

生命科学

NaCl和Na₂CO₃胁迫下的高粱MAPKs基因家族表达模式

陈宏宇¹, 冯树丹¹, 刘相国², 尹悦佳², 于莹³, 杨丽颖¹, 郝东云^{2,3}

1. 哈尔滨师范大学 生命科学与技术学院, 哈尔滨 150025; 2. 吉林省农业科学院 生物技术研究中心, 长春 130033|3. 吉林大学 生命科学学院, 长春 130012

摘要:

通过在全基因组水平上进行NaCl和Na₂CO₃胁迫下高粱 MAPKs基因表达模式的研究, 探索高粱MAPKs基因在胁迫条件下参与信号传导的机理. 结果

表明, 从高粱基因组中鉴定出16个MAPKs 基因, 命名为 SbMPKs. 这些SbMPKs 在NaCl和Na₂CO₃胁迫下的表达模式明显不同, 表明中性盐胁迫诱导的信号响应不同于碱性盐. 在NaCl胁迫下, 除了 SbMPK₁₃的表达量在12 h时达到最大值外, 所有高粱 MAPKs 基因在24 h内表达持续上调; 在Na₂CO₃胁迫下, 只有 SbMPK₃, SbMPK₁₀和 SbMPK₁₃表达上调, 表明这3个基因可能与高粱碱性盐胁迫应答反应有关. 系统发育分析表明, SbMPK₁₃属于C组 MAPKs 基因, 并且与水稻中受脱落酸(ABA)和盐胁迫诱导表达的 OsMAPK₂亲缘关系较近, 进一步证实了 SbMPK₁₃可能是参与高粱盐胁迫应答的重要调控基因.

关键词: 高粱; MAPKs 基因; 表达模式 计算识别; 盐碱胁迫

Expression Pattern of MAPKs Genes in Sorghum bicolor under Stresses of NaCl and Na₂CO₃

CHEN Hong yu¹, FENG Shu dan¹, LIU Xiang guo², YIN Yue jia², YU Ying³, YANG Li ying¹, HAO Dong yun^{2,3}

1. College of Life Science and Technology, Harbin Normal University, Harbin 150025, China; 2. Biotechnology Research Center, Jilin Academy of Agricultural Sciences, Changchun 130033, China; 3. College of Life Science, Jilin University, Changchun 130012, China

Abstract:

The availability of sorghum genome makes it possible to perform the genome wide analysis of the expression profile of MAPKs genes in Sorghum bicolor under the stresses of NaCl and Na₂CO₃ so as to explore the MAPKs involvement into saline alkali signaling pathway. The results show that 16 MAPKs genes were identified from the genome of Sorghum bicolor, namely SbMPKs, and their expression profiles under the stresses of NaCl and Na₂CO₃ differ from each other significantly. This suggests that neutral salt induced signal response may differ from that induced by alkaline salt. Under the stress of NaCl, all SbMPKs were up regulated continuously during 24 h except the SbMPK₁₃ whose expression reached to the maximum at 12 h. Under the stress of Na₂CO₃, however, only SbMPK₃, SbMPK₁₀ and SbMPK₁₃ were up regulated, implying that SbMPKs are likely responsible specifically for alkaline salt stress in sorghum. P

Phylogenetic analysis classified SbMPK₁₃ into the C group of MAPKs, which is similar to OsMAPK₂ that is responsible to ABA and salt stress in rice, further confirming that it is involved possibly in the regulation of salt stress response genes in sorghum.

Keywords: Sorghum bicolor MAPKs gene expression pattern computational identification saline alkali stress

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通讯作者: 郝东云

作者简介:

作者Email: dyhao@cjaas.com

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