

988-1 Profile of microbial resistance to antimicrobials of bacteria isolated in iron caves in the eastern Amazonia -PA

Autores:

Mayara Maria Souza (UNIOESTE - Universidade Estadual do Oeste do Paraná); Camila Vogt Santos (UNIOESTE - Universidade Estadual do Oeste do Paraná); Luana Souza (UNIOESTE - Universidade Estadual do Oeste do Paraná); Debora Pedroso (UNIOESTE - Universidade Estadual do Oeste do Paraná); Larissa de Assis Carrets (UNIOESTE - Universidade Estadual do Oeste do Paraná); Debora Marina Bandeira (UNIOESTE - Universidade Estadual do Oeste do Paraná); Fabiana Gisele da Silva Pinto (UNIOESTE - Universidade Estadual do Oeste do Paraná)

Resumo:

Brazil brings together some of the world's largest iron formations that have become a major target of study in recent years. Thus, environmental bacterial, specifically from cave environments, become an important source for the development of bioactive compounds due to their ability to adapt to extremophile environments. Knowledge about the microbial potential of these cave microorganisms gives us a starting point for the development of new antimicrobial compounds. Therefore, the objective of this research was to determine the antimicrobial resistance profile of bacterial isolates from iron caves in Serra da Bocaina, located in the Campos Ferruginosos National Park, in the municipality of Cana dos Carajás, PA, Brazil. For this, 51 bacteria isolated from the soil of iron caves selected from two caves (GEM-1462 and GEM-1423) were evaluated for resistance to 12 commercial antimicrobials, namely Amoxicillin (10 µg), Nalidixic Acid (30 µg), Ampicillin (10 µg), Ciprofloxacin (5 µg), Chloramphenicol (30 µg), Streptomycin (10 µg), Imipenem (10 µg), Gentamicin (10 µg), Norfloxacin (10 µg), Trimethoprim (5 µg), Sulfazotrim (25 µg) and Tetracycline (30 µg). Bacteria were isolated from the surface layer of each cave, in the first 10 cm in three different zones: photic zone, dysphotic zone and aphotic zone. The collection took place under the license of the Biodiversity Authorization and Information System (SISBIO) nº 79255-1 in the dry and rainy season, a period that covers the months of September 2022 and March 2023, respectively. To assess antimicrobial resistance, the Kirby-Bauer disk diffusion technique was used, as described by Bauer et al. in 1966. The resistance profile was then analyzed following the guidelines established by the Clinical and Laboratory Standards Institute (CLSI) in 2017. The results revealed different resistance patterns, bringing valuable information about the dynamics of bacteria in caves under different environmental conditions. It was observed that 68.7% of bacteria in the dry season were resistant to at least 2 antimicrobials, while in the rainy season the percentage of resistance was 92.8%. In general, approximately 80% of bacteria exhibited resistance to at least two antimicrobials. Notably, both Ampicillin and Amoxicillin, belonging to the penicillin class, stood out as antimicrobials to which bacteria demonstrated significant resistance, in addition to the previously mentioned high resistance to Trimethoprim. On the other hand, it was observed that the quinolones (Ciprofloxacin and Norfloxacin) and the aminoglycoside (Gentamicin) maintained their constant effectiveness throughout the different sampling seasons. This suggests that these bacteria showed less pronounced or impactful resistance to these antimicrobials over the study period.

Palavras-chave:

antimicrobials , iron caves , resistance

Agência de fomento:

Unioeste, IABS, Instituto Tecnológico do Vale