Title: ANTIMICROBIAL PEPTIDES AS POTENTIAL ANTIBACTERIAL, ANTIFUNGAL AND ANTIPARASITIC SUBSTANCES

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Abstract:

The number of resistantt microorganisms to antimicrobial drugs has increased, and became a public health concern, especially among clinical isolates. The search and development of new antimicrobial substances are relevant, and antimicrobial peptides produced by bacteria emerge as alternative potential molecules to be used to fight infectious diseases. The aim of this study was to investigate the potential of antagonistic substances produced by bacteria to inhibit other bacteria, fungi (*Candida* spp.) and protozoa (*Leishmania*). The screening for antibacterial and antifungal activity was performed by agar overlay method, and the antiparasitic activity was determined by MTT assay. A total of 466 bacteria samples (98 Gram-negative bacilli and 368 Gram-positive cocci) isolated from various sources, including human and environmental specimens, kept in our culture collection, were screened for potential antagonist activity. To evaluate the antagonism against bacteria, 466 bacterial strains were used as indicator microorganisms, resulting in 805 episodes of antagonism, of which, 31 *Enterococcus* sp., 7 *Staphylococcus* sp. and *Pseudomonas aeruginosa ATCC* 27853 inhibit the growth of five or more indicators. The antifungal assays showed two *Staphylococcus* strains and one *Enterobacteria* inhibiting *Candida glabrata*. Other *Candida* strains (*C. tropicalis, C. dubliniensis, C. albicans, C. krusei e C. parapsilosis*) were not inhibited by any bacteria. Regarding the antiparasitic activity, antagonistic activity was observed by two different bacteria resulting in lethal dose (LD) for *Leishmania amazonensis* ranging between 48.75% and 58.95%, and for *Leishmania braziliensis*, ranging between 49 and 50%. These results suggest the presence of compounds able to inhibit microbial and parasitic growth. Further studies are needed, to determine the nature of these substances, as well as the mechanism of action and activity spectrum.

Keywords: Antimicrobial substances, Antagonistic activity, *Candida*, *Leishmania.*

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