

# Tuber wild plants of Shinasha people as food and medicine in Bullen district, North West of Ethiopia

## Abstract

Bullen district is noted for its rich diversity of plant species apart from wetlands to flood plains serving the habitat requirement of several inhabitant communities and is unique in its nature by having rich diversity of wild edible plants. A number of cultivated tuber food plants such as Qocho (*Dioscorea cayenensis*), Anchote (*Coccinia abyssinica*), Sekuar Dinich (*Ipomoea batatas*), Dinich (*Plectranthus edulis*), Zingibil (*Zingiberof ficiaale*) and Godere (*Colocasia esculanta*) etc. having their wild relatives such as *Colocasia esculenta*, *Curcuma bulbifera*, *Dioscorea prehensilis*, *Dioscorea hispida* and *Dioscorea oppositifolia* etc. are present in the district. The present survey encompasses documentation previous of 29 wild tuberous plant species belonging to 15 family and 24 genera tabulated with botanical name, local name, and family, habit and habitat mode of consumption and medicinal uses.

**Keywords:** bullen, diversity, tuber, wild edible

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 Mosissa D,<sup>1</sup> Abraha B<sup>2</sup>
<sup>1</sup>Ethiopian Biodiversity Institute, Ethiopia

<sup>2</sup>Department of Biology, Bahir Dar University, Ethiopia

**Correspondence:** Dereje Mosissa, Ethiopian Biodiversity Institute, Assosa Center Forest and Rangeland biodiversity case team, Assosa, Ethiopia, Tel +251949045964, Fax +251116613722, Email derament5964@gmail.com

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## Introduction

Plants provide food and medicine besides protecting the environment and are very important for survival of peoples. Human beings have adapted to the present life style of crop cultivation for food from hunting gathered nearly 10,000 years ago, probably due to population explosive, climate change, over hunting may be as simple disserve for more food.<sup>1</sup> Wild edible plants are important in the livelihood strategies of local people, and forest dwellers in many developing countries.<sup>2</sup> Western region of Ethiopia is rich in the floral diversity of roots and tubers. It harbours one of the richest biodiversity hot spots in the Western Ghats and the North eastern regions. The hotspot contains a large number of wild relatives of cultivated tuber crops as well as many under- exploited tuber crops known to tribals. Major portion of the genetic diversity of wild species and land races existing in the tropical forests and remote villages are yet to be explored, collected and conserved.<sup>3</sup>

Wild edible plants as alternative to staple food during deficit are valuable supplements for a nutritionally balanced diet.<sup>4</sup> The wild tuber plants characteristically have a storage organ may be as true bulb, corm, tuber, tuberous root and rhizome. Carbohydrates and nutrients reserve are stored in these organs to support growth of plants. Nutritional profile of many wild edible plants have found comparable and sometime better to many cultivated varieties.<sup>5</sup> Wild plants provide the medicines cheaply and readily available to the vast majority of the rural population, as is the case in many other developing countries in the world. They are also a source of some of the active ingredients in modern pharmaceuticals. However, the active compounds, proper methods of preparation, dosages, effectiveness and side effects of medicines prepared from these plants have not yet been studied extensively.<sup>6</sup>

The rural communities of developing countries depend on wild edible plants to meet their food requirements during periods of food shortage. Studies conducted by<sup>7</sup> indicated that the wild edible plants are mostly serving as supplementary foods in different parts of Ethiopia. Wild edible plants are nutritionally rich<sup>8</sup> and can supplement especially vitamins and micronutrients.<sup>7</sup> These show that wild edible

plants are essential components of many African diets, especially in period of seasonal food shortage.

The Ethiopian flora has approximately 6000 species of higher plants of which about 10% are endemic.<sup>9,10</sup> The country is known as the biodiversity hotspot and center of origin and diversification for a significant number of food plants and their wild relatives.<sup>11</sup> The wide range of climatic and edaphic conditions permitted the growing of a variety of wild food plants.<sup>12</sup> Some studies in Ethiopia indicated that many rural people are endowed with deep knowledge on how to use plant resources. This is particularly true with regard to the use of medicinal plants<sup>13</sup> and wild edible plants that are consumed at times of famine and other hardships.<sup>7</sup> In this regard, the elder community members are mostly the key sources of knowledge about plants.<sup>7</sup>

The consumption of wild plants seems more common in food insecure areas of the country as compared to relatively food sufficient areas.<sup>14</sup> Although many rural people of Ethiopia usually feed on wild food tuber plants for survival during drought they also play an important role in securing the health of both people and live stocks. The available published studies on the diversity and ethnobotany of wild food plants especially of tubers are limited to specific area.<sup>10</sup> In northwestern and western Ethiopia, the consumption of wild food plants seems to be one of the important local survival strategies and appears to have intensified due to the repeated climatic shocks hampering agricultural production and leading to food shortages.<sup>8</sup> The Shinasha (Boro) people are one of the minority ethnic groups in Ethiopia. According to Ethiopian central statistics their population is estimated to be around 32,701. Their language Shinasha belongs to the North Omotic, Gonga language sub-family with Anfillo, Kafa and Sheka language and is spoken from the stretches of northwest to southwest Ethiopia.

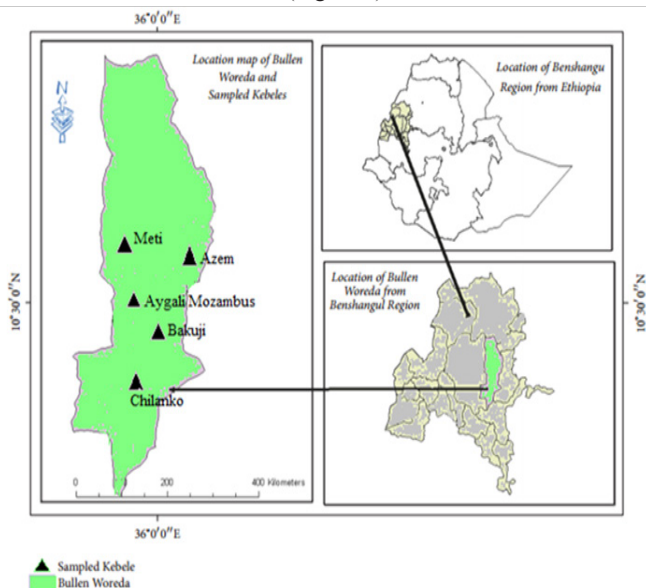
The people live mostly in Metekel zone that is located about 650 km northwest of Addis Ababa the Ethiopian capital city. Their livelihood is based on subsistent agriculture (ploughing land and rearing animals for domestic use). The Shinasha people are known for their use of traditional medicine uniquely from geophytes and foods of wild sources than from many other Ethiopian ethnic groups.

However, ethno botanically these people remain unexplored and no comprehensive account of their traditional practice is available. As is the case elsewhere in the country, both the traditional knowledge and the plants utilized by these people are under threat due to reasons mainly attributed to degradation, deforestation and overharvesting of rare species. This calls for an urgent action to collect and document the indigenous knowledge.

In Bullen Woreda of Benshanguel-Gumuz region, the non-cultivated plants provide considerable amount of supplementary food and have significant contribution to generating additional income for many households. However, there has not been sufficient research carried out about the indigenous knowledge of wild edible tuber plants in Bullen district. Therefore, this study was designed to identify and document wild edible tuber plant species,<sup>8</sup> identify and record the parts and mode of consumption of wild edible tuber plants,<sup>7</sup> evaluate the exploitation and conservation status of the species, and<sup>15</sup> assess threats on the wild edible tuber plant species and recommend the possible management scenarios for their conservation.

## Materials and methods

Ethno botanical survey with respect to wild edible tuberous plants was carried out during June 2015 to September 2016. The study area was frequently visited, local informants were used to locate and collect the plants. The uses of plants and its parts and method of usage were obtained through semi structured questionnaires, frequent interaction and discussion with local villagers, which included farmers, housewives and herdsmen. Live specimens and available photographs were shown to them for local identification. Standard methods were followed with regards to collection of plant materials, drying, mounting, preparation and preservation of herbarium sheets and museum sample.<sup>16</sup> Botanical identification of the species were done with the help of floras of Ethiopia<sup>9</sup> and also the herbarium collection maintained in AAU (Figure 1).

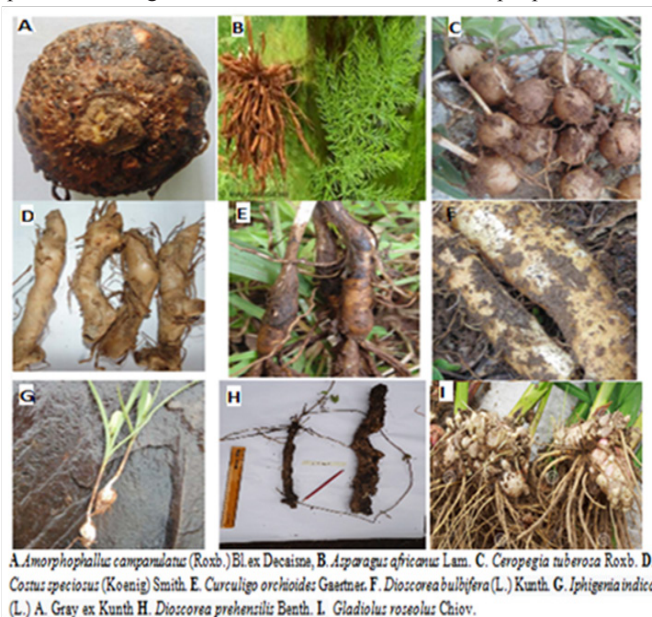


**Figure 1** Location map of the study Woreda and sampled kebeles.

## Results and discussion

The study provides empirical evidence about traditional knowledge

and diversity of Wild tuberous plants. The study area is floristically rich and includes various useful wild tuberous plant species. The present survey encompasses the documentation of 29 wild tuberous plant species belonging to 15 family and 24 genera tabulated with botanical name, local name, and family, habit and habitat, mode of consumption and their medicinal uses. A maximum of 05 plants from *Araceae*, 05 from *Dioscoreaceae*, 03 from *Liliaceae*, 03 from *Asclepiadaceae* and 02 from *Zingiberaceae* 02 from *Fabaceae* and 01 from *Passifloraceae*, *Aponogetonaceae*, *Costaceae*, *Hypoxidaceae*, *Commelinaceae*, *Cyperaceae*, *Euphorbiaceae*, *Nelumbonaceae*, *Alismataceae* were reported along with photographs (Table 1 & Figure 2). Wild tuberous plants have dual significance for their food value and some pharmaceutically active constituents. Most of the tuberous plants grow in shady and moist places due to habitat destruction and overexploitation for food and medicine. The wild tuberous plants are facing the threat of extinction e. g. *Ceropegia*, the fleshy underground parts of most of the species are eaten by animals apparently wild Warthog in the district and this probably accounts for the scarcity of these attractive plants. Therefore, proper and organized documentation of these plants and identification of potential species for prioritization of conservation through sustainable management is finding essential so that the resources and knowledge can be preserved, managed and utilized. The little emphasis made for the promotion of wild species were of significant importance to local farmers, recently there had been increased concern for the need to domesticate promising wild species as a long term source of income to the rural people.



**Figure 2** Some samples of wild food tubers collected in Bullen District.

## Conclusion

The study on knowledge and diversity of tuberous wild plants with food and medicinal uses in Bullen District was immensely stated and documented. The study revealed that there are about 29 wild tuberous plant species belonging to 15 family and 24 genera of which all the household members of the study area collects and consumes for the purpose of medicine and as food resources. This helped to ensure the maintenance of indigenous knowledge associated with wild food plant species particularly of tubers. Many of the tuber plants found

in the study area are found to be under growing pressure, due to anthropogenic and socioeconomic factors. This has resulted in the dwindling of the species of wild edible tuber plants and the associated indigenous knowledge of the people (Table 1).<sup>17–19</sup>

**Table 1** List of wild tuber food and medicinal plants in Bullen District

No.	Botanical name	Family	Local Name (Shinashigna)	Habit & habitat	Mode of consumption	Medicinal Use
1	<i>Adenia hondala</i> (Gaertner) de Wilde	Passifloraceae	Ewa	Climbing herb, frequent in forests	Tuber eaten cooked	Juices of roots used in skin troubles
2	<i>Alocasia fornicate</i> (Roxb.) Schott.	Araceae	Drutsa	Perennial herb, occurs abundant along fast stream	Tubers are eaten cooked with much acidic fruit like tamarind	Used in rheumatism, dropsy, swelling, constipation, piles etc.
3	<i>Amorphophallus bulbifera</i> (Roxb) Bl		Shuna	Herb, occasional in shade on clayey soil in forest	Corms eaten cooked	Used in piles, worm infestation, liver and splenic diseases
4	<i>Amorphophallus</i>	Araceae	Shuna	Herb, occasional in shade on clayey soil in forest	Corms eaten	Used in elephantiasis, tumours,
	<i>campanulatus</i> (Roxb.)				cooked	haemorrhages, vomiting, seminal
	Bl.exDecaisne					weakness
5	<i>Aponogeton echinatus</i>	Aponogetonaceae	Akadisha	Submerged, tuberous herb, common in stagnant water	Tuber eaten cooked	Used in skin diseases, leucorrhoea
	Roxb					
6	<i>Arisaema tortuosum</i>	Araceae	Emanni	Herb, occurs in westerns plains	Corm eaten cooked	Roots used to kill worms, brain tonic
	(Wall) Schott & Endl. var. <i>tortuosum</i>					
7	<i>Asparagus Africana</i> lam.	Liliaceae	Gaha	Woody herb, common in shade	Tuber eaten cooked	Used in nervous disorders, acidity,
				on thin soil of plain		dyspepsia, diarrhea, burning sensation, hypertension
8	<i>Ceropegia tuberosa</i> Roxb.	Asclepiadaceae	Meena	Erect herb, occurs in scrub forest	Tubers eaten either in raw or in cooked form	Used as seminal debility and general debility
9	<i>Chlorophytum laxum</i> R.Br	Liliaceae	Munna	Herb, locally common in hill tops	Tuber eaten cooked	Sexual weakness, obesity, leucorrhoea
10	<i>Colocasia esculenta</i> (L.) Schott.	Araceae	Sheta	Rhizomatous herb, locally abundant in marshy places	Tuber eaten as a vegetable after cooking	Used in somatalgia, alopecia, haemorrhoids and congestion of the portal system
11	<i>Costuss peciosus</i> (Koenig) Smith	Costaceae	Ginnii	Perennial, creeping tuberous herb, fairly common in wisin woodland	Rhizome eaten cooked	Rhizome juice is used as medicine for treatment of Jaundice, dysentery, skin diseases
12	<i>Curculigo orchoides</i>	Hypoxidaceae	Tosha	Tuberous herb,	Roots are used for	Used in spermatorrhoea,
	Gaertner			common in the exposed	preparation of	piles, jaundice, gonorrhea

Table Continued..

No.	Botanical name	Family	Local Name (Shinashigna)	Habit & habitat	Mode of consumption	Medicinal Use
				grassland	Local drinks	
13	<i>Curcuma neilgherrensis</i> Wight.	Zingiberaceae	Bodi-zanzibila	Perennial herbs, Common on exposed areas and on hill slopes in Wisin woodland	Rhizome used to flavor cooked food	Cardiac diseases, abdominal disorders
14	<i>Cyanotis tuberosa</i> (Roxb)	Commelinaceae	Shukarie	Creeping, tuberous herb, common in sandy soil of plains	Tuberous root eaten cooked	Used in inflammation, skin diseases, verminosis, vomiting
15	<i>Cyperus rotundus</i> L.	Cyperaceae	Bambiya	Herb, in plains, as weed of cultivation	Tuberous root eaten cooked	Used in stomach and bowel complaints
16	<i>Decalepis hamiltonii</i> Wight & Arn.	Asclepiadaceae	Meenna	Climbing herb, found in rocky places	Roots made into pickles	Used in polyuria, haemorrhage, jaundice
17	<i>Dioscorea bulbifera</i> L.	Dioscoreaceae	Shawat- matakeya	Perennial climbers, wet deciduous forest	Tubers are cut in to small pieces and boiled in water; water is decanted, cooked and used as food	Paste of tuberous root is applied on erysipplas, swellings, syphilis, etc
18	<i>Dioscorea prehensilis</i>	Dioscoreaceae	Anga	Perennial climbers, common in forest	Tubers are cut in to small pieces and boiled in water; water is decanted, cooked and used as food	Tuber powder form applied to ulcer
Bent.						
19	<i>Dioscorea hispida</i> Dennst	Dioscoreaceae	Shawat- Matakeya	Perennial climbers, occurs in wet forest	Tubers are cut in to small pieces and boiled in water; water is decanted, cooked and used as food	Used in piles and dysentery
20	<i>Dioscorea oppositifolia</i> L.	Dioscoreaceae	Angga	Perennial climbers, common in forest	Tubers are cut in to small pieces and boiled in water; water is decanted, cooked and used as food	Tubers used as tonic and in swellings
21	<i>Dioscorea pentaphylla</i> L.	Dioscoreaceae	Annga	Perennial climbers, wet	Tubers are cut in to small pieces and boiled in water; water is decanted, cooked and used as food	Tubers used as tonic and in swellings
				deciduous forest		
22	<i>Hemidesmus indicus</i> (L.) R. Br.	Asclepiadaceae	Futsa	Climbing herb, common in	Root powder is used as an additive in preparation of tea & coffee	Used in burning sensation, skin
				wettest places		diseases, asthma, fits, dyspepsia, helminthiasis



Table Continued..

No.	Botanical name	Family	Local Name (Shinashigna)	Habit & habitat	Mode of consumption	Medicinal Use
23	<i>Iphigenia indica</i> (L.) A. Gray ex Kunth	Liliaceae	Zaza	Herb, fairly common in shade on grassy soil of hills	Corm eaten cooked	Corms used in colic
24	<i>Manihot esculenta</i> Crantz	Euphorbiaceae	Kazawari	Small tree, occurs in Wisin woodland forest	Tubers eaten cooked	The juice of tubers to treat constipation
25	<i>Nelumbo nucifera</i> Gaertner.	Nelumbonaceae	Echeqa	Aquatic, perennial, stoloniferous herb, Common in open tank	Roots eaten cooked	Used in pharygopathy, dysentery, smallpox, cough
26	<i>Pueraria tuberosa</i> (Roxb. ex Wild.) D.C.	Fabaceae	Qulqa	Climber, stream beds, dry tracts, Hill forests and in Waste lands	The tuber is fleshy, tastes liquory and eaten cooked	Powered roots is given in sprue, rheumatism, swellings, prostrate problems
27	<i>Sagittaria sagitifolia</i> L.	Alismataceae	Jingita	Rooted, scapigerous herb, occurs in wetlands	Roots eaten cooked	Used as discutient; also given to arrest flow of milk in nursing mothers
28	<i>Vigna vexillata</i> (L.) Rich.	Fabeceae	KafiAtsa	Climbing herb, occurs in forest	Tuberous roots are eaten cooked	Paste of tuberous root is applied on swellings
29	<i>Zingiber montanum</i> (Koenig) Link ex A	Zingerberaceae	Zanzibila	Herb, Moist, sandy, loose soil in shady places	Roots made into pickles	Used in cough, stomachache, asthma and also as a vermifuge

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## Conflict of interest

None of the authors of this paper has a financial or personal relationship with other people or organizations that could inappropriately influence or bias the content of the paper. It is to specifically state that “No Competing interests are at stake and there is No Conflict of Interest” with other people or organizations that could inappropriately influence or bias the content of the paper.

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