C. AFFICHE A56 :

IMPACT OF EXTRACTION CONDITIONS ON CHEMICAL STRUCTURE, THERMAL PROPERTIES AND ANTIOXIDANT ACTIVITIES OF ULVAN FROM THE GREEN SEAWEED ULVA LACTUCA

Hela YAICH[1]* ; Haikel GARNA[2] ; Fatma ABBES[1] ; Mohamed Bouaziz[3], Souhail Besbes[1], Aurore Richel[4], Christophe Blecker[5], Hamadi Attia[1]

1-Laboratoire de Valorisation, Analyses et Sécurité des Aliments, École Nationale d'Ingénieurs de Sfax, Route de Soukra, 3038 Sfax, Tunisia.
2-Laboratoire de Biotechnologie et Valorisation des Bio-Géo-Ressources, Institut Supérieur de Biotechnologie de Sidi Thabet, BP-66, 2020 Sidi Thabet, Ariana, Tunisia
3-Institut Supérieur de Biotechnologie de Sfax, Route de Soukra, BP 1175, 3038 Sfax, Tunisia
4-Unité de Chimie Biologique Industrielle, Université de Liège, Gembloux Agro -Bio Tech, passage des Déportés 2 - 5030 Gembloux, Belgium
5-Unité de Valorisation des Bio-ressources, Université de Liège, Gembloux Agro- Bio Tech, passage des Déportés 2 - 5030 Gembloux, Belgium.
*loultihia@yahoo.fr

Keywords: Ulvan, NMR, TGA, antioxidant activities

Abstract: Ulvan, the sulphated polysaccharide from green seaweed Ulva lactuca, was extracted using different processes, in order to weigh up the effects of extraction conditions on chemical structure, thermal properties and antioxidant activity. Regardless the procedure of the extraction, the Nuclear Magnetic Resonance (NMR) spectroscopic analysis allowed the identification of two major repeating units in ulvan samples. These were ulvanobiuronic acid 3-sulphate type A [?-D-GlcA (1?4) ?-L-Rha 3S] and type B [?-L-IdoA (1?4) ?-L-Rha 3S]. Thermal analysis of ulvan extracts was done with TGA (Thermal Gravimetric Analyzer). Depending on the extraction methods, the degradation of ulvan samples varied from 200 °C to 220 °C. All extracts exhibited great scavenging activity on DPPH radical at a low concentration and extract found at pH 1.5 and 90 °C displayed higher inhibitory effect (IC50 =13.56 µg/ml). Studies revealed positive correlation between sulphate content and metal scavenging activity (R2 = 0.97) and negative correlation between sulphate content and reducing power (R2 = - 0.89). Therefore, ulvan could be used as a rich source of natural antioxidants with potential application in the food industry as well as cosmetic and pharmaceutical areas.