



Cloning and characterization of peanut allene oxide cyclase gene involved in salt-stressed responses

H.H. Liu^{1*}, Y.G. Wang^{2*}, S.P. Wang³ and H.J. Li³

¹Postdoctoral Research Center of Shandong Shengfeng Seeds Co., Ltd., Jiaxiang, Shandong, China

²Institute of Genetics and Developmental Biology, Chinese Academy of Sciences, Beijing, China

³Shandong Shengfeng Seeds Co., Ltd., Jiaxiang, Shandong, China

*These authors contributed equally to this study.

Corresponding author: Y.G. Wang

E-mail: ygwang@genetics.ac.cn

Genet. Mol. Res. 14 (1): 2331-2340 (2015)

Received May 6, 2014

Accepted October 23, 2014

Published March 27, 2015

DOI <http://dx.doi.org/10.4238/2015.March.27.18>

ABSTRACT. In this study, the full-length cDNA encoding allene oxide cyclase (*AhAOC*) was isolated from peanut (*Arachis hypogaea* L.). The deduced amino acid sequence of *AhAOC* showed high homology with other plant AOCs. The transcript of *AhAOC* was found to be abundantly expressed in roots. Expression analysis demonstrated that *AhAOC* was induced by abscisic acid, methyl-jasmonic acid, salicylic acid, salinity, polyethylene glycol, and cold stresses, particularly by high salinity. Overexpression of *AhAOC* in rice increased root elongation and plant height compared with expression in control plants and conferred tolerance against salinity. Thus, the *AhAOC* gene may play an important role in increasing the expression of transcription factors (*MYB2* and *OsONAC045*) and functional genes (*DREB1F* and *LEA3*) in transgenic rice under salt stress as well as improve stress tolerance through the

accumulation of compatible solutes (proline and soluble sugar). The *AhAOC* gene is a potential resource for enhancing salt tolerance in crop species.

Key words: Allene oxide cyclase gene; Gene cloning; Overexpression; Peanut; Salt stress