Effect of MW and US treatment on microalgae growth

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Algae are eukaryotic photosynthetic microorganisms with a large variety of species adapted to living in a wide range of ecosystems. About 50,000 species of algae are present, but only around 30,000 of them have been analyzed [1]. These photosynthetic microorganisms can grow rapidly in large quantity requiring inorganic compounds such as CO_2, light energy source and nutrients like nitrogen and phosphorous for their growth [2]. Some of the beneficial roles exhibited by the algae are as primary producers, source of food for animals and humans, antibiotics and medicines, purifier of wastewater, biofuel, fertilizer and pollution controller by fixing CO2. Microalgae biomass can be converted to biofuels such as biohydrogen, biodiesel, methane, etc [3]. Nutraceuticals, fatty acids, stable isotopic biochemicals, phycobiliproteins, carotenoids were also reviewed as commercial application of microalgae [4].

This work explores the potential of MW and US to increase microalgae growth. The experiments were performed using *Nannochloris sp*. grown photo-autotrophically in Zarouk medium in a Sartorius PBR 25S photobioreactor with a capacity of 3L, connected to a Miniflow 200SS equipment for microwave irradiation or a MMM Clamp-on type device for US irradiation. Both types of irradiations were carried out continuously for a set amount of time.

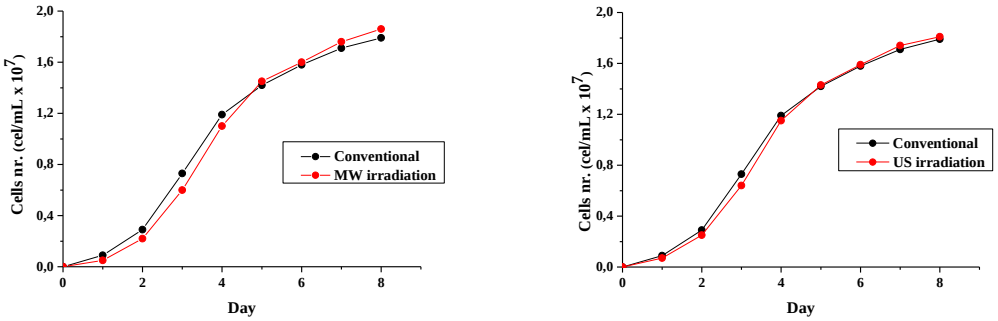

Figure 1. Comparisson of growth curves for *Nannochloris sp.* with/without MW irradiation(left) and with/without US irradiation(right)

The algal oil content, its composition and the carotenoids content (from the control algae and from the algae growth in the presence of US or MW) were determined. Significant differences were obtained.

Acknowledgment
The authors acknowledge the financial support received from the Competitiveness Operational Programme 2014 - 2020, Action 1.1.4: Attracting high-level personnel from abroad in order to enhance the RD capacity, ID project: P_37_471, MY SMIS 105145, Ultrasonic/Microwave nonconventional techniques as new tools for nonchemical and chemical processes, financed by contract: 47/05.09.2016 and from PN.19.23.01.02.

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