
Ecology and biodiversity – from individuals to the biosphere

Ecology and biodiversity – from individuals to the biosphere, from past to the future

Ecology is a major biological discipline which deals with the relationships between individuals, populations, and their environment, and with the structure and dynamics of ecological communities and ecosystems. There are close links to other biological disciplines, namely evolutionary biology, parasitology, physiology, behaviour or conservation biology. For this reason, ecological issues are studied at many departments within the Charles University. Our team studies ecology of all taxa, ranging from bacteria to flowering plants, insects or vertebrates, including humans.

The research comprises all spatial scales, from the detailed studies of subtle interactions between individuals within local ecological communities up to the exploration of the origin of macroecological patterns at continental scale. We study both aquatic and terrestrial ecosystems, mostly in Europe, but also in relatively exotic environments, namely tropical rainforests and savannas in Africa or microbial communities in Arctic and Antarctic environments. We are interested, for instance, in the evolution of life histories, in the origin of adaptations to extreme environments or in ever changing interactions between organisms and biodiversity variation in space and time.

We combine theoretical and mathematical approaches with experiments and traditional field research. Ecological research has many practical applications, stemming for instance from our studies of spatial spreading and effects of invasive plants and animals, the role of post-industrial sites for preserving biodiversity, or studies of host-parasite interactions.

Selected outputs

- Storch D., Keil P. & Jetz W. (2012): Universal species-area and endemics-area relationships at continental scales. *Nature* 488: 78-81.
- Herben T., Nováková Z., Klimešová J., Hrouda, L. (2012): Species traits and plant performance: functional trade-offs in a large set of species in a botanical garden. *Journal of Ecology* 100: 1522-1533.
- Pyšek P., Jarošík V., Hulme P.E., *et al.* (2010): Disentangling the role of environmental and human pressures on biological invasions across Europe. *Proceedings of the National Academy of Sciences of the United States of America* 107(27): 12157-12162.