Controlling chaotic dynamics of a continuous ecological model

Abstract

In this paper a technique of controlling chaotic behavior of a three species food chain model with Sokol-Howell functional response by involving intraspecific competition is discussed. The model is proved to be dissipative in the positive octant. Controlling conditions of chaotic behavior of the system are carried out. Stability analysis of the equilibrium points is analyzed. Lyaponuv exponents and bifurcation diagrams are used to study the complex dynamics of the model. The impact of the intraspecific competition in the dynamics of the foodchain model with Sokol-Howell response is investigated theoretically as well as numerically.

Keyword: Bifurcation diagram; Chaotic; Period doubling; Sokol-Howell response