

植物遗传学

## 水稻和其它禾本科植物基因组多倍体起源的证据

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收稿日期 修回日期 网络版发布日期 接受日期

**摘要** 基因加倍 (Gene Duplication) 被认为是进化的加速器。古老的基因组加倍事件已经在多个物种中被确定, 包括酵母, 脊椎动物以及拟南芥等。本研究发现水稻基因组同样存在全基因组加倍事件, 大概发生在禾谷类作物分化之前, 距今约7 000万年。在水稻基因组中, 共找到117个加倍区段 (Duplicated Block), 分布在水稻的全部12条染色体, 覆盖约60%的水稻基因组。在加倍区段, 大约有20%的基因保留了加倍后的姊妹基因对 (Duplicated Pairs)。与此形成鲜明对照的是加倍区段的转录因子保留了60%的姊妹基因。禾本科植物全基因组加倍事件的确定对研究禾本科植物基因组的进化具有重要影响, 暗示了多倍体化及随后的基因丢失、染色体重排等在禾谷类物种分化中扮演了重要角色。

**关键词** [基因组加倍](#) [基因组进化](#) [多倍体化](#)

分类号

## Evidence for Ancient Whole-Genome Duplication Event in Rice and Other Cereals

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### Abstract

Gene duplication has been proposed as an accelerator of evolution. Ancient genome duplication events have been identified in diverse organisms, such as yeast, vertebrates, and Arabidopsis. Here, we have identified a whole genome duplication event (WGD) in the rice genome, which took place prior to the divergence of grasses about 70 million years ago (mya). A total of 117 duplicated blocks were detected, which are distributed on all 12 chromosomes and cover about 60% of the rice genome. About 20% genes on these duplicated segments are retained as duplicate pairs. In contrast, 60% of the transcription factor genes are retained as duplicates. The identification of a WGD in the ancestral grass genome will impact the study of grass genome evolution, and suggest that polyploidization and subsequent gene losses and chromosomal rearrangements have played an important role in the diversification of grasses. <br><br>

**Key words** [genome duplication](#) [genome evolution](#) [polyploidization](#)

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