ANTIBACTERIAL ACTIVITY OF AQUEOUS AND ETHANOLIC EXTRACTS OF PSIDIUM GUAJAVA LINN. LEAVES AGAINST PSEUDOMONAS AERUGINOSA

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RESUMO

Introduction: *Psidium guajava* L., popularly known as guava, is a native tree to tropical regions of America, widely used in folk medicine. Its leaves contain chemical components with antimicrobial properties. *Pseudomonas aeruginosa,* is an opportunist pathogen capable of developing antibiotic resistance under specific conditions such as the emergence of resistant intra-treatment strains. Besides, the World Health Organization considers it a priority bacterium for which research and development of new therapeutic agents are needed. Objective: The aims of this work were to evaluate the antibacterial activity of aqueous and ethanolic extracts of *Psidium guajava* L. leaves against *Pseudomonas aeruginosa* and its drug synergism with commercial antibiotics. Methods: Dry extracts were obtained by digestion. Sterile water and ethanol 96° were used as extraction solvents. Extracted solutions were concentrated in a rotary evaporator and then dried at 37°C. Minimum Inhibition Dose (MID) was determined by the disc diffusion method, and the inhibition diameters (ID) were measured. Effective dose used on each disc was 8; 4; 2; 1; 0.75; 0.5 and 0.25 mg. Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC) were carried out only with the extract that showed antimicrobial activity. Concentrations used were between 32 to 0.00625 mg mL^{-1}. Bactericidal or bacteriostatic activity was evaluated with the MICI (MBC/MIC ratio). Drug synergism between extract and commercial antibiotics was determined by the double-disc test and disc diffusion method. Five *Pseudomonas aeruginosa* clinical strains were used. *Pseudomonas aeruginosa* PAO1 was used as a reference strain. Each experiment with the reference strain was performed in triplicate and the mean was obtained. Results: Only the ethanolic extract showed antibacterial activity. It was observed against *P. aeruginosa* PAO1 with a MID= 0.5 mg and ID= 7.7 ± 0.6 mm and it did no show antibacterial activity against clinical strains with the doses tested by disc diffusion method. However, a CIM= 2.0 mg mL^{-1} and a MBC= 16.0 mg mL^{-1}, and a CIM = 6.1 mg mL^{-1} and a MBC= 13.9 mg mL^{-1} were obtained for the reference strain and clinical isolates, respectively. MICI qualified the action of the extract as bacteriostatic. Drug synergism trial showed indifference by the double-disc method. However, synergism was observed with ciprofloxacin, piperacillin, meropenem, amikacin, and ceftazidime and antagonism with colistin for the reference strain by the disc diffusion method. While, synergism was observed with piperacillin, meropenem, and ceftazidime and antagonism with ciprofloxacin, amikacin, and colistin for clinical strains. Conclusions: Ethanolic extract of *Psidium guajava* L. leaves showed moderate antibacterial activity against *P. aeruginosa*. These results suggest the presence of active metabolites with antibacterial properties to be further investigated. Drug synergism was observed with piperacillin, meropenem, and ceftazidime and antagonism with colistin; and results were not conclusive with ciprofloxacin and amikacin.

PALAVRAS-CHAVE: Anti-Bacterial Agents, Drug Synergism, Plant Extracts, Pseudomonas aeruginosa, Psidium guajava

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