

甘蓝型油菜芥酸和二十碳烯酸含量的基因效应*

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摘要 以甘蓝型油菜的4种纯合芥酸基因型之间所有可能的6个杂交组合的P1、P2、F1、F2、B1和B2 世代为材料, 用生统遗传学方法研究了芥酸和二十碳烯酸的基因作用形式及效应。发现无论 亲本是单基因差异还是二基因差异, F1和F2代的芥酸含量都接近中亲值, F1略大于中亲值和 F2。世代均值分析表明, 芥酸含量的遗传符合加性显性模型, 加性效应占绝对优势, 显性效 应不显著。用数量遗传学方法估计的芥酸基因数与已知的结果相近。

关键词 [甘蓝型油菜, 芥酸, 二十碳烯酸, 基因效应, 基因数目, 世代均值分析](#)

分类号

The Gene Effects of Erucic and Eicosenoic Acids in Brassica napus L.

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Abstract

The six basic populations (P1, P2, F1, F2, B1 and B2) of each of all possible crosses between four genotypes of erucic acid in Brassica napus L. were studied. The erucic acid contents of F1 and F2 were approximately equal to the average value of their parents, and the value of F1 was slightly larger than that of F2 and mid-parental value regardless of single locus or two loci between the parents. Generation mean analyses indicated that the simple additive-dominance model was adequate for erucic acid. The additive effects [d] were predominant and the dominant effects [h] were insignificant in most of crosses. The additive effects of two loci were nearly equal and ranged from 13.0 to 14.5. The dominance effects were less than 1.0. When the parents differed from each other at one locus, the dominance direction of the locus was positive if the other locus was eAeA or eCeC, and negative if the other was EAeA or ECEC. The inheritance of eicosenoic acid content was quite complicated. When the parents differed from each other only at one locus, the contents of F1 and F2 were lower than that of the large parent but higher than the mid-parental value, and the increasing genes were partially dominant to the decreasing genes. The contents of F1 and F2 were higher than that of the large parent and showed overdominance in the case of eAeAeCeC × EAeAECEC, but lower than that of the smaller parent and displayed underdominance in EAeAeCeC × eAeAECEC. Generation mean analyses revealed that the complexity of eicosenoic acid was associated with the non-allelic interactions. There were negative dominance × dominance [1] in the case of one locus difference and the additive effects were nearly equal to the dominance effects. There were additive × additive [i] and additive × dominance [j] in the case of two loci difference whereas dominance and dominance × dominance were insignificant. The number of genes controlling erucic acid content estimated by the methods of quantitative genetics were very close to the known results by Mendelian methods.

Key words [Brassica napus](#) [Erucic acid](#) [Eicosenoic acid](#) [Gene effects](#) [Number of genes](#) [Generation mean analysis](#)

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