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百合肌动蛋白基因 *lilyActin* 的克隆与表达分析

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Cloning and Expression Analysis of Actin Gene (*lilyActin*) from Lily

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摘要 为了在百合功能基因表达研究选择一个理想内参基因, 依据岷江百合cDNA文库所获得的百合肌动蛋白(Actin)基因的EST序列, 采用RACE技术进行该基因cDNA全长克隆, 并利用实时荧光定量PCR分析其在不同组织中的表达模式, 获得百合肌动蛋白基因cDNA全长序列(GenBank登录号: JX826390), 命名为*lilyActin*。该基因cDNA全长1 367 bp, 其中, 5'非编码区91 bp, 3'非编码区233 bp, 开放读码框1 134 bp, 编码377个氨基酸。序列比对发现, 该基因与其它15种植物肌动蛋白核苷酸序列的相似性均在80%以上, 氨基酸序列的相似性达98%。进化分析显示, 百合肌动蛋白与郁金香肌动蛋白的亲缘关系最近。实时荧光定量PCR结果显示, 该基因在百合的花蕾、叶片和鳞片组织中恒定表达, 表明相对于其他物种的内参基因, *lilyActin*更适宜作为百合属植物的内参基因。

关键词: 百合 Actin 基因 基因克隆 表达分析 内参基因

Abstract: In this study, the objective is to provide a reference gene for gene expression studies of *Lilium*. Based on the actin gene EST sequence of the cDNA library of *Lilium regale* Wilson, a full-length cDNA sequence was cloned from *Lilium regale* Wilson through rapid amplification of cDNA ends (RACE) method and the gene expression characters were analyzed by the real time PCR. The full-length cDNA sequence (GenBank: JX826390) designated as *lilyActin* from *Lilium regale* Wilson was 1 367 bp in length, contains a 1 134 bp open reading frame (ORF) encoding a 377 amino acid proteins, with 91 bp in the 5' UTR and 233 bp in the 3' UTR. Homologous alignment shows that it shares over 80% nucleotide sequence similarity and over 98% amino acid sequence similarity with actins in other plants. The phylogenetic tree reconstructed on the base of amino acid sequences suggests that the relationship of actin between *Lilium regale* and *Tulipa gesneriana* is the most intimate. Real time PCR analysis revealed that *lilyActin* was constantly expressed in various organs of *Lilium regale* Wilson such as flowers, leaves, bulbs. The results showed that relative to other reference gene *lilyActin* can be more appropriate for *Lilium*.

Keywords: *lily*, Actin gene, gene clone, expression analysis, reference gene

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