

# Does the riparian stand and age affect ecosystem functioning in streams?

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In riparian restoration projects tree species are often planted in assemblages that diverge from patterns seen in natural communities. This restoration practice may have consequences on the aquatic ecosystem processes as streams obtain energy from leaf litter inputs in the riparian zones. Leaf litter decomposition in streams is a vital ecosystem-level process, which depends on the activity of microorganisms and invertebrates. In the current study we attempted to assess whether leaf age and type of different widespread tree species in the Northwest Portugal, namely oak (*Quercus robur* L.), alder (*Alnus glutinosa* (L.) Gaertn.) and eucalyptus (*Eucalyptus globulus* Labill.) affect ecosystem functioning in streams. Leaf mass loss and fungal biomass and invertebrate biomass and diversity were examined in five mixtures with varied percentage of juvenile and mature leaves of oak, alder and eucalyptus. Our results indicate that leaf age and type had a significant effect on leaf mass loss, fungal biomass, and invertebrate biomass, abundance and diversity. Age class showed a significant effect on the decomposition of alder leaves and the associated fungi and invertebrates, but effects were not evident for other leaf types. This study gives an insight into how changing the diversity and community of riparian forest stand through restoration practices influence the ecosystem process, and may have consequences for future management strategies.

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