IN VITRO ANTIOXIDANT AND ANTIBACTERIAL ACTIVITIES OF GOSSYPIUM HIRSUTUM L. (MALVACEAE)

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Gossypium hirsutum L. (Malvaceae), popularly known as cotton, is traditionally used in the treatment of inflammation, healing, infection and bleeding. The current study aimed to determine the total phenols and flavonoids contents, and the antioxidant and antibacterial activities of ethanolic extract (EE) and hexane (HF), dichloromethane (DF), ethyl acetate (AF) and butanol (BF) fractions obtained from G. hirsutum leaves. The total phenols and flavonoids contents were determined by spectrophotometry using the calibration curves of gallic acid and rutin, respectively. The antioxidant activity was determined by 2, 2-diphenyl-1-picrylhydrazyl (DPPH) and ferric reducing antioxidant power (FRAP) methods. Antibacterial activity was established by the determination of the Minimal Inhibitory Concentration (MIC) using the microdilution method according the Clinical Laboratory Standards Institute (CLSI) guidelines followed by the Minimal Bactericidal Concentration (MBC), classifying the pharmacological effect as bacteriostatic or bactericidal. Staphylococcus aureus subsp. aureus (ATCC®6538™), Escherichia coli (ATCC®25922™), Salmonella enterica subsp enterica serovar Choleraesuis (ATCC®10708™) and Pseudomonas aeruginosa (ATCC®27853™) were used as reference bacterial strains. The total phenolic and flavonoid contents varied from 1.86 to 26.49 and 0.67 to 7.17 g/100g, respectively. The half maximal effective concentration (EC₅₀) on DPPH and FRAP assays varied from 24.99 to 215.48 and 25.61 to 166.20 μg/mL, in this order. EE (bacteriostatic), HF (bacteriostatic) and AF (bactericidal) were active against S. aureus (ATCC®6538™) with MIC of 5, 2.5 and 5 mg/mL, respectively. AF (bacteriostatic) and BF (bacteriostatic) were active against S. Choleraesuis (ATCC®10708™) with MIC of 5. mg/mL for both samples. DF and AF produced MIC of 5 mg/mL against E. coli (ATCC®25922™) with bacteriostatic effect. AF (bacterioatatic) was active against P.aeruginosa (ATCC®27853™), of with MIC of 5 mg/mL. These results suggest that G. hirsutum is an interesting source of active constituents for the search of new therapeutic approaches.

Keywords: Gossypium hirsutum. Malvaceae. Antioxidants. Anti-Bacterial Agents. Plants, Medicinal.

Acknowledgments: UFJF, FAPEMIG, CNPq, CAPES.