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Chemical Composition and in Vitro Evaluation of Antioxidant and Antibacterial Activity of *Rosmarinus officinalis* L. Extract

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Abstract**:** The present study was on extracting and identifying the secondary metabolites in the leaves of *Rosmarinus officinalis* L and evaluating their biological activities. Four compounds were identified in the methanolic extract: which include total polyphenols, anthocyanins, C -glycosides and aglycones. The content of total polyphenols were 12.87 mg EAG g^{-1} dry matter. The anthocyanins, C-glycosides and aglycones were estimated as 1.13, 0.07 and 0.045 mg g^{-1} respectively. The antioxidant activity of the compounds contained in the methanolic extract was evaluated in vitro by several tests. In the case of the DPPH assay, IC50 are 0.122, 0.130, 0.350 and 0.370 mg ml^{-1} for antocyanins, total polyphenols, C-glycosides and aglycones respectively. For the FRAP test, at a concentration of 1 mg ml^{-1}, the reducing power of iron showed ODs of 2.54, 2.52, 1.98 and 1.62 for total polyphenols, anthocyanins, aglycones and C-glycosides, respectively. The antibiogram shows that anthocyanins and C-glycosides significantly inhibited the growth of two bacterial strains, causing zones of inhibition of 12, 25 and 14.5 mm in diameter for *Escherichia coli* and 10.5 and 13.75 mm for *Staphylococcus aureus,* respectively. The microdilution method in liquid medium conclude that the best minimum inhibitory concentration (MIC) for anthocyanins and C-glycosides on *Staphylococcus aureus* is 62.5 mg ml^{-1} and 11.5 mg ml^{-1}respectively. MIC of 31.25 mg ml^{-1} and 45.84 mg/ml was obtained for anthocyanins and c-glycosides against *Escherichia coli*. The study indicate that anthocyanins and total polyphenols show a good antioxidant activity. Anthocyanins and C-glycosides have an inhibitory effect on the growth of *Escherichia coli* and particularly on *Staphylococcus aureus* which is a sensitive bacterium. These results can be considered as very promising and justify further research, among others, on the identification of antioxidant and antimicrobial components in the active extracts

Keywords: Antimicrobial activity, Antioxidant activity, Chemical composition, Methanolic extract, *Rosmarinus officinalis* L.