

Identification of *Malus Sieversii* ABA Receptor PYL8 Interacting Proteome Using Y2H-seq

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Abstract

The seed dormancy of *Malus sieversii* belongs to the comprehensive type of dormancy, abscisic acid (ABA) is one of the important hormones to lift the seed dormancy. ABA receptor pyrabactin resistance-like (PYL) is involved in seed germination and various stress responses. 14 *MsPYL* genes were evaluated in the genome of *Malus sieversii*. Phylogenetic analyses demonstrated that *MsPYL* can be divided into three groups. The *MsPYL* promoter region contains cis-acting elements for expression induction by abiotic stresses such as abscisic acid, drought and low temperature. *Arabidopsis* overexpression analyses have shown that *MsPYL8* exhibited a markedly reduced germination rate compared to the wild-type. The transgenic lines exhibited a diminished germination rate, an extended growth period, and a reduction in the biomass of the aboveground parts. In addition, we found that *MsPYL8* interacted with 30 proteins, including low-temperature-induced 65 kDa protein-like (LTI) and late embryogenesis abundant (LEA). The results demonstrated that PYL8 binds to ABA during seed germination, inhibits the dephosphorylation activity of protein phosphatases type 2C (PP2C) and activates the transmission of sucrose non-fermenting-1-related protein kinases 2s (SnRK2s) to abscisic acid insensitive 5 (ABI5) signaling to ABI5, thereby activating the expression of ABA-responsive genes to regulate ABA signal transduction. The screening and validation of PYL8 interaction with LTI, and LTI interaction with ABI5 provides a basis for in-depth elucidation of the mechanism of PYL gene involvement in *Malus sieversii* seed dormancy lifting under the regulation of ABA signaling pathway.

Keywords

Malus Sieversii Ledeb. Roem, Membrane Yeast Two Hybrid Library, PYL, Protein Interaction