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Logistic approximations and their consequences for bifurcations patterns and long-run dynamical behavior

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ABSTRACT

On infinitesimally short time interval various processes contributing to population change tend to operate independently so that we can simply add their contributions (Metz and Diekmann (1986)). This is one of the cornerstones for differential equations modeling in general. Complicated models for processes interacting in a complex manner may be built up, and not only in population dynamics. The principle holds as long as the various contributions are taken into account exactly. In this paper we discuss commonly used approximations that may lead to dependency terms affecting the long run qualitative behavior of the involved equations. We prove that these terms do not produce such effects in the simplest and most interesting biological case, but the general case is left open.

References

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