people of Vidarbha. A total of **55 angiosperms plant species** were identified, belonging to **36 families** and **52 genera**. Among them, **31 families (43 genera)** were dicotyledons, while **5 families (9 genera)** were monocotyledons, indicating the dominance of dicot taxa in ethnoveterinary medicine. These plants are administered in various forms such as decoctions, pastes, powders, and extracts, often prepared using traditional methods passed orally across generations. The wide range of species recorded reflects both the ecological diversity of Vidarbha and the rich indigenous knowledge base of its inhabitants.

The findings of this study underline the critical role of medicinal plants in sustaining livestock health in rural economies and highlight the urgent need for systematic pharmacological validation, conservation of bioresources, and preservation of traditional knowledge for future veterinary applications.

Figures : 03 References : 39 Table : 01
KEY WORDS : Angiosperms, Ethnoveterinary medicine, Livestock diseases, Medicinal plants, Vidarbha region,

Introduction

Ethnoveterinary medicine (EVM) refers to the traditional knowledge, practices, and beliefs associated with the healthcare of livestock, developed over generations by rural and indigenous communities[1.21]. It encompasses the use of medicinal plants, minerals, and other natural products, as well as ritualistic and management practices, for the treatment of animal diseases[1]. In developing countries such as India, ethnoveterinary practices continue to play a crucial role in livestock healthcare, particularly in areas where access to modern veterinary services is limited or economically unfeasible[2].

India is one of the world's richest regions in terms of biodiversity and cultural diversity, and this combination has nurtured a vast repertoire of ethnomedicinal knowledge. Around 70–80% of rural communities in India rely on traditional medicine, both for themselves and for their animals[2]. Tribal communities inhabiting forest regions, including central India, have particularly preserved diverse plant-based veterinary practices that form the backbone of local animal healthcare systems[2].

ACKNOWLEDGEMENTS : The author is highly grateful to the local people and tribal communities of the Vidarbha region, Maharashtra, for generously sharing their traditional knowledge of medicinal plants used in livestock healthcare. Their cooperation and trust made this study possible. Special thanks are extended to farmers, cattle herders, and village elders who provided valuable information on ethnoveterinary practices.

The Vidarbha region of Maharashtra lies in central India, occupying about one-third of the state's geographical area. The region is characterized by tropical dry deciduous forests, basaltic soil derived from Deccan Traps, and a predominantly hot and dry climate[12]. Rich in biodiversity, Vidarbha is home to several forest species such as *Tectona grandis*, *Madhuca longifolia* var. *latifolia*, *Bambusa bambos* and *Terminalia* spp., which are widely used for both human and animal health remedies[2] .

Livestock rearing is an integral part of the rural economy, providing dairy products, manure, draught power, and supplementary income. Small holders and tribal communities depend heavily on cattle, buffalo, goats, and poultry for subsistence[22]. However, recurrent droughts, crop failures, and inadequate veterinary infrastructure have made farmers increasingly vulnerable, thereby emphasizing the significance of traditional animal healthcare systems[2].

In Vidarbha, livestock suffers from a wide range of ailments, including infectious diseases such as foot-and-mouth diseases, haemorrhagic septicaemia, black quarter, and mastitis[1]. Emerging threats such as lumpy skin disease and tick-borne illnesses further complicate livestock health management[1].

Although government veterinary hospitals and dispensaries exist, their accessibility is uneven, particularly in remote tribal and forested areas[2]. High costs of modern veterinary drugs, poor transportation, and a lack of trained manpower exacerbate the problem[2]. Consequently, traditional herbal remedies remain the primary source of treatment for many rural households in Vidarbha.

Ethnoveterinary research across India has documented a rich variety of plant species used for animal healthcare. In Bundelkhand, 41 species from 25 families were reported for treating livestock ailments[31]. In Uttarakhand, 73 species were identified, employed in the management of bloat, diarrhoea, pneumonia, and mastitis[2]. From Meghalaya, 96 species were documented for treating foot-and-mouth diseases, bone fractures, and digestive disorders[1]. Similar findings were reported from Assam[2], Madhya Pradesh[33], and Keralam[3].

Within Maharashtra, several ethnobotanical surveys have identified medicinal plants used by tribal groups in Gadchiroli, Chandrapur, and Bhandara districts for both human and veterinary healthcare[3] . However, comprehensive studies on ethnoveterinary practices specific to Vidarbha remain relatively scarce. One notable survey recorded 46 plant species used by Gond and Madia tribes in Gadchiroli for treating livestock diseases such as wounds, abortions, and digestive disorders[1].

The present investigation adds significantly to the ethnoveterinary literature by documenting 55 plant species used in livestock healthcare in Vidarbha. These belong to 36 families and 52 genera, with dicotyledonous taxa clearly dominating; 31 families and 43 genera are dicots, while 5 families and 9 genera are monocots. This pattern is consistent with findings from other regions of India, where dicots are more frequently represented in ethnomedicinal practices due to their greater phytochemical diversity.

The plants identified in this study were reported by tribal and local people to be useful for treating a broad range of conditions like wounds, mastitis, gastrointestinal disorders, reproductive problems, skin infections, and parasitic infestations. Remedies are typically prepared as pastes, decoctions, or powders, often administered orally or applied externally, and are based on traditional methods transmitted orally across generations[1,2].

The documentation of ethnoveterinary knowledge in Vidarbha is significant for several reasons. It provides a scientific record of local knowledge systems at risk of erosion due to cultural change and modernization[1]. It highlights the biodiversity of Vidarbha as a source of medicinal plants with potential pharmacological importance. In light of increasing drug resistance and the high cost of modern veterinary medicine, ethnoveterinary remedies may provide affordable and effective alternatives for smallholder farmers[3].

Finally, the integration of traditional practices into formal animal healthcare, through validation and conservation of medicinal plants, could strengthen sustainable livestock management in the region.

Material and Methods

Study Area : The research was carried out in the Vidarbha region of Maharashtra, which covers 11 districts: Nagpur, Wardha, Bhandara, Gondia, Chandrapur, Gadchiroli, Amravati, Yavatmal, Akola, Washim, and Buldhana (**Fig. 1**). Geographically, the region lies in the eastern part of the state between 18°302 –21°452 N latitudes and 76°302 –80°452 E longitudes. The climate is predominantly tropical, with hot summers, monsoon rainfall, and moderate winters. The eastern districts are rich in forests dominated by tropical dry deciduous vegetation, which supports a high diversity of medicinal plants. The population here is largely rural and tribal, dependent on agriculture and livestock rearing, with traditional ethnoveterinary practices forming an essential part of animal healthcaret [,13].

Data Collection : Field surveys were conducted in rural villages and forest-fringe areas from 2015 to 2024. Data on medicinal plants used in livestock healthcare were

TABLE-1: List of Ethnoveterinary Medicinal Plants

S. No.	Specimen No.	Scientific Name	Ver. Name	Family	Part Used	Disease/s
1	PTH0459	*Acacia leucophloea*	Hiwar	Fabaceae	Leaves	Stomach problems
2	PTH0439	*Acacia nilotica*	Babhul	Fabaceae	Flowers / Bark	Jaundice / dysentery
3	PTH0927	*Acorus calamus*	Yakad	Acoraceae	Rhizome	Skin infestations
4	PTH0616	*Aegle marmelos*	Bel	Rutaceae	Leaves / Seeds	Sun-burns
5	PTH0600	*Allium cepa*	Kanda	Liliaceae	Bulb / Leaves	Cough / Ectoparasites
6	PTH0776	*Anagalis arvensis*		Primulaceae	Whole plant	Expel leeches from nostrils
7	PTH0038	*Annona squamosa*	Sitaphal	Annonaceae	Seeds	Tick bites
8	PTH0258	*Argemone mexicana*	Utati	Papaveraceae	Leaves / Seeds	Food infection / rheumatism
9	PTH0983	*Asparagus racemosus*	Marbat	Liliaceae	Roots	Arthritis
10	PTH0320	*Azadirachta indica*	Neem	Meliaceae	Leaves	Wounds
11	PTH0923	*Bambusa arundinacea*	Bas	Poaceae	Leaves / Roots	Easier delivery / diarrhoea
12	PTH0187	*Basella alba*	Dalbhaji	Basellaceae	Leaves	Weaknesses
13	PTH0315	*Butea monosperma*	Palas	Fabaceae	Flowers	Dysurea / Paralysis

S. No.	Specimen No.	Scientific Name	Ver. Name	Family	Part Used	Disease/s
14	PTH0831	*Calotropis procera*	Rui	Asclepiadaceae	Flowers / Latex	Easier delivery / Snake bite
15	PTH0325	*Carrisa congesta*	Karvand	Apocynaceae	Roots / Leaves	Ephemeral fever
16	PTH0397	*Cassia fistula*	Bahawa	Fabaceae	Leaves / Fruits	Indigestion / apetite / constipation
17	PTH0489	*Cissampelos pareira* var. *hirsuta*		Menispermaceae	Roots / Leaves	Scorpion stings
18	PTH0796	*Coriandrum sativum*	Sambhar	Apiaceae	Leaves / Fruits	Loose motion
19	PTH0528	*Curcuma longa*	Halad	Zingiberaceae	Rhizome	Foot-and-mouth
20	PTH0804	*Cynodon dactylon*	Harari	Poaceae	Leaves / Stem	Increase lactation / Conjuctivitis
21	PTH0534	*Datura metel*	Kala Dhotra	Solanaceae	Roots / Leaves / Fruits	Wounds / Cold
22	PTH0410	*Delonix regia*	Gulmohar	Fabaceae	Bark	Fever
23	PTH0152	*Eclipta prostrata*	Maka	Asteraceae	Leaves	Wounds
24	PTH0580	*Ficus benghalensis*	Wad	Moraceae	Roots	Stomachache
25	PTH0839	*Ficus religiosa*	Pimpal	Moraceae	Leaves	Tonsils
26	PTH0460	*Gardenia gummifera*	Dikemali	Rubiaceae	Leaves	Wounds and skin lesions

S. No.	Specimen No.	Scientific Name	Ver. Name	Family	Part Used	Disease/s
27	PTH0706	*Hibiscus cannabinus*	Ambadi	Malvaceae	Leaves / Flowers	Ring worms
28	PTH0041	*Hibiscus rosa-sinensis*	Jaswand	Malvaceae	Bark	Twitching
29	PTH0814	*Holoptelea integrifolia*	Chilar	Urticaceae	Leaves	Ectoparasites
30	PTH0642	*Impatiens balsamina*	Chiwdi	Balsaminaceae	Leaves	Worts in nipples
31	PTH0805	*Justicia adhatoda*	Adulsa	Acanthaceae	Leaves / Bark	Diarrhoea / dysentery
32	PTH0568	*Limonia acidissima*	Kawath	Rutaceae	Leaves	Intestinal worms
33	PTH0307	*Madhuca longifolia* var. *latifolia*	Moha	Sapotaceae	Flowers	Fever
34	PTH0299	*Mangifera indica*	Aam	Anacardiaceae	Fruits	Indigestion
35	PTH0567	*Moringa oleifera*	Mungna	Moringaceae	Roots / Leaves / Fruits	Ulcers / Diarrhoea / dysentery / Rheumatism
36	PTH0564	*Musa paradisiaca*	Kel	Musaceae	Roots / Leaves	Body heat
37	PTH0140	*Ocimum tenuiflorum*	Tulas	Lamiaceae	Leaves	Cough / Cold
38	PTH0034	*Oryza sativa*	Dhan	Poaceae	Grains	Increase lactation
39	PTH0481	*Psidium guajava*	Peru	Myrtaceae	Leaves	Fever
40	PTH0265	*Ricinus communis*	Erand	Euphorbiaceae	Seeds	Constipation
41	PTH0819	*Sapindus emarginatus*	Ritha	Sapindaceae	Bark	Wounds by Worm infestation after calving

S. No.	Specimen No.	Scientific Name	Ver. Name	Family	Part Used	Disease/s
42	PTH0477	*Securinega virosa*	Pandhri pisaundi	Euphorbiaceae	Leaves	Dysentery
43	PTH0518	*Semecarpus anacardium*	Bibba	Anacardiaceae	Seeds	Foot-and-mouth
44	PTH0352	*Soymida febrifuga*	Rohan	Meliaceae	Bark	Foot-and-mouth
45	PTH0382	*Sterculia urens*	Kadai	Sterculiaceae	Leaves and stem mucilage	Pleuropneumonia
46	PTH0314	*Syzygium cumini*	Jambhul	Myrtaceae	Bark	Joint pain
47	PTH0543	*Tagetes erecta*	Zendu	Asteraceae	Leaves	Hydrophobia
48	PTH0406	*Tamarindus indica*	Chinch	Fabaceae	Leaves / Fruits	Swellings / tongue sores
49	PTH0337	*Terminalia chebula*	Hirda	Combretaceae	Fruits	Tick infestations
50	PTH0519	*Tinospora cordifolia*	Gulvel	Menispermaceae	Leaves	Maggot wounds
51	PTH1044	*Tribulus terrestris*		Zygophyllaceae	Leaves	Colic / Cough
52	PTH0797	*Trigonella foenum-graecum*	Methi	Fabaceae	Seeds	Easier delivery
53	PTH0377	*Vitex negundo*	Nirgudi	Verbenaceae	Leaves	Diarrhoea
54	PTH0926	*Zingiber officinale*	Adrak	Zingiberaceae	Rhizome	Physical disability
55	PTH0266	*Ziziphus mauritiana*	Bor	Rhamnaceae	Leaves / Seeds	Skin burns

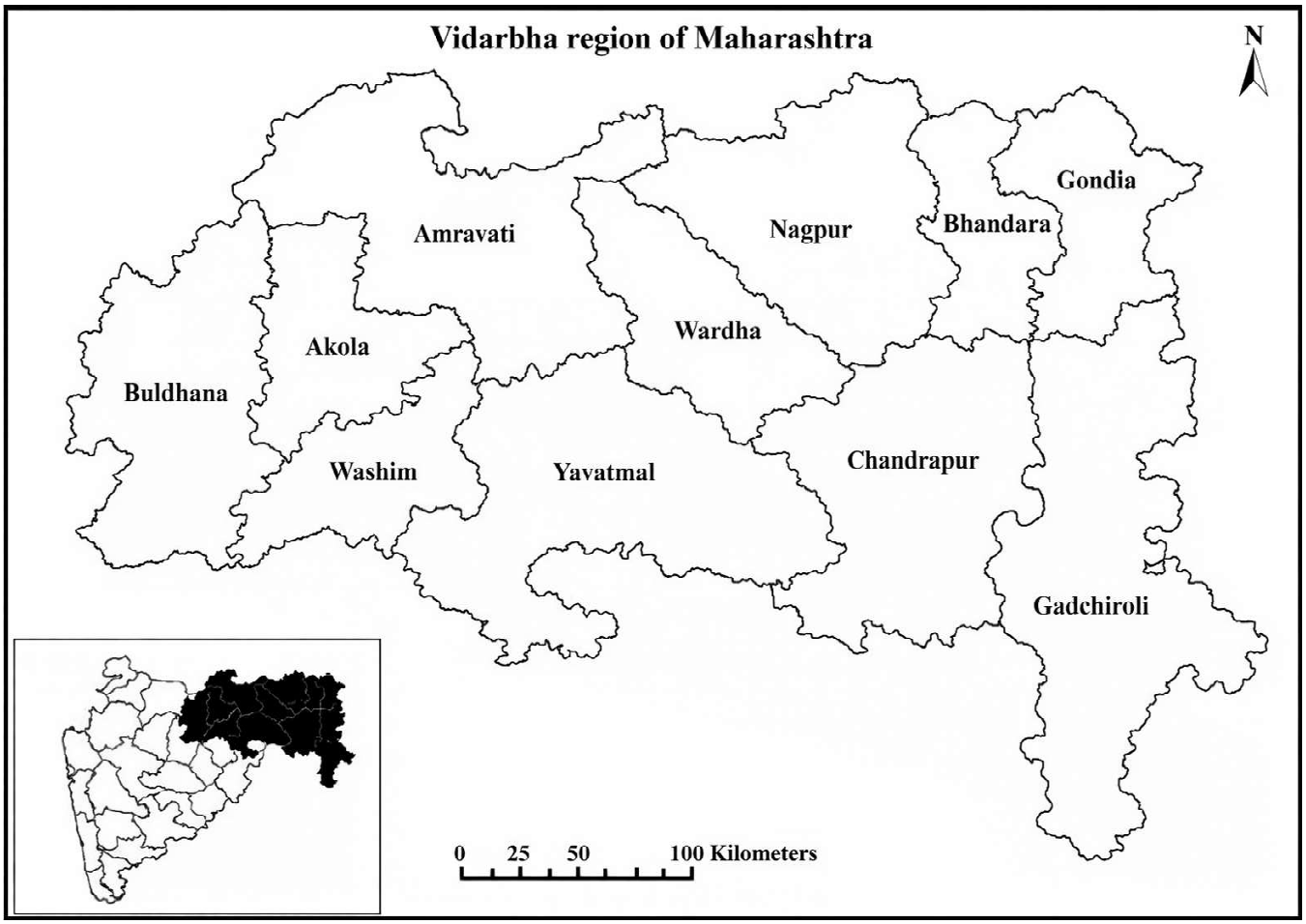

Fig. 1: Vidarbha region in Maharasthra state[17]

gathered using semi-structured interviews, open-ended questionnaires, participatory rural appraisal, and group discussions with local healers, livestock rearers, and elderly community members. The information collected included vernacular names, plant parts used, methods of preparation, routes of administration, and diseases treated. To enhance reliability, data were cross-verified through repeated discussions with different informants[1].

Plant Collection and Identification

All reported plants were collected during field visits, with the help of informants. Collected specimens were dried, pressed, mounted on herbarium sheets, and preliminarily identified in the field. For taxonomic authentication, specimens were compared with standard references such as *Flora of Maharashtra State*[3] and *Flora of Nagpur District*[3]. Voucher specimens were deposited in the departmental herbarium of Botany department, Dharampeth M. P. Deo Memorial Science College, Nagpur for future reference.

Results and Discussion

The present study documented **55 angiosperm species**, distributed across **52 genera and 36 families**, used by tribal and local communities of the Vidarbha region for treating livestock ailments. Among these, **dicotyledons** were dominant with **46 species (43 genera, 31 families)**, while **monocotyledons** were represented by **9 species (9 genera, 5 families)** (**Table-1**).

The family Fabaceae contributed the maximum number of species (7 spp.), followed by Euphorbiaceae, Malvaceae, Myrtaceae, Moraceae, Menispermaceae, and Poaceae (2–3 spp. each). The prominence of Fabaceae is consistent with ethnomedicinal studies across India and Africa, where members of this family are widely employed in both human and veterinary medicine[1,32].

Different plant parts were employed in the treatment of livestock diseases. **Leaves were the most frequently used plant part (33 species, *i.e.,* 42%)**, followed by roots (8 spp.), fruits (6 spp.), seeds (7 spp.), bark (7 spp.), flowers (4 spp.), whole plants (3 spp.), bulbs (1 sp.), rhizomes (2 sp.), stem mucilage (1 sp.), and latex (1 sp.) (**Fig. 2**).

The dominance of leaves is attributed to their accessibility, year-round availability, and richness in bioactive compounds . Similar trends were reported in

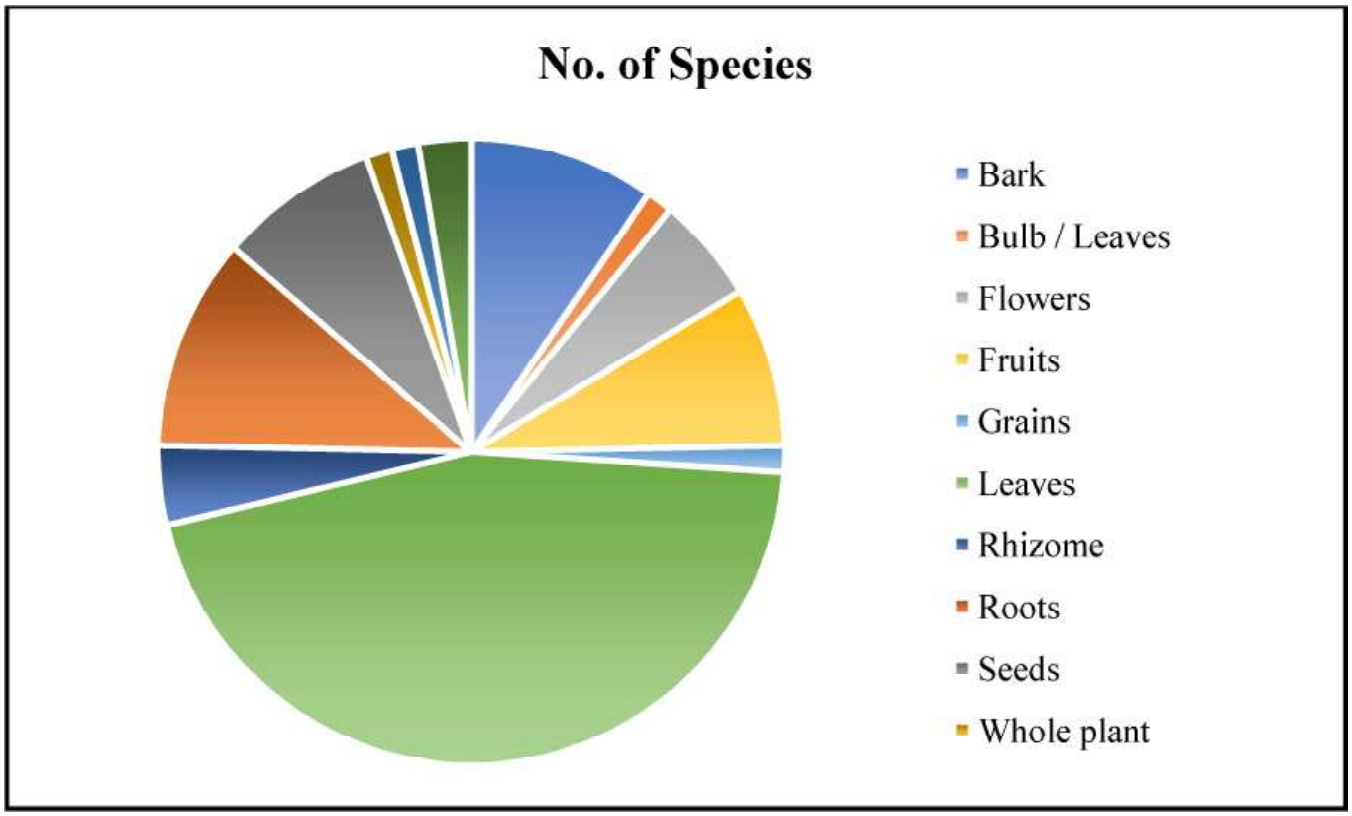

Fig. 2 : Plant part used

ethnoveterinary studies from Madhya Pradesh[3], Andhra Pradesh[2] and Kenya[23], where leaves formed the bulk of preparations for livestock treatments. Use of underground parts (roots, bulbs, rhizomes) was comparatively lower, possibly due to ecological and cultural concerns over plant destruction during harvesting.

The ethnomedicinal repertoire covered a broad spectrum of livestock ailments. The most frequently reported categories of diseases included gastrointestinal disorders like diarrhoea, dysentery, stomach-ache and indigestion (12 species), dermatological conditions like wounds, skin infections and burns (8 species), respiratory diseases like cough, cold, fever (7 species), and reproductive problems like ease of delivery, lactation increase (5 species). Other conditions treated included foot-and-mouth, arthritis, rheumatism, colic, mastitis, and parasitic infestations (Fig. 3).

These findings resonate with earlier observations from Maharashtra, Gujarat, and Karnataka, where gastrointestinal and dermatological ailments were dominant in ethnoveterinary applications. Since livestock in tropical regions are frequently exposed to contaminated fodder, unhygienic water, ticks, and parasites, community reliance on herbal remedies for such ailments reflects ecological pressures and livestock management realities.

Medicinal plants were administered in various forms including decoctions, pastes, juices, powders, and extracts. Oral administration was common for gastrointestinal, febrile, and systemic diseases, while topical applications were preferred for wounds, skin burns, and external parasitic infestations. These traditional preparation methods are consistent with other ethnoveterinary surveys in India[2,33], suggesting a strong cultural continuity in indigenous veterinary practices.

The high number of species documented reflects both the ecological diversity of Vidarbha and the cultural depth of indigenous knowledge. However, as noted in similar studies, such knowledge is largely transmitted orally and is increasingly at risk due to rapid socio-economic changes[11]. Documentation of these practices is therefore critical not only for the preservation of traditional wisdom but also for the identification of novel pharmacological leads for veterinary science.

Moreover, several species recorded in the present study e.g., *Azadirachta indica*, *Terminalia chebula*, *Aegle marmelos*, *Calotropis procera* are already known for their antimicrobial, antiparasitic, and anti-inflammatory properties, validating their ethnoveterinary uses[1,3]. Systematic phytochemical and pharmacological evaluation of such species is required to standardize dosages and ensure safety in veterinary practice.

The frequent use of roots, bark, and whole plants

in some remedies may threaten wild populations if harvesting is unsustainable. Conservation of medicinal plants, combined with awareness among local communities about sustainable harvesting techniques, is essential. Integration of ethnoveterinary knowledge with biodiversity conservation programs can help secure both livestock healthcare and ecological balance in the Vidarbha region[3,11].

Conclusion

The present investigation documents 55 angiosperms plant species belonging to 36 families and 52 genera that are traditionally used by the local people of Vidarbha region for treating livestock diseases. The findings emphasize the continued reliance of local people and tribal communities on medicinal plants for ethnoveterinary care, particularly in areas where access to modern veterinary services is limited. The predominance of dicotyledonous taxa reflects their phytochemical diversity and therapeutic value, while the frequent use of leaves demonstrates the preference for easily accessible and renewable plant parts.

A wide spectrum of ailments including foot-and-mouth, diarrhoea, dysentery, wounds, mastitis, skin infections, arthritis, and reproductive complications are managed through plant-based remedies, generally prepared as pastes, decoctions, powders, or juices. This knowledge, orally transmitted through generations, illustrates the resilience and ecological understanding of the indigenous people of Vidarbha. However, threats such as deforestation, overharvesting, and erosion of

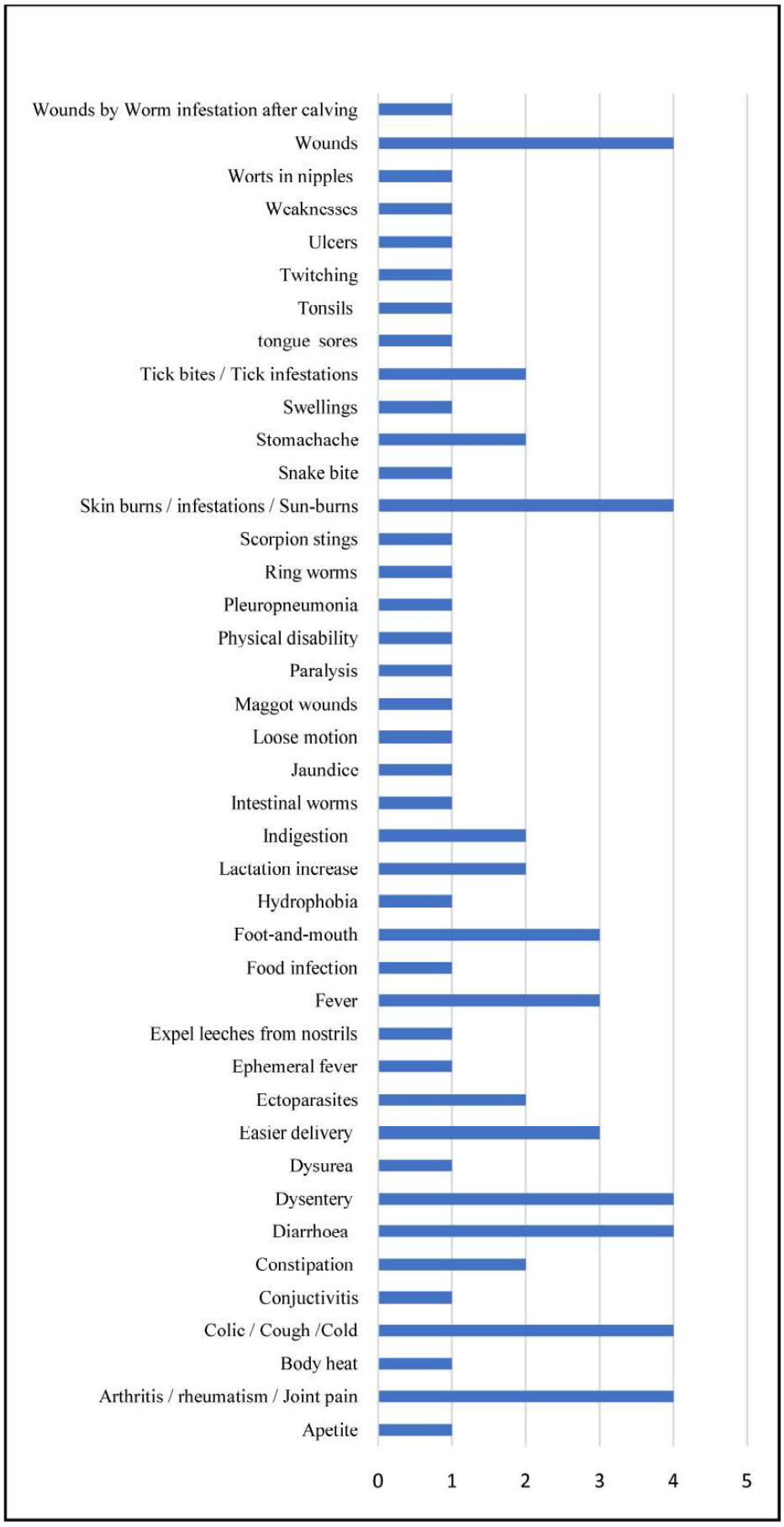

Fig. 3: Number of species claimed

traditional culture place this valuable heritage at risk.

Thus, ethnoveterinary practices in Vidarbha region not only contribute significantly to livestock health and rural livelihoods but also represent a potential source for developing novel veterinary drugs.

References

1. Balamurugan V, Venkatesan G, Shivachandra SB, Singh RK. Emergence and spread of lumpy skin disease in South Asia: A challenge for livestock health and productivity. *Vet World.* 2020; **13**(9) : 1850–1858.
2. Borthakur SK. Ethnobotanical studies on the fodder and medicinal plants of Assam. *Anc Sci Life.* 1992; **11**(3–4) : 193–198.
3. Chakraborty A, et al. Antimicrobial activity of some ethnomedicinal plants of India. *J Ethnopharmacol*. 2010; **128**(2) : 254–258.
4. Chaudhary RP. Biodiversity in India: Status and conservation. *Curr Sci.* 2018; **115**(3) : 419–420.
5. Cotton CM. Ethnobotany: Principles and applications. Chichester: John Wiley & Sons; 1996.
6. Cunningham AB. Applied ethnobotany: People, wild plant use and conservation. London: Earthscan; 2001.
7. Giday M, Asfaw Z, Woldu Z, Teklehaymanot T. Medicinal plant knowledge of the Bench ethnic group of Ethiopia. *J Ethnobiol Ethnomed.* 2009; **5** : 34.
8. Heinrich M. Ethnobotany and its role in drug development. *Phytother Res.* 2000; **14**(7) : 479–488.
9. Humane PT. Statistical analysis of Ethnobotanically important flora of Bhandara District (MS), India. *International Journal of Life Sciences.* 2020; **8**(3) : 583-588.
10. Jain SK, Patole S. Ethnoveterinary plants of Gond and Madia tribes in Maharashtra. *Ethnobotany.* 2001; **13**(1–2) : 46–50.
11. Kala CP. Indigenous uses, population density and conservation of threatened medicinal plants in protected areas of the Indian Himalayas. *Conserv Biol.* 2005; **19**(2) : 368–378.
12. Kamble SY, Pradhan SG. Flora of Vidarbha region. *J Econ Taxon Bot.* 1988; **12**(1) : 121–132.
13. Khobragade PY, Humane PS, Zade VS. Ethnomedicinal studies in central India: A review. *Int J Bot Stud.* 2021; **6**(4) : 45–51.
14. Kumar R, Gupta RC, Sharma A. Ethnoveterinary remedies of livestock ailments in India. *Indian J Tradit Knowl.* 2010; **9**(3) : 456–462.
15. Laloo RC, Kharlukhi L, Jeeva S, Mishra BP. Status of ethnoveterinary medicine in Northeast India: A case study from Meghalaya. *J Ethnopharmacol.* 2018; **227** : 47–57.
16. Lans C, Turner N, Khan T, Brauer G, Boepple W. Ethnoveterinary medicines used for ruminants in British Columbia, Canada. *J Ethnobiol Ethnomed.* 2007; **3** : 11.
17. Mani JK, Varghese AO, Joshi AK. Assessment of gross primary productivity in semi-arid agricultural region of central India using temporal MODIS data. In: Obi Reddy GP, Patil NG, Chaturvedi A, editors. Sustainable management of land resources: An Indian perspective. Oakville: Apple Academic Press Inc. 2017; pp. 366–388.
18. Martin GJ. Ethnobotany: A methods manual. London: Chapman & Hall; 1995.
19. Mathias E. Ethnoveterinary medicine: Harnessing its potential. *Vet Bull.* 2004; **74**(8) : 27–37.
20. Mathias-Mundy E, McCorkle CM. Ethnoveterinary medicine in Africa. Boulder: Lynne Rienner Publishers; 1989.
21. McCorkle CM. An introduction to ethnoveterinary research and development. *J Ethnobiol.* 1986; **6**(1) : 129–149.
22. Naik R, Manjula N. Contribution of livestock to rural livelihoods: A study in Vidarbha region. *Indian Res J Ext*

Educ. 2015; **15**(4) : 45–51.

23. Njoroge GN, Bussmann RW. Diversity and utilization of ethnoveterinary medicinal plants in Embu district, Kenya. *J Ethnobiol Ethnomed.* 2006; **2** : 54.
24. Patil DA, Gaikwad SB. Traditional knowledge on medicinal plants used for livestock diseases in Maharashtra. *Indian J Tradit Knowl.* 2011; **10**(2) : 334-338.
25. Phondani PC, Maikhuri RK, Kala CP. Ethnoveterinary uses of medicinal plants among traditional herbal healers in Alaknanda catchment of Uttarakhand, India. *Afr J Tradit Complement Altern Med.* 2010; **7**(3) : 195–206.
26. Rathod P, Nikam TR, Hulsure RS. Constraints in livestock service delivery in Maharashtra. *Indian J Anim Sci.* 2014; **84**(2) : 220–224.
27. Reddy KN, Bhanja MR, Raju VS. Ethnoveterinary medicine in Andhra Pradesh, India. *Indian J Tradit Knowl.* 2006; **5**(3) : 327–330.
28. Reddy KN, Pattanaik C, Reddy CS, Raju VS. Traditional knowledge on medicinal plants used for livestock diseases in Eastern Ghats of Andhra Pradesh. *Indian J Tradit Knowl.* 2006; **5**(3) : 368–372.
29. Sastry CB. Ethnoveterinary practices in India. *Livest Int.* 2005; **9**(2) : 14–17.
30. Sharma BD, Balakrishnan NP, Rao RR, Hajra PK. Flora of Maharashtra State. Calcutta: Botanical Survey of India; 1996.
31. Singh HB, Kumar A. Medicinal plants used in animal healthcare in Bundelkhand region of Madhya Pradesh. *Ethnobotany.* 2000; **12**(1–2) : 55–61.
32. Singh R, Singh B, Singh O. Ethnomedicinal plants used in veterinary practices in India. *Int J Herb Med.* 2012; **2**(4) : 22–28.
33. Tiwari L, Pande PC, Pande HC. Traditional veterinary practices in Madhya Pradesh. *Indian J Tradit Knowl.* 2010; **9**(2) : 345–348.
34. Ugemuge NR. Flora of Nagpur District. Nagpur: Shree Printers; 1986.
35. Unnikrishnan PM. Animals in Ayurveda: Ethnoveterinary perspectives. *Indian J Tradit Knowl.* 1998; **7**(1) : 62–67.
36. Ved DK, Goraya GS. Demand and supply of medicinal plants in India. New Delhi: NMPB; 2008.
37. Verma AK, Kumar M, Bussmann RW. Traditional herbal remedies used for the treatment of livestock diseases in Madhya Pradesh, India. *J Ethnobiol Ethnomed.* 2007; **3** : 19.
38. Warokar AS, Ingle SN, Humane P. Ethnomedicinal practices of Bhandara district, Maharashtra. *J Phytol Res.* 2012; **25**(1) : 15–20.
39. Yadav R, Khan F, Dixit A. Ethnoveterinary medicine: Traditional knowledge and its significance. *Int J Herb Med.* 2014; **2**(2) : 23–30.