

## INDIGENOUS PLANT FOODS WHICH ARE COMMONLY CONSUMED BY THE TRIBAL COMMUNITIES IN DUMBRIGUDA AREA OF VISAKHAPATNAM DISTRICT, ANDHRA PRADESH, INDIA.

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### ABSTRACT

The present study encompasses the in-depth investigation on uncultivated vegetables in the Dumbriguda agency region of Visakhapatnam District. The study also deals with community perspectives and utilization of wild vegetables in their food system. The study revealed that a total of 55 indigenous food plants formed the largest group which includes tubers, rhizomes, roots, young leaves, buds, bulbs, inflorescence, unripe/ripe fruits and seeds. Analysis of the recorded information revealed that out of 55 species, 54 are belonging to Angiosperms (dicots and monocots) and 1 species of pteridophyta member. Among them 24 species are used as leafy vegetables, 21 species for fruits, 6 species for tubers, 4 species for tender shoots, 2 each for seeds and flowers.

**Key words** indigenous food plants, adivasi communities, Dumbriguda, Visakhapatnam.

### INTRODUCTION

The Adivasi people of Dumbriguda fully depended on both wild and cultivated plants for their food, medicine, shelter and other uses. Community obtained knowledge of plants from their ancestors through oral tradition. The major tribal communities are Nookadora, Kotiya, Kondakammari, Bagatha, Kondh, Muliya, Kondadora and Valmeeki. The local adivasi communities cultivates millets in forest lands, foot hills and plain dry lands and its associated naturally grow plants popularly known as “weeds” are consumed by them seasonally. Consuming ragi malt is regular diet among them and wild traditional foods are also the major contributing factors to enhance their nutritional security. Communities who do farming in the podu lands are able to collect wild edible tree

leaves, flowers and fruits and seeds and tubers and rhizomes than others who own only plain lands. However adivasi families who are depended on minor forest products usually maximum time they spent in the forest so they are able to collect jack fruit seeds, young bamboo shoots, *Dioscorea* sp. tubers for self consumption as well as sell or exchange with others in the village.

### MATERIAL AND METHODS

#### Study Area:

The study area of Dumbriguda is one of the 11 tribal mandals of Visakha District. Visakhapatnam District is one of the North Eastern Coastal districts of Andhra Pradesh and it lies between 17° - 15' and 18°-32' Northern latitude and 18° - 54' and 83° - 30' in

Eastern longitude. It is bounded on the North partly by neighboring district known as Vizianagaram and the Orissa State, on the South by East Godavari District, on the West by Orissa State and on the East by Bay of Bengal. Dumbriguda is a mandal headquarter which consists 22 Panchayats and 87 revenue villages. Total population of the area is 44,878 among them 93.43% are tribal communities. It is a first attempt on conducting an exploratory study towards understanding traditional food system of tribal communities in this region, however earlier workers had done some similar studies on uncultivated food plants in several other tribal areas in the country and within the state. Ethnobotanical Studies on the wild edible plants of Irula tribes of Pillur valley, Tamilnadu carried out by L. Rasingam *et al.* (2012)<sup>1</sup>, Wild edible plants of Chandrapur district, Maharashtra compiled by Reddy (2012)<sup>2</sup>, Traditional Knowledge on wild food plants in Andhra Pradesh species enlisted by Reddy *et al.* (2007)<sup>3</sup>, Wild edible plants traditionally used by the tribes in the Parambillulam wildlife Sanctuary, Kerala done by Yesodharan and Sujana(2007)<sup>4</sup>. Wild edible plants of Koch Bihar district, West Bengal compiled by Sobhan Kr Mukherjee (2008)<sup>5</sup>. Community conservation point of view experiences of Dalits in Semiarid region of Telangana published an article entitle on conservation of uncultivated food by local communities by Salome Yesudas(2004)<sup>6</sup>. Salome & Satish<sup>8</sup> has contributed on Traditional food systems of Dalit in Zahirabad region Medak under indigenous people's food systems, India for FAO publication.

**Figure-1. Wildly grown curry leaf**



The present work is the outcome of regular extensive survey work that has been conducted in different tribal habitations as part of the Revalorizing of Small Millets in South Asia RESMISA Action Research in Dumbriguda Area from the period of 2011 to Dec 2013. Interviews and discussions were held with local elderly knowledgeable persons both women and men to record naturally available greens which are associated with millet crop lands in the area. Participatory tools were used to map seasonal occurrence of edible greens, status of its availability and community mobility towards access them. Focus interviews made with women to record preparation of recipes. Local experts assisted in field identification based on local names. Plants specimens were collected to prepare herbarium for taxonomical identification. Local floras were used to identify plant specimens<sup>9-12</sup>. Photographs were taken to show other neighboring communities to cross check variations in plants utilization.

## RESULTS AND DISCUSSION

During this study it was observed that the tribal communities of the Dumbriguda area fill in the gaps in food needs by supplementing with uncultivated food plants in their daily diet. They were well familiar with the plants of surrounding forests and knew what to eat and how to treat and season some foods and they recognize non edible portions and harmful substances and they have indigenous techniques to remove harmful portions and subtences. Out of the 53 species of uncultivated vegetables collected from this area, 52 species are belongs to angiosperms and one species belongs to pteridophyta. The nature of habit of estimated plant species were revealed that trees occupied highest position with 21, followed by herbs (14species), climbers ( 9 species), Shrubs (6 species), each one species of fern and Vine. Among them 21 species are used as leafy vegetables, 21 species for fruits, 6 species for tubers, 4 species for tender shoots, 2 each for seeds and flowers.

It is also interesting observation that tribal communities not only used for self consumption but they also sell wild edible products to earn

income. Young shoots of bamboo, fruits of *Artocarpus heterophyllus*, *Limonia acidissima*, *Phoenix sylvestris*, *Semecarpus anacardium* and *Syzygium cumini* are commonly sell by adivasi women seasonally in weekly markets.

**Figure-2 *Costus speciosus* ( tuber is edible)**



Local adivasis utilize annual wild greens during rainy and winter season. Tubers and climbers are mainly harvested during winter and early summer and where as young leaves from trees are utilized in summer.

**Figure-3. An adivasi man is harvesting tuber of *Dioscorea sp***



Interestingly adivasi community elders have tremendous knowledge in terms of utilization of neighboring plant material for consumption for example *Colacasia esculenta* petiole and leaves are commonly used as vegetable than tubers and using as vegetable leaves of *Moringa oleifera* is

very high than flower. Nutritional data perfectly matches their choice of foods.

**Figure-4. *Diplazium esculentum* ( tender leaves (which shows circinate vernation are edible)**



Some tubers like Pindi dumpa and Nagali dumpa are harvested by Adivasis during celebration of traditional community festivals like Gotnaika and Itukala pandaga. As part of celebration of these festivals community harvest tubers collectively and cook and eat along with family members.

The nutritional data analysis shows that carotene is in rich amounts in wild edible leaves. The species like stalk of *Allium cepa* and leaves of *Alternanthera sessilis*, *Amaranthus spinosus*, *Cassia tora*, *Celosia argentea*, *Centella asiatica*, *Colacasi esculenta*, *Moringa oleifera*, *Murraya koenigii*, *Portulaca oleraceae*, *Trianthema protulacastrum* and *Solanum nigrum* leaves are commonly consumed by adivasi communities. The leaves of *A. sessilis*, *M. oleifera* *M. koenigii*, *A. cepa*, *C. argentea* and *M. viridis* are popular wild leafy vegetables in the area and adivasis are consuming them frequently i.e., once a week. Carotene which is a precursor of Vitamin A s ranges from 1926 mg to 19690 mg/100g. there is

an immediate need to do the analysis of Beta carotene from these plant foods as Beta carotene conversion of Vitamin A is much better than carotene.

There are hundreds of uncultivated foods available in this area; different adivasi tribes eat these foods in different ways which includes raw as well as cooked form. Most of the foods fall under category of fruits, leafy vegetables and roots and tubers. Food composition data is not available for all the listed foods. It is important to do the food composition analysis for these foods as soon as possible.

**Figure-5. Adivasi women are exchanging greens**



Traditional foods those are available in different seasons in the forest. Among the total, 34 foods are rich in vitamin C, 38 in calcium, 22 in Iron and 39 are rich sources of carotene and beta carotene which is converted to vitamin A in the body. Most of them fall under 2 or 3 categories also, thus making them as multivitamin cum mineral package. (Table-1)

As source of micronutrients these foods are matchless. They are like natural multivitamin and mineral capsules containing high amounts of calcium, iron, beta carotene and vitamin C. In the light of this knowledge we have to promote these foods and look for policy support in conservation and consumption. They radiate

hope for the hopeless picture of India's malnutrition.

Fibre is an important non nutritional element that is missing in the present day food style; these foods offer plenty of fibre which has good role in prevention of certain types of cancer and constipation. It plays an important role in diabetic diets. Overall fibre is missing in our present day diets and these foods offer micro nutrients in plenty along with fibre has a major supportive role improving the health and nutritional status of the people.

## CONCLUSION

Documentation of indigenous greens from ethno botanical approach is important for enhancing the understanding of Indigenous knowledge system. The wide consumption and availability of wild plants attest their value, and are especially visible among indigenous culture. Balancing agro biodiversity is major challenge in the study area due to several factors like promotion of mono crops and perennial plantation which results adverse impact on plant biodiversity. There are many wild greens are still unexplored and they have to be studied scientifically.

Research questions:

- Documentation local food systems of Adivasi communities of Dumbriguda
- Documentation of uncultivated edible plants from their agriculture fields
- Taxonomical identification and food composition analysis of both plant and animal indigenous foods of adivasi communities of Dumbriguda.

## ACKNOWLEDGEMENT

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**Table-1. List of Indigenous food plants recorded from Dumbriguda region of Visakhapatnam district, AP.**

Botanical name, Family name	Habit	Local name	General Habitat	Part used	Mode of Use/ Recipe	Source NIN (2003) <sup>7</sup>				
						Fibre in mg/100g	Calcium in mg/100g	Iron in mg/ 100g	Carotene in mg/ 100g	Vitamin C in mg/ 100g
<i>Acacia pennata</i> (L.) Willd. (Mimosaceae)	Shrub	Singaya akulu	Forest	Fruit	Fruits are edible		41	2.5	1297	47
<i>Aegle marmelos</i> (L.) Corr. (Rutaceae)	Tree	Maredu	Forest, Podu lands	Fruit	Fruit is edible Medicinal use	2.9	85	0.6	55	8
<i>Allium cepa</i> L. (Liliaceae)	Herb	Ullikadalu	Agricultural fields	Stalk	Stalk are cooked as vegetable	1.6	50	7.43	4900	17
<i>Alternanthera sessilis</i> (L.) R.Br. ex Roem &Schults. (Amaranthaceae)	Herb	Pulagati kura	Fallow lands	Leaves	Leaves are cooked along with dal	2.8	510	16.7	1926	17
<i>Amaranthus caudatus</i> (Amaranthaceae)	Herb	Thota kura	Fallow lands	Leaves	Leaves are cooked as vegetable	1	321	-	-	-
<i>Amaranthus spinosus</i> L. (Amaranthaceae)	Herb	Mullu kura	Millet's land	Leaves	Leaves are used as vegetable	1.1	800	22.9	3564	33
<i>Amaranthus viridis</i> L. (Amaranthaceae)	Herb	Chiluka thotakura	Fallow lands	Leaves	Leaves are used as vegetable	6.1	330	18.7	-	178
<i>Amorphophalus paeoniifolium</i> (Araceae)	Tubers herb	Adavi Kanda	Forest and near streams	Tubers	Tubers are boiled in salt water and then cooked as vegetable.					
<i>Artocarpus heterophyllus</i> Lamk. (Moraceae)	Tree	Panasa chettu	Forest	Fruits and seeds	Ripe fruits are eaten and boiled seeds are eaten and cooked as vegetable	2.8	20	0.6	130	7
<i>Bambusa arundinaceae</i> (Poaceae)	Shrub	Veduru kommulu	Forest	Tender shoots	Tender shoots are boiled and dried them up and cooked as vegetable curry	0	20	0.1	0	5
<i>Bauhinia sp</i> (Papilionaceae)	Tree	Gondru kura	Forest	Tender leaves	Tender leaves are used as vegetable to make curry					
<i>Bauhinia vahlii</i> (Papilionaceae)	Vine	Adda teega	Forest	Seeds	seed (semi burnt) pulp is eaten as snack item while drinking toddy.	1.1	302	6.8	0	0

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<i>Boerhaavia diffusa</i> L. (Nyctaginaceae)	Herb	Ambati kura	Forest and common lands	Leaves	Young leaves are cooked as vegetable		193	6.1	109	5.49
<i>Buchanania lanzan</i> Spreng. (Anacardiaceae)	Tree	Jarike	Forest	Fruit	Fruit is edible					
<i>Canthium parviflorum</i> Lamk. (Rubiaceae)	Shrub	Balusaku	Forest, common lands	Leaves and fruits	Tender leaves are cooked as vegetable and ripen fruits are edible					
<i>Capparis zeylanica</i> (Capparidaceae)	Climber	Adonda teega	Forest	Fruit	Young fruits are cooked as vegetable.					
<i>Caryota urens</i> L. (Palmaceae)	Tree	Solopi (jeeluga chettu)	Forest, podu lands	Toddy and stem pith	Collected toddy boils it until lukewarm and drink and died trees stem pith is used as vegetable.					
<i>Cassia tora</i> L. (Caesalpinaceae)	Shrub	Tantepu kura	Fallow lands	Tender leaves	Tender leaves are used as leafy vegetable		869	9.7	10418	225
<i>Cayratia sp.</i> (Vitaceae)	Climber	Pulla kura	Forest	Tender shoots	Tender shoots are use as vegetable					
<i>Celosia argentea</i> L. (Amaranthaceae)	Herb	Guruvu kura	Milletts land	Tender leaves	Leaves are used as leafy vegetable		398	20.9	2963	-
<i>Centella asiatica</i>	Herb	Elukachevi	Near streams	Tender leaves	Vegetable curry		-	4.28	11813	2.39
<i>Cissus quadrangularis</i> L. (Vitaceae)	Climber	Athuku bachali	Forest	Tender shoot and leaves	Prepared chutney and cooked as vegetable		650	2.1	-	-
<i>Colacasia esculenta</i> (L.) Schott. (Araceae)	Herb	Saru kura	Near streams	Petiole and leaves	Leaf petiole and leaves are cooked as vegetable.		227	10	10278	12
				Tubers	Tubers are used as vegetable.		40	0.4	24	24
<i>Costus speciosus</i> Koen ex Retz. (Costaceae)	Herb	Besika dumpa	Forest water logging areas	Rhizome	Rhizomes are used to prepare rasam particularly given to the sick person who is suffering with fever.					

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<i>Cucurbita maxima</i> (Cucurbitaceae)	Climber	Gummadi chiguru	Kitchen garden	Tender shoots and leaves	Tender shoots leaves are cooked as vegetable and it is very delicious with ragi malt.		392	-	-	-
<i>Digera muricata</i> (L.) Mart. (Amranthaceae)	Herb	Chenchu neyyi kura	Near streams	Leaves	Leafy vegetable					
<i>Dioscorea bulbifera</i> L. (Dioscoreaceae)	Climber	Chedu dumpa	Forest	Tubers	Boiled tubers are edible					
<i>Dioscorea oppositifolia</i> L. (Dioscoreaceae)	Climber	Tega dumpa	Forest	Tubers	Boiled tubers are edible					
<i>Dioscorea pentaphylla</i> L. (Dioscoreaceae)	Climber	Vymu dumpa	Forest	Tubers	Boiled tubers are edible	0.9	25			
<i>Dioscorea spp.</i> (Dioscoreaceae)	Climber	Gadda nagali dumpa	Forest	Tubers	Tubers edible either boiled or cooked on fire					
<i>Diospyrus melanoxylon</i> Roxb. (Ebenaceae)	Tree	Thummika pandlu	Forest	Fruit	Fruit is edible	5.6	40	0.9	44	-
<i>Diplazium esculentum</i> (Athyriaceae)	Fern	Konkodi kura	Forest and near streams	Folded leaves	Tender folded leaves are cooked as vegetable.					
<i>Ehretia laevis</i> Roxb. (Boraginaceae)	Tree	Pisinika	Forest	Fruit	Fruit is edible					
<i>Emblica officinalis</i> (Euphorbiaceae)	Tree	Usirika	Forest	Fruit	Medicinal use, Fruit is edible		50	1.2	9	600
<i>Hibiscus cannabinus</i> L. (Malvaceae)	Herb	Pulupu kura	Forest	Leaves	Leaves are cooked as vegetable		172	2.3	6970	20
<i>Leucas aspera</i> (Lamiaceae)	Herb	Thummike mokka	Forest and fallow lands	Leaves	Leaves are cooked as vegetable		719	81.6	2320	-

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<i>Limonia acidissima</i> (Rutaceae)	Tree	Velaga pandu	Forest and road sides	Fruit	Fruit is edible, young fruits are eaten to control diarrhea.	5	130	0.48	61	3
<i>Madhuca indica</i> L (Sapotaceae)	Tree	Ippa pokalu	Forest	Flower and seeds	Dried flowers are edible and fermented to prepare alcohol. Seeds for edible oil.					
					Fruits		45	0.2	302	40
<i>Mangifera indica</i> L (Anacardiaceae)	Tree	Konda mamidi	Forest	Fruit	Fruit pulp is edible and pulp is used to make mango jelly.		14	1.3	1990	16
<i>Mentha viridis</i> L. (Lamiaceae)	Herb	Pudina	Forest	Leaves	Leaves are used to make chutney		200	15.6	5480	27
<i>Momordica dioica</i> Roxb. (Cucurbitaceae)	Climber	Agakara teega	Forest	Fruits	Fruits are cooked as vegetable					
<i>Moringa oleifera</i> Lamk. (Moringaceae)	Tree	Munaga akulu	Forest	Flowers, tender leaves and fruits	Leaves are cooked as vegetable curry		440	7	19690	220
					Flowers are cooked as vegetable		51	-	-	-
<i>Murraya koenigii</i> (L.) Spreng. (Rutaceae)	Tree	Konda karivepaku	Forest	Leaves	Leaves are used to prepare chutney		830	0.9	7110	4
<i>Musa sp</i> (Musaceae)	Shrub	Konda arati	Forest, near streams	Fruits	Ripen fruits are edible and young fruits are cooked as vegetable.		17	0.4	78	7
<i>Phoenix sylvestris</i> Roxb. (Arecaceae)	Tree	Eetha pandlu	common lands	Fruits	Fruits are edible					
<i>Piper nigrum</i> (Piperaceae)	Climber	Konda miriyam	Forest	Root	Make decoction and take internally to control fever					

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<i>Pithecellobium dulce</i> (Roxb) Benth. (Mimosaceae)	Tree	Seema chinta	Forest, along field fences	Fruits	Fruits are edible		14	1	-	108
<i>Portulaca oleraceae</i> (Portulacaceae)	Herb	Pedda payala kura	Cultivated fields	Leaves	Leaves are cooked as vegetable.		111	14.8	2292	29
<i>Schleichera oleosa</i> (Lour.) Oken. (Sapindaceae)	Tree	Busi pandlu	Forest	Fruit	Oil extract from seeds Fruit is edible					
<i>Semecarpus anacardium</i> L. (Anacardiaceae)	Tree	Nalla cheedi	Forest	Fruit	Ripen fruit like thalamus are edible, seed pulp is also edible					
<i>Solanum nigrum</i> L. ( Solanaceae)	Herb	Kamanchi	Common lands	Leaves	Leaves are cooked as vegetable		367	7.1	13919	257.7
<i>Syzygium cumini</i> (L.) Skeels (Myrtaceae)	Tree	Neredu	Forest and near streams	Fruit	Ripen fruits are eaten		15	0.4	40	18
<i>Tamarindus indica</i> L. (Caesalpinaceae)	Tree	Chintha chigurlu	Forest	Tender leaves seeds	Tender leaves are cooked along with dal. Seeds are semi burnt in charcoal and pulp is eaten.		19	1	228	53
<i>Terminalia bellirica</i>	Tree	Tade pandu	Forest	Fruit	Medicinal use					
<i>Trianthema portulacastrum</i> L. ( Aizoaceae)	Herb	Ambali madu kura	Fallow lands	Leaves	Leafy vegetable		219	20.7	6052	88.06
<i>Ximenia americana</i> L. (Olacaceae)	Tree	Nakkeru	Forest	Fruit	Ripen fruits are edible					
<i>Zizyphus oenoplea</i> (L.) Mill. (Rhamnaceae)	Shrub	Parimi	Forest	Fruit	Fruit is edible					

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