Controlling chaos of the Ricker population model

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Abstract

For certain parameters, a class of density dependent Leslie population model has a chaotic attractor. The chaotic dynamics of the Ricker mapping is studied. Control parameter is perturbed slightly depending times by the improvement of OGY. By the pole placement technique of the linear control theory, when the mapping point wanders to the neighborhood of the periodic point, the control parameter is perturbed. The chaotic motion are controlled on the stable periodic period-1 point and period-2 orbits, and the influence of different control parameter ranges on the control average time is analyzed. When the selected regulator poles are different, the number of iterations used to control chaotic motion on a stable periodic orbit is difference. Numerical simulations are presented to illustrate our results with the theoretical analysis and show the effect of the control method. The analysis and results in this paper are interesting in mathematics and biology.

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