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Popular Article

Vegetable micro-greens: A nutritional powerhouse

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Abstract

Food play important role in the development of the human body, which help in developing a healthy and balance culture. Micro-greens had been seen the stimulated inquisitiveness in the last few years via range of self-control. Vegetable micro-greens are young edible plants that are harvested just a few weeks after germination. They are smaller than baby greens but larger than sprouts, typically measuring 1-3 inches in height. These greens are cultivated from a variety of vegetables, including kale, spinach, radish, broccoli, and many others. The term "micro-greens" refers to the stage of growth at which they are harvested, usually when their first true leaves appear. One of the most remarkable aspects of micro-greens is their exceptional nutritional profile. Despite their small size, they are densely packed with vitamins, minerals, and antioxidants. Studies have shown that micro-greens can contain up to 40 times higher nutrient concentrations compared to their mature counterparts.

Keywords: micro-greens, food, nutrition benefits, vegetables

Introduction

In recent years, there has been a growing interest in micro-greens, a new trend in the culinary world. These tiny plants, harvested at an early stage of growth, are packed with intense flavors and vibrant colors. Despite their small size, micro-greens have gained popularity due to their exceptional nutritional value and versatility in the kitchen (Sharma *et al.*, 2022). Micro-greens originated in California in the 1980s, where they were initially used as a garnish for gourmet dishes. These miniature plants are typically harvested between 7 to 21 days after germination, when they have developed their first true leaves. They are distinct from sprouts, which are harvested earlier, and baby greens, which are harvested later. Micro-greens encompass a wide variety of plant species, including vegetables, herbs, and even some edible flowers (Bhaswant *et al.*, 2023).

What is Vegetable Micro-greens?

Vegetable micro-greens are young edible plants that are harvested just a few weeks after germination. They are smaller than baby greens but larger than sprouts, typically measuring 1-3 inches in height. These greens are cultivated from a variety of vegetables, including kale, spinach, radish,



broccoli, and many others. The term "micro-greens" refers to the stage of growth at which they are harvested, usually when their first true leaves appear (Sharma *et al.*, 2022).

Nutritional Value

One of the most remarkable aspects of micro-greens is their exceptional nutritional profile. Despite their small size, they are densely packed with vitamins, minerals, and antioxidants. Studies have shown that micro-greens can contain up to 40 times higher nutrient concentrations compared to their mature counterparts. For example, red cabbage micro-greens have been found to contain significantly higher levels of vitamin C, vitamin K, and vitamin E than mature cabbage. These concentrated nutrients make micro-greens a valuable addition to any diet, particularly for those seeking to boost their immune system and overall health (Weber, 2017).

Cultivation

The cultivation of micro-greens can be done both commercially and at home. The process involves growing the plants in a shallow container filled with a growing medium, such as soil or hydroponic mats. Adequate light, moisture, and ventilation are crucial to ensure healthy growth. The short growth cycle of micro-greens makes them an attractive option for urban dwellers with limited space, as they can be easily grown on windowsills or in small trays. Additionally, their rapid growth allows for a continuous supply of fresh greens throughout the year (Marios *et al.*, 2016).

Some common vegetables used for micro-greens

1. **Radish:** Radish micro-greens have a spicy and peppery flavor. They are quick to grow and add a nice crunch to dishes.
2. **Sunflower:** Sunflower micro-greens have a nutty and slightly sweet flavor. They are rich in vitamins and minerals.
3. **Pea:** Pea micro-greens have a fresh and sweet flavor. They are packed with nutrients and are a good source of protein.
4. **Broccoli:** Broccoli micro-greens have a mild and slightly bitter taste. They are high in antioxidants and are a good source of vitamins A and C.
5. **Kale:** Kale micro-greens have a strong and slightly bitter flavor. They are packed with nutrients and are known for their high levels of antioxidants.

Culinary Uses

Micro-greens offer a myriad of culinary possibilities, adding both flavor and visual appeal to a wide range of dishes. Their delicate textures and concentrated flavors make them ideal for garnishing salads, soups, sandwiches, and main courses. Micro-greens can also be incorporated into smoothies, juices, and even desserts, providing a nutritious boost to any meal. Chefs around the world have embraced micro-greens as a creative way to elevate their culinary creations, experimenting with unique combinations and presentations (Teng *et al.*, 2021).



Health Benefits

The consumption of micro-greens has been linked to numerous health benefits. Their high nutrient content contributes to improved digestion, enhanced cardiovascular health, and strengthened immune system. Additionally, the presence of antioxidants in micro-greens helps combat oxidative stress and reduces the risk of chronic diseases, such as cancer and diabetes. Incorporating micro-greens into one's diet can also aid in weight management and promote overall well-being (Ebert, 2022).

Environmental Sustainability

In addition to their nutritional benefits, vegetable micro-greens offer environmental advantages as well. Growing micro-greens requires significantly less space, water, and time compared to traditional farming methods. They can be cultivated indoors or in urban areas, making them an ideal option for those living in densely populated cities. Furthermore, micro-greens can be grown year-round, providing a consistent supply of fresh greens regardless of the season (Singh *et al.*, 2020).

Factors for successful cultivation of vegetable micro-greens

1. **Choosing the right seeds:** Select seeds that are specifically labeled for micro-green production. Some popular choices include broccoli, radish, sunflower, and pea.
2. **Preparing the growing medium:** Use a good-quality potting mix or coconut coir as the growing medium. Ensure it is well-draining and free from contaminants.
3. **Providing adequate light:** Micro-greens require bright, indirect light for healthy growth. Place them near a sunny window or use grow lights to provide sufficient light intensity for at least 12-16 hours a day.
4. **Watering properly:** Water the micro-greens gently and evenly, ensuring that the growing medium remains moist but not waterlogged. Avoid overwatering, as it can lead to mold or fungal growth.
5. **Maintaining proper airflow:** Good air circulation is crucial to prevent diseases and mold. Use a small fan or open windows to ensure adequate ventilation.
6. **Harvesting at the right time:** Micro-greens are typically ready for harvest when the first true leaves appear (around 1-3 weeks after sowing). Use clean scissors to cut them just above the soil level.

Nutrient management in micro-greens

Nutrient management in micro-greens involves providing the necessary nutrients for their optimal growth and development. Micro-greens are young, tender greens that are harvested at an early stage, usually within 7-14 days after germination. Since they have a short growth cycle, it is crucial to provide them with adequate nutrients to ensure their nutritional value and quality. Here are some key points to consider for nutrient management in micro-greens:



- 1. Growing medium:** Choose a suitable growing medium that provides essential nutrients, water retention, and proper drainage. Common options include peat-based mixes, coco coir, or soilless hydroponic systems.
- 2. Fertilizer:** Micro-greens have high nutrient requirements due to their rapid growth. Consider using a balanced, water-soluble fertilizer with a higher concentration of nitrogen (N) for vegetative growth. Dilute the fertilizer according to the manufacturer's instructions and apply it during watering.
- 3. Macronutrients:** Micro-greens require macronutrients like nitrogen (N), phosphorus (P), and potassium (K) for healthy growth. Nitrogen promotes leafy growth, phosphorus aids in root development, and potassium enhances overall plant vigor. Adjust the fertilizer ratios based on the specific needs of the micro-green variety.
- 4. Micronutrients:** Micro-greens also need essential micronutrients such as iron, manganese, zinc, copper, and boron. These micronutrients are usually present in trace amounts in the growing medium or can be supplemented through a micronutrient fertilizer.
- 5. pH and EC levels:** Maintain the pH level of the growing medium between 5.5 and 6.5 for optimal nutrient availability. Additionally, monitor the electrical conductivity (EC) levels to ensure proper nutrient uptake and avoid nutrient imbalances.
- 6. Irrigation:** Provide adequate and consistent moisture to the micro-greens. Overwatering or under watering can lead to nutrient deficiencies or excesses. Avoid water logging by ensuring proper drainage.

Conclusion

Micro-greens have emerged as a nutritional powerhouse, offering a plethora of health benefits and culinary possibilities. Their concentrated nutrients, vibrant colors, and intense flavors make them a valuable addition to any diet. Whether grown at home or sourced from local farmers, micro-greens have the potential to revolutionize the way we approach healthy eating. By incorporating these tiny plants into our daily meals, we can nourish our bodies, tantalize our taste buds, and embark on a journey towards optimal health and wellness.

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