

Effect of Hormones Priming on Enzyme Activity and Lipid Peroxidation in Wheat Seed under Accelerated Aging

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Abstract : Seed aging during storage is a complex biochemical and physiological processes that can lead to reduce seed germination. This phenomenon associated with increasing of total antioxidant activity during aging. To study the effects of hormones on seed aging, aged wheat seeds (control, 90 and 80% viabilities) were treated with GA3, Salicylic Acid, and paclobutrazol and antioxidant system were investigated as molecular biomarkers for seed vigor. The results showed that, seed priming treatment significantly affected germination percentage, normality seedling percentage, H2O2, MDA, CAT, APX, and GPX activates. Maximum germination percentage achieve in GA3 priming in control treatment. Germination percentage and normal seedling percentage increased in other GA3 priming treatment compared with other hormones. Also aging increased MDA, H2O2 content. MDA is considered sensitive marker commonly used for assessing membrane lipid peroxidation and H2O2 result in toxicity to cellular membrane system and damages to plant cells. Amount of H2O2 and MDA declined in GA3 treatment. CAT, GPX and APX activities were reduced by increasing the aging time and at different levels of priming. The highest APX activity was observed in Salicylic Acid control treatment and the highest GPX and CAT activity was obtained in GA3 control treatment. The lowest MDA and H2O2 showed in GA3 control treatment, too. Hormone priming increased Antioxidant enzyme activity and decreased amount of reactive oxygen space and malondialdehyde (MDA) under aging treatment. Also, GA3 priming treatments have a significant effect on germination percentage and number of normal seedling. Generally aging seed, increase ROS and lipid peroxidation. Antioxidant enzymes activity of aged seeds increased after hormone priming.

Keywords : hormones priming, wheat, aging seed, antioxidant, lipid peroxidation

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