

·综述·

结合系统发育与群体遗传学分析 检验杂交是否存在的技术策略

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摘要: 杂交通常指不同类群间(种间或种内)经有性途径的遗传交流。越来越多的研究表明, 作为一种遗传交换过程, 杂交是生物多样性形成、维持和丧失的重要机制, 它广泛参与了动物、植物、微生物等的类群分化。然而, 我们对杂交过程中遗传交换的普遍性、存在模式、产生机制的认识还非常有限。当前, 高通量测序技术的飞速发展和基因组学研究技术的普遍应用, 为深入评价遗传交换的普遍性和进化意义提供了前所未有的契机。如何选用恰当的研究技术与策略检验潜在的杂交并评价它的特征, 成为大家普遍面临的问题。本文试图综合来自系统发育和群体遗传等相互关联学科中不同的技术策略, 以当前流行的高通量测序技术为核心, 结合表型和细胞遗传学等多种数据获取和分析手段, 概括不同分析策略的特点, 联系必要的实例研究, 为生物多样性与进化领域的学者提供检测遗传交换的参考。

关键词: 遗传交换; 基因流; 生物多样性; 系统发育; 群体遗传

Approaches used to detect and test hybridization: combining phylogenetic and population genetic analyses

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Abstract: Hybridization among diverging (interspecific or intraspecific) groups involves gene flow and genetic recombination. Increasingly, studies have shown that hybridization, a process of genetic exchanges, occurs widely in the divergence and unity of animals, plants, and microorganisms, and acts as an important mechanism for the formation and maintenance of biological diversity. The rapid development of high-throughput sequencing technology and the widespread application of genome-level techniques provides an unprecedented opportunity for us to further evaluate the universality and evolutionary significance of hybridization. However, selecting appropriate research techniques and strategies to detect the potential hybridization and evaluate its characteristics becomes a common question. In this review, we attempt to synthesize methods from phylogenetics and population genetics of the genomic era to provide biodiversity and evolutionary researchers a practical reference for testing hybridization.

Key words: genetic exchange; gene flow; biodiversity; phylogenetics; population genetics

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