



Ethnoveterinary Practices Used in Ayodhya District of Uttar Pradesh: A Documentation of Herbal Medicaments

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ABSTRACT

Background: In the rural landscapes of Ayodhya, Uttar Pradesh, traditional plant-based remedies remain an essential lifeline for livestock health, even as the forces of modernization and fading cultural memory threaten their survival. The present study aimed to document and preserve ethnoveterinary knowledge practiced by local communities for managing common livestock ailments using herbal medicaments.

Methods: Between January and July 2025, field surveys and semi-structured interviews were conducted across all tehsils and development blocks of Ayodhya district, engaging 76 experienced informants. Plant specimens were collected from wild and cultivated sources, identified taxonomically and analyzed using relative frequency of citation (RFC) to assess their popularity in treating various ailments.

Result: A total of 30 plant species belonging to 20 families were documented for the management of 20 livestock ailments including mastitis, bloat, diarrhoea and external parasitism. *Curcuma longa*, *Brassica juncea* and *Aloe barbadensis* were among the most frequently cited species. Older and illiterate informants possessed significantly greater ethnoveterinary knowledge ($p < 0.05$). The findings highlight the rich traditional knowledge base and emphasize the need for scientific validation and conservation of these practices.

Key words: Ethnoveterinary medicine, Medicinal plants, Traditional animal healthcare.

INTRODUCTION

In the heart of rural India, Ayodhya quietly upholds a profound legacy of using medicinal plants to care for their animals. Long before veterinary clinics reached the various communities of Ayodhya, knowledge and wisdom were passed down through generations, enabling the livestock keepers to treat ailments with herbs gathered from the surrounding forests and fields. This practice of ethnoveterinary medicine shows the deep, respectful and understanding relationship between the people, plants and animals. Localities prefer the ethno-medicine as compared to the allopathic remedies as they are cheaper and readily available (Tariq *et al.*, 2014).

Today, as Ayodhya is being reshaped by rapid globalization and development, this traditional knowledge and wisdom face an existential threat. Modern pharmaceuticals, although expensive, are not readily available in remote areas and their overuse may lead to drug resistance, as well as ecological concerns.

However, amidst all these challenges, there lies an opportunity. These ethnoveterinary practices are not relics of the past; they are sustainable and culturally rooted alternatives that complement modern veterinary care. In regions where formal healthcare for animals remains inadequate, the time-tested remedies remain the very first line of defense against various common ailments.

This study seeks to explore and document the various ethnoveterinary practices used in Ayodhya, casting light upon the plant species used, methods of preparation and the local wisdom that shapes their application. By capturing

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this knowledge before it disappears, we aim to preserve a vital cultural heritage (Jagadeeswary *et al.*, 2014), advocate for its integration into broader veterinary and conservation frameworks and honor the rich wisdom of our rural communities and the resilient traditions that continue to nurture both livestock and livelihoods.

MATERIAL AND METHODS

Study area

The study was conducted in the Ayodhya district (Fig 1) situated in the Eastern Plains Agro-climatic Zone (UP-9) of Uttar Pradesh, India. Covering an area of about 2,522 km² ranging from Latitude 26.50°N-27.10°N and Longitude 81.95°E-82.45°E, the district is richly endowed with the Saryu (Ghaghara) and Tamsa Rivers.

Economically, Ayodhya is an agrarian society; besides agriculture, livestock provides milk and meat and plays a pivotal role in the rural economy by providing income and employment to marginal, small and landless farmers. Currently, there are 29 veterinary hospitals and 36 animal service centres operating for animal health services in the district. In addition to these, the T.V.C.C. of College of Veterinary Science and Animal Husbandry A.N.D.U.A.&T., Kumarganj, also serves as an excellent institution for veterinary services in the district. According to 20th Livestock Census (2019), total animal population was 8,25,452 excluding poultry population (5,19,963). Documentation of

ethnoveterinary practices included all 5 Tehsils (Sadar, Rudauli, Bikapur and Sohawal and Milkipur) and all 11 Development Blocks.

Ethnoveterinary fieldwork and methods

As the modern veterinary health curative system is inadequate due to economic barriers in the study area, it leads to poor livestock health and production. Under such circumstances, people use ethnoveterinary practices and herbal medicines as curative and prophylactic health care.

Ethics statement

Data collection followed general ethical norms for ethnoveterinary surveys. All participants (Livestock owners, handlers, local paravets, traditional healers) were informed of the study purpose and provided verbal consent prior to interview.

Data collection

Before data collection, some of the commonly occurring ailments were listed and their prevalence was checked and confirmed with the data available at T.V.C.C., C.V.Sc. and A.H. A.N.D.U.A.&T., Ayodhya (Annual Record sheet, T.V.C.C., A.N.D.U.A.&T.). In order to collect information and its documentation, well-informed persons of the relevant area were approached. Interviews and discussions were performed using a well-prepared questionnaire (Martin, 1995). Data was also gathered from owners of patients who came for treatment at T.V.C.C., C.V.Sc. A.H.,

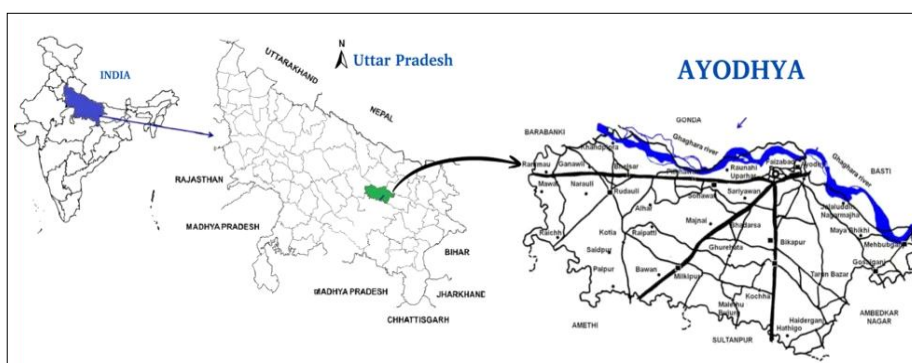


Fig 1: Location map of Ayodhya district, Uttar Pradesh, India [Tiwari *et al.*, 2024].



Fig 2: Study areas marked with numbers in Ayodhya district, Uttar Pradesh, India. Source: Adapted and modified by the authors from MapsofIndia.com (accessed on 21 July 2025).

A.N.D.U.A.&T., Ayodhya, Uttar Pradesh. Some field surveys were also conducted in study villages like Pithla, Tarun, Nandigram etc., where a transect walk method of Participatory Rural Appraisal (PRA) was adopted (Cunningham, 2001). This method relied on semi-structured interviews and discussions with key participants in the local Awadhi language. Some interviews were conducted by well-trained correspondents. A total of 15 villages (Fig 2) were covered during April-July, 2025, which covers the whole district (Table 1). All methods used in the collection of information were designed to obtain precious knowledge of traditional ethnoveterinary practices across that area. To improve reliability, data collected from one area was cross-verified with data from other adjoining areas.

Plant collection and identification

Plant specimens were collected from both wild and cultivated habitats. As most of the specimens were collected from public lands, no official permissions were required. Verbal consent was obtained for the collection of some specimens that were cultivated on private land. All specimens collected were given unique collection numbers for further references. Collected specimens were identified with the help of available literature (Srivastava *et al.*, 2000) and were validated by Dr. Devendra Kumar, Asst. Professor, Department of silviculture and Agroforestry, College of Horticulture and Forestry A.N.D.U.A.&T., Ayodhya.

Data analysis

Relative frequency of citation (RFC)

The frequency with which each plant species was cited for treating various diseases in proportion to overall citations. RFC scales the popularity of plant species in treating any disease ailments (Rahman *et al.*, 2016). This is given by

$$RFC = \frac{FC}{N}$$

Where

FC = Number of citations of that plant.

N = Total number of citations.

RESULTS AND DISCUSSION

Plant species documented

This study recorded 30 plant species of 20 families that are used across Ayodhya district in traditional ethnoveterinary practices. These include 11 trees (36.66%), 9 herbs (30%), 7 shrubs (23.33%) and 3 climbers (10%). Commonly used plant species (Table 2) are *Curcuma longa*, *Brassica juncea*, *Tectona grandis*, *Bambusa vulgaris*, *Oryza sativa*, *Aloe barbadensis* Miller, *Acacia catechu*, *Citrus limon*, *Azadirachta indica*, *Nicotiana tabacum*, *Ocimum gratissimum* (Fig 3), *Cissus quadrangularis*, *Terminalia arjuna* (Fig 4A), *Linum usitatissimum*, *Calotropis procera*, *Piper nigrum*, *Datura stramonium*, *Ficus religiosa*, *Butea monosperma* (Fig 4B), *Ocimum tenuiflorum*, *Zingiber officinale*, *Allium sativum*, *Ferula asafoetida* and *Vigna mungo*. Localities use various above-listed plants with a variety of minerals like sodium chloride, ash, calcium carbonate etc. along with some animal products like ghee, butter, milk, etc. Combinations of these are given either orally or applied topically over skin

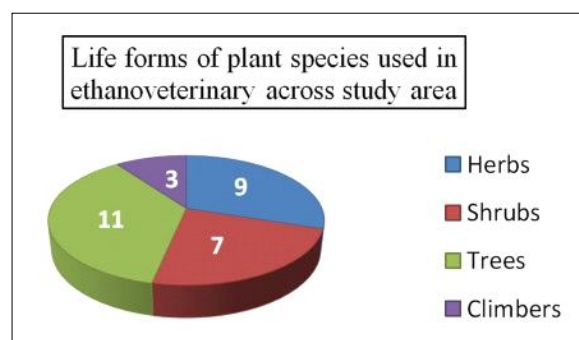


Fig 3: Informants demonstrating Bantulsi (*Ocimum gratissimum*).

Table 1: Details of villages, number of informants and methods used.

Block	Tehsil	Village	Image mark	Method	No. of Informants
Tarun	Bikapur	Tarun bazaar	2	Field survey	9
		Haider ganj	5	Interview at TVCC	4
		Kochha	7	Semi-structured Interview	4
Bikapur	Milkpur	Pithla	4	Field survey	12
Amaniganj		Raipatti	12	Interview at TVCC	3
Milkpur		Maya	9	By correspondent	3
Maya bazaar	Rudauli	Saidkhanpur	6	Telephonic	1
Harringtonganj		Saidpur	1	Interview at TVCC	4
Mawai		Mawai	11	Semi-structured Interview	5
Pura bazaar	Sadar	Ranopali	8	Interview at TVCC	4
		Mehbubganj	13	By correspondent	4
		Nandigram	15	Field survey	11
Masodha	Sohawal	Purkhepur	14	By correspondent	5
Pura Bazar		Bhelsar	10	Interview at TVCC	3
Rudauli		Sohawal	3	Interview at TVCC	4

or mucosa in the form of a paste. Various information regarding parts of plants being used were also collected during survey. Leaves were used mostly (46.66%) followed by seed (20%), stem (13.33%) then bark, fruit (6.66% each) followed by whole plant, flower, root and resin (3.33% each).

Relative frequency of citation

Relative frequency of citation (RFC) of these plant species were calculated which ranges from 0.08 to 0.89. Highest RFC recorded was of Turmeric (0.89) while lowest was for Palash (0.08). Aloe vera, Bamboo and Peepal also recorded with higher RFC values which show their wide popularity in ethnoveterinary medicine.

Demographic characteristics of ethnoveterinary knowledge

Documentation from 76 informants (52 male and 24 female) ranging from 35 to 65 years in age was done at various places including their homes, fields and at T.V.C.C., through sampling methods described previously (Fig 5). A sample t-test was performed for statistical significance of various aspects of data. The two age groups, i.e., the young

group (35-45 years) and the mature group (46-65 years), showed a significant difference ($p < 0.05$) in no. of plant species reported. A significant difference ($p < 0.05$) was also seen between literate and illiterate informants on the basis of their citations. However, no such significant difference ($p > 0.05$) in the number of ethnoveterinary practices cited was seen in male and female informants. On this basis, it can be said that illiterate and mature (46-65 years) informants had more information on ethnoveterinary uses of plant species in comparison to the literate and young group (35-45 years) (Sharma *et al.*, 2021).

Range of livestock ailments treated

Various practices used in Ayodhya district are as follows:

Abscess

Young leaves of Peepal (*F. religiosa*) and Dhatura (*D. stramonium*) with mustard oil or ghee are applied for ripening of abscess.

Anestrous

Sprouted wheat (*T. aestivum*) and black lentil (*V. mungo*) with Mahua (*M. longifolia*) and common salt is fed to animal

Table 2: Scientific names, common names, parts used and RFC values of plant species used in ethnoveterinary practices across study area.

Scientific name	Common name	Part used	RFC
<i>Acacia catechu</i>	Catechu (Kattha)	Stem	0.24
<i>Amaranthus chaulai</i>	Bathua/Chenopodium	Leaf	0.21
<i>Allium sativum</i>	Garlic	Stem/Bulb	0.13
<i>Aloe barbadensis</i>	Aloe vera	Leaf	0.76
<i>Azadirachta indica</i>	Neem	Leaf and seed	0.60
<i>Bambusa vulgaris</i>	Bamboo	Leaf	0.76
<i>Brassica juncea</i>	Mustard	Seed	0.79
<i>Butea monosperma</i>	Palash	Leaf and bark	0.08
<i>Calendula officinalis</i>	Marigold/Genda	Leaf	0.22
<i>Calotropis procera</i>	Calotropis (Madar)	Leaf	0.26
<i>Cissus quadrangularis</i>	Hadjod	Stem	0.45
<i>Citrus limon</i>	Lemon	Fruit	0.11
<i>Curcuma longa</i>	Turmeric	Root/Rhizome	0.89
<i>Curcuma amada</i>	Amahaldi	Leaf/Rhizome	0.19
<i>Dalbergia sissoo</i>	Shisham	Leaf	0.29
<i>Datura stramonium</i>	Dhatura	Leaf	0.66
<i>Ferula asafoetida</i>	Asafoetida (Hing)	Resin	0.71
<i>Ficus religiosa</i>	Peepal	Leaf	0.74
<i>Linum usitatissimum</i>	Linseed (Alsi)	Seed	0.50
<i>Madhuca longifolia</i>	Mahua	Flower	0.21
<i>Mimosa pudica</i>	Touch me not (Chui Mui)	Whole	0.21
<i>Nicotiana tabacum</i>	Tobacco	Leaf	0.29
<i>Ocimum gratissimum</i>	Wild basil (Ban Tulsi)	Leaf	0.18
<i>Ocimum sanctum</i>	Tulsi	Leaf	0.29
<i>Oryza sativa</i>	Paddy (Rice)	Seed	0.68
<i>Piper nigrum</i>	Black pepper	Fruit	0.26
<i>Terminalia arjuna</i>	Arjun	Bark	0.55
<i>Triticum aestivum</i>	Wheat	Seed	0.34
<i>Vigna mungo</i>	Black lentil (Urad)	Seed	0.34
<i>Zingiber officinale</i>	Ginger	Rhizome	0.31

daily till it comes in heat. Jaggery with dried Ginger (*Z. officinale*) is also fed in some areas as an alternative.

Bloat/Tympany

Castor oil (*R. communis*) and lukewarm water with Asafoetida (*F. asafoetida*) is drenched to animals in equal amount.

Burn

Local application of Linseed oil (*L. usitatissimum*) and lime water. Some also reported mixture of butter and camphor applied topically over burnt area for relief.

Diarrhea

Ginger (*Z. officinale*) ground with leaves of Guava (*P. guajava*) and Neem (*A. indica*) added with Jaggery was found effective by localities. Leaves of Shisham (*D. sissoo*) are crushed and fed as a substitute. Asafoetida (*F. asafoetida*) with common salt is also used in some areas. Tamarind (*T. indica*) leaves were also fed in some areas.

External parasites

Leaves of Tulsi (*O. tenuiflorum*), Neem (*A. indica*) and garlic (10 g each) are ground and boiled in 100 ml of Neem oil. Suspension is cooled and applied over the body of infested

animals. Tobacco (*N. tabacum*) boiled in water and sprayed over the body of large animals.

FMD lesions

Datura (*D. stramonium*) leaves boiled in mustard oil with a pinch of copper sulphate are applied topically. The bark of Palash (*B. monosperma*) is ground and applied to lesions.

Fever

Leaves of calotropis (*C. procera*) and black pepper are grinded and fed to animals. Wild basil (*O. gratissimum*) leaves are also found effective by locals.

Endoparasite

Oral administration of Bathua/Chenopodium (*A. chaulai*) oil. Powder of Palash (*B. monosperma*) seeds are also fed in some areas. Bark and leaves of seeds of *Banmarsi* were powdered and drenched as stated by some locals.

Horn injury

Topical application of a paste of black gram (*V. mungo*). Local application of sindoor/Red lead (*Lead oxide*) also applied on horns. In case of bleeding from horn, topical application of paste of alum, camphor in mustard oil is done.

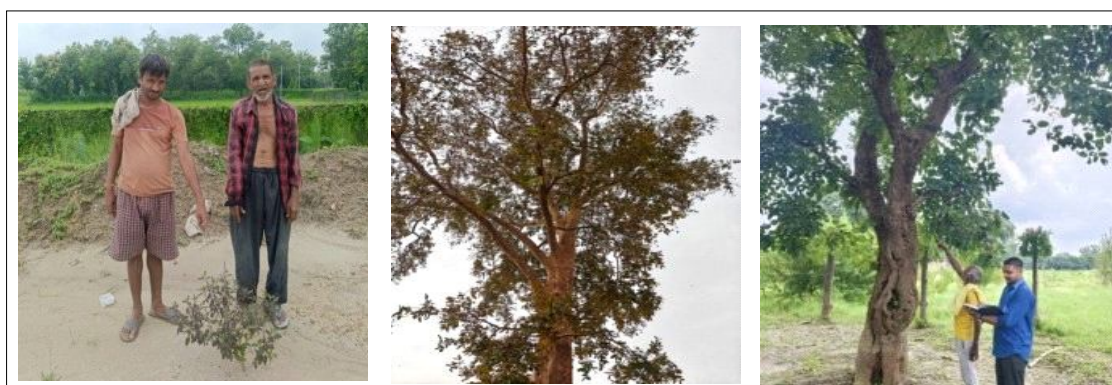


Fig 4: A: Arjun (*Terminalia arjuna*) in study area, B: informant showing Palash Tree (*Butea monosperma*).

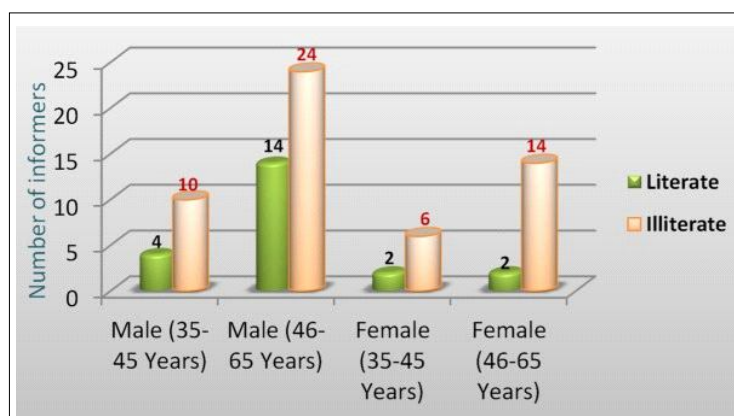


Fig 5: Demographic distribution of informants in study area.

Impaction

Linseed oil is drenched for relieving impaction in ruminants.

Joint swelling

Aloevera (*A. barbadensis*) leaves, hadjod (*C. quadrangularis*), calcium carbonate and bark of Arjun tree (*T. arjuna*) are mixed in the form of paste and applied over swollen joints/bones. Bark of Arjun (*T. arjuna*) and Hadjod (*C. quadrangularis*) are also fed.

Maggot wound

Neem oil (*A. indica*) is used as a maggot repellent. Ghee with tobacco (*N. tabacum*) leaves and camphor is filled inside maggot wounds for speedy recovery.

Mastitis

Red clay and ghee/butter is applied over the udder to reduce inflammation. Aloevera (*A. barbadensis*), mustard oil, lemon juice and turmeric (*C. longa*) are mixed and made paste for application over teats.

Oral Ulcers

Alum, turmeric (*C. longa*) and aloevera (*A. barbadensis*) are used in paste form for topical application over ulcers. Catechu (*A. catechu*) paste is also applied as an astringent.

Otitis

Ear drops made from Neem oil (*A. indica*) and spirit. Washing of ear with Neem water followed by ear drops prepared from Marigold/Genda (*C. officinalis*) leaves.

Retention of placenta

Leaves of Shisham (*D. sissoo*) boiled in water are drenched when lukewarm. Bamboo (*B. vulgaris*) leaves are also a good choice. Some traditional healers also used to feed Paddy.

Sprain

Mustard oil was heated until it reached a warm temperature suitable for topical application (approximately 40-45°C) added with salt and applied topically. Castor (*Ricinus communis*) leaves paste with Lard is applied topically in some regions. Amahaldi rhizome (*C. amada*) paste is also used by some traditional healers over sprain.

Udder edema

100 ml mustard oil with 10 g turmeric (*C. longa*) powder and 2 crushed garlic (*A. sativum*) cloves is boiled and massaged over edematous swelling twice daily.

Uterine prolapse

The whole plant of touch-me-not (*M. pudica*) is ground with goat milk and fed for preventing reoccurrence of prolapse.

The results of this research reveal that ethnoveterinary wisdom remains an element of animal health care in rural Ayodhya demonstrating a deep cultural basis and reliance on easily accessible botanical resources. The frequent use of plants in customary treatments underscores the confidence communities have in these herbs consistent

with ethnoveterinary accounts, from northern and central India. This regional commonality implies that rural farmers encounter alike ailments and consequently utilize herbal remedies. Significantly numerous species recorded in this research, like turmeric, neem, aloe, tulsi and calotropis possess established effects reinforcing the legitimacy of their ongoing traditional application.

Dependence on plant components like leaves may indicate accessibility as well as cultural choices while also promoting sustainable gathering methods as harvesting leaves results in less environmental harm compared to removing roots or bark. This aligns with studies demonstrating that communities instinctively prefer plant parts that promote the species long-term preservation. The documented plant utilization patterns, in Ayodhya reveal that indigenous knowledge systems are deeply intertwined with consciousness even if respondents do not explicitly express this.

Variations in knowledge levels among respondents also indicate that age-old veterinary expertise is susceptible to being lost between generations. Senior members exhibited higher knowledge than their younger livestock-raising counterparts backing worldwide worries that traditional methods are fading quickly as societies adopt contemporary veterinary services. Although broader availability of veterinary care is advantageous the possible loss of herbal-based wisdom could reduce affordable treatment choices, for disadvantaged families. This pattern highlights the importance of recording, local training initiatives and conservation efforts to protect this knowledge system from erosion (Nisha *et al.*, 2024).

An examination of treatments alongside documented research shows that numerous plants employed in Ayodhya, such as *Cissus quadrangularis*, *Mimosa pudica* and *Madhuca longifolia* have not been thoroughly investigated scientifically despite their application in animal health care. This points to a potential for pharmacological and clinical validation research particularly for ailments like mastitis, bloat and parasitic infestations that result in considerable financial damage. The ongoing dependence on these plants indicates that rural populations already hold disease-management approaches that could guide the development of evidence-based veterinary remedies. Overall, the study suggests that ethnoveterinary knowledge in Ayodhya district is not merely a cultural remnant but a functional, experience-based healthcare system with scientific potential. Preserving this knowledge, validating key remedies and integrating safe practices into modern livestock extension programs could significantly strengthen primary animal healthcare in resource-limited settings.

CONCLUSION

Ethnoveterinary practices in Ayodhya district represent a functional, experience-based animal healthcare system rooted in traditional knowledge. The study documented

diverse plant species used with locally available materials to manage common livestock ailments in a cost-effective manner. Variations among communities reflect cultural diversity and adaptability of indigenous knowledge systems. However, rapid modernization and declining interest among younger generations threaten its continuity. Scientific validation, proper documentation and conservation efforts are essential to preserve this valuable traditional healthcare resource for sustainable livestock management.

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Conflict of interest

All authors declare that they have no conflict of interest related to publication of this manuscript.

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