

研究论文

通过白菜型油菜和埃塞俄比亚芥的Ar和Cc基因组导入创造甘蓝型油菜新材料

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摘要

油菜是目前我国主要种植的油料作物之一, 但现有的种质资源限制了产量的进一步提高。本研究采取了一种新的育种方式来增加甘蓝型油菜的种质资源, 即通过远缘杂交结合分子标记辅助选择的方式将白菜型油菜的Ar基因组和埃塞俄比亚芥的Cc对现有的甘蓝型油菜品种的基因组 (AnAnCn) 进行部分替换。通过对五倍体杂交后代 (ArAnBcCcCn) 进行染色体选择, 找到了染色体数目为38的材料。为了和现有的甘蓝型油菜进行区分, 得到的新材料被认定为甘蓝型油菜新材料。实验结果表明, 得到的部分甘蓝型油菜新材料具有基本正常的减数分裂过程、正常的花粉萌发以及胚囊发育过程, 这说明甘蓝型油菜新材料达到了遗传平衡。分子标记分析表明: 甘蓝型油菜新材料的约50%的基因组被白菜型油菜的Ar基因组和埃塞俄比亚芥的Cc替换, 并且这些甘蓝型油菜新材料之间具有丰富的遗传多样性。因此, 白菜型油菜的Ar基因组和埃塞俄比亚芥的Cc基因组导入对于丰富现有的甘蓝型油菜种质资源具有明显的效果。

关键词 [甘蓝型油菜; 花粉萌发; 胚囊发育; 基因组导入; 遗传距离](#)

分类号

Production of Partial New-typed Brassica Napus by Introgression of Genomic Components from B. rapa and B. carinata

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Abstract

<P>A breeding strategy for widening the germplasm of Brassica napus was proposed by introgression of the Ar subgenome of B. rapa (ArAr) and Cc of B. carinata (BcBcCcCc) into natural B. napus (AnAnCn). The progenies with 38 chromosomes that were derived from the self-pollinated seeds of pentaploid hybrids (ArAnBcCcCn) were used for further research. Some of the partial new-typed B. napus showed normal meiotic behavior, high portion of germinated pollen and normal embryological development. This indicates that the selected new-typed B. napus had a balanced genetic base. Molecular analysis showed that about 50% of the genome in the new-typed B. napus was replaced by Ar and Cc subgenome from B. rapa and B. carinata. Considering the genetic diversity among different lines of new-typed B. napus, it was deduced that the introgression of the genomic components

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from *B. rapa* and *B. carinata* could widen the genetic diversity of rapeseed.</P>

Key words [new-typed *B. napus*](#) [pollen germination](#) [embryo sac development](#) [genome introgression](#) [genetic distance](#)

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