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Exploration of ethnoveterinary plants commonly used by Pahari ethnic tribe of district Poonch, Jammu and Kashmir, India

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Ethnoveterinary medicine involves the traditional use of medicinal plants to treat livestock diseases and remains vital in rural communities with limited access to modern veterinary care. This study documented the ethnoveterinary knowledge of the Pahari community in Poonch district, Jammu and Kashmir. Field surveys and semi-structured interviews were conducted with 86 informants, including farmers and traditional healers. Data regarding medicinal plants, plant parts used, preparation methods, and treated ailments were analyzed using ethnobotanical indices such as Use Value (UV) and Relative Frequency of Citation (RFC). A total of 65 medicinal plant species were recorded for the treatment of 14 livestock diseases. Leaves were the most commonly used plant part (28%), while herbs were the dominant life form (42.64%). *Melia azedarach* showed the highest UV (0.82) and RFC (0.80), whereas *Datura stramonium* had the lowest UV (0.05). Informant consensus factor value range from 0.87-1.00, indicating a high level of agreement among informant for the treatment of livestock ailments. The documented ethnoveterinary knowledge highlights culturally important medicinal plant species with potential for future phytochemical and pharmacological investigation.

Keywords: Ethnoveterinary, Indigenous knowledge, Medicinal plants, Pahari tribe

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Veterinary science integrates biological, cultural, and social factors that influence animal health and welfare[1]. A significant component of this field is the traditional use of medicinal plants for treating animal diseases, particularly in rural and resource-limited regions[2]. This knowledge system, known as ethnoveterinary medicine (EVM), includes indigenous beliefs, diagnostic practices, and plant-based remedies used for livestock healthcare. For generations, pastoral and farming communities have relied on locally available plants as affordable and accessible sources of veterinary treatment[3].

Ethnoveterinary knowledge is largely transmitted orally through folklore and traditional practices, making it vulnerable to loss due to modernization and socio-cultural changes[4]. In Himalayan regions such as Jammu and Kashmir, livestock rearing plays a vital role in the rural economy. However, parasitic infections, particularly gastrointestinal helminths, significantly reduce livestock productivity, causing economic losses of nearly 20-25% through decreased milk, meat, and wool production[5]. The prevalence of these infections is influenced by climatic conditions, grazing patterns, and animal husbandry practices[6], and several studies have reported a high incidence of helminth infections in small ruminants across India[7].

Despite the rich ethnobotanical diversity of the Himalayan region, ethnoveterinary knowledge of the Pahari community in District Poonch, Jammu and Kashmir, remains poorly documented in the scientific literature. Previous studies from Jammu and Kashmir have primarily focused on ethnomedicinal plants used in human healthcare or have investigated ethnobotanical knowledge in other regions and communities[8]. Comprehensive documentation of medicinal plants used specifically for livestock healthcare by the Pahari tribe is lacking. Furthermore, quantitative evaluation of this traditional knowledge using ethnobotanical indices such as Use Value (UV), Relative Frequency of Citation (RFC), and Informant Consensus Factor (ICF) has not been reported for this community. This knowledge is increasingly threatened by socio-economic changes and the gradual decline in traditional knowledge transfer to younger generations,

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highlighting the need for systematic documentation and scientific validation. Therefore, the present study was undertaken to systematically document the ethnoveterinary knowledge of the Pahari community in District Poonch, Jammu and Kashmir, identify medicinal plant species used for the treatment of livestock ailments, quantitatively assess their cultural importance using established ethnobotanical indices, and provide baseline information for future pharmacological investigations and biodiversity conservation thereby contributing to the preservation of indigenous knowledge and supporting future pharmacological research[9].

Materials and Methods

Study area

The study was conducted in Poonch region of, Jammu and Kashmir, India, located in the Pir Panjal Himalayan range near the Line of Control. The region is predominantly inhabited by the Pahari community, whose livelihood largely depends on agriculture and livestock rearing. Owing to the rich diversity of medicinal plants and extensive traditional ethnoveterinary knowledge[10], the area was selected for the present study (Fig. 1).

Data collection

A field survey was conducted in the Poonch region of Poonch district, Jammu & Kashmir (2022-2023) to document ethnoveterinary knowledge. Informants were selected using purposive samplingto identify individuals possessing extensive knowledge of ethnoveterinary practices, including traditional healers, experienced livestock owners, village elders, and farmers. Subsequently, snowball sampling was employed, whereby the initially selected informants recommended other knowledgeable individuals within

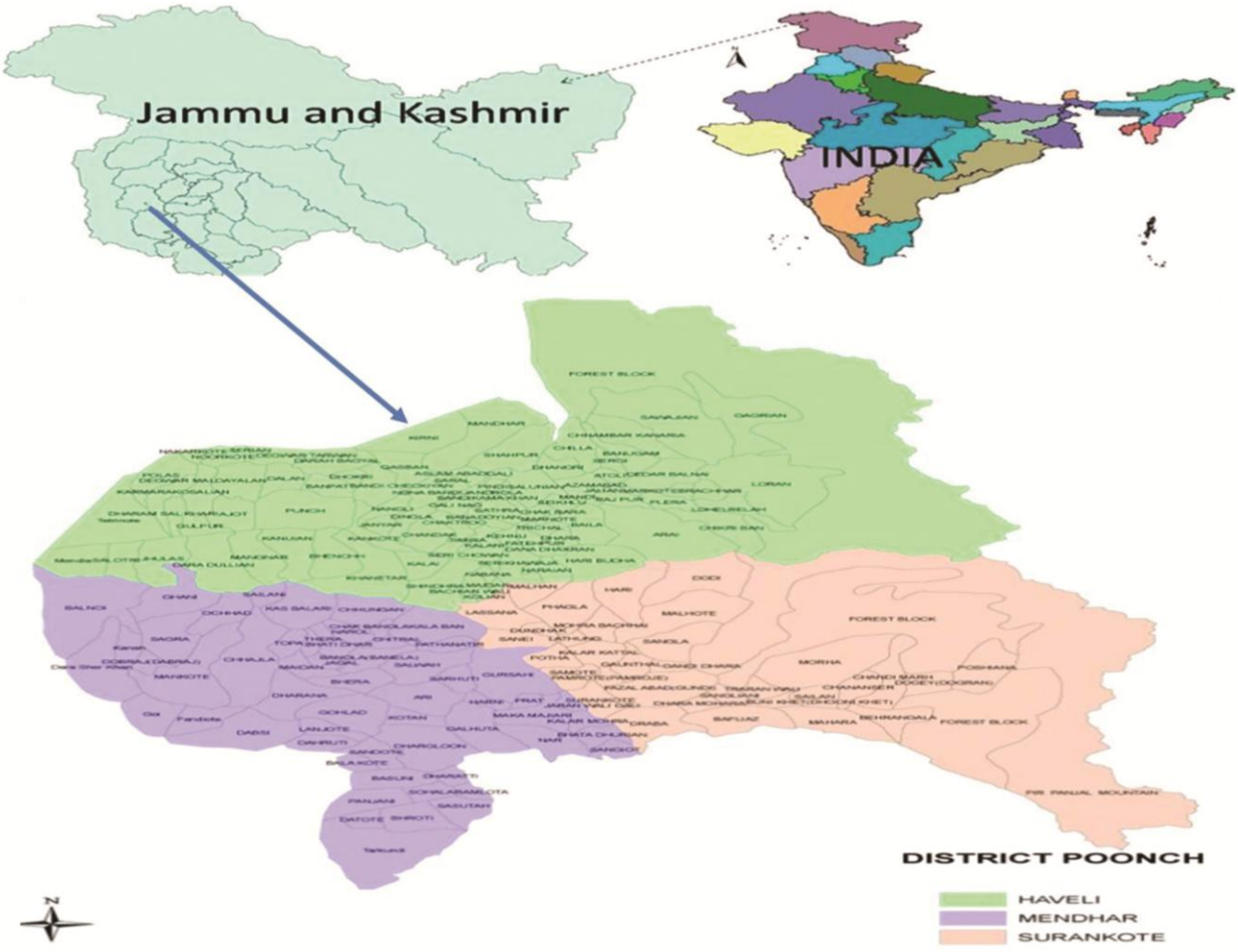


Fig. 1 — Map showing study area Poonch Jammu and Kashmir, (National Informatics Centre, Ministry and Electronics & Information Technology, Govt. of India)[10]

the community. A total of 86 informants aged 25-70 years participated, with most between 55-70 years. Data were collected through direct interviews and semi-structured questionnaires after obtaining written consent from the local tribal committee and oral consent from participants. Questionnaires were prepared in English and translated into the local Pahari language. To ensure translation accuracy and conceptual equivalence, the translated questionnaire was reviewed by bilingual native Pahari speakers familiar with ethnoveterinary terminology and compared with the original English version. The questionnaire was pre-tested with a small group of informants from the study area, and minor modifications were made to improve the clarity and comprehensibility of the questions before the final survey. Demographic details and information on medicinal plants-local names, habitats, plant parts used, preparation methods, additives, and dosages-were recorded (Supplementary Fig. S1). With the help of traditional healers, voucher specimens of reported plants were collected from different habitats. GPS location, habitat, and plant life form were also documented for each species. Specimens were pressed, dried, identified, and deposited at the National Herbarium of Baba Ghulam Shah Badshah University, Rajouri. Plant identification was done using standard floras and verified by Dr. Shreekar Pant. Assistant Professor Department of Environmental Science.

Data analysis

Determining which plants are most helpful for particular populations, estimating potential medicinal plant uses, to quantitatively evaluate the ethnoveterinary importance of the recorded medicinal plants, three widely used ethnobotanical indices- Use Value (UV), Relative Frequency of Citation (RFC), and Informant Consensus Factor (ICF) were calculated. These indices were selected because they provide complementary information on the cultural significance, popularity, and agreement among informants regarding the use of medicinal plants.

Use value (UV)

Use value (UV) was calculated to assess the relative importance of each medicinal plant based on the diversity and frequency of its reported ethnoveterinary uses. Species with higher UV values are considered to have greater cultural and practical importance within the study community[11-13]. The use value is calculated using the following formula:

Where n is the total number of informants chosen for the interview and Ui is the number of usage reports indicated by each informant for a particular plant species. The plant's use value does not specify whether it is employed for one or several purposes[14].

Relative frequency of citation (RFC)

This study employed the relative Frequency of Citation (RFC) method to assess the extent of traditional knowledge concerning the utilization of ethnoveterinary plants within the regions of interest[15,16]. This metric was computed using the equation below:

$$RFC = Fc/N$$

In this context, Fc represents the count of informants who have mentioned the use of the plant, and N represents the total number of informants who took part in the survey.

Informant consensus factor (ICF) of the veterinary ailments

The Informant Consensus Factor (ICF), as described by Heinrich *et al.*[17]; Gao *et al.*[18]; Gazzaneo *et al*.[19] and Wu *et al.*,[20] serves as a measure of consensus among informants regarding the utilization of plants for treating various ailments for example intestinal, parasitic, mouth and foot, diarrhea, wound healing, infectious, and general health conditions. A higher ICF value indicates a greater level of agreement among informants, with values closer to 1 reflecting stronger consensus. Low ICF values, close to 0, suggest random plant selection or lack of information exchange among informants. Conversely, high ICF values, nearing 1, indicate well-defined community selection criteria or active information exchange among informants[21]. ICF is calculated by subtracting the number of plant species used (nt) from the number of use-reports in each category (nur), and dividing the result by the number of use-reports in each category minus one.

$$ICF = (nur - nt) / (nur - 1)$$

Where, *nur* represents the number of use reports for a particular ailment category and *nt* represents the number of plant species used for that category.

Statistical analysis

Quantitative ethnobotanical analysis was performed using Use Value (UV)**,** Relative Frequency of Citation (RFC**)**, and Informant Consensus Factor (ICF) to assess the cultural importance of medicinal plants, their

citation frequency, and the level of agreement among informants. These indices were calculated using standard published formulas. Descriptive statistics were used to summarize the demographic characteristics of informants and ethnoveterinary data.

Results

Sociodemographic information of the informant

A total of 86 informants participated in the study. They were grouped into four age categories: 61 to 70 years (55 informants), 51 to 60 years (15 informants), 41 to 50 years (10 informants), and 31 to 40 years (6 informants) (Table 1). The majority of the informants belonged to the 61-70-year age group, indicating that older members of the community retained a substantial proportion of the documented ethnoveterinary knowledge.

Characteristics of ethnoveterinary plants and their use value

A total of 65 ethnoveterinary plants from 38 distinct families were identified in the Poonch region of Poonch district. The families Poaceae and Rosaceae had the highest number of species, while Lythraceae, Berberidaceae, Acanthaceae, and Brassicaceae each contributed only one species (Fig. 2). In terms of plant categories, herbs (42.64%) represented the majority, followed by trees (30%) and shrubs (26.47%) (Fig. 3). The use value was employed to assess the significance of each plant in treating animal ailments. *Melia azedarach* had the highest use value (0.82), while *Datura stramonium* had the lowest use value (0.05) (Table 2). At the study site, the leaves and fruits were the most commonly used plant parts for ethnoveterinary purposes (Fig. 4). The leaves of these native medicinal plants were particularly favored for treating a wide range of animal diseases.

Relative frequency of citation

Melia azedarach emerged as the dominant species in the study area, with a Relative Frequency of

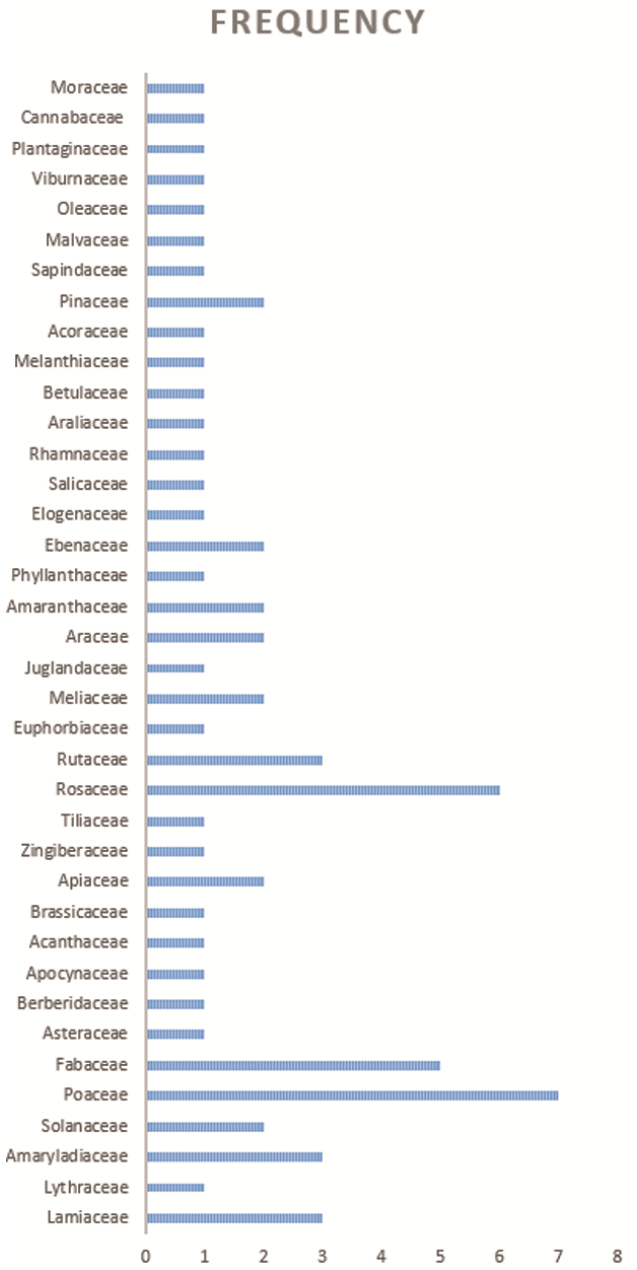


Fig. 2 — Frequency of 38 plant families used in the treatment of different veterinary disease

Table 1 — Sociodemographic data of the informants involved

Age	No of respondent	Gender		Literacy among informant				Experience in cattle farming in year	Type of cattle farming		Method of animal treatment	
		Male	Female	Never attended school	Upto Primary level	Upto High school	Graduate		Commercial	livelihood	Local plant + Conventional medicine	Local plant
31-40	06	4	2	0	0	2	4	15	06	0	06	
41-50	10	6	4	0	0	4	6	25	02	08	09	01
51-60	15	11	4	1	2	8	4	35	04	11	06	09
Above 60	55	41	14	27	21	5	2	51	04	51	08	47

Citation (RFC) of 0.80, suggesting its frequent mention by informants. In contrast, *Aesculus indica* was identified as the recessive species, with an RFC of 0.22, as detailed in (Table 2). The treatment of parasitic and intestinal infections was the most commonly reported veterinary application for livestock in the study area, while eye infections and bacterial diseases were less frequently cited (Fig. 5).

Informant consensus factor (ICF) of the veterinary ailments

A total of 20 distinct livestock ailments were identified in the region. Among these, the most prevalent conditions were parasitic infections, intestinal issues, fever and cough, diarrhea, and foot and mouth disease. These 20 ailments were systematically grouped into 14 broader categories, based on shared symptoms and infections targeting the same organ systems. This classification was guided by a thorough analysis of symptoms and affected organs, such as grouping all intestinal infections under a single category to reflect their similar treatment approaches. This method enhances the organization and understanding of the diseases, thereby simplifying the study of their ethnomedicinal significance. It also highlights patterns in plant therapeutic use, facilitating more targeted conservation efforts and the application of traditional knowledge for health management (Table 3). The Informant Consensus Factor (ICF) values for the ailments were predominantly high, with most exceeding 0.80. Notably, four ailments- bacterial infections, joint injuries, eye infections, and leech removal-had the highest ICF value of 1, indicating strong agreement among informants. On the other hand, the lowest ICF value of 0.87 was observed for fever and cough as well as parasitic diseases. Parasitic infections and intestinal infections were associated with the highest number of species (15) and the greatest number of use reports (112 and 110, respectively), with ICF values of 0.87 and 0.90.

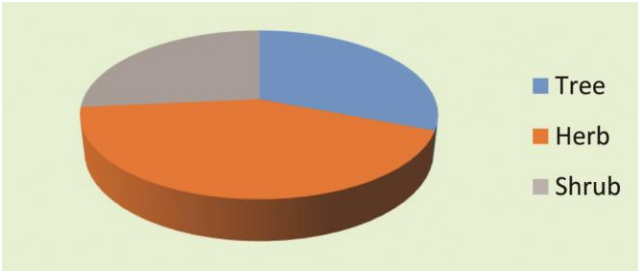


Fig. 3 — Distribution of plant habits collected from the study site

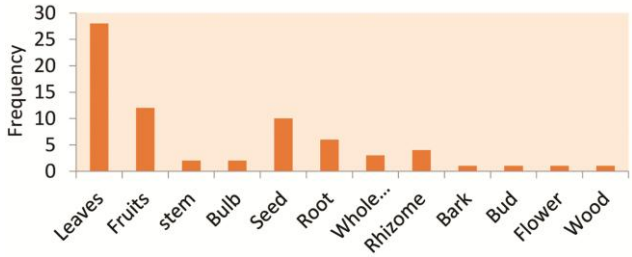


Fig. 4 — Distribution of plant part used in the treatment of veterinary disease

Table 2 — Showing plant used to treat livestock disease along with their use value

S.No	Scientific Name and Voucher No.	Pahari Name	Family	Part used	Uses	UV	FC	RFC
			Herb					
1	*Allium sativum* L. BGSBU- 04	Thoom	Amaryllidaceae	Bulb	To treat fever and cough in cattle.	0.69	52	0.60
2	*Acorus calamus* L. BGSBU- 62	Bach	Acoraceae	Rhizome	To cure gastrointestinal problems.	0.22	47	0.54
3	*Achillea millefolium* L. BGSBU- 63	Chau, Pehlkach	Asteraceae	Root	Use to treat snake bite in cow and buffaloes.	0.24	52	0.60
4	*Allium cepa* L. BGSBU- 14	Payaz	Amaryllidaceae	Bulb	Used to treat snake bite.	0.38	55	0.63
5	*Arisaema flavum* (Forssk.) Schott. BGSBU- 64	Sap nimak	Araceae	Fruit	Used against Snakebite	0.43	49	0.56
6	*Allium tuberosum* Rottler ex Spreng. BGSBU- 66	Jungli lassan	Amaryllidaceae	Buds	Use to treat mouth infections.	0.36	39	0.45
7	*Achyranthes aspera* L. BGSBU- 03	Phutkanda	Amaranthaceae	Root	Used to treat fever in cattle	0.29	31	0.36

… *Contd*.

Table 2 — Showing plant used to treat livestock disease along with their use value (Contd.)

S.No	Scientific Name and Voucher No.	Pahari Name	Family	Part used	Uses	UV	FC	RFC
				Herb				
8	*Angelica glauca* Edgew. BGSBU- 06	Chora	Apiaceae	Root	Used to treat cold in goat.	0.23	32	0.37
9	*Brassica juncea* (L.) Czern. BGSBU- 67	Sariya	Brassicaceae	Seed	Used for skin infections and increase to milk production	0.38	44	0.51
10	*Bambusa bambos* (L.) Voss. BGSBU- 72	Baans	Poaceae	Leaves, stem	Used to treat helminthic infestation	0.52	55	0.63
11	*Cicer arietinum* L. BGSBU-73	Channa	Fabaceae	Seed	Seed coat is used to increase milk yield.	0.69	54	0.62
12	*Cannabis sativa* L. BGSBU- 19	Pangg	Cannabaceae	Leaves	Used to treat intestinal infections.	0.43	55	0.63
13	*Capsicum annuum* L.BGSBU- 59	Mirch	Solanaceae	Fruit	Used to treat nasal discharge	0.40	43	0.51
14	*Cynodon dactylon* (L.) Pers. BGSBU- 60	Khabbal	Poaceae	Whole Plant	Used to treat wounds.	0.38	37	0.43
15	*Coriandrum sativum* L. BGSBU- 68	Dhaniya	Apiaceae	Seed, Leaf	Used for abdominal distension, diarrhoea, constipation, fever, and indigestion.	0.59	53	0.61
16	*Chenopodium album* L. BGSBU- 02	Bathua	Amaranthaceae	Leaves	Used externally to remove ectoparasites and heal wounds.	0.29	29	0.33
17	*Foeniculum vulgare* Mill. BGSBU- 07	Sounf	Apiaceae	Fruit	Used to treat stomach infections.	0.61	47	0.54
18	*Hordeum vulgare* L. BGSBU- 77	Jau	Poaceae	Seeds	Used to treat foot and mouth disease.	0.70	59	0.68
19	*Malva neglecta* Wallr. BGSBU- 32	Sonchal	Malvaceae	Leaves	Soaked leaves used to treat constipation in calves.	0.23	22	0.25
20	*Oryza sativa* L. BGSBU- 42	Dhan	Poaceae	seed	Used for Retention of placenta and wound healing.	0.47	57	0.66
21	*Punica granatum* L. BGSBU-31	Daruna	Lythraceae	Fruit	Used for intestinal infection.	0.81	41	0.47
22	*Picrorhiza kurroa* Royle, BGSBU- 41	Koudh	Plantaginaceae	Rhizome	Used to treat pneumonia and parasitic infection.	0.27	33	0.38
23	*Trillium govanianum* Wall. ex D.Don. BGSBU- 33	Trae patri	Melanthiaceae	Rhizome	Used to treat intestinal infection.	0.30	25	0.29
24	*Thymus linearis* Benth. BGSBU- 71	Ajwain	Lamiaceae	Seed	Used for digestion problems.	0.69	58	0.67
25	*Triticum aestivum* L. BGSBU- 57	Kanik	Poaceae	Seed	Used as animal fodder.	0.43	35	0.40
26	*Trigonella gladiata* Steven ex M.Bieb BGSBU- 26	Methi	Fabaceae	Leaves	Used to treat throat and diarrhoea.	0.45	57	0.66
27	*Justicia adhatoda* L. BGSBU- 92	Behkar	Acanthaceae	Leaves	Used as an antiseptic	0.35	26	0.30
28	*Zea mays* L. BGSB- 1933	Makk	Poaceae	Fruit	Maize flourused to treat mouth diseases.	0.47	51	0.59
29	*Zingiber officinale* Roscoe. BGSBU- 69	Adrak	Zingiberaceae	Rhizome	Used for constipation, food poisoning, haematuria, indigestion, and stomachache	0.52	52	0.60

… *Contd*.

Table 2 — Showing plant used to treat livestock disease along with their use value (Contd.)

S.No	Scientific Name and Voucher No.	Pahari Name	Family	Part used	Uses	UV	FC	RFC
				Tree				
30	*Azadirachta indica* A. Juss. BGSBU- 80	Neem	Meliaceae	Leaves	Used to treat parasitic and bacterial diseases.	0.52	51	0.59
31	*Alnus nitida* (Spach) Endl. BGSBU- 16	Sarol	Betulaceae	Leaves	Used to cure mouth infection	0.21	28	0.32
32	*Aesculus indica* (Colebr.) Hook. f. BGSBU- 93	Bankhori	Sapindaceae	Leaves	Treatment of chest diseases in buffalo, horses and cow.	0.19	19	0.22
33	*Cedrus deodara* (Roxb. ex D.Don) G.Don BGSBU- 39	Dyar	Pinaceae	Wood	Oil used to remove ticks and lice.	0.73	24	0.27
34	*Citrus medica* L. BGSBU- 78	Garghal	Rutaceae	Fruit	Used for digestion and acidity problems.	0.29	44	0.51
35	*Diospyros lotus* L. BGSBU- 88	Malook	Ebenaceae	Fruit	Used to treat intestinal problems.	0.59	50	0.58
36	*Phyllanthus emblica L.* BGSBU- 79	Amla	Phyllanthaceae	Fruit	Fruit extract used to treat foot-and-mouth disease.	0.36	38	0.44
37	*Grewia optiva* J.R.Drumm. ex *Burret*. BGSBU- 74	Tamman	Tiliaceae	Leaves	Used to remove parasites in calves.	0.75	65	0.75
38	*Juglans regia* L. BGSBU- 27	Akhroat	Juglandaceae	Leaves	Leaf extract used to treat skin disease.	0.53	57	0.66
39	*Melia azedarach* L. BGSBU- 34	Darek	Meliaceae	Leaves, Bark	Used to treat stomach infections.	0.82	69	0.80
40	*Olea europaea subsp. cuspidata.* BGSBU- 38	Kaou	Oleaceae	Leaves	Used to treat intestinal worm infections.	0.79	25	0.29
41	*Prunus persica* (L.) Batsch. BGSBU- 46	Aaru	Rosaceae	Fruit	Used to remove ectoparasites.	0.59	61	0.70
42	*Prunus armeniaca* L. BGSBU- 81	Charota	Rosaceae	Seed	Seed powder used to treat intestinal worms.	0.66	55	0.63
43	*Pinus roxburghii* Sarg. BGSBU- 82	Cheer	Pinaceae	Bark	Resin used to join broken horns.	0.31	61	0.70
44	*Pyrus communis* L. BGSBU- 83	Nashpati	Rosaceae	Leaves	Used for digestion problems and diarrhoea.	0.47	49	0.56
45	*Pyrus pashia* (Buch. Ham. ex D. Don) Steud. BGSBU- 85	Kainth	Rosaceae	Fruit	Ripe fruit juice used to treat eye infections.	0.36	64	0.74
46	*Salix alba* L. BGSBU- 48	Beesa	Salicaceae	Bark	Bark extract used to treat skin infections.	0.48	45	0.52
47	*Senegalia catechu* (L.f.) P.J.H. Hurter & Mabb. BGSBU- 65	Khair	Fabaceae	Bark	Bark extract used to treat foot infections.	0.45	44	0.51
48	*Vachellia nilotica* (L.) P.J.H. Hurter & Mabb. BGSBU- 86	Kikar	Fabaceae	Leaves and Bark	Used to treat sore throat and dysentery.	0.56	38	0.44
				Shrub				
49	*Amaranthus viridis* L. BGSBU- 01	Ghanar	Amaranthaceae	Leaves	Used to treat obesity and snakebite.	0.36	54	0.62
50	*Berberis lycium* Royle BGSBU- 1910	Simblu	Berberidaceae	Stem, root, leaves	Used for wound healing and liver problems.	0.48	62	0.72

… *Contd*.

Table 2 — Showing plant used to treat livestock disease along with their use value (Contd.)

S.No	Scientific Name and Voucher No.	Pahari Name	Family	Part used	Uses	UV	FC	RFC
				Shrub				
51	*Calotropis procera* (Aiton) W.T. Aiton BGSBU- 08	Aak	Apocynaceae	Leaves	Used to treat parasitic infections in buffaloes.	0.22	35	0.40
52	*Datura stramonium* L. BGSBU- 53	Datur	Solanaceae	Seeds	Unripe seeds used to treat diarrhoea.	0.05	20	0.23
53	*Diospyros melanoxylon* Roxb. BGSBU- 87	Tarnari	Ebenaceae	Leaves	Leaf extract used to treat skin diseases.	0.47	63	0.73
54	*Elaeagnus parvifolia* Wall. ex Royle BGSBU-89	Kankoli	Elaeagnaceae	Fruit	Used for cough, lung infections, and toothache.	0.66	53	0.61
55	*Euphorbia illirica* Lam. BGSBU- 90	Dodal	Euphorbiaceae	Root	Root extract used as an anthelmintic.	0.70	53	0.61
56	*Ficus carica* L. BGSBU-61	Pherwada	Moraceae	Leaves	Used to remove retained placenta in cattle.	0.63	51	0.59
57	*Girardinia diversifolia* Friis. BGSBU- 58	Kayari	Urticaceae	Roots	Used for retained placenta.	0.27	21	0.24
58	*Mentha longifolia subsp. longifolia*BGSBU-30	Poodna	Lamiaceae	Leaves	Leaf extract used to treat abdominal pain.	0.46	44	0.51
59	*Rosa indica* L. BGSBU-75	Gulab	Rosaceae	Flower	Flowers used to treat constipation in animals.	0.37	33	0.38
60	*Rubus fruticosus* L. BGSBU- 91	Akhra	Rosaceae	Fruit	Used to treat diarrhoea.	0.47	33	0.38
61	*Vitex negundo* L. BGSBU- 28	Bana	Lamiaceae	Leaves	Used to treat mouth ulcers.	0.40	47	0.54
62	*Viburnum cotinifolium* D. Don. BGSBU- 56	Kuch	Adoxaceae	Leaves	Used to heal external wounds.	0.28	36	0.41
63	*Zanthoxylum armatum* DC. BGSBU- 76	Timber	Rutaceae	Bark, Seed, whole plant	Used to treat mouth blisters.	0.68	37	0.43
64	*Ziziphus nummularia* (Burm.f.) Wight & Arn. BGSBU- 84	Beer	Rhamnaceae	Leaves	Leaves used on cuts and wounds.	0.51	63	0.73
				Climbers				
65	*Hedera nepalensis* K. Koch. BGSBU- 09	Chau	Araliaceae	Leaves	Used to remove leeches from animal nostrils.	0.21	36	0.41

Status of ethnoveterinary medicinal plants

The perceived status of ethnoveterinary medicinal plants varied across the three study regions (Fig. 6). 57% of the informants perceived a decline in medicinal plant populations, 34% considered them sparsely available, and 9% reported no change, indicating a general perception of reduced availability of ethnoveterinary medicinal plants across the study area.

Discussion

The present study documented 65 medicinal plant species, belonging to 38 different families, were identified from the study site, with 15 species specifically utilized to treat intestinal and parasitic diseases in livestock. Similar ethnoveterinary plant diversity has been documented in others parts of Jammu and Kashmir and Himalayan region[22,23].

The predominance of herbs over trees and shrubs observed in the present study is consistent with previous ethnoveterinary investigations conducted in the northwestern Himalayas[22,24,25].

Foot and mouth disease, skin infections, infestations caused by internal and external parasitic worms, and mouth blisters were among the conditions treated using medicinal plants collected from the Poonch region. Several of the plant species identified in this study were also referenced in previous research conducted in nearby areas[7,26]. The most commonly utilized plant parts were leaves, fruits, and seeds plants are often applied individually or, in some cases, combined with two or

three other species to enhance the therapeutic efficacy of the herbal remedies for various health issues. The most frequently cited species in the present investigation, including *Melia azedarach*, *Grewia optiva*, *Ziziphus nummularia*, *Diospyros melanoxylon*, and *Berberis lycium*, are also recognized for their ethnomedicinal importance in several Himalayan studies. Similar uses of these species for treating gastrointestinal disorders, skin infections, parasitic infestations, and wounds have been documented in Jammu and Kashmir, Himachal Pradesh, northern Pakistan, suggesting considerable similarity in ethnoveterinary practices across the western Himalayan region[22,24,27]. The high Use Value (UV) and Relative Frequency of Citation (RFC) of *Melia azedarach* may reflect its familiarity and frequent use within the local community, as well as its wide range of reported medicinal applications. Phytochemical investigations of *M. azedarach* have identified diverse bioactive constituents, including limonoids, triterpenoids, flavonoids, phenolics, steroids, and lignans, while pharmacological studies have reported antimicrobial, antifungal, antioxidant, antiparasitic, and other biological activities[28]. These findings provide a scientific basis for further investigation of the traditional uses of *M. azedarach*, although the present ethnoveterinary observations should not be interpreted as evidence of therapeutic efficacy

The high Informant Consensus Factor (ICF) values (0.87–1.00) indicate strong agreement among informants regarding the use of medicinal plants for

Table 3 — Informant consensus factor (ICF) for ethnobotanical information by 86 Pahari informants

Ailment category	Species used	Citations	ICF
Fever and cough	13	98	0.876
Intestinal infection	15	110	0.872
Foot and mouth disease	9	91	0.911
General health	4	71	0.960
Diarrhea	4	75	0.960
Retention of placenta	4	61	0.950
Parasitic infection	15	112	0.874
Wound healing	5	79	0.949
Infectious disease	9	97	0.917
Snake bite	4	83	0.963
Bacterial disease	1	79	1.000
Broken horn injuries	1	81	1.000
Eye infection	1	77	1.000
Leech removal	1	50	1.000

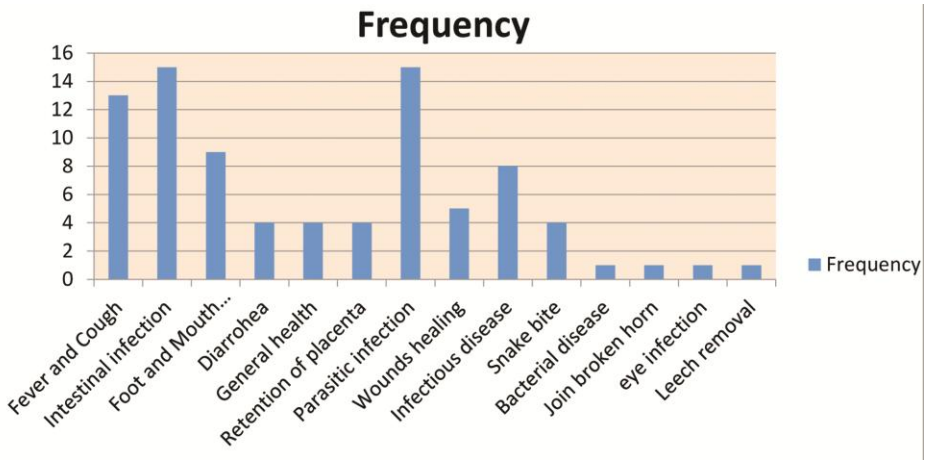


Fig. 5 — Showing frequency of number of plants used against different disease

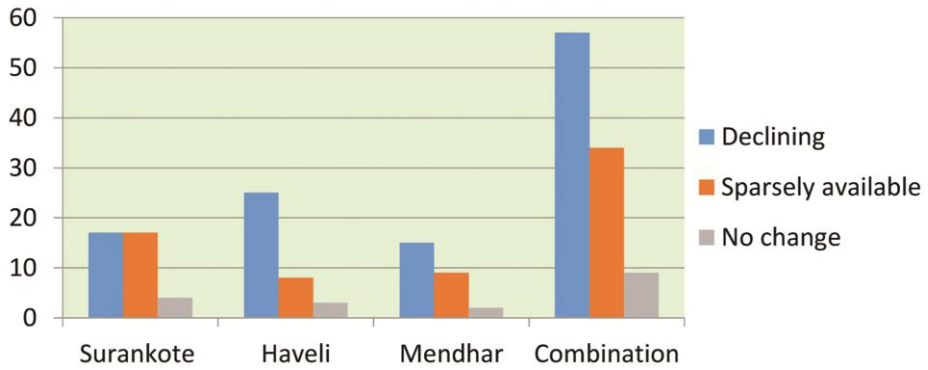


Fig. 6 — Region-wise perceptions of informants on the current status of ethnoveterinary medicinal plants

treating different livestock ailments, suggesting that ethnoveterinary knowledge is well preserved within the Pahari community. High ICF values are generally considered to reflect a high degree of consensus among informants and may indicate the perceived effectiveness and cultural importance of the reported medicinal plants, as documented in previous ethnobotanical studies by Heinrich *et al.*[17] and Trotter & Logan[29,]. However, consistently high ICF values may also be influenced by the relatively homogeneous cultural background of the informants, the restricted geographical scope of the survey, and the transmission of shared traditional knowledge within the community, which can introduce reporting bias. Similar observations have been reported by Vitalini *et al.*[30], who noted that high consensus values may partly reflect cultural homogeneity and common knowledge-sharing practices.

Approximately 80% of informants reported that their knowledge of indigenous traditional remedies was passed down through generations, primarily from parents, grandparents, and occasionally local practitioners or traditional healers. The findings of the current study reveal that older informants possess a wealth of traditional ethnoveterinary knowledge, in contrast to the younger generation, who are more influenced by modern practices[31]. Furthermore, certain medicinally important plant species are facing extinction due to destructive harvesting practices, which also contribute to the decline in local biodiversity. There is an urgent need to raise awareness among local populations regarding the importance of conserving and sustainably utilizing these therapeutic plants.

The use of medicinal herbs for treating illnesses has substantially enhanced the health and productivity of cattle, benefited local populations and contributed to the economic success of farmers. Indigenous knowledge, through its documentation and analysis, offers potential applications across several research fields, including phytochemistry, toxicology, pharmacology, pharmacognosy, and veterinary science. Researchers have acknowledged the growing need for alternative treatments that can expedite the therapeutic process and promote the development, improvement, and productivity of domestic animals[32]. Formal ethnoveterinary studies are essential for validating the effectiveness of these traditional treatments[31].

The findings of this research are in the preliminary stages, and further validation of the medicinal plant applications for animal husbandry is required. A pharmacological analysis of the therapeutic plants identified in this study will provide valuable insights into the correlation between traditional ethnoveterinary knowledge and modern medicine. In addition to facilitating the development of practical pharmacological approaches, the documentation of indigenous ethnoveterinary knowledge will also promote the conservation and sustainable use of biodiversity, particularly medicinal plants. Numerous studies have indicated that younger generations show decreasing interest in traditional medical practices[33]and are largely unaware of the healing plants present in their environment. Only a few elderly individuals continue to pass down this knowledge to the younger population. This study aimed to document, assess, and compare traditional ethnoveterinary plant knowledge while identifying research gaps and potential future directions for the region. Further studies involving multiple ethnic communities and broader geographical areas are recommended to assess the wider applicability of the present findings. The documented uses, particularly those of *M. azedarach*, provide a basis for future phytochemical and pharmacological investigations; however, the ethnoveterinary observations reported here should not be interpreted as evidence of therapeutic efficacy.

A limitation of the present study was the uneven age distribution of informants, with most participants belonging to old age groups. Knowledge saturation was not formally assessed. Future studies should include a more balanced age distribution and assess knowledge saturation.

Conclusion

This study systematically documents Pahari ethnoveterinary knowledge in Poonch, revealing valuable medicinal plant resources and knowledge patterns that warrant conservation, pharmacological validation, and integration into sustainable livestock healthcare.

Supplementary Data

Supplementary data associated with this article is available in the electronic form at https://nopr.niscpr.res.in/jinfo/ijtk/IJTK_25(10)(2026)947-958_SupplData.pdf

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Author Contributions

RAM: Conceptualization, methodology, field investigation, data collection, data analysis, visualization, and writing-original draft. SAR: Conceptualization, methodology, supervision, interpretation of results, and critical revision of the manuscript. RK: Field investigation, data collection, plant identification/authentication, and manuscript review. AAS: Data curation, statistical analysis, visualization, and manuscript review. MAHK: Supervision, validation, interpretation of findings, project administration, and critical revision of the manuscript.

Conflict of Interest

The authors declare no conflict of interest

Ethics Approval

Formal institutional ethical approval was not required for this study according to the applicable institutional guidelines because the study involved documentation of traditional ethnoveterinary knowledge through voluntary interviews and did not involve clinical intervention or experimentation on human participants. Permission was obtained from the relevant local/community authorities, and informed consent was obtained from all participants before data collection.

Use of Artificial Intelligence (AI)

Artificial intelligence (AI) tools were not used in the design, analysis, interpretation, or generation of the research results. The authors take full responsibility for the accuracy, originality, and integrity of the manuscript.

Data Availability

The data generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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