

Global bifurcation and structure of stationary patterns of a diffusive system of plant-herbivore interactions with toxin-determined functional responses

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Abstract

In this paper, a homogeneous diffusive system of plant-herbivore interactions with toxin-determined functional responses is considered. We are mainly interested in studying the existence of global steady state bifurcations of the diffusive system. In particular, we also consider the case when the bifurcation parameter, one of the diffusion rates, tends to infinity. The corresponding system is called shadow system. By using time-mapping methods, we can show the existence of the positive non-constant steady state solutions. The results tend to describe the mechanism of the spatial pattern formations for this particular system of plant-herbivore interactions.

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