

TITLE: EVALUATION OF THE ANTIBIOTIC ACTIVITY OF ORGANIC EXTRACTS OF THE MESOCARP OF THE UNRIPE FRUIT OF *Couroupita guianensis* AGAINST BACTERIA ASSOCIATED WITH HOSPITAL INFECTIONS

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ABSTRACT:

According to the Global Antimicrobial Resistance Surveillance System (GLASS) *Escherichia coli*, *Klebsiella pneumoniae*, *Staphylococcus aureus* e *Streptococcus pneumoniae* are the most commonly resistant strains found in hospitals around the world. These bacteria are the main causes of hospital infections, increasing the death rates and costs invested in the intensive care units (ICU) and general hospitalizations, for example. As reported by the World Health Organization (WHO) there is a group of bacteria mostly found in the hospital environment that no longer responds to the regular treatments offered in hospitals. In this context, the development of new drugs is very demanding to change the scenario where bacterial resistance is increasing. *Couroupita guianensis* also known as cannonball tree has been reported in the literature with vasodilating, antiplasmodic, antitumor and anti-inflammatory activities. Thus, the objective of this work was to analyze the bioactive compounds of extracts of the mesocarp of the unripe fruit of *C. guianensis* against bacterial species known to cause hospital infections. The extraction was performed with dry material following an increasing order of polarity, as follows: hexane, chloroform, ethyl acetate, acetone and ethanol. The antibacterial activity was evaluated by disk diffusion assay using 1mg of each extract, and the results presented a broad-spectrum of antibiotic action for ethyl acetate extract. Inhibitory halo was found for gram positive bacterias *S. aureus* (25mm) and *S. epidermidis* (15mm) as well as gram negative bacterias *K. pneumoniae* (12mm) and *E. coli* (13mm) (which demonstrated resistance to tobramycin 13mm, gentamycin 15mm and ampicillin 13mm). The same extract showed a potent activity against *S. aureus* in the minimum inhibitory concentration (MIC) assay, presenting a MIC of 125ug/mL. However, the bacteria *K. pneumoniae* were not as sensitive, presenting a MIC of 1000ug/mL. Ethyl acetate extracts were fractionated by TLC and analyzed by bioautography assay showing more than one spot of inhibition in the same extract. The active fractions were separated by flash liquid chromatograph using the retention factor (RF) obtained in the previous assay. The cytotoxicity was also evaluated by MTT and neutral red assays in Vero cell line (ATCC® CCL-81) showing a minimum cytotoxic concentration (MCC) of 1000ug/mL. Together the results corroborate the potential use of the ethyl acetate extracts against *S.aureus* infection.

Keywords: *Couroupita guianensis*, cannonball tree, hospital infection, *Klebsiella pneumoniae*, *Staphylococcus aureus*.

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