

Intra- and inter-specific competitions between stage-structured species in a patchy environment

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Abstract

Creatures have varied ability in their different life stages to compete for resource, space or mating, so that separating a population by life stages is an important baseline in describing an ecological population. In addition, behaviors of creatures (like competition between species and their life regulation) and the interact of species with environment (for example, dispersal according to the spatial heterogeneity of a habitat) are both considerable features to construct mathematical models. Based on the considerations, a model with two lifestages, immature and mature, and incorporating both intra- and inter-competitions between two species is explored to study invasion of species in a two-patch environment. The monotone dynamics in such a model provides us a property to explore its local and global dynamics. This is a joint work with Prof. Chih-Wen Shih and Dr. Kuang-Hui Lin.