

园艺—研究报告

抑制消减杂交法研究复等位基因遗传的

冀瑞琴¹, 宋倩², 辛喜凤², 周雪², 冯辉^{1, 2}

1. 沈阳农业大学园艺学院

2.

摘要:

AB01是本课题组培育的复等位基因遗传的核雄性不育大白菜甲型“两用系”，目前已建立了一套该材料的应用技术体系，但其不育分子机制尚不明确。本研究以AB01的不育株和可育株为材料，利用抑制差减杂交技术构建了正反抑制差减cDNA文库，并通过测序及生物信息学手段寻找育性相关基因，以此来推断该材料的不育分子机制。研究中共找到27个差异表达基因，其中25个基因在NCBI数据库中均有同源序列，这些基因中7个与花发育相关，5个与脂类代谢相关，3个与活性氧及能量代谢相关，3个与光合作用及叶绿体合成相关，其余7个为功能未知基因。由此推测复等位基因遗传的核雄性不育大白菜不育的发生与脂类、能量代谢及光合作用有关。

关键词： 分子机制

The Molecular-mechanism Research of Multiple-Allele-Gene Controlled Male-Sterile in Chinese Cabbage (*Brassica rapa* L. ssp. *chinensis*) by Using Suppression Subtractive Hybridization

.....

Abstract:

AB01, the two-type line of multiple-allele inherited male-sterile Chinese cabbage (*Brassica rapa* L. ssp. *chinensis*) was bred by our research group, the technology system of this material had been build, but its sterile molecular mechanism was not clear yet. In this research, sterility and fertility cDNA libraries including 27 differentially expressed clones were constructed using the fertile and sterile buds of AB01 by the suppression subtractive hybridization (SSH). According to BLAST screening and functional annotation, 25 ESTs were homology to known sequence of the databases at the National Center for Biotechnical Information (NCBI). The 25 genes, with homology to known proteins, could be divided into 4 groups (7 flowers developing-related genes, 5 lipid metabolism, 3 energy metabolism genes, 3 chloroplast related genes and 7 encode the unclassified proteins). The results suggested the molecular mechanism of multiple-allele-gene controlled male-sterile Chinese cabbage was related with lipid metabolism, energy metabolism and photosynthesis progress.

Keywords: molecular mechanism

收稿日期 2011-03-14 修回日期 2011-03-24 网络版发布日期 2011-09-21

DOI:

基金项目:

国家自然科学基金; 中国博士后科学基金; 辽宁省教育厅实验室专项

通讯作者: 冯辉

作者简介:

作者Email: fenghuiaaa@263.net

参考文献:

[1] Feng H, Wei YT, Xu M et al. Multiple allele model for genic male sterility in Chinese cabbage[J]. Acta Horticulturæ, 1996, 467: 133-142.
[2] 冯辉, 徐巍, 王玉刚. ‘奶白菜A1023’品系核基因雄性不育系的定向转育[J]. 园艺学报, 2007, 34 (3): 659-664.

扩展功能

本文信息

- ▶ Supporting info
- ▶ PDF(1389KB)
- ▶ [HTML全文]
- ▶ 参考文献[PDF]
- ▶ 参考文献

服务与反馈

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ 引用本文
- ▶ Email Alert
- ▶ 文章反馈
- ▶ 浏览反馈信息

本文关键词相关文章

- ▶ 分子机制

本文作者相关文章

- ▶ 冀瑞琴
- ▶ 宋倩
- ▶ 辛喜凤
- ▶ 周雪
- ▶ 冯辉

PubMed

- ▶ Article by Ji,R.Q
- ▶ Article by Song,q
- ▶ Article by Xin,X.F
- ▶ Article by Zhou,x
- ▶ Article by Feng,h

- [3] Feng H, Wei P, Piao ZY et al. SSR and SCAR mapping of a multiple-allele male-sterile gene in Chinese cabbage (*Brassica rapa* L.) [J]. *Theor. Appl. Genet*, 2009, 119: 333 - 339.
- [4] Zhang Q, Huang L, Liu TT et al. Functional analysis of a pollen-expressed polygalacturonase gene BcMF6 in Chinese cabbage (*Brassica campestris* L. ssp. *chinensis* Makino) [J]. *Plant cell rep.*, 2008, 27 (7): 1207-1215.
- [5] 张玉刚, 许雪峰, 李天忠, 韩振海. 小金海棠抑制性消减cDNA文库的构建及文库质量分析. *中国农学通报*, 2005, 21(3): 77-80.
- [6] Wu JY, Shen JR, Mao XZ et al. Isolation and analysis of differentially expressed genes in dominant genic male sterility (DGMS) *Brassica napus* L. using subtractive PCR and cDNA microarray[J]. 2007, *Plant Sci.*, 72: 204-211.
- [7] 冀瑞琴, 董祥柏, 冯辉等. 水杨酸途径中的防御基因在转草酸氧化酶基因油菜中的表达[J]. *植物生理学通讯*, 2009, 45(7):677-680.
- [8] 冀瑞琴, 董祥柏, 冯辉等. PDF1.2基因在转草酸氧化酶基因甘蓝型油菜中的表达[J]. *植物生理学通讯*, 2009, 45(5): 479-482.
- [9] 孙晓甜, 郜刚, 闫桂琴等. 青枯菌M5菌株特异基因组消减文库的构建[J]. *中国农学通报*, 2008, (3): 62-66.
- [10] 谢潮添, 杨延红, 朱学艺等. 白菜细胞核雄性不育花药的细胞化学观察[J]. *实验生物学报*, 2004, 37 (4): 295-302.
- [11] 石晶. 水稻脂肪酰基还原酶OsMS2基因的克隆及其在花粉壁发育中功能研究[D]. 上海: 上海交通大学, 2007.
- [12] 米海莉, 张曦燕, 樊云芳等. 枸杞雄性不育与植株发育进程中活性氧代谢的关系[J]. *江西农业大学学报*, 2008, 30 (5): 796-798.
- [13] 吕清璐, 沈向群, 汪玉等. 美女樱雄性不育系与可育系花器官发育过程中生理生化指标的比较分析[J]. *江苏农业科学*, 2010, (3): 221 - 223.
- [14] 赵明, 章建新, 王美云. 短时高温诱导小麦雄性不育过程中光合作用的变化[J]. *作物学报*, 1997, 23 (4): 496-500.
- [15] 史公军, 侯喜林, 袁建玉. 白菜胞质雄性不育系及保持系叶片色素含量及其超微结构[J]. *南京农业大学学报*, 2004, 27 (4): 31-35.

本刊中的类似文章

1. 许鑫科, 苑兆和, 冯立娟, 尹燕雷, 徐榕. 彩叶植物叶色表达机制研究进展[J]. *中国农学通报*, 2008,24(11): 339-345
2. yanghongyukm@.com.拟南芥在植物抗病性分子机制研究中的作用[J]. *中国农学通报*, 2006,22(5): 358-358
3. 林郑和, 陈荣冰.植物铝毒及其耐铝机制研究进展[J]. *中国农学通报*, 2009,25(13): 94-98