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研究报告

利用cDNA微阵列分离津田芜菁花青素生物合成相关基因

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摘要

花色素苷是植物的重要次生代谢产物, 在植物体内行使多种生理功能。利用UV-A处理48 h后津田芜菁块根变红, 以黑暗处理条件下的白色块根为对照, 与削减文库特异基因片段制备的cDNA微阵列进行杂交。UV-A处理条件下津田芜菁中表达上调的基因为81个, 表达下调的基因为47个, 表达上调的基因中包括与花青素生物合成直接相关的基因片段*cytochrome P450*, *PAL*, *F3H*, *ANS*, *CHS*, *DFR*和*GST*等。Northern杂交结果显示, UV-A处理48 h的津田芜菁试材中, *PAL*、*CHS*、*F3H*、*DFR*和*ANS*基因的表达量明显高于黑暗条件下白色块根中这些基因的表达量, 进一步验证了芯片杂交结果的可靠性。

关键词 花色素苷 津田芜菁 块根 UV-A cDNA微阵列 基因表达

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Screening the Genes Associated with Anthocyanin Biosynthesis in Roots of ‘Tsuda’ Turnip Using cDNA Microarray

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Abstract

<P><FONT face=Verdana>Anthocyanins are important secondary metabolites in plants, which are involved in many functions. The white peel of an enlarged root in ‘Tsuda’ plants turned red after irradiated with UV-A light for 48h, but remained white when held in the dark. Red earthnuts and white peels were hybridized with cDNA microarray made by unique gene fragments of subtraction library. The expression of 81 genes were up-regulated including <EM>cytochrome P450</EM>, <EM>PAL</EM>, <EM>F3H</EM>, <EM>ANS</EM>, <EM>CHS</EM>, <EM>DFR </EM>and <EM>GST </EM>gene fragments related to anthocyanidin biosynthesis. The expression of 47 genes was down-regulated after irradiated with UV-A light. The northern blotting results showed that the expression of <EM>PAL</EM>, <EM>CHS</EM>, <EM>F3H</EM>, <EM>DFR </EM>and <EM>ANS </EM>in red root peels was more in ‘Tsuda’ turnip after irradiation with UV-A light than in white ones held in a dark condition. The results of northern blotting verified the reliability of cDNA microarray.</FONT></P>

Key words Anthocyanin ‘Tsuda’ turnip root UV-A cDNA microarray gene expression

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