

Antioxidative System of Pigeon Pea (*Cajanus cajan* L. Millsp.) Roots under Waterlogged, Saline and Combined Stress Condition

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Abstract—The aim of our work was to study the response of antioxidative enzyme catalase in root of pigeon pea (*Cajanus cajan* L. Millsp.) genotypes (ICPH-2431, PARAS, UPAS-120, H09-33). Four genotypes were raised in polythene bags filled with half kg soil + FYM manure mixture (3 soil: 1manure v/v), NPK (@20:60:20 kg per ha). Twenty and forty days after sowing the pots were placed in cemented tanks (length 160 cm, breadth 125 cm and depth 65 cm). Waterlogging salinity (30 mM NaCl) and waterlogging + salinity (30 mM NaCl) treatments were given for 8 and 12 days. A 50 to 70 % increase was observed in catalase activity of roots under waterlogging treatment for 8 days which further increased to 60 to 90 % with 12 days waterlogging treatment in 20 days old plants. No significant increase in catalase activity of roots was observed under salinity treatment for 8 days and 12 days. Waterlogging and salinity treatment in combination were more deleterious resulting in 85 to 110 % increase in catalase activity of roots after 8 days and 92 to 140 % after 12 days. ICPH-2431 performed best under waterlogging and waterlogging + salinity treatments (8 days and 12 days) followed by PARAS, HO9-33 and UPAS-120. On another hand, in case of 40 days old plants 70 to 100% increase was observed in under waterlogging treatment for 8 days. Salinity treatment for 8 days results in 10 to 30% increase in catalase activity of 40 days old plants. On the basis of our observations, we conclude that stress is more deleterious when given at later stages of plant growth.