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## A study on wild underutilized edible plant species of Kokrajhar district of Assam (India) consumed as vegetables having ethno medicinal properties

**Sanchita Brahma, Mahadev Uzir Basumatary, Rupak Kumar Nath and Lolesh Pegu**

### Abstract

A study was attempted to take stock of the conventional underutilised edible plants available in the Kokrajhar district of Assam, NE India having ethno-medicinal properties and utilised as a source of herbal medicines by the tribal people of the district. The district is demographically inhabited by Bodos, Rava, Koch Rajbongshi, Santhal, Orao, Muslim, Nepali, Bengali, etc., and the Bodos are the commanding inhabitants of Kokrajhar district of Assam, belonging to the schedule tribe (plain). They are mainly dependent on edible plant resources growing wild in natural habitats for their day-to-day activities. Vegetables are the protective foods that play an important role in a balanced diet. Vitamins, micronutrients, and pharmaceuticals are necessary for the correction of deficiency disorders and diseases. Utilization of underutilised edible plant resources as vegetables as well as herbal medicinal sources by the tribal communities is a common practice. However, with the change in eating habits of the people in recent times, the popularity of the same has declined among the new generations. An attempt has been made to document traditional and underutilised vegetables having medicinal properties to make the common masses aware. The methodology included a structured questionnaire, personal interviews with the village headman and knowledgeable elderly people, group meetings and discussions with both young and elderly people, women, and also the local vegetable traders.

In the present study, 76 plant species belonging to 41 families have been documented, which were used as sources of vegetables and also used in the treatment of different diseases. The wealth of plant resources recognised and documented in the study included varied types of herbs, shrubs, climbers, and some trees.

**Keywords:** Wild vegetables, ethno-botany, rural livelihood, Kokrajhar district, Assam, India

### 1. Introduction

Traditional plants have a dominant place in the socio-cultural healthcare system and also contribute significantly to the rural livelihoods of tribal people in Kokrajhar district. Apart from providing food, nutrition, and medicine, herbal medicinal plants are an important component of the biodiversity, ecosystem, and biological heritage. Since ancient times, herbal plants have been used by the tribal communities in rural health care as sources of drugs for many ailments. Nature has gifted mankind with these traditional herbs for different ailments. In *Bodo* society, traditionally, women have been the main producers of plant-based medicinal products. Through performing different household activities, women conserve economically important plant species like those used as food, traditional medicine, and dye, etc. In India, nearly 45,000 species having medicinal properties have been recorded, but only 60 species of them find major commercial use as per the National Medicinal Plant Board.

The *Bodo* tribal community comprises one of the major and oldest tribal communities in Assam and is part of the greater *Bodo-Kachari* family. Kokrajhar is in the North Bank Plain Zone of the lower Brahmaputra valley and is the westernmost district of Assam state. Agriculture is the main occupation of the people. Apart from agriculture, other traditional economic activities include the following: forest products, rearing of pigs, poultry, duckery, fishing, goats, *eri* silk production and weaving, etc. The district has the largest forest cover in the state (40%), closely followed by Chirang district (28.2%), Baksa district (23.3%), and Udalguri district (8.5%). The majority of the inhabitants of the forest area are mainly the *Bodos* and the *Adivasis*. They are underprivileged, solely dependent on paddy cultivation and the collection of forest products.

They were forest-friendly people who used forest resources in their daily life to a subsistence level.

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Forest multifunctional assets provide a variety of resources that enable various bases for livelihood. These forests harbour a large variety of wild edible herbal plants that grow very well in their natural habitats and have been utilised by the *Bodo* tribes and other ethnic communities of the region as dietary supplements since time immemorial. Vegetables are the "protective supplementary food" as they contain large quantities of minerals, vitamins, and essential amino acids which are required for normal functioning of human metabolic activities and for prevention of diseases.

These traditional underutilised wild edible herbal plants are nature's gift to mankind and serve as alternatives to staple foods during food scarcity as a valuable supplement to a nutritionally balanced diet. Apart from providing a balanced diet, these plants also serve as a traditional herbal medicinal base for curing different ailments in the rural areas. Studies on the use of ethnomedicine by the *Bodo* communities inhabiting different areas of Assam have been reported by different workers (Basumatary *et al.*, 2004; Das *et al.*, 2006; Saikia *et al.*, 2010; Paul *et al.*, 2011a; Paul *et al.*, 2011b) [1, 3, 5, 8, 9]. It has been observed that, though there are similarities in plant

species and overall uses, their uses vary greatly.

Traditionally, womenfolk have been the cornerstone of medicinal plant-based activities, and small-scale micro-enterprises like family-based health and livelihood-oriented enterprises in rural areas have tremendous opportunity. It is critical to preserve the wealth of germplasm from non-traditional food and herbal medicine sources. Prime importance should be given to protecting the fast disappearing medicinal plant-based traditional knowledge, which is still abundant in the forest and forest fringe villages of Kokrajhar district and cannot be overemphasized. Therefore, an effort has been made for the identification and documentation of different sources of vegetables present in a wild and underutilised state, which are consumed both as vegetables and for ethno-medicinal purposes by the *Bodo* community. Therefore, an attempt has been made to identify the traditional underutilised non-conventional plant resources and document these plants' utilisation in ethnomedicine as well as as a source of vegetables by the *Bodo* inhabitants of Kokrajhar district, Assam, India.



**Fig 1:** Map of the Bodoland Territorial Region (BTR), Kokrajhar, Assam, India

## Materials and Methods

### Study area

The study area of Kokrajhar is in the Bodoland Territorial Region (BTR), an autonomous region in Assam, Northeast India. BTR is made up of four districts, *viz.*, Kokrajhar, Chirang, Baksa, and Udalguri, situated on the north bank plain zone of the Brahmaputra river. It is predominantly inhabited by the *Bodo* people and other indigenous communities of Assam and lies between 89° 46'E and 90° 38'E longitudes and 26° 19'N to 26° 54'N latitudes. Agroclimatically, the district falls under the Lower Brahmaputra Valley Zone of Assam. The climate of the district is humid sub-tropical in nature, characterised by a warm, humid summer with heavy rainfall and a relatively cool, dry winter with scanty rainfall.

### Data collection

Ten villages (Karigaon, Serfanguri, Titaguri, Bhaoragaja, Dotma, Nayakgaon, in the Kokrajhar District of Assam (North-East India) and 10 local markets (*viz.* Kharigaon, Khanglabada, Tiniali, Maldang, Daily Bazaar, Sarfanguri, Alangi, Bou bazaar, Naikgaon, Kokrajhar main bazaar etc.)

were selected for the present study at different seasons of the year during 2017-18 and 2018-19 through a structured questionnaire. Field trips were conducted during 2017-2018 and 2018-19 to gather information about the different traditional and wild edible plants having ethno-medicinal values. Traditionally, resourceful people, village headmen, and knowledgeable elderly people of the village belonging to the *Bodo* community were selected based on their reputation and knowledge of traditional medicine. For cross-verification and collection of supplementary information, if any, on food and medicinal plant use, several rounds of group discussion (GD) and group meetings (GM) were held in each village with the village headman. A questionnaire and interview schedule were prepared for the collection of data such as local name, edible parts used, season of availability, method of use as food, and medicine. With the help of local villagers, traditional rural practitioners, and learned elderly people or village heads, plant species were identified and collected from their natural wild habitats, home gardens, etc., and their multipurpose uses were recorded. Live specimens along with photographs were taken.

Local vegetable vendors and villagers were also consulted for

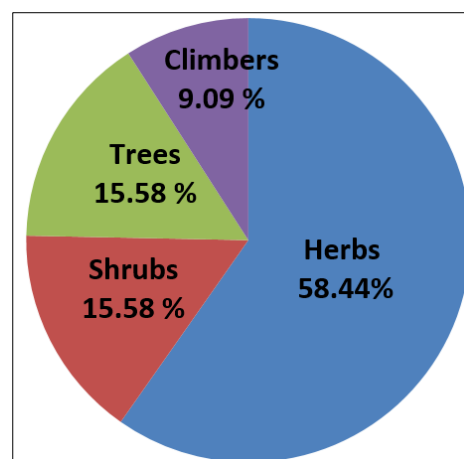
identification of the collected plants and to appraise their traditional knowledge on use as a source of traditional vegetable and herbal medicine by referring to relevant scientific literature such as books, journals, other written records etc. Information about collected plant species was verified subsequently by consulting with the expert professionals from the various organisations and colleges.

**Results and discussion**

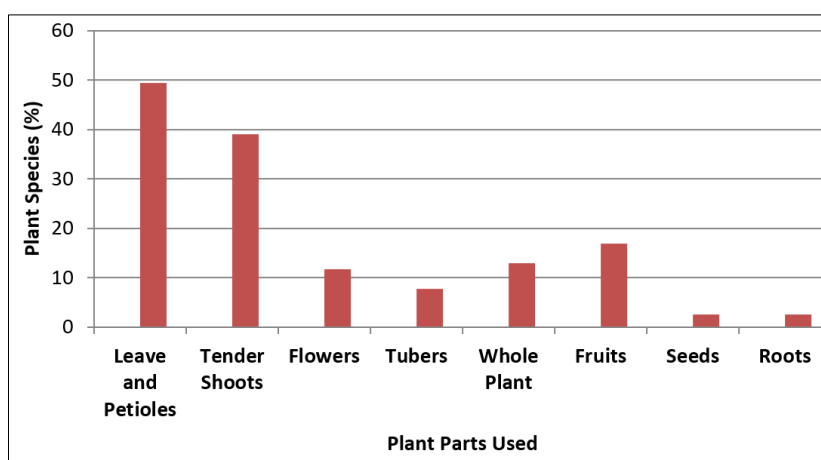
The present study, conducted in Kokrajhar district of BTR, Assam, reported a total of 76 traditional wild edible plant species belonging to 41 families, mainly used for human consumption both as vegetables and for curing different ailments as medicinal herbs. The majority of these plants grow wild in their natural habitats in the forests, which are collected and eaten either as cooked vegetables or used as a source of herbal medicines for curing different kinds of ailments. The traditional knowledge and skills about the various uses of the identified and documented plant species either as food or medicine are conserved by the village head or ancestors of the community and passed from one generation to the next.

The list of traditional wild edible vegetables consumed both as a source of food and herbal medicine by the Bodo tribes of Kokrajhar district of Assam is presented in Table 1, along with their botanical names, vernacular names (in Assamese and Bodo), edible parts used, time of availability and medicinal use. A total of 76 underutilised herbs, shrubs, climbers, trees, ferns, and mushrooms growing wild and used traditionally by the *Bodo* tribes of Kokrajhar district as a source of vegetables and as ethno-medicine have been

studied. The identified and documented plant species included 45 herbs (58.44%), 12 shrubs (15.58%), 7 climbers (9.09%), trees (15.58%), respectively (Fig. 1). These plants were used by the tribal communities for the local treatment of approximately 25 human diseases like allergy, asthma, cold & cough, worm infection, skin diseases, malarial fever, liver disorder, jaundice, hepatitis, diabetes, anaemia, toothache, gynaecological problems, cuts & wounds, rheumatic pain, kidney trouble, snake poisoning, weakness, constipation etc. Most of the plants were used for their tender shoots, leaves and petioles but flowers, tubers, fruits, seeds, roots and whole plants were also utilized as sources of traditional vegetables (Fig. 2).



**Fig 2:** A pie diagram depicting the growth habits of traditional plants



**Fig 3:** Different parts of traditional plants used are represented in a bar graph

Seasonal availability of these traditional wild edible plants was reported to vary greatly during the year of study. The spring and *kharif* seasons recorded the maximum availability of the traditional sources of vegetables, while the rabi season recorded the least availability of the traditional wild edible plants. The study reported plant species belonging to 41 families having food and medicinal value, which revealed the importance of forests in the day-to-day life of the *Bodo* tribes. Similar reports on ethno wild vegetables and ethno medicinal plants of Manas were also documented by Basumatary *et al.* (2015) [2]. About 29 ethno-medicinal plants used by the *Bodo* community of Chakrashila Wild Life Sanctuary (WLS) for curing different types of ailments were also reported by Talukdar and Gupta (2014) [8]. Traditional wild edible vegetables and ethno-medicinal plants obtained from forests

have great socio-economic significance and play a very important role in the livelihoods of tribal communities. A total of 52 wild edible plants consumed as vegetables by the *Bodo* tribes of Kokrajhar District, Assam (North-East India) were also documented by Narzary *et al.* (2013) [4]. The study revealed that wild edible traditional sources of vegetables not only serve as alternatives to staple food during periods of food scarcity but also provide a valuable supplement for a nutritionally balanced diet. Due to poor communication and health facilities, the traditional herbal plants and their knowledge play an important role in treating several diseases by the tribal communities locally. These herbal medicines have no side effects and help resource-poor tribal people meet their daily food and drug needs. Commercial cultivation of these crops has not yet taken off as

some of these crops grow luxuriantly only in their natural habitat and become dormant during the winter season. The women folk of the villages source these traditional herbs, shrubs, or climbers from the forests and sell them in the markets during their season of availability. They are also associated with the culture and traditions of the *Bodo* tribal community. The use of traditional underutilised edible wild leafy vegetables as a source of vegetables and ethnomedicine

during the New Year Festival of *Bodos* (Bwisagu), which falls in the month of April, is an age-old traditional practise in the Kokrajhar district of Assam. In recent times, the younger generations are not aware of these plants. Therefore, it is necessary to document the traditional wild sources of vegetables for a healthy and well-balanced diet and as an herbal medicine for curing different ailments.

**Table 1:** List of traditional wild edible plants used as vegetable & ethno medicinal plants by the *Bodos* along with their edible parts used

Sl. No.	Botanical name (Bodo & Assamese name)	Family	Edible parts used	Time of availability	Medicinal Use	Plant Part Used as Vegetable
1.	<i>Justicia adhatoda</i> L. Syn. <i>Adhatoda vasica</i> Nees, Boga bahak/Baska tita (Ass.)/Barsika bibar gwja (Bodo)	Acanthaceae (Evergreen Shrub)	Flowers	April to June	The plant has tremendous medicinal value. The leaves and flowers are used for worm trouble, cough, asthma, bronchitis, colds, allergies, etc.	Flowers are eaten fried or cooked with rice flour and alkali.
2.	<i>Andrographis paniculata</i>	Acanthaceae (Evergreen Shrub)	Leaves	June to November	Leaves are used as medicine for malaria, good for the liver, skin diseases, and anti-worms	-
3.	<i>Centella asiatica</i> Bor manimuni (Ass.)/ Manimuni geder	Apiaceae (Herb)	Whole plant	November to March	It is beneficial from in digestion, is good for dysentery, stomach trouble, prevents nerve disorders and increases memory power.	Tender leaves and shoots are preferably taken as cooked vegetables. Raw leaf juice is also used in stomach problem
4.	<i>Alocasia macrorrhiza</i> (Lour.) Koch. Mana Thaso (Bodo)/Man Kochu (Assamese)	Araceae (Herb)	Young shoots & tubers	September to February	Used for blood purification & good source of iron	Tender shoots and tubers are taken after cooking, preserved for future use by slicing and drying.
5.	<i>Colocasia esculenta</i> var. <i>esculenta</i> L. Schott. i) Eddoe type Panchamukhi (Bodo/Assamese) ii) Dasheen type Ahina kochu (Assamese)/ Aabor Thaso (Bodo)/	Araceae (Herb)	Tubers	November to December	Blood purification & good source of iron	Tubers are eaten as cooked vegetable
6.	<i>Amorphophallus sylvaticus</i> (Roxb.), Kunth Olodor (Bodo)	Araceae (Herb)	Young leaves/ Petioles	March to April	Used for blood purification & good source of iron	Leaves and petioles are taken as cooked vegetable
7.	<i>Amorphophallus paeonifolius</i> (Dennst.) Nicolson/A. <i>campanulatus</i> , Ol- Kochu (Assamese.)	Araceae (Herb)	Young leaves/ Petioles	March to April	Young leaves/petioles used for blood purification & good source of iron	Used as a cooked vegetable (tender leaves, petioles, and tubers).
8.	<i>Xanthosoma sagittifolium</i> L./Boga Dohi/Dudh kochu (Assamese.)/Thaso gufuru (Bodo)	Araceae (Herb)	Tender leaves, petioles and tubers	Throughout the year	used for blood purification and a good source of iron	Used as a cooked vegetable (tender leaves, petioles, and tubers).
9.	<i>Xanthosoma nigrum</i> Vell/Kola Dohi /Kola kochu (Assamese)/ Thaso gwswm (Bodo)	Araceae (Herb)	Tender leaves, petioles and tubers	Throughout the year	Used for blood purification & good source of iron	Leaves, petioles and tubers are taken as cooked vegetables. It has no acidity.
10.	<i>Amaranthus spinosus</i> L., Hatikhutura/Kata khutura (Ass.)/Su gwnang Kuduna (Bodo)	Amaranthaceae (Herb)	Tender shoots/ leaves	September to January	Beneficial for anaemia	Leaves and shoots are prepared as cooked vegetable
11.	<i>Amaranthus viridis</i> L. Khutura sak (Ass.)/Kudunapisa (Bodo)	Amaranthaceae (Herb)	Tender shoots/ leaves	September to January	Beneficial for anemia and urinary problem	Leaves & shoots are prepared as cooked vegetable
12.	<i>Chenopodium album</i> L. Jilmil (Ass.)/ Butua (Bodo)	Amaranthaceae (Herb)	Tender shoots	November to March	Rich in minerals & other nitrogenous compounds	Tender shoots & leaves cooked as vegetable
13.	<i>Alternanthera sessilis</i> (L.) R. Br. Ex. DC., Matikaduri (Ass.)	Amaranthaceae (Herb)	Tender leaves & shoots	April to October	Beneficial to the liver	Tender shoots & leaves eaten fried as vegetable.
14.	<i>Hydrocotyle sibthorpioides</i> Lamk., Horu manimuni (Ass.)/ Manimuni pisa (Bodo)	Apiaceae (Herb)	Whole plant	November to March	Leaves are used for stomach troubles and in the healing of wounds, loss of appetite	Leaves and tender shoots are cooked as vegetable
15.	<i>Eryngium foetidum</i> , Man dhania/Naga dhania (Ass.)/ Gongar dundia (Bodo)	Apiaceae (Herb)	Leaves	Throughout the year	Increases appetite, blood haemoglobin, aids in digestion.	Leaves used for seasoning curries
16.	<i>Enhydra fluctuans</i> Lour.	Asteraceae	Leaves/	April to	Used for liver complaints,	Leaves and young shoots

	Helochi, Helancha (Ass.)/ Alangshi (Bodo)	(Herb)	Shoots	June	coughs, skin diseases, etc	eaten as cooked vegetable
17.	<i>Chromolaena odorata</i> (L.) Voigt, Syn. <i>Eupatorium odoratum</i> L., Jarmanibon or Nogorbera (Ass.)/Bangrilewa (Bodo)	Asteraceae (Shrub)	Tender leaves	June to October	Highly medicinal in intermittent fever and dysentery, it is also used externally in swellings, cuts, and wounds.	Tender leaves are cooked in combination with other vegetables
18.	<i>Spilanthes paniculata</i> Wall. ex D.C., Bhringaraj (Ass.)/Usumwi (Bodo)	Asteraceae (Herb)	Leaves	Throughout the year	It is used as medicine for sore mouths, toothaches, wounds, and other ailments	Curry is prepared from leaves
19.	<i>Lasia spinosa</i> (L.) Thaw. Chengmora (Ass.)/Sibru (Bodo)	Araceae (Herb)	Leaf petioles	April to August	Given in gynecological problems	Tender leaf petioles, leaves & flower spadix are taken as cooked vegetables.
20.	<i>Basella alba</i> L. var. <i>rubra</i> (L.) Stewartt Ronga Puroi sak (Ass.)/Mwifraigwja (Bodo)	Basellaceae (Climber)	Young shoots, tender stems, leaves & Fruits	May to July	Beneficial for anaemia and skin allergies	Tender stems, and leaves are preferred as cooked vegetables
21.	<i>Basella alba</i> L. Var. <i>alba</i> (L.) Stewartt Boga Puroi sak (Ass.)/Mwifraigufur (Bodo)	Basellaceae (Climber)	Young shoots, tender stems, leaves & Fruits	May to July	Good for anaemia patients, but not good for people suffering from rheumatic pain	Shoots, tender stems, and leaves are cooked as vegetable.
22.	<i>Oroxylum indicum</i> (L.) Vent., Bhatghila, Dingdinga (Ass.)/Karoikhandai (Bodo)	Bignoniaceae (Small deciduous Tree)	Young shoot/ Leaves/ Flowers	October to March	Fruits are used in jaundice & malaria. Root bark is an astringent tonic and tender fruits are carminative and stomachic	Flowers are used as vegetable. The whole plant is having medicinal properties
23.	<i>Drymaria cordata</i> (L.) Wild ex. Roemer & Schultes, Lai Jabori (Ass.)/Jabsri (Bodo)	Caryophyllaceae (Herb)	Tender leaves & shoots	September to January	Used as medicine for sinus problems, cough, tonsillitis, and in the treatment of cuts and wounds.	Tender leaves and shoots are used as vegetable
24.	<i>Stellaria media</i> L. (Nabiki)	Caryophyllaceae	Whole plant	September to March	The plant has medicinal value.	Whole plant is used as vegetable.
25.	<i>Garcinia Morella</i> / <i>G. cowa</i> (Gaertn.) Desr. Kuji Thekera (Ass.)/Thaika pisajar(Bodo)	Clusiaceae (Tree)	Fruits	May to June	Dried fruit slices consumed in dysentery	Fruit used in curry with fish; fruit slices preserved by sun-drying; pickles also prepared.
26.	<i>Garcinia pendunculata</i> Roxb. Bor-thekera (Ass.)/Thaika gederjar(Bodo)	Clusiaceae (Tree)	Fruits	May to June	Dried fruit slices consumed in dysentery, used as a refreshing drink, prevent stomach problems.	Fruits used in curry with fish, fruit slices preserved by sun-drying, and pickles are also prepared
27.	<i>Ipomoea aquatica</i> Forsk. Kolmou (Ass.)/Mande (Bodo)	Convolvulaceae (Herb)	Leaves & tender shoots	March to October	Used against piles, and to treat high blood pressure	Young leaves and tender shoots are mostly preferred as cooked vegetables.
28.	<i>Bryophyllum pinnatum</i> Dupar tenga/ Pategoja (Ass.)/Patgaja (Bodo)	Crassulaceae (Herbaceous perennial plant)	Leaves	Throughout the year	It is used to treat kidney stones, urinary problems, and other ailments.	Young leaves are mostly preferred.
29.	<i>Costus speciosus</i> (Koe. Ex Retz.) Smith, Jom (insulin plant) Jamlakhuti/Devi tokon (Ass.) Buri thokon (Bodo)	Costaceae (Herbaceous perennial plant)	Young shoot	April to May	Rhizome decoction is taken for jaundice and urinary trouble, intestinal worms, diabetes, etc.	Young tender shoots are eaten as a vegetable.
30.	<i>Dillenia indica</i> L. Outenga (Ass.)/Thaigir (Bodo)	Dilleniaceae (Tree)	Fruit (Fleshy calyx)	September to March	Good for stomach disorders & mucilage in fruit is good for hair re-growth	Fleshy calyx eaten raw and cooked as a vegetable
31.	<i>Dioscorea alata</i> L. Kath aloo (Assamese)/ Tah Aloo (Bodo)	Dioscoreaceae	Tuber	September to March	Used for curing various ailments such as stomach aches, burns, skin diseases, contraceptives, dysentery, rheumatism, etc	Root tubers are used as vegetables after cooking or being roasted over fire.
32.	<i>Dioscorea esculenta</i> L. Kath aloo (Assamese)/Tah gunda (Bodo)	Dioscoreaceae	Tuber	September to March	Used to treat skin diseases, contraception, dysentery, rheumatism, and other ailments	Root tubers are used as vegetables after cooking or being roasted over fire.
33.	<i>Phyllanthus niruri</i> (Bhui amlakhi)	Euphobiaceae	Whole plant	May to October	This plant's juice is beneficial for diabetes and jaundice-	-
34.	<i>Antidesma acidum</i> Retz., Abutenga/Saru heloch (Ass.) Lapasaiko (Bodo)	Euphorbiaceae (Shrub)	Leaves	March to October	Good for dysentery, diarrhoea, malarial fever, and worm infections of the G.I. tract	Leaves are cooked as vegetables, slightly sour in taste & leaves are preserved for later use

35.	<i>Sesbania grandiflora</i> (L.) Poir., Bokphul (Ass.)/ Bogbibar (Bodo)	Fabaceae	Flower	March to May	Medicine for stomach disorders.	Flowers are either fried as vegetables or prepared as pokoda.
36.	<i>Casearia glomerata</i> Roxb. Ex., Tel bhukuri (Ass.)/ Daopenda (Bodo)	Flacourtiaceae (Herb)	Young shoots and leaves	April to October	Ground leaves are used to treat cuts and wounds, as well as dysentery	Young leaves are cooked as vegetables, usually with chicken.
37.	<i>Gmelina arborea</i> Roxb. Gamari (Ass.)/Gambari (Bodo)	Lamiaceae (Tree)	Flower	January to April	-	Flowers are eaten fried as a vegetable
38.	<i>Leucas indica</i> (Roth) Spreng. Syn. <i>L. Aspera</i> L., Doron (Ass.)/Khangsinsa (Bodo)	Lamiaceae (Herb)	Leaves	March to December	Leaves used to treat indigestion, rheumatic pain, sinusitis, nasal hemorrhage, liver ailments, snake bites, scorpion stings, headaches, and other ailments.	Tender shoots, are taken as cooked vegetables.
39.	<i>Plectranthus ternifolius</i> D. Don Jwглаori (Bodo)	Lamiaceae (Herb)	Young leaves, Shoots	June- November	Colds, coughs, and fevers are treated with this medicine.	Pungent young shoots are eaten as a vegetable. It is a popular vegetable among the Bodos.
40.	<i>Oscimum basilicum</i> L. var. <i>purpurascens</i> , Ram tulosi (Ass.)/Tulsi (Bodo)	Lamiaceae (Herb)	Young Shoots	August to February	It was used as a cold and cough medicine	Young shoots, which have a fragrant taste, are often used as a seasoning for culinary purposes.
41.	<i>Vitex negundo</i> L. Posotia (Ass.)/ Nisinda (Bodo)	Lamiaceae	Leaves	Throughout the year	Leaf extract is given with piper longum in catarrhal fever, malarial fever, and cough of dried leaves used to relieve headaches and asthma.	Tender leaves are used as vegetables.
42.	<i>Azadirachta indica</i> A. Juss, Mahaneem (Ass.)/ Neem (Bodo)	Meliaceae	Leaves	July to August	Used for stomach pain, worm infection, skin diseases, bronchitis, cough and as an air purifier.	Leaves are eaten raw or fried.
43.	<i>Hibiscus sabdariffa</i> L. Mestatenga (Ass.)/ Mwitha gwja(Bodo)	Malvaceae (Shurb)	Leaves, young shoots and fruits	April to October	Leaf juice used in dysentery	Leaves, young shoots, and ripe fruits are cooked vegetables. Usually eaten with fish
44.	<i>Moringa oleifera</i> , Sajina (Ass.)/ Swrjwna (Bodo)	Moringaceae (Evergreen tree)	Young leaf, flower and fruit	November to April	Various parts of this plant, such as the leaves, roots, seeds, bark, fruit, flower, and immature pods, act as anti-pyretic, anti-tumor, anti-inflammatory, antiulcer, diuretic, and antidiabetic.	Young leaves, flower buds, and fruits are cooked as vegetables.
45.	<i>Musa</i> spp., Koldil (Ass.)/ Thaler mwikhum (Bodo)	Musaceae	Flower bud/inflorescence	Throughout the year	The flower bud is a good source of iron	Flower buds cooked as vegetables.
46.	<i>Nymphaea nouchali</i> Burm. F, Boga bhet,/Seluk (Ass.)/Toblo (Bodo)	Nympheaceae	Fruit, leaf petiole, seed and root	May to October	For intestinal problems.	Fruits, leaf petioles, and roots are cooked as vegetables. Seeds are eaten raw or roasted.
47.	<i>Nymphaea rubra</i> Roxb.ex Andrews, Ronga bhet, Mokula, Seluk (Ass.)/Toblo (Bodo)	Nympheaceae	Fruit, leaf petiole, seed and root	May to October	Used as medicine	Fruits, leaf petioles, and roots are cooked as vegetables. Seeds are eaten raw or roasted
48.	<i>Boerhavia diffusa</i> L., Punarnava (Ass.)/ Laije (Bodo)	Nyctaginaceae	Young shoots	May to September	Good for anaemia and used as an antiworm	Young leaves cooked as a vegetable.
49.	<i>Oxalis corniculata</i> L., Soru tengeshi (Ass.)/ Singri gwkhwi (Bodo)	Oxalidaceae (Small diffused Herb)	Whole plant	October to February	Used in dysentery and high blood pressure, it relieves intoxication. The whole plant has a cooling, stomachic effect.	Young shoots and leaves are used as vegetable. It is mildly acidic.
50.	<i>Oxalis debilis</i> .H.B.K. var. <i>corymbosa</i> (DC) Lour, Bor tengeshi (Ass.)/ Singri gederjar (Bodo)	Oxalidaceae (Small diffused Herb)	Whole plant	October to February	Medicinal in dysentery and diarrhoea	Young shoots and leaves are used as vegetable. It is mildly acidic.
51.	<i>Nyctanthes arbortristis</i> L. Hewali (Ass.)/Sephali (Bodo)	Oleaceae (Evergreen Shrub)	Flowers	September to November	Used to expel common worms, coughs, gastroenteritis, stomach aches, dysentery, intoxication from wine, etc.	Fresh flowers are used in making pakodas, curry, and also dried for use as vegetables. Young leaves are used for making vada
52.	<i>Piper longum</i> Pipali/Mosla (Bodo)	Piperaceae (Climber)	Fruits	September to December	Fruit extract mixed with cinnamon in hot water to cure pneumonia, typhoid, cough, etc.	Dry fruits are used as spices and seasonings.

53.	<i>Volvariella volvacea</i> . (Jigabni Mwikhun)	Plutaceae	Whole mushroom	May to September	Whole mushroom have medicinal properties.	The entire portion is consumed as a vegetable.
54.	<i>Bambusa balcoona</i> Roxb. Bhaluka baah (Ass.)/Auwa burka mewai (Bodo)	Poaceae	Young shoots	April to July	Young off-shoots excellent calcium source.	Young off-shoots are eaten as cooked vegetables with grinded rice and/or fish or meat. Dried shoots are also used as vegetables.
55.	<i>Bambusa tulda</i> Roxb. Jati bah (Ass.)/Auwa gubwi mewai (Bodo)	Poaceae (Tree)	Young shoots	April to July	Excellent calcium source	Young off-shoots are eaten as cooked vegetables with ground rice and/or fish or meat. Dried shoots are also used as vegetables
56.	<i>Fagopyrum cymosum</i> Meissn. (Mwisungka)	Polygonaceae	Young shoots and leaves	September to January	For stomach disorders	Shoots and young leaves are cooked as vegetables with fish.
57.	<i>Polygonum mycrocephallum</i>	Polygonaceae	Leaves and tender shoots	Throughout the year	It prevents all kinds of stomach ailments.	Shoots and young leaves are cooked as vegetables with fish.
58.	<i>Polygonum chinense</i> Pirali Paleng (Ass.)	Polygonaceae	Leaves	April to October	Medicine for diabetes.	Shoots and young leaves are cooked as vegetables.
59.	<i>Monochorea hastata</i> L., Jonakiphul or Bhat meteka (Ass.)/Ajinai(Bodo)	Pontederiaceae (Herb)	Flower bud and flowers	April to July	Used to treat intestinal issues.	Inflorescence is used as chutney after frying.
60.	<i>Monochorea vaginalis</i> L., Bhat meteka (Ass.)/ Ajinai (Bodo)	Pontederiaceae (Herb)	Flower bud and flowers	April to July	Used to treat intestinal issues.	Inflorescence is used as chutney after frying.
61.	<i>Portulaca oleracea</i> L. Malbhog khutura, Hah thengia (Ass.)/ Hangswgarma (Bodo)	Portulacaceae (Runner)	Leaves/ stem	September to May	Leaves/stem used as an antiseptic, kidney ailment, liver problem, and in jaundice.	Tender leaves and shoots are eaten as vegetables.
62.	<i>Pteris ensiformis</i> Burm. f Dhekia (Ass.)/ Dingkia(Bodo)	Pteridaceae (Herb)	Tender shoots	April to October	Young leaves	Young fronds are eaten as vegetables.
63.	<i>Hedyotis diffusa</i> (Willd.) Roxb. Syn. Oldenlandia diffusa Wild. Bonjaluk (Ass.)/Daosriating (Bodo)	Rubiaceae (Climber)	Leaves	December to February	Leaves are used as medicine for stomach trouble and juice is taken for body aches and peptic ulcers.	Leaves are cooked as vegetable.
64.	<i>Paederia foetida</i> L. Bhedai lota, Padurilota (Ass.)/Bhedali- lewa, Kipi bendwng (Bodo)	Rubiaceae (Climber)	Leaves & tender twigs	March to November	Used as medicine to cure stomach aches, constipation, gastric problems, piles, and also in diarrhoea and dysentery.	Pungent young shoots are eaten as a vegetable. It is a popular vegetable among the Bodos.
65.	<i>Murrya koenigii</i> (L.) Spreng. Narashinha/ Bishahari(Ass.)/Narsingh(Bodo)	Rutaceae (Shrub)	Leaves	April to November	Raw or cooked leaf extract is given for indigestion and other stomach ailments, hepatitis, skin diseases etc.	Leaves are eaten cooked as a vegetable
66.	<i>Houttuynia cordata</i> T Hunb. Masundari (Ass.)/Maisundri (Bodo)	Saururaceae (Herb)	Leaves	April to October	Leaves are taken raw or steamed in dysentery; leaf extracts are taken in constipation	Leaves are eaten either raw or cooked as a vegetable. Leaves and roots are taken as chutney.
67.	<i>Solanum nigrum</i> L., Loskochi (Ass.)/Mwisung (Bodo)	Solanaceae	Tender shoots & fruits	November to May	Considered extremely beneficial for burns.	Young leaves are used as a mixed vegetable. Ripe fruits are eaten after roasting.
68.	<i>Solanum indicum</i> L., Bhot bengena (Ass.)/ Funtao Ambu/(Bodo)	Solanaceae	Fruit	November to January	It is good for worm infections and skin diseases.	Fruits are eaten as vegetables.
69.	<i>Solanum khasianum</i> Cl., Syn Solanum viarum Dunal, Tit bhekuri or Hati bhekuri (Ass.)/ Kuntainara (Bodo)	Solanaceae	Fruit	April to November	Fruits used as medicine.	Leaves and fruits are eaten as vegetables.
70.	<i>Bacopa monnieri</i> Brahmi (Ass./Bodo)	Scrophulariaceae	Whole plant	March to September	Plant used as a memory enhancer, beneficial for fever, ulcer tumors, asthma, and leprosy	The entire plant is consumed as a vegetable.
71.	<i>Lentinus polychrous</i> (Sal mwikhun)	Strophariaceae	Whole mushroom	May to September	Whole mushroom have medicinal properties and are abundant source of protein.	The entire portion is consumed as a vegetable.
72.	<i>Termitomyces eurhizus</i>	Tricholomatacea	Whole	May to	Whole mushroom have	The entire portion is

	(Mwikhun Hapaw)		mushroom	September	medicinal properties and are abundant in protein.	consumed as a vegetable.
73.	<i>Vitis rependa</i> W & A, Dausrem (Bodo)	Vitaceae	Leaves	March to June	Leaves used as a medication	Leaves are used as vegetables.
74.	<i>Lippia geminate</i> H. B. & K. (Ontaibajab)	Verbenaceae (Herb)	Leaves	April to October	The leaves are used to treat colds and coughs.	Leaves are eaten as a vegetable.
75.	<i>Clerodendrum colebrookianum</i> Wall., Naphaphu (Ass.)/Lukhna bipang (Bodo)	Verbenaceae	Tender leaves	November to April	Tender leaves are used to treat high blood pressure.	Tender leaves are eaten as vegetables.
76.	<i>Pygmaeopremna herbacea</i> (Roxb.) Mol denke Syn. <i>Premna herbacea</i> Roxb. Matiphesua (Ass.)/Keradapini (Bodo)	Verbenaceae (Shrub)	Leaves & young shoots	Jan to July	Used as medicine for fever, sleeping sickness, cold & cough, and jaundice.	Leaves and young shoots are used as vegetables. Ripe fruits are also eaten. It is considered a high quality vegetable.



**Fig 4:** *Centella asiatica* (Manimuni gidir)



**Fig 5:** *Amorphophalus paenofolius* (Ol-kochu)



**Fig 6:** *Colocasia esculenta* (Ahina kochu/Thaso abor)



**Fig 7:** *Colocasia esculenta* (Panchamukhi)



**Fig 8:** *Xanthosoma sagittifolium* (Boga Dohi/Thaso gufur)



**Fig 9:** *Xanthosoma sagittifolium* (Kola Dohi/Thaso gwswm)



**Fig 10:** *Amaranthus spinosus* (Kata Khutura/Su gwnang khuduna)



**Fig 11:** *Amaranthus viridis* (Khutura/Khuduna Pisa)



**Fig 12:** *Chenopodium album* (Jilmil Saak/Butua)



**Fig 13:** *Alternanthera sessilis* (Matikanduri)



**Fig 14:** *Eryngium foetidum* (Mandhania/Gongar dundia)



**Fig 15:** *Enhydra fluctuans* (Helonchi/Alangsi)







**Fig 33:** *Monochorea hastata*.  
(Jonakiphul/Ajinai)



**Fig 34:** *Pteris ensiformis* Burm. f.  
(Dhekia/Dingkia)



**Fig 35:** *Houttuynia cordata* T.  
(Masundari/Maisundril)



**Fig 36:** *Solanum indicum* L.  
(Bhot bengena/Funtao ambu)



**Fig 37:** *Solanum khasianum*  
Cl... (Hati bhekuri/Kuntainara)



**Fig 38:** *Lippia germinata* H.B. &  
K. (Onthai bajab)



**Fig 39:** *Bacopa monnieri*.  
(Brahmi)



**Fig 40:** *Pygmaepremna herbacea*  
(Matiphesua/Keradapini)



**Fig 41:** *Casearia glomerata*  
(Tel bhukuri/Daopenda)



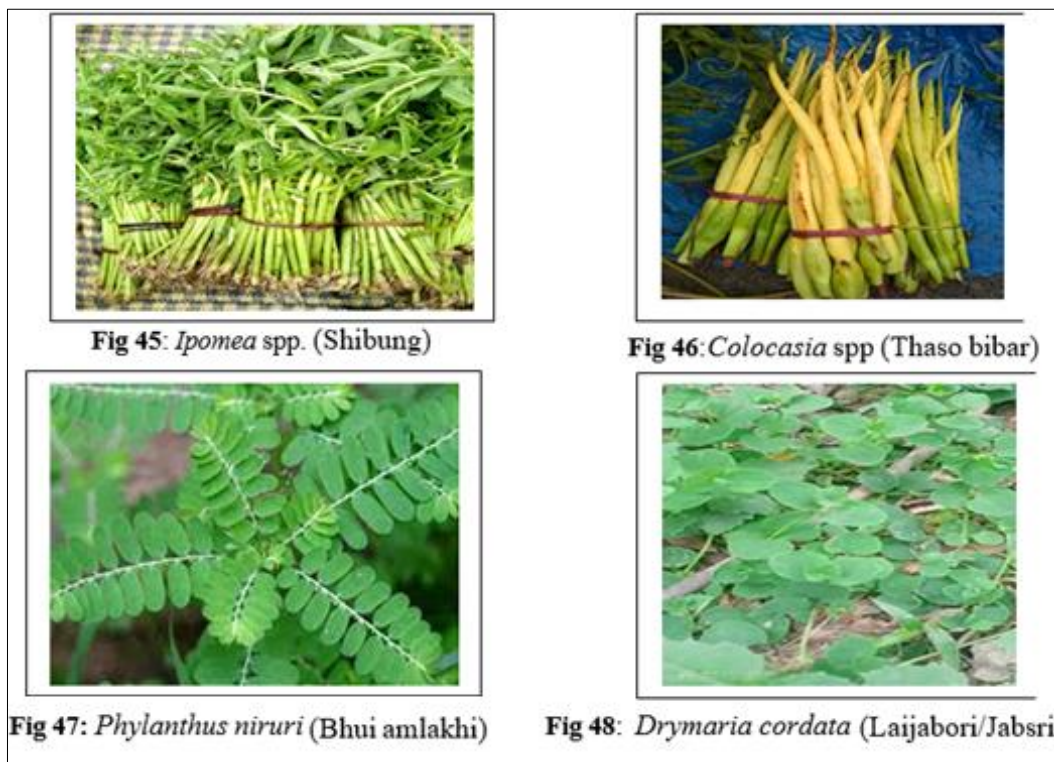
**Fig 42:** *Colocasia* spp.  
(Kachu thur/Thaso Bishong)



**Fig 43:** *Colocasia* spp.  
(Kachu lati/Thaso Ating)



**Fig 44:** *Mentha* spp.  
(Pudina/Podina)



### Conclusion

The underutilized wild plants form an important component of daily diet as source of vegetable which are inexpensive, locally available and have a great socio-economic significance in the life of Bodos. Apart from providing nutrition these plants were utilized in traditional health care system in the Bodo community since time immemorial. Traditionally, women have been the main producers of plant-based medicinal products through household micro-enterprises. However with passage of time & change in socio-economic conditions, some of these underutilized plants are in the verge of extinct. Immediate attention is needed to protect, preserve, and popularise the traditional wealth of indigenous plant resources among the tribal communities of Kokrajhar district. If proper values can be added to the traditional medical knowledge-based health practises a large number of jobs can be created in the rural areas. Thus, underutilized wild edible plants consumed as vegetable and also utilized as medicinal plants have high potential in creating jobs and pushing economic growth in resource-constrained areas suffering from limited educational opportunities, lack of infrastructure, and underdeveloped medicinal plants-based trade in the Kokrajhar district of Assam, India.

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