**CAROTENOID PROFILE OF *TETRASELMIS STRIATA* GROWN UNDER OPTIMAL CULTIVATION CONDITIONS IN A PILOT SCALE BIOREACTOR**

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**Abstract**

Microalgae are recognized as a valuable natural source of bioactive compounds, such as proteins, lipids, carotenoids and vitamins, for the aquaculture industry. The carotenoid profile of *Tetraselmis striata,* laboratory cultivated at different pH, temperature and photoperiod, was analyzed using Ultra High-Pressure Liquid Chromatography (UPLC) coupled with a mass spectrometer (Q-TOF). Identification and quantification of the carotenoid profile were performed using standard solutions (astaxanthin, lutein & zeaxanthin, canthaxanthin, echinenone, lycopene, b-cryptoxanthin, b-carotene), and an internal standard (trans-β-apo-carotenal). A carotenoid extraction protocol was developed and chloroform was selected as the extraction solvent. A saponification protocol was applied for the successful removal of chlorophylls, lipids, and esters, assisting in the quantification of b-carotene, canthaxanthin, and b-cryptoxanthin. However, this method had a notable deterioration effect on the remaining carotenoids. Consequently, a simultaneous extraction protocol without saponification was followed to quantify the rest of the carotenoids. Α scale-up cultivation of *T. striata* was conducted in a 40 L capacity paddlewheel stainless steel raceway pond (110.5 x 61 x 20 cm, external length, width and height, respectively), by applying the optimal cultivation conditions found in previous laboratory trials (continuous illumination, 25oC and pH8), in terms of its high biomass productivity (92.5 mg L-1 d-1). Carotenoids detected in *T. striata* were b-carotene (7063.4 mg/kg dry biomass), lutein & zeaxanthin (1692.8 mg/kg), echinenone (190.9 mg/kg), b-cryptoxanthin (40.7 mg/kg), astaxanthin (33.5 mg/kg) and canthaxanthin (2.12 mg/kg), while lycopene was not detected in any of the analyzed samples. The results showed that *T. striata* can be considered a potential natural source of carotenoid compounds.