

Systematics, Biodiversity and Evolution of Plants

Prof. Dr. Elvira Hörandl

People

Head of Department: Prof. Elvira Hörandl, permanent assistant (curator): Dr. Marc Appelhans. Our team comprises four postdocs, six to eight PhD students with associated BSc and MSc students, three technicians, one secretary and one gardener.

Research

The major research topics are evolution, phylogeny and taxonomy of flowering plants. Our mission is to understand the patterns and processes of diversification of plants in space and time. We focus on evolutionary and biogeographical processes at the population and species level, and on the evolution of reproductive systems in angiosperms. Current projects (funded by DFG, the German Research foundation) focus on the following topics:

- Species delimitation in an Eurasian apomictic polyploid complex in *Ranunculus* (10 to 800 species).
- Crossing experiments to understand the origin and establishment of asexual reproduction in hybrids (apomixis).
- Experimental stress treatments to study the influence of environmental conditions on the mode of reproduction.
- Diversification, phylogeny and evolution of species-rich genera in space and time (tropical Rutaceae [*Melicope*, *Zanthoxylum*], willows [*Salix*]).



Herbarium Göttingen (GOET; Dr. Marc Appelhans)

With about 800,000 herbarium specimens and more than 15,000 type specimens, the herbarium ranks among the largest and most important herbaria in Germany. The herbarium was founded in 1832, but the oldest specimens date back to about 1700. The most important historical collections include specimens collected by Albrecht von Haller in 1732/33, and by Georg Forster during the 2nd World Voyage of Captain James Cook from 1772 to 1775.

In our department, herbarium specimens are mainly used for phylogenomic studies and geometric morphometry.

Digitization of our collection has been a major task in the past years. All known type specimens as well as the most important historical collections have been digitized and are available online through GBIF.org (all specimens) and plants.jstor.org (types only).

Methodical approaches

Field sampling, cultivation of plants and experimental work; phylogenomics and population genomics; biogeographical analyses; flow cytometry and embryology; morphometrics.



Teaching

- Basic and advanced courses for the three Bachelor programs Biology, Biodiversity and Ecology, and the teacher's training.
- Focus "Evolution of Embryophyta" within the Master program of Biodiversity, Ecology, and Evolution with seminars, practicals (wet lab, bioinformatics, microscopy), and field courses.
- PhD training with specific seminars for Systematics, methodical courses for bioinformatics, and a research-orientated training within the GAUSS programs.

