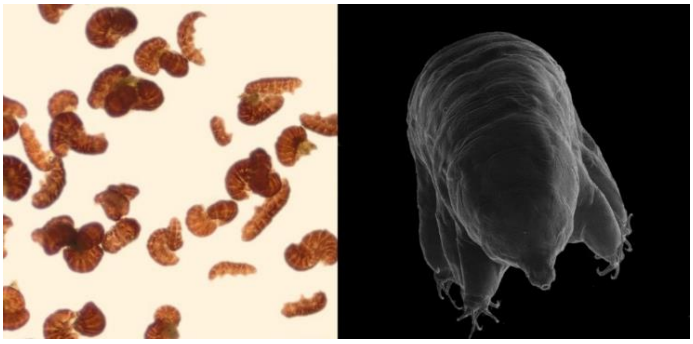
Understanding how habitat desiccation influences the animal communities is fundamental in today's changing word and a detailed knowledge of their tolerance limits will help in forecasting the effects of global change. Natural ecosystem can be studied; however, they are extremely complex and as such challenging for researchers. On the opposite end, laboratory experiments are easy to implement but their oversimplification can lower their translatability to processes that occur in nature. To solve this issue, I propose **rock pools** as a new model system that integrates both the advantages of natural and laboratory systems. **Rock pools** are small clearly defined and replicated natural habitats hosting relatively simplified biological communities.

Rock pools are eroded depressions that occur in bedrock that accumulate sediment on their bottom. These habitats occur all over the globe (including Poland) in all major biomes, depend mainly on precipitation for filling, and are some of the most persistent and oldest freshwater habitats worldwide. Rock pools are harsh habitats to live in as they are unpredictable and can desiccate or freeze quickly. In the project I will check how the toughest animals on Earth – **tardigrades** – can deal with this problematic habitat.



Tardigrades (also known as water bears or moss piglets) are a group of microscopic invertebrates less than 1 mm in size famous for the ability of survive complete desiccation but also a space vacuum!

In this project, **I will study how many and what tardigrades live in Polish rock pools and how they react to multiple desiccation-hydration cycles** and compare the results with similar data obtained for Italian rock pools. I will use a **metabarcoding approach** which is a molecular technique that allows to sequence a small fragment of gene of interest from all the creature (microscopic and macroscopic) that are found in a rock pool. These sequences constitute barcodes specific for each species. Therefore, by comparing the sequences with a reference database it is possible to classify them and determine what organisms inhabit a rock pool.

I will be interested in **how the environmental conditions of the rock pools determine what tardigrade species and how many individuals can colonize them**. I will also study how tardigrades disperse between rock pools and whether the distance between them is important.

Tardigrades do not live alone in rock pools, but share their habitat with some predators, like flatworms. However, tardigrades are much more resistant to desiccation than their predators. Thus, **I will test if tardigrade populations are more abundant in the rock pools that desiccate too often to allow predators to live in it, creating a safe haven for tardigrades**.

This project will allow to advance our understanding of **how animal communities are assembled in extreme habitats** and answer the question of what is the contribution of specific species traits to live in particular habitat and not elsewhere.

By describing the diversity of the fauna from rock pools, this project will also provide information useful to plan conservation strategies for this unique and overlooked habitat that is home to likewise unique and charismatic animals.