

长期人工选择对群体遗传结构的影响——一项计算机模拟研究

吴仲贤, 张沅, 杨子恒

北京农业大学畜牧系

收稿日期 修回日期 网络版发布日期 接受日期

摘要 运用数字计算机模拟研究了长期人工选择的反应。考虑了不同的基因作用模型(加性、显性与超显性)、群体含量(小群体 $N_f=N_m=10$, $N_e=20$; 大群体 $N_f=N_m=100$, $N_e=200$)、遗传力水平以及位点间连锁强度等因素共54个组合, 270个群体各49代的选择反应。结果表明, 对于三种基因作用模型, 只有强烈的连锁(相邻位点之间交换率为 $r=0.01$)在小群体中对选择反应有显著影响, 它可以阻碍有利基因的固定, 加速它们的丢失, 从而降低选择反应。中等强度的连锁($r=0.1$)或大群体中的紧密连锁都没有显著的作用。大群体中的选择反应要明显地高于小群体中的, 特别是遗传力低的性状。本文还讨论了不同选择系杂交以获致进一步进展的问题, 讨论了长期选择理论研究结果与实际模拟的偏差。

关键词 [长期选择](#), [选择反应](#), [计算机模拟](#)

分类号

Effects of Longterm Selection on the Genetic Structure of Populations — A Simulation Study I. Simulation Models and Selection Responses

Wu Zhongxian, Zhang Yuan, Yang Ziheng

1. Department of Animal Sciences, Beijing Agricultural University; 2. Department of Animal Sciences, Gansu Agricultural University

Abstract

Monte Carlo method has been utilized to investigate responses to longterm selection. The simulation involves 3 gene effect models (additive, dominant, and over-dominant), two population sizes, three linkage intensities, and three heritability levels, thus making 54 combinations. For each combination, 5 replicate populations are selected over 49 consecutive non-overlapping generations. The results demonstrate that under all the gene effect models, linkage is important only in the case of small populations and intense linkage, when it reduces responses significantly due to hampering the fixation of favourable alleles and accelerating their loss. Linkage has no apparent effect if it is not very tight or if the population is large. Much greater responses are achieved in the large populations than in the small ones, especially for traits with low heritability. Among those discussed are problems of crossing selected lines to obtain extra responses, and discrepancy of some theoretic results on selection limits.

Key words [longterm selection](#) [Responses](#) [Computer simulation](#)

DOI:

通讯作者

扩展功能

本文信息

- ▶ [Supporting info](#)
- ▶ [PDF\(731KB\)](#)
- ▶ [\[HTML全文\]\(0KB\)](#)
- ▶ [参考文献](#)

服务与反馈

- ▶ [把本文推荐给朋友](#)
- ▶ [加入我的书架](#)
- ▶ [加入引用管理器](#)
- ▶ [复制索引](#)
- ▶ [Email Alert](#)
- ▶ [文章反馈](#)
- ▶ [浏览反馈信息](#)

相关信息

- ▶ [本刊中包含“长期选择,选择反应,计算机模拟”的相关文章](#)
- ▶ [本文作者相关文章](#)

- [吴仲贤](#)
- [张沅](#)
- [杨子恒](#)