

研究报告

白菜 *OguCMS* 相关 MYB 家族新基因 *BcMYBogu* 的克隆与特征分析

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摘要

为研究 CMS 核质互作的分子机理, 将甘蓝型油菜 (*Brassica napus* L.) 和白菜 (*B. campestris* L. ssp. *chinensis* Makino) 杂交并连续回交 6 代获得白菜 *OguCMS*, 在与保持系花药细胞学比较的基础上, 运用 cDNA-AFLP 筛选得到白菜 *OguCMS* 早、中期花蕾提早表达的 MYB-like 差异片断, 利用 RACE 克隆得到该片断的 cDNA 全长, 命名为 *BcMYBogu* (GenBank 登录号: EF127861), 对其氨基酸序列和表达特征进行研究。结果表明, 白菜 *OguCMS* 绒毡层在四分体后增生, 高度液泡化, 导致小孢子花粉外壁异常, 细胞质同外壁分离并降解; 花药变白; *BcMYBogu* 具有典型的 MYB DNA 结合域—W 残基和 SH[AL]QKY[RF] 基序; 系统进化分析显示 *BcMYBogu* 与 AtMYB26, AtMYB32 和 AtMYB4 等聚类在同一分枝; RT-PCR 分析表明 *BcMYBogu* 在莲座叶、花茎和花蕾中均有表达, 但在 *OguCMS* 花蕾中表达量显著上升。由此推测 *BcMYBogu* 是一个新的与白菜 *OguCMS* 相关的 MYB 家族新成员。

关键词 [白菜\(*Brassica campestris* ssp. *chinensis*\)](#) [OguCMS](#) [BcMYBogu](#) [绒毡层](#)

分类号

Molecular cloning and characterization of *BcMYBogu*, a novel member of the MYB family involved in *OguCMS* in *Brassica campestris* ssp. *chinensis*

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Abstract

<P>In the attempt to elucidate the molecular mechanism of CMS. Ogura cytoplasmic male sterile (OguCMS) lines were obtained in Chinese cabbage after interspecific hybridization between Brassica. napus L. OguCMS and B. campestris ssp. chinensis followed by recurrent backcross with B. campestris ssp. chinensis as the pollen donor. The CMS lines were significantly characterized by the whitish anther and indehiscence of anther. The tapetal hypertrophy with excess vacuolation was the first observed defective soon after the tetrad stage, subsequently the microspores defected in pollen wall formation, and later the cytoplasm detached from the exine wall and underwent degeneration. With aid of cDNA-AFLP and RACE approaches, we cloned the BcMYBogu (GenBank accession No: EF127861) in Chinese cabbage, which is premature expressed in early and middle stage floral buds of DguCMS lines, and predicted to encode a novel protein with a DNA binding domain: SH[AL]QKY[RF] motif at the N-terminus. Phylogenetic comparison revealed that the *BcMYBogu* was clustered with AtMYB32, AtMYB26 and AtMYB4, which were indicated to be involved in male sterility in Arabidopsis thaliana. The BcMYBogu transcript was detected in rosette leaves, floral buds and stems by RT-PCR analysis. Compared with the maintainer, the expression level of BcMYBogu was increased in these organs, especially in floral buds of OguCMS lines. Our investigation suggests

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that BcMYBogu is a new member of the MYB family involved in male sterility in Chinese cabbage.</P>

Key words [Chinese cabbage \(*Brassica campestris* ssp. *chinensis*\)](#) [OguCMS](#) [BcMYBogu](#) [Tapetum](#)

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