

Traditional knowledge and use of tropical roots and tubers by indigenous tribes of India: A review

Sheela Immanuel, D Jaganathan* & Prakash P

Section of Extension and Social Sciences, ICAR-Central Tuber Crops Research Institute, Sreekariyam,
Thiruvananthapuram 695 017, Kerala, India

*E-mail: djaganathn@gmail.com

Received 19 September 2025; revised 17 April 2026; accepted 08 July 2026

Tribal communities play a crucial role in safeguarding India's genetic resources. They mostly live in forest areas, hills and islands. Tuber crops are cultivated by tribes and are used as food and for medicinal needs. The conventional food systems of indigenous tribes are treasures of knowledge passed on to generations. India is adorned with diversified variety of edible plants which supports the food basket of the tribes and help alleviate food scarcity. The major tuber crops cultivated in tribal areas are cassava, sweet potato, elephant foot yam, yams, taro and also minor tubers like Chinese potato, arrowroot etc. Tribes rely heavily on tubers as it provides cheap source of carbohydrate and energy in addition to fibre, calcium, iron, and vitamins. Tuber crops have antioxidant, hypoglycemic, hypocholesterolemic, antimicrobial and immunomodulatory effects. Tubers are effective against dysentery, diarrhoea, piles, wounds, injuries, and other stomach related issues. This review article gives a comprehensive overview of how different tribal communities across India utilize these tuber crops in their daily lives, highlighting their significance beyond basic nourishment.

Keywords: Indigenous tribes, Nutritional security, Roots and tuber crops, Traditional knowledge, Tribal communities

IPC Code: Int Cl.²⁶: A23L 19/10

In India, the tribal communities inhabit deep forest and hilly regions and they are mostly self reliant, rarely relying on the outside world. Tribes in India were more extensively documented and recognized during the period of British colonial expansion into the country's diverse geographical regions¹. Historically, tribes occupy in and around the forest and were highly depended on them for primary source of income and food. The ecosystem around them influenced their collective value systems, creativity, belief and social system. The tribes live in isolation and possess their own way of living, tradition and culture². Their health management was through traditional healing practices, and taboos with medicinal plants as sources of medicine. They have typical houses, food habits, resource utilization pattern, coping mechanism and socialization processes. The ecosystem in which they are living provides them a sense of identity, unity and sense of resistance. In the process of growth, they became vulnerable in various frontiers.

Agriculture is their main stay and they cultivate the crops conventionally giving low yields, with subject to vagaries of weather. The tribals have unique societal culture and traditions and with natural food systems³. The traditional food systems of indigenous communities embody a rich repository of knowledge that has been transmitted across generations⁴. Traditional foods possess more essential nutrients than other foods⁵. Traditional use of medicinal plants is the highest known in any country among other existing flora⁶. The World Health Organisation, reports that around 80% of the global population uses conventional medicine to treat illnesses⁷.

India has a greater number of wild edible plants and many of them are consumed locally by the tribes. Roots and tubers were associated to human evolution and very much linked to human survival, existence, and socio-economic history⁸. Tuber crops form one among the major foods of the tribals. Wild edible tuber species are eaten by tribes during food scarcity.

India possesses substantial genetic resources of tropical tuber crops and holds genetic diversity particularly aroids, yams and other minor tuber crops⁹. Edible tubers enrich the diet of the people

*Corresponding author

besides medicinal properties¹⁰. Root and tuber crops are cultivated extensively across several states of India. In tribal regions, the predominant crops comprise cassava, sweet potato, taro, yams, and elephant foot yam, along with lesser-known tubers such as Chinese potato, arrowroot etc.

Minor tubers are used to treat piles, diarrhoea, vomiting, rheumatism, headache, epilepsy, leprosy, ulcers, jaundice and dysentery. It can also be used as laxative, galactagogue, stimulants, tonics, carminatives, and expectorants. Root decoction of *Ipomoea carnea* is known to lower blood pressure. In Kerala and most of the states, the planting season for tuber crops traditionally begins around the time of the *Sivarathri* festival, which is observed during February–March¹¹.

Materials and Methods

To compile the review, a narrative synthesis approach was used to examine the traditional knowledge and use of tropical roots and tubers by indigenous tribes of India. The methodology was designed to ensure a comprehensive and systematic assessment of the available literature. Relevant literature was identified through searches conducted in major electronic databases. Additional sources were retrieved from institutional repositories, conference proceedings, and other publications. The search covered the period from 1911 to 2022 but still earlier seminal works were also included. The key words used were tuber crops, traditional knowledge, indigenous knowledge, medicine, food, and tribes. Boolean operators (AND/OR) and truncation were applied to refine the search. Studies were included based on their focus on traditional knowledge systems concerning the utilization of tuber crops, the provision of empirical, ethnographic, or documented evidence, and their relevance to social systems across diverse regions. The preliminary search identified nearly 140 records. Following relevance screening, 120 articles were selected for detailed full-text assessment. After applying the inclusion criteria, a total of 77 publications were incorporated into the review. Information from the selected studies was systematically compiled into a data matrix containing details such as authorship, publication year, study location, crop type, indigenous practices examined, research methodology, and major findings. Priority was given to peer-reviewed studies and well-documented ethnographic works.

Results and Discussion

Tribal communities in India

Tribal communities are predominantly associated with forests, hilly terrains, and other remote regions, where they maintain distinct lifestyles along with unique cultural and religious practices. Historically, tribal societies relied primarily on hunting and gathering for their subsistence. However, increasing population pressure and competition for natural resources have led to a gradual transition towards settled agriculture as a source of livelihood¹². Traditionally, tribal economies have been based on hunting, gathering, and fishing activities, either independently or in combination with shifting cultivation practices¹³. Further, tribal communities being small groups have traditional values, with limited societal relationships¹⁴. Tribal societies are compact and self-sufficient. The tribe consists of a group who occupy a territory who has similar culture and common interest¹⁵. The tribe is defined as ‘a social group with territorial relationship, endogamous practices, governed by tribal leaders connected by language or dialect, maintaining social distance from other tribes, and adhering to tribal traditions, beliefs and customs¹⁶’.

As per 2011 Census, the population of Scheduled Tribe in India was 10.45 crore, 8.6 % of the total population of the country and 11.3% of the population in rural area. Of this, 5.25 crore were male and 5.20 crore were female. The growth rate among female STs was 25%, compared to 23% for males¹⁷. More specifically, India has a tribal population of approximately 67.6 million, with women accounting for nearly half of this population¹⁸. India, one of the biggest low-middle income country, having 8.6% of tribal population¹⁹ and India has the second largest tribal population in the world. Although tribal communities constitute a relatively small proportion of India's population, they possess considerable cultural importance and contribute significantly to the country's social and cultural diversity²⁰. According to the 2011 Census, the literacy rate among Scheduled Tribes (STs) was 59 per cent, which was substantially lower than the national average literacy rate of 73%²¹. Using secondary data sources, educational institutions and hospitals are yet inaccessible to the tribes²². The challenges faced by the tribal population are low-income levels, illiteracy, unemployment, and the persistence of traditional cultivation practices. Limited access to education, inadequate healthcare,

high infant mortality rates, low participation in wage employment, insufficient opportunities for self-employment, and weak organizational and leadership capacities are the major factors constraining the economic empowerment of tribal women²³. Furthermore, a substantial proportion of agricultural labourers in India belong to Scheduled Castes and Scheduled Tribes²⁴. Tuber crops such as yams, taro, and sweet potato constitute an important component of the daily diet of tribes including the Khanda of Odisha, the Kadar and Mudhuvars of Tamil Nadu, and the Mannan and Muthuvas of Kerala.

Use of tuber crops by tribal farmers across different regions of India

Southern region

Cassava serves as an important dietary staple for many tribal communities in Tamil Nadu. Two distinct varieties of cassava are traditionally recognized, namely *Mullu Valli kizhangu* and *Vethala Valli kizhangu*. Cassava is valued not only as a food source but also for its various medicinal and therapeutic properties. These roots have formed an integral component of the traditional food system of the Paliyar community for many generations. Cassava is used traditionally to treat fatigue, dehydration with diarrhoea, sepsis, and to induce labour. The leaves and roots of cassava are commonly consumed as part of the diet. Malayali is one of the 36 scheduled tribes of Tamil Nadu constituting around 54% of the total tribal population in Kolli hills. In this region, cassava is a popular cash crop that constitutes 70% of crop production with over 11,129 ha area under cultivation²⁵. Cassava was traditionally found as wild plant in forests or cultivated in homesteads in the Kolli Hills before becoming a cash crop during 1990s²⁶.

The tubers of *Amorphophallus paeoniifolius* (Dennst.) Nicolson, commonly referred to as *Karunai kizhangu* or *Senai kizhangu*, is employed in traditional healthcare practices in the Kolli Hills for managing respiratory ailments such as bronchitis and asthma. *Amorphophallus campanulatus* Blume (*Kattu karunai*) is employed for managing tumours and promoting postnatal recovery in women. In indigenous medicinal practices, *Amorphophallus sylvaticus* Kunth (*Sepang kizhangu*) is employed to alleviate cough and address conditions associated with sexual debility. *Dioscorea oppositifolia* L. *Malaiyan kizhangu* (or) *pavalakodi*, the tubers are powdered, and mixed with milk and it is given for

itching. Decoctions prepared from the tubers of *Dioscorea esculenta* Burk. (*Mulli kizhangu* or *Siruvalli kizhangu*) are traditionally used for the treatment of urinary retention. *Dioscorea alata* L. (*Rasavalli kizhangu*) is widely utilized as a food crop, with its tubers commonly prepared as sabji and consumed for their traditional laxative and vermifuge effects. The powdered rhizome of *Drynaria quercifolia* (L.) J. Smith (*Attukal kizhangu*) is also employed in traditional medicine as an anthelmintic remedy²⁷.

Unexploited medicinal and edible tubers from 42 tribal settlements in the Pechiparai social forest in Kanyakumari, Tamil Nadu are reported²⁸ and documented the traditional knowledge of medicinal tuber crops of those tribes²⁹. Several bioactive constituents have been identified in cassava roots, including cyanogenic glucosides (linamarin and lotaustralin), non-cyanogenic glucosides, hydroxycoumarins such as scopoletin, terpenoids, and flavonoids, highlighting the crop's potential nutritional and medicinal value³⁰.

The Malabar region of Kerala is recognized for its rich diversity of yams and taro, which are maintained in family farming systems and occur in wild or semi-wild habitats. These crops play a crucial role in ensuring nutritional security to tribal populations as emergency food resources during seasonal and acute food shortages³¹. Yams and taros are still the staple foods for marginalised communities. A study was conducted to document the distribution of wild tuber crop species and the conservation practices adopted by the Kattunaikka tribe, one of the predominant indigenous communities inhabiting the Western Ghats³¹. The Wayanad district of Kerala harbours approximately 21 species of *Dioscorea*, underscoring its rich yam diversity. Species such as *D. hamiltonii*, *D. belophylla*, *D. oppositifolia*, and *D. pentaphylla* var. *pentaphylla* are widely consumed as food. In addition to their dietary importance, these yams serve as valuable medicinal resources for tribal communities such as the Kadar, Paniyar, Kattunaickar, and Malapandaram, highlighting their role in sustaining indigenous food systems and traditional healthcare practices.

The Cholanaikkan tribes of Nilambur valley and Kattunaikkan of Wayanad rely on root tubers and green leaves in their diet. The Kurumbar of Attappady also gathers tubers for food. Mostly the tribes use tubers to manage the lean periods and use them in

therapeutic recipes. Tubers used by the Cholanaickan, namely *Mothhakka* and *Koyanna* require peeling, chopping and immersion in running water for at least 12 hours. The non fibrous tubers such as *Pathivenni*, *Solavenni*, *Koyana* and *Errani* are preferred over fibrous ones like Noorai, Kavala. All tubers except *Solavenni* are considered 'cold food'. *Solavenni* is valued as equivalent to meat. The Malvettuvan tribe of Kasaragod district uses tubers like *Ketha kizhangu*, *Perimuthala*, *Narakizhangu*, *Chembravally* for treating certain diseases. The Uttara Kannada and Mysore in Karnataka represent significant hotspots of tuber crops diversity, possessing a wealth of cultivated varieties and wild relatives³².

Tuber growers reported that colocasia is good for maintaining blood pressure, whereas Chinese potato helps in digestion at the time of pregnancy. Arrowroot is considered useful for alleviating fever, dysentery, and fatigue, whereas *Bili Suli Gedde* is believed to help prevent leucorrhoea in women. Elephant foot yam is also widely recognized for its role in the traditional treatment of haemorrhoids³². *Dioscorea* are consumed maximum either as raw or after cooking, roasting or frying. It was also observed that both cultivated and wild tubers form alternative staple foods for their lives⁹.

Joida taluk of Uttara Kannada is a home for the 'Kunbi' tribes and the tuber crops being the livelihood. For welcoming guests, they offer boiled greater yam³³. The tribes Kanikkar use a lot of wild yams for consumption as that of the Kunbi tribes in Karnataka³⁴. Boiling the tubers was reported to reduce the acidity and anti-nutrients present in the tuber³⁵.

The minor tubers are used for curing many ailments like hypertension, diabetes, paralysis, fever, piles, cough, etc. The tubers Pirashi, Chinese potato and arrowroot were perceived to relieve weakness and give strength, probably due to high carbohydrate. Studies carried out across the globe have also indicated similar findings³⁶.

Andhra Pradesh is nestled to 33 tribal communities. In the Alluri Sitaram Raju district, tribes generally consume boiled tubers of *Alocasia fornicata*. *Amorphophallus paeoniifolius* (Dennst.) Nicolson is eaten as curry; *Colocasia esculenta* (L.) Schott. & Endl. is used as leafy vegetable. Boiled tubers of *Dioscorea bulbifera* L., *Dioscorea oppositifolia* L., *Dioscorea pentaphylla* L., *Dioscorea tomentosa* Spreng. are also eaten. Tubers of certain species are cooked and eaten as curries and also used as a

substitute for rice during food scarcity. Species like *Dioscorea bulbifera*, *Dioscorea oppositifolia*, *Dioscorea pentaphylla*, *Dioscorea tomentosa* and *Tacca lentopetaloides* are nutritionally valuable and widely used as food³⁷.

Central region

Madhya Pradesh is renowned for its rich diversity and its long-standing tradition of utilizing plant-based products for healthcare and therapeutic purposes. Hoshangabad district is predominantly inhabited by the Korku and Gond tribes³⁸. The vernacular name of *Alocasia indica* (Roxb.) is *mana* which is used by the tribes for treating inflammation and arthritis. The tuber is crushed into a smooth preparation and placed over the affected body part overnight for a period of five to six days. *Amorphophallus bulbifera* (Roxb.), with its local name *Van Makka*, is used for wound treatment. *Amorphophallus companulatus* Blume with the local name *Gimmi Kand* is used to treat piles. Traditional healers utilize *Curcuma decipiens* Dalzell (Jangli Haldi) for addressing skin-related ailments. The remedy involves the topical application of a mixture prepared from a small amount of turmeric powder and kala jeera. *Curcuma angustifolia* Roxb. (Tikhur) is used for treatment of jaundice. *Curculigo orchoides* Gaertn with the local name *Kali musli* is used for diarrhoea. *Dioscorea alata* L. (*Bhainsdhate*) is used for treating fungal skin diseases. *Dioscorea esculenta* (Lour.) (*Pindi Pindalu*) is believed to promote weight gain. *Dioscorea pentaphylla* L. (*Bhusa Kand*)³⁹ is used to treat skin diseases. The medicinal uses of these plants by the Korku and Gond tribes have been verified from Indian Ayurvedic literatures⁴⁰⁻⁴².

Dioscorea bulbifera has long been recognized in traditional Indian healthcare practices for the management of several ailments, including diarrhoea, dysentery, scrofula (struma), throat disorders, and tuberculosis⁴³. Tribal communities inhabiting the Satpuda Hills also employ this species as a remedy for intestinal worm infestations⁴⁴. Among the Bhoja people of Dehradun in Uttarakhand, the tubers are consumed orally to alleviate diarrhoeal and dysenteric conditions. A preparation made from roasted and mashed tubers mixed with salt is traditionally administered to relieve cough. Furthermore, crushed twigs and young shoots are applied to the scalp as a treatment for dandruff⁴⁵. The leaves are utilized in indigenous medicine for managing various skin ailments, while consumption of raw tubers is believed to stimulate appetite and improve food intake⁴⁶.

Eastern region

The tribal farming systems of Chhattisgarh, Jharkhand, and Odisha prominently feature root and tuber crops such as sweet potato, cassava, taro, yams, and elephant foot yam⁴⁷. *Dioscorea* species available to the tribes have nutritive and antioxidant content not only enrich their diet but also make them ethnomedicinally important^{48,49}. The Mankirdia tribe traditionally harvests the tubers of *Dioscorea bulbifera* L. and *Dioscorea pentaphylla* L. for use in managing skin ailments, relieving abdominal discomfort, and regulating fertility⁵⁰. Koraput region of Odisha, is an important centre of biological diversity⁵¹. *Tacca leontopetaloides*, *Alocasia macrorrhizos*, *Amorphophallus campanulatus*, *Amorphophallus paeoniifolius*, and *Dioscorea glabra*, serve dual roles as food sources and medicinal resources. Boiled cassava tubers are consumed to alleviate digestive disorders such as indigestion. The juice extracted from arrowroot is employed in the treatment of indigestion, diarrhoea, and dysentery. A paste prepared from *Ipomoea mauritiana* is applied externally to manage skin problems and as a traditional remedy for snakebite. Likewise, the tubers of *Ipomoea paniculata* are utilized to promote lactation and improve digestion.

In traditional healthcare systems, *Dioscorea tomentosa* J. Koenig. ex Spreng., (Targai Kanda), is valued for its boiled tubers, which are consumed as a restorative tonic to enhance physical strength. The tubers of *Dioscorea wallichii* Hook. f. (Cherenga Kanda) is traditionally administered for alleviating stomach ailments. In the case of *Amorphophallus campanulatus* Olua, a paste prepared from the tuber is applied externally as a remedy for piles. The tuber paste of *Dioscorea oppositifolia* L. (Pit Kanda) is used topically to manage swelling, joint discomfort, rheumatic conditions, and envenomation caused by snake or scorpion bites. Tribal communities also consume several *Dioscorea* species as dietary supplements. The stem juice of *Alocasia macrorrhiza* (L.) Donn is believed to relieve scorpion and nettle stings. The rhizome of *Alocasia indica* (Roxb) Schott act as mild laxative and diuretic⁵².

Dioscorea species have long been valued in traditional healthcare systems and are also recognized as important sources of steroidal precursor compounds⁵³. The medicinal use of *Dioscorea* species dates back to around 2000 BC⁵⁴. Studies have further shown that the tubers of *Dioscorea bulbifera* L. can be processed to improve their palatability and have

traditionally served as an emergency food resource during periods of adverse climatic conditions and food scarcity⁵⁵. *Amorphophallus dubious* Blume, *A. sylvaticus* and *A. paeoniifolius* are used in the treatment of piles, diarrhoea, rheumatism, and other ailments. *Coleus forskohlii* (Wild.) Briq, *C. amboinicus* Lour are used as cardio tonic, remedy for metastatic conditions, thrombosis and urinary diseases etc.

North Eastern region

In the northeastern states, tuber crops are widely cultivated and consumed by tribal communities, who mainly grow traditional varieties⁵⁶. Tribal women belonging to the Pnar of Jaintiya Hills, the Garo of Meghalaya, and the Naga of Nagaland prepare a diverse range of ethnic foods using tubers, leaves, and other edible plant parts⁵⁷. Taro powder is traditionally used for joint pain, while elephant foot yam powder is commonly employed for piles and gastrointestinal disorders. Several *Dioscorea* species occurring in the Garo Hills of Meghalaya form an important part of the local diet. Tender leaves of tuber crops are also consumed, and the tubers are often cooked with fish and meat. Sweet potato and cassava tubers, taro corms, and young petioles are chopped, boiled, and fed to pigs⁵⁸. Cassava, taro, and *Dioscorea* are commonly cultivated in jhum (shifting cultivation)⁵⁸. About 28 *Dioscorea* species and 25 varieties have been reported from the Garo Hills.

Cultivation of tuber crops is a common practice in both homestead gardens and jhum fields under mixed-cropping systems. Taro leaves are cooked as vegetables, while the tender shoots are sliced, sun-dried, and stored for use during lean seasons. Sweet potato and cassava are generally consumed after boiling or roasting over fire. Elephant foot yam serves both as a food source and a medicinal plant, and dried yam rings are prepared for use during the off-season. The crop is traditionally utilized for managing ailments such as piles, dysentery, and digestive disorders⁵⁹.

Boiled tubers of sweet potato and taro, either fresh or dried, are commonly consumed in the morning and evening. Their diet includes fresh plant parts as well as partially processed products derived from tuber crops. During the growing season, tender leaves, shoots, and petioles of taro are widely eaten, whereas preserved and semi-processed products are utilized during periods of food scarcity. In the West Garo Hills, cassava tubers are processed into chips and

flour. Nearly all parts of sweet potato and taro are used for consumption. The petioles of various taro types are prepared either fresh or dried and are regarded as a popular traditional delicacy in Meghalaya⁶⁰.

The Naga tribes, belonging to the Indo-Mongoloid ethnic group, constitute a major proportion of the population of Nagaland. Semi-processed tuber products such as Teangwan and Tunggan (dried taro tubers) and Penkhen Kheh (cassava flour) substitute nearly 55% of cereal consumption. Tender leaves, shoots, and petioles of taro are regularly consumed, along with preserved tuber products during the lean season⁶¹. The rich taro diversity of Mon district and its significance in the food culture of the Konyak community was highlighted^{62,63}. Tuber-based foods blended with soybean among the Ao tribe of Nagaland was documented⁵⁷ and the preparation of taro-based foods in Manipur⁶⁴.

Tuber crops are widely cultivated and consumed in Tripura by both tribal and non-tribal communities. The tubers and tender petioles of elephant foot yam are used as food and also valued for their traditional medicinal properties. Boiled elephant foot yam is often mashed to prepare local dishes such as 'Bata' or 'Bharta'. The tender emerging leaf sprouts enclosed within the spathe of wild elephant foot yam, locally known as Dakadoma, are commonly deep-fried after removing the spathe and coating them with gram or rice flour batter. Tender petioles at the mature stage are chopped and cooked with dried fish. Highly acrid tubers are processed by slicing, boiling with common soda for 10-15 min, shade-drying, and then cooking the pieces with dried fish and spices.

Swamp taro rhizomes are cut into slices dipped into besan flour paste and deep fried and called 'Kochu Bhaja'. The petioles of swamp taro are boiled, finely chopped, and mashed before being cooked with roasted seeds of *Dolichos*, peanuts, spices, and occasionally roasted small prawns to prepare a traditional dish known as 'Kochu Saag'. Taro corms are commonly prepared with fish or dried fish and are locally referred to as 'Charar Dal'. Taro leaves are also used in the preparation of 'Saag' with dried fish, while another dish, known as 'Kochu Patar Tak' or 'Ambal', is made by cooking the leaves with tamarind. The flower spathes of cultivated and semi-wild taro are cut into pieces after removal of the spadix and cooked with dried fish. The highly acrid rhizome of Bish Kochu (giant taro) is usually kept under shade for about a week before consumption⁶⁵.

Both cultivated and wild forms of elephant foot yam are used in the management of cough, piles, asthma, and for blood purification. Various yam species are employed in folk medicine for treating fever, cough, headache, gonorrhoea, leprosy, abdominal disorders, and constipation. Boiled tubers of aerial yam are consumed to control dysentery, while leaf paste is applied externally to burns and boils. The sap extracted from taro petioles is used on wounds to promote blood clotting and is also believed to help alleviate fever and cough. Taro is additionally utilized for treating piles and tonsillitis, and its boiled leaves are consumed as a source of essential minerals. Swamp taro is traditionally used in the treatment of liver ailments, ulcers, and rheumatic conditions. A paste prepared from mashed giant taro rhizomes is applied to painful areas affected by gout and rheumatism and is also considered useful against oedema and constipation. Numerous reports have highlighted the traditional healthcare applications of these tuber crops⁶⁶⁻⁶⁹. The use of these in ethnomedicine by tribal healers may be attributed to abundance of antioxidants and other phytochemicals, which exhibit significant antibacterial activity⁷⁰⁻⁷².

Islands regions

The Onge represent one of the few remaining hunter-gatherer communities inhabiting the Andaman and Nicobar archipelago. They are regarded as the most recent indigenous settlers of these islands and are believed to possess racial affinities with populations of Southeast Asia⁷³.

The Nicobaris conserve edible species of *Colocasia* sp., *Dioscorea* sp., *Tannia* sp., and *Amorphophallus* sp. *Dioscorea alata* is among the principal tuber crops consumed year-round by the tribes. Local cultivars such as 'Achin' and 'Paltu' of *Dioscorea alata* and 'Tumik' of *Dioscorea esculenta* are particularly preferred by the Nicobari tribes¹⁰. The tubers are commonly eaten in boiled or fried forms, while dietary requirements for carbohydrates, fats, and proteins are supplemented through foods such as boiled tubers, pandanus cake, rice cake, and coconut⁷⁴.

Yams are consumed in diverse forms, including fresh tubers, cooked soups, and flour-based preparations. The tubers are known to contain a range of bioactive compounds and essential vitamins, including carotenoids and tocopherols^{75,76}. The leaves, young shoots and corms of taro are used as vegetable. Sweet potato is consumed as they are tasty and have plenty of starch⁷⁷.

Conclusion

Tribal communities traditionally cultivate crops near their homes and rely on indigenous knowledge to identify edible and medicinal plants, especially wild tubers, which have long been essential for food and healthcare. Although changing food habits have influenced their diets, tubers remain valuable for nutrition and traditional medicine. Limited access to modern agricultural technology results in low productivity, making sustainable farming systems crucial. Integrating tuber crops into tribal farming can improve land productivity, income, nutrition, employment, and environmental sustainability. Documenting and scientifically validating tribal medicinal knowledge can support modern healthcare, while government interventions continue to improve tribal livelihoods and resource utilization.

Acknowledgments

The authors are thankful to the Indian Council of Agricultural Research and ICAR-Central Tuber Crops Research Institute for their support.

Author Contributions

The paper conceived and designed by SI, performed the literature review by DJ. The manuscript was written by SI, DJ and PP.

Conflict of Interest

The authors declare that there is no conflict of interest.

Declaration on the Use of Artificial Intelligence

The authors declare that Artificial Intelligence (AI) assisted tools were not used for the generation, analysis, interpretation of research data, nor for drawing scientific conclusions. The authors have carefully reviewed, verified, and edited the article and accept full responsibility and accountability for the accuracy, originality, and integrity of the manuscript.

Data Availability

The datasets and information used in this review may be accessed by contacting the corresponding author.

References

- 1 Bhukya B, The mapping of the adivasi social: colonial anthropology and adivasis, *Econ Polit Wkly*, 43 (39) (2008) 103-109.
- 2 Shrivastava D & Wadhwa S K, Globalization and its effect on indigenous knowledge, *Sci Conserv Archaeol*, 36 (3) (2018) 419-425.
- 3 Ghosh-Jerath S, Singh A, Magsumbol M S, Kamboj P & Goldberg G, Exploring the potential of indigenous foods to address hidden hunger: nutritive value of indigenous foods of Santhal tribal community of Jharkhand, India, *J Hunger Environ Nutr*, 11 (4) (2016) 548-568. doi: 10.1080/19320248.2016.1157545
- 4 Kuhlein H V, Why are Indigenous Peoples' food systems important and why do they need documentation? In: *Indigenous peoples' food systems: the many dimensions of culture, diversity and environment for nutrition and health*, Kuhnlein H V, Erasmus B & Spigelski D (Eds.), (Food and Agriculture Organization of the United Nations and Centre for Indigenous Peoples' Nutrition and Environment, Rome), (2009) 1-7.
- 5 Schuster R C, Wein E E, Dickson C & Chan H M, Importance of traditional foods for the food security of two First Nations communities in the Yukon, Canada, *Int J Circumpolar Health*, 70 (3) (2011) 286-300. doi: 10.3402/ijch.v70i3.17833
- 6 Kala C P, Dhanyani P P & Sajwan B S, Developing the medicinal plant sector in North India: Challenges and opportunities, *J Ethnobiol Ethnomed*, 2 (2006) 32. <https://doi.org/10.1186/1746-4269-2-32>
- 7 Marshall N T, *Searching for a Cure: Conservation of Medicinal Wildlife Resources in East and Southern Africa*, (TRAFFIC International, Cambridge, United Kingdom), (1998). <https://www.traffic.org/site/assets/files/9719/conservation-of-medicinal-wildlife-resources-in-east-and-southern-africa.pdf>
- 8 Ogunlakin G O, Oke M O, Babarinde G O & Olatunbosun D G, Effect of drying on proximate composition and physico chemical properties of Cocoyam flour, *American J Food Tech*, 7 (4) (2012) 245-250. DOI: 10.3923/ajft.2012.245.250
- 9 Samyadurai P, Thangapandian V & Aravindhavan V, Wild habits of Kolli Hills beign staple food of inhabitant tribes of Eastern Ghats, *Indian J Nat Prod Resour*, 3 (3) (2012) 432-437.
- 10 Edison S, Unnikrishnana M, Vimala B, Santha V Pillai, Sheela M N, *et al.*, *Biodiversity of tropical tuber crops in India*, Bulletin -7, (National Biodiversity Authority Chennai, Tamil Nadu, India), (2006) p 60
- 11 Viswanathan M B, Ethnobotanically important plants, In: *Tamil Nadu biodiversity strategy and action plan – Forest Biodiversity*, R. Annamalai (Ed.), (Tamil Nadu Forest Department, Chennai), (2004) 177-231.
- 12 Anburaja V & Nandagopalan V, Agricultural activities of the Malayali tribal for subsistence and economic needs in the mid elevation forest of Pachamalai hills, Eastern Ghats, Tamil Nadu, *Int J Agric Res Innov Technol*, 2 (1) (2012) 32-36. DOI: 10.3329/ijarit.v2i1.13992
- 13 Purkayastha N, Concept of Indian tribes: An overview, *Int J Adv Res Manag Soc Sci*, 5 (2) (2016) 1-9.
- 14 Lewis I M, Tribal society, In: *The International Encyclopedia of the Social Sciences*, Vol 16, (The Macmillan Company & The Free Press, New York), (1968) 146-151
- 15 Linton R, The study of man: An introduction, *Books by Alumni* 699, Appleton-Century, New York, (1936) p 522 <https://works.swarthmore.edu/alum-books/699>
- 16 Majumdar D N, *The Affairs of a tribe: A study of tribal dynamics*, (The Universal publishers Ltd, Lucknow), (1950).

- 17 Government of India, Census 2011. Available online: http://www.censusindia.gov.in/2011census/population_enumeration.aspx (accessed on 7 May 2014)
- 18 Nath D, Rajawat B S & Sharma R, Involvement of tribal farm women in agricultural development in Meghalaya, *Pharma Innov J*, 11 (6) (2022) 2571-2573.
- 19 Mavalankar D, Doctors for tribal areas: Issues and solutions, *Indian J Community Med*, (41) (2016) 172-176. doi: 10.4103/0970-0218.183587
- 20 Vyas N N & Mann R S, *Indian tribes in transition*, (Rawat Publications, Jaipur-Delhi, India), (1980), p 20.
- 21 GOI, Census 2011, (Government of India, New Delhi), 2011
- 22 Parmer H S, Tribal development in Himachal Pradesh with special reference to Kinnaur, *Economic Affairs*, 34 (2) (1989) 100-107.
- 23 Puttaraja Heggade & Heggade O D, Economic empowerment of tribal women in Karnataka: A case study in Mysore and Chamarajanagar Districts, *Stud Tribes Tribals*, 10 (2) (2012) 173-181.
- 24 Marchang R, Land, agriculture and livelihood of scheduled tribes in North-East India, *J Land Rural Stud*, 6 (1) (2018) 67-84. <https://doi.org/10.1177/2321024917732905>
- 25 King E O, Siddick S A, Gopi G & Kav N, *Integrated agriculture enhances farm productivity and livelihoods in agro-biodiversity hotspots*, Stories of change, (WREN media and International Development Research Centre (IDRC)), (2014).
- 26 Rengalakshmi R, Alagukannan G, Anil Kumar N, Arivudai Nambi V, Balakrishnan V, *et al.*, Rural and tribal women in agrobiodiversity conservation: An Indian case study, (FAO Regional Office for Asia and the Pacific, Bangkok, Thailand and M.S. Swaminathan Research Foundation Chennai, India), (2002).
- 27 Bhuvaneswari R, Ramanathan R, Krishnapriya P, Madheswaran A & Dhandapani R, Survey of wild tuberous medicinal plants of Kolli hills in Namakkal district, Tamil Nadu, India, *Int J Herb Med*, 3 (4) (2015) 41-48.
- 28 Sujatha S & Renua F B, Medicinal and edible tubers from forty two settlements of tribals from Pechiparai social forest in Kanyakumari District, India, *Sch Acad J Biosci*, 1 (5) (2013) 213-216. DOI: 10.36347/sajb.2013.v01i05.012
- 29 Lobo R, Prabhu K S, Shirwaikar A & Shirwaikar A, *Curcuma zedoaria* Rosc. (white turmeric): a review of its chemical, pharmacological and ethnomedicinal properties, *J Pharm. Pharmacol*, 61 (1) (2009) 13-21. <https://doi.org/10.1211/jpp/61.01.0003>
- 30 Blagbrough I S, Bayoumi S A, L Rowan M G & Beeching J R, Cassava: An appraisal of its phytochemistry and its biotechnological prospects, *Phytochemistry*, 71 (17-18) (2010) 1940-1951. doi: 10.1016/j.phytochem.2010.09.001
- 31 Balakrishnan V, Ratheesh Narayanan M K & Anil Kumar M, Ethnotaxonomy of *Dioscorea* among the Kttunaija people of Wayanad District, Kerala, India, *Plant Genet Resour Newsl*, 135 (2003) 24-32.
- 32 Jadhav V S, Naik K R & Joshi S N I, Utilization of tuber crops in Western Ghats of Karnataka, *Pharma Innov J*, SP-11 (2) (2022) 1216-1219.
- 33 Asha K I, Sheela M N, Vivek Hegde, Archana Mukherjee, Krishna Radhika N, *et al.*, Survey and collection of tuber crops from Joida, Uttara Kannada - An unexplored biodiversity hotspot, *J Root Crops*, 43 (2) (2017) 102-106.
- 34 Asha K I & Nair M C, Ethnic knowledge system on wild *Dioscorea* sp. (yams) by the Kanikkars of Southern Western Ghats, Kerala, *Indian J Plant Genet Resour*, 15 (2) (2002) 146-149.
- 35 Savage G P, Vanhanen L, Mason S M & Ross A B, Effect of cooking on the soluble and insoluble oxalate content of some New Zealand foods, *J Food Compos Anal*, 13 (3) (2000) 201-206. <https://doi.org/10.1006/jfca.2000.0879>
- 36 Ghosh J C, Indigenous drugs of India, 2nd Edition, School of Chemical Technology, Calcutta, (1940) p 268
- 37 Reddy K N, Pattanaik C, Reddy C S & Raju V S, Traditional knowledge on wild food plants in Andhra Pradesh, *Indian J Tradit Know*, 6 (1) (2007) 223-229.
- 38 Abbas J A, El-Oqlah A A & Mahasneh A M, Herbal plants in the traditional medicine Bahrain, *Econ Bot*, 46 (2) (1992) 158-163. <https://doi.org/10.1007/BF02930630>
- 39 Burkill I H, The polarity of the bulbils of *Dioscorea bulbifera*, Linn. Journ. & *Proc. Asiat. Soc. Bengal (n.s.)*, 7 (1911) 467-469.
- 40 Kamble S Y, & Pradhan S G, Ethnobotany of the Korkus in Maharashtra, *Nelumbo*. 22 (5) (2024) 201-202. DOI: <https://doi.org/10.20324/nelumbo/v22/1980/75454>.
- 41 Rai M K & Ojha G C, Ethnomedicinal studies of Chhindwara District Mandhya Pradesh Plants used in stomach disorders, *Indian Medicine*, 1 (2) (1989) 1-5.
- 42 Abhyankar R K & Upadhyay R, Ethnomedicinal studies of tubers of Hoshangabad Madhya Pradesh, *Bull Environ Pharmacol Life Sci*, 1 (1) (2011) 57- 59.
- 43 Panduraju T, Bitra V R, Vemula S K, & Reddy P R V, Wound healing activity of *Dioscorea bulbifera* Linn., *J Pharm Res*, 3 (12) (2010) 3138-3139.
- 44 Kosalge S B & Fursule R A, Investigation of ethnomedicinal claims of some plants used by tribals of Satpuda Hills in India, *J Ethnopharmacol*, 121 (3) (2009) 456-461. doi: 10.1016/j.jep.2008.11.017
- 45 Dutta B, Food and medicinal values of certain species of *Dioscorea* with special reference to Assam, *J Pharmacogn Phytochem*, 3 (4) (2015) 15-18.
- 46 Mishra R K, Upadhyay V P & Mohanty R C, Vegetation ecology of the Similipal Biosphere Reserve, Orissa, India, *Appl Ecol Environ Res*, 6 (2) (2008) 89-99.
- 47 Nedunchezhiyan M, Misra R S, Mukherjee A & Sivakumar P S, Livelihood security through tubers, *Indian Horticulture*, 58 (2013) 37-38.
- 48 Son I S, Lee J S, Lee J Y & Kwon C S, Antioxidant and anti-inflammatory effects of yam (*Dioscorea batatas* Decne.) on azoxymethane induced colonic aberrant crypt foci in F344 rats, *Prev Nutr Food Sci*, 19 (2) (2014) 82-88. doi: 10.3746/pnf.2014.19.2.082
- 49 Chandrasekara A & Josheph Kumar T, Roots and tuber crops as functional foods: a review on phytochemical constituents and their potential health benefits, *Int J Food Sci*, 2016 (2016) 3631647. doi: 10.1155/2016/3631647
- 50 Kumar S, Jena P K & Tripathy P K, Study of wild edible plants among tribal groups of Similipal Biosphere Reserve forest, Odisha, India; with special reference to *Dioscorea* species, *Int J Biol Technol*, 3 (2012) 11-19.
- 51 Padhan B & Panda D, Wild tuber species diversity and its ethno-medicinal use by tribal people of Koraput District of Odisha, *Indian J Nat Prod Resour*, 2 (1) (2016) 33-36.

- 52 Parida S & Sarangi M, Medicinal uses of few edible tuber crops by 'Dongria Kandha' tribes of Kandhamal district of Odisha, India, *Indian J Tradit Know*, 20 (1) (2021) 122-131.
- 53 Shah N C, My experiences with herbal plants and drugs as I knew Part XVI: *Dioscorea* and *Costus*, *Herb Tech Ind*, (2010) 21-30.
- 54 Singh K N & Kaushal R, Comprehensive notes on commercial utilization, characteristics and status of steroid yielding plants in India, *Ethnobot Leaflet*, 11 (2007) 45-51.
- 55 Martin F W & Degras L, Tropical yams and their potential: part 6. Minor cultivated *Dioscorea* species, Agriculture Handbook Number 538, Science and Education Administration, United States Department of Agriculture, Washington D.C., (1978) P 1-23.
- 56 Nath D & Shil S, Sustainable livelihoods of tribal farmers of Tripura through tuber crop cultivation, *A Journal on Tribal Life and Culture*, 19 (02) (2016) 18-23.
- 57 Tiwari S C & Mahanta D, Ethnological observations on fermented food products of certain tribes of Arunachal Pradesh, *Indian J Tradit Know*, 6 (1) (2007) 106-110.
- 58 Das T K & Singh N A, Indigenous tuber crops production system practiced by the Tribe of West Garo Hills District of Meghalaya, *Agric Ext J*, 1 (5) (2017) 1-5.
- 59 Angami T, Kalita H, Makdoh B, Touthang L, Alone R A, et al., Tuber crop based farming system: An approach for sustainable rural livelihood in North East India, *Populat Khethi*, 6 (1) (2018) 02-05.
- 60 Anantharaman M, Mantri V, Shanpru E, Sohliya B K, Rathore N S, et al., Roots and tubers for livelihood enhancement in Meghalaya, India, Results of a scoping study, Research Brief No. 2, (Food Resilience through Root and Tuber Crops in Upland and Coastal Communities of the Asia-Pacific (Food START+). International Potato Center), (2017) p 2
- 61 Sivakumar P S, Thirugnanvel A & Martha Chakruno, Understanding the mechanisms of achieving food and nutritional security through traditional tuber crops foods: A case study among Konyak tribes of Nagaland, India, *J Root Crops*, 40 (2) (2014) 49-57.
- 62 Saikia A & Bhaduri S, An institutional analysis of transition to market: The case of shifting cultivators in Mon, Nagaland, *Int J Rural Manag*, 8 (1&2) (2012) 19-34.
- 63 Jamir N S, Takatemjen & Limasemba, Traditional knowledge of *Lotha-Naga* tribes in Wokha district, Nagaland, *Indian J Tradit Know*, 9 (1) (2010) 45-48.
- 64 Devi P & Suresh Kumar P, Traditional, ethnic and fermented foods of different tribes of Manipur, *Indian J Tradit Know*, 11 (1) (2010) 70-77.
- 65 Das B, Lembisana Devi H & Nagachan S V, Genetic resources of tuber crops in Tripura and tuber crops based ethnic foods, *J Root Crops*, 42 (2) (2016) 28-38.
- 66 Das N J, Saikia S P, Sarkar S & Devi K, Medicinal plants of North Kamrup district of Assam used in primary health care system, *Indian J Tradit Know*, 5 (4) (2006) 489-493.
- 67 Sarma H, Sarma A M & Sarma C M, Traditional knowledge of weeds, a study of herbal medicines & vegetables used by the Assamese people (India), *Herba Polonica*, 54 (2) (2008) 80-88.
- 68 Saikia B, Borthakur S K & Saikia N, Medicoethnobotany of Bodo tribals in Gohpur of Sonitpur district, Assam, *Indian J Tradit Know*, 9 (1) (2010) 52-54.
- 69 Medhi P & Borthakur S K, Genetic resources of root and tuber crops from North Cachar Hills of Assam, *J Root Crops*, 37 (2) (2011) 131-143.
- 70 Mulla W A, Salonkhe V R, Kuchekar S B & Qureshi M N, Free radical scavenging activity of leaves of *Alocasia indica* (Linn.), *Indian J Pharm Sci*, 71 (3) (2009) 303-307. doi: 10.4103/0250-474X.56036
- 71 Hurkadale P J, Shelar P A, Palled S G, Mandeykar Y D & Khedkar A J, Hepatoprotective activity of *Amorphophallus paeoniifolius* tubers against paracetamol- induced liver damage in rats, *Asian Pac J Trop Biomed*, 2(1) (2012) 238-242.
- 72 Sheikh N, Kumar Y, Misra A K & Pfoze L, Phytochemical screening to validate the ethnobotanical importance of root tubers of *Dioscorea* species of Meghalaya, North East India, *J Med Plants Stud*, 1 (6) (2013) 62-69.
- 73 Das T S, The Indian Islands, (Cosmo publications, New Delhi), (1985).
- 74 Gopalan C, Rama Sastri B N & Balasubramanian C, *Nutritive value of Indian foods*, (National Institute of Nutrition, Indian Council of Medical Research, Hyderabad, India), (1977).
- 75 Iwu M M, Okunji C O, Ohiaeri G O, Akah P, Corley D, et al., Hypoglycaemic activity of dioscoretine from tubers of *Dioscorea dumetorum* in normal and alloxan diabetic rabbits, *Planta Med*, 56 (3) (1990) 264-267. doi: 10.1055/s-2006-960952
- 76 Bhandari M R, Kasai T & Kawabata J, Nutritional evaluation of wild yam (*Dioscorea* spp.) tubers of Nepal, *Food Chem*, 82 (4) (2003): 619-623. Doi: 10.1016/S0308-8146(03)00019-0
- 77 Damodaran V, Sankar M, Singh L B, George J & Roy S D, Role of tuber and root crops in integrated farming system In: *Integrated Farming System for Tropical Islands of India*, V Damodaran, M Sankaran, LB Singh, James George, S Dam Roy, (Eds) (ICAR-CIAR, Port Blair), (2016).