Tuberous Wild Plant of Shinasha People as Food and Medicine in Bullen District Northwest of Ethiopia

Dereje Mosissa1* and Birhanu Abraha2

1Ethiopian Biodiversity Institute Assosa Center Forest and Rangeland biodiversity case team, Assosa, Ethiopia. Email: derament5964@gmail.com, Phone: +251(0)949045964
2Department of Biology, Bahir Dar University, Bahir Dar, Ethiopia. Email: berhanu.tsegay@yahoo.com, Tel: +251(0)918 766 766

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

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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 [6]. Wild edible plants are important in the livelihood strategies of local people, and forest dwellers in many developing countries [10]. 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 [7].

Wild edible plants as alternative to staple food during deficit are valuable supplements for a nutritionally balanced diet [13]. 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 [15]. 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 [5].

The rural communities of developing countries depend on wild edible plants to meet their food requirements during periods of food shortage. Studies conducted by [8] indicated that the wild edible plants are mostly serving as supplementary foods in different parts of Ethiopia. Wild edible plants are nutritionally rich [17] and can supplement especially vitamins and micronutrients [8]. 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 [18], [19]. 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 [16]. The wide range of climatic and edaphic conditions permitted the growing of a variety of wild food plants [3].

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 [2] and wild edible plants that are consumed at times of famine and other hardships [8]. In this regard, the elder community members are mostly the key sources of knowledge about plants [8].

The consumption of wild plants seems more common in food insecure areas of the country as compared to relatively food sufficient areas [1]. 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 livestocks. The available published studies on the diversity and ethnomedicine of wild food plants specially of tubers are limited to specific area [19]. 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 [17].

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, Gongga 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, ethnobotonically 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-Gumez 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, [17], identify and record the parts and mode of consumption of wild edible tuber plants, [8], evaluate the exploitation and conservation status of the species, and [4] assess threats on the wild edible tuber plant species and recommend the possible management scenarios for their conservation.
Methodology
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 [9]. Botanical identification of the species were done with the help of floras of Ethiopia [18] and also the herbarium collection maintained in AAU.

Result 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 and Fig.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.
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).
| No. | Botanical Name                        | Family       | Local name (Shinashigna) | Habit & Habitat                        | Mode of consumption | Medicinal use                                      |
|-----|--------------------------------------|--------------|--------------------------|----------------------------------------|---------------------|---------------------------------------------------|
| 1   | *Adenia hondala* (Gaertner) de Wilde | Passifloraceae | Ewa                      | Climbing herb, frequent in forests     | Tuber eaten cooked  | Juices of roots used in skin troubles              |
| 2   | *Alocasia fornicate* (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   | *Amorphophallus bulbifera* (Roxb) Bl | Araceae      | Shuna                    | Herb, occasional in shade on clayey soil in forest | Corms eaten cooked  | Used in piles, worm infestation, liver and spleenic diseases |
| 4   | *Amorphophallus Campanulatus* (Roxb.) Bl, ex Decaisne | Araceae | Shuna                    | Herb, occasional in shade on clayey soil in forest | Corms eaten cooked  | Used in elephantiasis, tumours, haemorrhages, vomiting, seminal weakness |
| 5   | *Aponogeton echinatus* Roxb          | Aponogetonaceae | Akadisha                | Submerged, tuberous herb, common in stagnant water | Tuber eaten cooked  | Used in skin diseases, leucorrhoea                  |
| 6   | *Arisaema tortuosum* (Wall) Schott & Endl. var. tortuosum | Araceae | Emanni                   | Herb, occurs in westerns plains         | Corm eaten cooked   | Roots used to kill worms, brain tonic               |
| 7   | *Asparagus Africana* lam.            | Liliaceae    | Gaha                     | Woody herb, common in shade on thin soil of plain | Tuber eaten cooked  | Used in nervous disorders, acidity, dyspepsia, diarrhea, burning sensation, hypertension |
| 8   | *Ceropegia tuberosa* 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   | *Chlorophytum laxum* R.Br            | Liliaceae    | Munna                    | Herb, locally common in hill tops       | Tuber eaten cooked  | Sexual weakness, obesity, leucorrhoea              |
| 10  | *Colocasia esculenta*                | Araceae      | Sheta                    | Rhizomatous herb, locally               | Tuber eaten as a vegetable after | Used in somatalgia, alopecia, leucorrhoea          |
| Sl. No. | Species Name                      | Family     | Common Name       | Habitat                                           | Uses                                                                 | Medicinal Uses                                                                 |
|--------|----------------------------------|------------|-------------------|--------------------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------------------------|
| 11     | *Costus speciosus* (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     | *Curculigo orchioides* Gaertner  | Hypoxidaceae | Tosha             | Tuberous herb, common in the exposed grassland   | Roots are used for preparation of Local drinks                      | Used in spermatorrhoea, piles, jaundice, gonorrhoea                           |
| 13     | *Curcuma neilgherrensis* 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     | *Cyanotis tuberosa* (Roxb)       | Commelinaceae | Shukarie          | Creeping, tuberous herb, common in sandy soil of plains | Tuberous root eaten cooked                                           | Used in inflammation, skin diseases, verminosis, vomiting                   |
| 15     | *Cyperus rotundus* L.            | Cyperaceae  | Bambiya           | Herb, in plains, as weed of cultivation          | Tuberous root eaten cooked                                           | Used in stomach and bowel complaints                                        |
| 16     | *Decalepis hamiltonii* Wight & Arn. | Asclepiadaceae | Meenna            | Climbing herb, found in rocky places             | Roots made into pickles                                              | Used in polyuria, haemorrhage, jaundice                                      |
| 17     | *Dioscorea bulbifera* 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, syphills, etc    |
| 18     | *Dioscorea prehensilis* Bent.    | 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                                           |
| 19     | *Dioscorea hispida*              | Dioscoreaceae | Shawat-           | Perennial climbers, occurs in                    | Tubers are cut in to small pieces                                   | Used in piles and dysentery                                                 |
| No. | Species Name | Family | Common Name | Habitat | Preparation and Usage |
|-----|--------------|--------|-------------|---------|-----------------------|
| 20  | Dioscorea oppositifolia L. | Dioscoreaceae | Matakaya | wet forest | Tubers are cut into pieces and boiled in water, water is decanted, cooked and used as food. Tubers used as tonic and in swellings. |
| 21  | Dioscorea pentaphylla L. | Dioscoreaceae | Angga | Perennial climbers, common in forest | Tubers are cut into pieces and boiled in water, water is decanted, cooked and used as food. Tubers used as tonic and in swellings. |
| 22  | Hemidesmus indicus (L.) R. Br. | Asclepiadaceae | Futsa | Climbing herb, common in wettest places | Root powder is used as an additive in preparation of tea & coffee. Used in burning sensation, skin diseases, asthma, fits, dyspepsia, helminthiasis. |
| 23  | Iphigenia indica (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  | Manihot esculenta Crantz | Euphorbiaceae | Kazawari | Small tree, occurs in Wisin woodland forest | Tubers eaten cooked. The juice of tubers to treat constipation. |
| 25  | Nelumbo nucifera Gaertner. | Nelumbonaceae | Echeqa | Aquatic, perennial, stoloniferous herb, Common in open tank | Roots eaten cooked. Used in pharyngitis, dysentery, smallpox, cough. |
| 26  | Pueraria tuberosa (Roxb. ex Wild.) D.C. | Fabaceae | Qulqa | Climber, stream beds, dry tracts, Hill forests and in Waste lands | The tuber is fleshy, tastes liquor and eaten cooked. Powered roots is given in sprue, rheumatism, swellings, prostrate problems. |
| 27  | Sagittaria sagitifolia 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  | Vigna vexillata (L.) Rich. | Fabaceae | Kaf Atsa | Climbing herb, occurs in forest | Tuberous roots are eaten cooked. Paste of tuberous root is applied on swellings. |
| 29  | Zingiber montanum (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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