



Ethnobotany of Wild Edible Plants, Hampi, Karnataka, India

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<p>Received on 05 Nov 2023 Revised on 30 Dec 2023 Accepted on 29 Jan 2024</p> <p>CC License CC-BY-NC-SA 4.0</p>	<p style="text-align: center;">Abstract</p> <p>This ethnobotanical study was conducted in the Hampi region of Karnataka, India, delves into the utilization of wild edible plants among local communities, particularly pastoralists. Through interviews and field observations, 21 significant wild edible plant species were identified, representing various botanical families. The study highlights the diverse roles of these plants in local diets and livelihoods, with leaves and fruits identified as the chief edible plant parts. Notably, Malvaceae emerged as the most prominent family for wild edibles, followed by Amaranthaceae, underscoring their importance in providing sustenance in challenging environments like semi-arid regions. Herbaceous plants were found to play a significant role in the local diet, while shrubs, trees, and climbers also contributed to the nutritional diversity of the region. The study emphasizes the reliance of local communities on traditional knowledge for food security and underscores the need for conservation efforts amidst modernization pressures. Additionally, novel culinary uses and nutritional benefits of certain wild plants were highlighted, reflecting the ongoing exploration of traditional knowledge for sustenance and well-being in local communities.</p> <p>Keywords: Medicinal plants, Pastoralists, Livelihood, Edible, Traditional, Conservation</p>
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Introduction

The utilization of wild edible plants has been a longstanding tradition among various communities worldwide, serving as a crucial source of sustenance and income. In the context of Hampi, Karnataka, India, this ethnobotanical study explores the intricate relationship between local communities and the diverse array of wild plants found in the region. Drawing upon a wealth of literature, this review aims to shed light on the significance of wild edible plants in the diets and livelihoods of rural households and forest dwellers, particularly among tribal populations.

Research indicates that globally, over 300 million individuals rely on forests for their sustenance and income (Burlingame, 2000; Pimentel et al., 1997). Among these, resource-poor families in rural regions depend heavily Available Online At: <https://Jazindia.Com>

on native plant resources for their livelihoods (Arnold and Perez, 2001; Shackleton and Shackleton, 2004). This reliance underscores the vital role of forests in supporting human communities and their well-being. In areas with limited economic opportunities, such as Hampi, communal resources play a crucial role in sustaining livelihoods, particularly for agricultural communities (Dovie et al., 2005).

In Hampi and similar regions, wild edible plants form an integral part of dietary habits, especially during periods of food scarcity (Beluhan & Ranogajei, 2010). Tribal communities, closely connected to forests, have developed dietary habits based on the seasonal availability and nutritional value of wild foods, relying on their own collections for sustenance. This traditional approach to food supply highlights the importance of wild edible plants in meeting the nutritional needs of local populations.

Furthermore, forests serve as primary sources of wild foods for rural households and forest dwellers in India (Pegu et al., 2013). These communities have rich socio-cultural traditions and dietary preferences intertwined with the utilization of wild plants. Historically, they have harvested plants from forests for food and medicinal purposes, utilizing various processing methods to meet their requirements.

However, despite the invaluable traditional knowledge associated with wild edible plants, modernization and the shift towards settled agriculture pose significant challenges. The transmission of traditional knowledge from one generation to the next is primarily oral, putting it at risk of being lost (Pegu et al., 2013). This trend towards loss of traditional knowledge could lead to a decline in the diversity of indigenous diets and poorer nutrition outcomes.

The ethnobotanical study of wild edible plants in Hampi, Karnataka, highlights the crucial role of these plants in the diets and livelihoods of local communities. As global trends towards modernization threaten traditional knowledge and practices, efforts to conserve and promote the sustainable utilization of wild edible plants are imperative. By recognizing the significance of wild plants in supporting human well-being, policymakers and researchers can work towards ensuring the preservation of this invaluable aspect of cultural heritage and biodiversity.

Materials and Methods

Location and Climate

The ethnobotanical study was conducted in Hampi, situated in the Vijayanagara district of Karnataka, India, positioned between 15.335° North latitude and 76.462° East longitude. Hampi experiences a tropical to semi-arid climate characterized by soaring temperatures in summers and mild winters. Rainfall, primarily occurring during the monsoon season from June to September, sustains agricultural activities. The soil composition predominantly consists of sandy and rocky terrain, with patches of red and black soil. Hampi boasts diverse vegetation, including dry deciduous forests, scrublands, and grasslands, with dense forest patches along riverbanks and hillsides. The presence of the Tungabhadra River contributes to the area's ecological richness and cultural significance by supporting riparian vegetation (Census 2021).

Sampling and Data Collection

Informants for the study were drawn from the local pastoral communities. The research commenced with participant observation, discussions, plant walks, and interactions aimed at establishing rapport with the pastoral communities. Free-listing exercises and semi-structured individual interviews were conducted to gather knowledge on the wild edible plants prevalent in the region (Martin, 2014). The interviews and questionnaires were conducted in the local dialect Kannada. Prior to commencing the study, informed oral consent was obtained from participants after explaining the scope and objectives of the research. Ethical guidelines outlined by the International Society of Ethnobiology (ISE) were strictly adhered to throughout the research process.

Plant Identification

Taxonomic identification of the plants was carried out utilizing various resources, including the book "Flora of Eastern Karnataka". Additionally, online plant identification websites such as The Plant List Available Online At: <https://Jazindia.Com>

(www.theplantlist.org), Plant.id (<https://plant.id>), and plantNet (<https://plantnet.org>) were consulted. In the field, Android applications such as iNaturalist and PlantSnap were employed for spot identification. Following collection, herbaria were prepared following the methods outlined in the manual written by Tucker & Calabrese (2015). The identification and authentication of these herbaria were obtained from the Central Ayurveda Research Institute in Bengaluru, under the Ministry of AYUSH, Government of India.

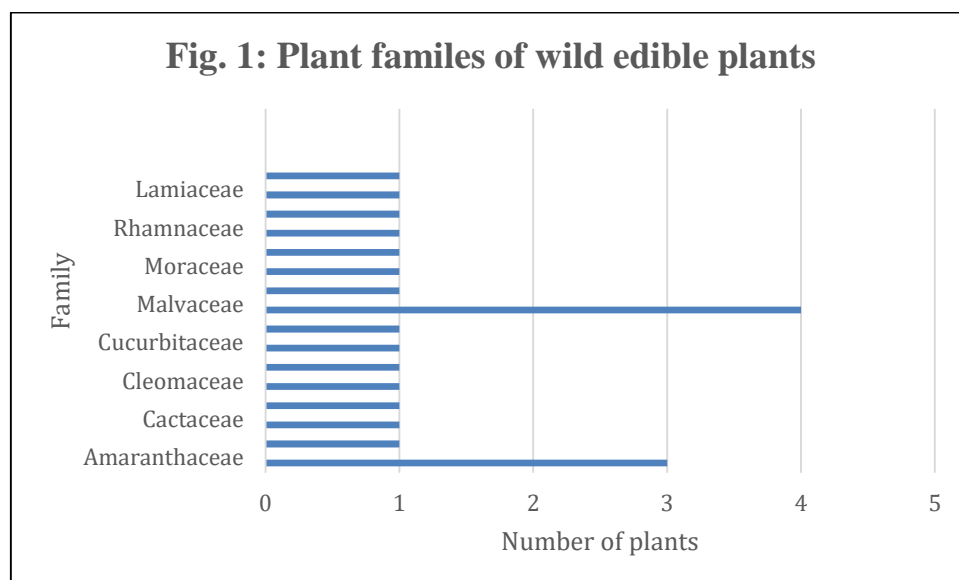
Data Analysis

Data collected from interviews, questionnaires, and field observations were systematically analysed to identify patterns and themes related to the utilization of wild edible plants by the local communities in Hampi. Qualitative methods such as thematic analysis was employed to interpret the findings and draw meaningful conclusions.

Overall, the methodology employed in this ethnobotanical study ensured rigorous data collection and analysis, adhering to ethical guidelines and utilizing a combination of traditional and modern techniques for plant identification and documentation.

Results

We conducted interviews with approximately 30 pastoralists, ranging in age from 22 to 68 years old. Of these, 8 were female and 22 were male. The majority of participants were illiterate, with only three men, aged 29, 32, and 39, having attended school up to the 10th grade. All participants belonged to the Kurubha ethnicity. A total of 21 plants were identified as significant wild edible plants found in the Hampi region. The highest number of plants belonged to the Malvaceae family, with four species recorded. The second largest family of wild edible plants found was Amaranthaceae. The remaining families, including Asparagaceae, Cactaceae, Capparaceae, Cleomaceae, Commelinaceae, Cucurbitaceae, Cyperaceae, Menispermaceae, Moraceae, Passifloraceae, Rhamnaceae, Salvadoraceae, Lamiaceae, and Fabaceae, each had one plant recorded (Fig 1).



Among the 21 plants identified as wild edible species in this study, 11 were classified as herbs. These herbaceous plants play a significant role in the local diet and cultural practices of the Hampi region. They include *Acaranthus aspera* (L), *Aerva javanica* (Burm.f.) Juss. ex Schult., *Digera murica* (L.) Mart. *Cleome monophylla* (L), *Commelina diffusa* (L), *Cyperus articulatus* L., *Sida acuta* Burm.f, *Corchorus olitorius* L, *Malvastrum coromandelianum* (L.) Garcke, *Corchorus olitorius* (L) and *Mesosphaerum suaveolens* (L) Kuntze. The diversity of herbaceous plants identified in this study reflects the rich botanical resources available to local communities and underscores their reliance on wild plants for food security and dietary diversity.

Additionally, five plant species were classified as shrubs, namely *Agave americana* (L), *Acanthocereus tetragonus* (L), *Capparis zeylanica* (L), *Ziziphus mauritiana* (Lam), and *Azima tetracantha* (Lam). Shrubs often thrive in semi-arid environments like Hampi and contribute to the resilience of local ecosystems. Their

inclusion in the list of wild edible plants highlights their importance as sources of nutrition and sustenance for pastoral communities.

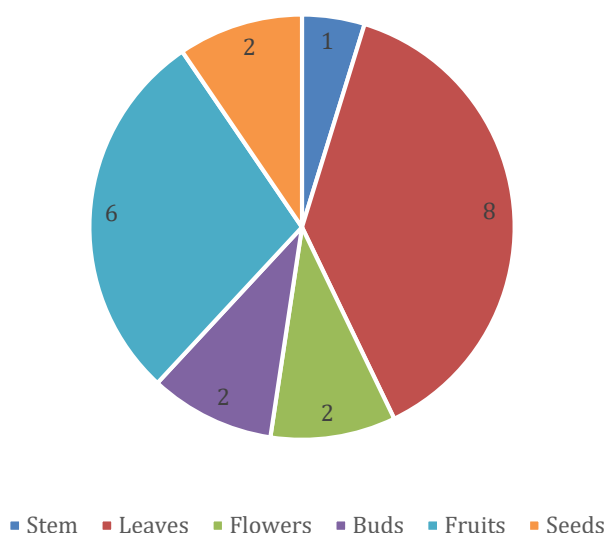
Furthermore, two tree species were identified in the study: *Ficus benghalensis* L., *Mimosa hamata* Willd. Trees provide not only edible fruits but also other valuable resources such as timber, shade, and habitat for wildlife. Finally, *Coccinia grandis* (L.) Voigt *Cocculus hirsutus* (L.) W. Theob., and *Passiflora foetida* L. are three climbers listed by informants in this study. Climbing plants often utilize vertical space efficiently and can be found in various habitats, including forests, scrublands, and riverbanks.

In various ethnobotanical studies, such as those conducted in semi-arid regions with similar climatic conditions, Malvaceae emerges as the foremost family for wild edibles, as supported by Harisha (2013), Ray et al., (2020), and Mutie et al., (2020). Notably, within the Amaranthaceae family, *Acaranthus aspera* L. and *Aerva javanica* (Burm.f.) Juss. ex Schult are encountered. Their leaves are esteemed as among the world's best green leafy vegetables, particularly in semi-arid regions, as observed by Tabuti et al., (2004). Interestingly, despite their water-storing capacity, Cucurbitaceae members are more extensively cultivated in semi-arid regions like subtropical India, as documented by Ram et al., (1999). This highlights the adaptability and significance of certain plant families in providing sustenance in challenging environmental conditions.

The young buds of *Agave americana* (L) and *Acanthocereus tetragonus* (L.), belonging to the Asparagaceae and Cactaceae families respectively, are commonly steamed and consumed alongside rice in many countries due to their rich nutritional content, as highlighted by Semuli (2014). *Capparis zeylanica* L. stands out as a plant well-suited for harsh terrain, offering significant nutrition ideal for semi-arid populations, as evidenced by Mishra et al. (2007). Various studies, such as Welcome et al., (2019) and Sadasivaiah et al., (2018), have identified members of Cleomaceae, Commelinaceae, Cucurbitaceae, Cyperaceae, Menispermaceae, Moraceae, Passifloraceae, Rhamnaceae, and Salvadoraceae families, which are commonly encountered in ethnobotanical research. These plants contribute to the culinary and nutritional diversity of communities residing in diverse ecological settings, underscoring their importance in sustaining human populations, particularly in challenging environments like semi-arid regions.

The chief edible plant parts are identified as leaves, followed by fruits. Among the edible leaves, eight plant species have been recorded: *Digera murica* (L.) Mart, *Commelina diffusa* L, *Sida acuta* Burm.f, *Corchorus olitorius* L, *Malvastrum coromandelianum* (L) Garcke, *Cocculus hirsutus* (L) W. Theob., and *Mesosphaerum suaveolens* (L) Kuntze. These leaves contribute to the nutritional diversity of local diets. Furthermore, the fruits of six plants are consumed by local communities: *Coccinia grandis* (L.) Voigt, *Ficus benghalensis* L, *Passiflora foetida* L, *Ziziphus mauritiana* Lam, and *Azima tetracantha* Lam. These fruits not only serve as sources of sustenance but also offer high antioxidant properties, as highlighted by Song et al., (2018) and Bhaskara Rao et al., (2014).

Additionally, the flowers of *Aerva javanica* (Burm.f.) Juss. ex Schult. and *Mimosa hamata* Willd. have been identified as edible in this study. The stems of *Cyperus articulatus* L. are boiled and added to soups, providing both sustenance and flavor to dishes. Notably, *Cyperus articulatus* is recognized for its contribution to food security, as noted by Munishi et al., (2011). Moreover, novel culinary uses have been recorded in the current study, such as the utilization of *Cleome monophylla* seeds. This demonstrates the ongoing exploration of traditional knowledge for culinary purposes. Furthermore, the edible fruits of *Azima tetracantha* Lam. and the usage of *Cocculus hirsutus* (L.) W. Theob. have been newly documented in this study, reflecting the continual discovery of edible resources within local ecosystems (Fig 2).

Fig. 2: Wild edible plant parts used for consumption

The leaves of *Commelina diffusa* are also found to be nutritious, as evidenced by Mugeru DK et al., (2016) study in Kenya, besides our study. The fruits of *Ficus benghalensis* L., *Passiflora foetida* L. and *Ziziphus mauritiana* Lam. are favored by local herders as wild edible foods, indicating their importance in local diets and livelihoods. Overall, these findings underscore the rich diversity of edible plants within various ecosystems and the importance of traditional knowledge in ensuring food security and nutritional well-being in local communities (Table 1).

Table 1. Ethnobotany of wild edible plants

Sl. No.	Botanical name	Family	Local name	Parts used	Mode of usage
1	<i>Acaranthus aspera</i> L.	Amaranthaceae	Uttareni gida	Seeds	The pastoralists mix the roasted seeds with honey and consume them as a snack.
2	<i>Aerva javanica</i> (Burm.f.) Juss. ex Schult.	Amaranthaceae	Dodda hindi gida	Flower	Inflorescence is used to make powder, mixed with spices, and eaten with Jowar roti.
3	<i>Digera murica</i> (L.) Mart.	Amaranthaceae	Goraje palle	Leaves	Boiled and used as a green leafy vegetable
4	<i>Agave americana</i> L.	Asparagaceae	Anekattale	Buds	Young flower buds are used as vegetables
5	<i>Acanthocereus tetragonus</i> (L.)	Cactaceae	Kalli	Buds	Young flower buds are used as vegetables
6	<i>Capparis zeylanica</i> L.	Capparaceae	Kaayi balli	Fruits	Fruits are edible
7	<i>Cleome monophylla</i> L.	Cleomaceae	Koli kalina gida	Seeds	Seeds are added to curries for flavor.

8	<i>Commelina diffusa</i> L.	Commelinaceae	Gubbachi bale	Leaves	Leaves are boiled and cooked
9	<i>Coccinia grandis</i> (L.) Voigt	Cucurbitaceae	Kaadu thonde	Fruits	Wild vegetable
10	<i>Cyperus articulatus</i> L.	Cyperaceae	Jekina hullu	Stem	The stem is used to prepare rasam
11	<i>Sida acuta</i> Burm.f.	Malvaceae	Bhimana kaddi	Leaves	Leaves are boiled and used as leafy vegetable
12	<i>Corchorus olitorius</i> L.	Malvaceae	Chuchali	Leaves	Wild green leafy vegetable
13	<i>Malvastrum coromandelianum</i> (L.) Garcke	Malvaceae	Chikka pundi	Leaves	Wild green leafy vegetable
14	<i>Corchorus olitorius</i> L.	Malvaceae	Nalita	Leaves	Wild green leafy vegetable
15	<i>Cocculus hirsutus</i> (L.) W. Theob.	Menispermaceae	Daagadi balli	Leaves	Leaves are boiled and cooked along with other veg
16	<i>Ficus benghalensis</i> L.	Moraceae	Aalamara	Fruits	Family: Moraceae Usage: Fruits are edible
17	<i>Passiflora foetida</i> L.	Passifloraceae	Sharabattu hannu	Fruits	Wild edible fruits
18	<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae	Kaadu bare gida	Fruits	Fruits are edible
19	<i>Azima tetracantha</i> Lam.	Salvadoraceae	Uppi mullu gida	Fruits	Fruits are edible
20	<i>Mesosphaerum suaveolens</i> (L.) Kuntze	Lamiaceae	Ganga tulasi	Leaves	The leaves of this wild edible variety are commonly added to saaru (soup).
21	<i>Mimosa hamata</i> Willd.	Fabaceae	Sagari mullu	Flowers	Flowers are used to make tea

Conclusion

The study conducted in the Hampi region, a semi-arid environment, revealed a rich diversity of wild edible plants crucial for food security. Through interviews with pastoralists, it was found that leaves and fruits were the chief edible plant parts, with a total of 21 significant wild edible plant species identified. Malvaceae

emerged as the foremost family for wild edibles, followed by Amaranthaceae, indicating the adaptability of certain plant families to challenging environmental conditions. Herbaceous plants played a significant role in local diets, while shrubs and trees contributed to the resilience of local ecosystems. The inclusion of climbing plants further highlighted the diversity of edible resources available. These findings underscore the importance of traditional knowledge in utilizing botanical resources for sustenance in semi-arid regions like Hampi, emphasizing the need for their conservation and sustainable management to ensure food security and nutritional well-being in local communities.

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