Extended Abstract

Journal of Plant Biotechnology and Microbiology

2019
Vol. 2, Iss. 1

The International Debate on Free Radicals and Natural Antioxidants in the Cellular Environment

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Biology and has been perceived as focusing around the use of antioxidant supplements to prevent a variety of human diseases. During the events of evolution, the emergence of photosynthetic system in aerobic organisms, plants in particular, generates reactive oxygen species and has opened up a paradoxical situation compelling life confront hostile environment and to be able to adapt, the redox processes have become increasingly significant. Antioxidants/ free radicals permeate the entire living systems in the cellular milieu. Life is a balance between the two like a tug-of-war: Antioxidants serve to decrease the levels of free radicals permitting them to perform useful biological functions without causing much damage. However, some damages are inevitable requiring repair systems to maintain cellular integrity and viability. Reactive oxygen species are all over the cellular environment in aerobic microbes, plants and animals. These species protect life from various types of infections and involve in critical signaling pathways. Eventually, these species also often kill cells, tissues and organs in the end. It would have been wonderful if life had evolved entirely in the anaerobic environment, in which case, the life-spans would have been much longer and diseases would have rarely occurred. Interestingly various medicinal plants possessing bio-active molecules can prevent human diseases. These molecules having diverse chemical structures possess high antioxidant profiles and encounter damaging radical species very efficiently at time scales of micro, nano, pico and femto seconds in cellular environment thereby preventing molecular damages to DNA and membranes. In this presentation, some of these aspects shall be discussed with reference to a few medicinal plants such as turmeric and tropical ginger. Recent Publications 1. NS Devi, R Kishor, GJ Sharma (2012) Microrhizome induction in Acorus calamus Linn.- an important medicinal and aromatic plant. Horticultural and Environmental Biotechnology 53(5): 410-414. 2. N Sandhyarani, R Kishor, GJ Sharma (2011) Clonal propagation of triploid Acorus calamus Linn. using dual-phase culture system. Journal of Crop Science and Biotechnology 14(3): 85-95. 3. A Ahlawat, M Katoch, G Ram, A Ahuja (2010) Genetic diversity in Acorus calamus L. as revealed by RAPD markers and its relationship with ß-asarone content and ploidy level. Scientia Horticulturae 124: 294-297. 4. KB Dusvek, EB Galambosi, KK Hethelyi, K Kartova (2007) Morphological and chemical variations of sweet flag (Acorus calamus L.) in the Czech and Finnish gene bank collection. Horticultural Science (Prague) 34: 17-25. 5. CM Bertea, CMM Azzolin, S Bossi, G Doglia, ME Maffer (2005) Identification of an E. coRI restriction site for a rapid and precise determination of ß-asarone free Acorus calamus cytotypes. Phytochemistry 66: 507-514.

Biography:

G J Sharma has completed his PhD in Radiation Biology from Jawaharlal Nehru University, New Delhi and Post-Doctoral Research from Department of Biochemistry, Brunel University, London. He was a Visiting Professor at National Institute of Food and Nutrition Research, Rome. He has 88 publications in international journals, supervised 20 PhDs, participated in over 75 conferences and delivered 24 invited lectures in conferences held in USA, UK, France, China, Netherlands, Italy, Singapore, Thailand and India. He is a reviewer of 12 international journals of repute. His research areas are plant biotechnology, food irradiation, free radicals and dietary antioxidants. He is a Member, Scientific Panel on GMOs and Foods, Food Safety and Standard Authority of India, Government of India.

Note: This work is partly presented at Advanced Research on Plant Pathology November 25-26, 2020 held at Newyork, USA