Effects of nutrient enrichment and riparian vegetation on litter decomposition in streams

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Anthropogenic impacts, such as nutrient enrichment and changes in riparian vegetation, are raising concern about their impacts on biotic communities and key ecosystem processes in streams. In this work, we examined how eutrophication and changes in riparian vegetation affect litter decomposition and the associated aquatic decomposers. Leaves of five plant species, namely *Alnus glutinosa*, *Castanea sativa*, *Eucalyptus globulus*, *Platanus* sp. and *Quercus robur*, were placed in coarse-mesh bags and immersed in seven low-order streams along a gradient of eutrophication (from 0.16 to 3.37 mg L^{-1} of $N\text{-}NO_3$ and 0.003 to 0.27 mg L^{-1} of $P\text{-}PO_4$) during 38 days. Leaf mass loss, diversity of benthic invertebrates, and diversity and reproduction of aquatic fungi were assessed. Litter decomposition increased along the gradient of eutrophication defined by increasing levels of nitrates, particularly in fast decomposing plant species. Decomposition was faster for *A. glutinosa* (from 31.5 to 86.2%) and slower for *Platanus* sp. (from 20.0 to 44.0%). Both invertebrate and fungal assemblages discriminated litter species and streams according to the level of eutrophication. Moreover, aquatic fungal reproduction decreased with eutrophication. Overall, decomposition of leaf litter and the associated fungi and invertebrates gave reliable measures for assessing anthropogenic impacts in streams.

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