

## Abstract

In shallow, rocky-bottomed river systems in Nova Scotia, Canada, decomposition rates of autumn-fallen red maple (*Acer rubrum*) and speckled alder (*Alnus incana*) leaf litter were determined in spring and early summer using litter bags. In most shaded upstream tributaries, decomposition followed a typical exponential curve ( $k = -0.013$  to  $-0.032 \text{ day}^{-1}$ ). In unshaded, downstream reaches, and sometimes in low-order tributaries, decomposition was often exceptionally rapid ( $2\text{--}5\% \text{ day}^{-1}$ ) and followed a linear pattern, associated with dense congregations of the caddisfly *Lepidostoma togatum*. Linear mass loss persisted until litter bags were empty, after 35–50 days. Colonization of litter bags by *L. togatum* was advanced after one week, and peak densities (40–120 animals/bag) could be reached in 2–3 wk. In a feeding experiment, alder litter in fine mesh litter bags containing 30 *L. togatum* larvae lost  $\sim 2.1\%$  mass  $\text{day}^{-1}$ , compared with only  $0.1\% \text{ day}^{-1}$  without *L. togatum*. The *L. togatum* congregations were a distinctly seasonal phenomenon, beginning in early June and ending in mid-July when the last of the larvae (one or two cohorts) pupated. Severe resource limitation among detritivores in these degraded river systems apparently leads to dense colonization of added litter and extremely fast, shredder-mediated decomposition.