A Discrete-time Holling Type II Model with Allee and Refuge Effects

Unal Ufuktepe[1], Burcin Kulahcioglu[2]

[1] *American University of the Middle East, Kuwait*
Unal.Ufuktepe@aum.edu.kw
[2] *Izmir University of Economics, Department of Mathematics, Turkey*

burcinkulahcioglu@izmirekonomi.edu.tr

Abstract: A discrete-time Holling type II prey-predator model with Allee and the refuge effects is formulated and studied. The existence of the positive equilibrium and Its stability are investigated for both hyperbolic and non hyperbolic cases. Numerical simulations are conducted to demonstrate the theoretical results.

REFERENCES

[1] Hui Cao, Z.Yue, and Y.Zhou, *The stability and bifurcation analysis of a discrete Holling-Tanner model*, Advances in Difference Equations, 2013:330, (2013) p 1–17.

[2] S.B. Hsu, T.W. Hwang, *Global stability for a class predator–prey system*, SIAM J. Appl. Math. 55 (1995) 763–783.

[3] N. Kasarinoff, P. van der Deiesch, *A model of predator–prey system with functional response*, Math. Biosci. 39 (1978) 124–134.

[4] S. Ruan, D. Xiao, *Global analysis in a predator–prey system with nonmonotonic functional response*, SIAM J. Appl. Math. 61 (2001) 1445–1472.

[5] J. Hainzl, *Stability and Hopf bifurcation a predator–prey system with several parameters*, SIAM J. Appl. Math. 48 (1988) 170–180.

[6] H.N. Agiza, E.M. ELabbasy, H. EL-Metwally, A.A. Elsadany, *Chaotic dynamics of a discrete prey–predator model with Holling type II*,Nonlinear Analysis: Real World Applications 10 (2009) 116–129