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Prospective of melatonin in crop production

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Melatonin, a derivative of tryptophan was clarified as a unique animal neurohormone for decades. Subsequently, melatonin has been found to be a phylogenetic old molecule present in all organisms tested. Its origin can be traced to primitive bacteria and other unicellular organisms. It has been found that considerably high levels of melatonin are present in green plants. It appears that this molecule involves many aspects of plant physiology including seed germination, biomass growth, flowering, fruit repining and resistance to abiotic and biotic stressors. The mechanisms of melatonin on plant physiology are not fully uncovered. However melatonin as an endogenously occurring potent free radical scavenger and antioxidant modifies the redox status of plants under unfavorable environmental conditions and this builds a corner stone for melatonin's beneficial effects on plants. Melatonin preserves the photo capturing-molecules, chlorophylls, carotenoids and other pigments, improves photosynthetic efficiency and increases the biomass weight. We hypothesize that melatonin application in agriculture will significantly increase the crop production especially under the unfavorable environmental conditions including drought, cold and high salinity field conditions.

Biography

Dun-Xian Tan, MD, PhD, Department of C&S Biology, The University of Texas Health Science Center, San Antonio. He has published 250 articles with 27,000 citations and h-index 92.

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