

侧柏与其他树种枯落叶混合分解对养分释放的影响

Impacts of decomposition of mixture of leaf litters from *Platycladus orientalis* and other trees on nutrient release

中文关键词: [侧柏](#) [枯落叶混合分解](#) [养分释放](#)

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中文摘要:

以黄土高原的主要人工林树种侧柏为对象, 通过采集侧柏及其他拟混交的8个树种的当年枯落叶, 以无林荒草地腐殖质层土壤作为分解介质, 在室内将侧柏与不同树种枯落叶剪碎后以一定比例混合装入尼龙网袋并埋入盛土培养钵中, 进行恒温恒湿下连续345 d分解培养试验, 测定分解前后枯落叶质量及养分含量的变化。结果表明: (1) 在枯落叶分解释放养分元素中, K最活跃而易于释出, P一般比较迟钝而难以释出, C、N居中并具有一定的释出同步性, 且各种养分的周转期约为1~2 a。(2) 与侧柏枯落叶混合分解后, 在对C释放的影响中白榆表现为促进作用, 紫穗槐、白桦和辽东栎表现为抑制作用; 在对N释放的影响中小叶杨表现为促进作用, 白桦、辽东栎和紫穗槐表现为抑制作用; 在对P释放的影响中除小叶杨、白榆不明显之外均表现为抑制作用; 在对K释放的影响中白榆表现为促进作用, 紫穗槐表现为抑制作用。(3) 应用主成分分析法分析不同树种枯落叶混合分解对C、N、P、K释放的综合影响结果表明, 与侧柏枯落叶混合分解后总体上促进养分释放的树种以白榆、小叶杨最显著, 其次为柠条和辽东栎; 而总体上抑制养分释放的树种以紫穗槐的作用最强, 白桦、沙棘和刺槐的作用较弱。

英文摘要:

Abstract For this study, *Platycladus orientalis*, a major tree species used in afforestation in the Loess Plateau, was chosen. Leaf litters of the current year were gathered from *P. orientalis* and 8 other tree species that were planned to be planted in mixed forests, and soil from the humus layer (0~20 cm) of a tract of tree-free waste grassland was used as medium, in which litters were to be decomposed. Mixtures of litter from *P. orientalis* with others were shredded and packed into nylon mesh bags according to a set ratio, separately. Then the bags were buried into the soil contained in pots for incubation under a constant temperature and humidity for 345 days on end. The litters were analyzed for quality and nutrient contents before and after the incubation. Results show that 1) among the nutrients released during decomposition of the leaf litters, K was the most active and easy to get released, while P was generally dull and difficult to get released, and C and N was moderate and often synchronous in releasing, and the recycle period of these nutrients was 1 ~ 2 a; 2) leaf litter of *Ulmus pumila* in the mixture acted positively, while that of *Amorpha fruticosa*, *Betula platyphylla* and *Quercus liaotungensis* negatively on C release; leaf litter of *Populus simonii* did positively, while that of *B. platyphylla*, *Q. liaotungensis* and *A. fruticosa* negatively on N release; litters of *P. simonii* and *U. pumila* did positively, while litters from all the other trees negatively on P release; and litter of *U. pumila* did positively, while that of *A. fruticosa* did negatively on K release; 3) the Principal Component Analysis of comprehensive effects of decomposition of various mixtures of leaf litters on releasing of C, N, P and K revealed that leaf litter of *U. pumila* and *P. simonii* in the mixture was the most significant in promoting nutrient release, and litters from *Caragana microphylla* and *Q. liaotungensis* followed, Litter from *A. fruticosa*, followed by litter from *B. platyphylla*, *H. rhamnoides* and *R. pseudoacacia*, showed obvious inhibitive effects on nutrient release.

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