

Dynamics of some delay logistic equations

Gergely Röst¹

¹*University of Oxford, UK (e-mail: rost@math.u-szeged.hu)*

The delay logistic equation, originating from Hutchinson, has played a crucial role in the theory of nonlinear delay differential equations, inspiring the development of a variety of techniques. However, the equation has received criticisms from biological modellers due to the lack of a mechanistic derivation.

In the talk we present a new delay logistic equation with clear biological underpinning from cell population dynamics. We give a global analysis of the equation showing global convergence to the positive equilibrium.

However, there exist very long transients with oscillatory patterns of various shapes. We also show that if we add an instantaneous positive feedback term to the classical delay logistic equation, then local stability does not imply global stability so a Wright-type conjecture is not valid any more.