

ISOLATION, CHARACTERIZATION AND ANALYSIS OF THE CAPACITY TO PRODUCE ANTIMICROBIALS SUBSTANCES FROM BACTERIA ASSOCIATED WITH *APLYSINA CAISSARA*.

Authors: Luiza Carminato 1 , Mota, A. C.R 1 , Custódio M.R. 2 , Hardoim, C. C.P. 1

Institution: 1 Laboratório de Interações Hospedeiro-Microbiota, Instituto de Biociências (IB), Universidade Estadual Paulista (UNESP), São Vicente, Brasil; 2 Laboratório de Biologia

Cellular de Invertebrados Marinhos, Departamento de Fisiologia Geral, Instituto de Biociências and NP-Biomar, Centro de Biologia Marinha, Universidade de São Paulo, São Paulo.

Abstract:

Marine sponges harbor diverse bacterial communities in which complex interactions are established. These animals are since 1970's the main sources of biotechnological products and it is known that several bioactive compounds obtained from these animals are, actually, synthesized by the associated microbial communities. In this survey, bacteria were isolated from the sponge *Aplysina caissara* collected in Praia Preta (São Sebastião), north coast of São Paulo. These microorganism were identified by 16S rRNA gene sequencing and their capacity to synthesize antimicrobial compounds against bacteria. In total, 36 bacteria were obtained from *Aplysina caissara* on R2A medium, belonging to four phyla: *Actinobacteria* (*Micrococcus*); *Bacteroidetes* (*Aquimarina* and *Aureiviga*); *Firmicutes* (*Bacillus*, *Brevibacillus*, *Cohnella*, *Fictibacillus*, *Lysinibacillus*, *Oceanobacillus* and *Staphylococcus*); *Gammaproteobacteria* (*Acinetobacter*); and some unclassified at the class level, which might indicate novel species. When submitted to dual antagonistic assay on BHI+agar and R2A plates, 15 of them demonstrated the potential of producing antimicrobial substances and inhibited both the growth of *Staphylococcus aureus* (ATCC 29213) and *Pseudomonas aeruginosa* (ATCC 27853). The obtained results also reveal an improved growth of these bacteria in R2A than on BHI medium and a greater inhibitory action on *S. aureus*, presenting halos with an average diameter of 15mm. The sample number 52, identified the genus *Fictibacillus*, revealed greatest inhibitory action, with a 30mm halo *S. aureus* and, a 18 mm halo *P. aeruginosa* on R2A medium. These results suggest that a simple cultivation approach can yield putatively novel bacteria species. Furthermore, almost one half of the isolated strains from *Aplysina caissara* produces bioactive substances capable of impairing the growth of *S. aureus* and *P. aeruginosa*. The antagonistic assays will be carried out to further characterize the inhibitory activity of these bacteria and the effect of these substances on the growth of other bacteria.

Key-words: Porifera, bacteria, antimicrobials, north coast of São Paulo, biotechnological potential, *Aplysina caissara*.

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