Ethnobotanical Knowledge and Traditional Uses of Wild Edible Plants of the Akot–Wadner Gangai Area, Maharashtra, India

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Abstract
Ethnobotanical knowledge plays a crucial role in sustaining rural livelihoods and preserving cultural heritage. The present study documents the traditional knowledge associated with wild edible plants in the Akot–Wadner Gangai region of Maharashtra, India. Field surveys and interactions with local inhabitants resulted in the identification of 15 plant species. Information regarding local names, parts used, modes of preparation, and associated health benefits was recorded. The findings indicate that these plants are integral to daily life, serving as accessible sources of nutrition and primary healthcare. Leaves and fruits were the most frequently utilized plant parts, often prepared as vegetables or consumed fresh, while certain species were used in home-based remedies for common ailments such as digestive disorders, skin infections, and respiratory issues. The study also highlights a gradual decline in traditional knowledge due to changing socio-economic conditions and reduced dependence on natural resources. Documentation of such knowledge is essential for its preservation and for promoting sustainable utilization of plant biodiversity.

Keywords: Ethnobotany, Indigenous knowledge, Wild edible plants, Traditional practices, Rural communities, Maharashtra

1. Introduction
Human societies have long relied on plants not only for sustenance but also for healing and cultural practices. Ethnobotany explores these interactions, providing insights into how communities utilize plant diversity in their daily lives. In many rural regions, traditional knowledge related to plant use continues to function as an informal yet effective system of resource management.

Wild edible plants form an important part of this knowledge system, particularly in areas where dependence on natural vegetation remains high. These species are often gathered from surrounding landscapes and incorporated into daily diets or used as remedies for minor health conditions. Studies have shown that such plants contribute significantly to dietary supplementation and health maintenance in rural populations (Bharucha & Pretty, 2010).

The use of plants in traditional medicine is deeply embedded in cultural practices, with knowledge being passed down through generations. However, increasing urban influence, reduced dependence on natural resources, and lifestyle changes are leading to a gradual decline in this knowledge. Previous research has highlighted similar concerns regarding the erosion of ethnobotanical traditions (Maikhuri et al., 2004).In this context, the present study aims to document and analyze the traditional knowledge associated with wild edible plants in the Akot–Wadner Gangai area, focusing on their cultural relevance and practical applications.

2. Materials and Methods

2.1 Study Area

The investigation was carried out in the Akot–Wadner Gangai region of Maharashtra, characterized by semi-arid conditions and seasonal vegetation patterns. The roadside environment supports naturally growing plant species that are accessible to nearby rural communities.

2.2 Ethnobotanical Survey

Information was collected through field visits and direct interaction with local residents. Special emphasis was placed on gathering knowledge from elderly individuals, who are considered key holders of traditional practices.

The following aspects were recorded:

Local plant names

Parts used

Mode of consumption

Associated traditional uses

2.3 Identification of Plant Species

Collected specimens were identified using standard botanical references and cross-verified with available literature.

3. Results

3.1 Ethnobotanical Diversity

The study documented 15 wild edible plant species that are actively utilized by local communities. These plants represent a range of growth forms, including herbs, shrubs, climbers, and trees, indicating their widespread availability in different microhabitats.

3.2. Patterns of Traditional Usage

Different plant parts were used based on their availability and perceived benefits. Leaves were commonly cooked as vegetables, while fruits were consumed directly. Seeds and roots were occasionally used in traditional preparations.

Examples include:

Use of leafy species in routine diets

Consumption of fruits during seasonal availability

Application of plant extracts in home-based remedies

3.3. Ethnobotanical Details of documented plants:

Sr.	Common Name	Botanical Name	Family	Part used	Season of availability
1.	Bamboo	*Bambusa vulgaris*	Poaceae	Young shoots	Monsoon
2.	Fig	*Ficus drupacea*	Moraceae	Fruits	Summer
3.	Sword bean (Abai)	*Canavalia gladiata*	Fabaceae	Pods and seeds	Monsoon to Winter
4.	Ber	*Zizipus mauritiana*	Rhamnaceae	Fruits	Winter
5.	American mint (Darp Tulsi)	*Hyptis suaveolens*	Lamiaceae	Leaves	Rainy season
6.	Sponge gourd (Dodka)	*Luffa cylindrica*	Cucurbitaceae	Fruits	Monsoon to winter
7.	Netted custard apple (Raamphal)	*Annona reticulata*	Annonceae	Fruits	Summer
8.	Guava (Peru)	*Psidium guajava*	Myrtaceae	Fruits, Leaves	All Seasons
9.	Indian almond (Jangli badam)	*Terminalia catappa*	Combretaceae	Seeds, Fruits	Post Monsoon to Winter
10.	Senna (Tarota)	*Cassia tora*	Fabaceae	Leaves, seeds	Monsoon
11.	Leafy mustard (Mohri)	*Brassica juncea*	Brassicaceae	Leaves	Winter
12.	Amaranth (Math)	*Amaranthus deflexus*	Amaranthaceae	Leaves	All Seasons
13.	Drum sticks (Shevaga)	*Moringa oleifera*	Moringaceae	Leaves, Pods	All Seasons
14.	Spider plant (Tilwan)	*Cleome gynandra*	Capparaceae	Leaves, flowers	Rainy Season
15.	Common mullein	*Verbascum thapsus*	Lamiaceae	Leaves, flowers, roots	Rainy Season

Table 1: Ethnobotanical Details of Wild Edible Plants Documented from the Akot–Wadner Gangai Area, Maharashtra

3.4. Nutritional and Pharmacological Significance of Documented Wild Edible Plants

1. Bamboo (*Bambusa vulgaris* Schrad. Ex J.C. Wendl*):*

Young bamboo shoots are collected mainly during the monsoon season when they are tender. Local people emphasized that the shoots must be properly boiled or fermented before consumption to remove bitterness. They are commonly cooked as a vegetable or preserved as pickles for later use. Informants reported that bamboo preparations help improve digestion and are commonly consumed during seasonal changes. Some elderly respondents also associated bamboo consumption with maintaining body strength. The plant has significant potential as a functional food due to its high protein, fiber, and low fat content.(Jeba Akhtar, Lima Patowary, 2022).

2. Fig (*Ficus drupacea* Thunb.):

The fruits are gathered when fully ripe and are eaten fresh, especially by children and shepherds while grazing livestock. Local people described the fruit as "light on the stomach" and suitable for consumption during hot weather. It is regarded as a nutritious food and is traditionally used to relieve minor digestive discomfort. It has a potential role in preventing oxidative stress-related disorders and in nutraceutical applications.The fruits are rich in essential minerals such as calcium, iron, phosphorus, potassium, and sodium, supporting various physiological functions. Among the several minerals contained in *Ficus* that support healthy bone development are iron and strontium.
(Hosakatte Niranjana Murthy et al., 2024).

3. Sword beans (*Canavalia gladiata* Jacq.):

The seeds and pods are consumed after proper soaking and boiling to remove their strong taste and are traditionally valued for their strength-enhancing properties. Informants highlighted that soaking and boiling are necessary steps before preparation. The plant is valued as a protein-rich food, especially in households with limited access to pulses. It is commonly believed to increase physical strength and is sometimes included in meals during periods of heavy labor. Sword beans are rich in iron, phosphorus, and potassium, making them a valuable source of plant-based protein and minerals for human consumption.(Vadivel V et al., 2010).

4. Ber (*Ziziphus mauritiana* Lam.):

The fruits are widely consumed either fresh, dried, or in semi-ripe form. They are commonly sold in local markets during the season. Villagers believe that regular consumption helps improve digestion, boost immunity and provides energy. Leaves and bark are occasionally used in traditional remedies, particularly for treating minor wounds and digestive issues. The plant is also culturally important and often associated with rural childhood food practices. Leaf extracts exhibit antibacterial activity (Anka et al., 2019). Fresh fruits and juice are also associated with improved liver function, while bark paste is traditionally applied for wound healing and skin infections (Akanda, 2026).

5. American Mint (*Hyptis suaveolens* L.):

Leaves are frequently used in home remedies. Local people prepare decoctions for treating cough, cold, and mild fever. Crushed leaves are also applied externally on the skin for relief from itching or minor infections. Informants described the plant as "medicinal by nature" and emphasized its role in treating common seasonal illnesses without the need for modern medicine. *Hyptis suaveolens* shows antifungal activity. It exhibits antibacterial and antidiabetic activity. It is traditionally used for gastrointestinal, respiratory, and inflammatory disorders.(L. Umedun Ngozi et al., 2014).

6. Sponge Gourd (*Luffa cylindrica* L.):The immature fruits are regularly used as a vegetable in daily meals. They are considered easy to digest and suitable for all age groups. Some respondents mentioned that it is particularly preferred during summer due to its "cooling effect" on the body. In addition to dietary use, certain parts of the plant are occasionally used in traditional remedies related to skin and digestive health.The fruits are consumed as vegetables and are beneficial for digestion, with antioxidant and anti-inflammatory properties. *Luffa cylindrica* has been widely used as a medicinal plant in treating various diseases. Aids in the treatment of various diseases and in addressing several clinical conditions. It is rich in vitamin A and vitamin C, and minerals like potassium, calcium, phosphorus and magnesium making it valuable for digestive health, blood purification, and skin care. Regular consumption contributes to weight management and enhances the body's antioxidant status.(P. N. Sonavane et al., 2021)

7. Raamphal (*Annona reticulata* L.):
The fruits are eaten fresh and are highly valued for their sweet taste and energy content. Local people often consume them as a seasonal fruit to reduce fatigue. Informants also mentioned the use of leaves and seeds in traditional practices, particularly for treating digestive problems and minor infections. The plant is generally considered beneficial for maintaining overall health. Fruits are highly nutritive, seeds possess anti cancer and other properties.The plant possesses significant nutritional and medicinal potential that warrants further investigation.(M. Prathapa Reddy et al., 2015)

8. Guava (*Psidium guajava* L.):
Guava fruits are widely consumed by people of all age groups, either fresh or in processed forms. Leaves are commonly used in decoctions for treating diarrhea, mouth ulcers, and throat infections. Local people often chew tender leaves directly for quick relief. The plant is considered one of the most useful species due to its easy availability and multiple health benefits. Guava is a nutrient-rich fruit containing high levels of vitamin C, flavonoids, and essential minerals. It is a rich source of vitamin C and essential minerals such as iron and phosphorus. It is valuable, boasting anti-inflammatory, anti-hypertensive, anti-obesity, antioxidant, antidiarrheal and antidiabetic properties due to its high levels of flavonoids, making it a versatile functional food. Guava leaves are rich in bioactive compounds like quercetin and guaijaverin, making them effective against diabetes, infections, and inflammatory conditions. Guava is also associated with anticancer, antimicrobial, and cardiovascular protective properties.(Faryal Asif et al., 2022)

9. Indian Almond (*Terminalia catappa* L.):
Seeds and fruits are consumed, and various parts of the plant are traditionally used for medicinal purposes. The seeds are eaten after breaking the hard shell and are valued for their taste and energy content. Leaves and bark are commonly used in traditional remedies, particularly for treating skin disorders, liver-related conditions, and gastrointestinal issues such as dysentery, diarrhea, and indigestion. Informants reported that leaf decoctions are occasionally used for internal cleansing and general health maintenance. These traditional uses are supported by reports highlighting the antioxidant and therapeutic potential of the plant.(M.H.A. Jahurul et al., 2022)

10. Senna (*Cassia tora* L.):
Cassia tora is commonly used by local communities for both dietary and medicinal purposes. The leaves are occasionally consumed as a vegetable after proper processing to reduce bitterness. Seeds and leaf paste are traditionally applied to treat skin conditions such as itching, rashes, and fungal infections. Informants reported that the plant is widely regarded as an effective remedy for dermatological problems and is often used as a first-line treatment. In addition to its traditional applications, it is also associated with the treatment of conditions such as ringworm, vitiligo, and other skin disorders. Scientific studies support these uses, indicating antifungal, antibacterial, wound-healing, hypolipidemic, and antioxidant properties. (Pooja Sahu et al., 2023)

11. Leafy Mustard (*Brassica juncea* L.):
Leaves are commonly used as a vegetable and form a regular part of the rural diet. They are often cooked with spices and consumed with staple foods. Informants believe that regular consumption helps in maintaining body strength and preventing weakness. It is also associated with improving blood quality and overall health. Leafy mustard is rich in vitamins A, C, K, and B-complex, offering antioxidant benefits, aiding in anemia prevention, and protecting cardiovascular health. It is an important crop for biofortification efforts to improve micronutrient content in diets.(Priyanka et al., 2021)

12. Amaranth (*Amaranthus deflexus* L.):
This plant is widely used as a leafy vegetable and is easily available in the wild. It is frequently collected and cooked in daily meals. Local people consider it a "strength-giving" food and often recommend it for individuals suffering from weakness or low energy. It is especially valued among women and children. Edible leaves and grains are utilized in stews, porridges, and even pharmaceutical formulations to treat anemia, ulcers, and inflammation.(Moazma Sattar et al., 2024)

13. Drumsticks (*Moringa oleifera* Lam.):
All parts of the plant are utilized. Leaves are cooked as vegetables, pods are used in curries, and seeds are occasionally used in traditional preparations. Informants consistently described it as a "complete plant" due to its wide range of uses. It is commonly recommended for improving immunity, strength, and overall health, and is often included in diets during illness or recovery. Moringa is known for antidiabetic, anticancer, antimicrobial, neuroprotective, and anti-inflammatory properties. Its seeds, pods, and leaves are all used for nutritional supplementation and medicinal formulations worldwide.(Lakshmipriya Gopalakrishnan et al., 2016)

14. Spider Plant (*Cleome gynandra* L.):
Leaves are collected and cooked as a vegetable, usually with local spices to reduce bitterness. It is considered beneficial for improving appetite and digestion. Some informants mentioned its use in maintaining general health, especially during seasonal changes. The plant is also associated with traditional dietary practices. It is rich in calcium, magnesium, potassium, phosphorus, and vitamins A, C, and E. Phytochemicals such as flavonoids, alkaloids, saponins, and tannins contribute to its antioxidant, anti-inflammatory, and hepatoprotective properties. It supports immune function, diabetes management, and acts as a natural therapeutic agent.(Eugénie Kayitesi et al., 2022)

15. Common Mullein (*Verbascum thapsus* L.):
Leaves and flowers are used in traditional remedies, particularly for respiratory problems such as cough, cold, and throat irritation. Herbal infusions prepared from the plant are commonly used during winter. It is traditionally used to relieve respiratory problems and soothe the respiratory tract. The plant exhibits strong anti-inflammatory, antioxidant, anticancer, and antimicrobial properties. Traditionally used for respiratory ailments (bronchitis, tuberculosis), wound healing, and gastrointestinal disorders, its extracts are also employed in herbal teas, ointments, and ear drops.(Muhammad Riaz et al., 2013)

3.5 Cultural Importance and Knowledge Systems:
The use of wild edible plants is closely linked with cultural traditions and daily practices. Knowledge regarding plant identification and usage is primarily transferred through oral communication within families. However, it was observed that younger individuals possess comparatively limited knowledge, suggesting a decline in the continuity of traditional practices.

4. Discussion

The present findings demonstrate that wild edible plants continue to serve as an important component of traditional knowledge systems in rural areas. Their use extends beyond basic nutrition, reflecting a broader cultural understanding of plant resources. The dependence on naturally available plant species is consistent with earlier studies that emphasize the role of wild foods in supporting subsistence lifestyles (Bharucha & Pretty, 2010).

Additionally, the use of plant-based remedies observed in the study supports previous reports highlighting the importance of traditional healthcare practices (Maikhuri et al., 2004).

Unlike purely nutritional or ecological studies, the present work emphasizes the knowledge dimension, wherein cultural practices influence plant utilization and conservation. The relationship between people and plants in this region reflects a sustainable approach developed through long-term interaction with the environment.

Despite these benefits, the erosion of traditional knowledge remains a major concern. Changes in lifestyle, increased reliance on market-based foods, and reduced interaction with natural environments are contributing factors. If not addressed, this may lead to the permanent loss of valuable ethnobotanical information.

In addition, the documentation of such plant species contributes significantly to the preservation of indigenous knowledge systems, which are often transmitted orally across generations. The gradual erosion of this knowledge due to modernization poses a serious concern for future sustainability. Promoting community participation in conservation practices can help in safeguarding both biodiversity and traditional wisdom. Furthermore, integrating wild edible plants into local nutrition and development programs may enhance their utilization and recognition. Scientific studies focusing nutritional profiling and pharmacological validation can further strengthen their acceptance in mainstream food and healthcare systems.

5. Conclusion

The study provides a comprehensive account of ethnobotanical knowledge associated with wild edible plants in the Akot–Wadner Gangai area. The findings indicate that these plants continue to play a meaningful role in daily life, particularly in terms of food practices and traditional remedies.

However, the gradual decline in knowledge transmission highlights the need for immediate attention. Efforts should be directed toward documentation, awareness generation, and integration of traditional practices into modern conservation frameworks to ensure their sustainability.

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