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RESEARCH ARTICLE

An Investigation of Medicinal Plants in Ethnoveterinary Practices in District Yamuna Nagar of Haryana, India

Varsha Nigam and Amarjit Singh*

Abstract

This study explores the medicinal plants being used to address medical issues of domestic animals in district Yamuna Nagar, Haryana. A survey regarding their ethnoveterinary use was conducted on 55 well versed informants who were rearing these animals. A total of 65 species from 36 families were being used including 28 herbs, 9 shrubs, 19 trees, 6 climbers and 3 grasses. Amongst different disease categories, 28 plant species were found to be used to treat digestive disorders. The family Fabaceae has the highest number of plants used and *Trigonella foenum-graecum* L. has been used across all the disease categories. The value of informants consensus factor in four major disorders varied from 0.74 to 0.60, with the highest in reproductive disorders. *Trachyspermum ammi* (L.) Sprague and *Azadirachta indica* A. Juss. have the highest use value of 0.44 and 0.38, respectively. Phytochemical properties of these plants in ethnoveterinary practices must be explored for future medication systems.

Keywords: Disorders, Ethnoveterinary, Livestock, Pharmacological potential, Yamuna Nagar

Introduction

The rich and diverse flora of India offers an extensive array of therapeutic plants. This abundance provides livestock keepers with numerous resources for treating their animal ailments. In Indian agriculture, livestock is crucial to the farmer's livelihood (Verma, 2014). According to a World Health Organization (WHO, 2005), report about 80 percent of people in developing countries largely depend on indigenous practices for managing and treating various diseases affecting humans and animals. Ethnoveterinary practices remain generally used in rural areas for livestock healthcare (Sharma *et al*., 2022). Many of the plants used in these practices are also widely utilized in treating human beings (Güler *et al*., 2021).

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In Haryana, an agricultural state with a predominantly rural population, pet animals have an important role in social and economic upliftment (Yadav *et al*., 2014). Over generations, people have developed their system for maintaining animal health and productivity using traditional local remedies and various religious customs. In their study, Rao *et al*. (2021) observed that Southern Haryana holds a wealth of ethnomedicinal knowledge, which could contribute to advancing herbal drug development programs. Ethnoveterinary treatment offers another approach, particularly in regions where routine care of animals is limited (Krishna *et al*. 2023).

The application of ethnoveterinary medicine varies not only within and among cultures but also between regions (Yineger *et al*., 2007). Ethno-veterinary practices provide a viable alternative to antibiotics and chemical medications for managing livestock health (Nair *et al*. 2017). In rural areas, livestock frequently suffers from various diseases, and due to a lack of veterinary services; the rural poor mostly depend on ethnoveterinary practices. People all around the world greatly rely on traditional methods of treatment of their animals. According to Gao *et al*. (2024), traditional medication is disappearing fast due to change in lifestyle, enhanced interest in Western medicines and cultural impacts.

Plants with high use value, identified through phytochemical and pharmaceutical studies, can be used to develop new drugs for treating health problems in

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both livestock and humans (Rafique Khan *et al*. 2021 and Nodza *et al*. 2022). According to Tariq *et al*. (2014) the plants which are widely used in ethnoveterinary treatments can be further explored for their therapeutic use. Oda *et al*. (2024) concluded in their study that agricultural authorities at various levels, educational institutions, and non-governmental organizations should motivate indigenous communities to foster a sense of ownership and active involvement in the sustainable management and preservation of medicinal plant biodiversity. In their study Singhal *et al*. (2024) suggested that the ethnoveterinary plant species, owing to their use must to be conserved, and collaborative efforts are to be made to protect their natural habitats.

Material and Methods

Study Area

The present investigation has been undertaken in district Yamuna Nagar that lies in Northern Haryana 29° 55'to 30° 28' N Latitude and 77° 04' to 77° 36' E Longitude (Figure 1).

The total geographical area of the district is 1768 square Kilometers (DCOH, 2011). A majority of people in the villages of this district are engaged in agriculture. They also rear milk animals for their household requirements. A Few of them also practice dairy farming and sell milk and its products to the nearby urban population. Some others also raise animals like sheep and goats for different purposes.

Data Collection

The survey was conducted from July, 2023 to June, 2024 and the information was gathered from experienced locals, including elders, herbalists, farmers, dairy practitioners, and local vaidyas. Data was collected through field interviews and surveys by semi-structured questionnaires to provide ethnoveterinary information on various topics, including animal disorders, and mode of medication. The required information regarding ethnoveterinary practice and the use of medicinal plants was taken from 55 informants from different villages. The data about the gender, age, and educational qualification of the informants was also collected. Information about the used plants, their parts,

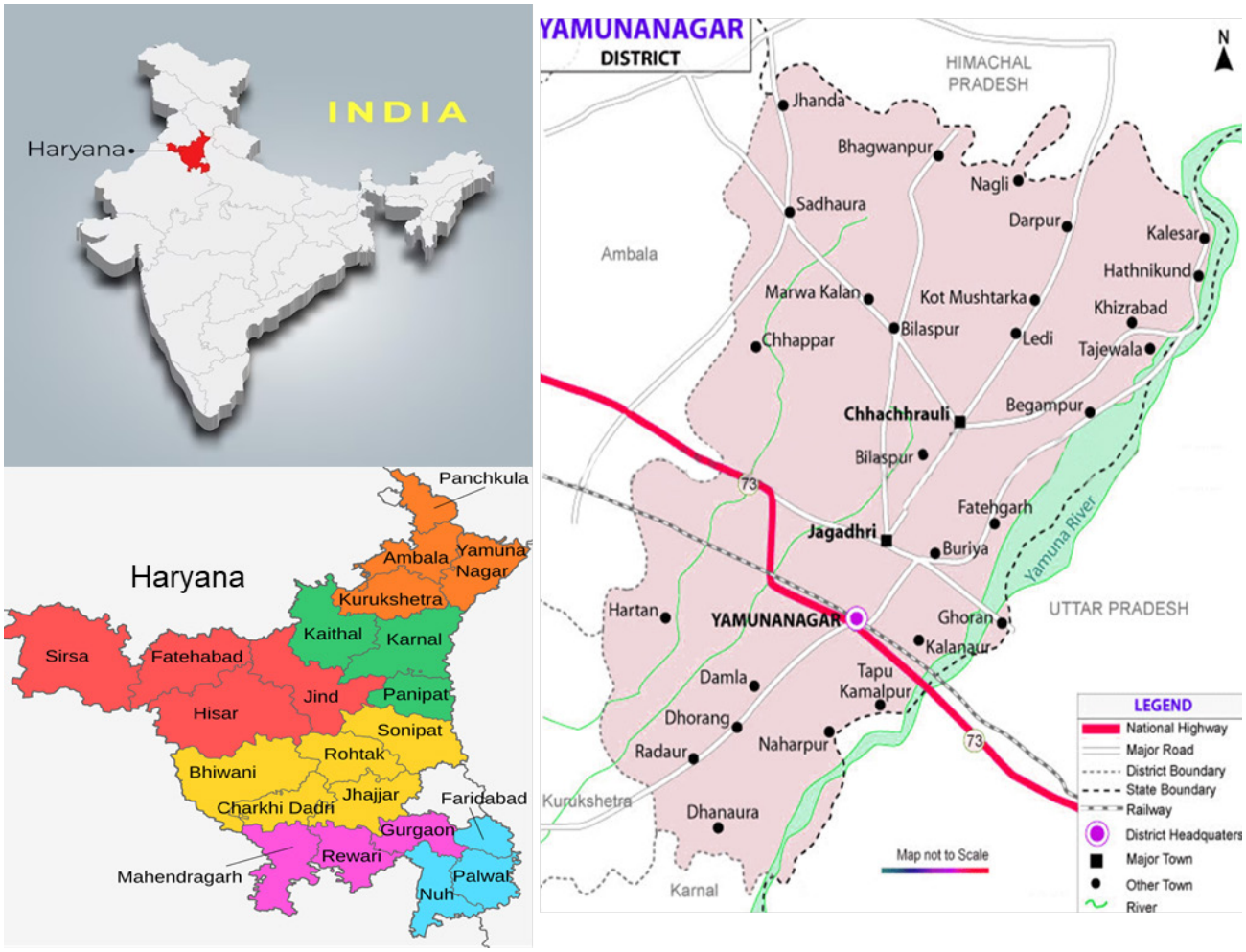

Figure 1: Location map of district Yamuna Nagar (Haryana) India

and methods was recorded. The applications of medicinal plants were grouped into four main categories: digestive, reproductive, pyretic, and dermatological disorders. Other health issues of animals were put together in a miscellaneous category of diseases.

Quantitative Analysis

The collected data has been analysed for Informants Consensus Factors (ICF) as used by Heinrich *et al*. (1998) and Use Value (UV) for important plant species as calculated by Philips et.al. (1994).

Informants Consensus Factor

The ICF was carried out to determine the consensus amongst the informants regarding the utility of plants for a specific category of disease. It was calculated by using the formula

$$ICF = \frac{Nur - Nt}{Nur - 1}$$

Where Nur = Number of used citations in each category

Nt = Total number of plant species used in that category.

A higher ICF value indicates that the information is well shared among the informants.

Use Value

The Use Value (UV) is employed to assess the relative significance of a particular species compared to others. It is calculated by dividing the sum of the total use reports for that species by the total number of informants, as shown in the equation below.

$$UV = \frac{\sum U}{N}$$

Where U is the number of use reports given by the informants for a plant species and

N is the total number of informers interviewed.

A higher value of UV indicates that for a plant species, there are many uses and the low value shows that the same species is lesser known and used in the area.

Observations and Results

In the present study, data was collected from 55 informants, including 41 males and 14 females, with the maximum number of informants from the age ranging from 30 to 60 years. The informants had varying levels of education, with 60 percent having studied up to high school (Table 1). A total of 65 medicinal plants from different habitats including 28 herbs, 9 shrubs, 19 trees, 3 grasses and 6 climbers from 36 different families were investigated (Figures 2 and 3). Of these plant species, 28 were being used for treating digestive disorders, 15 for reproductive, 18 for pyretic, 16 for dermatological disorders and 15 species were used for miscellaneous ailments. Some of the plant species have more than one use for different categories of animal disorders and they have been placed in different tables thus making the total number of 65 plant species (Tables 2 to 6).

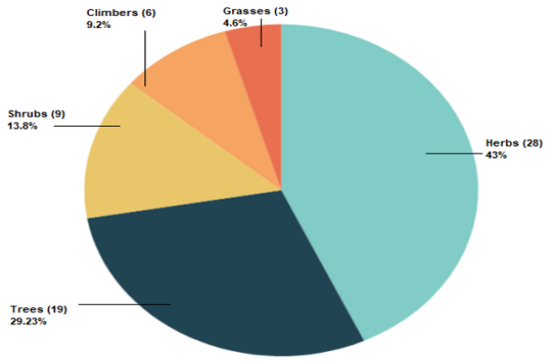

Figure 2: Life forms of the plants in the present study

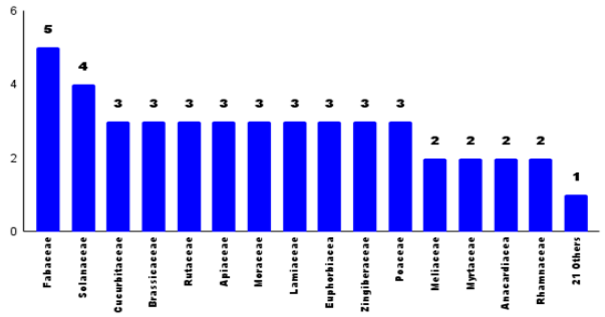

Figure 3: Representation of Families and number of Plants for Ethnoveterinary use

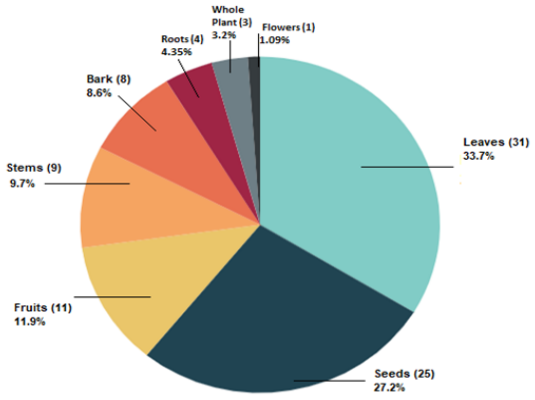

Figure 4: Frequency of plant part used in veterinary treatment

Table 1: Demographic observations of the informants in the area under study

Demographic features	*Categories*	*Number*	*Percentage*
Gender	Male	41	74.5
	Female	14	25.5
Age in Years	0-30	2	3.6
	30-60	41	74.6
	Above 60	12	21.8
Education	Uneducated	12	21.8
	Up to High School	33	60.0
	Above High School	10	18.2

Table 2: Plant species and their ethnoveterinary use to treat digestive disorders

S.N.	Botanical Name	Vernacular Name	Family	Habit	Part used	Method
1	*Achyranthes aspera* L.	Latjeera	Amaranthaceae	Herb	Whole plant	Paste of the whole plant given orally in case of loose motion.
2	*Aegle marmelos* (L.) Corrêa	Bel	Rutaceae	Tree	Fruits	Crushed fruits or decoction given orally for loose motion.
3	*Azadirachta indica* A.Juss.	Neem	Meliaceae	Tree	Leaves	Decoction with salt given orally for nematodes in the stomach.
4	*Baccharoides anthelmintica* (L.) Moench	Kali jeeri	Asteraceae	Herb	Seeds	Ground seeds added to wheat flour and water and given orally to treat loss of appetite.
5	*Bombax ceiba* L.	Semal	Bombacaceae	Tree	Leaves	Decoction given orally in case of bloating.
6	*Brassica campestris* L.	Sarson	Brassicaceae	Herb	Seed	Mustard oil mixed with butter-milk fed orally for constipation.
7	*Calotropis gigantea* (L.) W.T.Aiton	Aak	Apocynaceae	Shrub	Roots	Decoction in water and salt given orally to treat bloating.
8	*Citrullus colocynthis* (L.) Schrad.	Tumba	Cucurbitaceae	Climber	Fruit	Fruit is crushed and mixed with water and drenched for indigestion.
9	*Citrus limon* L.	Lemon	Rutaceae	Shrub	Fruit	Juice with salt to improve appetite..
10	*Cucumis callosus* (Rottler) Cogn.	Kachri	Cucurbitaceae	Climber	Fruit	Paste of dried fruits with water is given in loose motion.
11	*Datura stramonium* L.	Datura	Solanaceae	Herb	Seeds	Ground seeds added in feed in case of loose motion.
12	*Eruca vesicaria* (L.) Cav.	Taramira	Brassicaceae	Herb	Seeds`	Paste is given in feed for bloating.
13	*Eucalyptus × hybrida* Maiden	Safeda	Myrtaceae	Tree	Leaves	Leaves added to fodder in case of loose motion.
14	*Ferula assa-foetida* L.	Hing	Apiaceae	Herb	Root	Root latex in water and is given orally for constipation.
15	*Ficus racemosa* L.	Goolar	Moraceae	Tree	Bark	Decoction of stem bark given orally to treat stomachache.
16	*Ficus religiosa* L.	Peepal	Moraceae	Tree	Leaves	Paste of leaves with salt fed orally to treat stomachache.
17	*Foeniculum vulgare* Mill.	Saunf	Apiaceae	Herb	seeds	Decoction of seeds with a little jaggery for loose motion
18	*Luffa cylindrica* (L.) M.Roem.	Torai	Cucurbitaceae	Climber	Fruit	Boiled fruits with salt given for bloating and loss of appetite.
19	*Mentha viridis* L.	Pudina	Lamiaceae	Herb	Leaves	Paste with water to treat bloating.
20	*Murraya koenigii* (L.) Spreng.	Curry Patta	Rutaceae	Shrub	Leaves	Boiled leaves in water, cooled and given to improve appetite.
21	*Phyllanthus emblica* L.	Anwla	Phyllanthaceae	Tree	Fruit	Crushed fruits mixed with salt given orally to improve appetite.
22	*Syzygium cumini* (L.) Skeels	Jamun	Myrtaceae	Tree	Leaves	Fresh leaves added to feed for loose motion.
23	*Terminalia chebula* Retz.	Harad	Combretaceae	Tree	Fruit	Fruit powder mixed with salt and fed for constipation.
24	*Trachyspermum ammi* (L.) Sprague	Ajwain	Apiaceae	Herb	Seeds	Ajwain seeds mixed with Jaggery and fed to treat constipation.
25	*Trigonella foenum- graecum* L.	Methi	Fabaceae	Herb	Leaves	Paste with a bit of salt fed orally for bloating.
26	*Vitex negundo* L.	Mahala	Lamiaceae	Shrub	Leaves	For bloating a paste of leaves in water fed orally.
27	*Zingiber officinale* Roscoe	Adrak	Zingiberaceae	Herb	Stem	To improve appetite stem decoction given orally.
28	*Ziziphus nummularia* (Burm.f.) Wight & Arn.	Jhariber	Rhamnaceae	Shrub	Fruits	Fruits are given in order to treat loose motion.

Table 3: Plant species and their ethnoveterinary use to treat reproductive disorders

SN.	Botanical Name	Vernacular Name	Family	Habit	Part used	Method
1.	*Arundo donax* L.	Narsal	Poaceae	Grass	Leaves	Leaves paste is given to remove the placenta.
2	*Celastrus paniculatus* Willd.	Malkangni	Celastraceae	Climber	Seeds	Seed extract in water is given after prolapse of the uterus.
3	*Cicer arietinum* L.	Chana	Fabaceae	Herb	Seeds	To maintain pregnancy seed paste is mixed with fodder
4	*Curcuma longa* L.	Haldi	Zingiberaceae	Herb	Stem	Stem paste in water with common salt for placenta removal.
5	*Eruca vesicaria* (L.) Cav.	Tara mira	Brassicaceae	Herb	Seeds	Seeds mixed with fodder for placenta removal.
6	*Ficus benghalensis* L.	Bargad	Moraceae	Tree	Bark	Decoction given orally to prevent abortion.
7	*Gossypium hirsutum* L.	Cotton	Malvaceae	Shrub	Seeds	Boiled with Methi seeds and jaggery and given to ease delivery.
8	*Lawsonia inermis* L.	Mehndi	Lythraceae	Shrub	Leaves	Mixed with fodder and fed orally to maintain pregnancy.
9	*Mangifera indica* L.	Mango	Anacardiaceae	Tree	Leaves	Mixed with fodder and fed orally for removal of placenta.
10	*Musa paradisiaca* L.	Banana	Musaceae	Herb	Leaves	Mixed with fodder to maintain pregnancy.
11	*Semecarpus anacardium* L.f.	Bhilawa	Anacardiaceae	Tree	Seeds	Crushed seeds mixed with jaggery and fed orally for estrus cycle.
12	*Solanum melongena* L.	Brinjal	Solanaceae	Shrub	Leaves	Mixed with fodder and fed orally to remove the placenta.
13	*Trachyspermum ammi* (L.) Sprague	Ajwain	Apiaceae	Herb	Seeds	Mixed with jaggery for placenta removal and uterus clearance.
14	*Trigonella foenum-graecum* L.	Methi	Fabaceae	Herb	Seeds	Mixed with fodder when delivery and placenta removal is delayed.
15	*Zingiber officinale* Roscoe	Adrak	Zingiberaceae	Herb	Stem	Paste of rhizome with common salt for uterus clearance.

Table 4: Plant species and their ethnoveterinary use to treat pyretic issues

SN.	Botanical Name	Vernacular Name	Family	Habit	Part used	Method
1	*Adhatoda vasica* Nees.	Vasak	Acanthaceae	Shrub	Leaves	Decoction of leaves given orally in case of general fever.
2	*Argemone Mexicana* L.	Satyanashi	Papaveraceae	Herb	Leaves	Paste with salt fed orally to lower body temperature.
3	*Azadirachta indica* A.Juss.	Neem	Meliaceae	Tree	Bark	Decoction given orally in case of fever.
4	*Baccharoides anthelmintica* (L.) Moench	Kali jeeri	Asteraceae	Herb	Seeds	Decoction with salt given orally to lower body temperature.
5	*Commiphora wightii* (Arn.) Bhandari	Googlu	Burseraceae	Shrub	Bark	Decoction of resin from bark given orally for relief from prolonged fever.
6	*Curcuma longa* L.	Haldi	Zingiberaceae	Herb	Stem	Paste with salt fed orally in case of prolonged fever and bodyache.
7	*Eruca vesicaria* (L.) Cav.	Taramira	Brassicaceae	Herb	Seeds	Paste of seeds with salt fed orally in case of fever.
8	*Ficus racemosa* L.	Goolar	Moraceae	Tree	Leaves	Decoction given orally for avoiding cold attack and fever.
9	*Lepidium sativum* L.	Halim	Brassicaceae	Herb	Seeds	Decoction of crushed seeds to lower body temperature.
10	*Leucas aspera* (Willd.) Link	Gomma	Lamiaceae	Herb	Whole plant	Paste of the plant is given in case of fever.
11	*Murraya koenigii* (L.) Spreng.	Kari patta	Rutaceae	Shrub	Leaves	Decoction given orally in fever due to cold.
12	*Picrorhiza kurroa* Royle ex Benth.	Kutki	Plantaginaceae	Herb	Stem	Decoction with salt given orally to get relief from fever.
13	*Piper nigrum* L.	Kali mirch	Piperaceae	Climber	Seeds	Decoction with a little salt for fever due to cold.
14	*Prunus dulcis* (Mill.) D.A.Webb	Badam	Rosaceae	Tree	Seeds	Mixed with Jaggery and fed to lower body temperature.
15	*Tinospora cordifolia* (Willd.) Hook.f. & Thomson	Geloy	Menispermaceae	Climber	Bark	Decoction with a little common salt for treating prolonged fever.
16	*Trachyspermum ammi* (L.) Sprague	Ajwain	Apiaceae	Herb	Seeds	Decoction with jaggery for fever due to cold.
17	*Trigonella foenum-graecum* L.	Methi	Fabaceae	Herb	Seeds	Decoction with jaggery for avoiding cold and fever,
18	*Zingiber officinale* Roscoe	Adrak	Zingiberaceae	Herb	Stem	Decoction with salt given orally in case of cold and fever.

Table 5: Plant species and their ethnoveterinary use to treat dermatological disorders

SN.	Botanical Name	Vernacular Name	Family	Habit	Part used	Method
1	Acacia nilotica (L.) Willd.ex Delile	Kikar	Fabaceae	Tree	Bark	Boiled in water and applied topically in case of foot and mouth disease.
2	*Achyranthes aspera* L.	Latjeera	Amaranthaceae	Herb	Root	Paste in water applied on wounds.
3	*Aloe vera* Mill.	Ghrit kumari	Asphodelaceae	Herb	Leaves	The gel from leaves applied topically for lesions on the skin.
4	*Argemone Mexicana* L.	Satyanasi	Papaveraceae	Herb	Fruits	Paste of roasted fruits applied on infected parts.
5	*Azadirachta indica* A.Juss.	Neem	Meliaceae	Tree	Leaves	Boiled in water and applied on the lumpy affected area.
6	*Calotropis gigantea* (L.) W.T.Aiton	Madar	Apocynaceae	Shrub	Flowers	Very dilute decoction of flowers with salt given orally for skin infections.
7	*Curcuma longa* L.	Haldi	Zingiberaceae	Herb	Stem	Powder mixed with mustard oil and pasted on cuts and wounds.
8	*Delbergia sisso* Roxb. ex DC	Shisham	Fabaceae	Tree	Leaves	Paste applied on rashes.
9	*Eruca vesicaria* (L.) Cav.	Tara mira	Brassicaceae	/Herb	Leaves	Paste applied on skin infections.
10	*Euphorbia hirta* L.	Duddhia	Euphorbiaceae	Herb	Whole plant	Paste applied on fungal infected area.
11	*Murraya koenigii* (L.) Spreng	Curry Patta	Rutaceae	Shrub	Leaves	Paste of leaves applied on wounds.
12	*Nicotiana tobacum* L.	Tobacco	Solanaceae	Herb	Leaves	Paste on skin affected by ectoparasites.
13	*Pongamia pinnata* (L.) Pierre	Sukhchain	Fabaceae	Tree	Leaves	Boiled in water and the rash-affected area is washed.
14	*Rumex dentatus* L.	Jangali palak	Polygonaceae	Herb	Leaves	Paste applied on fungal-affected sites.
15	*Solanum xanthocarpum* Schrad.	Neeli katili	Solanaceae	Herb	Fruits	Paste of roasted fruits applied on skin infections.
16	*Trigonella foenum- graecum* L.	Methi	Fabaceae	Herb	Seeds	Paste of seeds with water applied on Infected parts.

Table 6: Plant species and their ethnoveterinary use to treat miscellaneous ailments

SN.	Botanical Name	Vernacular Name	Family	Habit	Part used	Method
1	*Amomum subulatum* Roxb.	Badi Elaichi	Zingiberaceae	Herb	Fruits	Decoction of the fruits with common salt given for muscle spasms.
2	*Baccharoides anthelmintica* (L.) Moench	Kali jeeri	Asteraceae	Herb	Seeds	Seed powder mixed with jaggery and given orally for swelling in the shoulder.
3	*Bombax ceiba* L.	Semal	Bombacaceae	Tree	Bark Bb Bark	Decoction given in case of blockage of urine.
4	*Calotropis gigantea* (L.) W.T.Aiton	Aak	Apocynaceae	Shrub	Leaves	A very dilute solution is used to wash the infected eyes.
5	*Cannabis sativa* L.	Bhang	Cannabaceae	Herb	Leaves	Leaf paste with fodder given in urinary blockage.
6	*Cynodon dactylon* (L.) Pers.	Doob ghaas	Poaceae	grass	Stem	Paste of stem in water is used to cleanse the infected eyes.
7	*Diospyros melanoxylon* Roxb.	Kendu plant	Ebenaceae	Tree	Leaves	Paste applied on swollen teats.
8	*Ricinus communis* L.	Arind	Euphorbiaceae	Shrub	Leaves	Paste of leaves applied in case of swelling of teats.
9,	*Saccharum officinarum* L.	Ganna	Poaceae	Grass	Stem	Jaggery is fed in general debility and added to many ethnoveterinary preparations.
10	*Sesamum indicum* L.	Til	Pedaliaceae	Herb	Seeds	Oil for massage in case of contusion.
11	*Toona ciliata* M.Roem.	Mahogany	Meliaceae	Tree	Bark	Bark extract applied on swollen teats.
12	*Trachyspermum ammi* (L.) Sprague	Ajwain	Apiaceae	Herb	Seed powder	Seed powder burnt on fire and smoke given in cold.
13	*Trigonella foenum -graecum* L.	methi	Fabaceae	Herb	Seeds	Seed powder mixed with jaggery to reduce swelling on teats.
14	*Ziziphus jujuba* Mill.	Ber	Rhamnaceae	Tree	leaves	Paste of leaves in water is used to cleanse the infected eyes.
15	*Ziziphus nummularia* (Burm.f.) Wight & Arn.	Jhariber	Rhamnaceae	Shrub	Root	Paste applied on wounds due to horn breakage.

Table 7: Informants Consensus Factor for major ailment categories

Ailments	*Nt*	*Nur*	*ICF Value*
Digestive Disorders (Constipation, loose motion, loss of appetite, bloating etc.)	28	69	0.60
Reproductive Disorder (Uterus Prolapse, pregnancy, placenta removal, estrus cycle etc.)	15	54	0.74
Pyretic issues	18	61	0.72
Dermatological disorders (Lumpy, skin parasites, skin infection, foot and mouth disease)	16	43	0.64

Table 8: List of important plants with their Use Value

S.No.	*Name of the Plant*	*Total use reports*	*Use Value*
1.	*Trachyspermum ammi* (L.) Sprague	24	0.44
2.	*Azadirachta indica* A.Juss	21	0.38
3.	*Leucas aspera* (Willd.) Link	16	0.29
4.	*Semecarpus anacardium* L.f.	11	0.20
5.	*Baccharoides anthelmintica* (L.) Moench	10	0.18
6.	*Zingiber officinale* Roscoe	8	0. 15
7.	*Eruca vesicaria* (L.) Cav.	8	0.15
8.	*Trigonella foenum-graecum* L.	8	0.15
9.	*Tinospora cordifolia* (Willd.) Hook.f. & Thomson	7	0.13
10.	*Acacia nilotica (L.) Willd.ex Delile*	7	0.13
11.	*Curcuma longa* L.	7	0.13
12.	*Ficus racemosa* L.	5	0.09
13.	*Citrullus colocynthis* (L.) Schrad.	5	0.09
14.	*Vitex negundo* L.	5	0.09

From the information collected, the ICF (Informants Consensus Factor) values were recorded as 0.60 for digestive disorders, 0.74 for reproductive disorders, 0.72 for pyretic issues, and 0.64 for dermatological disorders (Table 7). The UV for important plant species has been shown in Table 8. *Trachyspermum ammi* (L.) Sprague had a use value of 0.44, *Azadirachta indica* A. Juss. 0.38 and *Leucas aspera* (Willd.) Link 0.29.

Among the families, Fabaceae and Solanaceae recorded the highest number of ethnoveterinary medicinal plants, with five and four species, respectively. They were followed by the Cucurbitaceae, Brassicaceae, Apiaceae, Moraceae, Lamiaceae, Rutaceae, Poaceae, Zingiberaceae, and Euphorbiaceae, each contributing three species (Figure 3). Meliaceae, Myrtaceae, Rhamnaceae, and Anacardiaceae families each contributed two plant species, while a single species each was reported from the remaining 21 families.

Different plant parts have been put to use in ethnoveterinary practice by the local farmers and other animal keepers to treat various ailments of their livestock. From the information on plant parts, leaves (33.7%) were most commonly used in different diseases of animals and this was followed by seeds, fruits, stems, bark, roots, whole plant, and flowers (Figure 4).

Discussion and Conclusion

Use of traditional knowledge to treat different animal diseases has a long history in the rural masses of India. As in many parts, livestock is kept in unhygienic conditions and this leads to different kinds of ailments. Ethnoveterinary practices play an important role in treating animal diseases and are cost-effective too. In this study, a total of 55 informants provided information about 65 plant species belonging to 36 families for their ethnoveterinary use. Amongst the plant species used, the highest number 28 was of herbs and leaves were the most common plant part used. Some other studies have also observed the highest number of herbal species and leaves as the most frequent part used in ethnoveterinary practices (Tariq *et al*. 2014 and Sharma *et al*. 2022). This is probably because of the frequent distribution of herbs and their easy availability in most of the areas. Leaves are physiologically more active, easy to process and their different metabolites can be used to treat animal diseases and hence they are the most often used plant part.

In different animal diseases, the highest number of 28 plant species has been used in digestive disorders. In a study Xiong and Long (2020) also reported the highest number of plants used to treat digestion-related animal disorders. It means local farmers have a wide variety of plants for the treatment of such ailments in different parts of the world.

The ICF value in the present study was found to be the highest for reproductive disorders and the lowest for digestive issues. The study by Tariq *et al*. (2014) reported the highest ICF value for gastric problems and the lowest for antipyretic issues. However, Rehman *et al*. (2022) reported the highest and lowest values of ICF for gastric and respiratory diseases respectively. The higher values of ICF indicate that there is a widespread acceptance as regard to plant species for treating a particular disorder and the lower value indicates that there is lesser sharing of information regarding the use of plant species in different areas (Kalita *et al*. 2024). The highest use values in the present study were found in the case of *Trachyspermum ammi* (L.) Sprague and *Azadirachta indica* A. Juss., while the first one was found to be useful in four of the five categories in all the animal disorders. However, a study by Chaachouay *et al*. (2022) in Morocco reported the highest use value of *Chenopodium ambrosioides* L. and *Trigonella foenum- graecum* L. These higher use values may be because of the availability of different plant species in different parts of the world and the

ethnoveterinary wisdom of the local human populations.

Ethnoveterinary medication is a more affordable and environmentally sustainable option than using an allopathic system. From the study it is clear that there is an urgent need for the documentation of this indigenous knowledge and to explore the plant species for their phytochemical compounds. This will help us in treating our livestock ailments in a more efficient and cost effective manner along with maximizing the pharmacological potential of our phytodiversity.

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