



Multidimensional characterization of pollen composition to support bumblebee health and resilience in a context of climate change



## PhD thesis synopsis

The decline in agricultural biodiversity, and particularly that of wild pollinators, threatens food security and human health. Populations of many pollinator species are now considered declining or vulnerable worldwide. In Europe and North America, several bumblebee species are threatened with extinction. Habitat loss, parasitic infections, pesticide use and malnutrition, aggravated by monocultures that restrict pollinators to a monotonous diet, are considered the main causes of this decline, to which climate change must be added. Maintaining a diversified diet of high nutritional quality to ensure the resilience of populations of these essential pollinators in a context of climate change is currently a major challenge. In this context, we wish to assess which nutritional resources maximize the reproduction and health of bumble bees, via a multidimensional approach that also includes the characterization of plant vitamins and secondary compounds. We also want to assess the nutritional needs and optimal dietary resources when bumblebees are exposed to environmental stresses such as parasitic infections and heat waves. We will use a non-lethal field approach to characterize the nutritional habitat of bumblebees in France, combined with experimental studies to assess which resources maximize the behavioral and reproductive health of bumblebees. Dietary resources will be characterized using high-performance liquid chromatography (HPLC) and mass spectrometry (LC-MS/MS).

**We are looking for someone interested to apply to the Doctoral School of Strasbourg on this project.**

## Working environment

The thesis will be carried out at the Institut Pluridisciplinaire Hubert Curien (IPHC) in Strasbourg, Department of Ecology, Physiology and Ethology (DEPE), under the co-supervision of Mathilde Tissier and Sophie Reichert. Fieldwork will be carried out in various regions of France, with experimental studies located in Strasbourg, and one or more advanced training courses in Canada and the USA during the thesis as part of international collaborations on bumble bee conservation, health and nutrition. Research and travel expenses are covered by an IdEx fund. International students with an MSc are welcome.

## How to apply

If you are interested, please send your CV, Master's transcripts and a covering letter with the contact details of 2 scientific referees to [mathilde.tissier@iphc.cnrs.fr](mailto:mathilde.tissier@iphc.cnrs.fr) and [sophie.reichert@iphc.cnrs.fr](mailto:sophie.reichert@iphc.cnrs.fr) before **May 15, 2024**. The closing date for the competition is June 11, 2024.

Find out more about our projects: <https://www.sppb-sffb.net/>