



Buzz pollinating bees and flower evolution

Master Project

EBC, Department of Ecology and Genetics, Plant Ecology and Evolution

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Background

During buzz pollination, bees use their powerful thoracic muscles to shake pollen out of flowers, producing an audible sound or “buzz”. Buzz pollination has evolved in 20,000 species of flowering plants, and about half of all bee species. Yet, we still know little about why some bees but not others buzz pollinate, and how does evolution have shaped flower and bee characteristics to fine tune buzz pollination. At a time when bee populations around the world face an uncertain future, understanding how and why bees buzz and how does this shape the ecology and evolution of many plant species and the productivity of some crops such as tomato or blueberry is essential.

Project aims and description

In this project, the student will use a variety of tools to measure the vibrational properties of bees' buzzes and combine them with observations of bee behaviour to study pollen foraging and pollen release from buzz pollinated flowers. The project can be adjusted to approximate areas of interest to the student. The student project will complement ongoing research at the lab and in concert with external collaborators.

Among the methods used in the project are:

- Conducting behavioural observations of captive bumblebees either through visual observations or with the aid of video and audio recorders
- Using laser vibrometers and accelerometers to quantify bee vibrations on flowers
- Conducting experimental manipulations of flower morphology and orientation to investigate the functional consequences of floral buzzes
- Growing and maintaining plant material in glasshouses and controlled environment facilities for experimentation

Qualifications

As the project involves working with bees, the student should be aware of the possibility of being stung. Plant-oriented sub-projects are also available if bee work is to be avoided. Ideal candidates will be interested in one or more of the following subjects: animal behaviour, pollination, floral evolution, plant reproduction, biomechanics, technological applications for studying ecology and evolution, ecology. The candidate should be able of conducting independent work (with appropriate support), be highly motivated, and work as part of a research team.

Other information

You can find out more about our work on buzz pollination at <https://plant-evolution.org>

An introduction to buzz pollination can be accessed for free [here](#):

<https://nph.onlinelibrary.wiley.com/doi/full/10.1111/nph.15666>.