TITLE: PHYTOCHEMICAL STUDY AND ANTIMICROBIAL ACTIVITIES OF EXTRACT ETHYL ACETATE FROM C*leome spinosa* JACQ.

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ABSTRACT:
Microbial resistance to antibiotics is one of the most serious public health problems worldwide. Besides that, especially in developing countries, infectious diseases caused by bacteria and fungi still represent a major cause of human mortality. *Cleome spinosa* (Jacq) is commonly used in phytotherapy and folk medicine to treat inflammatory processes and microbiological infections; this specie shows a great potential for the discovery of molecules with potential biological activities. Due to widespread use of this plant in traditional medicine, this study evaluated the antimicrobial activity and phytochemical screening of ethyl acetate extract of roots of *C. spinosa*. The extract of roots was obtained with ethyl acetate using a Soxhlet equipment, being filtered and evaporated after the extraction process. In vitro antimicrobial activity was performed by the microdilution assay in order to obtain the Minimum Inhibitory Concentration (MIC) and the Minimum Microbicide Concentration (MMC) against Gram-positive (*Staphylococcus aureus* and *Bacillus subtilis*) and Gram-negative (*Escherichia coli*, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*) bacteria, as well as against fungi (*Candida albicans*, *C. glabrata*, *C. parapsilosis*, *C. tropicalis* and *C. krusei*). The phytochemical analysis of secondary metabolites was undertaken by thin layer chromatography for the presence of secondary metabolites using specific standards. The results showed that MIC (3.12 to 25 mg/mL) and MMC (6.25 to 50 mg/mL) of ethyl acetate extract were active against Gram-positive bacteria; on the other hand, both MIC and MMC were active at 6.25 mg/mL against Gram-negative bacteria. The antifungal assay resulted in values of MIC from 6.25 to 25 mg/mL and MMC of 50 mg/mL. The phytochemical analysis of the studied extract revealed the presence of flavonoids, terpenoids and tannins, whose chemical groups are well known to have significant inhibitory action against bacteria and fungi. Although the mechanisms of action of antibiotics derived from natural products are distinct, the cytoplasmic membrane ranks as the most common site of action for secondary metabolites, occurring lysis, leakage of cellular contents and consequently cell death. These results encourage the identification of active substances with a high valuable perspective for the treatment of infections caused by drug resistant microorganisms.

Keywords: Bacteria, *Candida*, medicinal plant.

Development Agency: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior.