

瓜实蝇嗅觉受体基因的克隆及表达谱分析

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Cloning and expression profiling of an olfactory receptor gene in *Bactrocera cucurbitae* (Coquillett) (Diptera: Tephritidae)

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摘要

昆虫的嗅觉受体是一个高度变异的蛋白家族, 其中一类Or83b嗅觉受体在不同昆虫体内高度保守, 在昆虫的行为调控过程中起到十分重要的作用。为进一步探讨Or83b受体的功能, 本研究利用RT-PCR和RACE方法克隆获得瓜实蝇*Bactrocera cucurbitae* (Coquillett) Or83b-like受体的全长cDNA序列, 命名为*BcucOr83b-like* (GenBank登录号: HM745934)。测序结果表明, *BcucOr83b-like*开放阅读框全长1 422 bp, 编码473个氨基酸残基。氨基酸序列比对表明, 此序列具有Or83b受体的典型特征, 序列中具有7个跨膜区和高度保守的C端区域。*BcucOr83b-like*与其他昆虫的Or83b具有较高的氨基酸序列一致性, 其中与桔小实蝇*Bactrocera dorsalis* (Hendel) Or83b的序列一致性高达99.6%。对该基因在瓜实蝇成虫不同组织和发育时期表达量的荧光定量PCR分析表明, *BcucOr83b-like*主要在瓜实蝇成虫触角中表达, 头部(去除触角)、雌虫前足和翅中也有较高的表达; 瓜实蝇在各个发育时期的表达水平不同, 在刚羽化雌成虫中的表达量最高。本研究为深入研究瓜实蝇Or83b受体的功能提供了理论依据。

关键词:

Abstract:

Olfactory receptors in insects were found to be extremely diverse, but there is a kind of olfactory receptor, Or83b, which shares a high identity among different insects and plays an important role in the regulation of insect behavior. In order to research the function of Or83b, the gene encoding Or83b receptor from *Bactrocera cucurbitae* (Coquillett) was cloned and named as *BcucOr83b-like* (GenBank accession no. HM745934). The sequencing results showed that the open reading frame of *BcucOr83b-like* was 1 422 bp in length, encoding 473 amino acid residues. Homology analysis showed that the deduced amino acid sequence of *BcucOr83b-like* had the characteristics of Or83b, with seven putative transmembrane domains and conserved C domains. *BcucOr83b-like* had very high similarity of amino acid sequence with those from other insects and shared 99.6% identity with the Or83b sequence from *Bactrocera dorsalis*. Tissue expression pattern revealed that *BcucOr83b-like* transcript was observed clearly in the antenna of *B. cucurbitae*, and highly expressed in the head (with antennae removed), female foreleg and wings. The temporal expression pattern further indicated that *BcucOr83b-like* was also expressed in different developmental stages at different expression levels, with the highest level in female adult newly emerged. This study provides a basis for further researching the function of Or83b from *B. cucurbitae*.

Key words:

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