

OPTIMIZATION OF ULTRASOUND-ASSISTED EXTRACTION OF ANTIOXIDANT PHENOLICS FROM ALGERIAN *TRIFOLIUM TOMENTOSUM* L. USING RESPONSE SURFACE METHODOLOGY

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Abstract. The current study aims to maximize the recovery of antioxidant phenolics from Algerian *Trifolium tomentosum* L. using an innovative green process: ultrasonic assisted extraction (UAE). Firstly, four different solvents were used: 50% acetone, 50% ethanol, 50% methanol, and 100% ethylacetate, as well as four different extraction methods: maceration, refluxed extraction, Soxhlet extraction, and ultrasonic assisted extraction (UAE); The classification of the best solvent (50% ethanol) and most effective extraction method (UAE) on the basis of quantified total phenolic (TPC) led to the second part, which focused on optimizing the UAE using response surface methodology (RSM) and a Box Behnken design (BBD). Algerian *Trifolium tomentosum* optimized extract demonstrated intriguing TPC and TFC greater than 30 mg GAE/g dw, and 6 mg QE/g dw, respectively, and potential total antioxidant capacity (TAC), closer to 20 mg AAE/ g dw. Based on these findings, Algerian *Trifolium tomentosum* optimized extract can be used as a green natural ingredient in cosmetic formulations as well as a food preservative.

Keywords: *Trifolium tomentosum*, antioxidant phenolics, green process, ultrasonic, response surface methodology.