International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Ethnobotanical Survey and Ethno-veterinary Study of Leafy Edible Plant in Kondagaon Chhattisgarh

Himani Sandey[1], Deepak Kumar Soni[2]

[1,2]Department of Botany, Dr. C.V. Raman University, Kargi Road Kota, Bilaspur Chhattisgarh

Abstract

Traditional knowledge of edible and medicinal plants plays a crucial role in the sustenance and healthcare of indigenous communities. The tribal populations of Kondagaon, located in the Bastar region of Chhattisgarh, India, have long relied on local flora for both nutritional and veterinary purposes. However, this knowledge is gradually declining due to modernization and lack of documentation. This study aims to document and analyze the ethnobotanical and ethno-veterinary uses of leafy edible plants in the region. Field surveys were conducted in different villages of Kondagaon district, employing semi-structured interviews and participatory observation methods. Local tribal inhabitants, including elders and traditional healers, were interviewed to gather information on plant usage. The collected plant specimens were identified and authenticated through botanical references. A total of 12 leafy edible plant species were documented, each playing a significant role in the diet of the local population. These plants were found to possess not only high nutritional value but also medicinal properties beneficial for animal health. Several species were reported to treat conditions such as digestive disorders, skin infections, and parasitic infestations in livestock. The findings highlight the deep-rooted traditional knowledge of the tribal communities in Kondagaon regarding the use of local biodiversity. Preserving this indigenous knowledge is essential for sustainable resource management and food security. Further studies and conservation efforts are recommended to integrate traditional practices with modern scientific approaches for sustainable development.

Keywords: Ethnobotanical survey and ethno-veterinary, leafy edible plants, Bastar region, Indigenous knowledge, Sustainable use, Plant species, Nutritional supplements, Animal health.

Introduction

Chhattisgarh, located in central India, is recognized as a biodiversity hotspot with a rich cultural and ecological heritage. The indigenous tribal communities, particularly in the Bastar region, maintain a deep-rooted relationship with their natural environment, relying on forest resources for food, medicine, and veterinary care. Kondagaon, a district within this region, is home to several tribal groups whose traditional knowledge plays a crucial role in their subsistence and healthcare practices (Soni & Shahi, 2021). Among these resources, leafy edible plants hold significant importance due to their nutritional value and medicinal properties, benefiting both human and animal health.

Literature Review

Research on ethnobotanical and ethnoveterinary practices has demonstrated the global significance of traditional knowledge in livestock management. Indigenous communities across various regions have long relied on plant-based remedies for treating livestock ailments, particularly in rural areas with limited access to modern veterinary care (Acharya & Acharya, 2010; Benítez et al., 2012). Studies in Nepal (Shrestha & Khadgi, 2019) and Spain (Benítez et al., 2012) highlight the continued use of medicinal plants in rural animal healthcare systems.

In India, several studies have explored the diverse ethnoveterinary practices employed by tribal communities. Chauhan and Meena (2015) documented plant-based treatments for common livestock diseases, while Das and Tripathi (2009) examined the use of herbal medicine in the Sunderbans. Research in Chhattisgarh, particularly in the Bastar region, has emphasized the socio- cultural values associated with ethnoveterinary knowledge (Kumar & Sharma, 2019; Pandey & Dubey, 2017). These studies suggest that traditional plant-based remedies remain vital to sustainable livestock management and agriculture. However, with the increasing influence of modern veterinary medicine, there is a growing need to document and preserve these indigenous practices.

Objectives of the Study

This study aims to:

1. Document the leafy edible plant species used by the tribal communities of Kondagaon for both human consumption and veterinary purposes.
2. Analyze the nutritional and medicinal significance of these plants in maintaining human and animal health.
3. Explore the role of ethnoveterinary practices in livestock management among tribal communities.
4. Contribute to the preservation of indigenous knowledge and promote the sustainable use of local biodiversity in rural healthcare and agriculture.

By integrating ethnobotanical and ethnoveterinary perspectives, this study seeks to highlight the importance of traditional plant-based knowledge in fostering sustainable agricultural and healthcare practices. The findings can contribute to conservation efforts, policy development, and the integration of indigenous knowledge with modern veterinary science for holistic animal and human health management.

Material and Methods

Study Area

The study was conducted in Kondagaon district, which is part of the Bastar division in Chhattisgarh, India. The region is characterized by dense forests, rich biodiversity, and a strong cultural heritage. The predominant population consists of indigenous tribal communities who rely on subsistence agriculture, animal husbandry, and forest-based livelihoods. Kondagaon is known for its diverse flora, which includes numerous edible leafy plants used for both human nutrition and ethnoveterinary applications.

Geographical Location

- Latitude: 19.5903° N

- Longitude: 81.6636° E

Fig. 1a: Map of Bastar, Chhattisgarh (including Kondagaon district).

Methodology

1. Ethnobotanical and Ethnoveterinary Data Collection

A qualitative ethnobotanical approach was adopted, using semi-structured interviews, participatory observation, and field surveys to document leafy edible plants used by the local communities for food and veterinary purposes. The methodology involved:

A. Participant Selection

- Local tribal community members, including elders, traditional healers, herbalists, farmers, and livestock owners, were selected as key informants.
- Purposive samplingand snowball sampling techniques were used to identify knowledgeable participants.

B. Questionnaire Format

A structured questionnaire was used to collect information on:

1. Personal Details: Site name, participant's name, age, sex, education, and occupation.
2. Plant Information: Local name, botanical name, family, habit, plant parts used.
3. Usage Details: Ethnomedicinal and ethnoveterinary applications.
4. Validation: Practitioner signature and interviewer's details.

Table 1a: List of some tribal people interviewed during research.

S.No	Name of Tribal Person	Location
1	Aayti Bai	Kondagaon
2	Bharti Korram	Kondagaon
3	Hirdai Netam	Kondagaon

4	Punav Ram Maravi	Kondagaon
5	Umendra Poyam	Kondagaon
6	Usha Kunjam	Kondagaon

2. Field Data Collection and Plant Documentation

Field visits were conducted to collect plant specimens and document their uses. The following techniques were applied:

- Direct Observations: Plants were observed in their natural habitat, and their local uses were documented.
- Herbarium Sample Collection: Representative plant specimens were collected, pressed, and preserved for identification.
- Photography: High-resolution images of plants were taken for reference and validation.
- Focus Group Discussions: Group discussions with tribal members helped cross-verify plant usage information.

3. Ethnoveterinary Survey

Ethnoveterinary practices were recorded through interviews and direct observation of livestock treatment methods.

A. Data Collection Techniques

- Interviews with Livestock Owners and Traditional Healers to gather knowledge of plant- based treatments.
- Case Studies: Specific cases of plant-based treatments for animal ailments were documented.
- On-Site Observations: Usage of plants in treating wounds, digestive issues, infections, fractures, and parasitic infestations was recorded.

4. Plant Identification and Authentication

Collected plant specimens were scientifically identified using:

- Local botanical guides and floras relevant to the Chhattisgarh region.
- Expert consultation: Traditional healers and botanists assisted in plant identification.
- Cross-referencing with standard taxonomic databases such as The Plant List and Tropicos.
- Voucher Specimen Preparation: Selected specimens were prepared for herbarium deposition.

5. Data Analysis

The collected data were analyzed qualitatively and quantitatively to assess plant usage.

A. Classification of Plant Uses

- Nutritional use: Edible leafy plants were categorized based on their dietary importance.
- Medicinal use: Plants were classified based on their therapeutic properties for both humans and animals.

B. Ethnobotanical and Ethnoveterinary Importance Index

- Frequency of Citation (FC): Number of times a plant was mentioned by different participants.
- Relative Frequency of Citation (RFC): Calculated using the formula:
- RFC=FC/N
- Where FC = Number of informants citing the plant, N = Total number of informants.
- Use Value (UV): Determined to assess the significance of each plant species in the local community.

Conclusion

This methodological approach ensures the scientific documentation and validation of traditional knowledge on leafy edible plants in Kondagaon. The study not only highlights the nutritional and medicinal significance of these plants but also aims to contribute to their conservation and sustainable utilization in both human and veterinary healthcare.

Results and Discussion

Leafy Edible Plants Used by Humans

The survey identified several leafy edible plants used by the indigenous population of Kondagaon. These plants were consumed primarily as vegetables, in soups, curries, and traditional dishes.

- ***Moringa oleifera* Lam.**
  - Local Name: Munga
  - Family: Moringaceae
  - Use: Moringa leaves are used extensively in the local diet, prized for their high nutritional value, including proteins, vitamins, and minerals. The leaves are commonly added to curries and soups.
- ***Solanum nigrum* Var.**
  - Local Name: Kakamachi
  - Family: Solanaceae
  - Use: The leaves are cooked and eaten as a vegetable. They are also valued for their medicinal properties, including anti-inflammatory effects.
- ***Amaranthus viridis* All.**
  - Local Name: Chaulai
  - Family: Amaranthaceae
  - Use: The leaves are cooked in soups and porridge. Amaranth is known for its high protein content and essential amino acids.
- ***Spinacia oleracea* L.**
  - Local Name: Palak
  - Family: Amaranthaceae
  - Use: Spinach is consumed regularly and is rich in iron, vitamins A and C, and folic acid. It is a common addition to many local dishes.
- ***Coriandrum sativum* L.**
  - Local Name: Dhania
  - Family: Apiaceae
  - Use: Coriander leaves are frequently used in salads, curries, and chutneys for flavoring and their digestive benefits.
- ***Basella alba* Var.**
  - Local Name: Poi
  - Family: Basellaceae
  - Use: The fleshy leaves are used in soups and stir-fries, providing a cooling effect and a source of vitamins.
- ***Portulaca oleracea* L.**
  - Local Name: Ghol
  - Family: Portulacaceae

- Use: it is used in Stomach pain and headaches, cough and sores. Purslane is eaten raw in salads or cooked in various dishes. It is rich in omega-3 fatty acids and is considered beneficial for heart health.

- ***Cissus quadrangularis* Var.**
- Local Name: Harjora
- Family: Vitaceae
- Use: It is used to treat bone fractures, osteoporosis, and other bone disorders. The plant contains steroidal compounds that act as phytoestrogens to prevent or reduce bone loss.

- ***Zingiber officinale* Var.**
- Local Name: Adrak
- Family: Zingiberaceae
- Use: It is traditionally used to ease menstrual cramps and regulate menstrual cycles. It is also consumed during pregnancy to alleviate morning sickness, though care is advised regarding dosage. Ginger has been used in ethnomedicine to address respiratory issues such as colds, coughs, and asthma. Its warming properties are believed to help clear mucus and alleviate congestion.

- ***Oxalis corniculate* Subvar.**
- Local Name: Awali
- Family: Oxalidaceae
- Use: The plant is traditionally used to alleviate digestive problems such as diarrhea, dysentery, and stomach pain. A decoction or juice made from the leaves is often consumed to regulate bowel movements and soothe the digestive system. It is commonly used in traditional medicine to treat inflammation and swelling. A paste made from its leaves is applied to inflamed areas or wounds to reduce pain and redness.

- ***Cannabis sativa* L.**
- Local Name: Ganja
- Family: Cannabaceae
- Use: It has been widely used for its analgesic properties. It is traditionally employed to alleviate chronic pain, headaches, muscle aches, and joint pain, particularly in conditions like arthritis and rheumatism. The seeds and resin are used to address digestive issues such as diarrhea, constipation, and colic. Cannabis is also believed to stimulate appetite and is traditionally given to individuals suffering from loss of appetite or malnutrition.

- ***Zea mays* Subsp.**
- Local Name: Makai
- Family: Poaceae
- Use: It is widely used in traditional medicine as a diuretic to treat urinary tract infections (UTIs), kidney stones, and bladder inflammation. A tea or decoction made from corn silk is consumed to promote urination and cleanse the urinary system.

Ethno-veterinary Uses of Plants

Many of the plants used by local communities for human nutrition also play an important role in traditional veterinary medicine.

1. ***Moringa oleifera***: The leaves are used to treat malnutrition in livestock, improving the overall health of animals. Moringa is also believed to aid in improving milk production in cows.

2. ***Solanum nigrum***: The leaves are used in poultices for treating wounds and infections in cattle. They are also used to treat respiratory ailments in goats.
3. ***Amaranthus viridis***: The leaves are used as fodder for livestock, providing a nutritional supplement during lean periods. They are particularly beneficial for enhancing the health of milking cows.
4. ***Spinacia oleracea***: Use in Horses and Cattle The plant's high fiber content helps in regulating bowel movements, alleviating issues such as bloating and indigestion in herbivorous animals. In some regions, spinach leaves are ground and mixed with water to make a paste or infusion that is given to animals to treat diarrhea and gastrointestinal upset.
5. ***Coriandrum sativum***: Coriander is used to alleviate digestive disorders in livestock, such as bloating and indigestion, and is sometimes mixed with animal feed.
6. ***Basella alba***: In rural veterinary practices, fresh leaves of Basella alba are crushed into a paste and applied to wounds on the skin of animals such as cattle, goats, and buffaloes. The plant's antimicrobial properties help prevent bacterial infections, while its anti- inflammatory action reduces swelling and promotes faster healing of the skin.
7. ***Portulaca oleracea***: Purslane is used to treat fever and inflammation in animals. It is often used as a poultice for external wounds and to promote internal healing.
8. ***Cissus quadrangularis***: Known for its bone-healing properties, this plant is used to treat fractures in cattle. The leaves are applied to the affected area or consumed to speed up recovery.
9. ***Zingiber officinale:*** Traditional veterinary practices use ginger as a natural remedy to expel intestinal worms in animals. Ginger is often combined with other herbs for more effective deworming formulations. It is used to treat foot and mouth disease, fever, diarrhea, mastitis, wounds, cough. Ginger paste or oil is applied externally for pain relief, wound care, or fungal infections. In poultry and livestock farming, ginger is sometimes mixed with feed to improve nutrient absorption and enhance growth performance. It is also used to reduce stress in animals during transportation or adverse weather conditions.
10. ***Oxalis corniculate***: Earache, body swelling, veterinary medicine, boils, eye problems, muscular swelling. The plant is commonly used to treat diarrhea, dysentery, and indigestion in animals. A decoction or paste made from the leaves is administered orally to livestock suffering from digestive ailments.
11. ***Cannabis sativa***: Anthelmintic, diarrhea, dysentery, cough, cold, veterinary problems, urinary problems, flatulence, stomachache, swollen stomach. It is traditionally used to relieve pain in animals, especially for conditions like arthritis, joint inflammation, and injuries. Decoctions or poultices made from the leaves are applied topically or given orally for pain management.
12. ***Zea mays*****:** Corn affected by head smut is crushed, mixed with lemon juice, and fed to animals as a remedy for diarrhea. Maize flour prepared from corn seeds is boiled with salt and water to enhance milk yield. Additionally, corn flour is combined with the juice of *Asparagus racemosus* roots and administered to buffaloes to boost milk production.

Fig 1.a.*Moringa oleifera* Fig. 1.b.*Solanum nigrum* Fig.1.c. *Amaranthus viridis*

Fig. 1.d.*Spinacia oleracea* Fig. 1.e.*Coriandrum sativum* Fig. 1.f. *Basella alba*

Fig. 1.g.*Portulaca oleracea* Fig. 1.h.*Cissus quadrangularis* Fig. 1.i.*Zingiber officinale*

Fig. 1.j.*Oxalis corniculate* Fig. 1.k.*Cannabis sativa* Fig. 1.l.*Zea mays*

Fig.1 : Plants that are found during ethnobotanical survey Table 2 a: Ethno-veterinary Uses of Plants:

Many of the plants used by local communities for human nutrition also play an important role in traditional veterinary medicine.

S.No.	Plant Name	Ethno-veterinary Use	Target Diseases	Target Animals	Reference
1	*Moringa oleifera* Lam.	Leaves used to treat malnutrition and improve milk production.	Malnutrition, low milk yield	Livestock, cows	(Fahey, 2005)

2	*Solanum nigrum* Var.	Leaves used in poultices for wounds and infections; treats respiratory ailments.	Wounds, infections, respiratory ailments	Cattle, goats	(Shukla, 2015)
3	*Amaranthus viridis* All.	Leaves used as fodder to improve health and enhance milk yield during lean periods.	Nutritional deficiency, low milk yield	Milking cows	(Kamal, 2013)
4	*Spinacia oleracea* L.	Regulates bowel movements, alleviates bloating, indigestion, diarrhea, and gastrointestinal issues.	Bloating, indigestion, diarrhea	Horses, cattle	(Niazi & Ali, 2017)
5	*Coriandrum sativum* L.	Used to alleviate digestive disorders; mixed with animal feed for better digestion.	Bloating, indigestion	Livestock	(Gupta & Bansal, 2016)
6	*Basella alba* Var.	Crushed leaves applied to wounds to prevent bacterial infections and reduce inflammation.	Wounds, bacterial infections, swelling	Cattle, goats, buffaloes	(Yadav & Yadav, 2014)
7	*Portulaca oleracea* L.	Treats fever and inflammation; used as a poultice for external wounds and promotes internal healing.	Fever, inflammation, wounds	General livestock	(Satyavati & Rathi, 2008)

8	*Cissus quadrangularis* Var.	Treats fractures; leaves applied topically or consumed to promote bone healing.	Bone fractures	Cattle	(Kirthikar & Basu, 1998)
9	*Zingiber officinale* Var.	Treats intestinal worms, foot-and-mouth disease, fever, diarrhea, mastitis, wounds, and cough; reduces stress in animals.	Worm infestation, foot-and-mouth disease, fever, mastitis, wounds, diarrhea, cough	Livestock, poultry	(Shubha & Suman, 2014)
10	*Oxalis corniculate* Subvar.	Treats earaches, body swelling, boils, eye problems, muscular swelling, diarrhea, dysentery, and indigestion.	Diarrhea, dysentery, digestive ailments, earache	Livestock	(Raskin & Dewitt, 1997)
11	*Cannabis*	Relieves pain	Pain (arthritis,	General	(Agurell &

	sativa L.	(arthritis, injuries, inflammation); treats diarrhea, dysentery, cough, flatulence, and urinary issues.	injuries), diarrhea, dysentery, cough, flatulence, urinary issues	livestock	Ohlsson, 2018)
12	*Zea mays Subsp*.	Corn with lemon juice treats diarrhea; maize flour improves milk yield; boosts milk production with Asparagus racemosus.	Diarrhea, low milk yield	Livestock, buffaloes	(Ramaraj & Sundararajan, 2019)

Discussion

The present study underscores the significance of green leafy edible plants in traditional ethnoveterinary practices among the tribal communities of Kondagaon, Chhattisgarh. The findings align with various earlier studies conducted in India and globally, emphasizing the relevance of these plants in animal healthcare systems.

Nutritional Support and Milk Production

The use of *Moringa oleifera* for enhancing milk production in livestock is well-documented. Fahey (2005) reported that *Moringa* leaves are rich in essential vitamins, minerals, and proteins, making them an effective supplement for improving overall livestock health. Similar studies by Gopalakrishnan et al. (2016) and Singh et al. (2019) highlighted the role of *Moringa* in addressing malnutrition in dairy cattle. Likewise, *Amaranthus spp.* has been identified as a high-protein fodder in various ethnoveterinary studies (Kamal, 2013), corroborating its role in sustaining livestock during lean periods. The dual role of *Zea mays* in treating diarrhea and boosting milk production, as reported by Ramaraj and Sundararajan (2019), supports its application in Kondagaon.

Treatment of Digestive Disorders

Several plants identified in this study have been widely recognized for their digestive benefits in veterinary care. *Spinacia oleracea*, which regulates bowel movements and alleviates bloating in cattle and horses, aligns with findings by Niazi and Ali (2017), who documented its effectiveness in managing gastrointestinal disorders in livestock. Similarly, *Coriandrum sativum* has been used traditionally to enhance digestion in ruminants, as described by Gupta and Bansal (2016). The application of *Oxalis corniculate* in treating diarrhea and dysentery has been supported by studies from Raskin and Dewitt (1997), confirming its role in ethnoveterinary medicine across various cultures.

Wound Healing and Infections

The traditional use of *Solanum nigrum* for wound healing and respiratory ailments in cattle and goats corresponds with findings by Shukla (2015), who documented its antimicrobial properties. The use of

Basella alba for treating bacterial infections and reducing inflammation is supported by Yadav and Yadav (2014), further validating its role in veterinary care. *Portulaca oleracea*, widely used for its anti-inflammatory properties, has also been reported in earlier studies (Satyavati & Rathi, 2008), reinforcing its traditional use in treating livestock wounds and fever.

Bone Healing and Structural Health

Cissus quadrangularis has been extensively studied for its bone-healing properties. The findings from this study are corroborated by Kirtikar and Basu (1998), who reported its widespread application in treating fractures in cattle. Its efficacy in accelerating bone regeneration is further validated by recent research on its phytochemical properties and calcium-binding abilities.

Management of Major Diseases

The study highlights the use of *Zingiber officinale* in treating multiple conditions, including foot- and-mouth disease, mastitis, wounds, and diarrhea. Shubha and Suman (2014) reported similar findings, confirming the broad-spectrum medicinal properties of *Zingiber officinale* in veterinary medicine. *Cannabis sativa*, which has been used traditionally for pain relief in livestock, has also been supported by studies from Agurell and Ohlsson (2018), who documented its analgesic and anti-inflammatory effects in animals.

Ethnomedicinal Significance and Sustainability

The integration of ethnoveterinary practices with modern livestock management has been emphasized in various global studies. Acharya and Acharya (2010) documented similar plant- based treatments in Nepal, while Benítez et al. (2012) reported on the sustainability of traditional veterinary medicine in rural Spain. Studies from India, such as those by Chauhan and Meena (2015) and Sahoo and Patil (2018), further reinforce the importance of preserving traditional knowledge systems for sustainable animal healthcare.

Conclusion

The findings of this study corroborate with previously published literature, demonstrating the significant role of green leafy edible plants in ethnoveterinary medicine. The results provide scientific validation for traditional practices, highlighting their sustainability and cost- effectiveness. Further pharmacological studies and clinical trials are necessary to integrate these medicinal plants into modern veterinary care, ensuring their continued relevance in rural livestock management.

Cultural and Ecological Significance

The use of these plants is deeply rooted in the culture and daily life of the local tribes of Kondagaon. The sustainable harvesting of these plants from forests ensures the continuation of traditional practices while supporting biodiversity conservation. Additionally, many of these plants are not only integral to local diets and veterinary care but are also embedded in cultural practices related to health and wellness.

Conclusion

The ethnobotanical and ethno-veterinary survey of leafy edible plants in Kondagaon, Chhattisgarh, reveals a significant diversity of plant species used for both human nutrition and veterinary care. These plants

play an essential role in the health and well-being of local communities and their livestock. The traditional knowledge surrounding these plants is invaluable for maintaining sustainable agricultural and veterinary practices. Efforts should be made to document and preserve this knowledge, ensuring that it continues to be passed down to future generations. Promoting the use of these plants in both human and animal health could contribute to biodiversity conservation and food security in the region.

This research paper provides a comprehensive examination of the use of leafy edible plants in Kondagaon, offering insights into their role in both human and animal health. By preserving and promoting traditional knowledge, these plants can be better utilized for sustainable agricultural and veterinary practices.

References

1. Acharya K.P., Acharya M. (2010). Traditional knowledge on medicinal plants used for the treatment of livestock diseases in Sardikhola VDC, Kaski, Nepal. J Med Plants Res. 4:235-239.
2. Agurell, S., & Ohlsson, A. (2018). Ethnopharmacology of *Cannabis sativa*. Phytotherapy Research, 22(9), 1344–1350.
3. Basu, S., & Jolly, P. (2015). Bone healing properties of *Cissus quadrangularis*: A review. Journal of Plant Biochemistry, 22(3), 215–223.
4. Benítez G, González-Tejero MR, Molero-Mesa J. Knowledge of ethnoveterinary medicine in the Province of Granada, Andalusia, Spain. Journal of Ethnopharmacology. (2012) 139:429–39.
5. Chauhan, N., & Meena, S. (2015). Traditional uses of medicinal plants in Chhattisgarh: An overview. Journal of Ethnobotany Research & Applications, 13(1), 101-110.
6. Das SK, Tripathi H. Ethnoveterinary practices and socio-cultural values associated with animal husbandry in rural Sunderbans, West Bengal. Indian J Trad Know. (2009) 8:201–5
7. Deepak Kumar Soni, & Sushil Kumar Shahi. (2021). Ethnobotanical data documentation of Keshkal, Chhattisgarh, India. Journal of Traditional and Folk Practices (JTFP), 9(1 & 2). Retrieved from https://jtfp.jntbgri.res.in/index.php/jtfp/article/view/6.
8. Fahey, J. W. (2005). *Moringa oleifera*: A review of the medical evidence for its nutritional, medicinal, and prophylactic properties. Part 1. Trees for Life Journal, 1, 1–15.
9. Gopalakrishnan, L., Doriya, K., & Kumar, D. S. (2016). Moringa oleifera: A review on nutritive importance and its medicinal application. Food Science and Human Wellness, 5(2), 49–56.
10. Gupta, A., & Bansal, S. (2016). Ethnobotanical studies on the medicinal and culinary uses of coriander *Coriandrum sativum*. Indian Journal of Traditional Knowledge, 15(4), 555–563.
11. Kamal, R. (2013). Nutritional evaluation of *Amaranthus species* as livestock fodder. Journal of Agricultural Science, 5(10), 128–135.
12. Kirtikar, K. R., & Basu, B. D. (1998). Indian Medicinal Plants: *Cissus quadrangularis* and its veterinary applications. Indian Medicinal Plant Journal, 2(1), 75–80.
13. Kumar, R., & Sharma, K. (2019). Ethnobotanical studies on the flora of Bastar region, Chhattisgarh. Indian Journal of Traditional Knowledge, 18(3), 456-467.
14. iazi, S. A., & Ali, A. (2017). The ethno-veterinary uses of spinach *Spinacia oleracea* in rural communities. Pakistan Journal of Botany, 49(5), 1917–1921.
15. Pandey, A. K., & Dubey, R. (2017). A review of medicinal plants in the Bastar region of Chhattisgarh. Medicinal Plants, 9(4), 342-350.

16. Ramaraj, R., & Sundararajan, M. (2019). Use of maize and its extracts in animal health management. Veterinary Science Journal, 45(6), 21–29.
17. Raskin, I., & Dewitt, G. M. (1997). Medicinal uses of *Oxalis* species. Journal of Ethnopharmacology, 56(2), 115–120.
18. Sahoo, M., & Patil, K. (2018). Ethno-veterinary practices in rural India: A review. Indian Veterinary Journal, 95(4), 14-19.
19. Satyavati, G. V., & Rathi, S. P. (2008). Traditional uses of *Portulaca oleracea* in treating inflammation and fever. Ethnopharmacology, 72(2), 255–259.
20. Shrestha I, Khadgi P. Herbal veterinary practices by tamang community in Central Nepal. NUTA J. (2019) 6:5–11. doi: 10.3126/nutaj.v6i1-2.23220.
21. Shubha, D., & Suman, B. (2014). Ethnopharmacological properties of ginger *Zingiber officinale*. International Journal of Pharmacology, 10(4), 167–173.
22. Shukla, S. (2015). Ethnobotanical uses of Solanum species in Indian traditional medicine. Springer.
23. Singh, A. R., & Gupta, S. P. (2016). Role of traditional knowledge in sustainable agriculture and animal husbandry: Case study from Chhattisgarh. Environmental Sustainability, 7(2), 221-230.
24. Singh, B. N., Singh, B. R., & Prakash, D. (2019). Nutritional and medicinal properties of Moringa oleifera. Phytochemistry, 152, 1–12.
25. Shukla, P. (2015). Antimicrobial and wound healing properties of *Solanum nigrum* in cattle. Indian Journal of Veterinary Science, 89(4), 45–50.
26. Yadav, P. K., & Yadav, M. (2014). Ethnobotanical uses of *Basella alba* in rural veterinary practices. Journal of Ethnobiology and Ethnomedicine, 10(1), 37–41.