Genetics and Molecular Research

Characterization of *OsPM19L1* encoding an AWPM-19-like family protein that is dramatically induced by osmotic stress in rice

H. Chen[1], H. Lan[2], P. Huang[1], Y. Zhang[1], X. Yuan[1], X. Huang[1], J. Huang[1] and H. Zhang[1]

[1]State Key Laboratory of Crop Genetics and Germplasm Enhancement/Jiangsu Collaborative Innovation Center for Modern Crop Production, Nanjing Agricultural University, Nanjing, China
[2]College of Life Sciences, Nanjing Agricultural University, Nanjing, China

Corresponding authors: J. Huang / H. Zhang
E-mail: hszhang@njau.edu.cn / huangji@njau.edu.cn

Genet. Mol. Res. 14 (4): 11994-12005 (2015)
Received January 26, 2015
Accepted May 25, 2015
Published October 5, 2015
DOI http://dx.doi.org/10.4238/2015.October.5.12

ABSTRACT. The plant-specific AWPM-19-domain proteins play important roles in plant development and stress responses. In the current study, *OsPM19L1* encoding *Oryza sativa* AWPM-19-like protein 1 was isolated from rice. Tissue-specific gene expression analysis revealed that *OsPM19L1* was highly expressed in the leaf sheath of rice. Interestingly, expression of *OsPM19L1* was high at the early stage of panicle development and decreased thereafter. qRT-PCR analysis indicated that *OsPM19L1* was dramatically induced by 20% PEG stress (>600-fold), exogenous abscisic acid (>350-fold), salt and cold stress. Subcellular localization assay suggested that the OsPM19L1-GFP (green fluorescent protein) fusion protein was localized in the membrane system in rice cells. Moreover, under stress conditions, *OsPM19L1* expression was enhanced in an *ABI5-Like1* (*ABL1*) deficiency rice mutant, *abl1*, suggesting that ABL1 negatively regulates *OsPM19L1* gene expression. Thus, *OsPM19L1*

appears to be closely associated with stress tolerance through ABA-dependent pathway in rice.

Key words: Rice; Membrane protein; AWPM-19-like; Abiotic stress; Panicle

