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Original Articles

竞争模型中三阶微分方程的Hopf分枝和平衡分析

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摘要 In this paper,a mathematical model of competition between plasmid-bearing and plasmidfree organisms in a chemostat with an inhibitor is investigated.The model is in the form of a system of nonlinear differential equations.By using qualitative methods,the conditions for the existence and local stability of the equilibria are obtained.The existence and stability of periodic solutions of the Hopf type are studied.Numerical simulations about the Hopf bifurcation value and Hopf limit cycle are also given.

关键词 竞争模型 局部稳定性

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Hopf bifurcation and analysis of equilibrium for a third-order differential equation in a model of competition

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Abstract In this paper,a mathematical model of competition between plasmid-bearing and plasmidfree organisms in a chemostat with an inhibitor is investigated.The model is in the form of a system of nonlinear differential equations.By using qualitative methods,the conditions for the existence and local stability of the equilibria are obtained.The existence and stability of periodic solutions of the Hopf type are studied.Numerical simulations about the Hopf bifurcation value and Hopf limit cycle are also given.

Key words model stability solution periodic solution branch Hopf bifurcation

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