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Osmotolerance and glucose insensitive phenotypes in Arabidopsis overexpressing the At-SAT41 putative ethylene responsive transcription regulator gene

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Objectives

To isolate salt stress tolerance genes in maize kernel

Materials and Methods

1. Material:

   Plant ; Maize endosperm cDNA library and *Arabidopsis*

2. Methods:

   Yeast screening, Ethylene triple response, Glucose germination test, Root bending assay

Results and Discussion

A yeast genetic research was used to isolate salt stress tolerance genes in maize kernel. Because there is good evidence to believe that common mechanisms that determine osmotolerance exist in eukaryotes and because yeast is much more amenable to genetic research than plants. We identified 98 SAT (Saline stress Tolerance) clones by yeast screening, including several clones that had never been annotated as salt stress responsive. These 98 SAT genes included not only salt-responsive genes but also genes responsive to other physiological conditions such as ABA phytohormone, oxidative stress, extreme temperatures and UV light stress. A seed cDNA that encodes a functional homologue of the *Arabidopsis* putative ethylene response transcription regulator enhances salt tolerance upon overexpression in yeast as well as in transgenic plant. Interestingly, it was found that plants overexpressing *At-SAT41* exhibited Glc-insensitive and partial ethylene insensitive phenotypes. Therefore, our results indicate that *At-SAT41* in *Arabidopsisis* mediating osmotolerance and altering ethylene and glucose signaling response.

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