

# 用R法估计方差组分的原理、方法和应用 Theory, Method and Application of Method R on Estimation of (Co)Variance Components

刘文忠LIU Wen-Zhong

山西农业大学动物科技学院, 太谷 030801 College of Animal Science and Technology, Shanxi Agricultural University, Taigu 030801

收稿日期 修回日期 网络版发布日期 接受日期

## 摘要

综述了R法估计方差组分的原理、方法和应用, 目的是使该方法能够得到合理应用。R法是通过计算全数据集对亚数据集随机效应的回归因子(R)来估计方差组分的。利用一种基于一个变换矩阵的多变量迭代算法, 结合先决条件的共扼梯度法求解混合模型方程组使R法的计算效率大为改善。R法的主要优点是计算成本低, 同时可以得到方差组分估值的抽样误差和近似置信区间。其缺点是对于同样的数据, R法较其他方法的抽样误差大, 而且在小样本中估计值往往有偏。做为一种可选方法, R法可以应用到大数据集的方差组分估计中, 同时应进一步研究其理论特性, 拓宽其应用范围。Abstract: Theory, method and application of Method R on estimation of (co) variance components were reviewed in order to make the method be reasonably used. Estimation requires R values, which are regressions of predicted random effects that are calculated using complete dataset on predicted random effects that are calculated using random subsets of the same data. By using multivariate iteration algorithm based on a transformation matrix, and combining with the preconditioned conjugate gradient to solve the mixed model equations, the computation efficiency of Method R is much improved. Method R is computationally inexpensive, and the sampling errors and approximate credible intervals of estimates can be obtained. Disadvantages of Method R include a larger sampling variance than other methods for the same data, and biased estimates in small datasets. As an alternative method, Method R can be used in larger datasets. It is necessary to study its theoretical properties and broaden its application range further.

关键词 [R法](#) [方差组分](#) [Key words](#) [Method R](#) [\(co\)variance components](#)

分类号

## 扩展功能

### 本文信息

- ▶ [Supporting info](#)
- ▶ [PDF\(0KB\)](#)
- ▶ [\[HTML全文\]\(0KB\)](#)
- ▶ [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“R法”的 相关文章](#)
- ▶ 本文作者相关文章
  - [刘文忠LIU Wen-Zhong](#)

## Abstract

## Key words

DOI:

通讯作者