



Comparative Responses of Rice (C₃) and Maize (C₄) Plants Towards Salinity, Drought and Metalloids Stress

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ABSTRACT: The wide range of abiotic stresses such as, drought, salinity, cold, flooding, metals and metalloids are major challenges in the environment. These abiotic stresses disrupt the physiological and biochemical processes of plants, leads to reduce growth and yields of the plants. The cereal crops such as, rice, wheat, maize, barley, sorghum, millet, oat and rye are worldwide cultivated crops. Rice (*Oryza sativa*) is a C₃ and maize (*Zea mays*) belongs to plants C₄ plants in terms to their carbon fixation mechanism. In the present study, 10 cultivars of rice and maize plants were examined against metalloid [As^{III} & As^V(15 to 240 μM)], salinity [NaCl (50 to 200 mM)] and drought stress [polyethylene glycol (PEG) (10 to 40 mM)] for 7 days to induce abiotic stress. The observed result of maize seedlings showed maximum reduction with As(III) ~ 36%, As(V) ~ 29%, NaCl ~ 47% and PEG ~53% in the fresh weight. The similar trends were also observed in the fresh weight of rice seedlings at same treatments except for PEG at 240 μM in which plants were dried. The result demonstrates that, C₄ plants have more potential than C₃ to survive in stress condition. Overexploitation of natural resources leads to abiotic stress such as, drought, cold, salinity, metals and metalloids, causing the serious problems in plants. The genetic manipulation or utilization of cheap & best natural resources would be the best option for the C₃ plants to provide tolerance in adverse environmental conditions. The utilization of natural byproducts may be used as low-cost bioprotectants as well as minimizing organic load in soil and environment. The application of natural wastages to amelioration of stress and its managements. © 2016 iGlobal Research and Publishing Foundation. All rights reserved.

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