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# Adaptation to a given habitat as a factor influencing dynamics and evolution of model populations.

We investigate the conditions under which a model population can survive in a given habitat, colonize a new (spatially separated) habitat and is able to co-exist with a population living in a neighbouring habitat.

Each habitat is represented by a square lattice and a model phenotype, describing the phenotype of an individual that is fully adapted to the considered habitat. The populations are composed of individuals that move over the lattice, mate, produce offsprings and die. The individuals are characterized by their genotypes, phenotypes and ages. The individuals adaptation to a given habitat depends on the number of its phenotypic features that are the same as the corresponding features of 'the model phenotype' according to a power function with some exponent n. The value of the adaptation is related to the individuals probability of survival.

We discuss the influence of the value of n on the population dynamics and its genetic and phenotypic variability. In particular, we compare the situations when: $n>1$ (briefly, in this case only the individuals that are quite similar to the model phenotype can survive easily) and $0>n>1$ (here, even small similarities between the phenotype of the considered individual and the model phenotype may be significantly advantageous for survival). For co-existing populations, possibilities of formation of hybrid zones of different shapes are also investigated. Computer simulations based on the standard Monte Carlo technique are performed.

## References

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