

## 陆地棉耐盐相关基因GhSAMS的克隆及表达

周凯, 宋丽艳, 叶武威\*, 王俊娟, 王德龙, 樊保香\*

中国农业科学院棉花研究所 / 农业部棉花遗传改良重点实验室, 河南安阳455000

## Cloning and Expression of GhSAMS Gene Related to Salt-tolerance in *Gossypium hirsutum* L.

ZHOU Kai, SONG Li-Yan, YE Wu-Wei\*, WANG Jun-Juan, WANG De-Long, FAN Bao-Xiang\*

Cotton Research Institute, Chinese Academy of Agricultural Science, Key Laboratory of Cotton Genetic Improvement of Agriculture Ministry, Anyang 455000, China

摘要

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**摘要** 为了挖掘棉花耐盐相关基因, 我们根据陆地棉耐盐性抑制消减文库中的一个S-腺苷甲硫氨酸合成酶基因的同源EST设计引物, 利用RACE结合RT-PCR技术克隆陆地棉S-腺苷甲硫氨酸合成酶基因的cDNA全长, 命名为GhSAMS。该cDNA全长1 576 bp, ORF为1 182 bp, 编码393个氨基酸的多肽。生物信息学分析表明GhSAMS蛋白与拟南芥、盐地碱蓬、水稻中该蛋白的相似性分别为91%、93%和93%。系统发育树结果显示GhSAMS与盐地碱蓬中该蛋白的亲缘关系最近。Real-time PCR分析结果表明, GhSAMS的表达受盐胁迫诱导, 在盐敏感材料中诱导被推迟, 而且, 该基因表达水平在耐盐材料中9835中明显高于在盐敏感材料中S9612中。我们构建了原核表达载体pET28-GhSAMS, 经IPTG诱导, 实现了GhSAMS在大肠杆菌中的表达, 为进一步开展GhSAMS的遗传转化工作奠定了有益基础。

**关键词:** 陆地棉 盐胁迫 S-腺苷甲硫氨酸合成酶基因 原核表达

**Abstract:** As one of main abiotic stresses in nature, salt stress does great harm to plants, and seriously affect plant growth and development. Simultaneously, the crops cultivated in the saline land undergo a wide range of yield decline. To excavate salt-tolerance gene, we cloned the cDNA of S-adenosyl-L-methionine synthetase gene from *Gossypium hirsutum* by RACE and RT-PCR, which was named GhSAMS, with the cDNA full length of 1 576 bp, ORF of 1 182 bp, and coding 393 amino acid residues. Bioinformatics analysis showed GhSAMS has the similarity of 91%, 93%, and 93% with *Arabidopsis thaliana*, *Suaeda salsa*, and *Oryza sativa*, respectively. Phylogenetic analysis showed GhSAMS was the closest to *Suaeda salsa*, and Real-time PCR suggested that GhSAMS was induced by salt stress, while the induction was postponed in salt sensitivity material. It showed lower gene expression level on salt sensitive material Zhong S9612 relative to salt resistance material Zhong 9835. At the same time, we established protokaryotic expression vector pET28-GhSAMS and transformed GhSAMS into *E. coli* after IPTG induction, showing a successful gene expression.

**Keywords:** *Gossypium hirsutum* Salt stress S-adenosyl-L-methionine synthetase Prokaryotic expression

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