

TITLE: *Polygonum hydropiperoides* MICHX. (POLYGONACEAE JUSS.): A PROMISING SOURCE OF BIOACTIVE COMPOUNDS AGAINST *Staphylococcus aureus*

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ABSTRACT:

Polygonum hydropiperoides Michx. (Polygonaceae Juss.), popularly known in Brazil as "erva-de-bicho", is an Asian native species also widely distributed in the American continent. Traditionally, it is used as astringent, antiseptic, anti-dysenteric, anti-hemorrhagic, anti-hemorrhoidal, diuretic, vermifugal, against varicose veins, erysipelas, rheumatism and in wound treatment. With this context in mind, the present study aimed to quantify the total phenolic and flavonoid contents and to evaluate the antibiotic potential of hexane (HE), ethyl acetate (EAE) and ethanol (EE) extracts from the aerial parts of *P. hydropiperoides*. The quantification of total phenolic and flavonoid contents was carried out by spectrophotometry, using colorimetric reactions with Folin-Ciocalteu and aluminum chloride (AlCl₃) reagents, respectively. The antibiotic potential was determined by the Minimum Inhibitory Concentration (MIC) using the broth microdilution method according to Clinical and Laboratory Standards Institute guidelines, and the Minimum Bactericidal Concentration (MBC) followed by the classification of the antibiotic effect using Andrews' method. The ATCC[®] reference strains of *Staphylococcus aureus* subsp. *aureus* (ATCC[®] 6538[™], ATCC[®] 25923[™] and ATCC[®] 29213[™]) and the routine strains of methicillin-resistant *Staphylococcus aureus* (MRSA) [MRSA 1485279, MRSA 1605677, MRSA 1664534, MRSA 1688441 and MRSA 1830466] were tested. Total phenolic and flavonoid contents varied from 17.44 ± 1.15 to 290.91 ± 2.70 mg/g of gallic acid equivalent (GAE) and from 0.12 ± 0.06 to 20.18 ± 0.11 mg/g of quercetin equivalent (QE), in this order. Among the investigated extracts, EAE was the most effective, being active against all the strains tested, with MIC values of 1250 µg/mL, except for MRSA 1664534 that showed MIC of 625 µg/mL, with a bacteriostatic effect for all strains. Probably, the antibiotic effect is related to the expressive presence of phenolic compounds. The results suggest that *P. hydropiperoides* is a promising natural source of bioactive substances with antibiotic potential which confer scientific support for its popular use mainly as antiseptic and in the treatment of superficial lesions caused by *S. aureus* strains, including MRSA.

Keywords: *Polygonum hydropiperoides*; Phenols; Flavonoids; *Staphylococcus aureus*; Methicillin-resistant *Staphylococcus aureus*.

Development Agency: Pró-Reitoria de Pós-Graduação e Pesquisa of the Universidade Federal de Juiz de Fora (Project n° 38479 and 42084 - PROPP/UFJF), Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG) (Process n° CDS-APQ-04680-10) and Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brazil (CAPES) - Finance Code 001.