CHEMICAL COMPOSITION AND BIOLOGICAL EVALUATION OF TRADITIONAL ALGERIAN PLANTS *MELISSA OFFICINALIS L.* AND *URTICA DIOICA L.*

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Abstract. *Melissa officinalis L.* and *Urtica dioica L.* were investigated for their phytochemical profiles as well as their antioxidant and anti-lithiatic properties. LC-MS/MS analysis revealed that *M. officinalis* possessed a more complex and diverse composition, particularly rich in flavonoids (myricetin, quercetin derivatives, apigenin, luteolin) and phenolic acids (caffeic, sinapic, ferulic acids). In contrast, *U. dioica* exhibited a simpler chemical profile, with lower flavonoid content but notable amounts of hydrophilic phenolics (caffeic acid, salicylic acid), riboflavin, and carotenoids such as *β*-carotene. The ethyl acetate fraction of *M. officinalis* was especially concentrated in polyphenols, whereas the aqueous fraction of *U. dioica* was richer in carotenoids and water-soluble antioxidants. These compositional differences corresponded to distinct biological activities. Antioxidant assays (DPPH, ABTS, FRAP) indicated that the ethyl acetate fraction of *M. officinalis* exhibited the highest radical scavenging activity. Furthermore, its aqueous extract showed significant anti-lithiatic efficacy, inhibiting calcium oxalate crystal formation by 87.12% at a concentration of 2 mg/mL.

Keywords: *Melissa officinalis L.*, *Urtica dioica L.*, LC-MS/MS, antioxidant activity, anti-lithiatic activity.