

Ecological side-effects of sexual reproduction

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We are broadly interested in the ecological causes and consequences of sexual reproduction. Our scientific projects can be broadly divided into three topics.

1. Evolution of reproductive traits

One of main drivers of reproductive trait evolution is the male-female interactions within a species. To understand why and how diverse sexual traits evolve, our group work on questions related to sexual selection and sexual conflict. Recent main projects are about postulated antagonistic pollen-pistil interactions over floral longevity, and we use a sexual dandelion (*Taraxacum japonicum*) and *Arabidopsis* plants. Our working hypothesis is that pollen has the ability to induce wilting or closure in its recipients.

2. Behavioural mechanisms of reproductive interference

Very closely related species are usually allopatric, but sometimes secondary contacts happen (potentially anthropogenically). During the secondary contacts of closely related species, interspecific mating or interspecific pollen transfer can occur, which can affect individual fitness (known as reproductive interference). We are interested in how reproductive traits mediate reproductive interference. Kyogoku previously asked this question using a pair of seed beetles (*Callosobruchus chinensis* and *C. maculatus*).

3. Eco-evolutionary consequences of reproductive interference

We are interested in the ecological consequences of reproductive interference.

Reproductive interference can affect population dynamics or drive phenotypic evolution.

For example, in one project Kyogoku asked which trait is more likely to evolve than another as an adaptation to avoid reproductive interference, through computer simulation modelling. We are also interested in empirical tests of such theoretical predictions.