

对人工饲料摄食性不同的家蚕品种Cph2基因的表达特征分析

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Expression pattern analysis of BmCph2 in *Bombyx mori* strains with different acceptance of the artificial diet

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摘要 家蚕*Bombyx mori*不同品种对人工饲料的摄食性存在很大差异。为探讨食性差异的分子机理, 本文基于对人工饲料摄食性不同的蚕品种(系)SAGE(serial analysis of gene expression)文库差异表达基因的分析, 发掘了1条家蚕假定表皮蛋白(cuticular protein hypothetical)基因*BmCph2*。采用半定量RT-PCR和实时荧光定量PCR方法, 对*BmCph2*在不同摄食性蚕品种(系)不同发育时期的表达特征进行了研究。结果表明: *BmCph2*基因在家蚕幼虫眠期和起蚕期高表达, 在胚胎期和幼虫将眠期几乎检测不到表达; 在幼虫头部与全蚕的表达特征相似, 而在中肠中表达活性很低, 推测该基因表达可能与家蚕新表皮的形成有关。*BmCph2*在对人工饲料摄食性不同的蚕品种(系)中的表达存在较大差异, 在摄食性好的高食性品种中表达量显著低于摄食性差的低食性品种; 饲料和忌避剂的气味刺激及取食刺激对不同品种(系)该基因的表达有不同的影响, 高食性蚕对诱导刺激比较敏感, 而低食性蚕受影响较小, 尤其是菁松A和菁松B的低食性品系几乎不受影响。本研究结果说明, *BmCph2*基因除可能参与表皮形成的同时, 还与家蚕的食性有密切关系, 但其具体机理有待于进一步研究。

关键词: 家蚕 假定表皮蛋白2 基因表达 食性 人工饲料

Abstract: The feeding habits to the artificial diet are diverse in different strains of the silkworm, *Bombyx mori*, and the molecular mechanism is not fully understood now. By investigating differentially expressed genes responsible for appetite of the silkworm to the artificial diet in the constructed SAGE (serial analysis of gene expression) library, we excavated a CPH2 (cuticular protein hypothetical 2) gene (*BmCph2*) from the silkworm based on the constructed SAGE library of differentially expressed genes in silkworm strains with different acceptance of the artificial diet. Semi-quantitative RT-PCR was employed to analyze the expression of *BmCph2* in different strains of the silkworm and real-time PCR was employed to further reveal its expression pattern. The results showed that *BmCph2* possessed a high expression level during the molting and newly molted stages, while it could be hardly detected during the embryonic stage and the time right before the molting stage. The expression profile of *BmCph2* in the head was similar to that in the whole body. However, the expression level of *BmCph2* was low in the midgut, suggesting that *BmCph2* may be related to the formation of new cuticle layer. *BmCph2* was differently expressed in *B. mori* strains with different feeding habits to the artificial diet. The expression level of *BmCph2* in *B. mori* strains with low feeding habit was significantly higher than that in *B. mori* strains with high feeding habit. The expression of *BmCph2* in different strains reacted differently to the flavour stimulus of food and repellent, and the feeding stimulus as well. The silkworms with high feeding habit were relatively sensitive, while those with low feeding habit were less influenced, specifically in the low feeding strains of Jingsong A and Jingsong B. The results suggest that *BmCph2* may be involved in feeding habits except for having the potential function in the formation of new cuticle layer. However, the detail mechanisms still need further investigation.

Key words: *Bombyx mori* cuticular protein hypothetical 2 gene expression feeding habit artificial diet

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