













Prospection of Bioactive Compounds Produced by Bacterial Isolates from Caves: Antioxidant and Antibacterial Activities

Patrícia Gatinho^(1,2), Cátia Salvador⁽¹⁾, Silvia Macedo-Arantes⁽¹⁾, M. Rosário Martins^(1,3), Ana Z. Miller^(4,1), Amélia M. Silva⁽⁵⁾, A. Teresa Caldeira^(1,6)*

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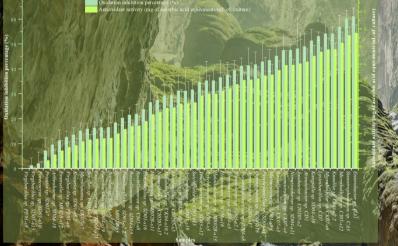
Introduction

Caves, natural geological formations resulting from rock cavities with adverse abiotic conditions, are considered extreme and inhospitable habitats. This further emphasizes the remarkable adaptability of microorganisms that manage to inhabit them. These unique environmental characteristics enable microorganisms to develop specific metabolisms and produce new bioactive compounds with potential activities, such as antimicrobial and antioxidant properties [1]. This research aims to evaluate the antioxidant and antibacterial activity against Gram-negative and Gram-positive of diluted lyophilised extracts produced by strains isolated from pristine environments such as 3 caves on Selvagem Grande Island (Madeira archipelago, Portugal), 2 caves on Lanzarote Island (Canary archipelago, Spain) and the Paleolithic Escoural Cave (Montemor-o-Novo, Portugal [2]). The results obtained suggest that the selected bacterial isolates produce biologically active compounds that have the potential to serve as viable alternatives to conventional antibiotics or as antioxidants. These findings have wide-ranging implications for health and wellbeing, covering areas such as nutrition, pharmacology, cosmetics, and even the culinary sector.

Methodology Obtention of free cells culture broths Biological activities assessment Antioxidant activity Antibacterial activity Free radical scavenging potential

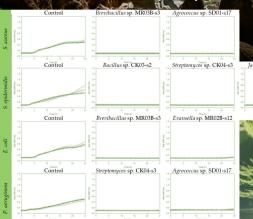
Results

Lipidic peroxidation inhibition





Antibacterial activity in liquid media



ral activity by paper disc diffusion method

Samples	Pathogenic bacteria and Bacterial inhibition zones (mm)			
Brevibacillus sp. MR02B-s3	6.50±0.50	n.d.	7.60±1.53	8.35±0.22
Evansella sp. MR02B-s12	n.d.	n.d.	7.10±1.05	n.d.
Bacillus sp. CK03-s2	n.d.	12.17±2.72	n.d.	n.d.
Streptomyces sp. CK04-s3	n.d.	8.03±1.95	n.d.	n.d.
Janibacter sp. CI0205-s2	n.d.	7.60±2.08	n.d.	n.d.
Agrococcus sp. SD01-s17	11.00±1.32	n.d.	n.d.	10.83±0.29
Mean values from 3 disks ± SD are demonstrated, n.d. – not determined.				

occus sp. SD01-s17 against

Remarks

- ^dia The extracts of the isolates *Enterobacter* sp. 1, *Stenotrophomonas* sp. CA3, *Microbulbifer* sp. CI05-s12, *Knoellia* sp. CI04-s2.2, *Microbulbifer* sp. CK07-s6, *Lysinibacillus* sp. CD7, *Kangiella* sp. SD04-s10, *Qipengyuania* sp. SD01-s18 and *Tenacibaculum* sp. SD03-s12 showed an antioxidant activity greater than 50% inhibition. In the future, it would be interesting to carry out a dose-response tests—for antioxidante
- Some extracts showed a high inhibition of the growth of pathogenic bacteria, with prominence in acillus sp. MR02B-s3, which showed activity against Staphylococcus epidermidis, Staphylococcus and Escherichia coli and Agrococcus sp. SD01-s17 extract which inhibited the growth of idis and Staphylococcus aureus during the 24h assay.























