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论文

甘蓝自交不亲和基因MLPK与SSP的FISH定位

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摘要：

利用FISH技术, 对自交不亲和基因*MLPK*与*SSP*在甘蓝有丝分裂前中期染色体、减数分裂早粗线期染色体以及伸长DNA纤维等3种分辨率水平的靶DNA载体上进行物理定位。结果表明, 在有丝分裂前中期, *MLPK*探针信号位于一对近中着丝粒同源染色体的短臂中部, 距着丝粒的百分距离约为53.41±3.16；*SSP*探针信号位于一对具有随体的近端着丝粒同源染色体的长臂端部, 距着丝粒的百分距离约为78.36±4.26。综合3种载体上的FISH结果表明, *MLPK*与*SSP*在甘蓝染色体组中可能都只有一个同源序列座位, 具有在单倍体基因组中的单拷贝性。重复FISH杂交表明, *MLPK*与5S rDNA位于同一对染色体。依据Armstrong的核型分析标准, 初步判断*MLPK*与*SSP*分别位于甘蓝的2号和7号染色体, 与*S*位点不存在连锁关系。另从比较基因组学角度对定位结果进行了讨论。

关键词： 甘蓝 MLPK基因 SSP基因 荧光原位杂交 自交不亲和性

Localization of *MLPK* and *SSP* Genes for Self-Incompatibility of *Brassica oleracea* by Fluorescence in situ Hybridization

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Abstract:

In *Brassica*, self-incompatibility recognition is controlled by the multiallelic gene complex (S-haplotypes) at the *S*-locus, which encodes both the male determinant *S*-locus pollen coat protein (SCR/SP11) and the female determinant *S*-locus receptor kinase (SRK). Studies of *MLPK* and *SSP* genes for self-incompatibility of *Brassica* have been gradually widespread since they were identified. However, the position and copy number of *MLPK* and *SSP* genes in *Brassica oleracea* genome are still unclear. In this paper, the localization of *MLPK* and *SSP* genes for self-incompatibility of *Brassica oleracea* on prometaphase chromosomes, early pachytene chromosomes and extended DNA fibers was conducted successfully by fluorescence *in situ* hybridization. The results indicated that *MLPK* probe was hybridized onto the short arm of a pair of homologous prometaphase chromosomes, and the percent distance from centromere to the signal point was about 53.41±3.16; *SSP* probe was hybridized onto the long arm of a pair of homologous prometaphase chromosomes with the satellite, and the percent distance from centromere to the signal point was about 78.36±4.26. Hybridization signals from three kinds of cytological targets with different FISH resolutions showed that both *MLPK* gene and *SSP* gene might be located at a single-copy locus in *Brassica oleracea* genome. Repeated FISH indicated that both *MLPK* and 5S rDNA probes were hybridized onto the same chromosomes. According to karyotype standard of Armstrong, it was primarily inferred that *MLPK* gene was located on the chromosome 2, and *SSP* gene on the chromosome 7. The results presumably revealed thatneither *MLPK* nor *SSP* is linked to *S*-locus. And they locate respectively on the different chromosomes in *Brassica oleracea*. In addition, the collinearity relationship of *MLPK* as well as *SSP* between *Brassica* and *Arabidopsis thaliana* was also discussed on the basis of comparative genomics.

Keywords: *Brassica oleracea* *MLPK* gene *SSP* gene Fluorescence *in situ* hybridization Self-incompatibility

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