

Título: *IN VITRO* EVALUATION OF THE ANTIBACTERIAL AND MODULATORY ACTIVITIES OF *Zornia reticulata* SM. AGAINST GRAM NEGATIVE BACTERIA

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Abstract:

The emergence of Gram negative bacteria with resistance phenotype to different classes of antimicrobial agents reduced its effectiveness, making it increasingly difficult to treat infections by these microorganisms. This problem has increased research in search of natural substances with antimicrobial activity, or that may enhance the activity of synthetic antibiotics. *Zornia reticulata* Sm. (Fabaceae) is a species used in traditional medicine for treatment of infectious. Thus this work aimed to evaluate the antimicrobial and modulating properties of the extract and fractions of *Z. reticulata* against Gram negative bacteria. The crude ethanol extract (CEE) was obtained from the leaves of the plant by percolation and concentrated in a rotary evaporator at 40°C. The fractionation was performed in liquid-liquid partition system with hexane (FHex), chloroform (FChl) e ethyl acetate (FEthac). The Minimum Inhibitory Concentrations (MIC) of CEE and fractions, individually and in combination with antibiotics gentamicin and ciprofloxacin were determined on standard ATCC strains and four multiresistant *Escherichia coli* and two *Pseudomonas aeruginosa*. From the MIC values of combinations of natural and antimicrobial products used to calculate the Fractional Inhibitory Concentration (FIC) in order to determine the effect of these interactions. The lowest values of MIC were obtained in the tests with the strains of *P. aeruginosa* being FEthac the most efficient, exhibiting activity at 2 e 4 mg.mL⁻¹ against *P. aeruginosa* 1 and 2 respectively. When evaluating the interactions between CEE and fractions with antimicrobial agents, it was noted that the FIC values indicated mainly synergistic and additive interaction. Among the synergistic combinations can highlight gentamicin and ciprofloxacin with FEthac for both strains. Antagonism was observed only in the combinations between FChl and gentamicin against *P. aeruginosa* 1 and FHex and ciprofloxacin against *E. coli* 3. Thus, it can be concluded that most of the interactions between the natural products and antibiotics tested showed synergistic or additive effect and *Z. reticulata* is a promising source of natural products that can be used in the antimicrobial therapy.

Keywords: Microbial resistance, Conventional antimicrobials, Medicinal plants, Interaction, Synergism.