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Evaluation of Growth Characteristics, Nutritional Value, and Antioxidant Properties of Different Microgreen Varieties

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ABSTRACT

Microgreens are young edible seedlings of vegetables, herbs, and other plant species that are harvested at an early stage of growth, generally after the development of their first true leaves. In recent years, they have gained popularity because of their rapid growth, attractive appearance, high nutritional value, and potential health-promoting properties. The evaluation of different microgreen varieties involves examining their growth characteristics, such as germination percentage, plant height, leaf size, stem length, fresh weight, dry weight, and overall biomass production. Nutritional evaluation focuses on determining the presence of essential nutrients, including carbohydrates, proteins, dietary fibre, vitamins, and minerals such as calcium, iron, potassium, and magnesium. Different microgreen varieties, such as broccoli, radish, mustard, fenugreek, and sunflower, may exhibit considerable variations in their nutritional composition. Furthermore, microgreens contain several bioactive compounds, including phenolic acids, flavonoids, carotenoids, and vitamin C, which contribute to their antioxidant properties. These antioxidants help neutralize harmful free radicals and protect cells from oxidative damage. The antioxidant potential can be evaluated through different biochemical methods, such as DPPH and FRAP assays. Environmental conditions, seed quality, growing media, light intensity, and harvesting time also influence microgreen growth and nutritional quality. Therefore, comparative evaluation of different microgreen varieties is essential for identifying superior varieties with better growth performance, nutritional benefits, and antioxidant potential. Such studies can promote healthy food choices, functional food development, and sustainable agricultural practices.