

Beretta, Edoardo; Kuang, Yang

Global analysis in some delayed ratio-dependent predator-prey systems. (English)

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This paper contains the boundedness of solutions, permanence, and the global stability of the boundary equilibrium $(k, 0)$ for the following delayed systems:

$$\begin{cases} x' = ax(1 - \frac{x}{k}) - cxy/(my + x), \\ y' = y(-d + fx(t - \tau)/(my(t - \tau) + x(t - \tau))); \end{cases} \quad (1)$$

$$\begin{cases} x' = ax(1 - \frac{x}{k}) - cv(x)y, \\ y' = dy(1 - fy(t - \tau)/x(t - \tau)). \end{cases} \quad (2)$$

Sufficient conditions are included for the positive equilibrium (when it exists) of system (1) to be globally asymptotically stable. The authors obtain an explicitly expressed region of attraction for the positive equilibrium of system (2) under suitable assumptions. The paper ends with a brief discussion which includes local stability results for the positive equilibrium of system (1) and (2).

Reviewer: [R.S.Dahiya \(Ames\)](#)

MSC:

[34K12](#) Growth, boundedness, comparison of solutions to functional-differential equations

[92D25](#) Population dynamics (general)

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[boundedness of solutions](#); [permanence](#); [global stability of boundary equilibrium](#); [positive equilibrium](#)

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