

TITLE: PRODUCTION OF EXTRACELLULAR ENZYMES AND ANTIMICROBIAL SUBSTANCES BY BACTERIA ISOLATED FROM TISSUE OF ZOANTHID *PALYTHOA CARIBAEORUM*

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#### ABSTRACT

The marine environment presents populations of extremely diversified microorganisms with high potential for the production of compounds of biotechnological interest. However, studies of marine microorganisms, especially those associated with zoanthids, are still scarce. In this work, the bacteria isolated from the zoanthid tissue of *Palythoa caribaeorum* of the coastal reefs of Carapibus (Paraíba) were analyzed in relation to the production of extracellular enzymes and compounds with antimicrobial action against human pathogens. The bacterial isolates belonged to the following genera: *Bacillus* (14 isolates), *Vibrio* (3 isolates), *Alteromonas* (2 isolates), *Marinobacter* (1 isolate) and *Staphylococcus* (1 isolate). The production of proteases and cellulases was evaluated in solid media containing gelatin or carboxymethylcellulose, respectively. Lipolytic activity was analyzed in the solid medium with tributyrin and in the solid medium with olive oil and rhodamine B. All the tested isolates produced proteases, while fifteen were able to produce cellulases. Sixteen isolates showed production of lipases in the medium with tributyrin, and only twelve in the medium with olive oil and rhodamine B. The isolates of the genus *Bacillus* produced the largest halos of gelatin and cellulose hydrolysis, while the isolate *Marinobacter* sp. was more active in lipase production. Standard strains of *Staphylococcus aureus*, *Bacillus cereus*, *Candida albicans*, *Escherichia coli* and *Pseudomonas aeruginosa* were used for the antibiosis test. None of the isolates presented antimicrobial activity against strains of *P. aeruginosa* and *B. cereus*. Thirteen isolates (*Vibrio* sp., *Alteromonas* sp., *Marinobacter* sp., *Bacillus* spp.) showed inhibitory activity against *E. coli*, and only three against *S. aureus*. The antimicrobial activity against *C. albicans* was notorious: fourteen isolates (*Vibrio* spp., *Alteromonas* sp., *Marinobacter* sp., *Bacillus* spp.) were able to provoke strong inhibition of the growth of this fungus. The data obtained indicate a potential of bacteria isolated from the *P. caribaeorum* tissue for the production of extracellular enzymes and antimicrobial substances, mainly against *E. coli* and *C. albicans*.

Keywords: bacteria, enzymes, antimicrobial activity.

