

## Comparison of the Effect of the Type of the Solvent on the Amount of Bioactive Compounds with Antioxidant Properties Extracted by Ultrasound from the Green Algae *Dunaliella salina*

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Received date: 2023.01.17

Reception date: 2023.05.18

### Abstract

Increasing concerns about diseases caused by oxidative stress and the increasing interest of consumers in the formulation of super-beneficial foods led to the creation of approaches to identify foods rich in nutritional antioxidants and the possibility of replacing these compounds with natural preservatives. This research was conducted in 2019 in the laboratory of Food Science Industries Research Center of Islamic Azad University, North Tehran Branch... *Dunaliella salina* algae powder was grown in Johnson's special culture medium. Then the extracts were subjected to ultrasound treatment based on the type of solvent (water, ethanol/water, ethanol 50:50) at the (10-30°C) for (15-30"). The hydrolyzes obtained from specific treatments was analyzed by GC-MS. The analysis of GC-MS showed that the ethanol hydrolyzes (15"-30°C) had the highest amount of extracted bio compounds with 25 types of compounds which accounted for 92/54% of all the extracted compounds. Tetradecane (7.53%), pentadecane (6.78%), fatty acids palmitoleic acid MUFA (61.4%) and oleic acid UFA (1.16%), ethyl oleate (23 2.2%) are the most important compounds identified. Alkanes, sterols, long chain unsaturated fatty acids, saturated fatty acids, ethyl ester and phenol were the main extracted compounds. Alkanes, sterols, long chain unsaturated fatty acids, saturated fatty acids, ethyl ester and phenol were the main extracted compounds. Aqueous hydrolyzate (100-30) obtained the lowest amount of extracted bioactive compounds with 3.97%, including tridecane (1.66%) and tetradecane (3.97%). Changes the type of solvent and temperature has a direct effect on the amount of extracted bioactive compounds. Solvents with less polarity have better results than solvents with more polarity. Because it extracts most of the bioactive compounds (abundant amounts of chlorophyll) due to its higher polarity. The presence of lipids and long chain fatty acids in the extracted compounds brings attention to the antibacterial activity of *Dunaliella salina* microalgae. Halophyte microalgae *Dunaliella salina* can become a potential source of antioxidant and antibacterial compounds in food industries and in the production of Functional foods

**Keywords:** *Dunaliella salina*, Bioactive compounds, Antioxidant effect, Functional food, Ultrasound.