

复苏植物旋蒴苣苔棉子糖合酶基因的克隆和表达

王智^{1,2}, 刘永秀², 魏建华^{1*}, 邓馨^{3**}

¹北京市农林科学院农业生物技术研究中心, 北京 100097;

²中国科学院植物研究所北京植物园, 北京 100093

³中国科学院植物研究所植物分子生理学重点实验室, 北京 100093

Cloning and Expression of a Gene Encoding a Raffinose Synthase in the Resurrection Plant *Boea hygrometrica*

Zhi Wang^{1,2}, Yongxiu Liu², Jianhua Wei^{1*}, Xin Deng^{3**}

¹Beijing Agro-Biotechnology Research Center, Beijing Academy of Agriculture and Forestry Science, Beijing 100097, China

²Beijing Botanical Garden, Institute of Botany, Chinese Academy of Sciences, Beijing 100093, China;

³Key Laboratory of Plant Molecular Physiology, Institute of Botany, Chinese Academy of Sciences, Beijing 100093, China

摘要

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摘要 复苏植物是研究植物耐脱水机制的特殊模式植物和宝贵的耐旱基因资源植物。以复苏植物旋蒴苣苔(*Boea hygrometrica*)为材料研究其在脱水和复水过程中棉子糖系列寡糖含量的变化,并克隆了旋蒴苣苔棉子糖合酶基因*BhRFS*。荧光定量PCR检测表明,*BhRFS*受干旱、低温(4°C)、高盐(200 mmol·L⁻¹NaCl)和ABA(100 μmol·L⁻¹)诱导表达上调,而高温(37°C)抑制其表达,H₂O₂(200 μmol·L⁻¹)处理对其没有影响。研究结果表明,*BhRFS*可能参与了多种非生物逆境胁迫抗性反应,并受到ABA依赖的信号通路调控。

关键词: 旋蒴苣苔 棉子糖系列寡糖 棉子糖合酶 复苏植物

Abstract: Resurrection plants are a valuable resource for understanding the mechanisms of dehydration tolerance and for mining candidate genes that can be used to improve drought tolerance in crops. Here, we determined the contents of galactinol, raffinose and stachyose in dehydrated and rehydrated leaves of a resurrection plant *Boea hygrometrica*. We cloned a dehydration-inducible gene encoding a raffinose synthase from *B. hygrometrica* and found that *BhRFS* was upregulated by cold (4°C), high salt (200 mmol·L⁻¹NaCl), and abscisic acid (ABA, 100 μmol·L⁻¹) but downregulated by high temperature (37°C) and not affected by H₂O₂ (200 μmol·L⁻¹). *BhRFS* may function in response to various abiotic stresses, possibly regulated by ABA-dependent signal pathways, therefore it is a good candidate gene for plant breeding to enhance plant stress tolerance.

Keywords: *Boea hygrometrica* raffinose family oligosaccharides raffinose synthase resurrection plant

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Corresponding Authors: 魏建华; 邓馨 Email: weijianhua@baafs.net.cn; deng@ibcas.ac.cn

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