

OR063*Evolutionary consequences of and selection on recombination in automictic populations***Jan Engelstaedter**

Many animal species, including many social insects, reproduce asexually through automictic parthenogenesis. Here, a modified version of meiosis takes place where diploidy is restored in the eggs through fusion of two meiotic products. In contrast to clonal reproduction, this entails a reduction in heterozygosity among the offspring. This reduction in heterozygosity depends on the type of automixis (e.g., central fusion or terminal fusion) but may also depend on the rate at which crossover events between the locus under consideration and its linked centromere take place. I present results from a mathematical model of a population reproducing through automixis that makes predictions on the consequences of recombination on standing genetic variation, in particular levels of heterozygosity. The model considers two loci, mutation and selection with arbitrary levels of dominance. It is demonstrated that with overdominance (heterozygote fitness advantage), heterozygotes may reach a higher or lower frequency than with sexual reproduction but may also go extinct when the rate at which they are eliminated through automixis is too high. For example, with central fusion automixis there exists a maximum recombination rate between locus and centromere above which heterozygosity is lost in the population. These results are of particular relevance for species with complementary sex determination systems. I also explore the mutation-selection balance of deleterious mutations and the resulting genetic load as well as the expected genetic variation at neutral loci linked to loci under natural selection. Finally, I also investigate how natural selection acts on recombination rates in automictic populations. Overall, the results from this model should provide useful predictions on evolutionary patterns in automictic species against which empirical results can be tested.