PB-38

The microtubule-associated RING finger protein 1 (OsMAR1) may act as a negative regulator for salt stress response through OsCPI2 (*Oryza sativa* chymotrypsin protease inhibitor 2) regulation

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[Introduction]

As sessile organisms, plants cannot avoid various biotic and abiotic stresses, such as high salinity, water deficits, extreme temperatures and high heavy metal concentrations, which negatively affect growth and productivity. Plants had evolved the ability to respond and adapt to various stressful events. In plant species, the ubiquitin proteasome system (UPS) plays a key role in plant responses during various abiotic stresses

[Materials and Methods]

Rice seeds (O. sativa L. cv Donganbyeo) were grown with commercial soil in a growth chamber (16/8-h light/dark photoperiod at 25/23°C with 70% relative humidity) for 2 weeks. For salt treatment, the seedlings were treated at 200 mM and then harvested at various time points: 1, 3, 6, 12, and 24h. To study molecular characteristics of OsMAR1 protein, we perform the confocal imaging assay, BiFC, Yeast two Hybrid, pull-down assay and *in vitro* ubiquitination assay. For the development of OsMAR1-overexpressing plants, the constructed 35S:OsMAR1-EYFP vector was transformed into *Agrobacterium* strain GV3101 and carried into (ecotype Columbia, Col-0) according to the floral-dip method.

[Results and Discussions]

In this study, we identified the molecular functions of a rice RING E3 ligase gene, which was named *Oryza sativa* microtubule-associated RING finger protein 1 (OsMAR1). The *OsMAR1* gene was highly induced under salt-, drought-, and ABA conditions. Using various molecular approaches, the OsMAR1 protein showed an interaction with the salt-induced chymotrypsin protease inhibitor gene, OsCPI2 (Tiwari et al. 2015), and led to its proteasomal degradation via the 26S proteasome pathway. Furthermore, heterogeneous overexpression of OsMAR1 in *Arabidopsis* plants led to a sensitive response under high salinity and mannitol stresses. These results suggest that OsMAR1 might play an important role in plant response to salt stress.

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