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研究论文

辐射育种获得油菜（*Brassica napus*）高油酸材料

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摘要 本研究用8~10万伦琴^{60}Coγ射线辐射双低油菜（*B. napus*）湘油15干种子，并对辐射后代进行高油酸连续选择，结果M_2、M_3、M_4油酸含量有不同程度提高，至M5油酸含量迅速提高，多数植株油酸含量在70%以上，最高油酸含量达93.5%。对高油酸突变体M604-855（种子油酸含量为91.5%）的fad2基因与网上公布的fad2基因DNA序列进行比对，发现突变体fad_2基因270位的碱基G转换为碱基A，导致密码子由TGG转换为TGA（终止密码子）。这一区域是fad_2蛋白的beta折叠区和保守区。另外，在1 044与1 062的碱基突变也导致终止密码子的产生。这些结构上的变化导致fad_2基因功能的丧失，使油酸不能转化成亚油酸，提高油酸含量。根据基因突变的分子机制，无论是碱基的转换或颠换，都需经过几次的复制，即经过几个世代才能完或，这也是在后期世代才出现高油酸变异的原因。

关键词 油菜 60Co电离辐射处理 高油酸育种

分类号 S565

High Oleic Acid Content Materials of Rapeseed (*Brassica napus*) Produced by Radiation Breeding

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Abstract High oleic acid content rapeseed breeding has great significance, because high oleic acid oil is a healthy and nutritious oil,which is of a long shelflife and also propitious to producing biodiesel fuel. The high oleic acid content breeding materials of rapeseed (B. napus) were obtained by 80 – 100 kR 60Co γ ray ionizing radiation treatment of dry seeds and continuous selection. The results showed that the oleic acid contents of M2, M3 and M4 progenies increased by different grades. Moreover, the oleic acid content of M5 progeny increased greatly. The oleic acid contents were higher than 70% in the most of the plants and the highest one reached 93.5%. The base G was transited by base A in fad2 gene at the 270 site of high oleic acid mutation (M6 04-855). The location is at the beta folding area and conservative area of this protein. Base mutation at sites 1 044 and 1 062 also led to produce a stop condon. These changes in structure led to loss the function of fad2. According to molecular mechanism of gene mutation, no matter what transvertion or transition happens, several replications are needed. That is to say several generations are needed. That was also the reason why high oleic acid content mutation occurred in later genenations.

Key words Rapeseed 60Co γ ray ionizing radiation Selection for oleic acid

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