

Proximate Composition of Underutilized Green Leafy Vegetables in Southern Karnataka

K. Sheela, Kamal G. Nath, D. Vijayalakshmi, Geeta M. Yankanchi and Roopa B. Patil

INTRODUCTION

Green leafy vegetables occupy an important place among the food crops as these provide adequate amounts of many vitamins and minerals for humans. They are rich source of carotene, ascorbic acid, riboflavin, folic acid and minerals like calcium, iron and phosphorous.

In nature, there are many underutilized greens of promising nutritive value, which can nourish the ever increasing human population. Many of them are resilient, adaptive and tolerant to adverse climatic conditions. Although, they can be raised comparatively at lower management costs even on poor marginal lands, they have remained underutilized due to lack of awareness and popularization of technologies for utilization. Now-a-days, underutilized foods are gaining importance as a means to increase the per capita availability of foods.

Since low consumption of green leafy vegetables in diet is one of the major factor, which leads to deficiency of vitamin A and iron, an attempt was made to identify and analyze the various underutilized green leafy vegetables for their nutrient content from selected regions of southern Karnataka.

MATERIAL AND METHODS

A total of 275 households from five districts comprising of 32 villages have been randomly selected and the respondent (woman) of each family was interviewed to elicit information on availability and utilization of underutilized foods. Samples of underutilized foods were identified and all the samples were collected directly from the fields. The moisture and ascorbic acid content of fresh samples were determined within 24 hours of procurement.

The fresh samples were cleaned, washed, chopped and oven dried at 80°C for 16 to 18 hours. They were ground to pass through a 40-mesh sieve and stored in airtight containers under refrigerated temperature for further use. The powdered samples were subsequently used for chemical analysis. All the analysis were

carried out on dry weight basis and expressed per 100g of edible portion. All the chemical analysis was carried out by standard procedures of AOAC (1975).

RESULTS AND DISCUSSION

Macronutrient composition of underutilized greens has been reported in Table 1. Protein content of the samples ranged between 0.7 to 3.6g/100g. It was high in Bilihonagone soppu, *Alternanthera sessilis* (3.56gm), followed by Chinese soppu, *Souropus androgynus* (3.40gm). Crude fibre content varied from 0.2 to 2.3g/100g being highest in Vayu soppu, *Gynandropsis pentaphylli* (2.51gm) followed by Maddittu soppu (2.23gm). The energy content ranged between 17 – 97 Kcal/100g.

Vegetables and greens are good sources of micronutrients as well. Micronutrient composition and oxalic acid content of vegetables has been presented in Table 2. Among the underutilized green leafy vegetables identified, iron content ranged between 3.68 to 37.34 mg/100g. The highest iron content was observed in Nelabasale soppu, *Portulaca deracea* followed by Anne soppu, *Celosia argentea* (28.26mg) and Naroli soppu, *Duranta repens* (27.25mg). By including these iron rich greens in daily diet one can easily fulfill 20 to 25 per cent of the daily requirement of iron from one serving. It is evident from the table that among the underutilized greens the calcium content ranged from 21 – 400mg/100g. Chilikeere soppu, *Oxalis acetasella* (400mg) was maximum followed by Jeeramenasina soppu, *Pimpivella* sp. (375mg) and Nelabasale, *Portulaca deracea* (326mg). As plant foods contain some natural compounds which act as an antinutritional factor interfering with the utilization of some of the nutrients. Oxalic acid is known to interfere with calcium absorption by forming insoluble salts with calcium. Oxalic acid content in samples was found in the range of nil to 121.09mg/100g. The higher ascorbic acid content was found in Knol Khol greens, *Brassica oleracea* (175mg) followed by Seege soppu, *Acacia* sp. (83mg) and

Table 1: Macronutrient composition of underutilized green leafy vegetables

S. No.	Local Name	Botanical Name	Moisture (%)	Protein (gm)	Fat (gm)	Fiber (gm)	Carbohydrates (gm)	Energy (Kcal)
1	Kadanugge soppu	<i>Rhynchosia rufescens</i>	71	1.7	0.3	0.9	19.2	86
2	Anne soppu	<i>Celosia argentea</i>	85	1.2	1.2	0.7	1.9	23
3	Vayu soppu	<i>Gynandropsis pentaphylla</i>	83	2.0	0.6	2.6	2.8	25
4	Bakracholi soppu	<i>Portulaca oleracea</i>	79	1.20	0.9	2.1	2.4	22
5	Putte soppu	<i>Boerhavia diffusa</i>	89	1.3	1.9	1.0	3.0	34
6	Dogalagere soppu	<i>Amaranthus viridis</i>	91	2.0	0.9	1.1	2.2	24
7	Knol khol soppu	<i>Brassica oleracea</i>	85	3.5	0.4	1.8	6.4	43
8	Bilihonagone soppu	<i>Alternanthera sessilis</i>	84	3.6	1.3	1.2	2.2	35
9	Marakesavu soppu	<i>Colocasia esculenta</i>	86	1.5	1.1	0.7	3.7	30
10	Harave (Bitter) soppu	<i>Amaranthus Sp.</i>	93	3.2	0.3	1.2	1.3	21
11	Jeeramensina soppu	<i>Pimpivella Sp.</i>	93	2.5	2.6	1.2	0.4	35
12	Mulla Harave soppu	<i>Amaranthus spinosus</i>	84	3.6	1.4	0.6	8.7	62
13	Ganake soppu	<i>Solanum nigrum</i>	74	2.0	1.3	0.7	13.2	73
14	Kaddanake soppu	<i>Alternanthera sessilis</i>	82	3.3	0.7	0.8	1.5	25
15	Nela Basale	<i>Portulaca deracea</i>	92	0.8	1.2	0.3	1.7	21
16	Ondelega	<i>Centella asiatica</i>	69	2.0	2.0	0.7	1.7	23
17	Chotte soppu	<i>Cassia tora</i>	85	0.7	2.0	0.9	1.4	17
18	Gida Basale	<i>Basella Sp.</i>	93	3.3	1.9	0.3	0.4	31
19	Chinese soppu	<i>Souropus androgynus</i>	88	3.4	1.4	1.7	0.5	28
20	Belesoppu	<i>Drymaria cordata</i>	84	1.5	0.9	0.9	8.9	49
21	Chilikere soppu	<i>Oxalis acetasella</i>	68	1.5	0.8	1.5	21.0	97
22	Bilidoddapathre	<i>Coleus Sp.</i>	91	0.9	1.2	2.1	1.7	22
23	Hulisoppu	<i>Oxalis corniculata</i>	68	1.2	0.5	2.0	6.9	63
24	Kake soppu	**	86	2.1	1.0	1.3	3.7	33
25	Paiche soppu	**	83	2.5	1.4	1.2	5.6	45
26	Kadakesa	**	75	1.8	0.9	2.3	15.2	76
27	Maddittu soppu	**	91	2.5	0.9	2.2	1.9	26
28	Yelaguri soppu	**	89	2.7	0.9	1.9	2.0	27
29	Goni soppu	<i>Portulaca oleracia</i>	83	1.9	0.4	1.36	11.2	56
30	Belwadke	<i>Portulaca quadrifida</i>	88	1.6	0.8	2.13	1.2	18
31	Utthrani soppu	<i>Achyranthes asPera</i>	78	2.1	0.7	1.92	8.3	48
32	Pundi soppu	<i>Hibiscus Sp.</i>	87	1.7	1.3	0.21	6.3	44
33	Seege soppu	<i>Acasia Sp.</i>	78	2.5	1.8	0.54	13.2	79
34	Ili Kivi soppu	<i>Agferaceae</i>	88	1.3	1.7	0.21	4.3	39
35	Yelsuri soppu	**	78	1.9	0.2	1.34	14.5	67
36	Naroli soppu	<i>Duranta repeus</i>	76	2.2	2.1	1.706	11.6	73
37	Punarpuli	<i>Garcinia indica</i>	75	2.3	0.5	1.24	17.2	82
38	Guava Leaves	<i>Psidium guajava</i>	80	0.8	1.2	0.691	3.9	30

** To be identified

Pundi soppu, *Garcinia indica* (55mg). Considering the daily recommended intake of ascorbic acid i.e. 40mg, consumption of these greens in fresh form can provide the day's requirement of vitamin C. Similar trend in the nutrient composition of greens has also been reported by Raghuvanshi et al. (2001).

The less commonly consumed greens analysed show a wide range of nutrient composition. These foods if consumed on a daily basis can take care of the micronutrient deficiency of

the population.

KEYWORDS Rural Households. Underutilized Greens. Micronutrient Composition. Macronutrient Composition. Antinutritional Factor.

ABSTRACT In India, various types of underutilized foods are available seasonally but are not utilized to the extent they should be in spite of their high nutritive value. Looking into the prevalence of high level of micronutrient malnutrition among vulnerable section, utilization of underutilized foods can be explored to overcome the nutritional disorders. Practically, there is no information available on the nutritive value of

Table 2: Micronutrient composition and oxalic acid content of underutilized green leafy vegetables

S. No.	Local Name	Botanical Name	Iron (mg)	Calcium (mg)	Ascorbic Acid (mg)	Oxalic Acid (mg)
1	Kadanugge soppu	<i>Rhynchosia rufescens</i>	25.23	238	35	42.50
2	Anne soppu	<i>Celosia argentea</i>	28.26	175	59	24.33
3	Vayu soppu	<i>Gynandropsis pentaphylla</i>	20.18	233	17	28.80
4	Bakracholi soppu	<i>Portulaca oleracea</i>	20.18	244	27	29.48
5	Putte soppu	<i>Boerhavia diffusa</i>	17.16	251	21	10.76
6	Dogalagere soppu	<i>Amaranthus viridis</i>	18.16	188	17	56.37
7	Knol khol soppu	<i>Brassica oleracea</i>	13.30	740	157	16.87
8	Bilihonagone soppu	<i>Alternanthera sessilis</i>	14.13	73	14	58.76
9	Marakesavu soppu	<i>Colocasia esculenta</i>	18.16	225	6	35.00
10	Harave (Bitter) soppu	<i>Amaranthus Sp.</i>	21.03	305	30	30.28
11	Jeeramensina soppu	<i>Pimpivella Sp.</i>	22.20	375	15	50.54
12	Mulla Harave soppu	<i>Amaranthus spinosus</i>	13.12	248	33	33.25
13	Ganake soppu	<i>Solanum nigrum</i>	17.16	204	12	50.62
14	Kaddanake soppu	<i>Alternanthera sessilis</i>	11.10	300	15	28.15
15	Nela Basale	<i>Portulaca deracea</i>	37.34	325	6	121.09
16	Ondelega	<i>Centella asiatica</i>	15.14	275	18	47.05
17	Chotte soppu	<i>Cassia tora</i>	20.18	144	29	19.65
18	Gida Basale	<i>Basella Sp.</i>	5.45	187	15	60.84
19	Chinese soppu	<i>Souropus androgynus</i>	10.09	313	22	33.25
20	Belesoppu	<i>Drymaria cordata</i>	12.74	278	15	38.66
21	Chilikere soppu	<i>Oxalis acetosella</i>	11.10	400	6	41.95
22	Bilidoddapathre	<i>Coleus Sp.</i>	12.45	208	25	34.18
23	Hulisoppu	<i>Oxalis corniculata</i>	14.75	234	21	25.37
24	Kake soppu	**	15.67	230	16	33.00
25	Paiche soppu	**	5.14	254	14	38.93
26	Kadakesa	**	16.55	280	3	51.55
27	Maddittu soppu	**	14.13	175	45	34.57
28	Yelaguri soppu	**	16.78	208	12	44.82
29	Goni soppu	<i>Portulaca oleracia</i>	16.17	227	15	61.35
30	Belwadke	<i>Portulaca quadrifida</i>	5.25	269	13	52.42
31	Utthrani soppu	<i>Achyranthes asPera</i>	18.16	394	8	73.87
32	Pundi soppu	<i>Hibiscus Sp.</i>	3.68	274	57	88.21
33	Seege soppu	<i>Acasia Sp.</i>	11.10	275	83	44.30
34	Ili Kivi soppu	<i>Agferaceae</i>	18.34	187	16	36.83
35	Yelsuri soppu	**	17.66	138	18	44.96
36	Naroli soppu	<i>Duranta repens</i>	27.25	250	17	52.45
37	Punarpuli	<i>Garcinia indica</i>	15.14	250	10	18.10
38	Guava Leaves	<i>Psidium guajava</i>	13.12	75	14	23.46

** To be identified

underutilized foods, which may contribute significantly to the nutrient intake of rural population. Thus, an attempt has been made to identify and analyze various underutilized vegetables for their nutrient content from selected regions of south Karnataka. A total of 38 green leafy vegetables have been identified and the iron content of the same ranged between 3.68 to 37.34mg/100g, the highest iron content was observed in Nelabasale greens, *Portulaca oleracea* (37.34mg). Calcium content ranged from 73 to 400mg/100g. Chilikere greens, *Oxalis acetosella* (400mg) had maximum calcium content. The highest ascorbic acid content was found in Knol Khol greens, *Brassica oleracea*.

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Authors' Address: K. Sheela, Kamal G. Nath, D. Vijayalakshmi, Geeta M. Yankanchi and Roopa B. Patil, Department of Rural Home Science, University of Agricultural Sciences, Hebbal, Bangalore 560 024, Karnataka, India
 Phone: 3415941, 3411483 Extn.1, Fax: 91-080-3415941,
 E-mail: sk_sheela@hotmail.com