Isolation and Biochemical Characterization of a Novel Antimicrobial Peptide From Brazilian Coast Corals


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Antimicrobial peptides (AMPs) are widespread in invertebrates, which depend of physical barriers and from innate immune system for their protection against pathogens. This study aims to screen extracts in order to purify and characterize antimicrobial peptides from marine animals from Brazilian coast. The corals specimens Palythoa caribaeorum, Carijoa riisei, Neospongodes atlantica, Muriceopsis sulphurea, Plexaurella grandiflora, Phyllogorgia dilatata were performed in Arraial d’Ajuda, BA, Brazil. Extracts were challenged against Staphylococcus aureus, Proteus mirabilis, Shigella flexineri, Klebsiella pneumoniae, Salmonella typhimurium, Streptococcus pyogenes and Escherichia coli. Bioassays showed that M. sulphurea and P. dilatata caused growth inhibitory effects toward most bacteria at a standard concentration of 200 µg.mL⁻¹. Last one was fractionated with ammonium sulfate (0-40%) showing higher activity against E. coli and S. aureus (30% and 80% respectively). Fraction was further purified by using Amicon® Ultra Centrifugal 10.000 MWCO originating the peptide Pd-AMP1. Pd-AMP1 sample was able to decrease S. aureus and E. coli development. Moreover, Pd-AMP1 was applied onto reversed-phase chromatography (C18) and peptides were eluted with linear gradient of 0-95% ACN yielding eight fractions. Furthermore, fraction eluted with 48% acetonitrile shows remarkable inhibitory activity toward Gram-positive and -negative bacteria. Mass spectrometry analyses showed a major peak of 5.371 Da. N-termini peptide Pd-AMP1 sequenced (AKIPGIDQPGNRQCDNDNCGTYCQ) showed 88% identity with a OsmC-like peroxidase from Chromohalobacter salexigens. Data here reported indicated that this peptide could be utilized as biotechnological tool on the control of human pathogenic bacteria.

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