
Phenotypic correlates of resource uptake rate in a population of litter-feeding detritivore

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Abstract

Ecological theory and empirical evidence indicate that intraspecific trait variability is important in mediating community assembly processes and the biotic control over the functioning of ecosystems. Resource uptake rate is an ecologically relevant trait that regulates trophic energy transfers and varies with individual metabolic rate and the interplay between behavioral and morphological traits of consumers. Here we assessed the extent of intraspecific trait variation and covariation in a species of litter-feeding detritivores. The stream detritivore *Gammarus fossarum* (Koch) was used as a model species in a laboratory feeding experiment. Litter consumption rate, pleopod beat rate (a proxy of mass-specific basal metabolic rate), foraging behavior, locomotion activity and mouthpart morphology were assessed on a total of 78 individuals, including 39 males and 39 females of varying body size. Most traits exhibited high levels of inter-individual variation which was consistent over time. Litter consumption rate correlates with locomotion activity, pleopod beat rate and indices of mouthpart shape. Our findings indicate that all individuals do not contribute equally to an ecosystem function and this intraspecific difference in functional trait may be driven by a suite of physiological, morphological, and behavioral traits known to display strong spatial and temporal variability.

Keywords: Phenotypic variability, Interindividual variation, Behavior, Morphological shape, Resting Metabolism, Ressource uptake, Litter consumption

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