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PROSPECTING ANTIMICROBIAL METABOLITES FROM SOIL-DERIVED *Pseudomonas* sp.

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The search for new compounds with antimicrobial properties has become increasingly important due to the rise of multidrug-resistant microorganisms. A promising source of these compounds is natural microbial products, especially those derived from soil, an ecosystem that harbors about 59% of life on Earth. In Brazil, soils are highly biodiverse, considering the diverse biomes distributed throughout its territory. In this context, the iCHIP (Isolation chip) technique is relevant for isolating and culturing microorganisms that are difficult to grow under laboratory conditions. Microorganisms were isolated from soil samples collected in the ecotone region between the Cerrado and the Atlantic Forest to prospect for compounds with antimicrobial activity from microorganisms isolated using the iCHIP technique. Among the strains selected based on antagonism tests against *Pseudomonas aeruginosa, Staphylococcus aureus,* and *Candida albicans*, the strain *Pseudomonas* sp. 3.2S2 stands out. After cultivation, extracts were obtained, fractionation techniques (SPE) were applied, and biological assays were performed to evaluate the activity against human pathogens, biofilm eradication, and cytotoxicity against cancer cells. For chemical profile analysis, metabolomics was used through the application of chromatographic methods (HPLC-DAD-ELSD and HPLC-MS/MS) and, for the dereplication process, the GNPS platform, in addition to the Dictionary of Natural Products and Natural Products Atlas databases. The MeOH 100% fraction obtained from *Pseudomonas* sp. 3.2S2 showed activity against *S. aureus* ATCC 25923 (MIC 128 µg/mL), *S. aureus* ATCC 29212 (MIC 256 µg/mL), and *Staphylococcus epidermidis* (MIC 64 µg/mL), as well as the ability to eradicate biofilm from *S. aureus* ATCC 25923 (63.3% ± 10.0). The major compound was isolated using preparative HPLC, and characterized as pseudopyronine B, based on NMR data. Spectroscopic (UV-Vis) and spectrometric data also confirmed the presence, in lower concentrations, of pseudopyronines A and C. The MIC of the isolated compound against *S. aureus* was 0.3906 µg/mL. In addition to the activity against *S. aureus* reported in this study, the literature also describes the action of pseudopyronines against other pathogens, reinforcing the potential of these metabolites as promising antimicrobial agents and highlighting the value of soil microorganisms in the production of bioactive compounds.
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