



FACULTY OF SCIENCE
Charles University

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KARL RUDOLPH'S LABORATORY FOR PALAEOECOLOGY

OFFER

- Experience in the field of European and North African palaeoecology.
- Palaeoecological analyses of sedimentary material.
- Numerical analysis and interpretation of data, quantitative land cover reconstructions.

REQUIREMENTS

- Quaternary sedimentary sequences containing preserved biological remains.
- Novel methods in ancient DNA, fossil analysis, leaf wax-derived dD and branched GDGTs.
- Access to palaeoecological data inaccessible in public databases.

KNOW-HOW & TECHNOLOGIES

**ECOSYSTEM DYNAMICS ON LONG-TERM SCALES;
STUDYING PROCESSES BEYOND OBSERVATION LEADING
TO AN UNDERSTANDING OF CLIMATE AND HUMAN
INTERACTIONS WITH EARTH'S SYSTEMS**

- Quaternary ecosystem dynamics driven by climate change.
- Archaeobotany of cultural systems.
- Fire dynamics and disturbance in postglacial ecosystems.
- Past land cover changes affected by anthropogenic disturbance.

„Our aim is to apply the reconstruction of past ecosystems, vegetation and flora to understand their long-term dynamics and to link these with present-day processes.“



CONTENT OF RESEARCH

- Holocene land-cover reconstruction: effect of climate, human impact, origin of natural vegetation.
- Long-term perspective of forest fires within temperate landscape.
- Post-glacial migration legacies of plant species.
- Holocene land-use changes.

MAIN CAPABILITIES

- Analysis of plant remains (pollen, macrofossils, charcoal, phytoliths) in natural and anthropogenic sedimentary environments.
- Pollen-based quantitative vegetation reconstruction using models of pollen dispersal and sedimentation.
- Quaternary ecology and macroecology of forest species.
- Administration and development of large palaeoecological databases, analysis of large datasets in order to answer ecological questions.
- Species distribution modelling.
- Description of fire regimes using charcoal record in soil and sedimentary sequences.

KEY RESEARCH EQUIPMENT

- Coring equipment for lakes and bogs.
- Fully equipped laboratory for treatment of palaeoecological samples (pollen, plant macrofossils, charcoal, phytoliths).
- Microscopic facility.

MAIN PROJECTS

- 2016–2018: EUROPIA Holocene disturbance dynamics in European *Picea abies* (Norway spruce) forests implications for conservation and management (Czech Science Foundation, grant No. 16-06915S).
- 2016–2018: Origin of diversity of Central European landscapes: using recent pollen and vegetation models to reconstruct historical biodiversity changes (Czech Science Foundation, grant No. 16-10100S).

- 2012–2015: Pollen-based land-cover reconstruction – model testing and its implications for Holocene environmental change studies (The Czech Science Foundation, grant No. P504/12/0649).
- 2007–2011: Long-term development of cultural landscape of Central Bohemia as a co-evolution of human impacts and natural processes (Grant Agency of the Academy of Sciences of the Czech Republic, IAAX00020701).
- 2009–2011: Forest wildfire dynamics in Czech sandstone areas and its effect on recent vegetation (Grant Agency of Charles University no. 97609).
- 2007–2009: Pollen Database of the Czech Republic (Grant Agency of Charles University no. 29407).
- Participation in one project funded by the European Research Council.

PARTNERS AND COLLABORATIONS

ACADEMIC PARTNERS

Institute of Botany of the Czech Academy of Sciences (Průhonice and Brno, Czech Republic) | Institute of Archaeology of the Czech Academy of Sciences, Prague | Czech University of Life Sciences, Prague | Department of Physical and Applied Geology, Eötvös University, Hungary | Institute of Ecology, Tallinn University, Estonia | CNRS GEODE UMR, Toulouse University Le Mirail, France | Department of Geography and Planning, University of Liverpool, the United Kingdom

ACHIEVEMENTS

Publications in respected international journals with high impact factors: *Global Change Biology*, *Quaternary Science Reviews*, *Journal of Biogeography*, *The Holocene*, *Climate of the Past*, *Journal of Vegetation Science*.

SEE OUR WEBPAGE

www.natur.cuni.cz/biology/botany/palaeoecology