



## Master Projects on Darwin wasps

at the Natural History Museum Basel

Darwin wasps (Ichneumonidae) are the most species-rich family of the insect order Hymenoptera. As parasitoids, they fulfil a vital role as regulators in terrestrial ecosystems. However, we still know too little about their diversity and ecology to fully appreciate the ecosystem services they provide and to unleash their full potential as biological control agents.

If you would like to help pushing back the frontier of ignorance in Darwin wasps, take a look at the suggested topics for master theses below. If interested also in fossil insects, visit the web page of Alexandra Viertler for more ideas ([www.nmbs.ch/home/museum/team/Alexandra-Viertler.html](http://www.nmbs.ch/home/museum/team/Alexandra-Viertler.html)).

### Evolution of host relations in Campopleginae parasitoid wasps

Many parasitoid wasps show extraordinary adaptations to attacking a particular group of insect hosts. This is especially true for the subfamily Campopleginae, members of which have adopted a virus into their genome, which they inject into the host together with the egg in order to use it as a weapon against their host's immune system.

Different genera of Campopleginae attack insects in four different orders: Lepidoptera (butterflies and moths), Hymenoptera: Symphyta (sawflies), Coleoptera (beetles) and Raphidioptera (snakeflies). In this project, you will compile a molecular dataset to reconstruct the tree of life of Campopleginae and use it to analyse how many times, when, and in which directions these drastic host switches took place, and whether the virus weaponry was retained or lost in their wake.



### Unravelling an alpine diversity hotspot – searching for new species on Alp Flix

If you thought that new species can only be found in tropical rain forests, think again! Another hotspot of undiscovered diversity lies at our doorsteps: the Alps. An estimate from Austria suggests that one in ten species of Darwin wasps found at altitudes above 1800m might be new to science.

Since twenty years, researchers study all kinds of organisms on Alp Flix ([www.schatzinselalpflix.ch](http://www.schatzinselalpflix.ch)), but only one subfamily of Darwin wasps has been covered to date. In this project, you will spend time in the area to observe and collect Darwin wasps at different altitudes, compare your samples to previously collected ones, and finally specialize on a group of choice, which you will revise in detail – and hopefully, you will find many new species to name and describe!

