

# Book of Abstracts of the

# 1<sup>st</sup> European Meeting on GEOMICROBIOLOGY OF VOLCANIC CAVES

2-3 March 2023, Seville (Spain)



A. Z. Miller, J. M. de la Rosa, N. T. Jiménez-Morillo (eds.)

**MICROVOLCAVE 23**  
**(Seville, 2-3 March 2023)**

*“Exploring the inside, understanding the outside worlds”*

**Book of Abstracts of the**  
**1<sup>st</sup> European Meeting on GEOMICROBIOLOGY**  
**OF VOLCANIC CAVES**  
**2 - 3 March 2023, Seville (Spain)**

**Editors:**

**Ana Z. Miller<sup>①②</sup> José M<sup>a</sup> de la Rosa<sup>①</sup> and Nicasio T. Jiménez-Morillo<sup>①</sup>**

---

① Instituto de Recursos Naturales y Agrobiología de Sevilla (IRNAS-CSIC), Reina Mercedes  
Av. 10, 41012 Seville, Spain

② Laboratório HERCULES, Universidade de Évora, 7000-809 Évora, Portugal.

---

*With the support of:*



*Edition and Layout:*

Ana Z. Miller  
José M. De la Rosa  
Nicasio T. Jiménez Morillo

*Cover picture:*

*Fuente de la Canaria* lava tube, by Ana Miller

*Published by:*

Instituto de Recursos Naturales y Agrobiología de Sevilla, Consejo Superior de Investigaciones Científicas (IRNAS-CSIC), Seville, Spain.

*Funded by:*

The Spanish Ministry of Science and Innovation from the Spanish State Agency (AEI) through the projects TUBOLAN (PID2019-108672RJ-I00) and HIRES-SOM (TED2021-130683B-C22).

The Portuguese FCT (*Fundação para a Ciência e a Tecnologia*) through the MICROCENO project (PTDC/CTA-AMB/0608/2020).

The Regional Government of Andalusia through the MICROLAVA research project (PROYEXCEL\_00185).

ISBN-13 978-84-09-48976-3

Printed in Spain – Impreso en España

Sevilla, 2023

## INDEX OF CONTENTS

### ORAL PRESENTATIONS

<b>Session 1. STUDIES ON THE VOLCANIC CAVES OF THE SELVAGENS AND LANZAROTE ISLANDS</b> (Chairs: Matteo Massironi and Ana Z. Miller)		<b>Page</b>
<b>1.1 “Geology of Selvagens”</b>	<u>Matteo Massironi</u> , <u>Francesco Sauro</u> , <u>Christine Meyzen</u> , <u>Riccardo Pozzobon</u> , <u>Ilaria Tomasi</u> and <u>Ana Z. Miller</u>	6
<b>1.2 “Selvagens Islands - History and science”</b>	<u>Manuel Biscoito</u> and <u>Francis Zino</u>	7
<b>1.3 “Flank margin speleogenesis in carbonatic sedimentary dikes of a volcanic island: the caves of Selvagen Grande”</b>	<u>Francesco Sauro</u> , <u>Matteo Massironi</u> and <u>Ana Z. Miller</u>	8
<b>1.4 “Genesis of the Corona Lava Tube”</b>	<u>Ilaria Tomasi</u> , <u>Matteo Massironi</u> , <u>Christine Meyzen</u> , <u>Francesco Sauro</u> , <u>Riccardo Pozzobon</u> , <u>Jesus Martinez-Frias</u> and <u>Elena Mateo Mederos</u>	9
<b>1.5 “Geomicrobiology of volcanic caves”</b>	<u>Ana Z. Miller</u>	10
<b>1.6 “Bioprospection of new compounds in pristine environments produced by bacterial isolates”</b>	<u>Patrícia Gatinho</u> , <u>Cátia Salvador</u> , <u>Silvia Macedo Arantes</u> , <u>M. Rosário Martins</u> , <u>Ana Z. Miller</u> and <u>A. Teresa Caldeira</u>	11
<b>1.7 “Screening samples collected at Selvagens and Lanzarote Islands: What could be expected from the biotechnological point of view”</b>	<u>Igor Tiago</u>	13
<b>1.8 “Bacterial isolates from Canary Islands (Spain) and the Selvagens Islands (Portugal) lava tubes”</b>	<u>Sara Gutiérrez Patricio</u> , <u>José Luis González-Pimentel</u> , <u>Leonila Laiz</u> and <u>Ana Z. Miller</u>	14
<b>1.9 “A Photojournalistic take on Microceno’s expedition”</b>	<u>Antonio Luis Campos</u>	15

## 1.6 Bioprospection of new compounds in pristine environments produced by bacterial isolates

Patrícia Gatinho<sup>(1,2)</sup>, Cátia Salvador<sup>(2)</sup>, Silvia Macedo Arantes<sup>(2)</sup>, M. Rosário Martins<sup>(2,3)</sup>, Ana Z. Miller<sup>(2,4)</sup>, A. Teresa Caldeira<sup>(2,5,6)\*</sup>

- (1) Department of Engineer, School of Science and Technology, University of Trás-os-Montes e Alto Douro, 5000-801 Vila Real, Portugal.
- (2) HERCULES Laboratory, Institute for Advanced Studies and Research, University of Évora, Largo Marquês de Marialva 8, 7000-809 Évora, Portugal
- (3) Department of Medical and Health Sciences, School of Health and Human Development, University of Évora, Évora, Portugal.
- (4) Instituto de Recursos Naturales y Agrobiología de Sevilla (IRNAS-CSIC), Avenida Reina Mercedes 10, 41012 Sevilla, Spain.
- (5) Department of Chemistry and Biochemistry, School of Sciences and Technology, University of Évora, Rua Romão Ramalho 59, 7000-671 Évora, Portugal
- (6) City U Macau Chair in Sustainable Heritage, Institute for Advanced Studies and Research, University of Évora, Largo Marquês de Marialva 8, 7000-809 Évora, Portugal.

\*Corresponding author: atc@uevora.pt

### Abstract

Pristine environments can be defined as places with limited or no connections to anthropogenic activities [1], for example karstic and marine caves, relevant locations of Natural and Cultural Heritage. Usually, these environments are exposed to extreme factors such as, temperature, salinity, osmolarity, UV radiation, pressure, or pH, with values close to the limit of life. In these extreme environments living organisms biosynthesize secondary metabolites with potential bioactivities giving them unique survival skills to grow in hostile conditions [2].

This study is being performed within the MICROCENO and TUBOLAN research projects and aims to search for new bioactive compounds produced by bacterial cultures, isolated from volcanic caves. Samples were collected from caves of Selvagens Islands (Madeira archipelago, Portugal) and Lanzarote Island (Canary archipelago, Spain).

Cultivable microorganisms were previously isolated on different culture medium and identified by sequencing 16S rDNA [3]. The antioxidant activity and antimicrobial spectra against Gram-negative and Gram-positive bacteria was evaluated. The results obtained suggest that selected bacteria isolates produce biologically active compounds with potential application in biotechnology and biomedicine. Additionally, screening assays testing antitumor potential of supernatants from bacterial strain cultures against a breast cancer epithelial cell line MDA-MB-231 and colorectal adenocarcinoma cell line Caco-2 are in progress.



1<sup>st</sup> European Meeting on:

**GEOMICROBIOLOGY OF VOLCANIC CAVES**  
Seville (Spain), 2-3 March 2023



Bioprospection and discovery of new compounds represent an opportunity for implement new products obtained by fast and low-cost biotechnological processes as a novel green-safe and sustainable solutions.

*Acknowledgements:*

The authors acknowledge the FCT – Foundation for Science and Technology, I.P., within the scope of the projects UIDB/04449/2020, MICROCENO (PTDC/CTA-AMB/0608/2020), ART3mis (2022.07303.PTDC) and C. Salvador (DL 57/2016/CP1372/CT0019) to individual support. The Spanish Ministry of Science and Innovation is also acknowledged for funding the TUBOLAN project (PID2019-108672RJ-I00).

**References:**

- [1] S. Atashgahi, MM. Häggblom, H. Smidt. *Environmental Microbiology* 20(3), 2018, 934–48. <https://doi.org/10.1111/1462-2920.14016>.
- [2] D. Giordano, *Marine drugs of MDPI* 19(11), 2020; 1–7. <https://doi.org/10.3390/md19110642>.
- [3] A. T. Caldeira, N. Schiavon, G. Mauran, C. Salvador, T. Rosado, J. Mirão, A. Candeias. *Coatings of MDPI* 11(2), 2021; 1–17.