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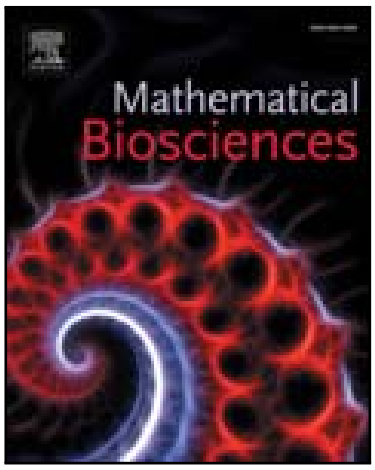

Evolutionary stability of ideal free dispersal under spatial heterogeneity and time periodicity

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Highlights

- We find a dispersal strategy that will produce an ideal free distribution in a logistic reaction-diffusion-advection model for population dynamics with dispersal in an environment that is variable in space and periodic in time, where the total amount of a resource in the environment is fixed but the location of the resource can move periodically.
- We show that in the class of strategies we consider the one that can produce an ideal free distribution is both evolutionarily stable and is a neighborhood invader strategy with respect to strategies that do not produce an ideal free distribution.
- In temporally periodic and spatially varying environments, achieving an ideal free distribution requires the use of nonlocal information. This is in contrast with the case of environments that are variable in space but constant in time, where an ideal free distribution can be achieved by using purely local information.

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