



Isolation, partial characterization and antimicrobial activity evaluation of bacterial communities associated to marine sediment and invertebrates from the southeast of Brazil

Marcelo Marucci Pereira Tangerina¹, Hebelin Correa², Bradley Halti², Wagner Vilegas¹, Russell Kerr²

¹UNESP- Univ Estadual Paulista, Coastal campus of São Vicente, Pça Infante Dom Henrique, s/n, CEP 11330-900 – Pq. Bitaru, São Vicente - SP, Brazil; ²UPEI-University of Prince Edward Island, Department of Chemistry, 550 University Avenue, C1A 4P3 Charlottetown - PE, Canada;
marcelomptang@hotmail.com

Abstract: Bacterial diversity of specific marine ecosystems and organisms has been widely investigated in Brazil, including research in bacterial communities of estuarine and mangrove sediments, deep water samples and associated with invertebrates [1]. Shrimp fisheries along the coast of Brazil are an impacting activity which can catch up to 21kg unusable by-catch material per kg of shrimp. This material may contain invertebrates that could be a prolific source of a great variety of bacterial genera with potential biotechnological importance [2]. In this study we explored the culture dependent bacteria associated to two of the most abundant invertebrate species (the snail *Olivancillaria urceus* and the sea star *Luidia senegalensis*), found in the unusable material, as well as the bacterial community associated to marine sediment (15-20m depth) near to the collection site. The bacterial isolation was done using four different pre-treatments of the samples followed by culturing in five media. The identification was done by partially sequencing of the 16S rDNA. After characterization, all isolates were cultivated in liquid Marine Broth Difco™ medium, extracted with ethyl acetate and the extracts washed with Milli-Q water. Finally, all extracts were diluted to 100 microgram/mL and tested against the following pathogens: methicillin-resistant *Staphylococcus aureus* ATCC 33591 (MRSA), *S. warneri* ATCC 17917, vancomycin-resistant *Enterococcus faecium* EF379 (VRE), *Pseudomonas aeruginosa* ATCC 14210, *Proteus vulgaris* ATCC 12454, and *Candida albicans* ATCC 14035. The results showed a great diversity of bacterial genera associated with the invertebrates and sediment. In total 122 isolates were obtained, belonging to Proteobacteria, Firmicutes and Actinobacteria phyla, distributed in 28 genera. Among all isolates tested, four strains exhibited moderate antimicrobial activity against reference strains MRSA and *S. warneri*. These results showed the potential of marine bacteria from Brazilian coast yet to be explored as a source of bioactive natural products as well as the great diversity of bacteria that Brazilian coast holds.

[1] Ióca LP, Allard P-M, Berlinck RGS. 2014. Thinking big about small beings--the (yet) underdeveloped microbial natural products chemistry in Brazil. *Nat Prod Rep* 31:646–75.

[2] 2003 EJJ. 2003. Squandering the seas: How shrimp trawling is threatening ecological integrity and food security around the world. *Environ Justice Found London*, UK 45.