TITLE: EVALUATION OF ANTI-BIOFILM ACTIVITY OF SPONGE-ASSOCIATED BACTERIA AGAINST *Staphylococcus* spp.

AUTHORS: Nunes, S.O. [1]; Rosa, H.S. [1]; Muricy, G. [2]; Laport, M.S. [1*]

INSTITUTION: [1]INSTITUTO DE MICROBIOLOGIA PAULO DE GÓES, UNIVERSIDADE FEDERAL DO RIO DE JANEIRO, (AVENIDA CARLOS CHAGAS FILHO, 373, CEP: 21941590, RIO DE JANEIRO – RJ, BRAZIL). [2]MUSEU NACIONAL, UNIVERSIDADE FEDERAL DO RIO DE JANEIRO, (QUINTA DA BOA VISTA, S/Nº, CEP: 20940040, RIO DE JANEIRO – RJ, BRAZIL)

ABSTRACT:
In medical settings, biofilms are the cause of persistent infections implicated in 80% or more of all catheters and orthopedic implant infections. Staphylococci are recognized as the most frequent causes of biofilm-associated infections. Conventional approaches used to treat acute infections may not clear chronic biofilm infections and in many cases promotes resistance. Currently, the most efficient means of eradicating a clinically significant biofilm remains the surgical removal of the infected implant, or debridement of wound or bone. Taking into account the increasing impact of bacterial biofilms, the interest in the development of new approaches for the prevention and treatment of adhesion and biofilm formation capabilities have increased. In this context, sponge-associated bacteria are known as a rich source of secondary metabolites with several biological activities, among them anti-biofilm activities representing a potential to integrate the arsenal of drugs for clinical use. In the present study, a screening for antimicrobial and anti-biofilm activity (dispersal of pre-formed biofilm) were performed using 83 bacteria isolated from marine sponge *Oscarella* sp. collected in the coast of Cabo Frio city, RJ, Brazil. Three staphylococci strains were used as indicators: *Staphylococcus aureus* ATCC 25923 and *Staphylococcus epidermidis* ATCC 35984, both known as biofilm producers, and *Staphylococcus aureus* ATCC 29213, used only in antimicrobial activity assays. All marine strains were tested for anti-biofilm and antimicrobial activity. Twenty seven (32.5%) strains were able to inhibit *S. epidermidis* ATCC 35984, 12 (14.5%) against *S. aureus* ATCC 25923 and 14 (16.9%) against *S. aureus* ATCC 29213. From the 83 tested marine bacteria, *Vibrio* sp. 78.3, *Acinetobacter* sp. 79.6, *Vibrio* sp. 79.9, *Vibrio* sp. 80.1 and *Shewanella* sp. 80.2 were noted to the antimicrobial activity, inhibiting the grow of all *Staphylococcus* strains. Three marine strains (*Acinetobacter johnsonii* 77.23, *Vibrio* sp. 81.6 and one unclassified strain 84.3) presented more than 65% of *S. aureus* ATCC 25923 biofilm dissociation. The unclassified strain 84.3 was able to dissociate more than 85% of pre-formed *S. aureus* biofilm. These results confirm the biotechnological potential of sponge-associated bacteria. Next, the bioactive fractions from marine bacteria with anti-biofilm activity will be obtained and chemically characterized.

Keywords: anti-biofilm, *Oscarella*, sponge-associated bacteria, *Staphylococcus* spp.

Development Agency: CAPES, CNPq, FAPERJ