Open position for the LSM call of applications

Department/Institute: Faculty of Biology, Zoology

Subject areas/Research fields:

please find an overview of the research fields in the PDF attached to this email

Keywords: raptorial appendages, convergent evolution, geometric morphometrics, conservation biology

Name of supervisor: Prof. Dr. Carolin Haug

Funding:

DAAD-GSSP (LSM)/LMU-CSC

Project title:

Evolution of raptorial appendages in Euarthropoda: similar functions and convergent solutions

Project description:

Evolution often results in similar morphologies in representatives of rather distantly related groups, which in several cases then fulfill similar ecological functions, increasing the resilience of an ecosystem. This type of evolutionary similarity, also called convergence, occurs in many different groups and morphological structures, the most prominent examples being the evolution of wings in birds, bats, pterosaurians, and pterygotan insects.

Within Euarthropoda, which mainly includes the groups Myriapoda, Insecta, Eucrustacea, and Chelicerata, convergent evolution is a common theme, for example leading to mimicry such as in wasps and hoverflies. Other prominent examples of convergent evolution are raptorial appendages, which evolved independently in many different representatives of Euarthropoda, for example in praying mantises, mantis lacewings or in mantis shrimps. Raptorial appendages are in general very widespread within Euarthropoda and evolved numerous times convergently, apparently as this feeding mode was and still is highly successful.

However, convergent evolution is usually only evaluated qualitatively, hence comparisons of morphologies between different groups or during different geological periods remain on a rather subjective level. Quantitative measurements of morphologies (e.g via geometric morphometrics) have the potential to provide more objective results, which are a better basis for large-scale comparisons.

The aim of this project is to reliably demonstrate functional convergence within different lineages of Euarthropoda. Finding such cases indicates higher resilience of ecosystems, absence thereof indicates more vulnerable ecosystems. Identifying vulnerable ecosystems is a key to improving efforts in conservation biological strategies.

References:

Haug, C., Haug, G.T., Kiesmüller, C. & Haug, J.T. 2023. Convergent evolution and convergent loss in the grasping structures of immature earwigs and aphidlion-like larvae as demonstrated by about 100-million-year-old fossils. Swiss Journal of Palaeontology 142, 21. https://doi.org/10.1186/s13358-023-00286-2

For further information, please contact: Prof. Dr. Carolin Haug, chaug@bio.lmu.de

Research group website: https://www.palaeo-evo-devo.info/