In nature, there are many reproductive strategies, which can be classified as asexual or sexual. As for sexual reproduction, apart from 'standard' fusion of male and female gametes, in some species – especially plants, but also fungi and animals – self-fertilization is possible. In this type of reproduction only one parent takes part – similarly as in asexual reproduction; the difference is that two gametes are involved: male and female one, produced however by one individual.

Self-fertilization leads to decreased genetic diversity in offspring in comparison to the result of fusing gametes from different individuals – however, it allows to obtain offspring whose whole genome (and not half) is made of one parent's genes; moreover, it allows to save time and energy, which in the latter case are usually spent to find a mate. In many species, which during evolution underwent transition from outcrossing to self-fertilization, so-called 'selfing syndrome' is observed. This phenomenon consists in degeneration of traits connected with reproduction via outcrossing – which can be a result of relaxed natural selection acting on these traits or adaptation to self-fertilization. In plants, such traits encompass e.g. flower degeneration and decrease in pollen number. Among animals, this phenomenon was observed i.a. in a model (i.e., commonly investigated) species, *Caenorhabditis elegans* nematode, which reproduces almost solely via self-fertilization of hermaphrodites; males (which can fertilize hermaphrodites) constitute a small fraction of population. In comparison to other, closely related species reproducing via outcrossing, in *C. elegans* i.a. behavioural differences were detected, such as female reluctance to mate with males or lack of mate 'guarding' by males via preventing her subsequent copulations, as well as small male sperm size.

What will happen, though, if, via introducing certain mutations, mating system is converted back to obligatory outcrossing? Current investigation of some traits show that change towards values characteristic for systems with high competition between males can be observed. In my project, I want to study this phenomenon on several levels:

a) fitness – whether in progress of evolution males from obligatory outcrossing populations can sire more offspring;
b) behavioural – whether male mating behaviour is altered in consequence of evolution in obligatorily outcrossing population;
c) genetic – whether in genes particularly active in males more changes can be observed in populations with restored outcrossing than in populations with predominant (or only) selfing.

This research will contribute to understanding how change of reproduction mode can influence evolution of traits related with sexual selection.