Spatial populations with seed-bank

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Stellingen

behorende bij het proefschrift

Spatial Populations with Seed-bank

van

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1. Adding structure to a seed-bank is crucial for modelling fat-tailed sleeping times without loosing the Markov property.

2. For infinite seed-banks with fat-tailed sleeping times, under the assumption that the mean of a genetype in deeper and deeper seed-banks converges, the variance converges to zero. Since the states of deep seed-banks determine the mean density of a gene type in the population, the deep seed-banks act like a reservoir of genetic diversity.

3. Finite seed-banks cannot prevent the loss of genetic diversity. Whether in the long term clustering or coexistence occurs is completely determined by the migration kernel, as for models without seed-bank. Still, finite seed-banks slow down the loss of genetic diversity.

4. For infinite seed-banks with fat-tailed sleeping times, migration no longer dictates the long-time behaviour, which is determined by both the rate of exchange with the seed-bank and the migration kernel.

5. The duality relation between backward and forward evolution is key to understanding genetic diversity in populations with seed-bank.

6. The diffusion function that determines the rate of reproduction has no influence on the dichotomy between clustering and coexistence. When the geographical space is the hierarchical group, the diffusion functions for large block-averages converge in the

hierarchical mean-field limit to the Fisher-Wright diffusion function.

7. In the hierarchical mean-field limit, the slow seed-banks are the equivalent of the deep seed-banks. They become deterministic on time scales that are faster than their own time scale.

8. On the hierarchical group, at each hierarchical level new genetic information comes from the seed-bank. This information changes the mean of all the active block-averages. Therefore the mean observed in the active block averages depends on the number of seed-banks that have started exchanging individuals with the active population.

9. Building-up real-world seed-banks is crucial for the maintenance of genetic diversity in ecosystems. The slow-down caused by these seed-banks helps humans to prevent the loss of genetic diversity.

10. The Meyer-Zheng topology teaches us that the longer you sleep, the larger your impact is.

11. Mathematics and music have in common that they are the most fun when they are practised with others