

TITLE: Evaluation of Antimicrobial activity of Brazilian Marine Invertebrates extracts against *Staphylococcus aureus*, *Staphylococcus epidermidis* and *Escherichia coli*.

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ABSTRACT:

Antimicrobial resistance is responsible for at least 50,000 deaths each year in Europe and US. Resistant pathogens are expected to be responsible for 10 million deaths worldwide by 2050. The antimicrobial resistance profile of pathogens has created the demand to search for new and effective antimicrobial agents. Marine organisms are among the most promising natural sources in the search for new bioactive substances as candidates to treat human diseases. About 80% of the drugs commercially available are natural products or have been inspired from the nature. The Brazilian coast, including its islands, has a huge extension and the marine biodiversity makes it promising to study these national ecosystems. The identification of the Minimum Inhibitory Concentration (MIC) against *S. aureus* HU25, *S. epidermidis* ATCC12228 and *E.coli* ATCC11775 strains was performed according to Clinical and Laboratory Standards Institute (CLSI 2014), where serial dilutions of marine extracts are incubated with the bacterial inoculum in 96-well plates for 24h/37°C. The reading was performed with the use of resazurin dye. The Minimal Bactericidal Concentration (MBC) has been performed by using aliquots of each MIC dilutions to be transferred to TSA plates and incubated for 24h/37°C. After this interval, bacterial growth was observed. We analyzed 72 marine extracts collected from 1996 to 1998. So far, 23 presented results with values for MIC lower or equal to 128 µg/ml and 13 of these, presented MBC lower or equal to 128 µg/ml. The cytotoxicity assay was performed in 3T3 cell culture. The results were analyzed by GraphPad Prism. Some extracts exhibited a very promising biological activity and we can reaffirm the importance of the search for new bioactive substances in nature to finding a possible solution for human diseases. Assuming natural products of marine organisms associated with the abundance of the therapeutic targets, it is implied that the molecules herein studied, present potential as antimicrobial agents against susceptible and resistant bacteria.

Keywords: marine extracts; bacterial infection; antimicrobial resistance;

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