Title: ANTAGONISTIC ACTIVITY OF DEEP-SEA SEDIMENT BACTERIA AGAINST *VIBRIO* AND *SHEWANELLA*

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Abstract:
Ocean sea floor microorganisms have evolved mechanisms of defence to thrive in the rash conditions of deep-sea sediments. The production of secondary metabolites is a manner encountered by sedimentary microorganisms to inhibit the existence of other species, thus decreasing competition for space and nutrients. The antimicrobial potential of microbial secondary metabolites have being targeted by industries and researches due to the increasing number of pathogenic antibiotic resistant strains. Emerging bacteria that have been exhibiting antibiotic resistance and leads severe diseases are some species of *Vibrio* and *Shewanella*. This project aims to evaluate the potential of deep-sea sediment marine bacteria in inhibit pathogenic strains of *Vibrio* and *Shewanella.* 33 deep-sea sediment marine bacteria were obtained from the microbial library of the Laboratory of Applied Microbiology in the University of Vale do Itajai (Brazil), which were previously isolated from sediment samples of the Atlantic Ocean. *Vibrio* and *Shewanella* were isolated from *Perna perna in natura* (Linneaus, 1758), morphologically and biochemically characterised, and genetically identified via their 16s rRNA gene sequence. The production of antimicrobial molecules was assayed by Agar Block and Disc Diffusion technique. Seven microorganisms were cultivated from mussels and had their morphological and biochemical profile evaluated. Two isolates were discarded from the experiment for their gram testing and oxidase characteristics. Five isolates were molecularly similar (99%) to *Morganella morganii*, *Shewanella algae*, *Shewanella haliotis* and *Vibrio cincinnatiensis. S. algae*, *S. haliotis* and *V. cincinnatiensis* are described as pathogenic strains in the literature and were tested with the deep-sea sediment marine bacteria. The Agar Block technique did not indicate the antimicrobial potential of all sediment bacteria tested. The Disc Diffusion assay indicated the activity of five deep-sea marine bacteria against *S. algae* and *V. cincinnatiensis* but none sediment bacteria inhibited *S. haliotis*. Four *Bacillus* strains were active against *S. algae* and one *Brevibacterium* strain supressed the growth of *V. cincinnatiensis*. The identity of the biologically active molecules remains unknown and additional studies are required. These findings demonstrate the high potential of deep-sea sediment marine bacteria in produce natural products with antimicrobial properties towards pathogenic gram-negative strains.

Key words: deep-sea sediment marine bacteria; antagonistic activity; pathogenic; *Vibrio*; *Shewanella*