

## **Fitness-based mating: A systematic analysis of a new preference model**

Natural populations exhibit a non-random mating behavior and it is assumed that mate preferences causing the non-random mating behavior play a role in sympatric speciation.

In my thesis, I have proposed a new model of a mate preference that is based on ecological performance and I have named it *fitness-based mating*. Individuals that express this mate preference choose primarily fit partners.

Fitness-based mating is modelled for haploid, diallelic populations. Individuals are distributed across two niches, and genomes are simplified to two loci. The first locus is subject to natural selection, and the second-locus genotype gives the strength of the mate preference. The population is separated into females and males, among which only females exhibit the mate preference. Ecological selection acts on both sexes alike.

With the model I have investigated how female choosiness based on direct advantages offered by their partners can cause and maintain a polymorphic population. Fitness-based mating is an evolutionary successful mating strategy. It spreads in a population due to its amplifying effect on the reproductive success and on the attractiveness of its carriers. A polymorphism arises naturally in the model. The emergence of a stable polymorphism of traits underlying ecological selection is of special interest, because a polymorphism can be a precursor of speciation.