

异源表达唐菖蒲GhOPR3 提高了拟南芥的抗逆性

连青龙^{1,2}, 辛海波², 李晓昕², 钟雄辉², 尹义蕾¹, 义鸣放^{2,*}

¹农业部规划设计研究院设施农业研究所, 农业部农业设施结构工程重点实验室, 北京 100125; ²中国农业大学观赏园艺与园林系, 北京 100193

Heterologous Expression of Gladiolus GhOPR3 Enhances the Abiotic Stress Resistance of Arabidopsis

LIAN Qing-long^{1,2}, XIN Hai-bo², LI Xiao-xin², ZHONG Xiong-hui², YIN Yi-lei¹, and YI Ming-fang^{2,*}

¹Institute of Facility Agriculture, Chinese Academy of Agricultural Engineering, Key Laboratory of Farm Building in Structure and Construction, Ministry of Agriculture, Beijing 100125, China; ²Department of Ornamental Horticulture and Landscape Architecture, China Agricultural University, Beijing 100193, China

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摘要 通过RT-PCR 与RACE 技术从唐菖蒲 (*Gladiolus hybridus*) 品种 ‘Rose Supreme’ 球茎中克隆茉莉酸生物合成途径中的关键酶——12-氧-植物二烯酸还原酶 (12-oxo-phytyldienoic acid reductase,

OPR) 基因的1 489 bp 全长cDNA 序列, quantitative RT-PCR 结果表明, GhOPR3 在唐菖蒲叶、花、根、匍匐茎、新球茎和籽球中都表达, 其中在籽球和匍匐茎中相对表达量较高; 0.1 ~ 0.5 mmol · L⁻¹ 的茉莉酸甲酯 (Methyl jasmonate, MJ) 处理后, 提高了GhOPR3 在球茎中的表达量和内源MJ 含量; 采用农杆菌介导侵染拟南芥花粉, 进行GhOPR3 基因的过表达分析, 过表达拟南芥株系较野生型提高了耐盐性和抗旱性; 提高了机械损伤后相关基因的表达水平和内源MJ 含量。

关键词: 唐菖蒲; 茉莉酸; 12-氧-植物二烯酸还原酶; 异源表达; 抗逆性

Abstract: OPR is a key enzyme in jasmonic acid biosynthesis pathway, a full-length cDNA named GhOPR3 was cloned in *Gladiolus hybridus* ‘Rose Supreme’ corms by RT-PCR and RACE. The results of quantitative RT-PCR showed that GhOPR3 gene was expressed in leaf, flower, root, stolon, corm and cormel, and the relatively high expression level of GhOPR3 was observed in cormel and stolon. Meanwhile, the expression level and the endogenous MJ content in corms steadily increased under MJ treatment with a raising concentration gradients from 0.1 mmol · L⁻¹ to 0.5 mmol · L⁻¹. GhOPR3 was overexpressed in *Arabidopsis*, which increased the salt tolerance and drought-resistant in *Arabidopsis*. After mechanical damage, the expression level of related resistance genes and the content of endogenous MJ were increased.

Keywords: *Gladiolus hybridus*, JA, OPR, heterologous expression, stress resistance

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