

Complex dynamics of a discrete-time prey-predator system with Allee effect

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Abstract

In this paper, we investigate the stability and bifurcation of a discrete-time prey-predator system which is subject to an Allee effect on prey population. It is concluded that the system undergoes flip and Neimark- Sacker bifurcations in a small neighborhood of the unique positive fixed point which depends on the number of prey-predator. The chaotic behavior that emerges with Neimark-Sacker bifurcation is controlled by the OGY method and hybrid control method. Moreover, the numerical simulations are done to demonstrate the theoretical results.

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