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INVOLVEMENT OF *ROSEA 1* (*ROS 1*) IN THE MECHANISMS THAT ENHANCE ANTHOCYANIN ACCUMULATION AND ABIOTIC STRESSES TOLERANCE IN TRANSGENIC TOBACCO

Aung Htay Naing

Kyungpook National University, South Korea

Co-expression of *Rosea1 (Ros1)* and *Delila (Del)* control regulation of anthocyanin in snapdragon flowers, while their overexpression in tomato, petunia, and tobacco also exhibited the similar functions. However, little data exist on how *Ros1* expression alone controls the anthocyanin regulation and on whether it is involved in the mechanism that leads to abiotic stress tolerance. Overexpression of *Ros1* promoted accumulation of anthocyanin in leaf and flower of tobacco (*Nicotiana tabacum* 'Xanthi') by elevating all key biosynthesis genes, particularly through more regulating *NtDFR and NtANS* in the former, while through more elevating *NtDFR* transcript levels in the latter. Under normal conditions, T2-*Ros1* and Wild-Type (WT) were able to well survive by producing well-developed broad leaves and regular roots, while a reduction in plant growth was observed under the cold and drought stresses. However, the T2-*Ros1* was able to more tolerate the stresses than WT by induction of higher Reactive Oxygen Species (ROS) scavenging activities (DPPH, ABTS), antioxidant-related gene expression (*SOD, CAT* and *POX*), and stress-responsive gene expression (*CBF1, Osmotin,* and *ABA*). In addition, *Ros1* is phylogenetically clustered with other MYB TFs that confer different abiotic stresses. These results suggest that overexpression of *Ros1* elevates expression of anthocyanin biosynthetic gene, antioxidant-related genes, and stress-responsive genes. The resultant increase in the genes expression improves anthocyanin accumulation and abiotic stresses tolerance.

Biography

Aung Htay Naing obtained his PhD degree majoring in Horticultural Biotechnology from Kyungpook National University where he is now working as Research Professor. He has been serving as Editorial Members and Peer Reviewers in international journals scoping for Horticulture, Plant Sciences, and Plant Biotechnology.

aunghtaynaing2005@gmail.com