Anti- Staphylococcus aureus Action of Libidibia ferrea var ferrea Extract and Fractions

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Introduction: Staphylococcus aureus infections have been associated to resistance antibacterial drugs. Medicinal plants represent a rich source of antimicrobial agents. Aim of the study was evaluate antibacterial activity as well characterize the composition of Libidibia ferrea var ferrea leaves collected from Caatinga area.

Material and Methods: Leaves were extracted with Cyclohexane solvent at room temperature for 12 hours. Then the extract was filtered and solvent was removed using a rotary evaporator. Phytochemical evaluation of cyclohexane extract (1mg/mL) investigated the presence of several secondary compounds. Purification of cyclohexane extract was performed by column chromatography on silica gel using C₆H₁₄; C₆H₁₄-CH₂CL₂ mixtures (9:1,1:1,v/v) and CH₂CL₂ solvents for elution, corresponded the fractions: F1, F2, F3 and F4, respectively. Then cyclohexane extract and fractions were analyzed by GC-MS. Final concentration of extract (100mg/mL) and Fractions (20 mg/mL) was prepared by reconstituting with dimethylsulfoxide solvent. Antimicrobial activity was evaluated by broth microdilution technique for determining the Minimum Inhibitory Concentration (MIC) and minimum bactericidal concentration (MBC). Extract and fractions were tested against Staphylococcus aureus clinical strains. Clindamycin (25mg/ml) used as positive control and dimethylsulfoxide used as negative control.

Results and Discussion: Phytochemical assay of extract revealed presence of flavonoids and terpenes. GC-MS analysis of extract showed aldehydes, alkanes and a diterpen as major compound. Fractions obtained of purified extract revealed 16 compounds, including fatty acids, terpenes, steroids and alkanes. Antibacterial activity of cyclohexane extract showed inhibitory effect against standard strain and clinical isolates with MIC (0.39 - 3.12mg/ml) and MBC (0.78 - 12.5 mg/ml). Fractions exhibited moderate activity with MIC (0.625 – 10 mg/ml) and MBC (5 -10 mg/ml). Clindamycin showed growth inhibition at concentrations of 0.019 to 0.156 mg/ml. Conclusion: Libidibia ferrea var. ferrea leaves extract exhibited strong antibacterial activity but this effect was reduced after fractionation, suggesting possibility of synergism between molecules present in the extract.

Key words: Antimicrobial activity, Libidibia ferrea var ferrea, Staphylococcus aureus, Natural products.
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