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EVALUATION OF GAMMA RAY INDUCED MUTANT POPULATIONS OF TWO EGYPTIAN BREAD WHEAT VARIETIES (TRITICUM AESTIVUM VULGARE L.) FOR PROLINE GENE EXPRESSION IN TWO CULTIVARS UNDER SALT STRESS

Wheat (Triticum aestivum vulgare L) is the major human consumable commodity in most areas of the world including Egypt. The productivity of wheat is adversely affected by salt stress, which is associated with decreased germination percentage, reduced growth, altered reproductive behaviour, altered enzymatic activities and disrupted photosynthesis. The irradiation of seeds may cause beneficial genetic variability that enables plant breeders to select new genotypes with improved characteristics. In the present study, grains of two wheat Egyptian cultivars: Sids-1 and Sakha-93 that had been exposed to gamma irradiation at dose levels of: 100, 200 and 300 Gy. These M1 seeds. Were sown and the M1 plants were under sodium chloride concentrations of 60 and 120 mM NaCl to get M2 grains. The content, activity and expression level of delta 1-pyrroline-5-carboxylate synthetase were carried out to evaluate the changes which may occur at biochemical and molecular levels for proline. Both cultivars Sids-1 and Sakha-93 showed an increase in proline level contents accumulation in their leaves under the different treatments. There was also an upregulation in the expression the genes involved in proline biosynthesis under stress. The relative expression was more pronounced in the salt stress concentration of 60 and 120 mM NaCl following the treatment 300 Gy. Comparable observations were also made in Sakha-93 cultivar. In conclusion, the results showed that the relative expression of proline gene increased more under sodium chloride treatments than in the combination treatments between sodium chloride and gamma rays. Gamma ray can be used as a useful tool for gene expression in plants and salt tolerance could be attributed to the constitutive induced changes, leading to more efficient genes in plants.

Country or International Organization

Egyptian Atomic Energy Authority

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Track Classification: Enhancing agricultural biodiversity through new mutation induction techniques