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How weak competition can affect the persistence of species in a Lotka-Volterra reaction-diffusion system

Lotka-Volterra systems describing two species competing for resources in heterogeneous environments have been widely studied in the context of random diffusion. One of the most striking results states that, when two species undergoing random diffusion are identical in all parameters except for their diffusion rates, the slower diffuser wins the competition. However, the introduction of directed dispersal into reaction-diffusion models can drastically change this outcome. In particular, there exist dispersal strategies, known as evolutionarily stable strategies, that allow a species adopting them to resist invasion by competing species following any other dispersal profile. In this presentation, I explore how species adopting an evolutionarily stable dispersal strategy can still be driven to extinction when interspecific competition is weaker than, but close to, intraspecific competition.