

Underutilized Green Leafy Vegetables For Combating Hidden Hunger

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Abstract:

Vegetables are an important part of everyone's life and a key component of a human balanced diet. Green leafy vegetables are the main drivers in achieving global nutrition security by providing nutrients, like vitamins and minerals. The world is dealing with erratic climatic conditions, agrarian distress and nutritional challenges as agricultural lands were over-exploited. In this current scenario to provide nutritional security, many of these greens are resilient, adaptive, and tolerant to adverse climatic conditions and don't require much investment, therefore it is called a poor man's vegetable. In India, most rural inhabitants depend on edible wild plants to meet their further food requirements and to obtain household food security. The nutritive value and medicinal properties of these leaves are more aware to villagers than people who live in cities. Some leafy vegetables provide nutraceutical and antioxidant health benefits. It is necessary that the locally available Green leafy vegetables, which are easy to cook and inexpensive, be used in the diets to eradicate micronutrient malnutrition, and also to prevent degenerative diseases. The reasons for the low utilization of underutilized vegetables are due to lack of awareness on their nutritional and medicinal importance. In this review, some important underutilized green leafy vegetables were discussed to create awareness for the welfare of everyone.

Introduction:

India is a country rich in biodiversity with about 45000 species of wild plants of which about 7500 species possess medicinal use in indigenous health practices. The green leafy vegetables have from times immemorial been food source to provide many micro nutrients that help maintain health and wellbeing. These leafy vegetables contain important nutraceutical constituents and hence some of them are referred to as pot herbs, greens, vegetables, leafy greens or salad greens. Though leafy vegetables are low in calories and fat

but are high in dietary fiber, iron, phosphorus calcium and magnesium, phytochemicals, vitamins like A, B, C and K, carotenoids, lutein and folates. Green leafy vegetables are nature's most potent antioxidants that can inhibit many of the life styles diseases prevalent now a days. The World Health Organization (WHO) recommends a daily intake of at least 400.0g of vegetables per person to protect against nutritional deficiencies and other chronic diseases due to hampering of immune system.

Daily consumption of 100.0g of leafy vegetables by adults and 50.0g by children will provide the daily requirements of β -carotene, folic acid and vitamin c and a part of the calcium and riboflavin requirements. The green leafy vegetables are the cheapest of all vegetables within reach of poor men with rich nutritional value. The cultivation of these vegetables will increase food production as they can easily be cultivated and provide balanced nutrition, food security, health security and poverty alleviation to deprived sections of society. So, four different underutilized green leafy vegetables have been chosen to discuss their nutritional value and health benefits. These include radish, carrot, pumpkin and colocasia leaves.

1. Radish Leaves:

- a) **Introduction:** Radish (*Raphanus raphanistrum* sub sp. *sativus*) is an herbaceous annual or biennial plant of Brassicaceae family grown for its edible taproot. The entire plant is edible. This short season vegetable's underground modified root can be consumed as a salad vegetable and top part as a leafy vegetables. The radish leaves are coarse, hairy, and prickly resulting in these leaves not being accepted as other common greens although it contains tons of dietary fiber and micro nutrients. The presence of a variety of nutrients in radish leaves makes it a versatile herb that can cure and alleviate various diseases and micronutrient deficiencies.
- b) **Nutritional value:** Every 100g of radish leaves gives energy of 28.0 Kcal, 3.8g protein, 2.4g carbohydrates, 1.0g dietary fiber, 81.0mg vitamin C, 0.09 mg iron, 59.0mg phosphorus and 280.0 μ g folate essential for many bodily functions.
- c) **Medicinal uses:** Radish greens contain more nutrition than their white root. Radish leaves are fatigue reliever, detoxifier, antiscorbutic, immunity boosters and antibacterial properties of this leave help curing hemorrhoids to a certain extent. The vitamin A and vitamin C content of radish leaves help in building the immune cells that only prevent the

onset of common ailments [4]. Radish leaves are naturally diuretic, dissolve stones and clear the urinary bladder along with laxative properties to ease constipation and bloated stomach.

2. Carrot Leaves:

- a) **Introduction:** Carrot (*Daucus carota*) is a root vegetable native to Europe and southwestern Asia. It is cultivated for its roots but the greens that emerge above the soil are also edible. The lack of awareness regarding its uses and cooking methods results in the leaves being discarded. In the past, there was the widespread belief that carrot greens are toxic, but this is likely due to their bitter flavor. The bitterness is usually associated toxicity, but as it turns out, these greens are edible and do not pose any threat to health. Due to their bitterness, however, they are rarely considered for consumption. Carrot greens are the most under-exploited greens class despite their high nutritional value. They contain omega 3 and 6 fatty acids, which are scarce, cannot be synthesized by mammals and must be obtained through diet.
- b) **Nutritional value:** Carrot greens contain an impressive list of nutrients including significant amounts of vitamin A, dietary fiber, vitamin C, calcium and iron. These greens also contain vitamin K and various phenolic compounds and carotenoids, along with trace amounts of other antioxidants. Every 100.0g of carrot greens provide energy of 77.0Kcal, 5.1g protein, 13.1g carbohydrates, 2.0g fiber, 340.0mg calcium, 110.0mg phosphorus and 8.8mg iron.
- c) **Medicinal uses:** Carrot greens have detoxifying properties, vitamin C and a significant level of antioxidants like lutein, zeaxanthin and β -carotene, helping to boost the immune system, protecting body against infections and foreign pathogens. High levels of potassium in greens can keep the blood pressure levels in control. They have high chlorophyll content that helps heal skin and rid the body of toxins. Vitamin K in carrot greens can regulate blood calcium levels and helps in blood clotting.

3. Pumpkin Leaves:

- a) **Introduction:** Pumpkin (*Cucurbita cucurbitaceae*) belongs to the Cucurbitaceae family. These leaves are large, lobed and grow on hollow stems in many parts of the world including Asia and Africa. They are not often consumed in regular diet because of their

fuzzy texture but can be eaten raw or cooked. Pumpkin originated in Central America over 7500 years ago.

- b) **Nutritional value:** Pumpkin leaves are healthy and delicious, loaded with iron and manganese essential for normal functioning of the body. Pumpkin leaves also include calcium, vitamins C, A and B in addition to magnesium, phosphorus and copper. Each 100g of pumpkin leaves can give energy of 57.0 Kcal, 4.6g protein, 7.9g carbohydrates, 0.207mg vitamin B₆, 2.22mg iron, 392.0 mg calcium and 112.0 mg of phosphorus.
- c) **Medicinal uses:** Pumpkin leaves enhance lactation in nursing mothers, lower cholesterol content, regulate blood sugar levels, fight against cancer, increase fertility and contain a high amount of calcium crucial for healthy bones and teeth. Vitamin A content in the leaves can improve eyesight, promote healthy skin and hair whereas vitamin C can help to heal wounds and form scar tissue. These fibrous leaves are also high in iron and have antimicrobial properties that fight against infections.

4. Colocasia Leaves:

- a) **Introduction:** Colocasia leaves are commonly known as Elephant ears due to their shape as well as Taro leaves. These are heart shaped leaves of the taro plant (*Colocasia esculenta*) widely grown in the subtropical and tropical regions. Taro plants are well known for their starchy, underground and brown tubers. Taro leaves are medium to large measuring 40 cm in length and 20 cm in width. Leaves are smooth, dark green on the surface and light green on underside. Both stems and veins have purple to red here and there. The leaves are tender with mild and nutty flavor when cooked and possess a slightly metallic and iron taste. Taro leaves are available year-round. The leaves are cooked (boiled, sauteed, fried or steamed) before consumption or can be fermented with lime or tamarind. The consumption of raw leaves without processing can be intense discomfort to the lips, mouth and throat due microscopic needle-like raphides of calcium oxalate monohydrate and proteases.
- b) **Nutritional value:** Every 100.0g of taro leaves gives energy of 56.0 Kcal, protein 3.9g, dietary fiber 2.9g, calcium 227.0 mg, iron 10.0 mg, phosphorus 82.0 mg, vitamin C 12.0 mg, vitamin K 108.6µg, riboflavin 0.45mg and niacin 1.1 mg.
- c) **Medicinal uses:** The colocasia leaves with high dietary fiber and low-calorie content can help boost heart health, reduce cholesterol, aid in weight loss, control blood pressure,

prevent anemia and promote overall wellbeing. The high levels of vitamin C can prevent many diseases and fight free radicals that cause cancer and boost the immune system. They are a rich source of vitamin A and carotenes which enhance eye health, maintain vision acuity and prevent various eye disorders such as blindness, myopia, cataract and muscular degradation. The high content of dietary fiber helps to maintain the normal digestive functioning.



Radish greens vada



Radish green dal



Carrot green soup



Carrot and its green sabzi



Pumpkin leaves tomato curry



Stir fry pumpkin leaves



Colocasia leaves chutney



Colocasia leaves pakoda



**Conclusion:**

Underutilized vegetables are rich in nutrition and are adapted to low-input agriculture. The incorporation of these leafy vegetables that grow abundantly in our countryside can usually be discarded due to lack of information of its usage although their vegetables are incorporated into the regular diets in various forms. They also can give adequate relief from degenerative diseases and protection from eye problems, iron deficiency, and oxidative damage. Focusing attention on neglected and underutilized vegetables is an effective way to help maintain a diverse and healthy diet and combat micronutrient deficiencies, the so-called 'hidden hunger, and other dietary deficiencies among the vulnerable social groups in developing countries.