Non-autonomous periodic systems with Allee effect

Rafael Luís*

Center for Mathematical Analysis, Geometry, and Dynamical Systems
Instituto Superior Técnico, Technical University of Lisbon
Lisbon, Portugal
rafaelluis@netmadeira.com
http://members.netmadeira.com/rafaelluis/

*Joint work with Saber Elaydi and Henrique Oliveira

In this work we introduce a new class of maps, called unimodal Allee maps (UAM). These maps arise in the study of population dynamics in which the system has three fixed points, a stable zero fixed point, an unstable positive fixed point (Allee point) and a stable positive fixed point (carrying capacity). We analyse the properties of the Allee points and the carrying capacity and establish their stability, for non-autonomous periodic systems formed by unimodal Allee maps.

Keys Words: Allee effect, Unimodal Allee maps, Allee point, Carrying capacity, Composition map, Stability, Domain of attraction.

References and Literature for Further Reading

[1] Saber Elaydi, Discrete Chaos, *Chapman and Hall/CRC*, Second Edition (2008).

[2] Saber Elaydi, An Introduction to Difference Equations, *Springer* third Edition (2005).

[3] J. Li, B. Song, X. Wang, An extended discrete Ricker population model with Allee effects, *Journal of Difference Equations and Applications*, 13, 4 (2007), 309-321.

[4] Rafael Luís, Saber Elaydi and Henrique Oliveira, An economic model with Allee effect, *Journal of Difference Equations and Applications*, Submitted, (2008).