学术讨论

多对独立杂合基因自交群体F_1到F_n基因型熵的变化 规律

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摘要

建立了具有多对独立杂合基因的自交群体的基因型熵的逐代演变数学模型，给出每一世代中各个基因型所占的比例的三叉树算法。揭示出群体的基因型熵与独立杂合基因对数m存在线性关系，与自交代数n存在非线性关系。固定代数n，具有m对独立杂合基因的群体的基因型熵是仅有一对杂合基因的群体的基因型熵的m倍；固定独立杂合基因对数m，群体的基因型熵由F1至F3逐代递增，在F3达到最大值，从F3起逐代递减，最终平衡在基因型熵最小的世代。讨论了这一模型对杂交育种工作的意义。

关键词　　熵　独立分配　随机交配　Hardy-Weinberg平衡　三叉树算法

分类号

Laws of the change in genotype entropy from F1 to Fn for pairs of independent genes of the selfing population

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Abstract

<P>This paper constructs a mathematic model for the change in each generation's genotype entropy of the selfing population with independent heterogenes, and describes a ternary tree algorithm to compute the proportion of every genotype. It reveals a linear relationship between the population genotype entropy and the pairs of independent heterogenes m, and a nonlinear relationship between the population genotype entropy and the ordinal number n of a selfing generation. As n is fixed, the population genotype entropy with m pairs of independent heterogenes is m times as many as that with only one pair. As the pairs of the independent heterogenes m is fixed, the population genotype entropy increases generation after generation from F1 to F3, reaching the maximum value at F3, and decreases generation after generation from F3, reaching equilibrium finally at the generation whose genotype entropy is minimum. In this paper, the significance of crossbreeding is also discussed.</P>

Key words　　entropy　independent assortment　random match　Hardy-Weinberg equilibrium　ternary tree algorithm

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