

天山雪莲冷调节蛋白基因*siCOR*转化烟草植株的抗旱性分析

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Drought-tolerance Analysis of Tobacco Plant Transformed with *Sasussured involuocrata siCOR* Gene

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摘要

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摘要 冷调节蛋白(cold regulated proteins, CORPs)是植物在冷驯化下产生的特异性蛋白,与植物的抗寒性密切相关。然而,大量研究表明,绝大多数植物冷诱导基因同样会响应水分胁迫。采用半定量RT-PCR分析天山雪莲(*Sasussured involuocrata*)冷调节蛋白基因*siCOR*的表达,结果表明*siCOR*是一个受干旱胁迫诱导表达的基因。为研究*siCOR*基因是否与抗旱性相关,以*siCOR*转基因烟草为研究材料,利用水分胁迫处理进行抗旱性分析。结果表明与野生型(wild-type, WT)相比,转*siCOR*植株叶片萎蔫较迟且程度较轻,复水后恢复快且较完全;其叶片相对含水量和PSII相对量子产率的降低幅度、相对电导率和丙二醛含量的升高幅度均低于野生型烟草植株。采用PEG6000模拟干旱胁迫,发现转*siCOR*植株T3代种子的萌发率较高,主根生长的受抑制程度较野生型轻。以上结果表明,*siCOR*基因在植物对干旱胁迫的响应中起重要作用。

关键词: 抗旱性 天山雪莲 冷调节蛋白基因 烟草

Abstract: Cold-regulated proteins (CORPs) are induced by cold and thus closely related with cold tolerance. Most cold-induced genes may respond to water stress. We used RT-PCR to confirm that cold-induced *siCOR* in *Sasussured involuocrata* was also induced by water stress. To investigate the possible role of *S. involuocrata siCOR* in drought tolerance, we performed the drought-tolerance analysis using *siCOR* transgenic tobacco. Compared with untransformed wild-type (WT) plants, transgenic lines had greener leaves and more roots. Water stress experiments showed transgenic lines with delayed and slightly wilted leaves, but they recovered faster and more completely after rewatering as compared with WT plants. Transgenic lines also showed lower reduction of relative water content and relative quantum yield of PSII and smaller increase of relative conductivity and malondialdehyde content as compared with WT plants. Under drought stress simulated with PEG6000 treatment, transgenic T3 seeds showed higher germination rate and reduced inhibition of main root growth than WT. These results suggested that *siCOR* may play an important role in drought stress.

Keywords: drought tolerance *Sasussured involuocrata siCOR* gene tobacco

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