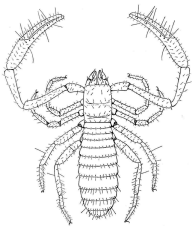
UNIL | Université de Lausanne
Faculté des géosciences et de l'environnement
bâtiment Amphipôle
CH-1015 Lausanne

Université de Neuchâtel

## MSc thesis topics


# Hidden biodiversity of caves in the Jura Mountains

**Context:** Caves represent extreme habitats characterised by the total absence of light and very low availability of nutrients. Nevertheless, they are home to a diversity of organisms from. While some organisms found in caves are not strictly restricted to these habitats (e.g., bats), others spend their entire life underground (i.e., troglofauna). This latter category includes many endemic and still poorly known species (C. Culver *et al.*, 2006). The most famous example in the Jura is *Gelyella monardi* (right illustration). The degree to which this highly specialised fauna may be threatened is unclear and assessing this requires first a good inventory of the biodiversity in caves (Wynne *et al.*, 2021).

**Goals:** In this project we will study the diversity of selected groups of cave invertebrates, focusing on myriapods or other groups (to be discussed). Both museum specimen and fresh material will be analysed. The morphology of the specimen will be described and each specimen will be DNA barcoded. Variable molecular markers will be used to separate closely-related taxa to identify possibly cryptic diversity or the genetic diversity between populations in different non-connected cave systems.

**Requirements:** Interest for invertebrate biodiversity, taxonomy and ecology

**Collaborations:** Dr. Pierre-Yves Jeannin & Dr. Marc Luetscher (ISSKA : Swiss Institute for Speleology and Karst Studies); Dr. Armand Nzoko (Laboratory of Soil Biodiversity, UniNe)

**Keywords:** Karst caves, invertebrates, taxonomy, DNA barcoding, morphology, endemism

**Workplace:** University of Neuchâtel, Lab. of soil biodiversity.

**Contact:** Prof. Edward Mitchell

**References:**

C. Culver, D., Deharveng, L., Bedos, A., J. Lewis, J., Madden, M., R. Reddell, J., Sket, B., Trontelj, P. & White, D. (2006) The mid-latitude biodiversity ridge in terrestrial cave fauna. *Ecography,* **29,** 120-128.

Wynne, J.J., Howarth, F.G., Mammola, S., Ferreira, R.L., Cardoso, P., Lorenzo, T.D., Galassi, D.M.P., Medellin, R.A., Miller, B.W., Sánchez-Fernández, D., Bichuette, M.E., Biswas, J., BlackEagle, C.W., Boonyanusith, C., Amorim, I.R., Borges, P.A.V., Boston, P.J., Cal, R.N., Cheeptham, N., Deharveng, L., Eme, D., Faille, A., Fenolio, D., Fišer, C., Fišer, Ž., 'Ohukani'ōhi'a Gon, S.M., Goudarzi, F., Griebler, C., Halse, S., Hoch, H., Kale, E., Katz, A.D., Kováč, Ľ., Lilley, T.M., Manchi, S., Manenti, R., Martínez, A., Meierhofer, M.B., Miller, A.Z., Moldovan, O.T., Niemiller, M.L., Peck, S.B., Pellegrini, T.G., Pipan, T., Phillips-Lander, C.M., Poot, C., Racey, P.A., Sendra, A., Shear, W.A., Silva, M.S., Taiti, S., Tian, M., Venarsky, M.P., Pakarati, S.Y., Zagmajster, M. & Zhao, Y. (2021) A conservation roadmap for the subterranean biome. *Conservation Letters,* **14,** e12834.