

论文

多种群生态时滞系统正周期解的全局吸引性

湖南师范大学数学系; 湖南大学应用数学系

摘要:

利用比较定理结合 Liapunov 泛函, 讨论一类具有多个周期时滞的多种群生态竞争-捕食系统正周期解的存在性和全局吸引性.

最后, 利用一致持久性理论, 讨论捕食-食饵系统正周期解存在的充要条件.

关键词: 比较定理 竞争 捕食系统 全局吸引性

分类号:

34C25; 34K15; 92D25

Attractivity of Positive Periodic Solution of Multispecies Ecological Delay System

Abstract:

In this paper, by means of comparison theorem and Liapunov functionals, the authors consider the global attractivity of positive periodic solution of multispecies ecological competition-predator system with several periodic delays. Finally, by using persistence theory, the sufficient and necessary conditions of positive periodic solutions are obtained for predator-prey delay systems.

Keywords: Comparison theorem Competition predator system Global attractivity.

收稿日期 修回日期 网络版发布日期

DOI:

基金项目:

国家自然科学基金(A0324623; 10271044)资助

通讯作者:

作者简介:

参考文献:

[1] Wu J H, Zhao X Q, He X Z. Global asymptotic behavior in almost periodic Kolmogorov equations and chemostat models. *Nonlin World*, 1996, 3: 589-611

[2] Teng Z D, Chen L S. The positive periodic solutions of periodic Kolmogorove type systems with delays. *Acta Mathematicae Applicatae Sinica*, 1999, 22: 446-456

[3] 范猛, 王克. 多种群生态竞争系统周期正解的存在性和全局吸引性. *数学学报*, 2000, 43(1): 77-82

[4] Lansun C. *Mathematical Models and Methods in Ecology*. Beijing: Science Press, 1988(in Chinese)

[5] de Mottoni P, Schiaffino A. Competition system with periodic coefficient: A geometric approach. *J*

扩展功能

本文信息

- ▶ Supporting info
- ▶ PDF(422KB)
- ▶ [HTML全文]
- ▶ 参考文献

服务与反馈

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ 引用本文
- ▶ Email Alert
- ▶ 文章反馈
- ▶ 浏览反馈信息

本文关键词相关文章

- ▶ 比较定理
- ▶ 竞争-捕食系统
- ▶ 全局吸引性

本文作者相关文章

- ▶ 文贤章
- ▶ 王志成

PubMed

- ▶ Article by Wen, X. Z.
- ▶ Article by Wang, Z. C.

[6]Cushing J M. Two species competition in a periodic environment. J Math Biol, 1980, 10: 385-400

[7] Cushing J M. Periodic Lotka Volterra competition equations. J Math Biol, 1986, 24: 381-403

[8]Ahmad S. On almost periodic solutions of the competing species problems. Proc Amer Math Soc, 1988, 102: 855-865

[9]Ahmad S. On the nonautonomous Volterra Lotka competition equations. Proc Amer Math Soc, 1993, 117: 199-204

[10]Gopalsamy K. Global asymptotic stability in a almost periodic Lotka Volterra system. J Austral Math Soc(Ser B), 1986, 28: 346-360

[11]Gopalsamy K. Global asymptotic stability in a periodic Lotka Volterrasystem. J Austral Math Soc (Ser B), 1985, 27: 66-72

[12]Ivarz C, Lazer A C. An application of topological degree to the periodic competing species problem. J Austral Math Soc Ser B, 1986, 28: 202-21

[13] 马知恩. 种群生态学的数学建模与研究. 合肥: 安徽科技出版社, 1996

[14] 文贤章. 多种群生态捕食 食饵时滞系统正周期解的全局吸引力. 数学学报, 2002, 45(1): 83-92

[15]Yang P H, Xu R. Global attractivity of the periodic Lotka Volterra system. J Math Anal Appl, 1999, 233: 221-232

[16]Hale J K. Asymptotic behavior of dissipative system. Math Surveys Monographs 25. Amer Math Soc, Rhode Island: Providence, 1988

[17 ]Zhao X Q. Uniform persistence and periodic coexistence states in infinite dimensional periodic semiflows with applications. Canadian Applied Mathematics Quarterly, 1995, 3(4): 473-495

本刊中的类似文章

1. 朱波; 韩宝燕.非Lipschitz条件下的倒向重随机微分方程[J]. 数学物理学报, 2008,28(5): 977-984
2. 郭子君; 吴让泉.正倒向随机微分方程解的比较定理[J]. 数学物理学报, 2007,27(2): 368-373
3. 魏刚;吴臻.随机递归最优控制和混合最优控制问题[J]. 数学物理学报, 2007,27(5): 811-818
4. 韦忠礼.次线性奇异三点边值问题的正解[J]. 数学物理学报, 2008,28(1): 174-182
5. 傅希林, 王克宁, 劳会学.脉冲摄动微分系统的有界性[J]. 数学物理学报, 2004,24(2): 135-143

文章评论 (请注意:本站实行文责自负, 请不要发表与学术无关的内容!评论内容不代表本站观点.)

反 馈 人	<input type="text"/>	邮箱地址	<input type="text"/>
反 馈 标 题	<input type="text"/>	验证码	<input type="text" value="4729"/>