



ANTIMICROBIAL ACTIVITY OF THE LEAVES OF *Miconia willdenowii*

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Abstract: Melastomataceae family comprises about 185 genera and 5000 plant species. In Brazil, there are more than 1300 species grouped in 17 endemic genera, distributed in altitude grounds and humid forests, representing one of the most significant families in Atlantic forest. *Miconia* is constituted by about 250 ornamental species, with several important biological properties including antibiotic, antitumor, analgesic, and antimalarial [1]. As a part of an ongoing project, that focuses bioprospective studies on endemic plants from the Atlantic forest located at Minas Gerais State, *Miconia willdenowii* is one of the plants selected by our group for phytochemical and bioprospective studies. To our knowledge, there are no literature data about chemical composition and pharmacological potentials of this plant. Thus, the leaves of *M. willdenowii* were macerated in EtOH, resulting in a crude ethanolic extract that was partitioned with hexanes and ethyl acetate. The three resulting fractions were then concentrated and submitted to sensitive assay against six fungi yeasts (*Candida albicans*, *Candida sp.*, *C. tropicalis*, *C. krusei*, *C. glabrata* and *C. parapsilosis*) and three bacteria species (*Staphylococcus aureus*, *Escherichia coli*, and *Pseudomonas aeruginosa*). The inhibitory potencies were assessed by determination of the minimal inhibitory concentration for 50% and 90% of microorganisms growth (MIC₅₀ and MIC₉₀, respectively). These assays were performed according to the microdilution broth method for yeast as M27-S4 document [2]. The culture medium used was Mueller Hinton broth and the target substances have been evaluated at concentrations of 100; 60; 30; 15; 7.5; 3.75; 1.875; 0.468; 0.23 and 0.06 µg/mL. The selected microorganisms are opportunistic and or pathogens. The hexane fraction showed the most significant inhibitory effects on *C. albicans* and *S. aureus* and was subjected to additional purification by column chromatography to provide 13 sub-fractions (A-M). All these sub-fractions were again tested for antimicrobial activity, revealing sub-fractions **F** (MIC₅₀ = 62.5 µg/mL for *C. albicans*; MIC₅₀ = 31.25 µg/mL for *C. Krusei* and MIC₅₀ = 7.81 µg/mL for *S. aureus*), **G** (MIC₅₀ = 62.5 µg/mL for *C. Krusei* and MIC₅₀ = 15.6 µg/mL for *S. aureus*), **H** (MIC₅₀ = 15.6 µg/mL for *C. Krusei* and MIC₅₀ = 31.25 for *S. aureus*) and **I** (MIC₅₀ = 31.25 µg/mL for *P. aeruginosa*) as the most active. At this moment, these 4 sub-fractions are under deeper investigation, aiming the isolation and characterization of the possible active metabolites, despite the contribution to the knowledge about the chemical constitution of this plant.

References:

[1] Ferreira, D. S., Esperandim, V. R., Marçal, M. G., Neres, N. B. R., Cunha, N. L., Silva, M. L. A., and Cunha, W, R. 2013. Natural products and Chagas' disease: the action of triterpenes acids isolated from *Miconia species*. Univ. Sci. 18 (3): 243-256.

[2] Clinical and Laboratory Standards Institute (CLSI). Reference method for broth dilution antifungal susceptibility testing of yeasts. Approved Standard-Third Edition. M27-S4. Wayne, PA, USA: CLSI, 2012.