

## 东乡野生稻与栽培稻正反交种间杂种F<sub>1</sub>的雄配子发生与发育

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## Cytological Studies of Male Gametogenesis and Development in the Reciprocal Interspecific Hybrid F<sub>1</sub> of Dongxiang Wild Rice (*Oryza rufipogon*) and *Oryza sativa*

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摘要

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**摘要** 该文以东乡野生稻与栽培稻(美国光壳稻P1003)的正反交种间杂种F<sub>1</sub>(正交为光壳稻P1003×东乡野生稻;反交为东乡野生稻×光壳稻P1003)为试材,研究其各个减数分裂时期的染色体行为特征、染色体交换重组及雄配子发育特点。结果表明:正反交杂种F<sub>1</sub>花粉母细胞细胞核减数分裂的同步性较高,细胞质为连续型胞质分裂类型。在细胞核分裂的过程中,核仁在前期I到中期I逐渐消失。染色体在前期I到中期I逐渐收缩,变得更加清晰可见。在终变期和中期I,90.54%以上的花粉母细胞能形成12个二价体(含少数棒状二价体和8字型二价体),部分花粉母细胞(正交9.46%,反交7.65%)出现少量的单价体、三价体和四价体。后期I观察到1.27% - 1.35%的花粉母细胞含有1至数条落后染色体。最终有92.6% - 94.8%的小孢子能发育成形态正常、染色能力强的成熟花粉粒。另外,在正反交杂种F<sub>1</sub>的粗线期中存在2个核仁,而反交杂种F<sub>1</sub>及其双亲的粗线期只有1个核仁。这些研究结果可为作物品种改良、种质资源创新以及种间亲缘关系研究提供细胞学证据。

**关键词:** 东乡野生稻 种间杂种 减数分裂 亲缘关系

**Abstract:** The reciprocal interspecific hybrid F<sub>1</sub> from *Oryza sativa* L. (smooth indica rice P1003 of USA) crossed with Dongxiang wild rice (*Oryza rufipogon* Griff.) was used to investigate the meiosis behavior, chromosome recombination, and characteristics of male gametophytes. The pollen mother cells (PMCs) of the reciprocal interspecific hybrid F<sub>1</sub> showed successive cytokinesis and a relatively higher synchronization in nuclear division.

The nucleolus disappeared gradually from prophase I to metaphase I. With condensation of chromatins, chromosomes became more identifiable from prophase I to metaphase I. At diakinesis and metaphase I, 90.5% of PMCs could form 12 bivalent chromosome configurations, including a few bar-bivalents and "8"-shaped bivalents. Low frequency univalents, trivalents and tetravalents were observed in other PMCs (9.46% PMCs in the original cross; 7.65% PMCs in the reciprocal cross). At anaphase I, one or more lagging chromosomes were observed in 1.27% - 1.35% of PMCs. Finally, 92.6% - 94.8% of microspores could develop into normal and stainable pollen grains. In addition, 2 nucleoli were observed in P1003 × Dongxiang wild rice at prophase I. However, Dongxiang wild rice × P1003 and their parents had only one nucleolus. These results provide cytological evidence for crop enhancement and phylogenetic relationships of rice.

**Keywords:** Dongxiang wild rice (*Oryza rufipogon* Griff.) interspecific hybrids meiosis phylogenetic relationship

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