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Ethnomedicinal and Veterinary Plants used by Local Pastoral Communities of Vijayanagara District, Karnataka, India

Srikala S. R[1], and Dr. Manjunath B.T.[2*]

[1]*Research Scholar, Department of Life Sciences, Christ Deemed to be University, Bengaluru - 560029, Karnataka, India*

[2*]*Professor, Department of Life Sciences, Christ Deemed to be University, Bengaluru - 560029, Karnataka, India*

***Corresponding Author:** Dr. Manjunath B.T.*

Professor, Department of Life Sciences, Christ Deemed to be University, Bengaluru - 560029, Karnataka, India, Email: manjunath.bt@christuniversity.in

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ABSTRACT

The ethnobotanical study conducted in the Vijayanagara district of Karnataka, India, aimed to document the traditional knowledge of medicinal and veterinary plant usage among local pastoral communities. The region's diverse ecosystem, ranging from dry deciduous forests to grasslands, provides a rich repository of plant species that have been utilized for generations by the indigenous population. Through participant observation, interviews, and questionnaire surveys conducted in the local Kannada dialect, information regarding the usage, preparation methods, and application modes of medicinal and veterinary plants was gathered. Prior Informed Oral Consent was obtained from all participants, adhering to ethical guidelines set by the International Society of Ethnobiology. Quantitative analysis using ethnobotanical indices, such as the Use Value, provided insights into the relative importance of different plant species in local traditional medicine. Taxonomic identification of plants was conducted using both traditional botanical resources and online databases, with in-field verification facilitated by mobile applications. The findings of this study contribute to the documentation and validation of traditional knowledge systems, highlighting the importance of preserving indigenous practices. Additionally, the study underscores the potential of ethnomedicinal and veterinary plants to inform modern healthcare practices and emphasizes the need for conservation efforts to protect biodiversity and cultural heritage.

Keywords: Biodiversity, Ethnobotany, Healthcare, Traditional, Veterinary

INTRODUCTION

Vijayanagara district in Karnataka, India, with its unique tropical to semi-arid climate, offers a distinct ecological niche that shapes the regional biodiversity, ranging from dry deciduous forests to scrublands and fertile riparian zones along the Tungabhadra River. This diverse vegetation is integral not only to the local ecosystem but also to the cultural and economic fabric of the area, especially in agriculture and tourism sectors. This ethnobotanical study delves into the traditional uses of plant species in Vijayanagara, emphasizing their roles in medicinal and veterinary applications by the local pastoral communities.

The interaction between indigenous people and their natural environment provides valuable insights into sustainable practices that could benefit wider ecological and health sectors. With local communities heavily reliant on natural resources, documenting these ethnobotanical practices is vital for conservation initiatives and for scientifically validating traditional knowledge. Traditional ecological knowledge, including ethnobotanical practices, is increasingly acknowledged for its contributions towards biodiversity conservation, sustainable resource management, and bioprospecting (Berkes, 1993; Cotton, 1996). These studies are particularly critical in regions like Karnataka, where a rich reservoir of indigenous knowledge exists yet remains under documented (Jain and Rao, 1997).

Research by Gadgil et al. (1993) has underscored the importance of local knowledge systems in ecological conservation, highlighting how indigenous practices contribute to the stability and sustainability of rural economies. Ethnobotanical research bridges the gap between traditional practices and modern scientific understanding, offering validated insights that integrate into contemporary science (Balick and Cox, 1996).

Ethnobotanical methodologies typically involve participatory approaches that value community input, as demonstrated in the works of Martin (1995) and Phillips et al. (1994). These methods respect local traditions and cultural sensitivities, ensuring comprehensive data collection (Alexiades, 1996). Additionally, the use of ethnobotanical indices like the Use Value (UV) lends scientific credibility to traditional knowledge, facilitating its acceptance and application in broader scientific contexts (Trotter and Logan, 1986).

Advancements in technology have also revolutionized data collection and analysis in ethnobotanical studies. The adoption of digital tools and mobile applications for plant identification and data recording has significantly enhanced the accuracy and efficiency of field research (Couvet et al., 2008).

The literature highlights the critical role of ethnobotanical studies in preserving biodiversity and traditional knowledge, particularly in ecologically rich regions like Vijayanagara. By integrating traditional methodologies with modern technologies, researchers can more effectively document and analyze the complex interactions between humans and their natural surroundings. This study aims to enrich this body of knowledge by examining the ethnomedicinal and veterinary uses of local flora by the pastoral communities in Vijayanagara district, thereby contributing to both scientific research and local sustainability.

MATERIALS AND METHODS

Study area

This ethnobotanical study focused on the vegetation across 11 villages in the Vijayanagara district of Karnataka, India, situated between 15.335° North latitude and 76.462° East longitude (Fig 1). The region experiences a tropical to semi-arid climate characterized by high temperatures during the summer and mild winters (Census 2021) Rainfall is primarily concentrated during the monsoon season from June to September, which is crucial for agriculture. The soil in Vijayanagara is predominantly sandy and rocky, interspersed with patches of red and black soil. The district's diverse vegetation includes dry deciduous forests, scrublands, and grasslands, with dense forest patches found along riverbanks and hillsides. The Tungabhadra River supports a rich riparian vegetation, enhancing the area's ecological richness and cultural significance. Agriculture is the predominant occupation here, with rice, millets, pulses, and cotton being the main crops cultivated. Animal husbandry and tourism also play significant roles in the local economy. Additionally, the region is rich in wild edible plants that contribute to both nutrition and cultural heritage, thereby enhancing the region's biodiversity and attracting tourists.

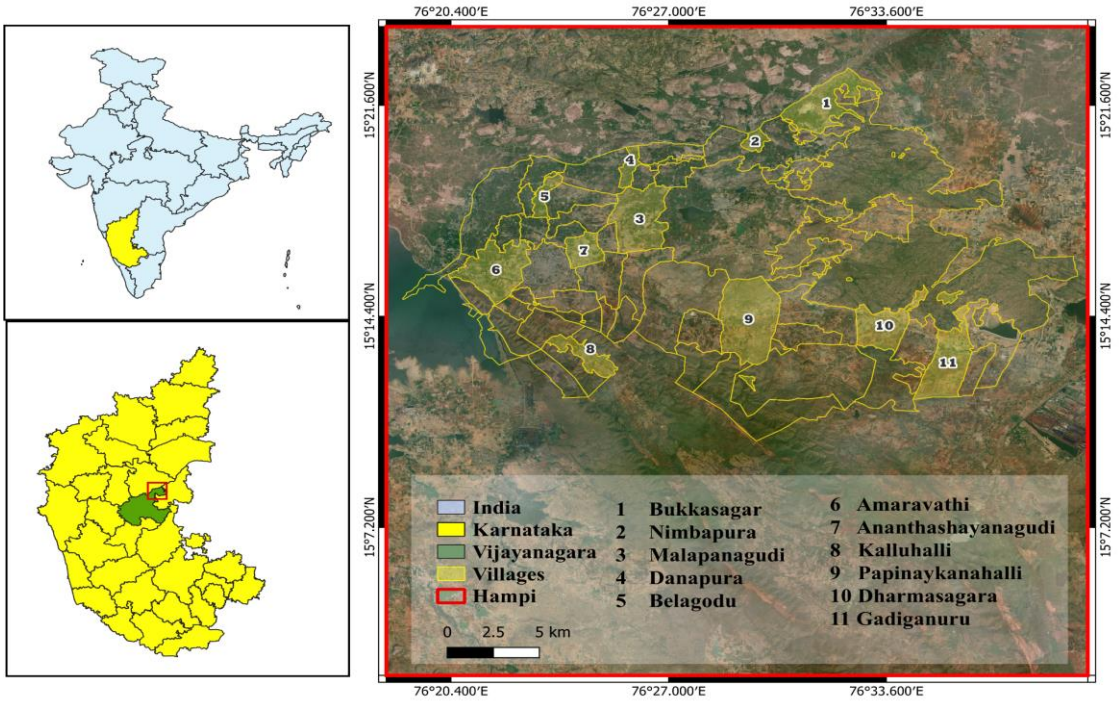

Fig. 1: Study Area Map of Ethnomedicinal and Veterinary Plants used by Local Pastoral Communities of Vijayanagara District, Karnataka, India

Data Collection and Analysis

The study commenced with participant observation, discussions, plant walks, and interactions designed to establish rapport with pastoral communities. To gather information on medicinal and veterinary plants used by local communities, informants from diverse socioeconomic backgrounds were selected using the snowball sampling method, which is favored for intentionally selecting expert informants (Jain, 1995). The research activities included free-listing exercises and semi-structured individual and group interviews, conducted using open-ended questionnaires as described by Martin (2014). The

questionnaire addressed the primary wild plants used for both medicinal and veterinary purposes. Interviews and questionnaires were conducted in the local Kannada dialect.

Prior Informed Oral Consent was obtained from all participants before initiating the study, with a clear explanation of the research's scope and objectives. The study adhered to ethical guidelines outlined by the International Society of Ethnobiology (ISE). To verify the authenticity of the data, information about the local name, parts used, and medicinal applications (including methods of preparation and mode of application) was cross-checked in various villages by showing either fresh specimens, communicating the local names, or displaying field photographs to informants.

Quantitative analysis of the documented data was performed using ethnobotanical indices. Specifically, the Use Value (UV) was calculated as follows:

$UV = \sum U/N,$

where "U" represents the number of uses mentioned by informants for a particular species, and "N" represents the total number of informants interviewed (Phillips et al., 1994). A high Use Value indicates that a plant is frequently mentioned, whereas a low score suggests fewer mentions.

Taxonomic identification of plants was conducted using the "Flora of Eastern Karnataka" and verified by online resources such as The Plant List (www.theplantlist.org), Plant.id (https://plant.id), and PlantNet (https://plantnet.org). In-field identification was aided by Android applications like iNaturalist and PlantSnap. Collected specimens were preserved into herbaria following the procedures described by Tucker and Calabrese (2015). Authentication of these herbaria was performed by the Central Ayurveda Research Institute in Bengaluru, under the Ministry of AYUSH, Government of India.

RESULTS

In total, 21 pastoral respondents were interviewed to gather information on medicinal and veterinary plants from 11 villages in Vijaynagar district. Among these, the families with the highest number of plants used for various medicinal and veterinary purposes were Euphorbiaceae and Apocynaceae, each with 7 and 6 plants, respectively. The second largest family, Amaranthaceae, accounted for 5 plants serving both medicinal and veterinary uses. Additionally, two plants each were found in the Lamiaceae and Solanaceae families, which have been noted for their good medicinal properties. The remaining 19 families each contributed one plant as shown in Fig 2.

In our study, families such as Amaranthaceae, Apocynaceae, Euphorbiaceae, Menispermiaceae, Solanaceae, and Verbenaceae exhibited both veterinary and medicinal properties. On the other hand, families including Boraginaceae, Convolvulaceae, Cucurbitaceae, Malvaceae, Lamiaceae, Lythraceae, Martyniaceae, Meliaceae, Pedaliaceae, Papaveraceae, Plumbaginaceae, Proteaceae, Sapindaceae, Aristolochiaceae, and Combretaceae were identified solely for their medicinal value in our study. Additionally, the family Cyperaceae was identified exclusively for its veterinary properties in the current study.

Among the listed plant species, those with a use value of 0.095 exhibit both medicinal and veterinary properties, including *Alternanthera paronychioides, Alternanthera pungens, Gomphrena celosiodes, Cascabela thevetia, Cryptostegia grandiflora, Oxystelma esculentum, Asparagus setaceus, Aloe vera, Euphorbia tirucalli, Jatropha curcas, Azadirachta indica, Tinospora cordifolia, Datura inoxia, and*

*Duranta erecta. C*onversely, those plants with a use value of 0.047, such as *Alternanthera sessilis, Calotropis gigantea, Aerva lanata, Vincetoxicum indicum, Wrightia tinctoria, Cordia sebestena, Argyreia nervosa, Citrullus colocynthis, Acalypha indica, Chrozophora tinctoria, Croton bonplandianus, Euphorbia antiquorum, Euphorbia heterophylla, Abutilon hirtum, Tectona grandis, Vitex negundo, Lagerstroemia speciosa, Martynia annua, Pedalium murex, Argemone mexicana, Plumbago zeylanica, Grevillea robusta, Dodonaea viscosa, Ailanthus excelsa, Solanum trilobatum, Aristolochia bracteata, Euphorbia lactea, and Conocarpus erectus,* exhibit either medicinal or veterinary properties exceptionally.

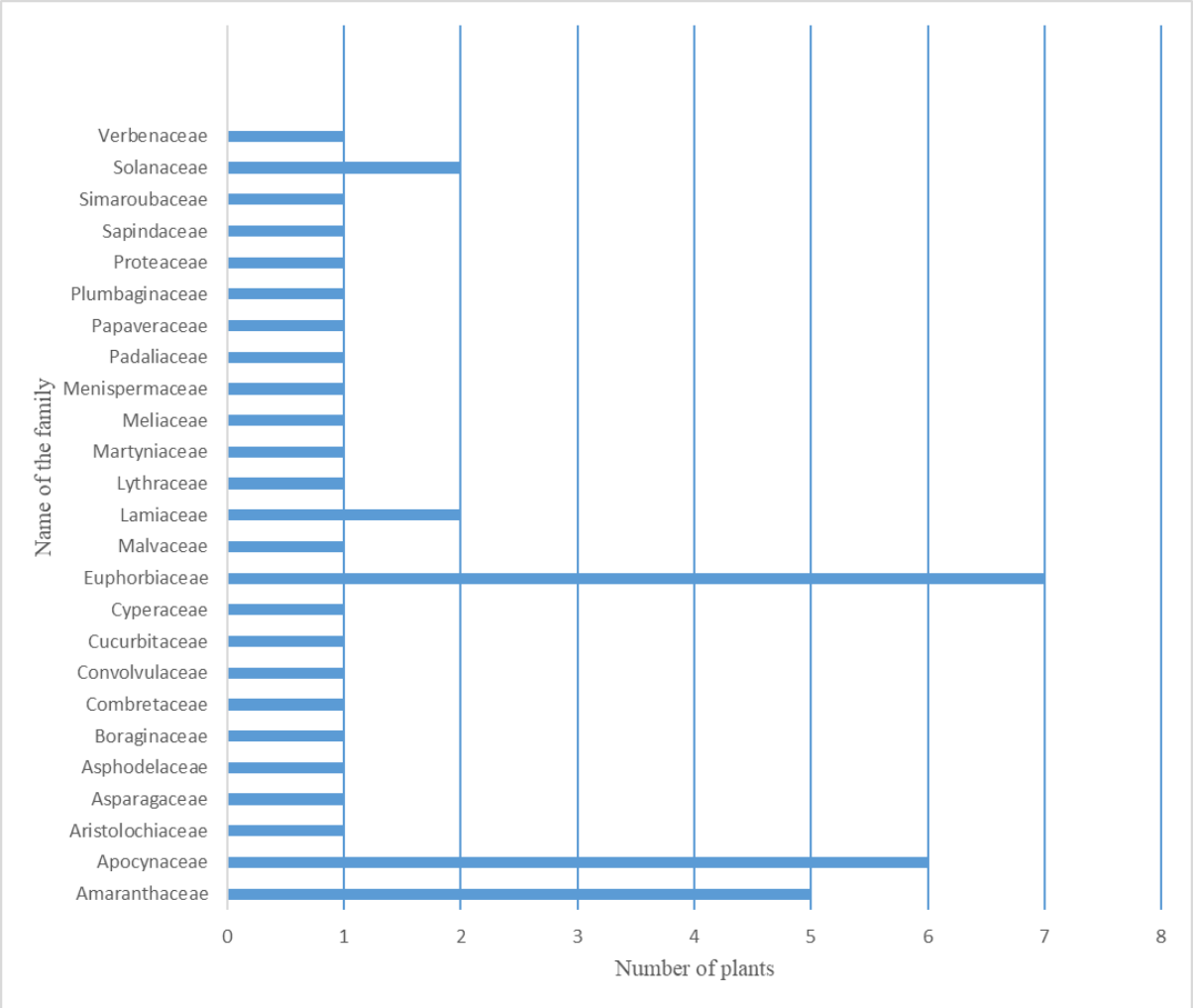

Fig. 2: Number of Plant Species Found in Different Plant Families

Various plants are found to show different pharmacological actions in table 1. The leaves of various plants are utilized to treat different disorders, either in the form of a paste or by boiling and inhaling the steam in the case of respiratory issues. These plants include *Alternanthera paronychioides, Alternanthera pungens* Kunth, *Alternanthera sessilis, Gomphrena celosiodes, Aerva lanata, Vincetoxicum indicum, Wrightia tinctoria, Asparagus setaceus, Aloe vera, Cordia sebestena, Acalypha indica, Chrozophora tinctoria, Croton bonplandianus, Euphorbia antiquorum, Euphorbia heterophylla, Euphorbia tirucalli, Jatropha curcas, Abutilon hirtum, Tectona grandis, Vitex negundo, Lagerstroemia speciosa, Martynia annua, Azadirachta indica, Tinospora cordifolia, Pedalium murex, Argemone mexicana, Plumbago zeylanica, Grevillea robusta, Dodonaea viscosa, Ailanthus excelsa, Datura inoxia, Duranta erecta, and Solanum trilobatum* L. The latex of *Calotropis gigantea,*

Cryptostegia grandiflora, and *Euphorbia tirucalli* as well as *Oxystelma esculentum,* are *predominantly used for treating cuts and wounds. The flowers of Argyreia nervosa are consumed to alleviate diarrhea,* while the fruits of *Citrullus colocynthis* are ingested to relieve stomach pain. The seeds and latex of *Jatropha curcas* L. *are used to treat infections and wounds.* These are the different plant parts used to treat various ailments in humans and cattle in Vijaynagar district (Table 1 and 2).

Table 1. Plants with Various Medicinal and Veterinary Properties

Sl. No.	Ailments	Plants
1	Gastrointestinal disorders in both human and cattle	*Argyreia nervosa* (Burm. f.) Bojer *Citrullus colocynthis* (L.) Sachrad *Chrozophora tinctoria* (L) A. Juss. *Euphorbia antiquorum* L. *Euphorbia heterophylla* L. *Pedalium murex* L. *Datura inoxia* Mill. *Euphorbia lactea* Haw. *Wrightia tinctoria*
2	Cuts, wounds, burns and skin infections in both human and cattle	*Alternanthera paronychioides* A.St.-Hill *Alternanthera sessilis* (L.) R.Br. ex DC. *Cryptostegia grandiflora* Roxb. Ex R. Br *Oxystelma esculentum* *Aloe vera* (L.) Burm.f. *Acalpha indica* L. *Euphorbia tirucalli* L. *Azadirachta indica* A.Juss *Calotropis gigantea* (L.) Dryand *Jatropha curcas* L.
3	Fever cold, cough, and other respiratory disorders in humans	*Cordia sebestena* L. *Vitex negundo* L. *Vincetoxicum indicum* (Burm.f.) Mabb. *Tinospora cordifolia* (Thumb.) Miers *Solanum trilobatum* L.
4	Cattle udder infection	*Aerva lanata* (L.) Juss. ex Schult.
5	Piles in human	*Argemone mexicana* L. *Tectona grandis* L.f.
6	Reproductive disorders in human	*Croton bonplandiaus* Bail. *Ailanthus excelsa* Roxb.
7	Eye, Ear, and mouth infections in cattle	*Grevillea robusta* A.Cunn.ex R. Br. *Cascabela thevetia* (L.) Lippoid
8	Fatigue in cattle and human	*Asparagus setaceus* (Kunth) Jessop
9	Bone fracture in both human and	*Dodonaea viscosa* (L.) Jacq

	cattle	
10	Leprosy in Human	*Abutilion hirtum* (Lam.) Sweet
11	Mosquito repellent	*Duranta erecta* L.
12	Chest pain in human	*Plumbago zeylanica* L.
13	Anxiety in human	*Lagerstroemia speciosa* (L.) Pers.
14	Inflammation in human	*Martynia annua* L.
15	Easy pasturage and constipation in both cattle and human	*Alternanthera pungens* Kunth.
16	Urinary tract infection in both cattle and human	*Gomphrena celosiodes* Mart.
17	Anemia in human	*Conocarpus erectus* L.

Table 2. Appendix of Various Medicinal and Veterinary plants, botabical name, local name and other Properties

Sl. No.	Botanical Name	Local Name	Family	Use Category	Mode of Usage
1	*Alternanthera paronychioides* A.St.-Hill	Honagonne soppu	Amaranthaceae	Medicinal and Veterinary	Leaves are made into a paste and applied to wounds, benefiting both cattle and humans
2	*Alternanthera pungens* Kunth.	Mullu honagonne soppu	Amaranthaceae	Medicinal and Veterinary	Leaf juice is administered to livestock for easy pasturage. Leaves are processed into a paste, combined with honey, and consumed to alleviate constipation in humans
3	*Alternanthera sessilis* (L.) R.Br. ex DC.	Mokkunna soppu	Amaranthaceae	Medicinal	Leaves are made into a paste, and applied to human wounds.
4	*Gomphrena celosiodes* Mart.	Nelarudrakshi	Amaranthaceae	Medicinal and Veterinary	Pastoralists consume a decoction of leaves to address urinary tract infections, while the juice is administered to cattle for the same purpose.
5	*Calotropis gigantea* (L.) Dryand	Ekke gida	Apocynaceae	Medicinal	Latex is utilized to treat various skin diseases in both cattle and humans.
6	*Aerva lanata* (L.) Juss. ex Schult.	Gorakshaganja	Amaranthaceae	Veterinary	A decoction made from its leaves is utilized to treat udder infections in cows.
7	*Cascabela thevetia* (L.) Lippoid	Kaasikanagalu	Apocynaceae	Medicinal and Veterinary	Used to treat cattle mouth infection. Latex is used to treat human eye infection
8	*Cryptostegia grandiflora* Roxb. Ex R. Br	Hambu rubber	Apocynaceae	Medicinal and Veterinary	Latex is used to treat wounds for both cattle and human
9	*Oxystelma esculentum*	Doodiballi	Apocynaceae	Medicinal and Veterinary	Latex is used to treat wounds for both cattle and human
10	*Vincetoxicum indicum*	Tattuna	Apocynaceae	Medicinal	The steam from the leaves is utilized to treat asthma.

	(Burm.f.) Mabb.				
11	*Wrightia tinctoria*	Ajmara	Apocynaceae	Medicinal	Leaves are eaten for mouth ulcers
12	*Asparagus setaceus* (Kunth) Jessop	Shathavari gida	Asparagaceae	Medicinal and Veterinary	It is used to treat fatigue for human beings. The paste made from the leaves is administered to goats and sheep when they're struggling to keep up with the herd.
13	*Aloe vera* (L.) Burm.f.	Lole Sara	Asphodelaceae	Medicinal and Veterinary	The juice is applied to burnt areas for both humans and cattle.
14	*Cordia sebestena L.*	Chellekendala	Boraginaceae	Medicinal	Tea made of leaves is consumed for cough and cold.
15	*Argyreia nervosa (Burm. f.) Bojer*	Samudravalli	Convolvulaceae	Medicinal	The paste made from flowers is consumed during diarrhea
16	*Citrullus colocynthis (L.) Sachrad*	Havumekke	Cucurbitaceae	Medicinal	The dried fruit is utilized to alleviate stomach pain and address other gastrointestinal disorders
17	*Acalpha indica L.*	Kuppi gida	Cyperaceae	Veterinary	Leaves are used to treat skin infections in cattle
18	*Chrozophora tinctoria (L) A. Juss.*	Surya varti	Euphorbiaceae	Medicinal	The paste of leaves are used as laxatives
19	*Croton bonplandiaus Bail.*	Alpabedi soppu	Euphorbiaceae	Medicinal	A paste made from leaves is mixed with honey and consumed to treat excessive white discharge in women.
20	*Euphorbia antiquorum L.*	Mundukalli	Euphorbiaceae	Medicinal	The leaf juice is drunk to treat constipation.
21	*Euphorbia*	Bedhi soppu	Euphorbiaceae	Medicinal	The leaf juice is drunk to

	heterophylla L.				treat constipation.
22	*Euphorbia tirucalli L.*	Bonka kalli	Euphorbiaceae	Medicinal and Veterinary	Latex is used to treat whitish bumps (warts) on the skin of both humans and cattle.
23	*Jatropha curcas L.*	Dodda haralu	Euphorbiaceae	Medicinal and Veterinary	Seed paste is used to treat the viral infection in cattle. Leaves and latex is used to treat wounds and cuts.
24	*Abutilion hirtum* (Lam.) Sweet	Thuddhi gida	Malvaceae	Medicinal	The paste of leaves is used to treat leprosy.
25	*Tectona grandis L.f.*	Thogadhe mara	Lamiaceae	Medicinal	The leaf juice is consumed to treat piles
26	*Vitex negundo L.*	Nurgundi	Lamiaceae	Medicinal	The smoke from the leaves is inhaled to alleviate coughs.
27	*Lagerstroemia speciosa (L.) Pers.*	Holedasavala	Lythraceae	Medicinal	The leaf juice is consumed to alleviate anxiety.
28	*Martynia annua L.*	Angla panje	Martyniaceae	Medicinal	The decoction of leaves is used to treat inflammation
29	*Azadirachta indica A.Juss*	Bevu	Meliaceae	Medicinal and Veterinary	Leaves are made into a paste and applied during chickenpox. The leaf paste is also used to treat various skin diseases in cattle.
30	*Tinospora cordifolia (Thumb.) Miers*	Amrutha balli	Menispermaceae	Medicinal and Veterinary	Leaves are consumed during cold and cough
31	*Pedalium murex*	Ane neggilu	Padaliaceae	Medicinal	Leaves are used to treat

	L.				gastric ulcers
32	*Argemone mexicana L.*	*Datturi gida*	*Papaveraceae*	*Medicinal*	*The water boiled with leaves is used for bathing during a fever.*
33	*Plumbago zeylanica L.*	Bili chitra	Plumbaginaceae	Medicinal	The leaf tonic is drank during chest pain.
34	*Grevillea robusta A.Cunn.ex R. Br.*	Jeeda	Proteaceae	Medicinal	Leaf juice is used to treat ear pain
35	*Dodonaea viscosa (L.) Jacq*	Bandarike	Sapindaceae	Medicinal	Leaves are used to treat bone fractures
36	*Ailanthus excelsa Roxb.*	Dodda bevu	Simaroubaceae	Medicinal	Leaves used as an antifertility plant
37	*Datura inoxia Mill.*	Ummethi	Solanaceae	Medicinal and Veterinary	Leaves is used to treat stomach pain caused by intestinal worms in both humans and cattle.
38	*Duranta erecta L.*	Neela kantha	Verbenaceae	Medicinal and Veterinary	The paste of leaves is rubbed on the bodies of cattle to repel mosquitoes and insects during the rainy season.
39	*Solanum trilobatum L.*	Mullu musta	Solanaceae	Medicinal	Leaves decoction is used to treat respiratory disorders
40	*Aristolochia bracteata Retz.*	Kitamari	Aristolochiaceae	Medicinal	Root decoction is used a an antidote for snake and scorpion bite.
41	*Euphorbia lactea Haw.*	Elagalli	Euphorbiaceae	Medicinal	Usage: The juice of succulent shrubs is used to treat intestinal parasites

42	*Conocarpus erectus L.*	Ustna valadha podhe	Combretaceae	Medicinal	The fruits are consumed by patients with anaemia.

DISCUSSION

In our study, we observed a significant distinction in the application of plant families for medicinal and veterinary uses in Vijaynagar district. The families Amaranthaceae, Apocynaceae, Euphorbiaceae, Menispermiaceae, Solanaceae, and Verbenaceae were notable for their dual utilization in both veterinary and human medicine. This dual use suggests a profound ethno-botanical importance, reflecting deep cultural and traditional knowledge, which aligns with findings from similar studies indicating the versatile therapeutic potentials of these families (Singh et al., 2017; Gupta et al., 2019).Interestingly, a study conducted by Shah et al. in 2013 in the semi-arid regions of Pakistan also identified Amaranthaceae and Euphorbiaceae as the families containing the most medicinal and veterinary uses under semi-arid conditions. And most of them are used either for their cuts and wounds or gastrointestinal properties, this may be because of their antimicrobial and antiviral properties.

Conversely, families such as Boraginaceae, Convolvulaceae, Cucurbitaceae, Malvaceae, Lamiaceae, Lythraceae, Martyniaceae, Meliaceae, Pedaliaceae, Papaveraceae, Plumbaginaceae, Proteaceae, Sapindaceae, Aristolochiaceae, and Combretaceae were utilized exclusively for medicinal purposes. This specificity may indicate a higher specialization in chemical constituents effective against human disorders, supporting the pharmacological segregation seen in other regions (Kumar and Sharma, 2018; Rao et al., 2020). Moreover, the family Cyperaceae was uniquely utilized for veterinary purposes in our study. The specialized use in veterinary medicine might suggest the presence of particular phytochemicals suited for treating ailments in animals, a unique ethnoveterinary knowledge that warrants further phytochemical and pharmacological investigation (Mohan et al., 2021; Eramma and Patil, 2023).

The distinct uses of these plant families emphasize the need to conserve these botanical resources and uphold traditional knowledge systems. The therapeutic breadth observed in these families also suggests potential areas for new drug development, highlighting the importance of ethnopharmacological studies in discovering novel therapeutic agents (Neves et al., 2019; Srikala et al., 2023; Srikala and Manjunath, 2023).

In our study, the analysis of use value (UV) provides significant insights into the relative importance of different plant species for medicinal and veterinary applications within the Vijaynagar district. Plant species with a higher UV, such as *Alternanthera paronychioides, Alternanthera pungens, Gomphrena celosiodes*, and others, which scored 0.095, were noted for their dual application in both traditional human and animal healthcare. This broad utility might be attributed to their accessibility, efficacy, and possibly their wide range of bioactive compounds that effectively address multiple ailments in both humans and animals (Begossi et al., 2002; Raju et al., 2014). On the other hand, species with a UV of 0.047—including *Alternanthera sessilis, Calotropis gigantea*, and others—demonstrated either medicinal or veterinary uses but not both. The more specialized use of these species could reflect a narrower spectrum of phytochemicals targeting specific conditions, or cultural preferences and traditional knowledge systems that dictate their use in either human or veterinary medicine alone (Vandebroek et al., 2004; Yineger et al., 2008).

It is also notable that some of the species with higher use values, such as *Aloe vera* and *Azadirachta indica*, are well-documented in the literature for their multifaceted therapeutic properties, which supports their broader use in both domains (Park and Lee, 2006; Kumar and Navaratnam, 2013). This correlation between documented pharmacological properties and higher use values in ethnomedicine underscores the validity of traditional knowledge as a basis for bioprospecting and further pharmaceutical development. Conversely, the specific use of plants with lower UVs suggests that while these species are valuable, their roles may be more circumscribed, possibly due to lesser-known or less efficacious properties, or because their use is limited to treating few common ailments. Future phytochemical studies on these plants could illuminate new compounds with potential health benefits, justifying the expansion of their use in traditional medicine systems.

The use value analysis not only highlights the importance of these plants in local health practices but also serves as a crucial indicator for prioritizing species for conservation and research, given their potential to contribute to global health (Gomez-Beloz, 2002; Albuquerque et al., 2007). This approach helps in understanding the interaction between cultural practices and natural resources, essential for sustainable management and utilization of medicinal plants. The use of medicinal plants for the treatment of various ailments in humans and livestock in the Vijaynagar district illustrates the rich ethnopharmacological knowledge embedded within local traditions. The diverse applications of plant parts, such as leaves, latex, flowers, fruits, and seeds, underscore the vital role these natural resources play in primary health care systems in rural settings.

The practice of using leaves from species such as Alternanthera spp. and Aloe vera in different forms, either as pastes or for steam inhalation, demonstrates the adaptability and accessibility of traditional remedies. This usage aligns with findings by Saslis-Lagoudakis et al. (2011), who reported similar medicinal applications of plant species across different geographic and cultural settings, suggesting a convergence in ethnobotanical practices that may be guided by the chemical properties of the plants. The application of latex from plants like *Calotropis gigantea* and *Euphorbia tirucalli* for wound healing is particularly interesting. Latex, as noted by Oudhia (2002), contains compounds with antimicrobial and antifungal properties, providing scientific backing for its traditional use. This supports the integration of such natural products into modern medicinal frameworks, given their potential efficacy and the growing resistance against synthetic drugs (Patridge et al., 2016; Renuka Jyothi et al., 2323; Nataraj et al., 2023;).

Moreover, the consumption of *Argyreia nervosa* flowers and *Citrullus colocynthis* fruits for gastrointestinal issues, such as diarrhea and stomach pain, reflects ethnomedicinal practices documented in other regions (Jain and Tarafdar, 1970). Such uses not only highlight the potential for discovering new active compounds but also emphasize the need for conservation of these species due to their medicinal value. Overall, the medicinal plants of Vijaynagar district serve as a crucial reservoir of pharmacologically active compounds that merit further scientific investigation and conservation. Continued ethnobotanical research, coupled with phytochemical and pharmacological studies, could lead to the development of novel therapeutics and support sustainable health solutions, particularly in resource-limited settings (Gurib-Fakim, 2006; Heinrich et al., 2018; Haleshappa et al., 2020a, 2020b, 2021).

CONCLUSION

In conclusion, the ethnobotanical study conducted in the Vijayanagara district of Karnataka, India, sheds light on the intricate relationship between local communities and the rich biodiversity of their

surroundings. Through meticulous documentation of traditional medicinal and veterinary plant usage, this research underscores the invaluable wisdom harboured within indigenous knowledge systems. The utilization of diverse ecosystems, ranging from dry deciduous forests to grasslands, highlights the adaptability and resourcefulness of local pastoral communities in harnessing nature's bounty for their healthcare needs.

By employing a multidisciplinary approach encompassing participant observation, interviews, questionnaire surveys, and quantitative analysis, this study not only provides a comprehensive understanding of traditional practices but also offers insights into the relative importance of different plant species in local medicine. Furthermore, adherence to ethical guidelines, such as obtaining Prior Informed Oral Consent, ensures the respect and protection of the rights of indigenous knowledge holders.

The taxonomic identification of plants, aided by both traditional botanical resources and modern technology, adds credibility to the findings while emphasizing the importance of preserving biodiversity and cultural heritage. Ultimately, the documentation and validation of traditional knowledge systems serve as a crucial step towards bridging the gap between indigenous practices and modern healthcare, while also advocating for conservation efforts to safeguard our natural and cultural legacy.

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