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RESEARCH ARTICLE

Under-utilized lesser-known wild edible plants of Tamil Nadu, India

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Abstract

The present study highlights the diversity of wild edible plants used by tribal and local communities in Tamil Nadu's phytogeographical regions, covering both the Western Ghats and Eastern Ghats. The ethnobotanical documentation includes 62 plant species across 36 families and 39 genera which are lesser-known wild edibles. The plants are categorized as 27 fruits, 26 leafy edibles, 3 tuberous edibles and 3 species of whole plants, stem and flower of single species each. These lesser-known wild edibles have significant potential but require further investigation to determine their nutritional value, potential for cultivation, agronomic practices, and propagation methods. Their sustainable conservation is also crucial to ensure their availability for future generations. This study sheds light on the importance of preserving traditional knowledge and biodiversity through scientific exploration.

Introduction

The growing global population, urbanization, and various crises have exacerbated hunger and malnutrition, particularly among vulnerable populations such as women, youth, and indigenous peoples. The text emphasizes the importance of harnessing wild plants in modern agriculture to create novel varieties that can contribute to a more diversified and resilient food supply. The current trends suggest that without significant changes, global malnutrition and undernourishment will persist, making it difficult to meet nutrition targets by 2030. While a limited number of plant species (around 30) provide the bulk of the world's energy needs, rural and tribal communities rely on a much broader diversity of wild edible plants, which are not part of conventional agriculture and are primarily found near local vegetation. The statistic that 582 million people are expected to be chronically undernourished by 2030, with more than half of them residing in African countries, underscores the urgent need for more sustainable and diverse food sources [1]. The fact that 45,000 wild edible plants have been recorded globally, with 3,900 species commonly consumed by remote populations, highlights the potential of these plants to contribute to food security if integrated into modern agricultural systems.

Tamil Nadu state's forests, covering approximately 27,079 km^2, support an impressive diversity of plant life, with 6,723 taxa, making Tamil Nadu the state with the highest number of plant species in India [2]. The region's forest vegetation includes 11 major and 40 minor forest types, creating a habitat for numerous endemic plants with economic and nutritional potential. The state's tribal communities, particularly the 12 major hill tribes residing in forested areas like the Nilgiris, Anamalais, Palnis, Agasthiyamalais, and the Eastern Ghats of Kolli and Shervarayan Hills, heavily rely on wild edible plants for their dietary needs. Ethnobotany of tribal communities of Western Ghats such as Palliyars [3]. and Kanis [4]. This reliance highlights the importance of these plants not only as a source of food but also as a genetic resource for developing high-yielding crop varieties and discovering new phytomolecules. The documentation and inventory of these wild edible plants are essential for identifying new crop species and sustainable dietary resources, especially as the global food system faces growing challenges related to population growth, climate change, and food insecurity. Exploring and utilizing these plant resources could help meet both regional and global food security needs, while preserving the ecological and cultural heritage of the tribal communities in Tamil Nadu. It is an opportunity for agricultural innovation, particularly in developing countries, to explore the cultivation of these underutilized wild plants, which could alleviate hunger and malnutrition, especially in rural and remote communities. The documentation and inventory of wild edible plants

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are essential for identifying new crop species and sustainable dietary resources, especially as the global food system faces growing challenges related to population growth, climate change, and food insecurity. Exploring and utilizing these plant resources could help meet both regional and global food security needs, while preserving the ecological and cultural heritage of the tribal communities in Tamil Nadu. It is an opportunity for agricultural innovation, particularly in developing countries, to explore the cultivation of these underutilized wild plants, which could alleviate hunger and malnutrition, especially in rural and remote communities. The documentation and inventory of wild edible plants are much essential for identifying the new crop plants and dietary resources to meet the global challenges.

Methodology

This study was conducted as part of an ethnobotanical documentation on plant diversity in the Eastern and Western Ghats of Tamil Nadu, led by the senior author. Ethnobotanical information was collected through informal, pre-scheduled interviews with local people and respondents of 12 different tribal communities residing across Tamil Nadu. Information on edible plant uses was documented, including specific plant parts used, modes of consumption, and preparations with supplemental ingredients. The documented areas and the distribution of the selected tribal communities are illustrated in Map 1. The chosen communities represent a diversity of ethnic cultures and traditions. Voucher specimens of the plants were collected, preserved as herbarium samples, and housed at the Sri Ganesan Herbarium (SGH) at The Madura College, Madurai. A total of 968 observations regarding locally used edible plants were recorded across Tamil Nadu. These records were carefully reviewed and cross-referenced with earlier literature and field observations, resulting in a final list of 62 lesser-known edible plant species. Specimens were identified in the field and verified against local Floras, with the current scientific names confirmed using Plants of the World Online [5] and the World Flora Online [6]. For each plant, we provide its botanical name, family, local name, edible plant part(s), and uses.

Observation

The present study highlighted a total of 62 plant species which are contributing 49 genera and 36 families with their edible uses. Based on the useful parts, fruits (27 species) and leaves (26 species) have been rated highly used wild edibles, followed by tuber and whole plant (3 species each), seeds with two species, stem and flowers with single species (Table 1). Out of these edible plants, 5 species belong to Capparidaceae, followed by Begoniaceae, Fabaceae with 4 species each, Amaranthaceae, Apocynaceae, Melastomataceae and Phyllanthaceae with 3 species each, Elaeocarpaceae, Primulaceae, Myrtaceae, Molluginaceae, Malvaceae, Oxalidaceae, Solanaceae and Rosaceae with 2 species and remining 20 families with single species each. Among these, about 20 plants species are eaten as fresh leafy edibles followed by ripened fruits with 9 species. Tubers of *Aponogeton natans* and *Ceropegia megamalayana* (Fig.2d) are eaten as raw and a tuber of *Maerua oblongifolia* is cooked and eaten. Succulent stem of *Ceropegia juncea* is used as fresh edible. Some plants used to prepare parched traditional recipes with adding common spices *viz*, *Arisaema leschanultii* (Fig. 2c), *Celosia polygonoides*, *Hypertelis cerviana*, *Malachra capitata*, etc. Plant species such as *Capparis diversifolia*, *Embelia adnata*, *Medinilla beddomei*, *Medinilla malabarica* and *Ceropegia meamalayana* are reported here as first entity for edible plants.

Discussion

Use of wild edible is coping mechanism in times of food shortage, provides important safety energy source for the rural poor. In Tamil Nadu, out of 37 scheduled tribes listed, about 12 are residing completely in forested areas (Map 1). Some prominent hills tribes are Irular, Kadar, Kanikaran, Kattu Naicken, Kurumban, Malasar, Malayali, Mudhuvan, Palliar, Panian, Toda and Urali. Several studies have already been documented the wild edibles of Tamil Nadu from the forest dwelling people [3, 7-15]. Palliyar tribes alone used more than 150 wild edible plants from the Western Ghats of Tamil Nadu [3].

Several wild edible fruit plants like *Artocarpus lakoocha*, *Aegle marmelos*, *Annona squamosa*, *Carissa carandas*, *Cordia dichotoma*, *Eugenia jambos*, *Limonia acidissima*, *Grewia tenax*, *Manilkara hexandra*, *Morus indica*, *Pithecellobium dulce*, *Schleichera oleosa*, *Spondias pinnata*, *Syzygium cumini*, *Tamarindus indica*, and *Ziziphus mauritiana* are contributing significantly to the nutritional supplements in rural areas [16]. A study documented about 28 important wild edible fruits from Western Ghats [17] and most species of wild edible fruit plants belong to the families of Anacardiaceae, Clusiaceae, Malvaceae, Myrtaceae, Phyllanthaceae, Moraceae, Rutaceae, etc.

Conventionally, tribal and rural people often rely on wild edible fruits for their food, which could provide primary dietary constituents and natural bioactive compounds [18]. Several of wild edibles have rich antioxidant principles which are protecting the human body from cancers and other infective disease [19]. Whereas wild edible plants are contributing more than 7.5% of local people dietary needs with other supplements like healing of medicinal ailments [20]. Most of the wild edible tubers have rich of carbohydrate resources along with number of other phytochemicals [9].

The study highlights that the scheduled tribes and forest communities in Tamil Nadu continue to rely on lesser-known wild edibles as part of their food sources, maintaining a deep understanding of their habitats, collection times, identification methods, preparation techniques, and consumption practices. This traditional knowledge, preserved through verbal communication, serves as a valuable cultural resource. It holds potential significance for future food security and nutrition, offering a sustainable way to support both the communities and broader needs for natural nutrition sources.

Conclusion

Table 1. Under-utilized Lesser-known wild edible plants of Tamil Nadu

SI.No.	Name of the plant	Family	Part used	Local name	Uses
1.	*Antidesma montanum* Blume	Phyllanthaceae	Fruit	Aasaripuli	Ripened fruits edible
2.	*Aponogeton natans* (L.) Engl. & K.Krause	Aponogetonaceae	Tuber	Kotti kizhangu	Raw and cooked tubers edible
3.	*Arisaema leschenaultii* Blume	Araceae	Leaves	Kaattukarunai	Fried leaves edible
4.	*Asystasia gangetica* (L.) T.Anderson	Acanthaceae	Leaves	Manjalthavasi	Cooked leaves edible
5.	*Bambusa bambos* (L.) Voss	Poaceae	Seed (grains)	Moongilarasi	Cooked grains edible
6.	*Begonia crenata* Dryand.	Begoniaceae	Leaves	Kalthamarai	Raw leaves edible
7.	*Begonia cordata* Vell.	Begoniaceae	Leaves	Kallurukki	Fresh raw leaves edible
8.	*Begonia floccifera* Bedd.	Begoniaceae	Leaves	Kalthamarai, Paraipulichai	Fresh raw leaves edible
9.	*Begonia roxburghii* (Miq.) A.DC.	Begoniaceae	Leaves and stem	Narayanasanjevi	Leaves edible as raw, stem coked along with green vegetable
10.	*Boerhavia erecta* L.	Nyctaginaceae	Leaves	Sirumukirattai	Cooked leaves edible
11.	*Bridelia retusa* (L.) A.Juss.	Phyllanthaceae	Fruit	Mulvaengai	Ripened fruits edible
12.	*Bulbophyllum fuscopurpureum* Wight	Orchidaceae	Leaf bulb	Seethai manjal	Fresh bulb edible
13.	*Canavalia gladiolata* J.D.Sauer	Fabaceae	Fruit	Thampatavarai	Cooked fruits edible

14.	*Capparis diversifolia* Wight & Arn..	Capparidaceae	Fruit	Koratti pazham	Ripened fruits edible
15.	*Capparis sepiaria* L.	Capparidaceae	Fruit	Karumsoorai	Ripened fruits edible
16.	*Celosia polygonoides* Retz.	Amaranthaceae	Leaves	Pulisirukeerai	Cooked leaves edible
17.	*Cereus pterogonus* Lem.	Cactaceae	Fruit	Sathurakalli	Ripened fruits edible
18.	*Ceropegia juncea* Roxb.	Apocynaceae	Stem	Vaelipulichai	Raw stem edible
19.	*Ceropegia megamalayana* (Karupp.) Kottaim.	Apocynaceae	Tuber	Paraikizhangu	Tubers edible as raw
20.	*Citrullus lanatus* (Thunb.) Matsum. & Nakai	Curcubitaceae	Fruit	Mithukkai	Unripe fruits made into dry pickles and ripened fruits edible
21.	*Cordia diffusa* K.C.Jacob	Boraginaceae	Fruit	Narivizhi	Ripened fruits edible
22.	*Crateva adansonii* DC.	Capparidaceae	Fruit	Mavalingam	Ripened fruit pulp edible
23.	*Elaeocarpus* serratus L.	Elaeocarpaceae	Fruit	Kattukotlan	Ripened fruits edible
24.	*Elaeocarpus variabilis* Zmarzty	Elaeocarpaceae	Fruit	Kottampazham	Ripened fruits edible
25.	*Embelia adnata* Bedd. ex C.B.Clarke	Primulaceae	Leaves	Pulippanthalai	Raw leaves edible
26.	*Embelia tsjeriam-cottam* (Roem. & Schult.) A.DC.	Primulaceae	Leaves and fruits	Kaattupulichai	Ripened fruits and leaves edible
27.	*Eugenia discifera* Gamble	Myrtaceae	Fruit	Kaattukoyya	Ripened fruits edible
28.	*Eugenia singampattiana* Bedd.	Myrtaceae	Fruit	Singampatti koyya	Ripened fruits edible
29.	*Flueggea leucopyrus* Willd.	Phyllanthaceae	Fruit	Vetpula	Ripened fruits edible
30.	*Garcinia indica* (Thouars) Choisy	Clusiaceae	Fruit	Kokkam puli	Ripened fruits edible
31.	*Hugonia mystax* Lam.	Linaceae	Fruit	Mothirakkanni	Ripened fruits edible
32.	*Hydrocotyle conferta* Wight	Araliaceae	Leaves	Siruvallarai	Cooked leaves edible
33.	*Hypertelis cerviana* (L.) Thulin	Molluginaceae	Plant	Parpadagam	Cooked plants edible
34.	*Ixora chinensis* Lam.	Rubiaceae	Fruit	Thetti pazham	Ripened fruits edible

35.	*Kadsura heteroclita* (Roxb.) Craib	Schisandraceae	Fruit	Thaenmilagu	Ripened fruits edible
36.	*Maerua oblongifolisa* (Forssk.) A.Rich.	Capparidaceae	Tuber	Poochakra kizhangu	Cooked tuber edible
37.	*Malachra capitata* (L.) L.	Malvaceae	Leaves	Punnaku keerai	Cooked leaves edible
38.	*Medinilla beddomei* C.B.Clarke	Melastomataceae	Leaves	Neervalam	Fresh leaves edible
39.	*Medinilla malabarica* Bedd. & C.E.C.Fisch.	Melastomataceae	Leaves	Pooncharai	Fresh leaves edible
40.	*Waltheria indica* L.	Malvaceae	Leaves	Sempodu	Cooked leaves edible
41.	*Morisonia flexuosa* L.	Capparidaceae	Fruit	Milagaipazham	Ripened fruits edible
42.	*Oxalis latifolia* Kunth	Oxalidaceae	Leaves	Malai aarai	Cooked leaves edible
43.	*Oxalis spiralis* Kunth	Oxalidaceae	Leaves	Sevappu aarai	Cooked leaves edible
44.	*Paramollugo nudicaulis* (Lam.) Thulin	Molluginaceae	Plant	Pura keerai	Cooked plants edible
45.	*Phoenix loureiroi* Kunth	Arecaceae	Fruit	Eecham	Ripened fruits edible
46.	*Physalis angulate* L.	Solanaceae	Fruit	Sodakkuthakkali	Ripened fruits edible
47.	*Physalis peruviana* L.	Solanaceae	Fruit	Sodakkuthakkali	Ripened fruits edible
48.	*Portulaca quadrifida* L.	Portulacaceae	Plant	Pasiri keerai	Cooked plants edible
49.	*Potentilla indica* (Andrews) Th.Wolf	Rosaceae	Fruit	Ponvandukannu	Ripened fruits edible
50.	*Psilotrichum patulum* (Willd.) I.M.Turner	Amaranthaceae	Leaves	Antharakeerai	Cooked leaves edible
51.	*Pupalia lappacea* (L.) Juss.	Amaranthaceae	Leaves	Magilikeerai	Cooked leaves edible
52.	*Rivea hypocrateriformis* (Desr.) Choisy	Colvolvulaceae	Leaves	Potthikeerai	Cooked leaves edible
53.	*Rivina humilis* L.	Petiveriaceae	Fruit	Kuruthinelli	Ripened fruits edible
54.	*Rubus fairholmianus* Gardner	Rosaceae	Fruit	Siru-unni	Ripened fruits edible
55.	*Sarcostigma kleinii* Wight & Arn.	Icacinaceae	Fruit	Kodikkalli	Cooked fruits edible
56.	*Senna italica* Mill.	Fabaceae	Seeds	Nilavagai	Cooked leaves edible

57.	*Senna obtusifolia* (L.) H.S.Irwin & Barneby	Fabaceae	Leaves	Oosithagarai	Cooked leaves edible
58.	*Sesbania sesban* (L.) Merr.	Fabaceae	Flower	Chithagarathi	Cooked flowers edible
59.	*Smilax wightii* A.DC.	Smilacaceae	Leaves	Kodiyelanthai	Tender leaves edible
60.	*Sonerila tinnevelliensis* C.E.C.Fisch.	Melastomataceae	Leaves	Kaattupulichai	Leaves used to substitute tamarind
61.	*Stephanotis* volubilis (L.f.) S.Reuss, Liede & Meve	Apocynaceae	Leaves	Perumkurinjan	Cooked leaves edible
62.	*Zaleya decandra* (L.) Burm.f.	Aizoaceae	Leaves	Uppukeerai	Cooked leaves edible

Map 1. Tribal distribution in Tamil Nadu

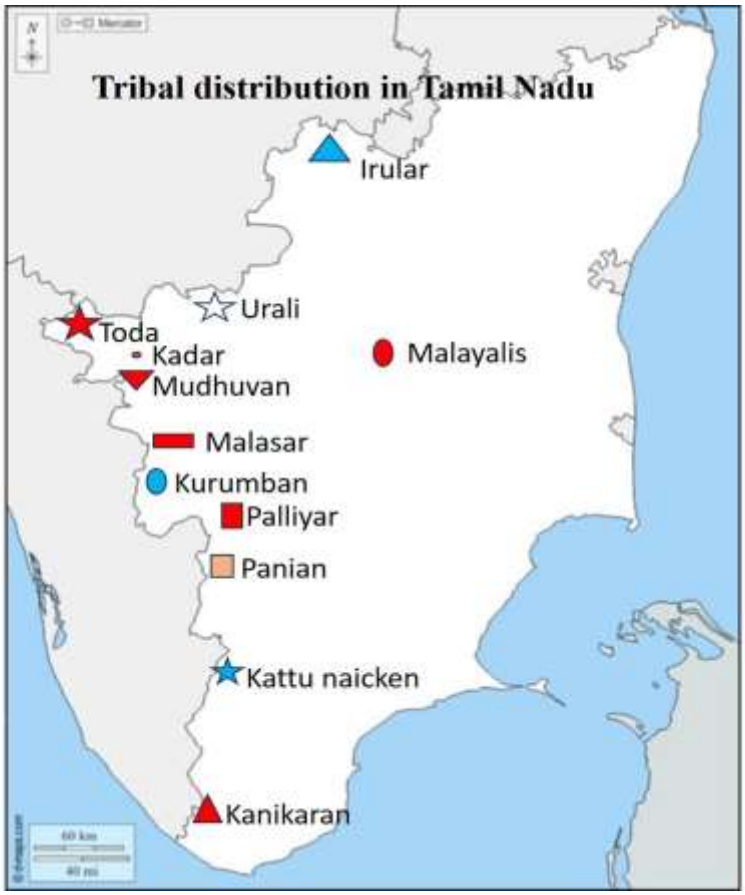

Figure 2. a. *Begonia floccifera*; b. *Begonia malabarica*; c. *Arisaema leschenaultii* (leaves); d. *Ceropegia megamalayana*; e. *Capparis diversifolia*; f. *Embelia adnata*; g. *Medinilla beddome*; h. *Medinilla malabarica*; i. *Sonerila tinnevelliensis*

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