EXPLORING CHILEAN PATAGONIA EXTREMOPHILES AND MARINE BACTERIA METABOLITES AS NEW ANTITRYPANOSOMAL COMPOUNDS

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Neglected Tropical Diseases as Chagas disease represents a public health challenge, affecting 7 million people worldwide. With an ineffective treatment, the search for new therapies is urgent. Microbial metabolites have been widely used as prototypes in FDA-approved drugs. Marine and extremophilic microorganisms produce an array of metabolites, depending on their adaptations to extreme conditions as those found in the glaciers and hypersaline lakes. Considering the huge chemodiversity of these microbial metabolites, we explored the anti-*T. cruzi* potential of extremophiles from sediments of the Chilean Glacier Grey Lake, the hypersaline Bitter Lagoon (Patagonia), and marine bacterial metabolites from Brazil. Sediments were plated in Marine agar and TSA agar medium, and the bacteria were isolated using conventional techniques. The identification of the bacteria was performed by MALDI-ToF/MS and 16S rRNA gene partial sequencing. The bacterial metabolites of ten Gram-negative bacteria were extracted with organic solvents and the anti-*T. cruzi* (Y strain) activity was evaluated against trypomastigotes at 150 µg/mL for 24h incubation, using resazurin. Chemical analyses were performed using Nuclear Magnetic Ressonance (^{1}H and ^{13}C NMR). The MALDI-ToF/MS analysis resulted the identification of only one bacteria, the *Planococcus maritimus*. The 16S rRNA sequencing identified three isolates as *Pseudoalteromonas rubra*, *Pseudoalteromonas piscicida* and *Cyclobacterium plantarum*. Our results demonstrated that all organic extracts killed 100% of the parasites at the highest tested concentration, with EC_{50} values between 3 and 62 µg/mL and benznidazole 6 µg/mL. Two potent extracts (PLASE1.1 and SMG37) were selected for NMR analysis and the results showed a mixture of compounds (< 1 kDa) containing aromatic rings. Marine microorganisms and those living in extreme environments represent new sources of small molecules with potential antitrypanosomal activity.

Supported by FAPESP 2024/16243-4 and CAPES.

Keywords: Trypanosoma cruzi, therapy, natural products