

叶绿体DNA(ctDNA)与细胞质雄性不育性

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摘要 本文通过DNA的热变性分析, 和利用限制性核酸内切酶(EcoRI、BamHI)消化ctDNA, 根据ctDNA热变性微分熔解性微分熔解曲线和在单向Agarose凝胶电泳及含变性剂浓度梯度双向电泳, 比较并分析了玉米、小麦和油菜的不育系及其相应的保持系的ctDNA。结果首次成功的揭示了这3种植物的不育系ctDNA与其保持系的ctDNA之间存在着明显的可能破坏叶绿体与细胞核以及线粒体之间的固有平衡, 从而可能导致细胞质雄性不育性的形成。

关键词

分类号

Chloroplast DNA and Cytoplasmic Male Sterility

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Abstract

This paper deals with the relationship of ctDNA and CMS of maize, wheat and rape. Intramolecular heterogeneity and fragmental patterns of DNA digested with restriction endonucleases were compared and analyzed. For this purpose methods of agarose gel electrophoresis and two dimensional gel electrophoresis with denaturated solvent concentration gradient were applied.

1. Map of differential calculus during heat denaturation indicated that ctDNA of sterile line in maize presented three melting regions. This meant that its base sequences were of heterogeneity. But ctDNA of its maintainer was homogenous.

2. Maize ctDNA was digested with both EcoRI and BamHI, wheat and rape ctDNA digested with EcoRI only. Fragmental patterns obtained indicated that no significant differences between sterile lines and their maintainers were observed. But in rape the sterile line lost one fragment presented in its maintainer.

3. Results obtained from two dimensional electrophoresis showed that remarkable differences both in number and relative positions of separated fragments were observed between sterile lines and their respective maintainers in all the three tested crops, no matter whether there were differences in one dimensional gel electrophoresis or not. These meant that there were some relations between ctDNA and CMS.

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