DYNAMICS OF A 3-SPECIES FOOD CHAIN SYSTEM WITH TIME DELAYS

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ABSTRACT

In this paper, we study the global stability in a time-delay reaction-diffusion system which models the dynamics of three-species food-chain interactions in ecology. The existence of global solutions and multiplicity of stead state solutions of the system are established. A condition on the interaction rates is given to ensure permanence of all species in the food chain. It is also shown that the time delays are harmless for the permanence effect in this model. Numerical simulations of the food-chain models with or without time delays are also given to demonstrate and compare dynamical behavior of the species.