

TITLE: BIOPROSPECTING OF COMPOUNDS WITH ANTIMICROBIAL ACTIVITY FROM BACTERIAL MARINE ISOLATES

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ABSTRACT:

The microbiota of marine organisms presents a still unknown diversity of bacteria which might play an important role in the physiology of this ecosystem. This diversity is an enormous wealth in terms of microorganisms and metabolic processes that can be used to the bioprospecting of genes of biotechnological interest, especially those with antimicrobial activity. Still, due to the current need for new types of antimicrobials to control multiresistant pathogens and emerging new infectious agents, marine chemiodiversity is one of the most promising alternatives for the search for natural compounds. Thus, the objective of this study is to perform the isolation of microorganisms producing compounds with antimicrobial activity with subsequent characterization. To date, 75 bacteria have already been isolated (differentiated by mass spectrometry using the MALDI-ToF), of which 39 have already undergone primary screening for antimicrobial activity and 18 had already demonstrated activity against GRAM negative and GRAM positive, with subsequent sequencing of the 16S rDNA gene for bacterial identification. Secondary screening is performed with the positive isolates in the primary screening, by means of an interaction test with biological membranes (phospholipids and polymerized polydiacetylene), in order to verify if the identified compounds interact with biomembranes. Furthermore, the isolates were submitted to an antibacterial activity detection system based in the production of fluorescence by the expression of the *gfp* gene due to activation molecules homoserine lactone (AHL), which are directly related to cell density of the producing bacterium used the antibacterial assay. Subsequently, the identified compounds will be characterized, separated by liquid chromatography and SDS-PAGE, identified and sequenced by mass spectrometry. The gene will be isolated and sequenced for further cloning and characterization of compound activity and structure. This systematic approach, together with the continued exploration of marine microbial diversity, will have the potential to generate new chemical compounds and bioactive drugs as well as accelerate the discovery of new genes with antimicrobial activity.

Keywords: antimicrobial activity, bioprospecting, microbial diversity, marine microbiota