

**Evolution of optimal life history with stochastic growth process
in age-size structured model**

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Abstract

Environmental stochasticities are one of the important factors for the life history because it is closely related to subsistence of species.

In my presentation, we focus on the stochasticity which affects the body-size growth rate under r -selection. We construct a mathematical model of stochastic life history on each individual by using a stochastic differential equation, and analyze the relationship between optimal life schedule and the age-size structured population dynamics by finding Euler-Lotka equation. Then, we use the formalism of optimal stopping problem to the analysis of optimal life history and show that our method can maximize intrinsic rate of natural increase. Finally, we apply our methodology to a semelparous life history, and show that a characteristic of the semelparous life history and methods to find the optimal life schedule under the stochastic growth process.