

胡萝卜FLC同源基因对低温及光周期响应

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Expression Analysis of FLC Homologues Responding to Low Temperature and Photoperiod in Carrot

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**摘要** 基于‘松滋野生’(Ws)和‘Amsterdam’(Af)胡萝卜转录组测序,挖掘胡萝卜FLC同源基因(DcFLCs),深入研究其对低温及光周期响应规律。结果表明,胡萝卜中存在3个具有完整MADS-box和K-box保守结构域的FLC同源基因DcFLC1、DcFLC2、DcFLC3,分别编码209、212、219个氨基酸残基蛋白,进化树显示与其它植物FLC亲缘关系较远。RT-PCR表明DcFLC1和DcFLC2在供试材料中均表达,而DcFLC3仅在部分材料中表达。qPCR结果显示低温能促进DcFLC1和DcFLC3在耐抽薹品种Af幼苗叶片和种根中表达,而DcFLC2仅在Af种根中表达显著,在幼苗叶片中表达不显著。DcFLC1和DcFLC2在抽薹敏感的Ws幼苗叶片和种根春化过程中表达规律不同,低温能促进DcFLC1在幼苗叶片以及DcFLC2在种根中表达。连续光照能促进DcFLC1、DcFLC2在Af幼苗叶片中表达,但在Ws中则不同。

关键词: 胡萝卜 DcFLCs 低温 光周期 基因表达

**Abstract:** Carrot (*Daucus carota* L.) is a biennial species and requires vernalization for flowering. The premature bolting of carrot occurs in winter-spring plastic tunnel and spring cultivation, and results in a complete loss of commercial value, but limited progress reported on the control of bolting and flowering in carrot. Basis on the transcriptome sequences, carrot FLOWERING LOCUS C homologues (DcFLCs) were screened. Cultivar ‘Amsterdam’ (Af) tolerance to premature bolting and wild sensitive species ‘Songzi’ (Ws) were selected to study the relative expression of DcFLCs under cold and photoperiod treatment examined by real-time qPCR. Three FLC homologues (DcFLC1, DcFLC2 and DcFLC3) were annotated with complete ORFs, MADS-box and K-box conserved regions, which encoded 209, 212 and 219 amino acids, respectively. Phylogenetic analysis showed that DcFLCs were clustered with other plants FLC homologous. DcFLC1 and DcFLC2 were confirmed to express in all species by RT-PCR, but DcFLC3 only in some. The relative expression of DcFLC1 and DcFLC3 were improved in Af young plants and roots during vernalization, while DcFLC2 was only improved in roots but no significance in young plants. DcFLC1 were improved in Ws young plants but no significance in roots during vernalization, while DcFLC2 in contrary. Both of the relative expression of DcFLC1 and DcFLC2 were improved in Af young plants under continuous illumination, but different in Ws.

Keywords: carrot, DcFLCs, low temperature, photoperiod, gene expression

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- [1] 徐启江, 梁毅. 胡萝卜新品种‘红芯105’[J]. 园艺学报, 2013,40(9): 1859-1860
- [2] 李慧<sup>1,2,\*</sup>, 李刚波<sup>1,3,\*</sup>, 丛郁<sup>4</sup>, 常有宏<sup>1,2,\*\*</sup>, 蔺经<sup>1</sup>, 盛宝龙<sup>1</sup>. 杜梨类钙调磷酸酶B亚基蛋白基因*PbCBL2*的克隆和功能初探[J]. 园艺学报, 2013,40(8): 1445-1455
- [3] 王伟东<sup>1</sup>, 蒋芯<sup>1</sup>, 杜昱林<sup>1</sup>, 王玉花<sup>1,2,\*</sup>, 黎星辉<sup>1,2,\*</sup>. 低温对茶树花粉管抑制作用与NO关系的研究[J]. 园艺学报, 2013,40(8): 1535-1540
- [4] 郑蓓蓓, 谢宗周, 郭文武. 脐橙与粗柠檬体细胞杂种果实类胡萝卜素、糖酸遗传的亲本偏向性[J]. 园艺学报, 2013,40(7): 1262-1268
- [5] 宋霄, 柏素花, 戴洪义. 苹果*NBS-LRR1*基因的鉴定与表达分析[J]. 园艺学报, 2013,40(7): 1233-1243
- [6] 李婷, 韩莹琰, 郝敬虹, 范双喜<sup>\*</sup>, 任月. 叶用莴苣*LsHsp70*基因的克隆及表达分析[J]. 园艺学报, 2013,40(6): 1081-
- [7] 郭磊, 蔡志翔, 张斌斌, 许建兰, 宋宏峰, 马瑞娟<sup>\*</sup>. 5-氨基乙酰丙酸促进桃果皮提前着色机制研究[J]. 园艺学报, 2013,40(6): 1043-
- [8] 杨蕊, 关雪莲<sup>\*</sup>, 张睿鹏, 杨文莉, 郑健, 冷平生. 低温胁迫下北海道黄杨叶肉细胞Ca<sup>2+</sup>和Ca<sup>2+</sup>-ATPase的变化[J]. 园艺学报, 2013,40(6): 1139-
- [9] 慕茜, 刘更森, 孙欣, 李玉, 陶然, 王晨, 房经贵. ‘藤稔’葡萄冬季休眠后期花芽发育相关基因表达的分析[J]. 园艺学报, 2013,40(5): 828-
- [10] 欧春青, 姜淑苓, 王斐, 王志刚, 马力, 李连文. 梨贝壳杉烯酸氧化酶基因*PcKAO1*的克隆与表达分析[J]. 园艺学报, 2013,40(5): 849-
- [11] 邬奇, 苏娜娜, 崔瑾. 不同光周期下黄瓜和番茄幼苗生长与ZT和IAA的相关性[J]. 园艺学报, 2013,40(4): 755-
- [12] 王琴, 陈金涛, 叶建飞, 甘林叶, 胡惠蓉. ‘地平线’天竺葵的花芽分化及光周期特性[J]. 园艺学报, 2013,40(4): 773-
- [13] 李亮, 董春娟, 尚庆茂. 内源水杨酸参与黄瓜叶片光合系统对低温胁迫的响应[J]. 园艺学报, 2013,40(3): 487-497
- [14] 王萍, 李彦慧, 张雪梅, 李保国, 姚飞飞. 低温对仁用杏雌蕊抗坏血酸—谷胱甘肽循环的影响低温对仁用杏雌蕊抗坏血酸—谷胱甘肽循环的影响[J]. 园艺学报, 2013,40(3): 417-425
- [15] 田景花, 王红霞, 张志华, 高仪. 低温逆境下两个抗寒性不同的核桃幼叶Ca<sup>2+</sup>的亚细胞定位的变化[J]. 园艺学报, 2013,40(3): 441-448