

TITLE: RESPONSE SURFACE METHODOLOGY ON THE OPTIMIZATION OF CROTON LECHLERI LEAVES EXTRACT FROM AMAZON FOREST, BRAZIL AND ANTIOXIDANT AND ANTIBACTERIAL ACTIVITIES

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ABSTRACT:

The medicinal plants used in folk medicine has been studied for the discovery of new antimicrobial agents due to the emergence of resistant microorganisms. The aim of this study was to determine the antioxidant and antibacterial activities of *Croton lechleri* leaves from Amazon Forest, Brazil. The optimization was carried out through a factorial 2^3 design to verify the solvent (ethanol and water), time (30 and 90 min) and temperature (35 °C and 70 °C) effect on the extraction of total phenolic compounds (TPC) and antioxidant activity (AA). The TPC was determined by Folin Ciocalteu and AA by scavenging activity of the DPPH• radical (2,2-diphenyl-1-picrylhydrazyl). The extract was evaluated for its antibacterial activity against Gram-positive (1 strain) and Gram-negative bacteria (2 strains) by assay for minimum inhibitory concentration (MIC) and minimum bacterial concentration (MBC). The MIC was determined by broth microdilution method in 96 wells plate in the optimized extract of *C. lechleri* leaves. The TPC ranged from 4.60 to 15.36 mg GAE.g⁻¹ (Gallic acid equivalent) and AA from 31.19 to 46.64 μmol Trolox.g⁻¹. The best TPC and AA extraction condition recommended by RSM was the use of ethanol at 70 °C, during 30 min and 90 min. In this study, the MIC assay against *Staphylococcus aureus* ATCC 25923, *Salmonella bongori* ATCC 43975 and *Salmonella typhimurium* ATCC 0028 was 0.15 mg.mL⁻¹. However, the extract did not show bactericidal activity (MBC) for the three tested bacteria. The results confirm the *C. lechleri* extract as a new source of antimicrobial agent, which suggests the further isolation of its compounds for the development of new drugs in the search for natural antimicrobial agents.

Keywords: bioactive compounds, antimicrobial activity, microdilution, optimization.

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