valdensis occurs in isolated limestone massifs. Third, the species has a large altitudinal range, but occurrence data suggest that it is more frequent at high altitude. These distributional features lead to contrasted scenarios about the role of dispersal and selective factors. The range limits suggest a post-glacial dispersal whereas the disjunct distribution may indicate the occurrence of cryptic and allopatric units within *P. valdensis*. Although correlation does not imply causality, the putative altitudinal distribution of *P. valdensis* also suggests a role of temperature. This species could maximize its physiological performance at low temperature, a trait that is equally advantageous for surviving *in situ* or dispersing in vacant habitats during ice melting periods. Alternatively, the altitudinal distribution of *P. valdensis* may also reflect a thermally dependent biotic interaction. In this study, we attempted to select the best supported scenario using a multifaceted approach. First, we used phylogeographic methods to determine which of the dispersal and cryptic speciation scenario was more plausible. Second, a logistic regression model was performed to quantify variation in the probability of occurrence with groundwater temperature. At last, we measured variation in survival and respiration over a range of temperatures within 4 populations to test for a causal relationship between temperature and the distribution of *P. valdensis*. This research was funded by the Agence Nationale de la Recherche (ANR08JCJC012001, "DEEP"), the Institut Universitaire de France and the European Commission (7th EU Framework Programme, Contract No. 226874, BioFresh).

Population and Community Ecology of Subterranean Organisms: poster presentation

Polycephalomyces ramosus (Hypocreales, Ascomycota) an interesting troglophilic entomogenous fungus, new for Croatia

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During the regular monitoring on Veternica Cave (Mt. Medvednica, Croatia) performed in cooperation of Croatian Biospeleological Society experts and Natural Park Medvednica, particular synnematous entomogenous fungus parasitizing on imago of subtroglophilic fly *Heteromyza* sp. (Heleomyzidae, Brachycera, Diptera) has been found. Specimens, found in the dark zone of the cave were sampled, microclimate data recorded and photo documentation performed. The fungus is identified as *Polycephalomyces ramosus* (Peck) Mains (Hypocreales, Ascomycota) according to the Seifert's monograph on stilbellaceous fungi. This anamorphic ascomycetous fungus is often found in caves, living as a hyperparasite on entomogenous fungi viz. *Hirsutella guignardii*, *Cordyceps barnesii* and *C. entomorrhiza*. Relying on data compiled in form of preliminary checklist of Croatian cave fungi, this species is considered as first record for the Croatian mycobiota. This first finding of *Polycephalomyces ramosus* parasitizing on *Heteromyza* fly, give us opportunity to perform *in situ* morphological and ecological assessment and to work on its taxonomical status. Similarly to *Cordyceps riverae* treated in previous detailed ecological research, *Polycephalomyces ramosus* too is always

found to produce fruitbodies (in this case synnemata) at extremely high air humidity (100%) and condensed water regularly appears on the surface of both synnemata and host bodies. Air temperature (10 °C) is also very constant ecological factor, and occurring in such large cave as Vjeternica, without daily fluctuations and negligible seasonal fluctuations. Both *Polycephalomyces ramosus,* as well as and *Cordyceps riverae,* are members of the same order and may well be rather closely related, especially due to their common subterranean and cavernicolous habitat where they parasitize or hyperparasitize on adult stages of arthropods and both do not require sunlight for completion of their whole life cycle. They are therefore able to live constantly inside cave habitats. However, final conclusions on both taxonomical and ecological issues will be possible only after the planned molecular research is done focused on these troglophilic fungal species.

Subterranean Biodiversity and Biogeography: oral presentation

Hydrogeological borehole investigations of groundwater ecology in the English Chalk

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Estimating the numbers of stygobiotic invertebrates in aquifers, and understanding their distribution within boreholes and how this relates to their distribution within aquifers is important for understanding their environmental and habitat requirements, as well as the ecosystem services they might provide (e.g. their role in biogeochemical cycling and their potential as water quality indicators). Single borehole dilution tracer tests and borehole imaging were used to identify the location of major flowing fissures intercepted in two boreholes of approximately 100 m depth in the English Chalk. To investigate variability in invertebrate faunal communities and numbers with depth, 3 flowing fissures were selected in each borehole – one near the water table, one near the bottom of the borehole and one in the middle. A double packer system was used to isolate each of these fissures, enabling them to be directly sampled. At each interval, invertebrates were collected from 5000 litres of pumped water. Previous net hauling from above the bottom of boreholes and borehole CCTV images indicated that stygobiotic invertebrates live in the water column (particularly on the borehole walls) at substantial depths above the bottom. Fauna from the isolated packer intervals therefore comprise both animals living in the borehole water column within the isolated interval and those living within the water pumped from the aquifer. The 5000 litres of pumped water was divided into 13 samples in which fauna were collected separately to investigate how numbers and types of invertebrates relate to the amount of water that has already been pumped from the interval. In each interval, water chemistry and microbiological samples were collected at the beginning, middle, and end of pumping. Results indicate that different intervals contain different numbers and types of fauna, and have different microbial populations, and provide new information on the ecology of Chalk groundwaters.