植物诱变育种·农业生物技术

突变率与突变频率的概念及估算

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摘要： 突变率是指单位时间内某种突变发生的几率,可表示为每个位点、每个基因、每个核苷酸或每个配子在每个世代或每次DNA复制时发生突变的几率。突变频率是指群体内发生某种突变的细胞或个体数的比例。突变的鉴定方法可分为表型鉴定和基因型鉴定两大类。基因型鉴定是继表型鉴定以后发展起来的检测突变的新方法。其中,微卫星技术在突变率的估算中得到较广泛的应用,但应用于植物突变率的估算却相对较少。本文以植物突变遗传和育种为例,简述了突变率和突变频率的估算方法,重点介绍了在硬粒小麦、鹰嘴豆、玉米、普通小麦和豌豆等作物中估算微卫星突变率的研究进展。对TILLING技术在突变检测中的应用进行了简要介绍。

关键词： 突变率　突变频率　表型鉴定　基因型鉴定　估算

The Concept and Estimation of Mutation Rate and Mutation Frequency

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Abstract: Mutation rate is the probability that a particular kind of mutation occurs per unit of time which can be expressed as mutations per locus, per gene, per nucleotide, or per gamete in each generation or at each DNA replication. Mutation frequency is the proportion of the number of mutated cell or individual in a population. Mutation can be identified from either phenotype or genotype. Genotypic identification is a new method after phenotypic identification for estimating the mutation rate, in which microsatellites have been widely used for estimation of the mutation rate, but very few data are available in plants. This article summarizes the estimation methods of mutation rate and mutation frequency from the point of view of plant mutation genetics and breeding, especially paying attention to the research advances in estimation methods of microsatellite mutation rate in crops including durum wheat, chickpea, corn, common wheat and pea. Furthermore, the application of TILLING (Targeting Induced Local Lesions IN Genomes) technology in mutation screening is briefly summarized.

Keywords: Mutation rate Mutation frequency Phenotypic identification Genotypic identification Estimation

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