

## CHARACTERIZATION OF A SPONGE-ASSOCIATED BACTERIA MERCURY RESISTANT *PSEUDOMONAS FLUORESCENS* STRAIN H40 AND ITS BIOTECHNOLOGICAL POTENTIAL

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Marine sponges are ecologically diverse hotspots of unexplored microbial communities and essential components of marine benthic communities. Besides the production of bioactive compounds, bacteria associated with the sponges can be used as indicators of contamination in marine ecosystems and as biosurfactant producers. The exact physiological role of biosurfactants has not yet been fully elucidated, however some functions have been ascribed to them such as the regulation of adhesion-release of cells to surfaces, antibiotic activity and anti-adhesive and biofilm disruption properties. Hence in the present study, the sponge-associated bacteria *Pseudomonas fluorescens* strain H40 was evaluated for its heavy metals resistance and ability to produce biosurfactants. The sponge associated *P. fluorescens* H40 was isolated from the Brazilian sponge *Polymastia janeirensis* in Cagarras Archipelago, Rio de Janeiro. It was observed that H40 strain was resistant to all tested heavy metals: HgCl<sub>2</sub>, CdCl<sub>2</sub> and Pb(NO<sub>3</sub>)<sub>2</sub>, individually or in combination. It was investigated whether the H40 strain could be used for decontamination of environments contaminated with mercury. Indeed, the H40 strain was capable to volatilize mercury and methylmercury, as indicated by reduction of Hg<sup>2+</sup> assay. For analyze if *P. fluorescens* strain H40 could be able to produce biosurfactant, three tests (hemolytic activity, drop collapse and emulsification) were performed. The H40 strain was positive for all tests performed and therefore classified as promising biosurfactant producing strain. Also, in order to determine the efficiency of the biosurfactants in eliminating the biofilm formation by the strains *Pseudomonas aeruginosa* and *Staphylococcus aureus*, the tissue culture plate method was performed. It was observed that the crude extract of biosurfactant produced by H40 strain promoted the detachment of over than 50% of both preformed biofilms. As we can see, the biotechnological exploitation of sponge-associated bacteria is very promising.

Key words: sponge-associated bacteria; *Pseudomonas fluorescens*; biotechnological potential

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