



European Society of Arachnology Early Career Newsletter

March 2022, No. 1

*Secretariat of the European Society of Arachnology
Department of Molecular Biology and Genetics, Democritus University of Thrace
Dimitras 19, 68100 Alexandroupolis, Greece
E-mail: maria.chatzaki@gmail.com*

Editor: Elena Piano, e-mail: elena.piano@unito.it
Co-editor: Marco Isaia, e-mail: marco.isaia@unito.it

Dear Fellow Arachnologists

We are pleased to introduce a new format for information exchange in our Society: the Early Career Newsletter (EarlCNews) of the European Arachnological Society. This newsletter is a special edition of the regular newsletter of the European Society of Arachnology.

This EarlCNews is intended as a platform for the younger members of our Society, including Bachelor, Master and PhD students. The EarlCNews offers the opportunity to report on one's own project and research results. It is a collection of summaries of Bachelor, Master and Doctoral theses that have been defended in the past year.

You will see that the abstracts are sorted according to two broad scientific areas: Ecology, Evolution & Behaviour; and Phylogeography, Systematics & Faunistics.

In order to facilitate direct communication and discussion between members on the research topics, the e-mail addresses of the early career researchers are provided at the end of each abstract to allow direct contact for discussion and exchange of ideas. In addition, senior scientists can easily reach out to suitable students in case a position becomes available. We hope that the EarlyCNews will help to network within the society.

Many thanks to Elena Piano for creating EarlCNews!

*Gabriele Uhl
President of the European Arachnological Society*



#ECOLOGY, EVOLUTION & BEHAVIOUR

Ondřej MACHAČ | PhD thesis

Ecology of spiders and harvestmen in specific habitats in forests

Arachnids are one of the most numerous group of terrestrial predators with huge ecological diversity, inhabit almost all habitats and many species are often specialized to specific habitat or even a microhabitat. Specific microhabitats include also tree trunks, tree cavities, nesting boxes or habitats affected by nesting cormorants. In the presented PhD thesis I dealt with the ecology of arachnids assemblages in these habitats. In the first part, we studied assemblages of spiders and harvestmen on tree trunks in two different habitats - floodplain forest and trees in the urban habitats and compare three sampling methods - modified pitfall traps, stick and cardboard tapes. We also studied differences of assemblages on different tree species. In the second part, we studied spiders and pseudoscorpions assemblages in the tree cavities in the old oaks by used two methods (pitfall trap into the tree hollow and window trap near the hollow entrance). We also studied comparison of trees in the forest and solitaires in the meadows and between live and dead trees. In the third part, we studied assemblages of overwintering spiders in nesting boxes in the lowland floodplain forest and the influence of selected environmental factors on their abundances. We also studied how temperature influenced re-settlement of spiders in the nesting boxes during the winter and spider assemblages in the nest material in the nesting boxes. In the fourth part, we studied assemblages of selected predatory invertebrates - spiders, harvestmen and centipedes in four differently affected plots in the cormorant colony and studied the effect of vegetation changes and nest density on their abundance and species diversity. Overall, the thesis shows new ecological knowledge about assemblages of arachnids in rarely studied specific microhabitats and habitats.

Contact: machac.ondra@seznam.cz

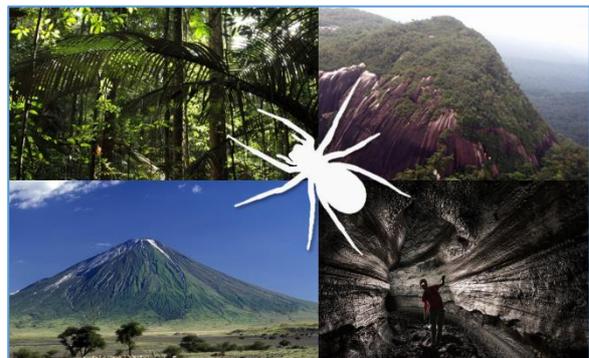


Supervisor: Ivan Hadrián TUF (Palacký University, Olomouc, Czech Republic)

Kaïna PRIVET | PhD thesis

Multiscale factors structuring diversity in taxa, traits, and evolutionary units of spiders in tropical environments

We investigated the patterns of diversity for tropical spider assemblages from contrasting habitats in South America and the Hawaiian Islands using different approaches. Comparisons were based on taxonomic entities and traits in South American Neotropical forest habitats, where we developed a morpho-species database and investigated traits that were measured (body size, leg length) and retrieved from literature (hunting guilds) in order to investigate the habitat filtering on spider assemblages. We found similar variations of taxonomic and trait diversities between habitats suggesting an effect of habitat filtering. For the Hawaiian Islands, we genetically defined evolutionary units by applying a multilocus (mitochondrial and nuclear) approach on a collection of Hawaiian wolf spiders for which taxonomic knowledge is incomplete and problematic. We found low diversity of spiders living at the surface but several independent colonizations of lava caves. Future studies on tropical spider diversity should integrate the three components of diversity together.



Graphical representation of the main contents of the PhD thesis

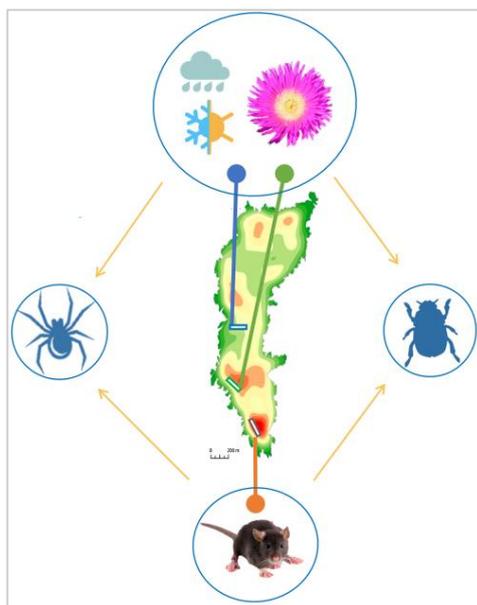
Contact: kprivet@hotmail.fr

Supervisors: Julien PÉTILLON & Rosemary GILLESPIE (Université de Rennes 1, France)

Julie BRASCHI | PhD thesis

Consequences of the control of invasive alien species on the spider and beetle assemblage dynamics on Bagaud Island (Port-Cros National Park)

Biological invasions are the first cause of biodiversity loss in island ecosystems. A ten-year program of ecological restoration has been developed on Bagaud Island (Port-Cros National Park, France) since 2010, involving the simultaneous eradication of two invasive taxa: *Carpobrotus spp.* (ice plant) and *Rattus rattus* (Black rat). The objectives of my thesis were to evaluate the consequences of these invasive plant and animal removals on the spider and beetle assemblage dynamics. (1) The taxonomic and functional richness of spider and beetle species increased significantly following *Carpobrotus* removal. (2) After *R. rattus* control, no differences were observed in beetle and spider taxonomic diversity. Mid-term monitoring, (ten years) may not be long enough to assess the restoration success of invasive rodent control. These results suggest that the bottom-up effects of *Carpobrotus* plants on higher trophic levels are huge, while the top-down effects of *Rattus* on lower trophic levels are not predominant.



Graphical representation of the main contents of the PhD thesis

Contact: julie.braschi@gmail.com

Supervisor: Philippe PONEL (Mediterranean Institute of Biodiversity and Ecology, Marseille, France)

Jan ALBL | Master thesis

Predatory behaviour and prey preference of scorpion *Buthus ibericus* Lourenço & Vachon, 2004

In 2015, *Buthus ibericus*, a scorpion living in Portugal and western Spain, was brought to the Czech Republic in order to observe its predatory behavior and prey preference. This research was executed in laboratory conditions at the Czech University of Life Sciences Prague. Observed scorpions of *Buthus ibericus* species were fed with testing species of prey: the turkestan cockroach *Shelfordella lateralis*, the cinereous cockroach *Nauphoeta cinerea*, the house cricket *Acheta domestica*, larvae of yellow mealworm *Tenebrio molitor*, the white-eyed assassin bug *Platyeris biguttata*, an unknown beetle of the genus *Tenebrio*, species of the class Diplopoda, the pillbug *Armadillidium vulgare*, the meadow grasshopper *Chorthippus parallelus*, huntsman spiders of the genus *Eusparassus*, the fire bug *Pyrrhocoris apterus* and ants of genus *Messor*. The aim of this Master thesis was to find out if the *Buthus ibericus* scorpion is a food generalist and if its predatory behavior is fitting for a large scale of prey. Based on statistical analyses conducted in RStudio programme, I could confirm that *Buthus ibericus* is a food generalist, therefore it does not prefer any type of prey. I also confirmed that its predatory behavior is adapted for a wide range of prey. In predatory behavior, it has been found that in the case of a scorpion *B. ibericus*, the type of prey does matter. Most of the types of prey affect the time of individual sections and aspects of predatory behavior. The ratio of the size of the prey to the size of the scorpion *B. ibericus* was also examined and if this ratio affects the success rate of eaten individuals. Tests showed that observed *B. ibericus* scorpions did not care about the prey size.



Contact: albljan94@gmail.com

Supervisor: Stanislav KORENKO (Czech University of Life Sciences, Prague, Czech Republic)

Gabriela PŘIBÁŇOVÁ | Master thesis

Sublethal effects of the insecticides neonicotinoids on migration abilities of spiders

The purpose for using pesticides is to kill organisms that cause damage (so-called pests) on various crops and thus prevent possible crop losses. Their side effect is a negative impact on non-target organisms. The presented diploma thesis is focused on the effect of neonicotinoids on invertebrates particularly on spiders. Its main goal was to document their influence on behavioral parameters influencing dispersal abilities such as locomotion and tendency to spread by wind (so-called ballooning). The diploma thesis compares the influence of neonicotinoids on model species, *Pardosa lugubris* (Walckenaer, 1802) and *Phylloneta impressa* (L. Koch, 1881) with different modes of prey hunting and compares the influence on adult and nymphal stages. Pesticides Actara® 25 WG, Biscaya® 240 OD, Confidor® 200 OD and Mospilan® 20 SP were applied to the spiders under laboratory conditions and their effect was tested at different concentrations and different methods of application. The biggest impact on spiders had Confidor. It clearly had the most significant negative effect on mobility and a tendency to spider wind propagation. The lethal effects were caused by neonicotinoids in nymphal individuals *Pardosa lugubris*, especially Confidor (even 100% mortality for tarsal application). During an experiment studying the effect on locomotion in adults of *Pardosa lugubris* it was found that the paralysis caused by neonicotinoids disappeared after 24 hours.

Contact: gpribanova@seznam.cz

Supervisor: Milan ŘEZÁČ (Charles University, Prague, Czech Republic)

Clara HAAS | Bachelor thesis

Effects of different types of reward on a jumping spider's learning performance

In learning essays, food rewards need to be attractive but small enough to avoid satiation and thus loss of motivation. We tested whether the jumping spider *Marpissa muscosa* can be better trained to associate a color with a small, accessible or with a visible, but inaccessible prey item. Individuals of one group received a single fly as a reward, those of a second and third group received a visual stimulus of inaccessible flies. Spiders of the third group additionally received a fly after each training. We conducted 10 training trials and a single test trial without rewards present. In the test trial, none of the three groups showed a learning success. While the performance of group one spiders stayed the same during the 10 training trials, it declined significantly in spiders with inaccessible reward. These results suggest that feeding on a reward is necessary to avoid loss of motivation.

Contact:

clarafulya.haas@stud.uni-greifswald.de

Supervisors: Philip O. M. STEINHOFF & Gabriele UHL (University of Greifswald, Germany)

Filippo DI PAOLO | Bachelor thesis

Spiders as model organisms to study the intraspecific variation of functional traits in urban ecosystems

The aim of this thesis is the bibliographic analysis of the studies in which the effect of environmental perturbations in the urban environment on functional traits has been studied, using web-building spiders as model organisms. The main pressures of the urban environment studied are: temperature increase, light pollution, atmospheric pollution, urbanization gradient, food availability and habitat type. The functional traits considered in the various studies fall



into the following macro-categories: morphology, feeding, life history, physiology and behaviour. The results of the studies show that the effect of urbanization on functional traits is very complex, with responses attributable both to phenotypic plasticity and to modifications of the genetic heritage. In general, studies underline the criticality of these effects and the need to intervene with management and planning actions of urban areas that can be compatible with the conservation of biodiversity and residual natural habitats.

Contact: filippo.dipaolo@edu.unito.it

Supervisors: Elena PIANO & Marco ISAIA (University of Torino, Italy)

Helena ROTHOVÁ | Bachelor thesis

Adaptations of terrestrial arthropods to the cave environment

Every living things on our planet is adapted to the environment it inhabitst, and a number of factors affect its overall appearance and behaviour. This is especially true for organisms living in environments with extreme conditions, where it has to adapt to be able to use the often limited resources. One of these environments are subterranean spaces lacking any light and having a limited supply of nutrients. This bachelor thesis presents a brief overview of the basic types of underground spaces and the way nutrients get into them, which are important factors that determine the presence of different groups of organisms. This thesis also summarizes the terminology used in relation to this type of environment. However, the main aim of this paper is to describe morphological, physiological, as well as behavioral adaptations to subterranean life of terrestrial representatives from particula groups of the tribe Arthropoda (Arachnida, Myriapoda, Crustacea, Hexapoda). From the presented list of specific adaptations in those groups it follows that all main evolutionary lines show similar types of adaptations, such as depigmentation, reduction or complete loss of vision, prolongation of body appendices, multiplication of sensory setae and enlargement of the body, as well as

adaptations that help organisms to use available resources.

Contact: rothova.hel@gmail.com

Supervisor: František ŠTÁHLAVSKÝ (Charles University, Prague, Czech Republic)

Ladislav SCHWEINER | Bachelor thesis

The consequences of low dispersal capacity on diversity and distribution of spiders

Spiders represent a highly diversified group. In terms of their dispersal capability, they can be classified in two categories: vagile and sedentary. Vagile spiders, most of the Araneomorphae infraorder lineages, are better adapted for dispersal thanks to their ballooning capability and generally more active lifestyle compared to the sedentary spiders, mostly belonging to the infraorders Mygalomorphae and Liphistiomorphae. The manner of dispersal and its efficacy represents a key factor for the colonization of new habitats and maintaining gene flow among the populations of the same species. Limited dispersal capability is responsible for the tendencies to local endemism in sedentary groups. This thesis aims to summarize our knowledge about the dispersal capabilities of sedentary spiders and the effect of vicariance and allopatric speciation on their distribution. The thesis provides a brief overview of dispersal barriers and evaluates their effect on the gene flow among the populations. The data proceeding from studies focused on selected sedentary spider lineages suggest that dispersal barriers have a strong negative effect on gene flow among their populations. Limited gene flow thus leads to genetic diversification and subsequent speciation.

Contact: ladislav.schweiner@gmail.com

Supervisor: Vera OPATOVA (Charles University, Prague, Czech Republic)



**#PHYLOGEOGRAPHY,
SYSTEMATICS & FAUNISTICS**

Marc Domènech ANDREU | PhD thesis

Reconciling standardized inventories and DNA barcoding to infer diversity patterns in Iberian spider communities

Biodiversity loss is a major global problem, so cataloguing diversity and understanding its patterns are the first steps before conservation actions can be taken. This is especially challenging for megadiverse groups, such as spiders. Here, we combine a standardised sampling protocol designed for spiders (COBRA) with DNA barcoding to infer diversity patterns of spider communities in oak forests of the Iberian Peninsula. We collected ca. 20,000 specimens belonging to 377 species, and obtained more than 3,200 DNA barcodes. Applying different species delimitation methods, we revealed instances of overlooked diversity and interesting cases of hybridisation. We also assessed how different factors of phylogenetic reconstruction affect our inferences of phylogenetic diversity. Using metabarcoding we revealed that immature stages represent an important part of diversity and affect our estimates. Finally, we found that the historical role as refugia of certain communities is reflected in differences in present patterns of phylogenetic diversity.



Graphical representation of the main contents of the PhD thesis

Contact: mdomenan@gmail.com

Supervisors: Miquel A. ARNEDO & Jagoba MALUMBRES-OLARTE (Universitat de Barcelona, Spain)

Barbora KOUBOVÁ | Master thesis

Spiders of the Bublák NNR

Results of faunistic survey on spiders (Araneae) from the surroundings of the national natural monument Bublák a niva Plesné (NPP Bublák) are presented in my Master thesis. NPP Bublák was declared as the national natural monument in 2017. This locality is famous because of gas springs called mofettes. NPP Bublák is situated in Cheb district near the villages Milhostov, Vackovec and Hartoušov. The river Plesná flows through NPP Bublák. Altogether 110 spider species (593 individuals) from 19 families were detected during the research which was carried out from 20.4. to 15.10. 2020. The number of spiders includes 537 adults (369 males and 168 females) and 56 juveniles. The highest number of species belongs to the families Linyphiidae, Lycosidae, and Araneidae. The most important records are those concerning the species listed in the red list of threatened spiders, namely: critically endangered: *Tmeticus affinis*, strongly endangered species: *Bathypantes setiger*. There were also four almost threatened species: *Pardosa paludicola*, *Pirata uliginosus*, *Leptorchestes berlinensis*, *Panamomops sulcifrons*, and seven endangered species: *Agyneta cauta*, *Ceratinella major*, *Clubiona subsultans*, *Cheiracanthium campestre*, *Philodromus emarginatus*, *Trochosa spinipalpis* and *Walckenaeria kochi*. Species of spiders are deposited in the Museum of West Bohemia in Pilsen, Department of Zoology (Czech Republic).

Contact: ba.koubova@seznam.cz

Supervisor: Ivana HRADSKÁ (University of West Bohemia, Plzeň, Czech Republic)



Alexandra MAREŠOVÁ | Bachelor thesis

Phylogeny and diversity of suborder Laniatores (Arachnida: Opiliones)

This bachelor thesis summarizes the general knowledge about phylogenesis, diversity and distribution of harvestmen from the suborder Laniatores. Until recently, phylogenetic relationships of this suborder were very few studied, but thanks to a recent studies they are still improving. The suborder Laniatores now includes 41 families, which are divided into ten superfamilies. An overview of distribution of individual families of the suborder Laniatores is also given in this work and so are factors influencing it. From abiotic factors there is humidity, temperature, climate, and altitude. Among biotic factors, the distribution may be influenced by the type of vegetation or by the human, where it is mainly the introduction of invasive species. The greatest emphasis is placed on morphological differences between individual families. The biggest differences can be observed on their bodies, especially in the form of different numbers and types of sclerotized protrusions.

Contact: saska.maresova@gmail.com

Supervisor: Matyáš HIRMAN (Charles University, Prague, Czech Republic)

Karolína RAUCHOVÁ | Bachelor thesis

Arachnofauna of the kaolin quarries near the Horní Bříza town

The research of spiders in the vicinity of the abandoned kaolin quarries near Horní Bříza town, is summarized in this bachelor thesis. This work was based on faunistic data from 2019–2020. In this period, there were 12 sites in close proximity of kaolin quarries and 12 sites in the wider area. Altogether 148 spiders species from 25 families were detected in both seasons using pitfall traps and individual collection. The total number of individuals was 1909 and it includes 1847 adults (1232 males, 615 females) and 62

juveniles. The most numerous species was *Trochosa terricola*. The most important records are those listed in the Red list of threatened spiders: category vulnerable: *Silometopus elegans*, *Gnaphosa lugubris*, *Pardosa paludicola*, *Piratula knorri* and *Hygrolycosa rubrofasciata*; endangered: *Bathyphantes setiger*, *Alopecosa schmidtii* and *Micaria dives*. Based on the Shannon-Wiener's index, the tighter sites of the abandoned kaolin quarries is more species diverse. We can therefore conclude on the importance for spiders of anthropogenic habitats that have been abandoned and have succumbed to natural renewal without human intervention.

Contact: rauchovk@students.zcu.cz

Supervisor: Ivana HRADSKÁ (University of West Bohemia, Plzeň, Czech Republic)

