ID: 253

Molecular and Pomological Characterization of Blueberries and their Role in Hidden Hunger

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Abstract

Blueberries are commercially important fruit crops grown worldwide that belong to the genus Vaccinium L. section Cyanococcus characterized by diploid, tetraploid and hexaploid levels, and different colourization and pigmentations. They function in regulating and serving immune signalling and defence mechanism purposes against pathogenic invasions. They also help to maintain and improve cognitive functions in humans. They are characterized by high amounts of flavonoids, anthocyanin pigments among other phytochemicals which confer abiotic stress tolerance and beneficial human health promoting precursors. Peculiar to blueberries is their eminent role in hidden hunger and nutritional deficiencies alleviation especially in low income and developing economies. Despite the invaluable role of blueberries, there has been a major focus on the traditional horticultural crops to the neglect of blueberries. A research gap therefore exists in the morphological, physiological, molecular, and pomological studies of blueberries for optimum ecological and biodiversity balance and human benefits especially in the endemic areas of hidden hunger. This study extensively reviewed the molecular and pomological characterization of blueberries. It also reviewed their application and prospects for hidden hunger alleviation, mechanisms to increase their yield, abiotic stress tolerance and food security achievement. It was revealed that intake of blueberries improves weight, reduces risk of cardiovascular diseases, neuroprotection and maintenance, anti-inflammatory and antioxidant actions, beneficial effects on vascular and glucoregulatory function, contribute to host health and reduce socioeconomic burdens. This research laid the foundation and provided gaps for research focus to address the impounding effects of hidden hunger especially in developing nations. It concludes on the need for further and pragmatic actions to increase breeding and research efforts on blueberries especially in the endemic zones of hidden hunger.

Turkish Journal of Agriculture - Food Science and Technology
Türk Tarım - Gıda Bilim ve Teknoloji Dergisi
International Peer-Reviewed Journal | ISSN: 2148-127X
www.agrifoodscience.com
Turkish Science and Technology Publishing (TURSTEP)