

桃生长素反应因子和生长素/吲哚乙酸蛋白家族基因的克隆及表达分析

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Cloning and Expression Analysis of ARF and Aux/IAA Gene Family Members in Peach

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摘要 生长素对果实发育起着重要的调控作用。生长素反应因子 (auxin response factor, ARF) 和生长素/吲哚乙酸蛋白 (auxin/indoleacetic acids protein, Aux/IAA) 是生长素信号转导系统中的两个关键因子, 在转录水平上对生长素参与的生理活动进行调控。为探索生长素调控桃果实发育的机制, 选取ARF家族的1个基因PpARF1, Aux/IAA家族的5个基因PpIAA3、PpIAA9、PpIAA17、PpIAA26和PpIAA29, 克隆其全长cDNA序列并进行生物信息学分析, 对它们在桃果实不同发育时期中果皮和种子的表达进行qRT-PCR检测。序列分析表明: 这6个基因的编码区全长分别为2 037、594、1 194、618、384和723 bp, 分别编码678、197、397、205、127和240个氨基酸; 氨基酸序列比对分析显示桃PpARF1蛋白序列和草莓的FvARF1 (XP_004300014.1) 同源性最高, 达到90.56%, PpIAA家族的5个蛋白同源性很低, 只有23.77%; 荧光定量PCR结果显示, 在花后52 d (果实发育硬核期), PpIAA3和PpIAA17在中果皮中的表达量显著升高; PpIAA26、PpIAA29和PpARF1在种子中的表达量显著升高。预示生长素可能在桃果实发育硬核期发挥着重要的调控作用。

关键词: 桃 生长素反应因子 生长素/吲哚乙酸蛋白 基因克隆 表达分析

Abstract: It has been known that auxin plays an important role in regulating fruit development. The transcription factors ARF and repressor protein Aux/IAA were the key factors in auxin signal transduction system, both of them are involved in regulating physiological activities at the transcriptional level. To explore the role of auxin in regulating the expression of the target gene during peach fruit development, the full-length of the cDNA sequences of the six related genes were isolated and analyzed by bioinformatics. One of them was PpARF1 selected from ARF family and the other five were PpIAA3, PpIAA9, PpIAA17, PpIAA26 and PpIAA29 selected from Aux/IAA family. The relative expression levels in mesocarp and seed of peach different developmental stages were also detected by quantitative real-time PCR. The results showed that: The number of the base pairs of the six genes were 2 037, 594, 1 194, 618, 384 and 723 bp, which encoded six proteins containing 678, 197, 397, 205, 127 and 240 amino acids respectively. The sequence of PpARF1 amino acid shares 90.56% homology with FvARF1 (XP_004300014.1) in *Fragaria vesca*; Homology of the five proteins belongs to the PpIAA family was very low, only 23.77%. The expression of PpIAA3 and PpIAA17 were significantly increased in mesocarp at the 52 days after full flowering (hard core period); The expression of PpIAA26, PpIAA29 and PpARF1 in seed also increased significantly during that period. The results suggested that auxin might play an important role in regulating development of peach fruit at hard core stage.

Keywords: *Prunus persica*, ARF, Aux/IAA, cloning, expression analysis

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- [1] 俞明亮, 马瑞娟, 许建兰, 沈志军, 宋宏峰, 蔡志翔, 张好艳, 张斌斌. 晚熟桃新品种‘霞晖 8 号’ [J]. 园艺学报, 2014, 41(3): 597-599.
- [2] 谢 玥, 王丽华, 董官勇, 郑晓琴, 庄启国, 李明章. 黄肉猕猴桃新品种‘金什 1 号’ [J]. 园艺学报, 2014, 41(3): 597-599.
- [3] 樊卫国, 罗 燕, 吴素芳, 葛会敏. 氮肥形态及配比对铁核桃根际环境及幼苗生长的影响 [J]. 园艺学报, 2014, 41(3): 437-441.
- [4] 张晓辉, 魏小春, 李锡香, 孙玉燕¹, 王 冠¹, 常兆晶¹, 刘冠群¹, 邱 杨¹, 宋江萍¹, 王海平¹, 沈 镝¹, 王大江², 韩月澎³. 苹果分子克隆 [J]. 园艺学报, 2014, 41(2): 215-226.
- [5] 张 勇, 汤浩茹*, 罗 娅, 王小蓉, 陈 清, 刘泽静. 草莓 FaCBF1 基因的克隆及表达分析 [J]. 园艺学报, 2014, 41(2): 242-246.
- [6] 崔 波^{1,2}, 武振江², 刘 佳², 张国付², 袁秀云¹, 叶永忠², *. 文心兰开花相关 *OnAP1-like* 基因的克隆及表达分析 [J]. 园艺学报, 2014, 41(2): 242-246.
- [7] 严娟, 蔡志翔, 沈志军, 张斌斌, 钱巍, 俞明亮. 桃 3 种颜色果肉中 10 种酚类物质的测定及比较 [J]. 园艺学报, 2014, 41(2): 242-246.
- [8] 张庆雨, 刘芳春, 段 可, 王 飞, 王延秀, 高清华. 水杨酸对草莓炭疽病响应基因 *FaNBS20* 表达的影响 [J]. 园艺学报, 2014, 41(2): 242-246.