



Broccoli: Revitalising nutritional security in Horticulture

Pragyan Priyadarshini

Department of Plant Physiology, College of Agriculture,
Odisha University of Agriculture and Technology, Bhubaneswar.



Abstract

One of the cruciferaceae family's most nutrient-dense foods is broccoli. It ensures food and nutritional security by appropriately meeting the dietary needs of the modern civilization. It is clear that broccoli has the potential to become the superfood of the future as more studies on its nutritional and therapeutic qualities emerge. However, like other crops, it is impacted by climate change, which reduces its potential.

Keywords: broccoli, cruciferous vegetable, nutritional powerhouse, medicinal properties, antibacterial, antioxidant, anti-inflammatory, anti-cancer

Introduction:

Broccoli (*Brassica oleraceae* L. var. *italica*) belongs to the Brassicaceae family and is closely related to cabbage, cauliflower and Brussels sprouts. Broccoli is one of the most important vegetables grown in temperate or tropical climates (Gray, 1982). Broccoli is a crop that can be easily grown in different soil types and adapts to many different climatic conditions (Erdem et al., 2010). It contains a high amount of water, fibre, protein, calcium, and iron, and serves as an excellent source of

vitamins A and C, alongside other health-enhancing and anti-cancer benefits (Acikgoz, 2011; Ávila et al., 2013). This vegetable is used in salads, as a fresh food, but it is also steamed and cooked with other vegetables. It is suitable for processing into frozen vegetable products.

The Effects of Emerging Climate Change on Broccoli Production

The agricultural sector is particularly vulnerable to climate change because of its heavy reliance on weather and climate, which makes it an adventurous economic activity. Climate change is a global environmental hazard to all sectors of human activity, including trade, industry, tourism, etc. Recent findings demonstrated that, with the exception of the quantity of lateral shoots, all metrics of broccoli plants cultivated in the field were impacted by higher than usual temperatures.

Present day scenario

According to the survey, there have been notable advancements in both organic and inorganic growth strategies in the worldwide fresh broccoli market. Product approvals, new launches, and other business expansion tactics



are becoming key priorities for many companies. Along with market strategies and SWOT analysis, the study also includes profiles of significant Fresh Broccoli Market companies.

Pharmaceutical Importance of Broccoli:

1. Nutritional Source

Broccoli is frequently viewed as a nutritional powerhouse due to its numerous health advantages and high nutrient content. It provides key minerals like potassium, calcium, and iron. This vegetable is rich in antioxidants, including vitamins C and E, β -carotene, and different types of flavonoids. It may aid in lowering cholesterol levels, keeping blood pressure in check, and enhancing cardiovascular health.

2. Anti-Inflammatory, Antioxidant

Inflammation is a normal reaction of the immune system aimed at safeguarding the body against injury, infection, or other dangerous factors. Nevertheless, prolonged inflammation can be detrimental to your health and lead to various illnesses, such as heart disease, arthritis, and certain cancers. Additionally, herbs have been discovered to enhance the creation of antioxidant enzymes that shield cells from damage associated with inflammation.

3. Anticancer Properties

Cancer poses the most significant threat to human society, resulting in fatalities globally, irrespective of socio-economic status. As of 2020, cancer ranked as the foremost cause of death worldwide, claiming nearly 10

million lives. Constantly growing awareness about the health advantages of fruits and vegetables contributes to public knowledge. Conversely, the rate of cancer cases continues to rise for a variety of reasons. Broccoli, a member of the cruciferous vegetable family, has garnered significant interest in cancer research due to its possible anticancer effects.

4. Antibacterial properties

Antioxidants may enhance the efficacy of antimicrobial treatments. Research indicates that pairing antioxidants with antimicrobial medications, like antibiotics or antiviral agents, can boost their effectiveness by minimizing tissue damage from oxidative stress and aiding the immune system's response to infections. While antioxidants are mainly recognized for their potential to counteract oxidative stress, certain antioxidants have also demonstrated inherent antimicrobial characteristics.

5. Antiproliferative activities

Three distinct maturity stages of selenium-enriched broccoli were assessed for their antioxidant and antiproliferative properties. Antioxidant assays revealed that the stage of selenium biofortification had notably higher levels of phenolic compounds and antioxidant activity.

Challenges and Future Perspectives

The impact of average temperature on both marketable and nonmarketable production is complex to understand. In this context, the temperatures experienced during the period directly after the



transition from vegetative growth to flowering, up to when the head size reaches 5-10 mm—which is regarded as the most temperature-sensitive phase—may be more noteworthy than just the average temperature.

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