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Biography

Gurumayum Jitendra Sharma has done his PhD (Radiation Biology) from Jawaharlal Nehru University, New Delhi and Postdoctoral research from Department of Biochemistry, Brunel University, London. Since 1976, he joined the Department of Life Sciences, Manipur University, and retired as Senior Professor in 2016. Currently, he continues as UGC-BSR Faculty Fellow in Life Sciences at Manipur University. He has 90 publications in national/international journals, supervised 20 PhDs, participated in over 75 conferences and delivered 34 keynote/plenary/invited lectures in conferences/congresses/workshops held in USA, UK, France, China, Japan, Netherlands, Italy, Singapore, Thailand and India. He was a Visiting Professor at National Institute of Food and Nutrition Research, Rome. He is reviewer for 12 international journals of repute, his research areas are Plant Biotechnology, food irradiation, free radicals and dietary antioxidants. He serves as Member, Scientific Panel on GMOs and foods, Food Safety and Standard Authority of India (FSSAI), Government of India.

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Note:

PROTECTION OF RADIATION-INDUCED DNA DAMAGE BY ANTIOXIDANT-RICH MEDICINAL PLANT EXTRACTS

The broad field of free radicals and antioxidants covers an emerging area known as redox 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, generates reactive oxygen species and has opened 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 living systems from various types of infections and involve in critical signaling pathways. Eventually, these species also often kill cells, tissues and organs in the end. The continual damages by these species, failing repair pathways, can cause age-related tumor development, neuro-degenerative diseases and several human disorders. 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, several medicinal plants possess bio-active molecules which can prevent human diseases. These molecules having diverse chemical entities possess high antioxidant profiles and encounter damaging radical species extremely efficiently at time scales of nano-, pico- and femto-seconds in cellular environment thereby preventing molecular damages done to the DNA and membranes. Antioxidant potentials and radioprotective properties of curcumin and rhizome extract of tropical ginger have been investigated. Free radical scavenging activities were measured using ferric ion reducing power assay, DPPH radical test, hydroxyl radical scavenging activity assay, nitric oxide scavenging assay and superoxide scavenging capacity. Both curcumin and tropical ginger extract exhibited good protection against radiation-induced damage in plasmid pBR322 and rat bone marrow cell DNAs as revealed by agarose gel and single cell gel electrophoreses. Some of these results shall be discussed in this paper.