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A necessary and sufficient condition for permanence of a Lotka-Volterra discrete system with delays. (English) Zbl 0976.92031

J. Math. Anal. Appl. 256, No. 1, 162-174 (2001).

Summary: We consider the permanence of the following Lotka-Volterra discrete competition system with delays k_1, k_2, l_1, and l_2:

$$x(n+1) = x(n)\exp\{r_1[1 - x(n-k_1) - \mu_1 y(n-k_2)]\},$$
$$y(n+1) = y(n)\exp\{r_2[1 - \mu_2 x(n-l_1) - y(n-l_2)]\}.$$

We show the system is permanent for all nonnegative integers k_1, k_2, l_1 and l_2, if and only if $\mu_1 < 1$ and $\mu_2 < 1$.

MSC:

92D40	Ecology
39A11	Stability of difference equations (MSC2000)
39A10	Additive difference equations
39A12	Discrete version of topics in analysis

Keywords:

Lotka-Volterra systems; permanence

Full Text: DOI

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