The oceanic depths (> 200m) are the least understood regions of the Earth and were considered azoic zones for centuries. In recent decades, ocean floor exploration demonstrates that the deep sea is inhabited by highly diverse and virtually completely unknown fauna. Biodiversity is an important part of human heritage, which protection is a challenging and urgent task. Most benthic organisms classified as macrobenthos (body length ranging from 1 mm to 10 cm) constitute an extremely diverse component of deep-sea ecosystems. The knowledge of their taxonomic composition and spatial distribution is essential for understanding the mechanisms shaping this diversity and assessing an ecosystem's resilience to natural or anthropogenic disturbances and its potential capacity for regeneration.

The COLONISERS research project aims to assess biodiversity and describe distribution patterns of small marine crustaceans, namely Typhlotanaidae (Tanaidacea: Peracarida). Typhlotanaidae is a highly diverse family (Fig. 1) and usually an abundant component of marine ecosystems in the bathyal (200–4000 m) and abyssal (4000–6000 m). Because of the lack of planktonic larvae and virtually sessile behavior (tube-building in bottom sediments, Fig. 1B), they are considered organisms with restricted mobility and are considered potentially ideal model groups biogeographic studies.

The COLONISERS will study a series of several thousand Typhlotanaidae collected during ten international deep-sea research expeditions in the north, central, and southwest Atlantic, and the north-west, central, and south-east Pacific Oceans. The project will follow an integrative approach, i.e., data from taxonomy, phylogenetics, spatial distribution, and ecology will be jointly analyzed and used to interpret results obtained from the phylogeographic analysis. Information on the spatial distribution of individual species across the latitudinal gradient and in poorly studied areas will be employed for the assessment of the biodiversity of ocean-floor ecosystems. The new molecular data obtained during project implementation and the relaxed molecular clock methods used will allow us to detect cryptic species and estimate the age of origin of different lineages. Spatial analysis of Typhlotanaidae will allow us to assess whether and how selected topographic structures (ocean trenches, underwater mountain ranges) shape the crustacean biogeographical ranges in the bathyal and abyssal zones, hence identify the place of the radiation.

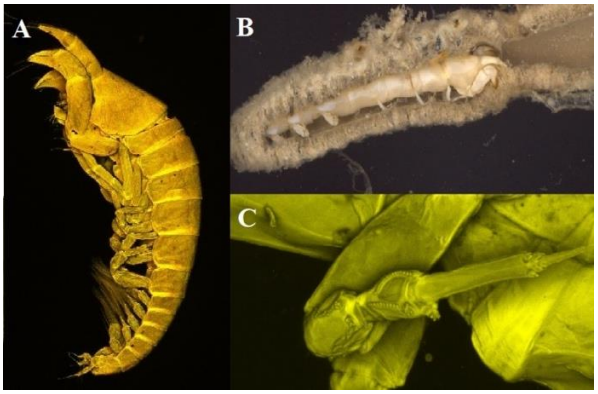

Fig. 1 *Typhlotanais grahami* Blażewicz-Paszkowycz, 2004; B. The individual inside the tube; C. "clinging apparatus" on legs (P4–6).

Active conservation and sustainable management of marine ecosystems require data on diversity, geographic ranges, and dispersal routes. The data obtained during the project implementation will support in the open databases, i.e., World Register of Marine Species (WoRMS), Ocean Biodiversity Information System (OBIS), GenBank, and BOLD, and will provide reference information for the design of Marine Protected Areas or for pointing the areas designated for economic exploitation (e.g., deep-sea mining).