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**Positive periodic solutions for an integrodifferential model of mutualism.** (English)

Zbl 0981.45002

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The paper deals with a system of two nonlinear integro-differential equations of first order which presents a model of mutualism. The ecological meaning of such type systems may be found in the book by *K. Gopalsamy* [Stability and oscillations in delay differential equations of population dynamics (1992; Zbl 0752.34039)]. Sufficient conditions are given for the existence of at least one positive periodic solution of the system under consideration. The proof is based on the continuation theorem on the existence of at least one solution of the operator equation with Fredholm operator of index zero; in this connection see the book by *R. E. Gaines* and *J. L. Mawhin* [Coincidence degree and nonlinear differential equations (1977; Zbl 0339.47031)].

Reviewer: [Anatoliy Aleksandrovich Kilbas \(Minsk\)](#)

**MSC:**

[45J05](#) Integro-ordinary differential equations  
[45M15](#) Periodic solutions of integral equations  
[45M20](#) Positive solutions of integral equations  
[92D25](#) Population dynamics (general)  
[45G15](#) Systems of nonlinear integral equations  
[92D40](#) Ecology

Cited in 17 Documents

**Keywords:**

[nonlinear integro-differential equations](#); [positive periodic solution](#); [continuation theorem](#); [mutualism](#); [Fredholm operator](#)

**Full Text:** [DOI](#)

**References:**

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- [6] Gopalsamy, K., *Stability and oscillations in delay differential equations of population dynamics*, (1992), Kluwer Academic Boston · [Zbl 0752.34039](#)
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