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Ethnobotanical Documentation, Nutritional Significance, and Extension Strategies for Wild Edible Vegetables in the Satpura Ranges of Pal, Jalgaon District, Maharashtra.

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Abstract

Wild edible plants, particularly wild leafy vegetables, contribute to food and nutritional security among tribal communities living in the Satpura ranges of Maharashtra. The present study documents the diversity, traditional uses, seasonal availability, culinary processing practices, and potential nutritional significance of wild edible vegetables consumed around Pal village, Raver taluka, Jalgaon district.

An ethnobotanical field survey and participatory rural appraisal were conducted in five adjoining tribal settlements. Information was collected through semi-structured interviews with elder women, traditional healers, and forest gatherers belonging mainly to the *Pawara*, *Tadavi* and *Bhill* communities. Plant specimens were collected during different seasons and identified using standard regional floras. A total of 28 wild edible plant species belonging to 20 botanical families were documented.

The recorded species are consumed as leafy vegetables, shoots, flowers, tubers, fruits, and other edible plant parts. They are traditionally valued as sources of dietary fiber and micronutrients, including iron, calcium, and vitamins. Their availability is particularly important during the early monsoon period, when cultivated crops are not yet ready for harvest and access to market vegetables is restricted. Traditional practices such as boiling, leaching, decanting, and combining wild greens with pulses or gram flour are used to improve palatability and reduce bitterness or antinutritional factors.

The study highlights the potential role of Krishi Vigyan Kendra, Pal, in documenting indigenous knowledge, conducting nutritional analysis, promoting nutrition gardens, supporting women's self-help groups, and developing value-added products. Conservation, scientific validation, and responsible utilization of wild edible vegetables could contribute to improved dietary diversity, cultural preservation, and supplementary livelihood generation in tribal communities.

Keywords: Wild edible plants; wild leafy vegetables; Satpura ranges; ethnobotany; tribal communities; nutritional security; Krishi Vigyan Kendra; underutilized crop

1. Introduction

Wild edible plants are important sources of food, nutrition, and traditional medicine for many indigenous and forest-dependent communities. In the Satpura ranges of northern Maharashtra, tribal communities have historically collected and consumed a diverse range of wild vegetables during different seasons. These foods supplement staple diets and provide locally available sources of nutrients during periods when cultivated vegetables are scarce.

The foothill and forest regions surrounding Pal village in Raver taluka, Jalgaon district, support considerable plant diversity. Communities including the Pawara, Bhil, Barela, and Tadvi traditionally possess detailed knowledge regarding the identification, collection, preparation, and medicinal uses of wild edible plants. Much of this knowledge is transmitted orally, particularly through women who are involved in food collection and preparation.

However, this traditional food system is under increasing pressure from changing dietary preferences, dependence on market foods, deforestation, habitat loss, migration, and urbanization. The gradual decline of traditional knowledge may also result in the loss of valuable plant genetic resources.

Wild vegetables are available locally and therefore inexpensive for low income sectors of the economy. They are good sources of important nutrients, which play significant roles in nutrition, food security and serve as supplements for the management of nutrition related illnesses. Foods plants are not only supplement to the food quality, but also an important option during starvation for survival and thus makes significant contribution to the human nutrition throughout the year (Kiran *et al*, 2011).

Krishi Vigyan Kendra, Pal, can support the documentation, conservation, scientific evaluation, and sustainable utilization of these resources. Therefore, the present study was undertaken to document selected wild edible vegetables of the Pal region, record their traditional uses and seasonal availability, and propose extension strategies for nutrition improvement and livelihood development.

Objectives

The objectives of the study were:

1. To document the wild edible vegetable species traditionally consumed in the Pal region.
2. To record their local names, edible parts, harvesting seasons, and culinary uses.
3. To document traditional processing methods used by tribal households.
4. To assess their potential contribution to dietary diversity and nutritional security.
5. To propose conservation, value-addition, and extension strategies through KVK Pal.

2. Materials and Methods

2.1 Study area

The study was conducted in and around Pal village, located in Raver taluka of Jalgaon district, Maharashtra. The study region lies in the foothills of the Satpura range and includes forested areas and adjoining tribal settlements. The approximate geographical location is 21°21′ N latitude and 75°54′ E longitude, with an elevation of approximately 400–650 m above mean sea level.

The region is characterized by tropical dry deciduous to moist deciduous vegetation. Annual rainfall is reported to be approximately 750–900 mm, with the majority occurring between June and September. The seasonal climate strongly influences the availability and collection of wild edible plants.

2.2 Survey design

Ethnobotanical information was collected from five adjoining tribal settlements, locally known as padas. Participatory rural appraisal techniques were used to identify commonly collected wild vegetables and to understand their seasonal availability and cultural importance.

2.3 Data collection

Data were collected through:

- Semi-structured interviews.
- Informal discussions with community members.
- Field observations.
- Group discussions with women involved in collection and food preparation.
- Interviews with traditional healers and forest gatherers.
- Seasonal field visits during the monsoon, post-monsoon, and summer periods.

2.4 Plant collection and identification

Representative plant specimens were collected during field visits and identified using standard regional floras. Identification was cross-verified by botanists and agronomy specialists associated with KVK Pal. Herbarium voucher numbers should be included for each species in the final manuscript, wherever available.

2.5 Data analysis

The documented plants were classified according to:

- Botanical family.
- Local or tribal name.
- Edible plant part.
- Harvesting season.
- Culinary use.

3. Results

3.1 Diversity of wild edible vegetables

A total of 24 prominent wild edible plant species belonging to 20 botanical families were documented from the study area. The plants were consumed as leafy vegetables, tender shoots, flowers, tubers, bulbils, pods, and central cores.

The following table presents selected species documented in the study.

Botanical name	Local name	Family	Edible part	Availability	Traditional use
Momordica dioica	Kartoli	Cucurbitaceae	Tender	July–September	Consumed as a vegetable
Senna tora (Synonym-*Cassia tora)*	Takla, Tarota	Fabaceae	Tender leaves and shoots	June–August	Cooked as *bhaji*
Launea procumbens	Pathari	Asteraceae	Tender leaves	July–October	Cooked with gram flour
Celosia argentea	Kurdu	Amaranthaceae	Tender foliage	July–September	Cooked with pulses
Commelina benghalensis	Kena	Commelinaceae	Tender aerial parts	July–October	Used as a leafy vegetable
Colocasia esculenta	Alu	Araceae	Tender leaves	Monsoon and winter	Cooked with gram flour
Digera muricata	Kunjru, Math	Amaranthaceae	Tender shoots	July–September	Used as a spinach substitute
Rivea hypocrateriformis	Phang	Convolvulaceae	Tender leaves	Monsoon	Cooked with gram flour
Celosia Argentina	Kuradu	Amaranthaceae	Leaves and seeds	July–September	Leaves cooked as greens
Physalis pubescens	Kapalphodi	Sapindaceae	Leaves	Monsoon	Leaves cooked as greens
Leptadenia reticulate Telosma pallida	Dodichi phule	Apocynaceae	Flowers	June to October	Cooked with gram flour
Portulaca oleracea	Ghol	Portulacaceae	Leaves and succulent stems	Monsoon and winter	Cooked with gram flour
Portulaca quadrifida L	Chiwal bhaji	Portulacaceae	Leaves and succulent stems	Monsoon and winter	Cooked with gram flour

Amaranthus viridis	Tandulja	Amaranthaceae	Tender leaves and succulent young stems	Monsoon and winter	Leaves cooked as greens
Sesbania grandiflora	Hadga phule	Fabaceae	Unopened flower buds	August through February/March	Cooked with gram flour
Bambusa arundinacea	Bamboo comb	Poaceae	Tender shoots	Monsoon	Cooked as *bhaji*
Hibiscus sabdariffa	Ambadi	Malvaceae	Flower and leaves	Monsoon and winter	Leaves cooked as greens
Chlorophytum tuberosum	Kulhar, Safed musli	Asparagaceae	Tender leaves and tubers	June–July	Leaves cooked as greens
Amaranthus viridis	Ran math, Kate math	Amaranthaceae	Leaves and tender stems	Mainly monsoon	Stir-fried with garlic
Dioscorea bulbifera	Kadu kanda, Gethi	Dioscoreaceae	Bulbils and tubers	Late monsoon to winter	Boiled and processed before consumption
Ensete superbum	Ran kela	Musaceae	Central core and flower bud	Monsoon to winter	Used in curries
Bauhinia spp.	Kachnar, Kanchan	Fabaceae	Flower buds and leaves	Late winter to spring	Flower buds sautéed
Ceropegia bulbosa	Khapar khuti, Kharpudi	Apocynaceae	Tubers and fleshy leaves	July–September	Eaten after suitable preparation
Moringa oleifera	Shevga	Moringaceae	Pods, flowers, and leaves	Winter to summer	Consumed as a vegetable

Photo Plate-1

 *Momordica dioica*	 *Senna tora*	 *Launea procumbens*	 *Celosia argentea*
 *Commelina benghalensis*	 *Colocasia esculenta*	 *Digera muricata*	 *Rivea hypocrateriformis*
 *Physalis pubescens*	 *Leptadenia reticulate*	 *Portulaca oleracea*	 *Portulaca quadrifida L*
 *Amaranthus viridis*	 *Sesbania grandiflora*	 *Bambusa arundinacea*	 *Hibiscus sabdariffa*
 *Chlorophytum tuberosum*	 *Amaranthus viridis*	 *Dioscorea bulbifera*	 *Ensete superbum*
 *Bauhinia* spp.	 *Ceropegia bulbosa*	 *Moringa oleifera*	

3.2 Seasonal availability

Wild leafy vegetables were most frequently available during the monsoon season, particularly from June to September. This period coincides with the early growth stages of cultivated crops. Consequently, wild vegetables

serve as an important dietary supplement before cultivated agricultural produce becomes available. Atram (2015) explore medicinal potential of wild leafy vegetables growing in rainy season from Maharashtra state. Patil and Patil (2000), Dhole (2021) documented wild edibles from different regions including Nasik (Maharashtra) and Gaya (Bihar).

Their importance is increased by:

- Limited market access in remote settlements.
- Difficult road conditions during the monsoon.
- Seasonal food shortages.
- Limited household purchasing power.
- High availability of tender leaves and shoots in forest and fallow areas.

3.3 Traditional culinary processing

The communities use several traditional processing methods before consuming selected wild plants. These include:

- Boiling and discarding the cooking water.
- Repeated washing or leaching.
- Removal of bitter or fibrous portions.
- Cooking with pulses or gram flour.
- Addition of tamarind, spices, or other ingredients to improve taste.
- Drying or powdering selected leafy vegetables for later use.

4. Discussion

4.1 Contribution to food and nutritional security

Singh *et al* (2021), explained wild edible vegetables provide an important source of dietary diversity for tribal households. Their local availability and low monetary cost make them particularly valuable during the monsoon season. The plants documented in this study are traditionally regarded as sources of vitamins, minerals, dietary fiber, and other beneficial phytochemicals.

4.2 Cultural and ethnobotanical importance

The use of wild vegetables reflects the close relationship between tribal communities and their natural environment. Knowledge of plant identification, harvesting season, preparation, and medicinal use is especially important among older women and traditional healers.

The loss of this knowledge may reduce both dietary diversity and cultural continuity. Documentation should therefore be undertaken with community participation, appropriate acknowledgement, and respect for local knowledge rights.

4.3 Conservation concerns

Some wild edible plants may be vulnerable to overharvesting, habitat degradation, and destructive collection practices. Tubers, roots, and whole-plant harvesting can reduce natural regeneration. Sustainable harvesting protocols should be developed, including:

- Collection of only mature and sufficient plant material.

- Avoidance of uprooting entire populations.
- Leaving reproductive plants in the field.
- Protection of natural regeneration sites.
- Establishment of community conservation plots.
- Development of nursery and seed-storage protocols.

4.4 Role of KVK Pal

KVK Pal can support the sustainable use of wild vegetables through the following activities:

- Establishing demonstration plots and Poshan Vatikas.
- Conducting nutritional and phytochemical analyses.
- Developing safe preparation and processing protocols.
- Training women's self-help groups in drying, powdering, packaging, and hygiene.
- Developing local value-added products.
- Maintaining a community-linked ethnobotanical database.
- Organizing annual Ranbhaji Mahotsav or wild-food festivals.
- Promoting cultivation of selected species outside forest areas.
- Developing awareness materials in Marathi and local tribal languages.
- Recording community ownership and attribution of traditional knowledge.

5. Proposed Extension Framework

A four-pillar extension framework is proposed for KVK Pal.

Pillar 1: Documentation and validation

- Prepare a photographic and botanical database of wild edible plants.
- Record local names and traditional preparation methods.
- Collect herbarium specimens and assign voucher numbers.
- Conduct laboratory analysis of commonly consumed species.
- Validate food-safety and detoxification procedures.

Pillar 2: Conservation and cultivation

- Establish ex-situ conservation plots at the KVK instructional farm.
- Promote selected species in nutrition gardens.
- Develop seed, tuber, and planting-material conservation methods.
- Train communities in sustainable harvesting.
- Encourage cultivation of high-demand species near homesteads.

Pillar 3: Value addition and enterprise development

- Train self-help groups in hygienic washing, drying, and packaging.
- Develop products such as dried leafy vegetables and vegetable powders.
- Prepare standardized recipes and processing manuals.

- Conduct shelf-life and acceptability studies.
- Establish local branding and market linkages.

Pillar 4: Awareness and policy support

- Organize wild-food exhibitions and food festivals.
- Conduct nutrition education programmes in tribal schools and villages.
- Include wild edible vegetables in community nutrition activities where appropriate.
- Coordinate with agricultural universities, tribal development agencies, forest departments, and local institutions.
- Develop guidelines for ethical documentation and benefit sharing.

6. Conclusion

The wild edible vegetables of the Satpura region surrounding Pal village represent important biological, nutritional, cultural, and livelihood resources. They supplement household diets, particularly during the monsoon season, and provide communities with locally available food sources during periods of limited agricultural and market supply.

The study demonstrates the need for systematic documentation, scientific nutritional evaluation, safe-processing protocols, and conservation planning. KVK Pal can play an important role by linking community knowledge with agricultural research, nutrition education, value addition, and women-led enterprise development.

Future research should focus on complete species documentation, quantitative ethnobotanical analysis, laboratory-based nutritional profiling, food-safety assessment, and participatory evaluation of conservation and commercialization models.

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