

专论与综述

植物远缘杂交中的染色体行为及其遗传与进化意义

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摘要 远缘杂交与多倍体化在高等植物的进化中起着重要的作用。但矛盾和令人费解的现象是“自然界在合成多倍体方面取得了巨大的成功, 而人类在这方面却收效甚微”。其原因一方面可能是自然多倍体是长期自然选择和进化的产物, 人类难以在短期内重复和完成这一过程; 另一方面可能对不同的染色体组结合后的遗传与互作机制还不太了解。故多倍体化后的遗传和表现遗传成了目前多学科研究的重点。在有些有性和体细胞杂种内亲本染色体在细胞内分开排列, 但此染色体行为的遗传和生物学意义还不太清楚。在植物远缘杂交中出现的假配生殖、半配生殖、染色体消除和亲本染色体组分开等异常染色体行为, 也反映出不同物种在配子和染色体水平上的不亲和。需对植物远缘杂交中的染色体行为和遗传进行不同层次与系统的研究, 才可能深入了解杂交后新种的形成及进化机制。

关键词 [植物远缘杂交](#) [异源多倍体](#) [遗传与进化](#) [染色体行为](#) [染色体组分开](#)

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Chromosomal Behaviors in Plant Wide Hybridizations and their Genetic and Evolutionary Implications

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Abstract

The wide hybridization and polyploidization play a significant role in the evolution of higher plants. On the contrary, the artificially synthesized allopolyploids are genetically unstable and fail to be used as crops. One reason for this situation may be that the allopolyploids in nature are the products of natural selection and evolution and it is difficult for human to repeat and perform the process in short periods. Another reason is that we know little about the interaction mechanisms between the genomes of different origins. So the genetics and epigenetics after allopolyploidizations are now studied by multidisciplinary approaches. The spatial separation of parental genomes in hybrid cells have been observed in some sexual and somatic hybrids, but the biological meanings remain to clarify. The abnormal chromosome behaviors in plant wide crosses, such as pseudogamy, semigamy, chromosome elimination and the mitotic and meiotic separation of parental genomes, may indicate the incompatibility of two parental species at gametic and chromosomal levels. The systematic studies at different levels on chromosomal behavior and genetics in plant hybridizations are needed to undermine the mechanisms responsible for the formation and evolution of new species.

Key words [wide hybridizations](#) [allopolyploidy](#) [genetics and evolution](#) [chromosomal behavior](#) [genome separation](#)

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