



## Chekurmanis: The Vegetable of 21st Century

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### Abstract:

Chekurmanis (*Sauropus androgynus*), a perennial tiny shrubby leafy vegetable from the Phyllanthaceae/Euphorbiaceae family, grows abundantly in South and Southeast Asia. The plant is endemic to India and the Burma area. It may be found in the Sikkim, Himalayas, Khasi, and Akra hills at 1200m heights, as well as in the Western Ghats of Kerala from Wynad northwards at 300-1200m elevation. It is said to have been introduced into Kerala from Malaysia in 1953 and is known in Malayalam as “Madura keera”. Sengtungrung (Sikkim), Malay Cheera (Kerala), Chakrmani (Andaman and Nicobar Islands), Chakurmani (West Bengal), Chinese Soppu (Karnataka), Dieng Soh Pit (Meghalaya), and Thavasikkeerai in Tamil. It is common in almost every home kitchen gardens in Kerala, although it has not been planted on a wide scale for commercial use. Sengtungrung (Sikkim), Malay Cheera (Kerala), Chakrmani (Andaman and Nicobar Islands), Chakurmani (West Bengal), Chinese Soppu (Karnataka), Dieng Soh Pit (Meghalaya), and Thavasikkeerai (Tamil) are also vernacular names.

### Botany

The plant is a slow-growing glabrous perennial shrub with a height of 2-3.5 m. Its major branches are terete and flaccid. The lateral branches are slender. The leaves are 5-6 cm long, dark green, oval or oblong, sessile, alternating, membranous, and short-stacked. The inflorescence has little crimson blooms. Flowers are monoecious, tiny, auxiliary, pedicelled, and grouped. The fruits are sessile, white or pinkish-white, and 0.2cm in diameter, with a meaty epicarp. Because of its photogynous and monoecious nature, the crop is extensively cross pollinated and entomophilous. As a leafy vegetable, it is often grown as a perennial plant at a height of 1-1.5m, with periodic leaf and apical harvest.

### Nutritional Compositions

Chekurmanis leaves are widely consumed in Malaysia but are less common in India, mainly limited to certain regions in the

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south. Known as the "Vegetable of the 21st Century," "Multivitamin Green," and "Powerhouse of Multivitamins," these leaves are extremely nutritious, packed with micronutrients, vitamins, and protein. They contain 73.6% water, 103 Kcal of energy, 6.8 g of protein, 3.2 g of fat, and 11.6 g of carbohydrates per 100 g of fresh leaves. They are especially rich in Vitamin A (9510 IU) and Vitamin C (247 mg). Additionally, they provide Thiamin (0.48 mg), Riboflavin (0.32 mg), Niacin (2.6 mg), Calcium (570 mg), Phosphorus (200 mg), and Iron (28 mg). Chekurmanis leaves have a protein content of 6-8%, which is higher than other leafy vegetables like methi and palak. They also surpass mangoes and papayas in Vitamin A content and are a rich source of  $\beta$ -carotene, Vitamins B, C, and E, thiamine, riboflavin, nicotinic acid, and various minerals including calcium, phosphorus, zinc, and iron. This makes chekurmanis an exceptionally nutrient-dense leafy vegetable, earning its nicknames. Minerals found in these leaves are crucial for physical and mental development, the immune system, and various metabolic processes.

Chekurmanis leaves are known for their strong antioxidant properties, likely due to their high vitamin C and E content. Given their rich nutrient profile, these leaves could be used to develop health-beneficial food products that help prevent micronutrient

deficiencies. However, chekurmanis leaves also contain significant amounts of the alkaloid papaverine. Consuming the leaves excessively, especially when raw, can lead to drowsiness and respiratory issues due to this alkaloid.

Chekurmanis (*Sauropus androgynous*) contains at least seven active compounds that can stimulate the synthesis of steroid hormones such as progesterone, estradiol, testosterone, glucocorticoids, and eicosanoids, including prostaglandins, prostacyclins, thromboxanes, lipoxins, and leukotrienes. When consumed by women, these active compounds promote the formation of femininity-related hormones, leading to smoother skin and healthier, softer hair. In men, these leaves stimulate hormone production, enhancing sexual vitality. Chekurmanis is highly regarded for its ability to restore vitality and improve male fertility.

### Medicinal Properties

- ❖ In rural areas, a decoction of chekurmanis roots is often recommended to treat fever.
- ❖ Pounded roots and leaves are used as a poultice for nasal ulcers.
- ❖ In parts of South India, a mixture of chekurmanis leaf juice, pomegranate root, and jasmine leaves is used to treat eye problems.

- ❖ The dark green leaves are a rich source of chlorophyll, which is valuable for blood building, cell rejuvenation, blood circulation, and regular bowel movements.
- ❖ The leaves are rich in micronutrients and phytochemicals with antioxidant properties that protect against heart disease and certain cancers. For instance, beta-carotene prevents lung and skin cancer, niacin prevents recurrent heart attacks, ascorbic acid boosts the immune system, and riboflavin treats lesions.
- ❖ Eating raw leaves can help lower high blood pressure.
- ❖ Nursing mothers are given the leaves as a vegetable to stimulate breast milk production, and they also induce milk production in lactating sheep.
- ❖ Chekurmanis is beneficial in treating anemia.
- ❖ The leaves help prevent tiredness, promote nutrient absorption from the digestive tract, and prevent chronic cardiovascular diseases.
- ❖ They contain amino acids such as lysine, methionine, tryptophan, phenylalanine, threonine, valine, leucine, and isoleucine.
- ❖ Polyphenols in the leaves have protective effects against human carcinogenesis, cardiovascular and renal disorders, memory and cognitive function decline, age-related neurological conditions like Alzheimer's, ulcers, and other ailments.
- ❖ Flavonoids in the leaves protect DNA from oxidative damage, inactivate carcinogens, inhibit mutagenic genes and enzymes that activate pro-carcinogens, and activate detoxification systems for xenobiotics.
- ❖ *Sauropus androgynus* leaves contain significant amounts of the alkaloid papaverine (580 mg per 100 g fresh leaves), which is used as an antispasmodic drug to treat visceral and vasospasm, erectile dysfunction, and acute mesenteric ischemia.
- ❖ In some South Asian countries, the plant is used as a slimming agent due to its anti-obesity properties.
- ❖ Additionally, chekurmanis lowers body heat, strengthens the body, prevents constipation, treats skin and eye diseases, and improves growth and mental stability.

## Production Technology

### Soil and Climate

Chekurmanis thrives in various soil types but shows optimal growth and yield in rich, well-drained sandy loam or semi-laterite soils. It prefers a pH of 7 but can tolerate

acidic soils. The plant flourishes in warm, humid climates with good rainfall and grows vigorously at lower elevations around 500 meters above sea level, though it can be found at elevations up to 1,200 meters. When grown in shaded areas, the plant produces broader leaves. Its growth is rapid during warm months but slows down in winter, with leaf production decreasing or the plant going dormant. However, it should regenerate from the stump.

### **Propagation**

There are no distinct varieties of this crop available. It is mainly propagated through stem cuttings and seeds, though both have a short viability period and should be planted soon after collection. Seeds remain viable for only 3-4 months when kept dry and cool. Plants grown from seeds take longer to reach harvest compared to those from cuttings. Stem cuttings, taken from 6-12 month old plants and measuring 20-30 cm with 5-6 nodes, are planted in polybags filled with a mixture of soil, sand, and manure in equal parts. Dipping the cuttings in a 50 ppm IAA/IBA solution before planting in polybags accelerates rooting. Cuttings should be planted in furrows at least two weeks before the onset of the monsoon in April-May. Rooting takes about 20-25 days. Chekurmanis is often grown as a hedge or fence around vegetable plots or in kitchen gardens.

### **Planting**

To plant one hectare, approximately one lakh cuttings are needed. These cuttings should be planted in shallow furrows at least 15 days before the onset of the monsoon in April-May. Once the plants reach a desirable height, they are transplanted into pits measuring 30 cm × 30 cm × 30 cm. The cuttings are spaced 60 cm apart.

### **Manures and Fertilizer**

When planting in the pits, fill them with 5 kg of farmyard manure (FYM) and 25 g each of urea, single superphosphate (SSP), and muriate of potash (MOP). After each clipping, applying a 7:10:5 (N:P:K) mixture at a rate of 30 g per plant, along with a 1% urea spray, significantly enhances leaf yield. It is common practice to tip the plants to develop laterals once they reach about 1 meter in height. After every clipping, the plants are manured and regularly watered during dry periods. Chekurmanis can be trained as a hedge or grown on bowers or trellises.

### **Irrigation**

Frequent irrigation is provided until root initiation occurs. Although chekurmanis can endure hot, dry weather for extended periods, regular watering is recommended to ensure the continuous growth and appearance of new leaves. Consistent application of fertilizer and mulch is also necessary to conserve moisture.

### **Harvesting and Yield**

When the plants reach about one meter in height, they should be tipped to encourage lateral growth. If left untrimmed, they can grow into small trees but can also be trained as hedges or on bowers or trellises. The first harvest of succulent leaves can be done 3-4 months after planting, when the plant is about 60-90 cm tall, and subsequent harvests can occur every fortnight if properly manured and irrigated. The first clipping of leaves and tender shoots is done 3-4 months after planting, or when the plants reach a height of 60-90 cm. Trimming the plants to a height of about 1-1.5 meters makes it easier to harvest the leaves and shoots. On average, the plants produce 30-50 tonnes per hectare or 1-3 kg of leaves per plant per year.

### **Insects and pests**

The plant is generally free from serious pests and diseases, though scale insects and aphids may occasionally appear and can be controlled by spraying Malathion at 1 ml per liter. Care should be taken not to harvest leaves and shoots immediately after spraying insecticide.

### **Uses and Foods Prepared from Chekurmanis**

- ❖ Chekurmanis is commonly grown in hot and humid climates. Its leaves and tender young tips are typically eaten like tropical asparagus, either raw in salads, steamed, or added to stir-fries,

rice dishes, egg dishes, soups, or casseroles. Sometimes, they are blanched and served with chili paste. The plant's flowers and small purplish fruits are also consumed.

- ❖ The leaves, tender shoots, and fruits can be eaten either raw or cooked. In Java, the acidic cooked leaves are used in soups, while the fruits are made into a sweetmeat.
- ❖ In Indonesia, chekurmanis leaves are used to provide a light green color in pastries and fermented rice. They are also included in sandwiches, salads, curries, meat dishes, rice dishes, scrambled eggs, omelets, pickles, casseroles, stir-fries, and as a garnish.
- ❖ The leaves can be cooked with crab meat, minced pork, or dried shrimp and tomatoes.
- ❖ In southern India, chekurmanis leaves are used to make cutlets.
- ❖ The leaves and young tips have a pleasant flavor similar to fresh garden peas with a slight nuttiness. In Kerala and Karnataka, they are eaten raw in salads or steamed, similar to tropical asparagus.
- ❖ Chekurmanis is featured in many ethnic recipes across South and Southeast Asia. In India, it is primarily cultivated in Tamil Nadu, Kerala, and

Karnataka, where the green leaves and young shoots are used as vegetables. The leaves are either cooked as a vegetable or ground into a spice powder in southern India. The plant is also grown as an ornamental hedge in yards or home gardens.

- ❖ Cooked chekurmanis leaves are acidic and used in soups in Java, and a sweetmeat is made from the fruits there.
- ❖ In Indonesia, the leaves are also used to give a light green color to pastries and fermented rice, and they feature in various dishes such as sandwiches, salads, curries, meat dishes, rice dishes, scrambled eggs, omelets, pickles, casseroles, and stir-fries, or as a garnish.
- ❖ Chekurmanis leaves can be used in recipes with crab meat, minced pork, or dried shrimp and tomatoes.
- ❖ In southern India, chekurmanis leaves are used for making cutlets.
- ❖ The leaves and tender young tips are known for their pleasant, slightly nutty taste, similar to fresh garden peas, and are enjoyed raw in salads or steamed in Kerala and Karnataka.

## Conclusion

Climate change and rising populations limit efforts to achieve food and nutritional

security. Producing a wider diversity of food crops can minimise risk and improve food security. Diversified diets based on a variety of crop species are critical to nutritional security. Leafy and underutilised vegetables, particularly chekurmanis, have high quantities of "macro," "micro," and "phyto" nutrients, which can help alleviate malnutrition and greatly contribute to nutritional security. As a result of its low cost, the consumption of this green leafy vegetable should be encouraged, particularly among the most needy segments of society. This might be a very practical technique for combating hunger in our country in the future.

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