



Short Communication

Augmentation of Enzymatic Antioxidant *In Vitro*

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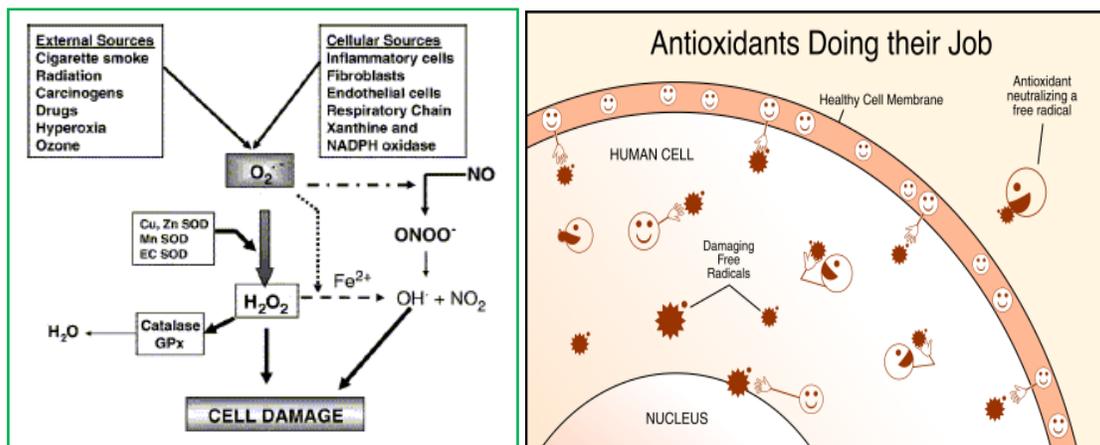
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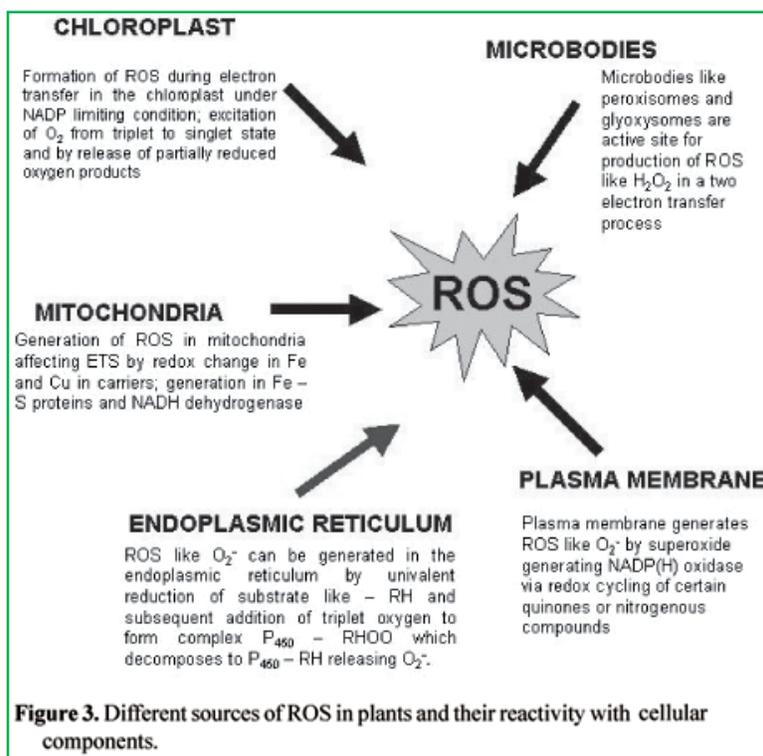
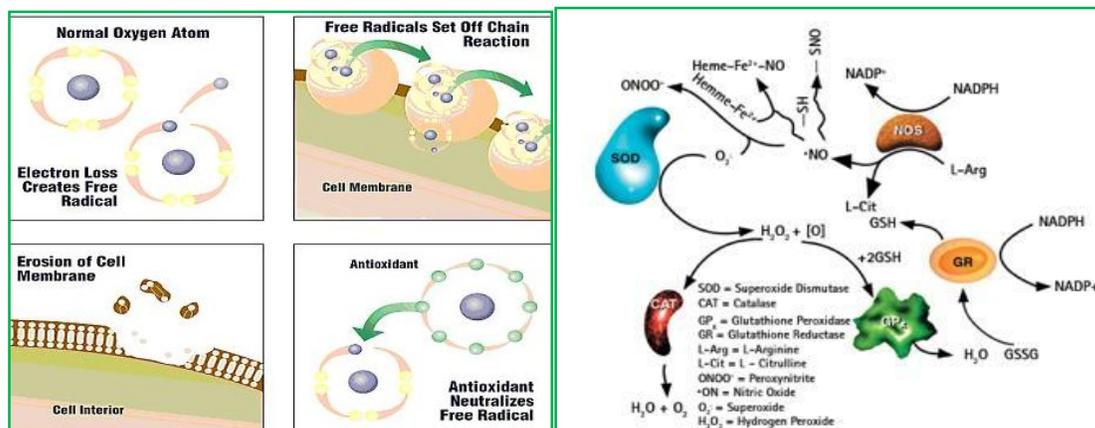
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Since the past half century, plant tissues culture has transformed from an experimental curiosity to a largely commercialized industry. Nevertheless, its widespread use is restricted by the formation of plantlets of abnormal morphology, anatomy and physiology induced by special conditions during *in vitro* culture e, g. high air humidity, decreased air turbulence, low irradiance, low CO₂, concentration during light period, cultivation media supplemented with sugars and growth regulators.



The *ex vitro* transfer or change in the environmental condition further impairs the plant system. Upon imposition of such stress, production of Reactive Oxygen Species (ROS, i. e. hydrogen sulphide (H₂S), superoxide radicals, hydroxyl radicals) from cellular organelles like mitochondria, chloroplasts, peroxisomes and cytosol is unequivocally a regular feature of the plants. This is a consequence of the fact that the photoperiod, temperature and relative humidity in laboratory conditions, beyond influencing the stomata aperture regulates the, process pf photosynthesis and respiration on chloroplasts and mitochondria, and thus the natural production of ROS in cells.

Although they are constantly produced, uncontrolled production of ROS causes oxidative stress and cellular damage. The extent of the damaging effect of ROS causes oxidative stress and cellular damage. The extent of the damaging effect of ROS depends on the effectiveness of the antioxidative system which include low molecular mass antioxidants, which ma be hydrophilic (glutathione, ascorbate) or lypophilic (α -tocopherol, β -carotene, phenols) as well as serve as antioxidative enzymes [superoxide dismutase(SOD), ascorbate peroxidise (APX), catalase (CAT), glutathione reductase (GR), monodehydroascorbate reductase (MDHAR), dehydroascorbate reductase (DHAR)].



While different sources like irradiation, drought, salinity, heavy metals, etc. cause ROS production and promote activities of antioxidative enzymes, the role of ROS in plant growth and development *in vitro* has also been well documented.

How to Cite this Article

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