

## CONTENTS

## Research Articles

- Asymptotic dynamics of a modified discrete Leslie–Gower competition system 1750076  
*Y. Chow and S. R.-J. Jang*
- On a non-autonomous reaction–convection diffusion model to study the bacteria distribution in a river 1750077  
*I. M. Mostefaoui and A. Moussaoui*
- Wright–Fisher-like models with constant population size on average 1750078  
*N. Grosjean and T. Huillet*
- Bifurcation and spatiotemporal patterns of a density-dependent predator–prey model with Crowley–Martin functional response 1750079  
*M. Sivakumar, K. Balachandran and K. Karupiah*
- Application of homotopy perturbation method to solve two models of delay differential equation systems 1750080  
*Ş. Yüzbaşı and M. Karaçayır*
- A spatial echinococcosis transmission model with time delays: Stability and traveling waves 1750081  
*Z. Xu and C. Ai*
- Parameter uncertainty in biomathematical model described by one-prey two-predator system with mutualism 1750082  
*D. Pal, G. S. Mahapatra and G. P. Samanta*
- An age-structured model of the human papillomavirus dynamics and optimal vaccine control 1750083  
*M. Al-Arydah and T. Malik*

(Continued)

Covered in Science Citation Index Expanded (also known as SciSearch®), Journal Citation Reports/Science Edition, Biological Abstracts, BIOSIS Previews

# CONTENTS — (Continued)

A model of cholera transmission with hyperinfectivity and its optimal vaccination control <i>C. Modnak</i>	1750084
Mathematical and computational analysis of CRISPR Cas9 sgRNA off-target homologies <i>M. Zhou, D. Li, X. Huan, J. Manthey, E. Lioutikova and H. Zhou</i>	1750085
Traveling wave solutions for a diffusive predator-prey model with predator saturation and competition <i>L. Zhu and S.-L. Wu</i>	1750086
Comparison between chikungunya and dengue viruses transmission based on a mathematical model <i>H. M. Yang</i>	1750087
Modeling the effects of cross-protection control in plant disease with seasonality <i>S. Gao, L. Xia, J. Wang and Z. Zhang</i>	1750088
Dynamics and bifurcations of a host-parasite model <i>A. Atabaigi and M. H. Akrami</i>	1750089
Stability and ergodicity of a stochastic Gilpin-Ayala model under regime switching on patches <i>A. Settati and A. Lahrouz</i>	1750090

International Journal of Biomathematics  
Vol. 10, No. 6 (2017) 1750076 (23 pages)  
© World Scientific Publishing Company  
DOI: 10.1142/S1793524517500760

Asymptotic d  
Leslie-G

Institute o

Departme  
Texas Tech Univ

We propose a modified discrete-time model to study competition outcomes. A new parameter that measures intraspecific competition in a population, either one or both populations, is introduced. The system can have up to four coexisting equilibria. For different competitive maps, it is shown that the outcomes then depend not only on the initial population distributions.

**Keywords:** Competition; saddle point

**Mathematics Subject Classification:** 35B44, 35B45, 35B46, 35B47, 35B48, 35B49, 35B50, 35B51, 35B52, 35B53, 35B54, 35B55, 35B56, 35B57, 35B58, 35B59, 35B60, 35B61, 35B62, 35B63, 35B64, 35B65, 35B66, 35B67, 35B68, 35B69, 35B70, 35B71, 35B72, 35B73, 35B74, 35B75, 35B76, 35B77, 35B78, 35B79, 35B80, 35B81, 35B82, 35B83, 35B84, 35B85, 35B86, 35B87, 35B88, 35B89, 35B90, 35B91, 35B92, 35B93, 35B94, 35B95, 35B96, 35B97, 35B98, 35B99

## 1. Introduction

Discrete-time models of different populations with non-overlapping generations are the two well-known examples in population dynamics [2]. Although the Beverton-Holt model is a decreasing function of the population, the logistic model is a decreasing function of the population while the Beverton-Holt model is an increasing function of the population. The logistic model possesses only simple equilibrium points.

Based on these two classic models, we developed to model population dynamics.