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Calculating hazard rates of introgression with branching processes

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STELLINGEN

behorende bij het proefschrift

‘Calculating hazard rates of introgression with branching processes’

van Atiyo Ghosh

- (1) Crop genes will almost surely introgress into their wild relatives (this thesis).
- (2) The inevitability of introgression does not mean that the risk of introgression is high, since it might take a long time before permanent lineages of an invading gene are formed. The distribution of times at which such lineages are formed govern the risk of introgression occurrence (this thesis).
- (3) Demographic stochasticity is of crucial importance in deriving the time at which permanent introgressed lineages are formed, and is thus a vital aspect in modelling the risk of introgression occurrence (this thesis)
- (4) Introgression risks can change in time. To average risk over time can lead to significant underestimation of risk at some times (this thesis).
- (5) Invasion probability is a non-monotonic function of population size. (this thesis).
- (6) Age-structured and time-inhomogeneous models can lead to situations whereby it is in an individuals interest to delay reproduction for the sake of maximising the probability of survival of its lineage. (this thesis, Tuljapurkar 1990)
- (7) To focus on the asymptotic behaviour of stochastic populations can make one over cynical—a system can be in transience for a long time. (this thesis, Klebaner 2011)
- (8) Changing assumptions need not change conclusions. (this thesis, Kimura 1962)
- (9) Evolutionary graph theory (as espoused by Lieberman, Hauert and Nowak, Nature, 2005) does not allow for empty spatial states. This results in the unbiological possibility of immortal individuals, and unrealistic conclusions regarding the combined effect of spatial structures, drift and selection on invasion probability.
- (10) Economic and ecological systems can be constructed in terms of self-interested interacting individuals subject to environmental pressures. It should be no surprise that quantitative techniques between both subjects are especially transferable.
- (11) As a corollary of (6), it is perhaps best that newly weds moving country do not have children.