MAX PLANCK INSTITUTE
FOR CHEMICAL ECOLOGY

The Max Planck Society is one of Europe's leading research organizations and conducts basic research in the natural sciences, life sciences, and humanities. The Max Planck Institute for Chemical Ecology in Jena carries out fundamental research on how organisms communicate with each other via chemical signals. We analyze ecological interactions with molecular, chemical and neurobiological techniques. In the Institute, organic chemists, biochemists, ecologists, entomologists, behavioral scientists, insect geneticists and physiologists work in collaboration to unravel the complexity of chemical communication that occurs in nature.

MSc student

Job Description

True bugs (Heteroptera) are a group of insects that have evolved a wide range of different feeding habits, including predation, herbivory, hematophagy (blood-feeding) and mycophagy (fungus-feeding). As the availability of nutrients varies greatly depending on the food source, true bugs have to adapt their digestive system to maximize nutrient extraction from their food. It has been shown that salivary protein composition differs in species with different diets. The saliva of predatory bugs contains many proteases and toxins, while the saliva of herbivorous bugs is rich in carbohydrate-active enzymes, particularly glycoside hydrolases (GHs). However, the role and function of specific enzymes in a particular diet is not clear.

Some true bug families have acquired genes encoding GHs through horizontal gene transfer from bacteria. These genes are highly expressed in the salivary glands and likely play an important role in the extraoral digestion of plant material. The aim of this project is to investigate the activity of these GHs as well as their ecological role, particularly in relation to diet shifts.

We seek

We are looking for a motivated student to investigate the activity and function of horizontally acquired GHs in true bugs. To do this, we will heterologously express candidate GHs in insect cells and test their activity against different polysaccharides. Moreover, we will knock-down GH-encoding genes in a model system using RNAi and assess phenotypic changes and fitness effects. The results will help us understand the role of horizontally acquired GH genes for dietary shifts in Heteroptera.

We offer

We are looking for a MSc student with a strong interest in insect evolution, ecology and molecular biology, and fluency in English. In return, we offer an international environment with state-of-the-art laboratories and a project integrated into ongoing research. Preferred start of the project is in summer 2025.

Application Deadline

Please apply here with your CV and a short motivation letter.

The Max Planck Society is committed to gender equality and diversity and actively supports the reconciliation of work and family life. We want to increase the proportion of women in areas where they are underrepresented. The Max Planck Society has also set itself the goal of employing more persons with severe disabilities. We therefore encourage them to apply. We also welcome applications from all backgrounds.

Have we sparked your interest? Please apply. We are looking forward to getting your complete application documents.

Website: www.ice.mpg.de