

Quantitative Biology > Populations and Evolution

Fixation in Evolutionary Games under Non-Vanishing Selection

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One of the most striking effect of fluctuations in evolutionary game theory is the possibility for mutants to fixate (take over) an entire population. Here, we formulate a WKB (Wentzel-Kramers-Brillouin) based theory to study fixation in evolutionary games under non-vanishing selection. Within this approach, we accurately account for large fluctuations and compute the mean times and probability of fixation for finite selection intensity w , beyond the weak selection limit. The power of our theory is demonstrated on prototypical models of cooperation dilemmas with multiple absorbing states. Our predictions compare excellently with numerical simulations, and we show that our method is superior to the Fokker-Planck approach and has a broader applicability for finite w .

Comments: 4 pages and 4 figures

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