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Showing some broccoli and cabbage genotypes biodiversity using randomly amplified polymorphic DNAs (RAPD)

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Ten RAPD markers were used to detect the genetic variability and relationships among 4 broccoli and 3 cabbage genotypes. The results of RAPD analysis showed that all the 5 primers surveyed detected polymorphism for all broccoli genotypes. A total of 39 DNA bands were amplified by the 5 primers from all genotypes and 21 of these fragments showed polymorphism (53.85%). The rest of these bands (46.15%) were common between the 4 genotypes. On the other hand, all of the 7 primers surveyed, used with cabbage, detected polymorphism among all cabbage genotypes. A total of 69 DNA bands were amplified by the 7 primers from all genotypes and 23 of these fragments showed polymorphism (33.33%). The rest of these bands (66.67%) were common between the 3 genotypes. The investigation suggested that the RAPD approach showed considerable potential for identifying and discriminating broccoli and cabbage genotypes.

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Nitric oxide regulated improvement in growth, antioxidant defense system and yield of rice plants grown under salinity

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The aim of the present experiment was to assess the effects of exogenously applied sodium nitroprusside (a nitric oxide donor) on growth and yield of rice plants in relation with antioxidation and membrane stability under salt stress. The experiment comprised of 4 rice cultivars, 2 of them were coarse rice cultivars (KS-282 and IRRI-6) and other 2 were fine rice cultivars (Shaheen Basmati and Basmati PB-95), two NaCl levels (0, 80 mM), and three sodium nitroprusside levels (0, 0.1, 0.2 mM). Salt stress caused a significant reduction in biomass production and grain yield while increased the proline, ascorbic acid, H_2O_2 and MDA contents in plants of all 4 rice cultivars. The activity of antioxidative enzymes (SOD, POD and CAT) was also significantly increased in salt stressed rice plants; however, the total phenolic content was decreased. Exogenous application of sodium nitroprusside as foliar spray was found effective in reducing the adverse effects of salt stress on plant biomass and grain yield while the accumulation of MDA and H_2O_2 decreased. The ameliorating effects of exogenous nitric oxide on biomass and grain yield were associated with enhanced activities of antioxidative enzymes (SOD, POD and CAT) and more accumulation of ascorbic acid, phenolics and proline that resulted in reduced lipid peroxidation (lower content of MDA) and less accumulation of H_2O_2. Of different sodium nitroprusside levels, 0.1 mM regime was found more effective in reducing the adverse effects of salt stress. Among fine rice cultivars, Shaheen Basmati performed better, while among coarse rice cultivars the performance of IRRI-6 was better to exogenously applied 0.1 mM nitric oxide. Overall, exogenous application of nitric oxide up-regulated the antioxidative defense mechanism in salt stressed rice plants and it could be used as an effective mean for the induction of salt tolerance in rice plants for better growth and grain yield.

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