TITLE: ISOLATION OF BACTERIA ASSOCIATED WITH *OSCARELLA* SPP. (PORIFERA) FROM CABO FRIO, RJ AND THEIR ANTIMICROBIAL ACTIVITY

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ABSTRACT

Marine sponges host diverse and dense microbial communities, which can comprise as much as 40% of the sponge biomass, being dominated by bacterial communities. The increased interest in the study of these sponge-associated bacteria is due to their biotechnological potential. Many of these bacteria have shown a broad range of biological activities such as antimicrobial and biosurfactant. However, few studies have been conducted about the microbial communities and their secondary metabolites of sponges of the genus *Oscarella* in the world. To this end, 13 samples of the genus *Oscarella* were collected from Pargos Island, Cabo Frio, RJ and were classified into three morphotypes according to the external morphological characters. The sponge samples were identified as belonging to the genus *Oscarella* by partial sequencing of gene *cob* (cytochrome *b*). Bacterial strains were isolated from the sponge morphotypes mentioned and two samples from the water filtered by *Oscarella*, performed by serial dilutions (10^{-1} to 10^{-4}) and plated in nine different culture media (BHI; BHI 1:10; Czapek-Dox; Marine; Marine 1:10; R2A; ACA; ISP-2; and M1). The last three culture media were selected to favor the growth of Actinobacteria phylum due its widely production of bioactive metabolites. The colony forming units (CFU) were analyzed as the morphological features, and 588 CFU were selected, cryopreserved and used for further assays. Marine agar was the medium with the greatest recovery in bacterial abundance (41%), followed by R2A (18%), showing distinct colonies based on shape and color. The production of antimicrobial substances by marine bacteria against pathogenic bacteria is being determined. Preliminary results showed that from 419 marine bacteria analyzed, 56 (13%) were bioactive against *Staphylococcus aureus* ATCC 29213 and two (0,5%) against *Escherichia coli* ATCC 25922. Concerning these results, M1 agar was the medium with the highest amount of isolates (44%) presenting antimicrobial activity, followed by ISP-2 (22%). All the isolates that were bioactive are being evaluated against resistant bacteria. Molecular identification of marine bacteria is being carried out by 16S rRNA sequence analysis. Further analysis will show if these bacterial strains will produce effective antimicrobial substances against resistant bacteria and biosurfactants.

Keywords: Antimicrobial activity; bacterial isolation; *Oscarella*; sponge-associated bacteria

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