

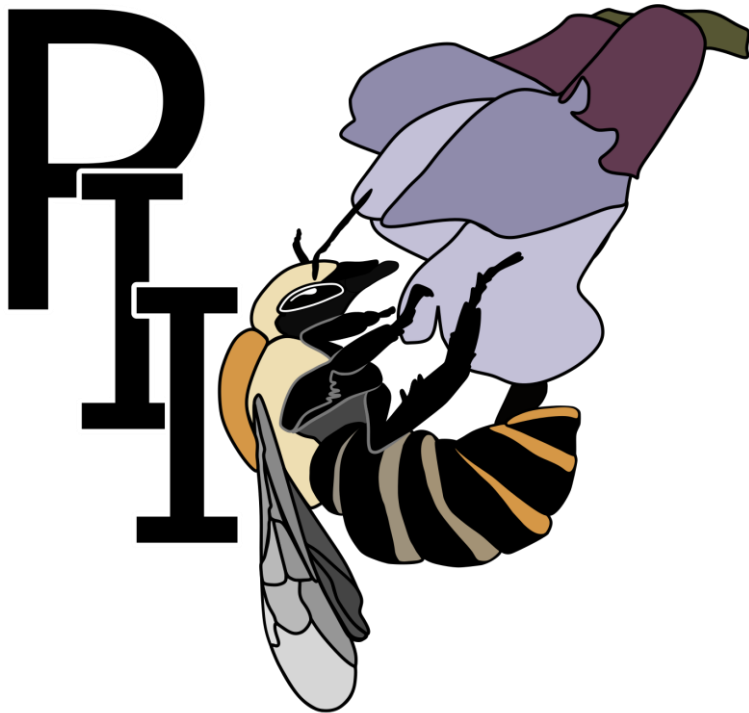
Dear Reader,

Here we have collected several possible positions from projects to master thesis.

If you need more information, please do not hesitate to contact the responsible person.

Yours sincerely,

The Team of Plant-Insect-Interactions



Plant-Insect-Interactions

Sommersemester 2024

IntraFlor

Background:

Intra-specific trait variation is the cornerstone of evolution and a prerequisite of local adaptation. Our goal is to understand how land use intensity affects local genetic diversity and morphological traits of two meadow plants – *T. pretense* and *R. acris*. We further aim to understand the subsequent effects of the floral trait plasticity on pollination and pollination outcome.

Methodological approach:

The fieldwork is conducted in the grasslands of three biodiversity exploratories in Germany– Swabian Alb, Hainich, and Schorfheide chorin. The work would start in summer, when the flowers and pollinators are abundant.

Based on your interest and the time period of your thesis, we would decide upon the floral traits that would be measured by you. We measure flower size, colour, nectar, pollen, and scent.

Pollinators need to be caught, photographed, and identified on the field.

Research question:

How do varying floral traits affect pollinator diversity, visitation patterns, and foraging frequency on common meadow flowers?

Time frame:

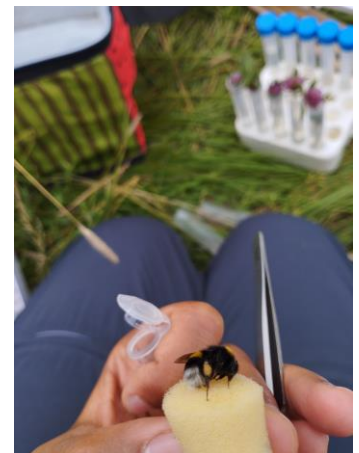
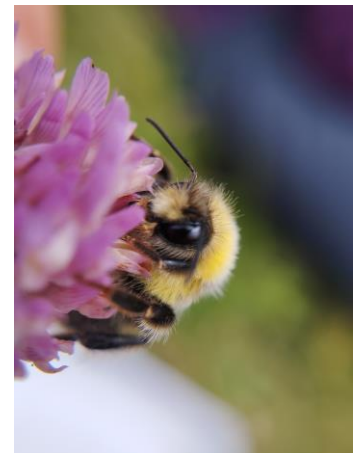
Starting from April to August; the duration adjusted based on the degree between 6 weeks up to 6 months. The exact dates of each exploratory excursion depend on weather conditions and flower abundance.

Requirements:

Fieldwork with plants and insects. A basic understanding of insect and plant identification is beneficial.

Contact:

Plant Insect Interactions, TUM:
Vidisha Bansal (vidisha.bansal@tum.de)



Sommersemester 2024

Bee Plant Pollution Micro plastics in Flowers and Bees

Background:

Anthropogenic particles like tire wear, soot and brake dusts are constantly released in the air, and therefore can sediment on various surfaces like plants and flowers. As pollinators primarily depend on the floral resources, a pollution of these resources has possibly detrimental effects. It is known that particles containing heavy metals or pesticides do harm, as they have negative effects on the physiology, cognitive performance, life expectancy and growth of insects. However, there is little information on how micro plastics and particulate matter affect pollinators, especially if you look beyond Honeybees (e.g. the approximately 600 native bees).

Methodological approach:

Samples of both Nectar and Bees are collected in the closer area of Freising together with environmental data. The samples are then processed and analysed with various microscopic methods. These data will be complemented by experiments, primarily done with *Osmia bicornis*, the red mason bee.

Research question:

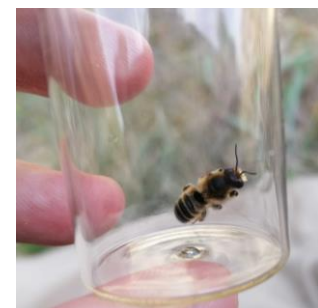
What is the extend of pollution found in both nectar and bees from the same sites. Can we see effects of plastic pollution on the larvae of a common wild bee.

Time frame:

Starting between February - April, duration adjusted on the degree between 6 weeks up to 6 months.

Requirements:

Fieldwork with plants and insects, very clean working in Lab and Field is important. A basic understanding of insect identification and R is beneficial. Use of Fiji and prior work on Research microscopes are a plus. Both German and English possible



Contact:

Plant Insect Interactions, TUM:
Kenneth Kuba (Kenneth.kuba@tum.de)



Sommersemester 2024

Pesticides in Pollen and Nectar

Background:

Pesticide use has been increasing over the last decades all over the world and can not only be found on crop plants but also in the surrounding flora. Pollinators depend on the resources provided by the plants and are therefore also exposed to pesticides through contact with the plants and consumption of the contaminated pollen and nectar. Many studies have already tested several pesticides and their effect on pollinators (bees among them). However, we need to expand our scope of testing to more species than commercially used bees like the honeybee and the buff-tailed bumblebee. And as of yet we have little information on how wild bees can cope with pesticides in their food.

Methodological approach:

A feeding experiment will be conducted with larvae of *Osmia bicornis* (red mason bee), in which the larvae will be fed with pesticide-contaminated pollen, and the survival rate and overall fitness will be recorded.

Research question:

What are the effects of 3 commercially available pesticides on larval fitness in the red mason bee *Osmia bicornis*?

Time frame:

Starting in April-May, the duration is up to 6 months including practical work, data analysis, and writing.

Requirements:

Not fearing bees, being able to handle the delicate larvae/eggs. A basic understanding of R is helpful. Motivation and joy for working with live animals.



Contact:

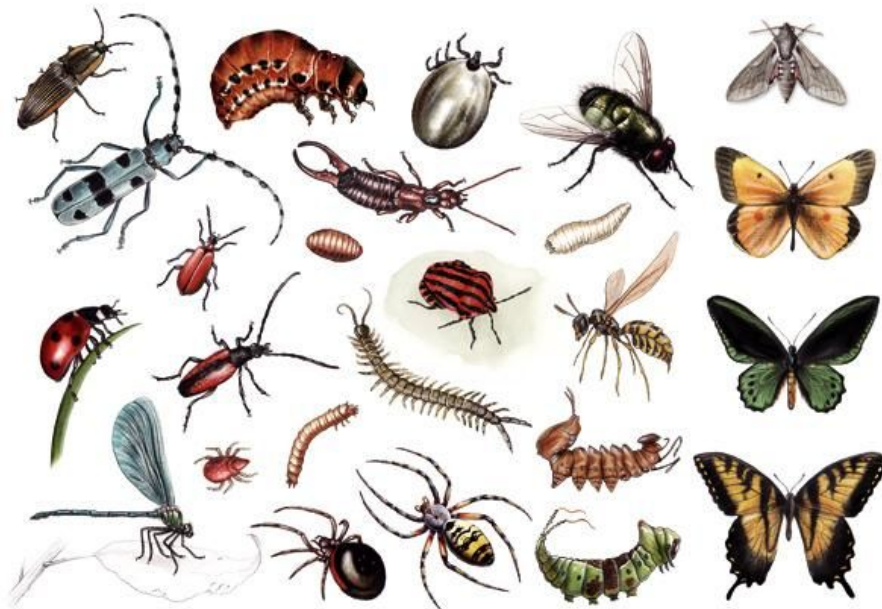
Plant Insect Interactions, TUM:
Carmen Nebauer (carmen.nebauer@tum.de)



Fieldwork HIWI and student search

We are working on different projects regarding climate impacts on bee and butterfly phenology and land use impacts on grassland foodwebs. We are looking for motivated students to be part of fieldwork

- **When?** May 2024 – June 2024
- **Positions available:** Bachelor, Master thesis and HIWI
- **Type of work:** Fieldwork across Germany and lab work in Freising
- **Tasks:** Field insect and plant collection, taxonomic determination of invertebrates
- **Requisites:** **Drivers license in Germany**, motivation, responsibility, interest in the natural world, time availability in May-June, interest in taxonomy
- **We offer:** training, guidance, travel costs for field experiments are covered (accommodation and transport), possibility to be part of publications, a great working group environment 😊



Have you been bitten by the science bug? Then contact us for more information:

Dr. Alejandra Parreño

alejandra.parreno@tum.de



Sommersemester 2024

The Potential of Agroforestry Sites for Restoring Pollinator Habitats in Europe

Background:

Agricultural land use, covering by far the largest proportion of terrestrial land modified by human activities, is crucial for feeding humanity, and the decisions on how farmers manage their land are a major driver for biodiversity change. In order to counteract pollinator decline and thus also the pollination services, our pan-European project RestPoll aims to permanently restore pollinator habitats and enhance their connectivity. (Taken from: <https://restpoll.eu/>)



Methodological approach:

Between April and September 2024, pollinators and plant-pollinator interactions on agroforestry and control sites will be sampled, e.g. by transect netting.



Research question:

What is the potential of agroforestry to support and promote pollinator communities in the agricultural landscape?

Time frame:

Start and duration of student participation according to project timeline and project scope (ECTS/weekly hours).



Requirements:

Motivation to participate in fieldwork and lab work. Independent, reliable and precise working attitude. A basic understanding of R and experience in pollinator taxonomy is helpful, but not needed.

Contact:

Plant Insect Interactions, TUM:
Paula Prucker (paula.prucker@tum.de)



Sommersemester 2024

Floral resources in urban gardens

Background:

Urbanization is a strong driver of land-cover change in the world, which puts stress on many pollinator species. An important factor in the survival of pollinators in cities is the availability of floral resources. When more food is available, more abundant and diverse pollinator communities have been found in urban areas. However, plants themselves are also put under stress from urbanization. It is still unclear how the quality and quantity of floral resources interact with urbanization.

Methodological approach:

We will collect and analyze nectar and pollen from five flower species in urban gardens in Munich and Berlin. After fieldwork, we will analyze the pollen and nectar in the lab to test the nutrient quality of the floral resources.

Research question:

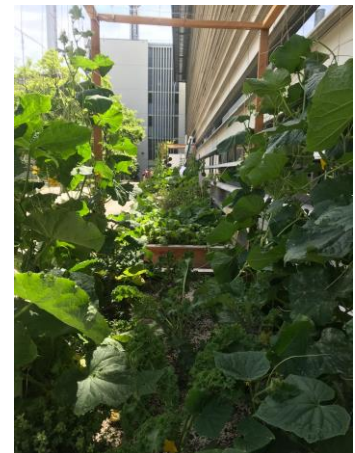
To what extent are nectar and pollen quality and quantity in different plant species affected by urbanization?

Time frame:

Starting between March - April, duration up to 6 months.

Requirements:

- Interest in ecology and urbanization
- Interest in doing fieldwork and lab work
- Independent and reliable working attitude
- A driver's license is useful



Contact:

Plant Insect Interactions, TUM:
Gaya ten Kate (gaya.ten-kate@tum.de)