Afforestation with Eucalyptus globulus and leaf litter decomposition in streams of northern Spain

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Abstract:

To test the hypothesis that decomposition of leaf species in streams is influenced by afforestation with Eucalyptus globulus, we compared decay rates, nutrient levels, fungal biomass and macroinvertebrate assemblages on alder and eucalyptus leaf litter in three streams (two headwaters under different forests, and a mid reach) of the Ag?era catchment (northern Spain). Whatever the reach, alder always decomposed significantly faster than eucalyptus. Litter contents in nitrogen and phosphorus rose during breakdown at the mid reach, but not at the headwaters. No differences in fungal biomass were found between alder and eucalyptus leaves at the headwater reaches; however, at the mid reach, eucalyptus showed the highest values. Alder litter, a high quality substratum, was readily colonized by shredders, and decayed rapidly at all sites. Eucalyptus, a low quality species, had lower nutrient contents and was less favoured by shredders. Under high nutrient levels (particularly phosphorus), however, it was readily colonized by fungi, thus shifting from medium to high breakdown rates. The potentially negative impact of afforestation with eucalyptus on streams can thus be reduced in situations of high concentrations of dissolved nutrients.

Keywords: Afforestation; eucalyptus; stream; litter breakdown; fungi; macroinvertebrates; nutrients

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สรุปย่อ : เมื่อเปรียบเทียบการย่อยสลายของใบยูคาลิปตัสกับต้น Alder ในแม่น้ำทางตอนเหนือของ สเปนพบว่าใบของยูคาลิปตัสย่อยสลายได้ช้ากว่า และมีแร่ธาตุอาหารในใบน้อยกว่า