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Overexpression of *GhSARP1* encoding a E3 ligase from cotton reduce the tolerance**to salt in transgenic *Arabidopsis***

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Abstract: Ubiquitination plays a very important role in the response to abiotic stresses of plant. To identify key regulators of salt stress, a gene *GhSARP1* (Salt-Associated Ring finger Protein) encoding C3H2C3-type E3 ligase, was cloned from cotton. Transcription level of *GhSARP1* was high in leaf, flower and fiber of 24, 27 and 27DPA (Days Post-Anthesis), but low in root and stem. Except PEG6000 treatment, the expression of *GhSARP1* was down-regulated by NaCl, cold and ABA after being treated for 1 hour. GhSARP1-GFP fusion protein located on the plasma membrane, which was dependent on trans-membrane motif. In vitro ubiquitination assay showed that GhSARP1 had E3 ligase activity. Heterogeneous overexpression of *GhSARP1* reduced salt tolerance of transgenic *Arabidopsis* in germination and post-germination stage. Our results suggested that the *GhSARP1* might negatively regulate the response to salt stress mediated by the ubiquitination in cotton.

Keywords: *Gossypium hirsutum*, RING finger protein, E3 ligase, salt stress

Introduction

Salinity is one of the most important abiotic stress that limit crop production in the world. Salinity can lead to hyperionic and hyperosmotic stresses. Severe salt stress cause growth retardation, decline of yield or death. Under unfavorable condition, crops can regulate the expression of stress-related genes involved in transcription^[1], post-transcription^[2], epigenetic modification^[3] and post-translation^[4] to make themselves survival.

Ubiquitin-mediated pathway is an important pathway to degrade misfolded or short-lived proteins and involved in many biology processes including lateral root formation, the response to phytohormones, phosphate

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