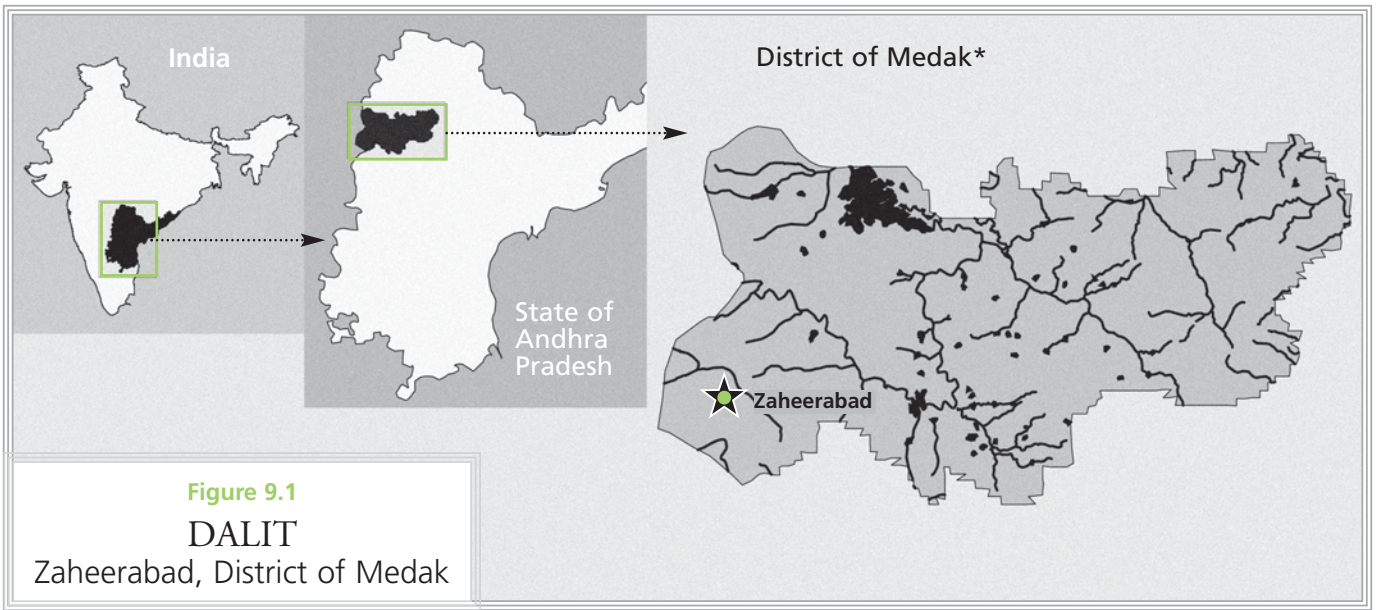


## Chapter 9

# Traditional food system of **Dalit** in Zaheerabad Region, Medak District, Andhra Pradesh, India

● BUDURU SALOMEYESUDAS<sup>1</sup> ● PERIYAPATNA V. SATHEESH<sup>1</sup>



Data from ESRI Global GIS, 2006.  
Walter Hitschfield  
Geographic Information Centre,  
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1  
Deccan Development  
Society (DDS),  
Begumpet, Hyderabad,  
Andhra Pradesh, India

“Aakuroloola chala balam unnadi,  
memu vati medi periginamu.”

“Greens give us strength, we grew up on them.”

**Edulapally Bayamma, a community member (Telugu language)**

## Abstract

The Dalit traditional food system in the Zaheerabad region has survived, largely as a result of conservation and the continuation of rich agro-biodiversity by women, which not only yields high-quality food and medicine for humans, but also high-quality fodder and medicine for animals, and high soil fertility which accommodates a host of nutritious, uncultivated foods.

The Dalit food list includes an extensive variety (329 species/varieties) of cereals, millets, pulses, oil seeds, fruits, vegetables, greens, roots and tubers. Roots, leaves, flowers, fruits, gums and bark are consumed seasonally. A rich variety is seen in processing methods: cooking, smoking, roasting, boiling, sun drying, shade drying, shallow frying and deep frying.

The nutritional contribution of the Dalit food system is fascinating as many of the foods are uncultivated and are considered weeds by the scientific community. The wild fruit contribution to the food system helps to create a respect for the surrounding environment of the village and nurtures an appreciation for nature in the younger generation. New nutrient data are presented for 21 greens and 15 wild fruits. Medicinal uses for 12 plants are given. Food and nutrient profiles of Dalit women were found to be acceptable and demonstrated that the food system supports community health.

## Introduction

**T**he Zaheerabad region of Medak District in the South Indian State of Andhra Pradesh is situated in a semi-arid region. Andhra Pradesh is the fifth largest state in India, with Hyderabad the capital city. Medak District is located northwest of Hyderabad and one of ten districts of Telangana region of Andhra Pradesh, it lies between 17° 27' and 18° 18' northern latitude and 77° 28' and 79° 10' eastern longitude (Figure 9.1). The total geographical area of the district is 9 699 sq km, accounting for 3.5 percent of the total area of the state. The district has 1 265 villages and ten towns,

with a population of more than two million (Registrar General & Census Commissioner, 1991).

Though semi-arid, lands here can receive erratic and heavy seasonal rainfall. Soils are highly degraded with soil depths in most places of less than 6 inches. Red soils dominate the land and productivity is regarded as generally low. Farmers report to feel extremely lucky if an acre of land produces 2 quintals (100 kg) of sorghum (cereal), and food security of the poor who mainly own these types of lands is threatened regularly. However, the Dalit of Zaheerabad have engaged in rural development activities to improve their nutrition. It is in this context that this research addresses agriculture of the poor and the role of uncultivated and wild food.

The scheduled caste representing the untouchables, called Dalit, is below the major four classes in the Hindu religion (Seenarine, 1996) with the majority living in extreme poverty and landless, illiterate and working as farm labourers (Annamalai, 2002). The Indian National Family Health Survey reported 17 percent of Dalit women to be short in stature and 42 percent to have chronic energy deficiency (International Institute for Population Sciences, 2000).

Agriculture of the poor in this district is characterized by consumption of many diverse plants, with a minimum of 8–12 crops being grown at the same time within the same field space. The symbiotic relationship between these crops can be seen in a wide range of issues: soil management, fertility management, internal cycle of inputs, pest control, labour management, diet management, risk insurance and many others. Farmers also look at their diverse field crops and wild foods from a spiritual point of view, and as a way of celebrating nature and establishing a communion with it. Over the millennia, uncultivated foods and wild foods have been an essential part of life for the poor in this region.

In this chapter, the phrase “uncultivated greens” may refer to edible green leafy plants growing naturally on the land and in uncultivated fields, partner crops in a cultivated field, or those available from cultivated plants but which are not the explicit objective of the cultivation. These are harvested at no cost by Dalit women farmers and consumed as vegetables, thus providing a rich source of nutrition and a source of food security. Reference to “wild” foods are to those not associated with agriculture and taken from forests or other non-agricultural spaces.

## Background

### Historical note

Medak was originally known as Methuku Durgam and was subsequently changed to Methuku because of the fine rice produced in this area. The Medak district first became part of the Kakatiya kingdom followed by the Bahamani, and later the Golconda kingdoms. Finally, with the fall of the Qutabshah dynasty, it was annexed to the Mughal empire. During the formation of Hyderabad State by the Asif Jahis, this district was detached and included in the Nizam’s dominion. It finally became a part of Andhra Pradesh, which took effect on 1 November 1956 after the States Reorganisation Act (Chief Planning Officer, 1995).

### Soils and water

The soils of the district are mainly red earth, comprising loamy sands, sandy loams and sandy clay loams. Red laterite soil is predominant in the Zaheerabad region. Black soils comprise clay loams, clays and silty clays and are found in Sangareddy, Andole, Narayankhed, and Narsapur regions. Red soils are generally non-saline and non-alkaline, while black soils are moderately alkaline with a highly soluble salt content.

The district does not have a major river. The Manjira, a tributary of the Godavari, is the only important river. Stored water is used for the drinking water needs of Hyderabad and adjoining areas. The other important streams in the district are the Haldi (or Pasupuyeru)

and the Kudlair. The Haldi is a tributary of the Manjira and enters the district from the north and flows through Medak town. The Kudlair, which drains the Siddipet region, is another river in the district and forms a tributary of the Mahair.

### Climate

The climate of the Zaheerabad region is characterized by hot summers and generally dry weather with rain showers expected during the monsoon season. The year is divided into three seasons: winter (November to February), summer (March to May) and southwest monsoon (June to October). Rainfall during the southwest monsoon months is about 84 percent of the annual rainfall, with July being the rainiest month. The average annual rainfall in the district is 896.7 mm.

May is the hottest month, with a mean daily maximum temperature of about 40 °C. With the onset of the southwest monsoon in the middle of June, the temperature decreases appreciably and the weather becomes more pleasant. December is the coldest month, with a mean daily maximum temperature of about 29 °C and a mean daily minimum temperature of about 14 °C. During the cold season, the night temperature may occasionally reach about 6 °C.

### Cropping systems of Zaheerabad region

The Zaheerabad region of the Deccan plateau area hosts enormous agricultural diversity despite the extinction of several cultivars, including traditional varieties of sugarcane (*manchi cheruku*, *tella cheruku*, *gomari cheruku* and *nalla cheruku*), ground nut (*pedda baimugh*), foxtail millet (*manchu korra*) and redgram (*tella thogari*), and threats to several crops and varieties, especially pulses and millets. On average, each acre of farm, especially those of small and marginal farmers, hosts eight to ten varieties of various crops. Farmers today cultivate 20 to 30 different varieties of various crops in an area of 1 to 2 acres, each in small quantities. This diversity provides a wide variety of nutritious food to the family at different stages of each season, provides an assortment of fodder and feed for the livestock,

improves the soil fertility and results in effective utilization of farmland. Crop diversity also ensures that, in times of unfavourable environmental conditions and climate, all food crops are not lost. Different farmers follow different cropping systems, depending upon soils and their situation, which are classified into “high”, “medium” and “low” diversity farms. Livestock in the district is important for providing animals used for production of milk and for pulling plows. According to the 1993–1994 census for Medak district, the total livestock population included 512 000 cattle, 115 000 buffaloes, 238 000 sheep, 237 000 goats and other livestock (an additional 35 000 animals) (Chief Planning Officer, 1995).

## Socio-economic profile

Medak has a total population of 2 269 800 persons, of whom 49 percent are female. Of this population, 85.5 percent live in rural areas. The district registered an annual population growth rate of 2.56 percent with a population density of 234 persons per sq km. Literacy is below the national average at 32.41 percent. However, male literacy is 45.15 percent, and female literacy is only 19.25 percent. Medak has a huge workforce, which stands at 47.78 percent, almost half the population. Of this, 78 percent are agricultural workers. The irrigated area as a percentage of cropped area is less than 30 percent. Of this, canal irrigation is only 3 percent (Chief Planning Officer, 1995).

In spite of all these handicaps and the predominance of rainfed agriculture and semi-arid environment, the district produces 160 kg per capita of food grains (Chief Planning Officer, 1995). Dalit form 17.5 percent of the population in the district and scheduled tribes comprise 4 percent of the population. Dalit women in the Zaheerabad region were reported to have had chronic energy deficiency (close to 60 percent with BMI below 18.5), with 71 percent of mothers working in agricultural activities, particularly fieldwork. Ninety-four percent used open-field toilets, and 79 percent were illiterate. Most mothers of young children were either pregnant or lactating (Schmid, 2005; Schmid *et al.*, 2006; Schmid *et al.*, 2007).

The Deccan Development Society (DDS) is a voluntary rural development organization which has

been working with Dalit women farmers in Medak District for more than 15 years giving support to volunteer Dalit women’s groups (*sanghams*) to enhance food security by reclaiming fallow lands and reintroducing elements of the local food system, particularly sorghum. The DDS has also developed demonstration schools and media centres to benefit Dalit sangham members. Health workers of the DDS have taken the lead to include uncultivated and wild foods in health promotion activities. In 2000, DDS initiated the study reported here to document the entire food system with the intention of managing local Dalit food to improve micronutrient nutrition and health.

## Methodology

The study included individual and group interviews in Telegu using participatory methodologies, as described by Kuhnlein *et al.* (2006). For individual interviews with women, written informed consent was first obtained from the *sangham* leader in each village and then from each Dalit mother. A written signature or a thumb impression was accepted as consent. A total of 149 Dalit mothers and their young children (aged 6–39 months who were living in households with a *sangham* member) were recruited from a total of 19 villages. Many key informant interviews of regional leaders were also conducted to complete background understanding of the food system. Research assistants from the nearby city fluent in English and Telugu were trained to conduct the interviews. Representatives from the Centre for Indigenous Peoples’ Nutrition and Environment (CINE), DDS and village leaders developed and signed a research agreement. Ethics approval was obtained by the Human Research Ethics Committee of the Faculty of Agricultural and Environmental Science of McGill University in Montreal, Canada (Schmid *et al.*, 2007).

Methodological themes and issues during the study used various tools with different groups (Table 9.1). Qualitative research included identification of species in the food system, seasonality and type of harvest and preference for use. One large sample for each species was collected and submitted for analysis at the National

**Table 9.1 Themes and methods used in research with Dalit women in Zaheerabad**

<b>Themes</b>	<b>Methods</b>
Attributes of foods and attribute ranking	Matrix ranking
Availability and consumption of foods per season	Interviews and focus groups with village women
Collection of recipes	Recipe competition
Food production process	Focus groups and interviews
Free list of foods used	Food inventory
General views on food and nutrition	Semi-structured interviews
Identification of uncultivated greens, tubers, roots and fruits	Transect walk
Medicinal values and other special features of foods	Focus group discussions
Nutrient composition analysis	Analysis at the NIN laboratory
Women's dietary data	24 hour recalls during two seasons

Institute of Nutrition (NIN) laboratory in Hyderabad. Analyses for nutrients were completed in duplicate or triplicate. A total of 32 fresh, raw samples were collected with the help of village volunteers, of which 26 were uncultivated green leafy vegetables. As soon as samples were received, they were cleaned for extraneous matter and cut into small pieces. A portion of each sample was digested using dry digestion procedures to measure trace minerals. Standard procedures of the Association of Official Analytical Chemistry (1984) were used for proximate composition and phosphorous content. The minerals were measured by Varian flame atomic absorption spectroscopy. For uncultivated greens and selected wild fruits nonaqueous reversed-phase HPLC methods for carotene separation (Zakaria *et al.*, 1979; Nelis and DeLeenheer, 1983) were explored and standardized. Food samples for vitamin C analysis were processed using metaphosphoric acid (Association of Vitamin Chemists, 1966) and vitamin C was determined with a modification of the method of Jagota and Dani (1982) using Folin-Ciocalteu reagent and a spectrophotometer at 760 nm.

## Results

### Traditional Dalit food list

To derive the traditional food list 12 key informants (three different age groups) met and created a free

listing of food. The Community Food System Tables were created for most species in this list, and are reported on the CINE website ([www.mcgill.ca/cine](http://www.mcgill.ca/cine)). The full list of foods traditionally consumed by Dalit families is presented in Table 9.2. It includes cultivated, uncultivated/wild and market foods.

In creating the community traditional food list, it became important to discuss foods with the village women in terms of recipes. Several terms unique to the food system evolved as noted in Table 9.3.

Market surveys were completed in six large villages where weekly markets were held, and where people normally purchased food. Village research assistants noted the kinds of purchased foods within food categories, and the number of items by food category is shown in Table 9.4. In general, some agricultural foods were found in markets, but the majority of Dalit women in the study grew their own food, as income was extremely limited.

Research assistants conducted unstructured interviews and focus groups with village Elders to determine the kinds of uncultivated foods that were still present in the region and retained in their knowledge, but which were little-used or unused during the research period. Nineteen of these foods are noted in Table 9.5.

### Taxonomic identifications

Several foods in the traditional food list required taxonomic identifications with the assistance of a

**Table 9.2 Dalit traditional food species list**

Scientific name	English/common name	Local name	Seasonality <sup>1</sup>	Preparation <sup>2</sup> cooked/raw
<b>Cereals and Grains</b>				
1 <i>Eleusine coracana</i> (2 var.)	Finger millet	tella thaidalu, erra thiada	Summer (March–May)	Cooked
2 <i>Hordeum vulgare</i>	Barley	yavlu	Winter (November–February)	Cooked with pulses
3 <i>Oryza sativa</i> (3 var.)	Rice	bailu nalla budda vadlu, bailu yerra vadlu, bailu tella budda vadlu	January–December	Boiled in water
4 <i>Panicum miliaceum</i>	Proso millet	kodi samalu	–	–
5 <i>Panicum miliare</i> (2 var.)	Little millet	sama, tella samalu	–	–
6 <i>Paspalum scrobiculatum</i>	Kodo millet	arekalu	–	Cooked
7 <i>Penisetum typhoideum</i>	Pearl millet, Italian millet	sajjalu	January–December	Cooked, roti, chapatti
8 <i>Setaria italica</i> (4 var.)	Foxtail millet	korralu	Winter (November–February)	Kichidi, pasham (sweet pudding), cooked
9 <i>Sorghum vulgare</i> (7 var.)	Sorghum	paccha jonna, tella malle jonna, erra jonna, kakimuttani jonna, sai jonnalu, rabi erra jonna, pyalala jonna	January–December	Cooked, roti
10 <i>Triticum aestivum</i> (3 var.)	Black thorny wheat	nalla mullu goduma, katte goduma, budda goduma	January–December	Cooked
11 <i>Zea mays</i> (2 var.)	Maize (dry)	makkalu	–	–
<b>Leafy vegetables</b>				
1 <i>Acalypha malabarica</i> *	–	pitta kura	Monsoon (June–October)	Curry with pulses
2 <i>Achyranthes aspera</i> *	–	uthareni	Monsoon (June–October)	Curry with pulses
3 <i>Allium cepa</i>	Onion stalks	ulli poraka	Monsoon & Winter (June–February)	Curry with pulses and greens
4 <i>Allium sativum</i>	Garlic stalk	yelligada poraka	Winter (November–February)	Curry with pulses and greens
5 <i>Alternanthera tenella</i> *	–	adavi punnaganti aalam	Monsoon (June–October)	Curry with pulses and greens
6 <i>Alternanthera sessilis</i> *	–	ponnaganti kura	Summer (March–October)	Curry with pulses and greens
7 <i>Amaranthus gangeticus</i> * (2 var.)	Amaranth tender	thota kura, thota kura kada	Monsoon & Winter (June–February)	Curry with pulses and greens
8 <i>Amaranthus paniculatus</i> *	Rajagira leaves	rajagiri kura	Monsoon (June–October)	Curry with pulses and others
9 <i>Amaranthus polygonoides</i> *	–	sirri kura	Monsoon (June–October)	Curry with pulses and others
10 <i>Amaranthus</i> sp.*	–	chakravarthi kura	–	Curry with pulses and others
11 <i>Amaranthus spinosus</i> *	Amaranth spined	mulla doggali	Summer (March–October)	Curry with pulses and others
12 <i>Amaranthus tristis</i> *	–	sirru aku	Monsoon (June–October)	Curry with pulses and others
13 <i>Amaranthus viridis</i> *	–	doggali kura, puwuthota kura	Monsoon (June–October)	Curry with pulses and others
14 <i>Aurthum graveolus wild</i> *	–	adavi soya kura	Monsoon (June–October)	Curry with pulses and others
15 <i>Basella rubra</i> *	Malabar spinach	yerra bacchali, mayalu	Monsoon (June–October)	Curry with pulses and others
16 <i>Baselia</i> sp. (3 var.)*	–	nalla bachali, pulla bachali, tella bachali	January–December	–
17 <i>Boerharia diffusa</i> *	–	athaka mamidi kura	Monsoon & Winter (June–February)	–
18 <i>Brassica campestris</i> var.*	Mustard leaves	ava akulu	Winter (November–February)	Curry with pulses
19 <i>Brassica oleraceae</i> var. <i>capitata</i>	Cabbage	gobi gadda	Monsoon & Winter (June–February)	Curry with pulses and others

*Continued*

**Table 9.2 (continued) Dalit traditional food species list**

	<i>Scientific name</i>	<i>English/common name</i>	<i>Local name</i>	<i>Seasonality</i> <sup>1</sup>	<i>Preparation</i> <sup>2</sup> <i>cooked/raw</i>
20	<i>Brassica oleraceae</i> var. <i>botrytis</i>	Cauliflower	phul gobi	–	–
21	<i>Canthium spinosa</i> *	–	balusuku	Monsoon (June–October)	–
22	<i>Carthamus tinctorius</i>	Safflower leaves	kusuma akulu	Winter (November–February)	Curry with pulses and others
23	<i>Cassia ariculata</i> *	–	thengedu puvvu	Winter & Summer (November–May)	Curry with pulses and others
24	<i>Cassia fistula</i> *	–	rela puvvu	Summer (March–May)	Curry with pulses and others
25	<i>Cassia tora</i> *	–	tagarancha, chinna tentem kura	Monsoon (June–October)	Curry with pulses and others
26	<i>Celosia argentia</i> *	–	gunagu, gurum kura	Monsoon (June–October)	Curry with pulses and others
27	<i>Cicer arietinum</i> *	Chickpea leaves	sanaga akulu	Winter (November–February)	Curry with pulses and others
28	<i>Cleome gynandra</i>	–	thalaila	January–December	Curry with pulses and others
29	<i>Cocculus hirsutus</i> *	–	doosari, cheepuru kura	Monsoon & Winter (June–February)	Curry with pulses and others
30	<i>Colocasia antiquorum</i>	Colocasia leaves	chama akulu	January–December	Curry with pulses and others
31	<i>Commelina benghalensis</i> *	–	yennadri	Monsoon & Winter (June–February)	Curry with pulses and others
32	<i>Corchorus olitorius</i> *	–	bankanti kura	Monsoon (June–October)	Curry with pulses and others
33	<i>Coriandrum sativum</i>	Coriander leaves	kothimiri	January–December	Curry with pulses and others
34	<i>Dioscorea bulbifera</i> *	–	jungle kand	–	–
35	<i>Dolichos lablab</i> (2 var.)	Field bean	anapa puvvu, chikkudu aaku kura	Monsoon (June–October)	–
36	<i>Digera arvensis</i> *	–	jonnachemchali	Monsoon & Winter (June–February)	Curry with pulses and others
37	<i>Enicostema hyssopifolium</i> *	–	gorumadi	March–October	Curry with pulses and others
38	<i>Ficus glomerata</i>	–	medi pandlu	Winter (November–February)	–
39	<i>Hibiscus cannabinus</i> (2 var.)	Gogu	pundi-thella, pundi erra, sarkar pundi kurra (govt variety)	January–December	Curry with pulses
40	<i>Glycine max</i>	Soya leaves	soya kooru	Winter (November–February)	Curry with pulses and others
41	<i>Gymnema sylvestre</i> *	–	pola patram	–	–
42	<i>Lactuca runcinata</i> *	–	atheli	Monsoon (June–October)	Curry with pulses and others
43	<i>Cassia sophera</i> *	–	chenngi	January–December	Curry with pulses
44	<i>Leucas aspera</i> *	–	tummi kura, chinnatummi kura	Monsoon (June–October)	Curry with pulses
45	<i>Maerremial emarginata</i> *	–	elakachevula kura	Monsoon & Winter (June–February)	Curry with pulses
46	<i>Mentha spicata</i>	Mint	pudina	January–December	Curry with pulses
47	<i>Merremia tridentata</i> var. <i>hastate</i> *	–	thadaka dobbudu	Monsoon & Winter (June–February)	Curry with pulses
48	<i>Mirabilis jalapa</i> *	–	gurumashi, tellagurumashi	Monsoon (June–October)	Curry with pulses
49	<i>Moringa oleifera</i> (2 var.)	Drumstick	munaga kura, munaga puvvu	January–December	Curry with pulses
50	<i>Moringa oleifera</i>	Drumstick flowers	–	Winter (November–February)	Curry with pulses
51	<i>Murraya koenigii</i>	Curry leaves	karivepaku	January–December	Curry with pulses
52	<i>Oxalis corniculata</i> *	–	adavi pulla kooru, pilliadugula kura	Winter (November–February)	Curry with pulses
53	<i>Phyllanthus maderaspatensis</i> *	–	poppu kura	Monsoon & Winter (June–February)	Curry with pulses

*Continued*



**Table 9.2 (continued) Dalit traditional food species list**

<i>Scientific name</i>	<i>English/common name</i>	<i>Local name</i>	<i>Seasonality</i> <sup>1</sup>	<i>Preparation</i> <sup>2</sup> cooked/raw
54 <i>Physalis minima</i> *	–	budda kasha, silleru kura	Monsoon (June–October)	Curry with pulses
55 <i>Piper betle</i>	Betel leaves	thamalapaku	January–December	Curry with pulses
56 <i>Portulaca grandiflora</i> *	–	goduma payala	January–December	–
57 <i>Portulaca oleracea</i> *(4 var.)	–	paruppu keerai, pappu kura, barre payala, ganga payala, nalla payala	Monsoon (June–October)	Curry with pulses
58 <i>Portulaca</i> sp*	–	sanna payala	January–December	Curry with pulses
59 <i>Rumex vesicarius</i>	–	chukka kura	Summer & Monsoon (March–October)	Curry with pulses
60 <i>Securingea virosa</i> *	–	tella pulcheri	–	–
61 <i>Sesbania aegyptiaca</i>	–	avisa puvvu	Winter (November–February)	Curry with pulses
62 <i>Sesbania grandiflora</i>	Agati	avise, agathi	Monsoon (June–October)	Curry with pulses
63 <i>Solanum nigrum</i> *(2 var.)	–	nalla kasha, kashapandla kura	Monsoon & Winter (June–February)	Curry with pulses
64 <i>Spinacia oleracea</i> (2 var.)	Spinach	pala kura, perinial palakura	January–December	Curry with pulses
65 <i>Tamarindus indica</i>	Tamarind leaves	chinta chiguru	Winter (November–February)	Curry with pulses
66 <i>Trachyspermum ammi</i>	–	oma koora	Winter (November–February)	–
67 <i>Trianthema decandra</i> *	–	tella garjala	Monsoon (June–October)	Curry with pulses
68 <i>Trigonella foenum</i>	Fenugreek leaves	menthikoora	Winter (November–February)	Curry with pulses
69 <i>Trigonella foenum graecum</i> *	–	adavi mentham kura	Monsoon & Winter (June–February)	Curry with pulses
70 <i>Zinziber officinale</i>	Ginger	allam aaku	Monsoon (June–October)	–
71 <i>Bascilla</i> sp*	–	angi bingi	Monsoon (June–October)	Curry with pulses
72 <i>Corchorus olitorius</i> *	Jute leaves	bakantti	–	–
73 <i>Erythrina indica</i> *	Indian coral tree	tellarjam puvvu	Summer (March–May)	Curry with pulses
<b>Roots tubers and vegetables</b>				
1 <i>Abelmoschus esculentus</i>	Okra, lady finger	benda kaya	Winter & Summer (November–May)	Cooked
2 <i>Allium cepa</i>	Onion	neerulli/ ulligadda	January–December	Used as an ingredient in cooking
3 <i>Benincasa hispida</i>	Ash gourd	boodida gummadi	Winter (November–February)	–
4 <i>Beta vulgaris</i>	Beet root	beetu gadda	Summer (March–May)	–
5 <i>Brassica oleracea</i> var <i>otrytis</i>	Cauliflower	phul gobi	Summer (March–May)	–
6 <i>Canavalia gladiata</i>	Sword beans	adavi chamma kaya	Winter & Summer (November–May)	–
7 <i>Capparis horrida</i> *	–	adavi adonda	January–December	–
8 <i>Capsicum</i> var. <i>grosa</i>	Capsicum	simla mirchi	Winter (November–February)	–
9 <i>Carica papaya</i>	Papaya green	poppayi kayi	January–December	–
10 <i>Coccinis cordifolia</i>	Ivy gourd	donda kaya	Winter & Summer (November–May)	–
11 <i>Colocasia antiquorum</i>	Colocasia	chama gadda	Winter & Summer (November–May)	–
12 <i>Colocasia antiquorum</i>	Colocasia stem	chama kada	Winter & Summer (November–May)	–
13 <i>Cucumis sativus</i>	Cucumber	keera kaya/ dosa kaya	Summer (March–May)	–
14 <i>Cyamopsis tetragonoloba</i>	Cluster Beans	goruchikkudu	Winter & Summer (November–May)	–
15 <i>Daucus carota</i>	Carrot	gajjara gadda	Summer (March–May)	–
16 <i>Dolichos lablab</i>	Field beans	kuura anpakaya	Winter (November–February)	–

*Continued*

**Table 9.2 (continued) Dalit traditional food species list**

<i>Scientific name</i>	<i>English/common name</i>	<i>Local name</i>	<i>Seasonality</i> <sup>1</sup>	<i>Preparation</i> <sup>2</sup> <i>cooked/raw</i>
17 <i>Entoluma macrocarpom</i>	Mushroom	putta godugulu	Monsoon (June–October)	–
18 <i>Faba vulgaris</i>	Double beans	pedda chukudu	Summer (March–May)	–
19 <i>Ipomoea batatas</i>	Sweet potato	ratnapuri gadda/ chilagada dumpa	Summer (March–May)	–
20 <i>Lagenaria siceraria</i>	Bottle gourd	sora kaya	Winter & Summer (November–May)	–
21 <i>Luffa acutangula</i>	Ridge gourd	beera kayi	Winter & Summer (November–May)	–
22 <i>Lycopersicon esculentum</i> (2 var.)	Green tomato	tamata pandu, kapinga pandlu	January–December	–
23 <i>Mangifera indica</i>	Green mango	mamidi kayi	Monsoon (June–October)	–
24 <i>Mirabilis jalapa</i>		gurumash gadda	–	–
25 <i>Momordica charantia</i>	Bitter gourd	kakara kaya	Winter (November–February)	–
26 <i>Momordica dioica</i>	Kakari gourd	adavi kakara	–	–
27 <i>Moringa oleifera</i>	Drumstick	mulaga kada	Summer (March–May)	–
28 <i>Phaseolus coccineus</i>	Scarlet runner beans	–	–	–
29 <i>Phaseolus vulgaris</i>	French beans	chekkudu	Winter & Summer (November–May)	–
30 <i>Raphanus sativus</i>	White raddish	mullangi/ ullem gadda	Summer (March–May)	–
31 <i>Solanum melongena</i> (3 var.)	Brinjal	Vankayalu, mullu vankaya, thell vankayalu	January–December	–
32 <i>Solanum tubersum</i>	Potato	alu gaddalu	January–December	–
33 <i>Trichosanthes anguina</i>	Snake gourd	potla kaya	Winter (November–February)	–
34 <i>Vicia faba</i>	Broad beans	pedda chikkudu	January–December	–
35 <i>Vigna catjang</i>	Cow pea pods	bebbari	Winter (November–February)	–
36 –	–	chenchu gadda	Summer (March–May)	–
37 –	–	domma dol gadda	Summer (March–May)	–
<b>Pulses</b>				
1 <i>Cajanus cajan</i> (4 var.)	Pigeon pea dhal	year thogari pappu, buraka thogari, thella thogari, nalla thogari	January–December	As a curry / gravy
2 <i>Cicer arietinum</i> (5 var.)	Chick pea	desi yerra shenagalu, tella shenagalu, nalla shenagalu, shenagalu	January–December	As a curry / snack
3 <i>Dolichos bitorus</i> (3 var.)	Horse gram	yerra ulavalu, nalla ulavalu, tella ulavalu	January–December	As a snack
4 <i>Dolichos lablab</i> (3 var.)	Field beans	tella anumulu, nalla anumulu, yerra anumulu	January–December	As a snack
5 <i>Lathyrus sativus</i>	Khesari-dhal	lanka pappu	January–December	–
6 <i>Lens esculenta</i>	Lentils	seri shenaga	January–December	As a curry
7 <i>Phaseolus aureus</i> Roxb (5 var.)	green gram	pesaripappu, manchi pesarlu, ganga pesari, balentha pesari, theega pesari	January–December	As a curry / snack
8 <i>Phaseolus aureus</i> Roxb	black gram dhal	minumulu	January–December	As a soup / gravy

*Continued*

**Table 9.2 (continued) Dalit traditional food species list**

Scientific name	English/common name	Local name	Seasonality <sup>1</sup>	Preparation <sup>2</sup> cooked/raw
9 <i>Pisum sativum</i> (2 var.)	Pea	nalla bata gallu, tella bata gallu	January–December	As a curry / snack
10 <i>Vinga catjang</i> (2 var.)	Cowpea	terra bebbari, tella bebbari	January–December	Snack / soup
<b>Fruits</b>				
1 <i>Achras sapota</i>	Sapota	sapota	Winter (November–February)	Consumed fresh
2 <i>Aegle marmelos</i>	Beal fruit	maredu	–	Consumed fresh
3 <i>Anacardium occidentale</i>	Cashew fruit	jeedi pandu	Summer (March–May)	Consumed riped
4 <i>Annona reticulata</i>	Bullock's heart	ramaphal	Winter (November–February)	Ripe
5 <i>Annona squamosa</i>	Custard apple	sitaphel	Winter (November–February)	Ripe
6 <i>Artocarpus heterophyllus</i>	Jackfruit	panasa	Winter (November–February)	Ripe
7 <i>Bassia longifolia</i> *	Mahua	ippa	Summer (March–May)	Ripe and juiced
8 <i>Buchanania latifolia</i> *	–	morri pandlu	Summer (March–May)	Ripe
9 <i>Carica papaya</i>	Papaya, unripened	poppadu pandu	January–December	Ripe
10 <i>Canthium dicoccum</i> *	–	nakkiri	Summer (March–May)	Ripe
11 <i>Calycopteris floribunda</i> *	–	bontha pandlu	Summer (March–May)	Ripe
12 <i>Carissa carandas</i> *	–	kalmi	Summer (March–May)	Ripe
13 <i>Catunaregam spinosa</i>	–	balusuku	Monsoon (June–October)	Ripe
14 <i>Citrullus vulgaris</i>	Watermelon	tarbuja	Summer (March–May)	Ripe
15 <i>Citrus aurantifolia</i>	Lime	nimma	January–December	Ripe
16 <i>Citrus aurantium</i>	Orange	santra	Winter (November–February)	Ripe
17 <i>Citrus sinensis</i>	Sweet lime	musambi	Winter (November–February)	Ripe
18 <i>Cucumis melo</i>	Musk melon	kharruja	November–May	Ripe
19 <i>Diospyros chloroxylon</i> *	–	illantha	Summer (March–May)	Ripe
20 <i>Embillica officinale</i>	Indian gooseberry	userikayi, amla	Winter (November–February)	Ripe
21 <i>Ficus carica</i>	Fig	anjuru, anjeer	Winter (November–February)	Ripe
22 <i>Ficus glomerata</i> *	Cluster fig	medi pandlu	Winter (November–February)	Ripe
23 <i>Gardenia gummifera</i> *	–	chimit pandlu	Summer (March–May)	Ripe
24 <i>Grewia asiatica</i> *	Phalsa	tada, thada	Summer (March–May)	Ripe
25 <i>Latina camera</i> *	–	kaki pandlu	Summer (March–May)	–
26 <i>Lycopersicon esculentum</i>	Tomato	tamata pandu	Monsoon & Winter (June–February)	–
27 <i>Malus sylvestris</i>	Apple	sepu	Winter (November–February)	–
29 <i>Mangifera indica</i>	Mango	mamidi	Summer (March–May)	Ripe, juiced, pickled, jam
30 <i>Morus</i> sp.	Mulberry	sudi pandlu/ thuthara pandlu	January–December	Ripe
31 <i>Musa paradisiaca</i>	Banana	areti pandu	January–December	Ripe
32 <i>Passiflora edulis</i>	Passion fruit	passion fruit	Winter (November–February)	Ripe
33 <i>Phoenix dactylifera</i> (2 var.)	Dates	khajoor pandu	January–December	Ripe, dried, fresh
34 <i>Phoenix sylvestris</i> *	Palm tree	itha	Summer (March–May)	Ripe
35 <i>Pithecellobium duke</i>	Manila tamarind	seema chintha, karukkapalli	Summer (March–May)	Ripe
36 <i>Psidium guajava</i>	Guava	jama	Monsoon & Winter (June–February)	Ripe
37 <i>Punica granatum</i>	Pomegranate	danimma	Monsoon (June–October)	Ripe

Continued

**Table 9.2 (continued) Dalit traditional food species list**

Scientific name	English/common name	Local name	Seasonality <sup>1</sup>	Preparation <sup>2</sup> cooked/raw
38 <i>Semecarpus anacardium</i>	Marking nut	nall jeedi	Summer (March–May)	–
39 <i>Solinum nigrum</i> *		kashe pandlu	Winter (November–February)	–
40 <i>Syzygium cumini</i>	Jambul, Java plum	alla nerudu	Monsoon (June–October)	–
41 <i>Vitis vinifera</i> (2 var.)	Grapes	angoor	Winter & Summer (November–May)	Ripe
42 <i>Zyziphus jujuba</i>	Ziziphus	reni	Winter (November–February)	Ripe
43 <i>Zyzyphus enoplia</i> *	–	parki	June–October	Ripe
44 *	–	chemidi pandlu	Summer (March–May)	Ripe
45 *	–	dodi pandlu	Summer (March–May)	Ripe
46 *	–	pam padga	Summer (March–May)	Ripe
47 *	–	pitta pandlu	Summer (March–May)	Ripe
48 *	–	pulichera pandlu	Monsoon (June–October)	Ripe
<b>Animal foods</b>				
1 <i>Anas. platyrhyncha</i>	Duck	bathu	–	–
2 <i>Antilope cervicapra</i>	Deer	ledi	–	–
3 <i>Arius sona</i>	Fish	jellalu	–	–
4 <i>Bos taurus</i>	Beef	pedda mamsam	–	Fried or as curry
5 <i>Bos taurus</i>	Cow's milk	aavu paalu	–	–
6 <i>Bubalus bubalis</i>	Buffalo meat	barre mamsam	–	–
7 <i>Bubalus bubalis</i>	Buffalo's milk	barre paalu	–	–
8 <i>Bubalus bubalis</i>	Ghee	neyye	–	–
9 <i>Bubalus bubalis</i>	Buffalo's milk concentrate	khova	–	–
10 <i>Bubalus bubalis</i>	Cow curd	perugu	–	–
11 <i>Bubalus bubalis</i>	Buttermilk	salla	–	–
12 <i>Capra hircus</i>	Goat meat	meka mamsam	January–December	As a curry
13 <i>Capra hircus</i>	Goat milk	meka paalu	–	–
14 <i>Capra hircus</i>	Goat heads and legs	meka thala, kallu	–	–
15 <i>Catla catla</i>	Fish	botchee	–	–
16 <i>Columba livia intermedia</i>	Pigeon	pauvram	–	–
17 <i>Gallus bankiva murghi</i>	Hen egg	guddu	January–December	Boiled, fried as curry
18 <i>Crus</i> sp.	Cranes	kongalu	–	–
19 <i>Gallus bankiva murghi</i>	Chicken/Fowl	kodi	January–December	As curry
20 <i>Leporidae sylvilagus</i>	Rabbit	kundelu	–	–
21 <i>Ophiocephalus striatus</i>	Fish	mottalu	–	–
22 <i>Ovis aries</i>	Mutton meat	potel mamsam	January–December	Fried or as curry
23 <i>Ovis aries</i>	Sheep, male (ram)	potel mamsam	–	–
24 <i>Paratephusa spinigera</i>	Crab	endra kaya	–	–
25 <i>Sclurus</i> sp.	Squirrel	udatha	–	–
26 <i>Sus cristatus</i>	Pig wild	adavi pandi	–	–
27 <i>Sus scrofa</i>	Pig meat	pandi	–	–

Continued

**Table 9.2 (continued) Dalit traditional food species list**

	<i>Scientific name</i>	<i>English/common name</i>	<i>Local name</i>	<i>Seasonality</i> <sup>1</sup>	<i>Preparation</i> <sup>2</sup> <i>cooked/raw</i>
28	<i>Varanidae varanus</i>	Monitor lizard	udumu	–	–
29	–	Birds	budda kongalu	–	–
30	–	Birds	bur akalu	–	–
31	–	Birds	dandi bebbarlu	–	–
32	–	Birds	guvulu	–	–
33	–	Birds	kamjulu	–	–
34	–	Crane	neeti kongalu	–	–
35	–	Fish dry	endu chapa	–	–
36	–	Prawns dry	endu royalu	–	–
37	–	Tortoise	thambelu	–	–
38	–	Venna	butter	–	–
39	–	–	adavi dummana	–	–
40	–	–	kamma kaki	–	–
<b>Nuts and oil seeds</b>					
1	<i>Anacardium occidentale</i>	Cashew nut	jeedi palukulu	Summer (March–May)	–
2	<i>Arachis hypogaea</i> (3 var.)	Groundnut/ Peanut	baimugulu, baimugulu pindi	–	Oil
3	<i>Areca catechu</i>	Areca nut/ Betel nut	poka pachellu vakkalu	Summer (March–May)	–
4	<i>Brassica nigra</i>	Mustard seed	avaalu	January–December	Oil
5	<i>Buchanania latifolia</i>	Piyal seeds	morri palkulu	January–December	Oil
6	<i>Carthamus tinctorius</i>	Safflower	kusumalu	January–December	Oil
7	<i>Cocos nucifera</i> (4 var.)	Coconut	kobbari kaya	January–December	Numerous preparations
8	<i>Guizotia abyssinica</i>	Niger seeds	gaddi nuvvulu	January–December	Oil
9	<i>Helianthus annuus</i>	Sunflower seeds	nalla kusumalu	January–December	Oil
10	<i>Linum usitatissimum</i>	Linseeds	aviselu	–	Oil / spicy powder
11	<i>Prunus amygdalus</i>	Almond	badam	Summer (March–May)	–
12	<i>Sesamum indicum</i>	Sesame seeds	nuvvulu	–	Oils
<b>Spices</b>					
1	<i>Allium sativum</i>	Garlic	elligadda, lahson	–	–
2	<i>Capsicum annum</i> (2 var.)	Chillies	mirapa kayai, lal mirch, mirapa kayai	–	–
3	<i>Coriandrum sativum</i> L.	Coriander	dhaniyalu, dhania	–	–
4	<i>Cuminum cyminum</i>	Cumin seed	karra jela, jeera	–	–
5	<i>Curcuma domestica</i>	Turmeric	pasupu, haldi	–	–
6	<i>Elettaria cardamomum</i>	Cardamom (small)	choti elachi	–	–
7	<i>Ferula asfoetica</i>	Asafoetida	hing, enguva	January–December	–
8	<i>Myristica fragrans</i> (2 var.)	Nutmeg	jaji kayi, japathri	–	–
9	<i>Papaver somniferum</i>	Poppy seeds	gasalu, khuskhus	–	–
10	<i>Pimpinella anisum</i>	Fennel	soapulu	–	–
11	<i>Piper nigrum</i>	Black pepper	meriyalu, kali mirch	–	–

Continued

**Table 9.2 (continued) Dalit traditional food species list**

Scientific name	English/common name	Local name	Seasonality <sup>1</sup>	Preparation <sup>2</sup> cooked/raw
12 <i>Syzygium aromaticum</i>	Cloves (dry)	lavangalu	–	–
13 <i>Tamarindus indica</i>	Tamarind pulp	chintha pandu, imli	–	–
14 <i>Tachyspermum amoni</i>	Bishop's weed	ajwain, omum	–	–
15 <i>Trigonella foenum-graecum</i>	Fenugreek seeds	menthalu, methi	–	–
16 <i>Zingiber officinale</i>	Ginger	allam, adrak	–	–
<b>Drinks</b>				
1 <i>Borassus flabellifer</i>	Toddy sweet	kallu	–	–
2 <i>Saccharum officinarum</i> (3 var.)	Jaggery cane drink	bellam palu, cheruku palu	–	–
3 –	Chai Tea	chai	–	–
4 –	Cola	sallati sisalu	–	–
5 –	Gaseous water	Soda	–	–
6 –	Neem tree sap	vepa kallu	–	–
<b>Miscellaneous foods</b>				
1 <i>Saccharum officinarum</i> (2 var.)	Jaggery	bellam, shekkari	–	Used as a sweating agent
2 –	Sweet biscuits	biscatllu	–	–
3 –	White bread	double roti	–	–
4 –	–	pappad	–	–
5 –	Mushrooms	potta godugulu	–	–
6 –	Honey	thena	Summer (March–May)	–
7 –	–	candy (hard)	–	–
8 –	–	chocolate	–	–
9 –	–	ice cream	–	–
10 –	–	bun (sweet)	–	–

<sup>1</sup> Winter (November–February); Summer (March–May); Monsoon (June–October)

<sup>2</sup> When preparation is not specified, there are various techniques used.

\* Uncultivated species.

– No data.

herbarium specialist. Fresh plants were collected with the root system intact during the flowering or fruit-bearing stage. Labelled samples were placed in a plant press and given to a taxonomist for identification. Table 9.6 lists the plants that were identified. Several traditional foods remain unidentified, in particular several wild fruits.

## Crop diversity

Farmers' fields were observed in order to gain insight into Dalit food crop diversity. The cropping systems

were shown to prevail in red and black soils in winter and summer seasons. It is obvious that traditional knowledge of the different soil conditions leads to different crop diversities, depending on whether the farmer prefers high, medium or low diversity (Table 9.7). Irrigated fields had much less diversity. While the main crops were limited to six to eight, each crop had several varieties. In addition, a host of uncultivated greens found among cultivated crops enhanced the biodiversity of the field and the community diet upon harvesting.

**Table 9.3 Description of food terms**

<i>Food term</i>	<i>Description</i>
Buva	Boiled and cooked cereal or millet
Attu	Savory pancake made with flour of pulses, cereals and millets
Charu	Spicy soup-like dish makes of pulses, tamarind and tomatoes
Chutney	Ground, spicy side dish made with vegetables, greens, pulses, oilseeds and tamarind
Kura	Side dish, usually spicy, made with vegetables, meat, fish, chicken and egg
Gudalu	Boiled whole gram
Jaggery	Refined and solidified molasses
Kichidi	Cooked mixture of cereal and pulse
Kapillu	Millets are exposed to flame slowly and rubbed in gunny bag to remove hull and husk
Laddu	Sweet ball usually made of gram flour
Masala	Ground and powdered Indian condiment and spice
Muruku	Hand extruded, salted, long, thin, deep-fried gram flour snack
Papad	Thin wafer-like rounds made of gram or cereal flour; stored in dry form; fried before serving
Pasham	Sweet pudding-like desert preparation
Pyalalu	Popped millets
Podi	Dry powder
Podi karam	Dry powder and dry curry
Pulusu	Sour gravy preparation usually made with tamarind pulp
Rawa/nooka	Broken cereal or millet
Roti/chapathi	Made with cereal or millet dough, thin round, baked on open pan
Sambar	Pulse and vegetable preparation which is spicy and eaten with cereal or millet
Sangati	Softly cooked cereal or millet
Upma	Savory dish made of broken cereal or millet
Vada	Small patties, deep-fried snack
Vadiyalu	Fresh chick pea; smoked lightly and consumed after chaffing and cleaning

**Table 9.4 Number of items in food categories found in local village markets**

<i>Type of ingredient</i>	<i>No. of items</i>	<i>Percent of total</i>
Animal food	18	13
Roots	3	2
Oil seeds	8	5
Spices	16	12
Fruits	13	10
Pulses	11	8
Nuts	3	2
Vegetables	16	12
Cereals	5	4
Sweets	5	4
Millets	6	4
Drinks	2	2
Greens	14	10
Ready to eat cereal	17	12
<b>Total</b>	<b>137</b>	<b>100</b>

**Table 9.5 Little-used or currently unused traditional food noted by Elders**

	<i>Scientific name</i>	<i>Local name</i>
1	Unknown	Angi bingi*
2	<i>Allium sativum</i>	Elligadda, Yelligadda poraka
3	<i>Amaranthus tristis</i>	Koya kura, Sirru aku*
4	<i>Amaranthus viridis</i>	Kuppi kura, Doggali kura*
5	<i>Aurthum graveolus wild</i>	Adavi soya kura*
6	<i>Boerhavia diffusa</i>	Athaka mamidi kura*
7	<i>Canthium spinosa</i>	Balusuku*
8	<i>Cassia fistula</i>	Rela puvvu*
9	<i>Cocculus hirsutus</i>	Doosari*
10	<i>Dolichos lablab</i>	Chikkudu aaku kura
11	<i>Enicostema hyssopifolium</i>	Gorumadi*
12	<i>Ficus racemosa</i>	Medi pandlu*
13	<i>Glycine max</i>	Soya kura
14	<i>Lactuca runcinata</i>	Atheli*
15	<i>Maerremia emarginata</i>	Elakachevula kura*
16	<i>Merremia tridentata var. hastata</i>	Thadaka dobbudu*
17	<i>Mirabilis jalapa</i>	Gurumashi*
18	<i>Oxalis corniculata</i>	Adavi pulla kura*
19	<i>Sesbania aegyptiaca</i>	Avisa puvvu*

\* Uncultivated greens.

**Table 9.6** List of newly identified plants with scientific names

Scientific name	Local name
<i>Acalypha malabarica</i>	Pitta kura
<i>Alternanthera tenella</i>	Adavipunnaganti aalam
<i>Cleome gynandra</i>	Thalaila
<i>Commelina benghalensis</i>	Yennadri
<i>Corchorus olitorius</i>	Bankanti kura
<i>Dioscorea bulbifera</i>	Jungli kand
<i>Lactuca runcinata</i>	Atheli
<i>Merremia tridentata</i> var. <i>hastata</i>	Thadaka dobbudu
<i>Mirabilis jalapa</i>	Tellagurumashi
<i>Phyllanthus maderaspatensis</i>	Poppukura
<i>Physalis minima</i>	Budda kasha

## Nutrient composition of traditional Dalit foods

In and around the Zaheerabad region of Medak district in Andhra Pradesh, Dalit regularly consumed some uncultivated leafy green vegetables. Since proximate composition and trace mineral content of these leafy vegetables were not available, studies were conducted by the DDS in collaboration with the NIN to collect and analyse these vegetables. Research was also completed to understand nutrient parameters in local varieties of pulses, grains and seeds and wild fruits, and these data are also reported here. Mean values for proximate composition and minerals in uncultivated greens and several local varieties of pulses, seeds and grains are given in Table 9.8.

**Table 9.7** Crops and varieties on Dalit farms (English and/or local names)

<p><b>Red soils: Winter rainfed</b></p> <p><b>High diversity</b></p> <p>Redgram (Erra thogari, Tella thogari, Nalla thogari and Burka thogari), Jowar (Gundu jonna, Thoka jonna, Tella mallejonna, Garib jonna and Erra Jonna), Field Bean (Tella Anumulu, Erra Anumulu and Nalla Anumulu), Cow pea (Tella Bebbarlu and Erra bebbarlu), Hibiscus (Erra pundi, Nalla pundi and Tella pundi), Green Gram (Kidki Pesari, Theega Pesari, Baandari Pesari and Manchi Pesari), Black gram (Manchi minumu, Sarkar and Nunupu minumu), Bajra, Sesamum, Niger, Foxtail millet (Tella Korra, Erra korra and Nalla korra), Finger millet, Kodo millet, Horse gram</p> <p>Jowar, Bajra, Red gram, Hibiscus, Field bean, Cowpea, Green gram, Black gram</p> <p>Green gram, Jowar, Field bean, Cow pea, Hibiscus</p> <p>Groundnut, Jowar, Field bean, Cowpea, Gingelly, Hibiscus</p> <p><b>Medium diversity</b></p> <p>Jowar, Bajra, Hibiscus</p>	<p>Gingelly, Jowar, Hibiscus</p> <p>Gingelly, Jowar, Red gram</p> <p>Dry land paddy, Finger millet</p> <p><b>Low diversity</b></p> <p>Niger</p> <p>Bishop's weed (Voma)</p> <p>Sun Hemp</p> <p>Horse gram</p> <p><b>Black soils: Winter rainfed</b></p> <p><b>High diversity</b></p> <p>Redgram (Erra thogari, Tella thogari, Nalla thogari and Burka thogari), Jowar (Gundu jonna, Thoka jonna, Tella mallejonna, Garib jonna and Erra jonna) Field Bean (Tella Anumulu, Erra Anumulu and Nalla Anumulu) Cow pea (Tella Bebbarlu and Erra bebbarlu) Hibiscus (Erra pundi, Nalla pundi and Tella pundi) Green Gram (Kidki Pesari, Theega, Pesari, Baandari Pesari and Manchi Pesari) Black gram (Manchi minumu, Sarkar and Nunupu minumu), Bajra, Sesamum, Foxtail millet (Tella Korra, Erra korra and Nalla korra), Finger millet, Kodo millet, Horse gram</p>	<p><b>Medium diversity</b></p> <p>Red gram, Jowar, Field bean, Cow pea, Black gram</p> <p>Red gram, Jowar, Field bean, Cow pea, Hibiscus, Green gram</p> <p><b>Low diversity</b></p> <p>Black gram, Manchi Pesalu, Gingelly, Hibiscus</p> <p>Green Gram, Saijonna (for fodder only)</p> <p>Sunflower</p> <p><b>Red Soils: Summer</b></p> <p><b>Medium diversity</b></p> <p>Rabi Jowar, Safflower</p> <p>Rabi Jowar, Horse gram</p> <p><b>Black soils: Summer</b></p> <p><b>High diversity</b></p> <p>Rabi jowar (Sai jonna, Tella malle jonna, Erra jonna and Pyalala jonna), Chick pea (Tella chanige, Nalla chanige and Erra chanige), Wheat (Budda Godhumalu and Katte Godhumalu), Safflower, Mustard, Linseed, Lathyrus, Lentils, Peas (Nalla battagalu, Tella</p>	<p>battagalu and Yerra battagalu), Oats, Hibiscus, Cucumber creeper</p> <p>Chickpea, Safflower, Lentils, Lathyrus, Peas, Linseed, Mustard</p> <p><b>Medium diversity</b></p> <p>Jowar, Chickpea, Safflower</p> <p>Chickpea, Safflower</p> <p><b>Low diversity</b></p> <p>Safflower</p> <p>Coriander</p> <p>With irrigation farms planted</p> <p><b>High diversity</b></p> <p>Sugarcane, Maize, Field bean, Hibiscus, Castor, Cluster bean, Portulaca oleracea, Sesbania</p> <p>Turmeric, Castor, Brinjal, Tomato, Cluster bean, Hibiscus, Anise</p> <p><b>Medium diversity</b></p> <p>Ginger, Chillies, Castor</p> <p>Garlic, Coriander</p> <p><b>Low diversity</b></p> <p>Paddy</p> <p>Potato</p> <p>Onion</p> <p>Sun hemp</p>
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Differences were found in vitamin C and total carotene content of uncultivated greens species grown in either red or black soil. Table 9.9 demonstrates some species showing higher levels on a particular type of soil. The reasons for different nutrients by soil type are not known.

The results of wild fruit analysis are presented in Table 9.10. Beta carotene varied from 5–429 µg/100g and total carotenes varied from 38–4 237 µg/100g.

### Additional qualitative data on food use

Through a series of qualitative interviews and focus groups, women discussed the attributes of uncultivated greens in terms of medicinal value, general availability in each season, taste, overall use, ability, use as cattle fodder and ability to use as green manure (e.g. re-plough into the soil as fertilizer). These properties were scored separately and summed to derive the overall most popular greens. The most popular and highly appreciated uncultivated greens of the 29 analysed were *budda kasha*, *sanna payala*, *adavi pulla koora*, *angi bingi*, *jonnachemchali*, *pittakura*, *bankanti kura* and *yennadri* (see Table 9.2 for scientific names). Culturally, the Dalit characterized their foods as cool and hot. Cool foods included sweet lime, apple, grapes, watermelon, musk melon, cucumber, ice cream, butter milk, curd, pomegranate, chick pea, pigeon pea, *ragi*, *rabi sorghum* porridge and sago. Hot foods included crab, foxtail millet, chicken curry, fish, egg, papaya, custard apple, bishop weed, ghee, linseed spicy powder, jaggery and tea.

With sharp agro-climatic constraints farmers strived to diversify their sources of food with crop diversity. Farmers celebrated large crop diversity – especially the diversity of uncultivated greens present in their fields – with great reverence. One example was celebration of “Shoonyam Panduga”, a festival celebrated in the month of December when most of the winter and summer crops reached maturity. Farmers worshiped the earth by walking around the field singing special songs related to the festival and also offering food and curry made with more than five uncultivated greens available during that time.

### Importance of uncultivated greens as food for the poor

Most poor rural people consumed uncultivated crops at least 50 to 80 days in a year. While working in their fields, the poor gathered these greens and brought them home. Those who did not work as farmers went to nearby fields specifically to gather these greens. *Doggali koora*, *gangavayeli*, *sammavayeli* and *pundi* were consumed throughout the year. *Pundi* and *doggali koora* were eaten more than 20 times in a year by some families. Some of the greens (e.g. *gunugu*) were sold as green fodder in nearby towns. Uncultivated foods such as *chennangi*, *soyikoora*, *adonda* and *adivikakarakaya* were also sold in towns because they were liked by urban dwellers, and were recognized as good for health. Greens such as *talaili* and *kashapandla chettu* were never uprooted, as they were less available and they were recognized for their high medicinal value. Even the landlords asked the farm labour women to not weed these two plants, so as to protect them. Some women earned a living by selling these uncultivated greens in nearby towns.

### Reduced availability of uncultivated greens in fields using chemical fertilizers

Uncultivated greens were present mostly in farm fields where manure was applied or where chemical fertilizers were not applied. Very few greens were seen in fields treated with chemical fertilizer, as they die when they are young because of the burning effect. In fertilized fields only half of what used to be available was present, with greens available for picking only after one or two irrigations. However, farmers felt it was not safe to eat these greens and they were generally not collected.

### Importance of uncultivated greens during famine

Historically, uncultivated foods were important during famine and stress periods. Eighteen years prior to this

**Table 9.8 Nutrient composition of selected Dalit traditional foods (per 100 g of edible portion)**

New Food Items	Moisture	Energy	Protein	Fat	CHO	Crude Fiber	Ash	Calcium	Phosphorus	Iron	Copper	Magnesium	Manganese	Zinc	$\beta$ Carotene
	g	kcal	g	g	g	g	g	mg	mg	mg	mg	mg	mg	mg	mg
<b>Cereals and grains</b>															
Foxtail millet	11.2	331	1384	12.3	4.3	60.9	8	3.3	31	290	12.9	-	-	-	-
Khairif sorghum	8.5	373	1559	8.0	3.1	78.3	0.8	1.3	10.3	297	13.3	0.6	1.5	153.9	2.5
Kodo millet	8	361	1509	7.7	1.8	80.5	0.2	1.8	23.5	208	-	2.9	5.1	67.3	2.8
Little millet	7.6	373	1559	6.9	2.0	82.5	0.1	0.9	22.4	169	25	1.1	1	53	2.8
Red foxtail millet	7.4	381	1593	9.0	1.2	81.2	0.2	1	13.8	210	21.5	1.1	1	82.4	3.7
Red sorghum	8.6	360	1505	7.6	3.5	78.2	0.6	1.5	11.8	315	7.6	0.8	1.1	143.6	3
<b>Leafy vegetables</b>															
Adavi mentham kura	74.4	92	385	2.7	1.9	16	3.4	1.6	171	33	34.9	0.2	84	1.7	0.8
Adavi pulla kura, Pilliadugula kura	72.6	90	376	6.0	2.5	10.8	4.1	4	331	98	139	0.5	116	3.4	1.1
Adavi soyakura	78.3	73	305	2.9	0.8	13.5	2.4	2.1	412	48	26.6	0.4	134	4	1.1
Adavipunnaganti aalam	80.8	53	222	4.6	0.7	7.1	2.2	4.6	535	41	11.2	0.2	122	3.1	0.3
Angi bingi	75.9	75	314	6.2	1.1	10	2.1	4.7	554	112	16.7	0.2	158	1.6	0.8
Atheli	85.1	46	192	4.0	1.1	5.1	1.7	3	320	152	13.6	0.4	130	2.7	1
Bankanti kura	72.5	88	368	5.0	0.8	15.2	2.8	3.7	366	77	15.4	0.2	82	1.3	0.5
Budda kasha, Silleru kura	79.4	65	272	6.0	0.8	8.5	1.5	3.8	424	96	24.5	0.7	177	101	1.6
Chemngi	67.4	109	456	8.5	1.3	15.9	3.3	3.6	882	125	10.7	0.4	258	3	1.1
Doosari, Cheepuru kura	44.4	189	790	9.1	1.9	33.8	7.6	3.2	1152	107	10.7	0.6	161	2.8	1.4
Elakachevula kura	40	202	844	14.3	1.5	32.8	5.4	6	1350	166	97	0.9	479	70	1.7
Gorumadi	53.2	140	585	7.0	0.7	26.5	4.2	8.4	1641	81	49.9	0.6	384	10.1	1.4
Gunagu, Gurum kura	83.1	49	205	3.9	0.3	7.6	2.1	3	398	78	20.9	0.3	291	2.5	0.8
Gurumashi	83.4	51	213	4.9	0.7	6.2	1.6	3.2	344	30	11.5	0.4	227	1.2	0.4
Jonnachemchali	33.3	183	765	9.3	1.6	32.8	8.8	14.2	3237	154	111.3	0.7	520	21.3	2.7
Nalla kasha	81.4	62	259	4.6	1.7	7.1	2.4	2.8	367	79	7.1	0.4	87	1.4	0.7
Pittakura	69.7	97	405	5.4	1.0	16.5	3	4.4	1342	152	40.7	0.4	130	2.7	1
Poppukura	60.9	132	552	3.0	2.6	24.1	4.2	5.2	767	91	59.4	0.3	205	5.7	1
Rela puwvu	73	95	397	4.4	1.4	16.3	3.3	1.6	184.6	94	10.6	0.2	3.4	73	1.1

Continued

**Table 9.8 (continued) Nutrient composition of selected Dalit traditional foods**

New Food Items	Moisture g	Energy kcal	Protein g	Fat g	CHO g	Crude Fiber g	Ash g	Calcium mg	Phosphorus mg	Iron mg	Copper mg	Magnesium mg	Manganese mg	Zinc mg	β Carotene mg	
<b>Leafy vegetables (Continued)</b>																
Sanna payala	92.1	24	100	1.4	0.4	3.6	1.1	1.4	124	25	25.3	0.1	113	0.6	0.3	–
Tagarancha, Chinna tentem kura	72.7	87	364	6.8	0.7	13.8	2.7	3.7	869	108	9.7	0.3	94	1.3	1.2	5.3
Tella garjala	85.2	38	159	2.9	0.4	5.8	1.9	3.8	219	45	20.7	0.2	79	3.4	0.5	0.7
Tellarjam puwvu	78.1	69	288	5.0	0.7	10.6	3	2.6	639	109	4.1	0.3	6	174.2	0.9	–
Thadaka dobbudu	44.6	196	819	12.5	3.9	27.8	5.3	5.9	556	140	49.1	0.7	250	4.2	1.6	–
Thalaila	50.6	161	673	14.2	2.7	19.9	2.7	9.1	2 245	235	212.9	0.3	6.4	298.1	2.2	–
Thengedu puwvu	76.7	84	351	2.5	2.2	13.6	3.7	1.3	167	42	12.7	0.2	58	0.6	0.6	–
Turmmi kura, Chinnatummi kura	65.1	110	460	3.7	1.2	21.2	4.5	4.3	719	46	81.6	0.5	64	5.8	1.1	4.1
Uthareni	81.3	65	272	3.3	0.3	8.3	3.3	3.5	417	68	12.5	0.2	188	3.6	0.4	10.5
Yennadri	87.4	35	146	2.3	0.4	5.6	1.9	2.4	243	47	17	0.1	67	1.6	0.4	–
<b>Roots tubers and vegetables</b>																
Gurumash gadda	59.5	191	798	3.0	0.4	42.2	3.5	5.2	1 838	110	7.3	0.3	1.0	120.2	2.2	–
<b>Pulses</b>																
Black Pigeon pea	5.6	370	1 547	22.6	1.6	66.4	0.4	3.4	17.7	371	4.3	1.4	1	119.8	3.3	–
Red gram	13.4	335	1 400	22.3	1.7	57	1.5	3.5	73	304	5.8	–	–	–	–	–
Red Pigeon pea	6.4	367	1 534	22.1	1.7	65.9	0.5	3.4	33.2	367	4.2	1.4	1.2	113.8	3.2	–

CHO Carbohydrates.

– No data.

**Table 9.9 Vitamin C and total carotene in uncultivated greens grown in either red or black soil**

Uncultivated greens	Vitamin C (mg/100 g)		Total carotene (µg/100 g)	
	Red soil	Black soil	Red soil	Black soil
Adavi ponnagnti aalam	110.2	107.8	5 434	5 150
Angi bingi	204.2	239.9	8 469	9 344
Athelli	64.8	91.5	6 454	6 461
Bankanti kura	151.2	117.2	7 019	8 431
Budda kasha	135.5	114.0	6 340	3 128
Elakachevula kura	164.0	111.8	8 787	12 882
Gunagu	99.0	125.5	2 963	3 967
Gurumash gadda	388.2	263.4	–	–
Gurumashi	391.2	161.3	14 891	9 836
Jonnachemchali	127.4	101.5	5 360	6 438
Nalla kasha	257.7	113.4	13 919	5 674
Palakura	84.2	249.6	5 080	11 308
Pitta kura	296.0	198.5	4 904	11 002
Sanna payala	47.4	60.2	2 286	2 470
Tagarancha	225.0	198.0	10 418	6 742
Tella garjala	88.6	77.3	6 052	6 112
Thadaka dobbudu	123.5	175.9	7 779	9 321
Thalaila	84.5	106.2	12 448	11 183
Tummi kura	134.9	175.0	3 155	7 020
Uthareni	31.8	94.6	6 022	5 311
Yennadri	123.6	103.9	3 502	4 164

– No data.

research, during a famine in the Zaheerabad region, people survived for four months eating only these uncultivated greens, especially *doggalikoora*, *gangavayeli*, *sannavayeli*, *pundi*, *gunugu koora*, *uttareni* and *kapringa pandlu*. People ate more curries made from these greens. Rotis were made from *jowar* flour mixed with *pundi* because there was not enough other flour. Poor people would restore wells for watering fields and collect these greens from nearby sugarcane fields.

### Uncultivated greens as tasty and rich sources of nutrition

Villagers testified that these greens were tasty and healthful. For example, Santoshamma of Basanthpur

**Table 9.10 β-carotene and total carotenoid content of wild fruits**

Telugu name	β-carotene	Total carotenoids
	µg/100 g (fresh weight)	µg/100 g (fresh weight)
Ambadikayalu	16.9	570.7
Balusakupandluu	19.9	404.5
Bothapandu	12.3	161.3
Chitmit	12.7	260.4
Eethapandu	191.2	396.8
Illintha	16.6	514.7
Irkupandu	12.2	63.7
Kakipandu	177.2	1 300.4
Kalmi	326.7	1 026.3
Kasipand	147.3	2 058.0
Medipandu	5.4	37.7
Morripandu	354.1	1 302.7
Nakkarapandulu	428.6	4 236.8
Pitlapandlu	22.4	766.8
Pulcheri	29.0	73.4

village reported that, “*Doggali koora* is more nutritious than a chicken egg”. When preparing uncultivated greens for consumption, the leaves of different greens may be cooked together without spices, and only a small amount of oil. Generally they were cooked with pulses. Even without added flavouring they were tasty, according to Seshamma of Algole village. Sometimes leaves of these greens were cooked by adding onion.

### High medicinal value of uncultivated greens

Uncultivated crops played a key role in the health of poor people. They utilized these greens in different forms – curry, leaf extracts and pressed into tablets (greens are pounded to paste, pressed and shade dried) to cure common ailments such as headaches, swellings, wounds, scabies, improper digestion, and major diseases such as jaundice and diabetes. *Atteli koora*, when fed to post-natal mothers, was known to improve breastmilk availability to infants. When lactating mothers ate

**Table 9.11 Medicinal uses of edible plants noted by Dalit women of Zaheerabad**

Scientific name	Telegu name	Medicinal use
–	Angi bingi	Gutaguta, polapatram, angibingi; for good digestion, dried leaves are made into powder, mixed in breast milk and fed to infants; leaf curry given for jaundice
–	Guntagalagari	Juice is antiseptic; tonic for hair growth
–	Bakantti	For serious wounds the mixture of guntagalagari and bakantti leaf powder is applied
–	Tellarjam puvvu	For white discharge the bark of the plant is eaten as a paste
<i>Achyranthes aspera</i>	Uthareni	The roots of the plant are used as a toothbrush to heal tooth disorders
<i>Cassia ariculata</i>	Thengedu puvvu	Leaf powder is applied to severe burns
<i>Ficus glomerata</i>	Medi pandlu	Latex (milk) is applied to soften boils and abscesses
<i>Lagerstoemia parviflora</i>	Chenngi	Juice is applied on swollen parts of the body
<i>Physalis minima</i>	Budda kasha	For good eyesight
<i>Portulaca sp.</i>	Sanna payala	For different skin diseases the juice of leaf is applied in combination with jaju (a special type of soil)
<i>Securingea virosa</i>	Tella pulcheri	For white discharge and heavy bleeding, the leaf and the fruits are eaten fresh or leaf is made into paste and soaked in neera overnight
<i>Solanum nigrum</i>	Nalla kasha	For jaundice the leaf and fruit is eaten; leaf juice is applied to swellings
–	No data.	

*pundit*, it was understood to be good for infants as it keeps the stomach clean. Uncultivated plants, like *kashapandla chettu*, were known as “Davakhana leni Mandu” (“medicine available without the existence of hospital”).

During the interviews with Dalit village women it became clear that several food plants were used for medicinal purposes and they wished this to be recorded. Therefore, interviewers also probed for this information. A summary of key species of uncultivated greens and their use as medicine is presented in Table 9.11 with scientific names and common Telegu names.

An interview exercise was completed with 11 Dalit women who were asked to identify uncultivated greens gathered in the region and which greens they consumed. Table 9.12 demonstrates how many women could identify (ID) each uncultivated green by its Telegu name, how many could not identify (cannot ID) and how many wrongly identified (WID) each green. The last two columns demonstrate how many women could use or not use the species. It is surprising how universally known these greens were, with most women being able to identify them by name or use them. Also, many women used the plants without having a name for them.

## Dietary assessment and anthropometry of children

Dietary assessments were conducted as reported in Schmid *et al.* (2006) and Schmid *et al.* (2007). Table 9.13 summarizes food group and nutrient intake of women in DDS *sanghams* (DDS-AP) in comparison to reported data for rural Andhra Pradesh (AP) and for the pooled All-India States (SP).

Average consumption of cereals and millets for all groups was consistently higher than recommended amounts for a healthy diet (using RDA of India). Milk and milk product consumption was low for all groups. For the AP and SP rural women, consumption of pulses and legumes, fats and oils, vegetables and greens tended to be low. However, the DDS *sangham* women consumed adequate amounts of cereals and millets, pulses and legumes, vegetables and greens.

Reported intakes of energy, protein, and iron exceeded standards. Women consumed 43 percent of dietary energy from traditional food. The balance of daily energy was from white rice (donated by government) or oil (purchased). While iron intakes were generally adequate (although bio-availability of these primarily plant-based diets is not known), intakes

**Table 9.12 Familiarity and use of uncultivated greens by Dalit women (number of women out of 11)**

Scientific name	Name	ID	Cannot ID	WID	Used	Not used
–	chinna payali	10	0	1	11	0
–	kura thonda	10	0	1	11	0
–	nalla bailli	5	5	1	10	1
–	pulichinta	4	1	6	7	4
–	puppyaku	7	1	3	10	1
–	thakkeli	8	0	3	9	2
<i>Achyranthes aspera</i>	uthareni	9	0	2	10	1
<i>Amaranthus polygamus</i>	thota kura	10	0	1	11	0
<i>Basella</i> sp.	pulla bachali	9	1	1	11	0
<i>Cassia tora</i>	tagarancha	10	0	1	10	1
<i>Celosia argentia</i>	gunagu	10	0	1	11	0
<i>Cleome gynandra</i>	thalaila	10	0	1	11	0
<i>Cocculus hirsutus</i>	doosari	8	0	3	8	3
<i>Colocasia antiquorum</i>	chama akulu	11	0	0	11	0
<i>Commelina benghalensis</i>	yennadri	7	2	2	10	1
<i>Digera arvensis</i>	jonna chemchali	7	4	0	11	0
<i>Gymnema sylvestre</i>	pola patram	8	0	3	10	1
<i>Hibiscus cannabinus</i>	pundi erra	11	0	0	11	0
<i>Hibiscus cannabinus</i>	sarkarpundi-govt variety	10	0	1	11	0
<i>Lactuca runcinata</i>	atheli	9	0	2	11	0
<i>Cassia sophera</i>	chenngi	7	2	2	10	1
<i>Leucas aspera</i>	tummi kura	9	0	2	11	0
<i>Maerremial emarginata</i>	elakachevula kura	9	1	1	11	0
<i>Mentha spicata</i>	pudina	9	0	2	11	0
<i>Mirabilis jalapa</i>	gurumashi	9	0	2	10	1
<i>Piper betle</i>	thalampaku	11	0	0	11	0
<i>Portulaca</i> sp.	sanna payala	11	0	0	11	0
<i>Solanum nigrum</i>	nalla kasha	9	0	2	10	0
<i>Solanum nigrum</i>	kashapandla kura	9	1	1	11	0
<i>Spinacia oleracea</i> var	perinial palakura	6	0	5	9	2
<i>Zinziber officinale</i>	allam aaku	9	0	2	8	3

ID Number of women who could identified.

WID Number of women who wrongly identified.

– No data.

for vitamin A and vitamin C were low in comparison to standards.

The dietary pattern in this region included cooked foods and very little consumption of raw foods except for fruits. For several reasons, people no longer ate wild seasonal fruit as in former years, which is a reason for low vitamin C consumption in this population.

Also, dietary analysis software may not have had a complete database for these nutrients, particularly for vitamin C in the greens.

Table 9.14 describes results of children reported by the National Nutrition Monitoring Bureau for Andhra Pradesh and the DDS *sanghams*. While the ages are not precisely comparable, the DDS Dalit

**Table 9.13 Food and nutrient intake profile of women in Andhra Pradesh (AP), States Pooled (SP) and DDS-AP**

	Recommended (g)	AP-Intake (g) <sup>1</sup>	SP-Intake (g) <sup>1</sup>	DDS-AP Dalit women (g) <sup>2</sup>
<b>Food groups</b>				
Cereals and Millets	460	542	464	661
Pulses and Legumes	40	35	33	86
Vegetables	60	38	40	92
Greens	40	10	13	39
Milk and Milk products	150	166	95	93
Fats and Oils	20	14	13	19
Sugar and Jaggery	30	12	23	20
Fruits	–	–	22	142
<b>Nutrients</b>				
Energy (Kcal)	2 425	2 430	2 172	2 567
Protein (g)	60	58	56	66
Iron (mg)	28	26	26	29
Vitamin A (µg)	600	352	288	239
Vitamin C (mg)	40	34	35	28

<sup>1</sup> National Nutrition Monitoring Bureau, 2002.

<sup>2</sup> Data modified from Schmid *et al.*, 2005, n = 149.

– No data.

had a higher percentage of children with normal weight for age. However, the number of moderately and severely malnourished children was roughly comparable.

With respect to vitamin A status in all of India, the prevalence of Bitot spots was 0.8 percent in pre-school children. About 60 percent of pre-school children in India are undernourished. In Andhra Pradesh, 1.1 percent had clinical signs of vitamin A deficiency (NNMB, 2002). In this study, a few women and children (approximately 8 percent) reported night blindness or exhibited symptoms of Bitot's spot or conjunctival xerosis. However, 35 percent of women reported night blindness during pregnancy (Schmid, 2005).

## Conclusions

The Dalit food system was found to have a wide diversity of food species, many of which were unrecognized to date. Women farmers display a wealth of traditional knowledge in their ability to recognize,

**Table 9.14 Distribution of children by weight for age**

Category	1–5 years (%) <sup>1</sup>	6–39 months (%) <sup>2</sup>
Normal children	8.5	37
Mild under nutrition	40.6	22
Moderate under nutrition	43.4	41
Severe under nutrition	6.9	

<sup>1</sup> National Nutrition Monitoring Bureau, 2002.

<sup>2</sup> Zaheerabad Dalit children. Data from Schmid *et al.*, 2005, n = 149.

grow and prepare these foods, and to also use them as medicine. In partnership with the NIN nutrient analysis laboratories, new nutrient composition data for uncultivated greens and wild fruits have been determined and reported here. Many excellent nutrient sources are in the Dalit food system.

Many types of green leaves were consumed as vegetables and most are rich sources of calcium, iron, carotene and vitamin C. These greens were inexpensive sources of many nutrients essential for growth and maintenance of normal health. Consumption of

uncultivated foods and wild fruits in adequate amounts should be encouraged for the entire family. Further, these food systems should be supported for production and consumption in midday meals and in schools at all levels ●

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> **Comments to:** salomeyesudas@hotmail.com

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