

Host polymorphism in *Daphnia* epidemics

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Abstract

In many disease systems, it has been observed that focal host strains characterized by various life-history traits can coexist. These are often competing for resources and interacting with pathogens and predators. To study such interactions we focus on the zooplankter *Daphnia dentifera*, commonly known as “water flea”, which experiences epidemics of the fungus *Metschnikowia bicuspidata*. To integrate the role of *Daphnia* as consumers, competitors and hosts, we develop an ODE system and analyze its dynamics. Specifically, we focus on two strains, the wild host and the invader. We use the theory of adaptive dynamics to describe the long term evolution of the population by considering small mutations. In this talk, we derive an expression for their growth rate using a standard linear stability analysis and adaptive dynamics approach and determine conditions that allow polymorphisms to occur in our system.

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