

Evolutionary change in metabolic rate of *Daphnia pulex* following invasion by the predator *Bythotrephes longimanus*

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Abstract

Metabolic rate is a trait that may evolve in response to the direct and indirect effects of predator-induced mortality. Predators may indirectly alter selection by lowering prey densities and increasing resource availability or by intensifying resource limitation through changes in prey behaviour (e.g. use of less productive areas). In the current study we quantify evolution of metabolic rate in the zooplankton *Daphnia pulex* following an invasive event by the predator *Bythotrephes longimanus* in Lake Mendota, Wisconsin, US. This invasion has been shown to dramatically impact *D. pulex*, causing a ~60% decline in their biomass. Using a resurrection ecology approach, we compared the metabolic rate of *D. pulex* clones originating from prior to the *Bythotrephes* invasion with that of clones having evolved in the presence of *Bythotrephes*. We observed a 7.4% reduction in metabolic rate among post-invasive clones compared to pre-invasive clones, and discuss the potential roles of direct and indirect selection in driving this change.

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