平成２１年度　環境科学院　修士論文内容の要旨

Determinants on litter decomposition of two early successional species

(遷移初期種二種のリター分解速度規定要因)

北海道大学　大学院環境科学院

環境起学専攻　先駆コース

竹内　史子

Takeuchi Fumiko

Abstract

Litter decomposition is interactively determined by microbial degradation, physical fragmentation and photodegradation, all of which are influenced by temperature, light quality, soil moisture and nutrient availability. Therefore, litter decomposition rates are altered by large disturbances that change the environments, including temperature, moisture and light. To litter decomposition processes are determined after large disturbances, litter decomposition patters on two early successional species, *Rhynchospora alba* and *Moliniopsis japonic*a, were examined in relation to vegetation that determined the environmental factors.

Mass remaining was lowest on bare ground (BG) than *R. alba* sedgeland (RA) and *M. japonica* grassland (MJ). The release patterns of N, C and P from litter differed between vegetation and between species, but did not between litter and peat surfaces. The release was negatively and linearly related to mass remaining in RA and MJ, but was not in BG. These results indicated that litter decomposition in BG was mostly derived from physical degradation. Although δ^{15}N was also related to mass remaining, the relationships were positive on *R. alba* litter and negative on *M. japonica* one. These reverse relationships suggested that the litter decomposition was mostly

conducted by bacterial activities in RA and MJ but had different mechanisms between *R. alba* and *M. japonica*. The environments measured by light, temperature and moisture showed that the higher light penetration, temperatures with fluctuation and moisture characterized RA. Therefore, these mutual effects on litter decomposition should be considered. Total litter supply to MJ was about 4 times higher than that in RA, indicating that the litter accumulation will be accelerated when *M. japonica* grassland replaces from *R. alba* sedgeland.

Keywords: Litter decomposition, nitrogen, phosphorus, microbial activity, photodegradation.