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Microgreens: A Nutritional Food

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Abstract

Interest has been on the rise in nutraceutical, fresh and functional foods necessitated by the growing interest in healthy eating. Consumers are looking for the foods that support their health. Presence of phyto-constituents and minerals in abundance, microgreens have gained popularity and provide an insight to the researchers in the field of health and nutrition. This article concludes by identifying major prospects for further future research aiming to encourage the researcher to enhance the product quality and production efficiency of the microgreens.

Introduction

Microgreens, also called 'vegetable confetti', are immature shoots germinated from seeds of herbs, vegetables or grains which are generally 1-2 inch in height. These are eaten raw along with their true leaves and stem, used as garnishes or salad dressings. Microgreens gained their importance due to their unique color, texture and taste which can be either sweet or spicy. Microgreens consist of three parts which are stem, cotyledons and true type leaves. Some examples of common microgreens include kale, celery, beetroot, lettuce, fenugreek, linseed *etc.* Greens can be divided into 3 categories depending on their age or size. Sprouts are smallest followed by microgreens that are larger and older and then comes the baby greens which are largest among all (Tan *et al.*, 2020). The difference between microgreens and sprouts is that microgreens are harvested without root whereas sprouts contain stem, leaves and root. Immature seedlings contain more vitamins, minerals than the mature seedlings. Microgreens have shorter shelf life even if they are stored in the refrigerator. They can be grown in variety of places like greenhouses or the buildings in which climate can be controlled.



Figure 1: Microgreens of different crops

Production

Microgreens can be produced at home easily and conveniently but producing it at large scale is a bit tedious task. Also, the cost of production is very high. Mixture required for this is standard, sterile, soilless media that includes a mixture of vermiculite, coconut water, peat and many more. Just fill the half of the tray with this mixture and then do seeding on it. Another method uses this material as a mat that is kept below the media and then places seeds on it. Seeding can be done either by broadcasting or in a row. Avoid overcrowding of seeds as this helps the stems to grow larger and make them susceptible to disease. Microgreens of certain crops require little or no fertilizer as the nutrients present in the seeds are sufficient for the plant to grow. But prefer little fertilizer so that the seedlings can grow quickly. This can be done by dipping them in the solution containing nitrogen for 30 seconds. They are generally harvested above the soil level depending on the species. For harvesting, wait for the microgreens to reach the first true leaf stage and the time required for reaching this stage is 7-21 days. After harvesting, wash them and store them in clamshell containers which are generally made up of plastic (Kyriacou et al., 2016).

Nutritional and Health Benefits

Nutrients in microgreens vary according to the variety but most of them are rich in potassium. They also contain vitamins, minerals and have some antioxidant properties. For example: lettuce seeds after 7 days of germination have the highest number of phenolic compounds and antioxidants as compared to older leaves. Microgreens of green daikon radish and red Amaranth contain the highest amount of vitamin K, vitamin C and vitamin E. Nutrients present in microgreens are beneficial for skin and eyes. There has been a great reduction in the number of cancer patients due to utilization of these microgreens in the diet. Moreover, consumption of these, help in improving the overall hormonal balance of the body. The crystalline compounds present in microgreens pose a wide range of health benefits. Estrogen stabilizer present in microgreens is beneficial to both men

and women. Therefore, microgreens are known as functional foods (Sun et al., 2013).

Table 1: Crops along with nutritional value and health benefits

Crops	Health Benefits
Broccoli	Stimulate immune system
Cress	Good source of fiber
Fenugreek	Stimulate appetite Effective against anemia and fatigue
Kale	Rich in anti-oxidants Prevent macular degeneration
Linseed	Rich in omega-3 fatty acids
Fennel	Decrease risk of heart attack
Mustard	Effective against fever and cold

Conclusion and Future Directions

Majority of the microgreen research has been supervised by a small number of researchers in conjunction with relatively narrow focus areas. There is a huge amount of territory yet to be investigated. Few species of microgreens have been studied and have not necessarily correlated with the varieties most likely to be commercialized. Developing microgreens can give networks expanded food security and empower independence in homes.

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