

George Mercer Award



The Mercer Award is the oldest of the awards granted by the ESA. It is given in memory of a young British ecologist who was killed in action in World War I. The award is given to an author under 40 years of age in recognition of a single outstanding paper in ecology published during the past two years.

The winners of the 2010 Mercer Award are **Meghan Duffy** and **Spencer Hall** for their paper,

"Selective predation and rapid evolution can jointly dampen effects of parasites on Daphnia populations," published in *American Naturalist* in 2008.

In this paper, Duffy and Hall elegantly couple observations on the natural population dynamics of a *Daphnia* host-parasite system with mathematical modeling to show that rapid evolution and selective fish predation can explain why two parasites have very different effects on their host. Their work addresses an apparent paradox in the host parasite literature. Many parasites are known to be highly virulent to host individuals and theory shows that such parasites should strongly regulate host populations. However, such regulation is uncommonly observed in nature. Duffy and Hall took a comparative approach to this problem, contrasting the effects of a bacterial and fungal parasite. Empirical work showed that both parasites were highly virulent to individual hosts, but only outbreaks of the bacterium influenced *Daphnia* population dynamics in natural lakes. The authors then used models parameterized with field data to explore why the virulent fungal parasite had little influence on *Daphnia* populations. Results showed that the combined effects of selective fish predation on infected hosts and rapid evolution of virulence, both of which the authors document in their system, could prevent the parasite from regulating host population dynamics.

This paper is a model for the tremendous insights that can be gained by combining field-parameterized mathematical models with careful empirical work. The authors' study not only provides a resolution to the paradox of virulent parasites with little impact on host populations, but also communicates two broad and fundamental messages for ecology. First, that evolution occurring on ecological timescales can alter the course of species interactions, and second, that embedding parasites within food webs is essential to fully understand food web dynamics.