Measuring the effect of inbreeding on reproducing offspring in a population of fruit flies.

Sara Mohebbi

The process of passing the genes to offspring is defined and quantified as reproductive success or “Fitness”. Generally in population genetics, fitness is equal with the number of individuals in the next generation. In a population, males and females might have different genes, also they can have similar genes but with different functions, which lead to some variations among them and their offspring. In other words; in one gender some genes might be functional in a specific level, and in the same time in the opposite sex they are not active at the same level and this difference might influence on the number of individuals they produce. Therefore, in a population based on different functions of some genes, we can have "good" females (with higher fitness values) vs. "bad" males (with lower fitness values) and vice versa. Interestingly, these genetic conflicts among genders not only affect the number of offspring in the next generation, but also create some new traits which are totally different from the parents. There are many elements which seem to influence on variation among sexes. One of them is the level of inbreeding. Depends on the sort of populations which are being crossed together, the severity of sexual variation will differ. Also the number of crossing will effect on sexual variation. Even the environmental condition of inbreeding is determining for this genetic event.

Since any genetic variation is the key-concept for evolution and due to the differences among genders different species with new genetic characteristics can be created, this assay was conducted to measure the effect of inbreeding on the level of reproductive success. A basic population of red-eyed fruit flies including 37 different genetic strains was crossed to a brown-eyed population to create a different new population. We crossed the new males and females with the brown-eyed population, let the females lay eggs, and observed the number of offspring, which represented the reproductive power of the new population. By analyzing the data and comparing the results from males to the results from females, we determined the pattern of reproductive success and demonstrated the variation that each gender show depends on their genetic differences.

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Evolutionary Biology Centre and Department of Cell and Molecular Biology, Uppsala University.
Supervisor: Dr. Edward Morrow