



Conference Abstract

Identification of sulfur-oxidizing *Thiothrix* bacteria on microcrustaceans from the sulfidic groundwaters of Mangalia (southeastern Romania)

Filip Paul Boancă[‡], Claire Audrey Chauveau[§], Jean-François Flot^{§,¶}, Maria Mirabela Pop[‡], Sanda Iepure^{‡,¶}

[‡] "Emil Racovita" Institute of Speleology, Cluj-Napoca, Romania

[§] Université libre de Bruxelles, Brussels, Belgium

[¶] Interuniversity Institute of Bioinformatics in Brussels – (IB)², Brussels, Belgium

[¶] Romanian Institute of Science and Technology, Cluj-Napoca, Romania

Corresponding author: Filip Paul Boancă (filip.boanca@yahoo.com)

Received: 06 Jul 2022 | Published: 14 Jul 2022

Citation: Boancă FP, Chauveau CA, Flot J-F, Pop MM, Iepure S (2022) Identification of sulfur-oxidizing *Thiothrix* bacteria on microcrustaceans from the sulfidic groundwaters of Mangalia (southeastern Romania). ARPHA Conference Abstracts 5: e90001. <https://doi.org/10.3897/aca.5.e90001>

Abstract

Movile Cave, located in southeastern Romania close to the Black Sea, is one of the most remarkable diversity hotspots worldwide with 52 species of invertebrates of which 37 are endemic (Brad et al. 2021). Due to the high concentration of hydrogen sulfide in its water, the primary production of organic matter in Movile Cave relies almost entirely on the chemoautotrophic activity of microorganisms, notably sulfur-oxidizing gammaproteobacteria belonging to the genus *Thiothrix*. In the presence of oxygen, these filamentous bacteria can oxidize hydrogen sulfide and reduce it into various sulfidic compounds, generating energy in the process. In sulfidic ecosystems, *Thiothrix* bacteria are frequently found free-living but also as epibionts or ectosymbionts growing on other organisms, such as amphipods (Flot et al. 2014). However, it is unclear whether *Thiothrix* bacteria also grow on microcrustaceans such as copepods or ostracods, of which several species are known from the sulfidic mesothermal aquifer of Mangalia, where Movile Cave is located. To find it out, we combined DNA sequencing using the reference bacterial 16S ribosomal RNA gene with morphological observations (including fluorescence microscopy). Our results reveal that *Thiothrix* bacteria are indeed present on microcrustaceans from

Mobile Cave and surrounding wells in the Mangalia region, highlighting the versatility of *Thiothrix*-crustacean associations in sulfidic ecosystems. This is the first report of an association between *Thiothrix* and groundwater microcrustaceans, and the second report of an association between *Thiothrix* and a nonmarine ostracod (Khalzov et al. 2021).

Keywords

Mobile Cave; Mangalia groundwater; sulfur-oxidizing bacteria; subterranean biodiversity; groundwater ecosystems; crustacean ectosymbionts

Presenting author

Filip Paul Boancă

Presented at

Proceedings of the 25th International Conference on Subterranean Biology (Cluj-Napoca, 18-22 July 2022)

Funding program

This work was supported by a grant of the Romanian Ministry of Education and Research, CNCS - UEFISCDI project number (PN-III-P4-ID-PCE-2020-2843) (EVO-DEVO-CAVE)

Grant title

Convergent evolution, development and adaptations of crustaceans from chemosynthesis-based cave ecosystems

Conflicts of interest

The authors declare no conflict of interest.

References

- Brad T, Iepure S, Sarbu S (2021) The chemoautotrophically based Mobile Cave groundwater ecosystem, a hotspot of subterranean biodiversity. *Diversity* 13 (3): 128. <https://doi.org/10.3390/d13030128>
- Flot J, Bauermeister J, Brad T, Hillebrand-Voiculescu A, Sarbu S, Dattagupta S (2014) *Niphargus*-*Thiothrix* associations may be widespread in sulphidic groundwater

ecosystems: evidence from southeastern Romania. *Molecular Ecology* 23 (6): 1405-1417. <https://doi.org/10.1111/mec.12461>

- Khalzov IA, Bukin SV, Zakharenko AS, Chernitsyna SM, Galachyants YP, Sitnikova TY, Zemskaya TI (2021) Microbial communities associated with the ostracods *Candona* sp. inhabiting the area of the methane seep Goloustnoye (Lake Baikal). *Symbiosis* 85 (2): 163-174. <https://doi.org/10.1007/s13199-021-00802-3>