

1138-92-135

Qingyan Shi* (shiqingyan3@163.com), 1449 N Mount Vernon Ave.A, Williamsburg, VA 23185, and **Junping Shi** and **Yongli Song**. *Hopf bifurcation and pattern formation in a delayed diffusive logistic model with spatial heterogeneity.*

Logistic differential equation models have been used to describe the growth and dispersal of population, and a time delay is often incorporated into the model because of the maturation time for reproduction or other biological process. When the resource function in the model is spatially homogeneous, the dynamics of the model has been thoroughly known: a large time delay will destabilize the constant equilibrium and temporal oscillations can be observed. Here, we study the dynamics of a delayed diffusive logistic model with spatially heterogeneous resource supply under Neumann boundary condition. It is shown that for large diffusion coefficient, a supercritical Hopf bifurcation occurs near the non-homogeneous positive steady state at a critical time delay value, and the dependence of corresponding spatiotemporal patterns on the heterogeneous resource function is demonstrated via numerical simulations. Moreover, it is proved that the heterogeneous resource supply contributes to the increase of the temporal average of total biomass of the population even though the total biomass oscillates periodically in time. (Received February 07, 2018)