

Wild edible plant Diversity of Kotagiri Hills - a Part of Nilgiri Biosphere Reserve, Southern India

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ABSTRACT:

The present study documented indigenous knowledge on wild edible plant resources from the tribe Irulas of Kotagiri at Nilgiri Hills. They are partially or fully dependent on the wildresources for their nutritional requirements. A total of 50 - plants were identified belonging to 31- families under 43 - genera. The present study observed that the tribal communities of the study area fulfill their food deficiency by supplementing wild food plants in their daily diet.

Keywords:

Wild edible, Indigenous Knowledge, Irulas, Kotagiri, Nilgiri Biosphere Reserve.

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INTRODUCTION

Wild edible plants play a major role in meeting the nutritional requirement of the tribal population in remote parts of the country (Manju Sundriyal and Sundriyal 2001). It is estimated that in India about 800 species are consumed as wild edible plants (Singh and Arora 1978). The documentation of indigenous knowledge on the utilization of local plant resources by different ethnic groups or communities is one of the main objective of ethnobotanical research^[48]. But much of the informations on wild edible plants are still lacking due to the lack of logical validation.

Wild edible plants not only provide food quantity but also make significant contribution to the population nutrition throughout the year (Grivetti and Ogle Britta, 2000; Ogle Britta, 2001; Ogle Britta *et al.*, 2001; Ogle Britta *et al.*, 2003). The potential of traditional vegetables may help to meet the increasing demands of the growing population. Increased use of traditional vegetables can contribute to enhance people's health and standard living as well as the economic and social status of the food producers themselves (Nirmala Joshi, 2007). Nutrients derived from plants are important to human health and complement other food sources (Abdoellah and Marten, 1986; Sims and Peterkin, 1987). Selection of a particular species for inclusion in the diet is location specific and influenced by the activities of plant material (Manju Sundriyal and Sundriyal, 2001).

India is considered as one of the Mega Diversity Centre in the world having wide variety of plants and rich in ethnic diversity. The climatic and ecological diversity create a foundation for very rich plant diversity Studies on wild edible plants have been carried out by various workers in India (Kaul *et al.*, 1982; Nagar, 1985; Sebastian & Bhandari, 1990; Bora & Pande, 1996; Girach *et al.*, 1998; ; Islami & Jha, 2001; Sharma & Singh, 2001; Lalramnghinglova, 2002; Patole & Jain, 2002; Pundir & Singh, 2002; Chakraborty, 2003; Krishna Prasad *et al.*, 2003 Kumer, 2003; Kulkarni *et al.*, 2003; Maya Devi, 2003; Nandanakunjidam, 2003; Narasimhan, 2003; Prasad *et al.*, 2003).

The ethnic population of Nilgiris has a very long tradition of close relationship with the wild plants. The indigenous knowledge is positively associated with the uses of plants in the isolated village and not in the village with less dependence on forest resources. In general, wild edible plants of the Nilgiri Hills have been largely neglected, despite its nutritional importance has indicated by

the frequent findings is them as rare plants, including new records for region or country. Moreover, it is perceptible that these large studies (Mohanan and Balakrishnan, 1991; Prasad and Balasubramanian, 1996; Paulsamy *et al.* 2005; Prasad *et al.*, 2003; Rajasekaran *et al.* 2005; Paulsamy *et al.*2009; Paulsamy *et al.* 2010) have abandoned quantitative aspects in the importance of these plants.

Kotagiri - Study area

Kotagiri (Kota- giri; Mountain of the Kotas), part of Nilgiri Biosphere Reserve, is the oldest and the third largest hill station in Nilgiris It is situated at an elevation of around 1793 m above sea level and located at 11.43°N and 76.88°E. The average rainfall is about 62 in. per annum and it is well distributed throughout the year. It possesses a natural charm and an agreeable climate among the hill stations of Nilgiris (**Fig-1**).

Irulas - People of the darkness

Irulas have been derived from the word "Irul" (Darkness), the dwellers of the jungle hence the name "People of the darkness". They are the Dravidian inhabitants and one among the Thirty six (36) sub- communities in Tamilnadu and found mainly in the Southern and Eastern slopes of the Nilgiri hills. According to the anthropologists, these people belong to the Negrito stocks, the ancestors of these people are supposed to have come to India from Africa (Jerome Jayanth, 2001). The principle languages of the Irulas are Tamil and Telugu. Irulas are an example of a culture that has preserved a highly diverse area ecosystem that sustains their life-style (Narasimhan, 2003; Ragupathy S and Mahadevan, 1997).

METHODOLOGY

The present ethnobotanical field surveys were conducted during May- August 2010 with the help of knowledgeable local people (Fig- 2). For authentication and proper verification of the plant they disclosed, some of the women were taken to the field and collected from the natural habitat. The voucher specimens for each species were collected and identified with the help of "*Flora of The Presidency of Madras*" (Gamble JS, 1935) and "*Flora of Tamil Nadu*" (Henry *et al.*, 1989; Henry *et al.*, 1987; Nagar M, 1985). Herbarium specimens were prepared as per the prescribed methodology (Jain and Rao, 1977). The voucher specimens are deposited in the Department of Botany, Bharathiar University Herbarium (BUH), Coimbatore, Tamil Nadu.



Table- 1 List of Wild Edible Plants used by the Irula tribe of Kotagiri Hills

Botanical Name	Family	Habit	Part(s) used	Mode of Preparation	Dietary Form
<i>Acalypha indica</i> L.	Euphorbiaceae	H	Leaves	Cooked	Leafy vegetable
<i>Aloe vera</i> (L.) Burm.	Liliaceae	H	Leaves	Raw	
<i>Alternanthera sessilis</i> (L.) R. Br. ex DC.	Amaranthaceae	H	Leaves	Cooked	Leafy vegetable
<i>Amaranthus caudatus</i> L.	Amaranthaceae	H	Twigs	Cooked	Leafy vegetable
<i>Amaranthus lividus</i> L.	Amaranthaceae	H	Twigs	Cooked	Leafy vegetable
<i>Amaranthus spinosus</i> L.	Amaranthaceae	H	Twigs	Cooked	Leafy vegetable
<i>Amaranthus tricolor</i> L.	Amaranthaceae	H	Twigs	Cooked	Leafy vegetable
<i>Anredera cordifolia</i> (Ten.) Steenis	Basellaceae	Cl	Leaves	Cooked	Leafy vegetable
<i>Artocarpus heterophyllus</i> Lam.	Moraceae	T	Fruit	Raw	Consumed as fruit
<i>Asparagus racemosus</i> (Willd.) Oberm.	Liliaceae	Cl	Tuber	Cooked	Vegetable
<i>Asystasia gangetica</i> (L.) T. And.	Acanthaceae	H	Leaves	Cooked	Leafy vegetable
<i>Berberis tinctoria</i> Lesch.	Berberidaceae	S	Fruit	Raw	Consumed as fruit
<i>Canna indica</i> L.	Cannaceae	S	Rhizome	Cooked	Vegetable
<i>Capsicum frutescens</i> L.	Solanaceae	H	Fruit	Raw/Cooked	Vegetable
<i>Cardiospermum halicacabum</i> L.	Sapindaceae	Cl	Leaves	Cooked	Leafy vegetable
<i>Centella asiatica</i> (L.) Urban	Apiaceae	H	Leaves	Cooked	Leafy vegetable
<i>Coccinia grandis</i> (L.) Voigt.	Cucurbitaceae	Cl	Leaves & Fruits	Cooked/ Raw	Leafy vegetable
<i>Colocasia esculenta</i> (L.) Schott.	Araceae	H	Periole & Tuber	Cooked	Vegetable
<i>Commelina benghalensis</i> L.	Commelinaceae	H	Leaves	Cooked	Leafy vegetable
<i>Dioscorea alata</i> L.	Dioscoreaceae	Cl	Tuber	Cooked	Used as vegetable
<i>Dioscorea bulbifera</i> L.	Dioscoreaceae	Cl	Tuber	Cooked	Used as vegetable
<i>Dioscorea pentaphylla</i> L.	Dioscoreaceae	Cl	Tuber	Cooked	Used as vegetable
<i>Drymaria cordata</i> (L.) Willd. ex Roem.	Caryophyllaceae	H	Leaves	Cooked	Leafy vegetable
<i>Elaeagnus kologa</i> Schlecht.	Elaeagnaceae	St	Fruit	Raw	Consumed as fruit
<i>Elaeocarpus tectorius</i> (Lour.) Poir.	Elaeocarpaceae	T	Fruit	Raw	Consumed as fruit
<i>Eryngium foetidum</i> L.	Apiaceae	H	Leaves	Cooked	Spice flavour
<i>Euphorbia hirta</i> L.	Euphorbiaceae	H	Fruit	Raw	Consumed as fruit
<i>Ficus racemosa</i> L.	Moraceae	T	Fruit	Raw/ Cooked	Vegetable
<i>Grewia hirsuta</i> Vahl.	Tiliaceae	T	Fruit	Raw	Consumed as fruit
<i>Lantana camara</i> L.	Verbenaceae	S	Fruit	Raw	Consumed as fruit

<i>Maesa indica</i> (Roxb.) DC.	Myrsinaceae	S	Fruit	Raw	Consumed as fruit
<i>Opuntia dillenii</i> (Ker- Gawl.) Haw.	Cactaceae	S	Fruit	Raw	Consumed as fruit
<i>Oxalis corniculata</i> L.	Oxalidaceae	H	Leaves & Fruits	Cooked	Leafy vegetable
<i>Oxalis latifolia</i> H.B.K.	Oxalidaceae	H	Leaves, Tuber	Cooked	Leafy vegetable
<i>Passiflora edulis</i> Sims.	Passifloraceae	Cl	Fruit	Raw	Consumed as fruit
<i>Passiflora foetida</i> L.	Passifloraceae	Cl	Fruit	Raw	Consumed as fruit
<i>Passiflora mollissima</i> (H.B.K.) Bailey	Passifloraceae	Cl	Fruit	Raw	Consumed as fruit
<i>Phoenix loureiroi</i> Kunth.	Arecaceae	T	Fruit	Raw	Consumed as fruit
<i>Phyllanthus emblica</i> L.	Euphorbiaceae	T	Fruit	Raw	Consumed as fruit
<i>Physalis peruviana</i> L.	Solanaceae	H	Fruit	Raw	Consumed as fruit
<i>Piper nigrum</i> L.	Piperaceae	Cl	Fruit	Raw/Cooked	Spice flavour
<i>Portulaca oleracea</i> L.	Portulacaceae	H	Leaves	Cooked	Leafy vegetable
<i>Rubus ellipticus</i> Smith.	Rosaceae	S	Fruit	Raw	Consumed as fruit
<i>Rubus rugosus</i> Smith.	Rosaceae	S	Fruit	Raw	Consumed as fruit
<i>Solanum nigrum</i> L.	Solanaceae	H	Leaves, Fruit	Raw/Cooked	Leafy vegetable
<i>Solanum torvum</i> Sw.	Solanaceae	S	Fruit	Raw/Cooked	Consumed as fruit
<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	T	Fruit	Raw	Consumed as fruit
<i>Talinum triangulare</i> Wild.	Portulacaceae	H	Leaves	Cooked	Leafy vegetable
<i>Vaccinium leschenaultii</i> Wight	Vaccinaceae	T	Fruit	Raw	Consumed as fruit
<i>Zizyphus oenoplia</i> (L.) Mill.	Rhamnaceae	St	Fruit	Raw	Consumed as fruit

Note: H- Herbs; S- Shrubs; T- Trees; Cl- Climbers; St- Stragglers

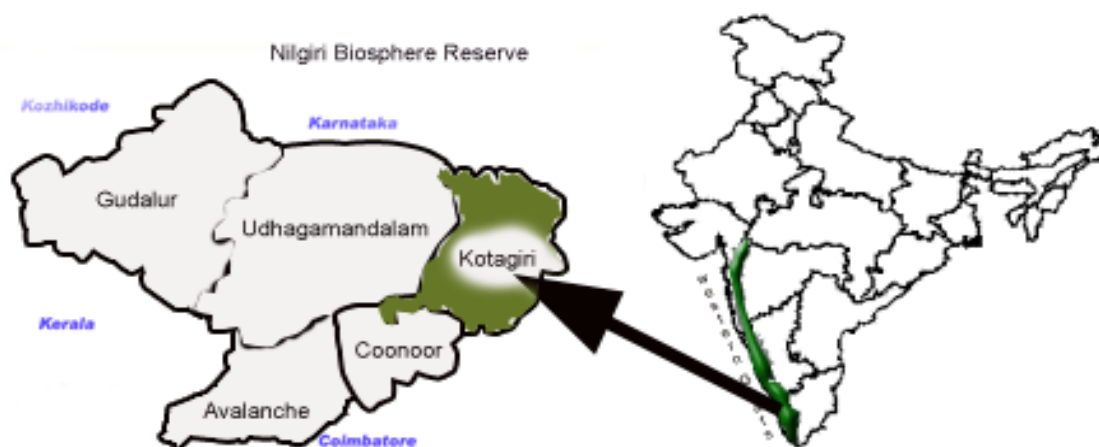


Fig.-1 India: Location Map of Kotagiri, Nilgiri Biosphere Reserve, Western Ghats



Fig. - 2: Survey carried out to the local people

Enumeration:

The identified plants are arranged alphabetically with family names in parenthesis, followed by the Habit, Part(s) used, Mode of utilization and Dietary form (**Table- 1**).

RESULT AND DISCUSSION:

Out of 31- families identified, the most widely utilized species belonged to Amaranthaceae (5), Solanaceae (4), Euphorbiaceae (4), Passifloraceae (3). Out of 50 plants documented, 17 - plant parts were used as leafy vegetables. They were either eaten raw (mainly fruits) or cooked as vegetables. In the present study, about 50- wild edible plants have been enumerated, among them 21 are herbs, 7 shrubs, 11 climbers, 2 stragglers and 9 trees (**Fig- 3**).

Wild edible plants were gathered in the form of fruits, leaves, roots, tubers, flowers etc. and these plants still share a good proportion of tribal dishes all over world (Anonymous, 1970- 1988; Duke and

Atchley, 1986; Neog and Mohan, 1994; Samant and Dhar, 1997). Traditionally wild edible species have been meeting the protein, carbohydrates, fat, vitamin and mineral requirements of the local residents to a greater extent (Sebastian and Bhandari, 1990). The present study is evident that the large sections of tribal communities are a dependent on a variety of plants to meet their requirements.

Plants used frequently such as *Amaranthus* spp., *Centella asiatica*, *Colocasia esculenta*, *Dioscorea bulbifera* etc. that are and can easily be propagated and maintained in the backyards of houses, so that it can be used readily. The dietary forms of these wild edibles are mostly the leafy vegetables, fruits and tubers. The nutritional value of traditional leafy vegetables is higher (Nordeide *et al.*, 1996; Orech *et al.*, 2007; Sundriyal and Sundriyal, 2001) than several common vegetables. They also contain antioxidants which offer protection against many chronic diseases like Heart disease and certain type of cancers (Saxena, 1999). Regular consumption of fruit is associated with reduced risks of cancer, cardiovascular disease (especially coronary heart disease), stroke, Alzheimer disease, cataracts, and some of the functional declines associated with aging (Liu, 2003). Tubers contain carbohydrates in the form of starch but they are easily digestible when compared to those of grains, cereals and pulses. They also supply minerals, vitamins and fibers etc. (Rajendran and Manian, 2009).

CONCLUSION:

The present study observed that in recent years there has been a greater change in the tribal culture and now a large portion of people practices agriculture. But the use of wild edible plant is still continued when they are available. It was found that the tribal women are well experienced and often the major players in utilizing wild traditional food plants. The present study also noted that the oral transmission of traditional knowledge is declining, so that there is an urgent need to document the Indigenous knowledge for serving future generations. Consequently, the ethnobotanical research is more important to encourage the people to preserve their valuable Indigenous knowledge, for sustainable utilization and conservation for future generation.

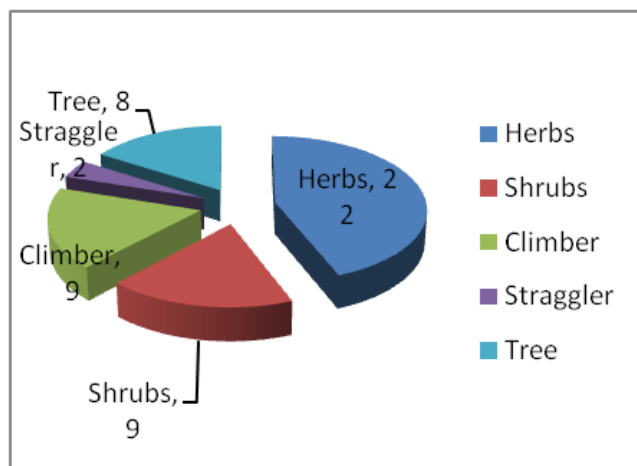


Fig.-3: Utilization of Wild Edible plants

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