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Functional analysis of a gene (*CaMBD*) encoding methyl-CpG-binding domain proteins isolated from red pepper (*Capsicum annuum* L.)

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Objectives

DNA methylation can directly interfere with the binding of sequence-specific transcriptional activators. We have isolated several genes encoding protein with the capability to bind specifically to methylated DNA were purified from red pepper. Sequence analysis revealed the presence of a common domain, the methyl-CpG-binding domain (MBD), which is sufficient to provide binding to methylated DNA. Thus, we have characterized methyl-CpG-binding domain (MBD) gene encoding MBD proteins in red pepper.

Materials and Methods

1. Materials

Red pepper (*Capsicum annuum* L.)

2. Methods

Sequence analysis, Southern blot, Northern analysis, GFP protein analysis

Result and Discussion

We studied monocot and dicot methyl-CpG-binding domain (MBD) proteins in the NCBI database and designated CaMBD primer. Thus, several genes encoding putative proteins possessing an MBD were found. MBD proteins in this studies were aligned using Clustal W. Southern blot analysis showed that copy number were existed in red pepper. Total RNAs were isolated from leaf, stem, flower and subjected to hybridization with the cDNA probes from genes encoding *CaMBD* proteins. Northern analysis showed that the gene was expressed in each other tissues. GFP-*CaMBD* fusion proteins were introduced into onion cell. *CaMBD* was found to be exclusively expressed in the nuclei. Our findings for *CaMBD* raise many questions as to functional mode of DNA methylation in plant.

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