Effect of Long-Term Salt Stress on Antioxidative Enzyme Activities of NyPa Forage (*Distichlis spicata* var. Yensen-4a) and Tall Fescue (*Festuca arundinacea* Schreb)

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Key words : salinization , ascorbate peroxidase , superoxide dismutase

Introduction Salinization plays a major role in soil degradation . It affects 19 .5% of irrigated and 2 .1% of dry agriculture land existing on the globe , including 38 .5 million ha that are salt-affected to various degrees in China (FAO , 2000) . Na+ imposes both ionic and osmotic stresses on plants , while the injurious osmotic effects and ionic toxicity lead to the generation of oxidative stress (Hernandez and Almansa , 2002) . To escape from the toxicity of activated oxygen species (AOS) , plants have developed a complex antioxidative defense system , including antioxidant enzymes such as ascorbate peroxidase (APX) , superoxide dismutase (SOD) and catalase (CAT) .

Materials and methods Two gramineous plants , NyPa Forage and tall fescue , were grown in plastic pots containing fine , white quartz sand . A half strength Hoagland nutrient solution was added daily . Thirty days later , salinity treatments were conducted by adding nutrient solution with 200 mM NaCl (salt stress treatment) or full-strength nutrient solution (control treatment) . Samples were harvested at 0 , 5 ,10 ,15 ,20 days after the start of the salt treatment .

Results The increased SOD activity in leaves was more conspicuous in NyPa Forage while its increase in roots was greater in Tall Fescue . APX activity was much greater in leaves of NyPa Forage than in leaves of tall fescue (Figure 1) . Activity of CAT in the leaf tissue of tall fescue , was not affected by salt stress throughout the experimental period .

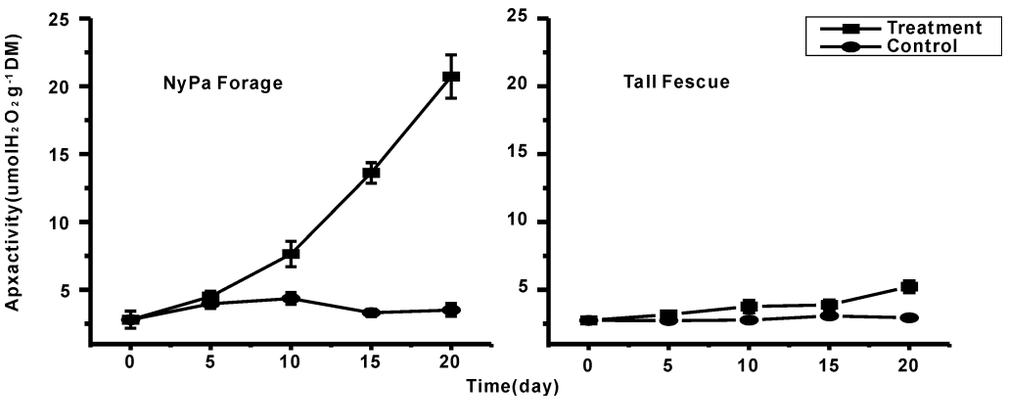

Figure 1 *Time course of total APX activity in leaves of NyPa Forage and tall fescue .*

Conclusion The present findings have suggested that NyPa Forage responded to NaCl stress by efficiently enhancing its antioxidative capacity in both leaves and roots when compared to tall fescue , and the results showed that the antioxidative enzyme activities of leaves and roots may not coordinate on the effect of salt stress . The antioxidative system in leaves was sensitive to salt stress , and may be an important biochemical trait for salt stress tolerance .

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