Reproduction in a Randomly Varying Environment: Lyapunov exponents

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Abstract:

Linear population dynamics in a stochastic environment involves an infinite product of non-commuting matrices. Following Metz et al. ((TEE 7 (6), 198-202, 1992), fitness can be measured by the Lyapunov exponent of that product. In some cases, an extreme event with low probability, correspond to a singular matrix, and the Lyapunov exponent can then be calculated in closed form. A toy model in plant biology is given. In passing, we have the nerve to present some speculations about 'financial biology'.