

Phytochemical Composition and Characterization of Bioactive Compounds of the Green Seaweed *Ulva lactuca*: A Phytotherapeutic Approach

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Abstract : The Moroccan coastline is particularly rich in algae and constitutes a reserve of species with considerable economic, social and ecological potential. This work focuses on the research and characterization of algae bioactive compounds that can be used in pharmacology or phytopathology. The biochemical composition of the green alga *Ulva lactuca* (Ulvophyceae) was studied by determining the content of moisture, ash, phenols, flavonoids, total tannins, and chlorophyll. Seven solvents: distilled water, methanol, ethyl acetate, chloroform, benzene, petroleum ether, and hexane, were tested for their effectiveness in recovering chemical compounds. The identification of functional groupings, as well as the bioactive chemical compounds, was determined by FT-IR and GC-MS. The moisture content of the alga was 77%, while the ash content was 15%. Phenol content differed from one solvent studied to another, while chlorophyll a, b, and total chlorophyll were determined at 14%, 9.52%, and 25%, respectively. Carotenoid was present in a considerable amount (8.17%). The experimental results show that methanol is the most effective solvent for recovering bioactive compounds, followed by water. Moreover, the green alga *Ulva lactuca* is characterized by a high level of total polyphenols (45 ± 3.24 mg GAE/gDM), average levels of total tannins and flavonoids (22.52 ± 8.23 mg CE/gDM, 15.49 ± 0.064 mg QE/gDM) respectively. The results of Fourier transform infrared spectroscopy (FT-IR) confirmed the presence of alcohol/phenol and amide functions in *Ulva lactuca*. The GC-MS analysis gave precisely the compounds contained in the various extracts, such as phenolic compounds, fatty acids, terpenoids, alcohols, alkanes, hydrocarbons, and steroids. All these results represent only a first step in the search for biologically active natural substances from seaweed. Additional tests are envisaged to confirm the bioactivity of seaweed.

Keywords : algae, *Ulva lactuca*, phenolic compounds, FTIR, GC-MS

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