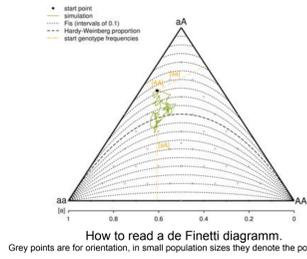


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QUESTION

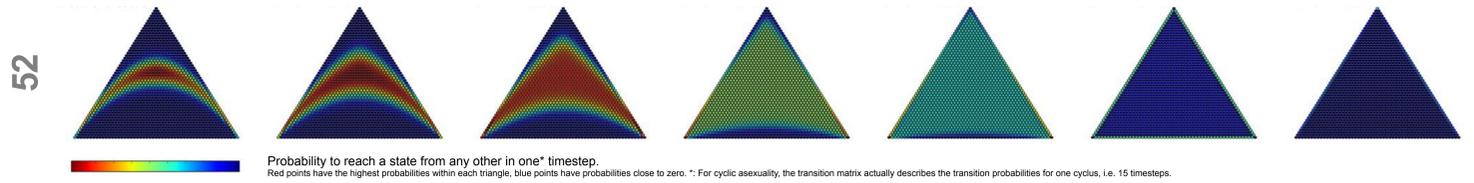


We developed a Markov chain model to analyse the genotypic composition of partially asexual populations evolving through time. At the moment, we are looking at the “classical” case of a single locus with two alleles *a* and *A* in a diploid organism. Mutation between the alleles occurs with a constant universal rate μ ($= 10^{-8}$ for all graphs on this poster). Populations are panmictic and have a constant, finite size *N*, and the potential clutch size of one individual exceeds the population size for both sexual and asexual reproduction. The rate of asexuality *c* describes the percentage of the offspring produced without gametic recombination. It is either constant throughout time (as in some plants), or changes in a *cyclus* (as in aphids, daphnia etc.). We use de Finetti diagrams to display our results, coupled with tools from network analysis.

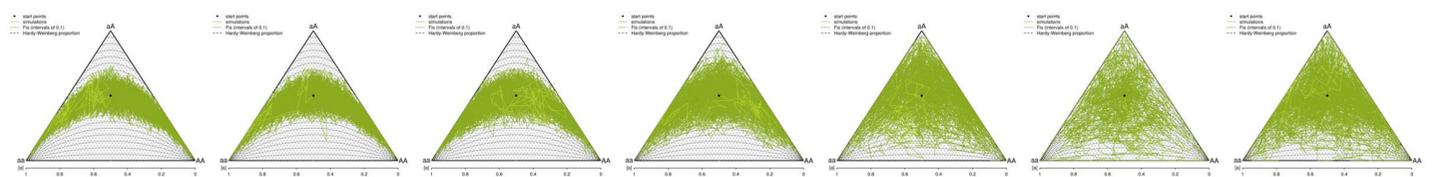
The aim of our study is to compare the evolutionary potential of populations with mixed sexual/ asexual reproductive strategies:

How do different rates/modes of asexuality influence the dynamics of genotypic composition in a population?
Do these effects show a linear dependence on *c*?

PROBABILITIES



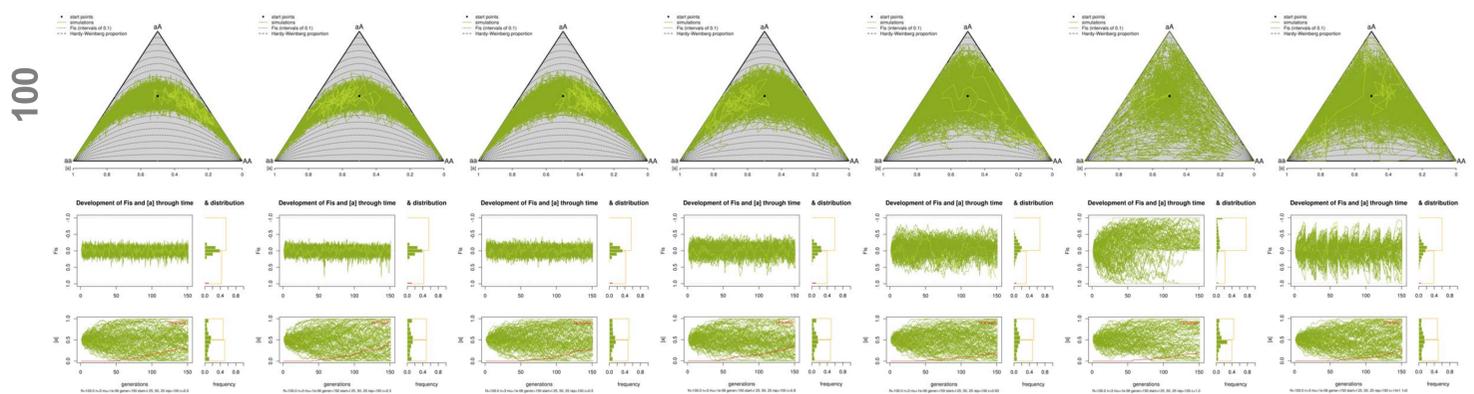
Our model allows us to calculate the transition probabilities between all possible genotypic compositions of a population (transition matrix). Based on this information, it is evident that each rate/mode of partial asexuality leads to a distinctive microevolutionary pattern.



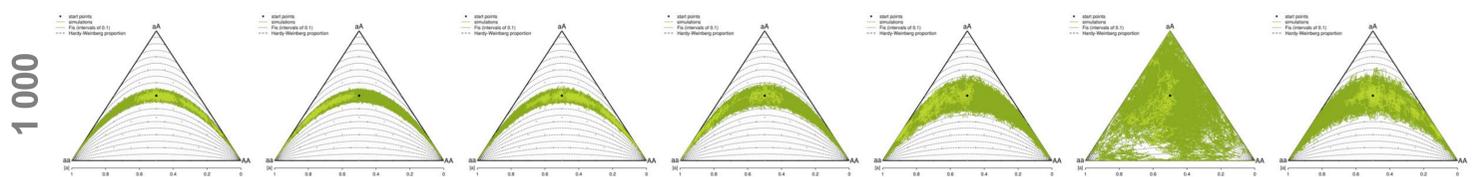
C

0.0 0.3 0.5 0.8 0.93 1.0 CYCLIC
14 ASEQUAL
+1 SEXUAL GENERATION

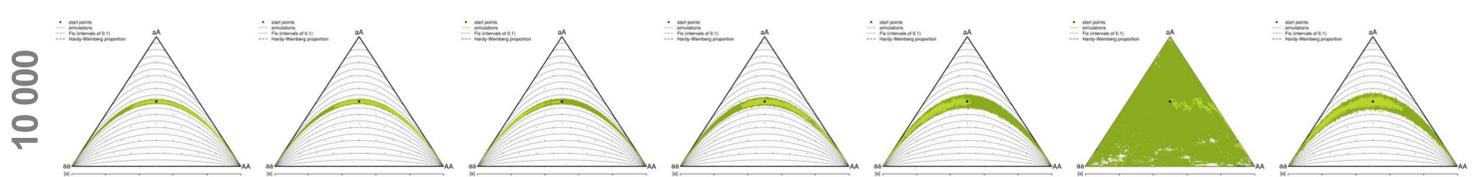
SIMULATIONS



Increasing the rate of asexual reproduction increases both the variance and the skew of F_{IS} values expected for a biallelic locus initially conforming to Hardy-Weinberg equilibrium at equal allele frequencies. Small changes in *c* have a stronger effect in predominantly asexual populations. Cyclic asexuals have a greater variance of F_{IS} than expected in comparison with the corresponding average rate.



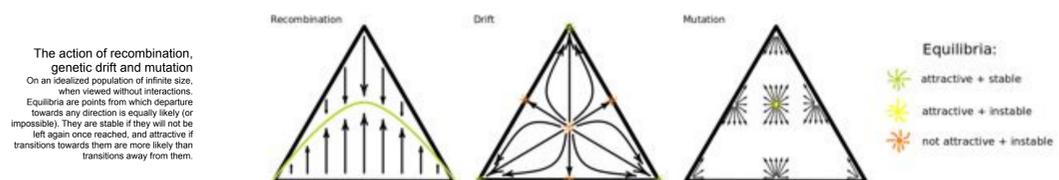
Larger populations are more indifferent against low rates of asexual reproduction, but otherwise follow the same pattern.



BACKGROUND

N

The trajectory a populations takes between different genotypic compositions is shaped by a number of processes: recombination, mutation and genetic drift are those encountered in our model. Partial asexuality decreases the amount of recombination taking place at each generation, thus decreasing the relative “strength” of its influence on the shape of trajectories. Since all three processes follow a different pattern, their interaction leads to the non-linearity of the effect of *c* on the microevolutionary dynamics we observed.



PARTIAL ASEQUALITY LEADS TO DISTINCTIVE EVOLUTIONARY DYNAMICS

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