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The remediation of drought stress under VAM inoculation through proline chemical transformation action

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The enhanced drought tolerance under arbuscular mycorrhizal (AM) inoculation and normal growth, discussed in this article which was found to be very rewarding due to the activity of photoreceptors. The photoreceptor action under drought stress in dual symbiosis showed not only the high photosynthetic bustle but also provide information about the broad range of developmental and physiological responses. The pot experiment conducted in a natural environment where drought condition was observed twice a week via regular irrigation with water up to 12 months. Plant analysis showed the highest concentration of water, hydrogen peroxide, carotenoids and proline in both leaves and roots with a large surface area of leaves followed by regular growth. It suggested that the elevated concentration of hydrogen peroxide (0.04±0.0 µmol(gFW)$^{-1}$) coupled with singlet oxygen species was the main modified molecular mechanism which was operative in drought condition. The accretion of proline under drought stress (32.3±0.3 µg/ml) was related to the highest branching pattern of young leaves and the chemical transformation of reactive oxygen species (ROS) including H_2O_2 and $3O_2$ into effective molecules like water and triplet molecular oxygen. The higher contents of carotenoids (5.0±1.2 mg(gFW)$^{-1}$) in drought over control (4.8±1.6 mg(gFW)$^{-1}$) and AM plant (4.9±1.2 mg(gFW)$^{-1}$) was found to be supportive in the conversion of singlet oxygen into triplet one. The formation of water molecule via OH radical transformation related to the rehydration capability of proline in a drought condition followed by the transmutation of singlet oxygen into triplet oxygen couple with the absorption of CO_2 was the internal molecular mechanism for normal the growth.

Biography

Rafia Azmat has completed here PhD at the age of 42 years from University of Karachi leading to postdoctoral studies from same University. She is the Professor in photochemistry in Department of chemistry in University of Karachi. She has published more than 125 papers in reputed journals, 5 chapters, 3 books and has been serving as an editorial board member of repute journals. She has pufiled 4 patents and 3 patents atricles.

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