



Micronutrient and Anti Nutrient Components of Selected Unconventional Leafy Vegetables in Bangalore City, India

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Abstract

Leafy vegetables are dense in micronutrients, and are of great importance to the nutrition of population in developing countries. Nutritive value of commonly consumed leafy vegetables has been studied extensively, but there is very less information available on nutritive value of unconventional leafy vegetables. Hence an attempt has been made to analyse the nutritional composition and anti nutritional factors in selected fifteen dehydrated unconventional leafy vegetables in Bangalore city, Karnataka, India. The iron content of greens ranged between 18.3mg to 104mg/100g, with the highest content in *Honagone soppu*, *Alternanthera sessilis* (104.53mg). The calcium content ranged between 104mg-388mg, and the highest calcium content found in *Thonde soppu*, *Coccinia grandis* (388.72 mg). Among the anti nutritional factors, tannins content ranged between 161mg – 1688 mg, with lowest content in *Anne soppu*, *Celosta argentea* (161.60mg). The oxalates ranged between 45mg-275mg, the lowest content of 45mg was observed in *Vayu soppu*, *Gynandropsis pentaphylla*.

Keywords: Unconventional greens, iron, oxalates, tannins.

Introduction

Multiple micronutrient deficiencies are wide spread globally with a large negative societal impact. Green leafy vegetables are micronutrient dense foods that provide sufficient vitamins and minerals and are of great importance to the nutrition of population in developing countries. There is a great diversity of flora and fauna in the world and there is lots of potentialities for enormous plant material which is not explored for mass consumption as they are regional specific and due to lack of awareness. Now-a-days, unconventional foods are gaining importance as a means to increase the per capita availability of foods. Nutritive value of commonly consumed leafy vegetables has been studied extensively, but there is very less information available on nutritive value of unconventional leafy vegetables. Hence an attempt was made to identify and analyse unconventional greens from markets of Bangalore city for their micronutrient content.

Material and Methods

A market survey (K R Market and Yeshawantpur Market) was done to elicit the information on availability and selling pattern of green leafy vegetables. A list of unconventional greens was made based on less consumption, less awareness, less sold and less availability. Samples of greens were collected from market. The fresh samples were cleaned, washed and removed inedible part, then chopped and oven dried at 80°C for 16 to 18 hours. The dried samples were powdered and sieved using 40 micro mesh sieve and stored in polyethene covers and sealed. The samples were stored under refrigerated condition for further use. The powdered samples were subsequently used for chemical

analyses. The nutrient composition and anti nutritional factors were analysed on dry weight basis. All the chemical analyses were carried out using AOAC standard procedures¹. Triplicate determination of each analysis was made and average calculated.

Results and Discussion

The micronutrient and anti nutrient composition of fifteen unconventional greens has been depicted in the table I.

It was observed that all the leafy vegetables are good source of micronutrients especially iron and calcium. The iron content of greens ranged between 18.3mg to 104mg/100g with the highest content in *Honagone soppu*, *Alternanthera sessilis* (104.53mg). The calcium content ranged between 104mg-388mg, and the highest calcium content found in *Thonde soppu*, *Coccinia grandis* (388.72 mg). The zinc and copper content varied between 1.98 to 7.28mg/100g and 0.62 to 2.25 mg/100g respectively. Oduse et al.,² analysed the proximate and mineral composition of less commonly consumed green leafy vegetables of South west Nigeria and found the percentage of moisture, protein, ether extract, ash, crude fibre and carbohydrate content varied from 78.60 to 88.47, 1.76 to 3.36, 0.20 to 2.93, 1.73 to 4.43, 2.56 to 3.73 and 2.73 to 12.33 respectively. Oko et al.,³ analysed the nutrient composition of leaves of *Mucuna pogeii*, an underutilized leafy vegetable and found that 8.25 per cent moisture content, 32.38 per cent protein, 30.55 per cent crude fibre. The iron, calcium and potassium content per 100 g of sample were 10.56 mg, 71.71mg and 43.21mg respectively. Similar trend in the nutrient composition of some uncommon greens has been reported by Thakur et al.⁴

Table-1

Micronutrient and anti nutrient components of unconventional leafy vegetables (per 100 g of sample on dry weight basis)

Sl. No.	Vernacular name (Botanical name)	Dietary fiber (g)	Ash (g)	Iron (mg)	Calcium (mg)	Zinc (mg)	Copper (mg)	Tannins (mg)	Oxalates (mg)
1	Agase soppu (<i>Sasbenia grandiflora</i>)	4.40	3.10	18.36	2039.46	2.11	0.62	900.00	92.40
2	Anne soppu (<i>Celosia argentea</i>)	3.40	3.20	103.57	1885.89	4.76	1.68	161.60	118.80
3	Basale soppu (<i>Portulaca deracea</i>)	2.35	0.68	64.12	2021.71	3.61	1.04	465.00	96.00
4	Carrot soppu (<i>Daucus carota L.</i>)	4.06	2.80	67.45	1733.05	3.87	1.20	1253.30	147.60
5	Cauliflower soppu (<i>Brassica oleracea L.</i>)	4.85	3.45	24.82	1759.99	3.66	1.10	1126.60	158.40
6	Ganake soppu (<i>Solanum nigrum</i>)	3.30	1.38	67.21	1560.04	4.17	2.13	843.30	69.60
7	Honagone soppu (<i>Alternanthera sessilis</i>)	7.38	3.64	114.55	1049.37	7.28	2.25	625.00	90.00
8	Huli soppu (<i>Oxalis corniculata</i>)	3.05	2.45	104.41	1538.84	3.99	1.20	993.30	84.60
9	Knol-khol soppu (<i>Brassica oleracea</i>)	4.80	2.85	37.60	2582.12	3.92	1.17	1221.60	275.40
10	Mulangi soppu (<i>Raphanus sativus L.</i>)	5.60	1.96	35.91	2580.02	4.45	0.73	1155.00	194.40
11	Nugge soppu (<i>Moringa pterygosperma</i>)	3.50	2.32	32.85	2058.31	2.16	0.73	1428.30	262.80
12	Ondelga soppu (<i>Centella asiatica</i>)	3.05	2.13	103.78	1788.58	6.32	1.86	940.00	111.60
13	Thonde soppu (<i>Coccinia grandis</i>)	4.68	1.84	58.69	3887.21	7.96	2.80	988.30	156.60
14	Thumba soppu (<i>Leucas aspera</i>)	7.90	2.35	70.19	1147.30	4.40	1.40	996.60	127.80
15	Vayunarayana soppu (<i>Gynandropsis pentaphylla</i>)	4.80	2.42	24.89	1113.10	1.98	0.85	1688.30	45.00

In the present study, among the anti nutritional factors, tannins content ranged between 161mg – 1688 mg, with lowest content in Anne soppu, *Celosta argentea* (161.60mg). The oxalates ranged between 45mg-275mg, the lowest content of 45mg was observed in Vayu soppu, *Gynandropsis pentaphylla*. Anti nutritional composition of less utilized green leafy vegetables by Joshi and Mathur⁵ reveals the similar results.

Conclusion

As the green leafy vegetables are inexpensive foods rich in micronutrients, utilization of unconventional green leafy vegetables can be explored to overcome some of micronutrient malnutrition.

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References

1. AOAC, Official Methods of Analysis, Association of Official Analytical Chemists, Washington, DC, **16th Edn, (1985)**
2. Oduse Kayode A., Idowu Micheal A. and Adegbite Adefolawe A., Chemical and phytochemical profile of some uncommon green leafy vegetables consumed in South West Nigeria, *IOSR Journal of Environmental Science, Toxicology and Food Technology*, **1 (3)**, 22-26 **(2012)**
3. Oko A.O., Ekigbo J.C., Idenyi J.N. and Ehihia L.U., Nutritional and phytochemical composition of leaves of *Mucuna pogeii*, *Journal of Biology and Life Science*, **3(1)** **(2012)**
4. Thakur Sunita, Kumar Sudhanshu and Kumar Aravind., Potential of some wild leafy vegetables as natural source for supplementation of micronutrients in vegetarian diets of Santhal Pargana area of Jharkhand, *Indian Journal of*

Fundamental and Applied Life Sciences, **2(3)**, 65-67
(2012)

leafy vegetables, *Asian Journal of Experimental
Biological Sciences.*, **1(4)**, 845-854 (2010)

5. Joshi Pallavi and Mathur Beena, Bioavailability of iron from the leaf powders of dehydrated less utilized green