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RESEARCH ARTICLE

# Value-Added Product Development: Soup Powder from Selected Perennial Greens and Its Sensory Profiling

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## ABSTRACT

An attempt was made to develop a soup powder mix using various perennial green leafy vegetables and to evaluate their organoleptic qualities. Fresh leaves of Moringa, Agathi, Chekurmanis, Malabar spinach, Ivy gourd, and Latchakottai were processed and ground into fine powder. Soup powders were prepared by blending the leaf powders with other ingredients, and sensory evaluation was conducted. Among the formulations, Chekurmanis soup powder received the highest scores across all organoleptic parameters, followed by Latchakottai and Moringa. The study suggests that these perennial greens have potential for commercial soup powder production enhancing nutritional intake and combating malnutrition.

**Keywords**: *Perenial greens; Soup powder; Organoleptic; Malnutrition*

## INTRODUCTION

Perennial greens have been consumed for ages by humankind, not only for food security but also for nutritional security. Even though the nutritional properties of popular vegetables are known, there are still ample numbers of vegetables that are obscure to humanity. These perennial greens contain a handful of vital nutrients, trace minerals, antioxidants and medicinally important bioactive compounds. The lack of knowledge among consumers and farmer's tendency to grow these greens renders their importance in the human diet.

*Moringaoleifera*is a nutrient-rich tropical tree valued for its protein, vitamins, and minerals, especially beneficial for mothers and children. Traditionally used in Ayurvedic and Unani medicine, it contains a range of bioactive compounds. Its health benefits include anti-diabetic, antioxidant, anti-inflammatory, and cardioprotectiveproperties (Mahaveerchand and Salam, 2024). *Sesbaniagrandiflora*, commonly known as Agathi, is a fast-growing legume tree native to Southeast Asia, valued for its edible leaves and flowers. Rich in bioactive compounds like alkaloids, flavonoids, and glycosides, it exhibits antibacterial, antioxidant, anti-inflammatory, and hepatoprotective properties (Chandwani*et al.,* 2021). *Sauropusandrogynus*, commonly known as Thavasikkeerai in Tamil, is a perennial shrub belonging to the Phyllanthaceae family, often referred to as "multivitamin green" due to its exceptional nutritional value. Its bioactive components offer protective effects against cancer, cardiovascular and renal disorders, neurological issues like Alzheimer's, and other ailments (Anju*et al.,* 2022).

*Basella alba*, commonly known as Malabar spinach, is a fast-growing, edible perennial vine native to tropical Asia and Africa, rich in protein, vitamins A and C, and essential amino acids. Its mucilaginous leaves have antioxidant, hypoglycemic, and gastro-

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protective properties (Ahmed, 2022). *Cocciniaindica*, commonly known as Little gourd, is a climbing perennial herb from the Cucurbitaceae family, native to India, Asia, and Africa. It is widely recognized for its antidiabetic and hypoglycemic properties and is used in traditional medicine for various ailments (Selvaraj, 2024). *Pisoniaalba*, commonly known as the lettuce tree, is an evergreen plant from the Nyctaginaceae family with edible leaves. In traditional medicine, its leaves are valued for their analgesic, anti-inflammatory, diuretic, hypoglycemic, and antifungal properties. They are used to treat wounds, ulcers, dysentery, snake bites, rheumatism, and arthritis (Sarvananda and Premarathna., 2021).

Although perennial greens have been used in the preparation of various medicines, their use as a vegetable has not been explored. Extracts produced from its leaves, stems and roots are widely available as herbal supplements. They can be available in the form of capsules, powders, or syrup form. Since the raw form of the greens cannot be stored for a long time and also not available in all vegetable markets throughout the year, it is dehydrated and made into powder, and could be made widely available in the market for consumers.

## MATERIALS AND METHODS

### *Collection of raw samples*

Tender leaf samples of Moringa, Agathi, Chekurmanis, Malabar spinach, Ivy gourd, and Latchakottai were collected from Orchard, TNAU. The leaves were wiped thoroughly with clean dry tissue paper.

### *Preparation of perennial green powder*

The clean, dry leaves were subjected to drying at in a hot air oven with frequent turning. The dehydrated sample was made into powder using a mixer, and it was immediately stored in an air tight container.

| Name of perennial greens | Temperature ( °C) | Duration (hours) |
|---|---|---|
| Moringa | 55 | 4.00 |
| Agathi | 55 | 4.50 |
| Chekurmanis | 55 | 4.30 |
| Malabar spinach | 55 | 6.30 |
| Ivy gourd | 55 | 5.00 |
| Latchakottai | 55 | 7.30 |

### *Preparation of perennial greens soup powder*

Tomato and small onion, each weighing 50 grams, were selected and thoroughly washed. The vegetables were then chopped into small pieces and blanched in a vessel for 5 minutes. Following blanching, they were dried in a cabinet dryer at 51°C for 24 hours. Once fully dehydrated, the vegetables were ground into fine powder and stored separately.

For the formulationof soup powder, the required quantities of ingredients were weighed as follows: 100 grams of dehydrated vegetable powder, 10 grams of cumin, 6 grams of black pepper, 5 grams of salt, and 5 grams each of selected perennial green leaf powders. The cumin and black pepper were coarsely ground before mixing. All the ingredients were thoroughly blended and packed into airtight containers for storage.

## RESULT AND DISCUSSION

The soups from various perennial greens were evaluated organoleptically by a panel of judges from different age groups, and scoring was given on a 9 to 1 hedonic scale. The sensory attributes,*viz*., appearance, texture, flavour, taste and overall acceptability of the products were assessed and compared with one another. Among the six perennial green leafy vegetable soups, Chekurmanis recorded the highest score values for the sensory attributes,*viz*., texture, flavour, taste and overall acceptance, which were followed by, Latchakottai, Moringa, Agathi, Malabar spinach and Ivy gourd. Owing to its high score values, mean

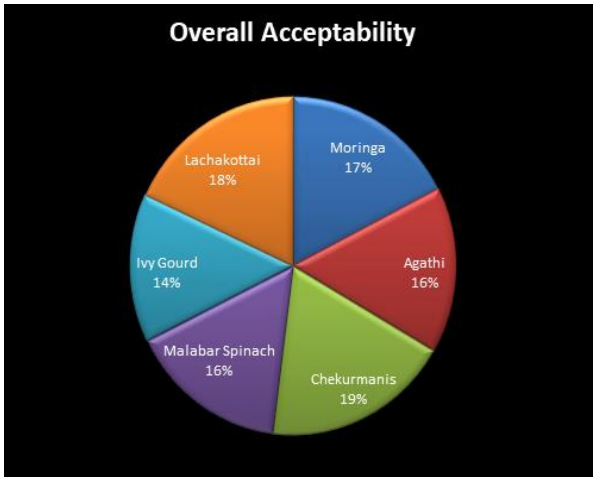


**Figure 1.Organoleptic score for perennial green soup powder**

**Table 1. Organoleptic score for the Perennial green soups**

| Parameters | Appearance | Texture | Flavour | Consistency | Taste | Overall Acceptability | Mean acceptance ± SD | Mean CV |
|---|---|---|---|---|---|---|---|---|
| Moringa | 7.75 | 8.95 | 7.50 | 8.15 | 8.40 | 8.25 | 8.17±0.509 | 0.062 |
| Agathi | 7.50 | 7.65 | 7.45 | 8.45 | 7.55 | 7.50 | 7.68±0.382 | 0.050 |
| Chekurmanis | 8.40 | 8.00 | 8.60 | 8.60 | 8.35 | 8.80 | 8.46±0.276 | 0.033 |
| Malabar Spinach | 7.60 | 7.40 | 6.55 | 8.55 | 7.65 | 7.40 | 7.53±0.641 | 0.085 |
| Ivy Gourd | 6.15 | 7.10 | 6.35 | 6.35 | 6.55 | 6.70 | 6.53±0.336 | 0.051 |
| Lachakottai | 6.20 | 8.50 | 8.50 | 7.10 | 8.50 | 8.55 | 1.0 ±0.320 | 0.127 |

acceptance was also high for Chekurmanis. Value-added products from chekurmanis and veldt grape have also been reported by Rashmi *et al*., (2022) and Praneetha *et.al*.,(2024)

From the above pie chart, it is concluded that Chekurmanis soup powder scored highest in attributes like texture, flavour, taste, and overall acceptability compared to other soup powders, which is highly desirable. Hence, the product can be produced on a large scale commercially and marketed to meet the nutrient requirements of the people.

## CONCLUSION

The study demonstrated that soup powders formulated using various perennial green leafy vegetables exhibit notable differences in sensory attributes. Among the six greens tested, Chekurmanis-based soup powder achieved the highest scores for texture, flavour, taste, and overall acceptability, followed by Latchakottai and Moringa. These findings highlight the potential of Chekurmanis and other perennial greens as valuable ingredients for developing nutritious, palatable, and commercially viable soup powders. Their rich nutrient profile, ease of dehydration, and year-round availability make them ideal candidates for addressing dietary deficiencies and promoting health through convenient food products.

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***Ethics Statement***

There were no human participants and/or animals included in this research

***Consent for publication***

All the authors agreed to publish the content.

***Competing interest***

There is no conflict of interest in publishing this content

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