Thesis options (BSc, BEd, MSc, MEd) at the Institute of Evolution and Ecology (EvE)

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Overall theme	Description	Methods	Contact
Mechanisms driving biodiversity	How does land use and habitat heterogeneity affect diversity of plant communities?	field and common garden experiments and observations	Katja Tielbörger
Decision making and learning in plants	Can plants choose between different plastic responses when facing different environmental conditions? Can plants learn?	greenhouse experiments, monitoring plant developmental-plasticity	Katja Tielbörger
Global Change Ecology	How will climate and land use change as well as invasive species affect species persistence or ecosystem functioning, particularly in drylands?	field observations and experiments, plant functional traits, remote sensing	Katja Tielbörger
Plant functional ecology	Functional responses of plant populations and communities to climate and land-use change. Functional traits as drivers of coexistence and stability.	Field experimental and observational studies; common garden and greenhouse controlled experiments; lab work on plant morphological and physiological traits; quantitative analyses of existing datasets (possibility to work without data collection).	Maria Majekova
Functional & ecological morphology (insects & other arthropods)	Study of form and function of morphological key structures of insects and their biological role; also under consideration of miniaturization of body size	micro computer tomography, 3D reconstruction, electron microscopy, histology, experimental morphology, highspeed videography, morphometry	Oliver Betz, Margarita Yavorskaya
Insect faunistics & ecology	Collection and interpretation of faunistic data on different groups of insects for conservation or field ecological questions, insect-friendly mowing techniques, initiative "colourful meadow" (urban ecology)	standard field collection of insect s, field ecology, statistics	Oliver Betz
Biomimetics	Bionic research in different fields, e.g. adhesive systems, joint-less movement principles, bionic theory	micro computer tomography, 3D reconstruction, electron microscopy, histology, experimental morphology, highspeed videography, morphometry	Oliver Betz, Manfred Drack
Reef fish biology and biodiversity	Studies of the visual interactions between fish and their prey or predators, camouflage, fluorescence, species diversity, species identification in the field	direct observation, learning to identify fish species, SCUBA diving, UW photography, fluorescence documentation, spectrometry, lab experiments (zebrafish, marine fish)	Nico Michiels
Conservation ecology	Projects aim to support species and biodiversity conservation efforts with evidence on critial habitat requirements, effectivity of measures, or the spatial distribution of diversity (mostly birds, insects, vertebrates).	Standardized field observations, coupled with semi-experimental habitat manipulation where feasible. E.g., territory mapping, habitat surveys, bird banding, capture-mark-recapture, statistical analyses.	Nils Anthes, Henri Thomassen
Mechanisms driving population structure	How do the various eco-evolutionary processes drive genetic structure among populations in space and time?	Molecular lab, genotyping/sequencing. Landscape genetics. GIS	Henri Thomassen
Spatial conservation prioritization	Integrating measures of biodiversity from different levels of organization to prioritize areas for conservation.	GIS, Species Distribution Modeling, spatial prioritization software	Henri Thomassen
Invasive plants	What makes invasive plants successful? What are the roles of different environmental factors and biotic interactions?	Multifactorial experiments in greenhouse, garden or field. Mesocosms (experimental communities).	Madalin Parepa, Oliver Bossdorf
Plant evolution & adaptation	How much genetic and phenotypic variation is there in natural plant populations? How do plants respond to environmental change through plasticity and evolution?	Controlled experiments in growth chamber, greenhouse and garden. Phenotype measurements. Molecular analyses. Quantitative genetics.	Oliver Bossdorf

Ecological restoration	Genetic and ecological differences among the different seed materials used for plant community restoration. Ecological consequences of different restoration strategies.	Common garden studies of different seed provenances. Community-level tests of ecological restoration. Biotic interactions (pollination, herbivory) experiments and observation.	Oliver Bossdorf
Ecotoxicology	Field and lab studies on the effects of environmental pollutants on fish and invertebrate animals	Field and climate chamber experiments, biochemistry, histo(patho)logy, embryology, physiology, quantitative analysis of behaviour	Rita Triebskorn, Heinz Köhler
Physiological stress ecology	How do individuals arrange themselves with natural stressors, e.g. heat? Aspects of physiological variation and selection pressure	Field and climate chamber experiments, thermography, thermal imaging, biochemistry, morphometry, respirometry	Heinz Köhler, Rita Triebskorn
Body plan changes	Developmental transition of body plans in molluscs as a model for macroevolution	Lab experiments, embryology, microscopy	Heinz Köhler