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ABSTRACTS

S07-004: ROLE OF SOS1 IN POTASSIUM NUTRITION

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Topic: Molecular Mechanisms of Abiotic Stress

Abstract Text:

Potassium nutrition is vital for plants, since this cation plays a major role in plant growth, stomatal movements, enzyme activation and osmoregulation. SOS1, a plasma membrane Na⁺/H⁺ antiporter which determines sodium homeostasis in saline conditions, was first described as an essential locus for potassium acquisition, as *sos1* plants are unable to grow under low potassium conditions. However, biochemical and transport assays in SOS1 showed this protein is highly specific for Na⁺ and doesn't transport K⁺ or other monovalent cations. The role of SOS1 in potassium uptake has been thus thought to be indirect, by preventing inhibition of potassium channels, such as AKT1, by sodium. This hypothesis was tested in our study by growing *sos1* and *akt1* mutants under controlled sodium and potassium conditions. When grown under low potassium levels, *sos1* growth was severely affected but only if the medium contained sodium. Removal of sodium abrogated the potassium phenotype. Growth of *akt1* mutant was reduced at low potassium levels but not affected by sodium at the low concentration of this cation used in the experiment. Moreover, an *akt1 sos1* double mutant behaved like *akt1* single mutant in normal conditions but, when sodium was added to the medium, growth was reduced compared to that of *sos1* and *akt1* single mutants in all the potassium concentrations tested. Our results shed light on the interaction of both SOS1 and AKT1 in potassium nutrition.

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