Steady states and Hopf bifurcation of a diffusive predator-prey model with prey harvesting and prey-taxis

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Abstract

This paper is concerned with a predator-prey model with prey-taxis and linear prey harvesting under the homogeneous Neumann boundary condition. The stability of the unique positive constant solution of the predator-prey model without prey-taxis is derived. Also, the emergence of Hopf bifurcation is concluded by choosing the proper Hopf bifurcation parameters. Moreover, the existence of non-constant positive steady states is investigated by the introduce of prey-taxis. The conclusions show that prey harvesting and prey-taxis can enrich the dynamics.

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