

Role of Plant Antioxidants (Ascorbic Acid, Glutathione, α -Tocopherol, Spermine) in Alleviating Salinity Stress on Growth and Yield of Wheat Plants

M.T. Sakr, E. A. Khatab* and M.H. Afifi*

Agric. Dept., Faculty Agric., Mansoura University, Mansoura and

**Field Crops Res. Dept., National Research Centre, Cairo, Egypt.*

APOT experiment was carried out to investigate the role of some plant antioxidants such as ascorbic acid, glutathione, α -tocopherol, spermine in alleviating the harmful effects caused by high salinity level (6g/l) in wheat plants. The seeds were pre-soaked and the plants sprayed with anyone of the antioxidants used. It was concluded that salinity stress depressed all growth parameters and yield components. The data also showed that the different antioxidants could partially alleviate the harmful effect of salinity stress on growth and yield of wheat plants.

The data showed that 6000 mg/l salinity level alone or in combination with any of antioxidants used increased the activity of total peroxidase, ascorbic peroxidase, superoxide dismutase and catalase in wheat leaves. In addition, salinity (6000 mg/l) alone or in combination with any of applied antioxidants increased the endogenous contents of ascorbic and glutathione and total phenols but decreased carotenoids.

Keywords: Wheat, Plant antioxidant, Salinity stress, Growth and yield.

Soil salinity is one of the major abiotic stresses affecting crop growth and productivity. Salt stress causes inhibition of growth and development, reduction in photosynthesis, respiration, and protein synthesis and disturbs nucleic acid metabolism. Decrease in uptake of K^+ , Mg^{2+} , Ca^{2+} , and thereby reduced growth at higher sodium concentration have also been reported (Sairam & Srivastava, 2002). Yang *et. al.* (1990) reported that there are two ways that salinity could retard growth: (a) By damaging the growth of cells so that they can not perform their functions or (b) By limiting their supply of essential metabolites. Sakr (1996) indicated that salinity suppressed both cell division and cell enlargement proportionally in wheat plants. Regarding the effect of antioxidant on wheat under salinity stress, Shalata & Neumann (2001) found that ascorbic acid acts directly to neutralize superoxide radicals, single oxygen or superoxide and as a

Emails: Sakrmt@yahoo.com

S_khatab_@hotmail.com

mohammadafifi@yahoo.com