

## Structural and functional measures of invertebrate and fungal communities as predictors of eutrophication

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To assess how eutrophication affects leaf-litter decomposition and the associated biota in streams, we examined i) the structure of invertebrate and fungal communities and ii) leaf mass loss of different plant species. Leaves of alder, chestnut, eucalyptus, plane tree and oak were placed in coarse-mesh bags and immersed in 6 low-order streams along an eutrophication gradient during 38 days. Additional benthic invertebrate samples were collected with a hand-net. The values of the IBMWP biotic index applied to benthic invertebrates increased from low to intermediate levels of eutrophication and then dropped sharply at high and very high levels of eutrophication. Cluster analysis applied to leaf-associated invertebrate and fungal communities separated the streams according to the eutrophication level. The % of shredders on leaves decreased, whereas the % of oligochaetes increased along the eutrophication gradient. Invertebrate biomass and density, as well as fungal biomass and reproduction increased along the eutrophication gradient, but decreased in the most eutrophic stream. Alder leaves decomposed faster than other leaf species. A hump-shaped relationship was established between leaf mass loss and the eutrophication gradient for all leaf species, suggesting that leaf decomposition is a valuable tool to assess changes in stream water quality. Results suggested that both structural and functional measures of invertebrate and fungal communities are good predictors of stream eutrophication when assessing the ecological integrity of streams.

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