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On stability and asymptotics of equations and systems of population dynamics with concentrated and distributed delays

Many differential equations of mathematical biology assume delayed production process and the instantaneous mortality. It is well known that introduction of delay can destroy stability of the unique positive equilibrium and even lead to chaos. However, for some types of equations and systems, lags in the reproduction term do not change stability properties. Consideration of variable, unbounded and distributed delays emphasizes robustness of this 'absolute stability' property.

Some interesting phenomena are observed in equations of population dynamics when the production part includes two different delays. We also consider Hutchinson and Mackey-Glass equations a controlled with a term whose variable coefficient can change its sign.