Permanence And Existence Of A Positive Periodic Solution To A Periodic Stage-Structured System With In Infinite Delay

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Summary

In this paper we consider a periodic non-autonomous competitive stage-structured system with infinite delay for the interaction between n species, the adult members of which are in competition. For each of the n species the model incorporates a time delay which represents the time from birth to maturity of that species. Infinite delay is introduced which denotes the influential effect of the entire past history of the system on the current competition interactions. We first prove by using the comparison principle that if the growth rates are sufficiently large then the solutions are uniformly permanent. Then by using Horn's fixed point Theorem, we show that the system with finite delay has a positive periodic solution. As a consequence of this result, we prove that even the system with infinite delay admits a positive periodic solution. (c) 2008 Elsevier Inc. All rights reserved.

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