

研究报告

井冈山森林凋落物分解动态及磷、钾释放速率

李海涛, 于贵瑞, 李家永, 梁涛, 陈永瑞

中国科学院地理科学与资源研究所, 北京 100101

收稿日期 2005-12-31 修回日期 2006-11-23 网络版发布日期 2007-3-21 接受日期

摘要 应用网袋分解法对井冈山地区亚热带常绿阔叶林、针阔叶混交林和高山矮林地上和地下(10 cm)2个分解层的叶凋落物进行了连续2年的分解试验, 测定了凋落物的分解速率以及P、K元素的释放动态. 结果表明: 3种林分叶凋落物残留率与时间呈负指数衰减关系. 各林分凋落物干质量损失前期较快, 第1年末两组平均质量损失率分别为50.6%(常绿阔叶林)、41.7%(针阔叶混交林)和40.13%(高山矮林), 且地上组显著高于地下组; 后期较慢, 至第2年末2组平均质量损失率分别达到60.95%(常绿阔叶林)、57.06%(针阔叶混交林)和56.60%(高山矮林), 均以常绿阔叶林、针阔叶混交林、高山矮林为序递减, 地上组与地下组的差异不显著. 根据Olson指数衰减模型对质量损失率结果进行拟合, 发现3种林分地上凋落物分解95%所需的时间($t_{0.95}$)为6.8~9.9年, 其大小排序为常绿阔叶林<针阔叶混交林<高山矮林. P在不同林分凋落物分解过程中均存在明显的净固持效应, 其强度顺序为高山矮林>针阔叶混交林>常绿阔叶林, 凋落物初始P含量和C/P可能是导致上述情形的原因. K在各林分的多数时间均表现为净释放. 以试验末期的元素释放量计算, P的释放速率在地上组和地下组之间无显著差异, 而K则为地上组显著高于地下组.

关键词 [凋落物](#) [分解速率](#) [磷](#) [钾](#) [养分释放](#)

分类号

Dynamics of litter decomposition and phosphorus and potassium release in Jinggan Mountain region of Jiangxi Province, China.

LI Hai-tao, YU Gui-ru, LI Jia-yong, LIANG Tao, CHEN Yong-ru

Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing 100101, China

Abstract

By using litter bag method, a 2-year experiment was made to study the dynamics of litter decomposition and phosphorus and potassium release of *Castanopsis eyrei*-dominated evergreen broad-leaved forest (EBF), *Pinus taiwanensis*, *Cyclobalanopsis nubium* and *Castanopsis fabri* coniferous and broad-leaved mixed forest (CBF), and *Rhododendron simiarum*-dominated mountainous dwarf forest (MDF) in Jinggan Mountain region of Jiangxi Province, China. In each forest, litter bags were placed on soil surface (aboveground treatment, AG) and at the depth of 10 cm (belowground treatment, BG). An inverse exponential relationship was found between litter decay rate and time for each of the three forests. The average value of the litter mass loss of AG and BG was 50.6% for EBF, 41.7% for CBF, and 40.13% for MDF by the end of first year, and 60.95% for EBF, 57.06% for CBF, and 56.60% for MDF by the end of second year, indicating that the litter decomposition of the forests was faster in first year than in second year. The annual litter loss decreased in the order of EBF>CBF>MDF, and that of AG was significantly higher than that of BG in first year but no significant difference was found in second year. According to the model simulation by Olson's exponential function, it might take 6.8—9.9 years to reach 95% of decay ($t_{0.95}$) for the forests investigated, compared with 8—17 years for warm temperate forests and 2-8 years for south subtropical forests. The $t_{0.95}$ value of the three test forests increased in the order of EBF<CBF with the intensity decreased in the order of MDF>CBF>EBF, which was related to the initial P content and C/P ratio of the litter. As for potassium (K), it was net release in most cases. By the end of the experiment, the release rate of P had little difference between AG and BG, while that of K was significantly higher in AG than in BG.

Key words [litter](#) [decomposition rate](#) [phosphorus](#) [potassium](#) [nutrient release](#)

扩展功能

本文信息

- ▶ [Supporting info](#)
- ▶ [PDF\(1033KB\)](#)
- ▶ [\[HTML全文\]\(0KB\)](#)
- ▶ [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“凋落物” 的相关文章](#)
- ▶ [本文作者相关文章](#)

- [李海涛](#)
- [于贵瑞](#)
- [李家永](#)
- [梁涛](#)
- [陈永瑞](#)

