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Indigenous food systems and traditional food knowledge among the Oraon Tribe of Sundargarh District, Odisha

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Abstract

Indigenous food systems represent an important repository of biodiversity, traditional ecological knowledge, and cultural heritage, contributing to sustainable diets and food security. The present study documented the indigenous food system, traditional food knowledge, culinary practices, post harvest preservation methods, and food related cultural traditions of the Oraon community of Sundargarh district, Odisha, India. A community based ethnographic study was conducted in eleven Oraon dominated villages using purposive sampling. Data were collected through key informant interviews, focus group discussions, participant observation, and guided transect walks, and analysed using thematic content analysis. The study documented 13 cultivated and 35 wild edible food species, comprising leafy vegetables, edible flowers, fruits, bamboo shoots, underground storage organs, seeds, and mushrooms. Twenty nine traditional dishes and diverse processing techniques, including fermentation, steaming, boiling, roasting, stir frying, and sun drying were also recorded. Traditional post harvest preservation methods and food related festivals such as Sarhul, Karma, Sohrai, and Nuakhai demonstrated the close integration of biodiversity, traditional ecological knowledge, and cultural practices. The findings highlight that the indigenous food system of the Oraon community remains an important source of dietary diversity, household food security, and cultural identity. Documentation and conservation of these food systems are essential for preserving Indigenous knowledge and promoting sustainable food systems, biodiversity conservation, and culturally appropriate nutrition interventions.

Keywords: Indigenous food systems, traditional ecological knowledge, wild edible foods, sustainable food systems, Oraon tribe, Odisha

1. Introduction

Indigenous food systems are founded on close interactions between biodiversity, traditional ecological knowledge, culture, environment, and contribute to sustainable diets, biodiversity conservation, climate resilience, and nutrition security ^[1, 2, 3]. Traditional ecological knowledge regulates seasonal harvesting, species selection, and sustainable resource management, thereby supporting both ecosystem conservation and dietary diversity ^[1, 3, 4]. Indigenous foods are also recognised as valuable sources of dietary fibre, vitamins, minerals, antioxidants, and other bioactive compounds that can improve diet quality and help address micronutrient deficiencies ^[2, 5].

Despite their ecological and nutritional importance, Indigenous food systems are increasingly threatened by land use change, forest degradation, agricultural intensification, market integration, climate change, urbanisation, and the growing consumption of commercially processed foods. These transitions have accelerated the erosion of traditional food knowledge and reduced the use of locally available food resources, particularly among younger generations ^[1, 3, 6].

India is home to more than 700 Scheduled Tribes, each possessing distinct food cultures shaped by local ecosystems and traditional knowledge. Wild edible plants, mushrooms, fruits, tubers, leafy vegetables, bamboo shoots, and other forest resources continue to supplement household diets,

particularly during periods of seasonal food scarcity ^[7, 8]. However, systematic documentation of Indigenous food diversity and associated traditional knowledge remains limited despite its importance for biodiversity conservation and nutrition sensitive development ^[2, 9].

Odisha has one of the largest tribal populations in India, with Scheduled Tribes accounting for approximately 22.8% of the state's population and representing 62 recognised tribal communities ^[10]. Among the major tribal communities of Odisha, the Oraon tribe is predominantly distributed in the north western districts, particularly in Sundargarh. Although several studies have documented wild edible plants and Indigenous foods from tribal regions across India, fewer studies have adopted an integrated food systems perspective encompassing Indigenous food diversity, traditional ecological knowledge, culinary practices, food preservation techniques, and socio cultural dimensions of food systems ^[11, 12]. Therefore, the present study aimed to comprehensively document the Indigenous food system of the Oraon community of Sundargarh district, Odisha including food diversity, traditional food knowledge, culinary practices, post harvest preservation methods, and food related cultural traditions.

2. Materials and Methods

The study was conducted in eleven Oraon dominated villages

across the Subdega, Balisankara, and Kutra blocks of Sundargarh district, Odisha, India. A community based ethnographic approach was adopted to document the indigenous food system, traditional ecological knowledge, culinary practices, post harvest preservation methods, and food related cultural traditions of the Oraon community. Participants, including village elders, experienced women, farmers, traditional food collectors, and community leaders, were selected purposively based on their knowledge of indigenous food resources. Data were collected through repeated field visits using semi structured key informant interviews, focus group discussions, participant observation, and guided transect walks. Information on indigenous food resources, vernacular names, seasonal availability, edible parts, collection and preparation methods, preservation practices, and cultural significance was documented. Plant species were identified using standard floras and authenticated taxonomic databases, while vernacular names were verified through repeated consultations with knowledgeable community members. Qualitative data were analysed using thematic content analysis, and findings were triangulated across different data sources to enhance credibility. Prior informed verbal consent was obtained from all participants, confidentiality, anonymity, and respect for community ownership of Indigenous knowledge were maintained throughout the study.

3. Results and Discussion

3.1 Indigenous Food Diversity

The Oraon community possesses a rich and diverse indigenous food system comprising both cultivated and wild food resources, as given in Tables 1 and 2. A total of 13 cultivated and 35 wild edible food species were documented. Cultivated foods included six leafy vegetables, two edible flowers, two fruits, and five underground storage organs i.e, tuber and corm whereas the wild food resources comprised leafy vegetables, edible flowers, fruits, bamboo shoots, underground storage organs, edible seeds, and mushrooms. Leafy vegetables constituted the largest food group and were predominantly available during the monsoon season, while fruits were mainly harvested during summer, rhizome and tubers during winter and throughout year, indicating a well developed seasonal food calendar. The wide diversity of cultivated and forest derived foods reflects the continued dependence of the Oraon community on surrounding ecosystems for household food security and dietary diversity. Similar dependence on wild edible resources has been reported among the Baiga, Gond, Kol and Oraon communities of central India ^[13], and among the Garo community of Meghalaya ^[14]. Likewise, Patro and Priyadarshini ^[15] reported that indigenous foods continue to supplement the daily diets of the Paraja community of Koraput.

Table 1: Commonly cultivated Indigenous foodstuffs

Sl. No.	Vernacular name	Scientific name	Availability Season	Edible Part
1.	Paichki Sag	<i>Colocasia esculenta</i>	Monsoon	Leaves
2.	Hidmicha	<i>Enhydra fluctuans</i>	Monsoon	Leaves
3.	Bathua Sag	<i>Chenopodium album</i>	Winter	Leaves
4.	Gunduru Sag	<i>Alternanthera sessilis</i>	Throughout the year	Leaves
5.	Lairta Sag	<i>Corchorus capsularis</i>	Monsoon	Leaves
6.	Benga Sag	<i>Centella asiatica</i>	Monsoon	Leaves
7.	Gangei	<i>Melastoma malabathricum</i>	Winter	Flowers and fruits
8.	Kudurum	<i>Hibiscus sabdariffa</i>	Winter	Fruits
9.	Lal Kanda	<i>Ipomoea batatas</i>	Winter	Tuberous root
10.	Aru Kanda	<i>Manihot esculenta</i>	Winter	Tuberous root
11.	Paichki Kanda	<i>Colocasia esculenta</i>	Winter	Corm
12.	Genthi Kanda	<i>Dioscorea bulbifera</i>	Winter	Tuber
13.	Oluakanda	<i>Amorphophallus paeoniifolius</i>	Winter	Corm

Table 2: Commonly collected wild foods

Sl. No.	Vernacular name	Scientific name	Availability Season	Edible Part
1	Sunsunia Sag	<i>Oxalis corniculata</i>	Monsoon	Leaves
2.	Chakar Sag	<i>Senna obtusifolia</i>	Monsoon	Leaves
3	Chakunda Sag	<i>Senna tora</i>	Monsoon	Leaves
4	Madaranga Sag	<i>Celosia argentea</i>	Monsoon	Leaves
5	Barada Sag	<i>Bauhinia purpurea</i>	Summer	Leaves
6	Kalama Sag	<i>Ipomoea aquatica</i>	Monsoon	Leaves
7	Khada Sag	<i>Amaranthus viridis</i>	Throughout the year	Leaves
8	Pitagama Sag	<i>Glinus oppositifolius</i>	Monsoon	Leaves
9	Baunsa Karadi	<i>Dendrocalamus strictus</i>	Monsoon	Shoots
10	Mahua	<i>Madhuca longifolia</i>	Spring	Flowers and fruit
11	Kendu	<i>Diospyros melanoxylon</i>	Summer	Fruits
12	Kusum	<i>Schleichera oleosa</i>	Summer	Fruits
13	Bhalia	<i>Semecarpus anacardium</i>	Summer	Fruits
14	Khajuri	<i>Phoenix sylvestris</i>	Summer	Fruits
15	Amla	<i>Phyllanthus emblica</i>	Winter	Fruits
16	Jamukoli	<i>Syzygium cumini</i>	Summer	Fruits
17	Panasa	<i>Artocarpus heterophyllus</i>	Summer	Fruits, seeds
18	Chara Koli	<i>Buchanania lanzan</i>	Summer	Fruit
19	Dumuri	<i>Ficus racemosa</i>	Summer	Fruit
20	Bela	<i>Aegle marmelos</i>	Summer	Fruit

21	Bana Khajuri	<i>Phoenix acaulis</i>	Summer	Fruit
22	Palua	<i>Curcuma angustifolia</i>	Winter	Rhizome
23	Soronda Kanda	<i>Dioscorea oppositifolia</i>	Winter	Tuber
24	Kasha Kanda	<i>Dioscorea glabra</i>	Winter	Tuber
25	Mitni Kanda	<i>Dioscorea pentaphylla</i>	Winter	Tuber
26	Kulia Kanda	<i>Dioscorea bulbifera</i>	Winter	Tuber
27	Bana Haladi	<i>Curcuma aromatica</i>	Throughout the year	Rhizome
28	Siali Beeja	<i>Bauhinia vahlii</i>	Summer	Seed
29	Kusumi Tel	<i>Schleichera oleosa</i>	Summer	Seed
30	Ruguda	<i>Astraeus hygrometricus</i>	Monsoon	Mushroom
31	Sal Chhatu	<i>Russula sp.</i>	Monsoon	Mushroom
32	Dhingri Chhatu	<i>Pleurotus ostreatus</i>	Monsoon	Mushroom
33	Bali Chhatu	<i>Agaricus sp.</i>	Monsoon	Mushroom
34	Humo Chhatu	<i>Termitomyces heimii</i>	Monsoon	Mushroom
35	Thanti Chhatu	<i>Termitomyces microcarpus</i>	Monsoon	Mushroom

3.2 Traditional Culinary Practices

The Oraon community prepares a wide variety of traditional dishes using locally available cultivated and wild food resources. Staple foods such as Mandia Jau, Basi Pakhala, Mahua Peja, and Makka Jau are prepared through soaking, fermentation, boiling, and slow cooking. Pulse based dishes include Kolatha Dali, Chana Dali Saga, and Biri Thuka, while wild leafy vegetables, bamboo shoots, and colocasia leaves are commonly boiled, steamed, stir fried or fermented before consumption. Wild tubers are generally boiled, kusum seeds

are roasted, and forest fruits are processed into relishes and soups. Animal source foods, including fish, meat, crabs, freshwater shrimp, and red weaver ants (Kai Chutney) are prepared by roasting, boiling, or cooking in lightly spiced gravies. Wild mushrooms are usually stir fried or boiled and mashed with mustard oil and spices. Festival dishes such as Dubhuni Roti, Dhukuli, Dana, and Thekua Roti are prepared using traditional methods and locally available ingredients, reflecting the rich culinary heritage and cultural identity of the Oraon community.

Table 3: Traditional culinary practices of Oraon Community

Sl. No	Traditional dish	Main Ingredients	Cooking Method
Staple Dishes (Cereal and millet based)			
1	Mandia Jau	Finger millet, broken rice	Fermentation and boiling
2	Basi Pakhala	parboiled rice, curd, spices	Fermentation and boiling
3.	Mahua Peja	Mahua flowers, millets	Sun drying and simmering
4.	Makka Jau	Maize cob, buttermilk	Pounding and boiling
Pulse based dishes			
1.	Kolatha Dali	Horse gram, Dried mango, spices	Sun drying and boiling
2.	Biri Thuka	Black gram, fermented rice water (<i>Kanji</i>)	Steaming and boiling
3.	Chana Dali Saga	Bengal gram dal, wild amaranth leaves, spices	Boiling and simmering
Green leafy vegetable based dishes			
1.	Saga Bhaja	Foraged leaves, Garlic, Mustard oil	Sauteing
2.	Danka Saga Bharta	Wild water spinach, spices, Mustard oil	Steaming
3.	Sunusunia Saga fry	Sunusunia sag, Mustard oil, Garlic	Shallow frying
4.	Benga Saga Pitau	Benga saga, Parboiled rice	Sauteing
Roots and Tuber based dishes			
1.	Matikanda Sejha	Forest yams/tubers	Boiling
2.	Paichki Patra Poda	Taro leaves, Black gram	Steaming/Roasting
Shoots and seed based dishes			
1.	Karadi Bhaja	Tender bamboo shoots, spices	Soaking and Sauteing
2.	Kardi Kanji	Bamboo shoot, Fermented rice water, Mustard oil	Soaking, fermentation and boiling
3.	Tentuli Khatta	Tamarind pulp, Jaggery, spices	Simmering
4.	Amba Sula	Dried raw mango, spices	Sun drying and boiling
5.	Kusuma Manji Bhaja	Kusuma Manji	Roasting
Mushroom based dishes			
1.	Koyeli Chhatu Bharta	Tree bark mushroom, spices	Sauteing
2.	Chhena Chhatu Bhaja	Native termite-hill mushrooms, spices, Oil	Sauteing
Animal food based dishes			
1.	Kai Chutney	Red weaver ants, spices	Grinding
2.	Patra Poda Mansa	Country poultry/game, spices	Grilling
3.	Machha Patrapoda	Small stream fish, spices, Mustard oil	Roasting
4.	Kankada Jhol	Fresh rice-field crabs, spices	Simmering
5.	Jhunga Jhol	Small brook shrimp, spices, Mustard oil	Simmering
Festival Dishes			
1.	Dubhuni Roti	Rice, Dal, Oil, Sugar	Soaking and deep fat frying
2.	Dhukuli	Rice, Dal, Jaggery	Soaking and steaming
3.	Dana	Rice, Dal	Boiling
4.	Thekua Roti	Rice powder, Jaggery, Oil	Boiling, simmering and deep fat frying

Comparable culinary traditions have been reported among several Indigenous communities in India and are increasingly recognised for enhancing nutritional quality while preserving cultural identity [7, 8].

3.3 Traditional Post Harvest Preservation Practices

The Oraon community employs traditional preservation methods such as sun drying, fermentation, and dehydration to extend the availability of seasonal foods and enhance household food security. Bamboo shoots are sliced, sun dried, and stored for later use, while leafy vegetables such as *Enhydra fluctuans*, *Corchorus capsularis*, and *Senna obtusifolia* are blanched, sun dried, powdered, and stored in airtight containers. Seasonal foods including mahua flowers, bitter gourd, and tomatoes are also preserved through sun drying, reflecting the community's traditional ecological knowledge and sustainable food management practices. Similar seasonal food calendars and preservation practices have been documented among Indigenous communities across central and eastern India, where traditional processing techniques enhance food availability during agricultural lean periods [11, 13].

3.4 Traditional Ecological Knowledge

The findings highlight the extensive traditional ecological knowledge maintained by the Oraon community regarding species identification, edible parts, collection sites, harvesting seasons, processing methods, preservation techniques and culinary uses. Comparable observations have been reported globally, where Indigenous knowledge systems contribute significantly to biodiversity conservation, sustainable resource management and climate resilience [1, 3]. However, rapid socio economic changes, changing dietary preferences and increasing dependence on market foods pose significant challenges to the continuity of this knowledge, a trend similarly reported among the Paraja community of Koraput [15].

3.5 Indigenous Foods, Festivals and Cultural Heritage

Beyond their nutritional importance, indigenous foods constitute an integral part of the cultural identity of the Oraon community. Festivals like Nuakhai directly celebrate seasonal food security, where farming families offer their first harvests to ancestors and deities before cooking communal meals with self grown crops. This culinary reverence extends to livestock management during Sohrai, a festival where domestic animals are ritually bathed, anointed with kujuri oil, and fed highly nutritious, specially prepared meals of boiled rice, lentils, and steamed foods served in traditional bamboo baskets. Furthermore, preservation techniques such as cultivating germinated grains (jawa) during Karma or gathering forest flowers and wild bounty during Sarhul highlight how their traditional beliefs regulate the sustainable foraging and usage of forest resources before the start of the new farming cycle. Ultimately, these spiritual celebrations reinforce a food system rooted in biodiversity, biodiversity resource conservation, and communal sharing. These findings support previous studies showing that Indigenous food systems preserve not only biodiversity and dietary diversity but also cultural continuity, social cohesion and community resilience [5, 11].

4. Conclusion

The present study highlights the diversity of cultivated and wild edible food resources, traditional culinary practices, post harvest preservation methods, and food related cultural traditions. The findings demonstrate that the indigenous food system of the Oraon community is deeply rooted in traditional ecological knowledge and represents a sustainable interaction between local communities and their surrounding environment. Therefore, systematic documentation, conservation, and promotion of indigenous food resources will not only safeguard valuable traditional knowledge and cultural identity but also contribute to sustainable food systems, biodiversity conservation, and improved food and nutrition security in alignment with the Sustainable Development Goals.

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