



Enrichment of nutritional compounds in seaweeds via integrated multi-trophic aquaculture (IMTA)

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Abstract:

Shifting from agriculture to marine aquaculture is an important step to cope with food supply in an era of global climate change, habitat destruction and severe shortage of freshwater. Cultivation of seaweeds is of particular interest because of the seaweed's multifunctional attributes: very productive and easy to grow, highly nutritional and contain high quantities of proteins, essential fatty acids, polysaccharides, dietary fibers, minerals, and vitamins. In the Far East, seaweeds have been utilized for centuries, today following the rising public awareness for natural and healthier food sources, there is a worldwide demand for seaweeds biomass. Seaweeds are key components of Integrated Multi-Trophic Aquaculture (IMTA). Currently, most marine aquaculture activities discharge surplus harmful nutrients into the environment. Excessive nutrients and their vast consequences can be minimized through IMTA, thus reducing the impact of aquaculture, and enabling long-term sustainability. In nature, seaweeds adjust their intracellular chemical composition in response to the surrounding environment. Our study focused on developing a unique IMTA system design of finfish and seaweed, dedicated to mimic environmental stressors, to control and stimulate the content of high-value proteins, starches, and minerals in the seaweeds. The seaweeds in our system exhibited fast growth rates (25% d⁻¹), removed about 95% of the harmful nutrients, and produced high tissue protein starch and mineral levels. The attained biomass can be used as functional foods and nutritional supplements. This multidisciplinary research is expected to lead a breakthrough in the aquaculture, food, and biotechnology industries, furthermore, can create a common cause bridging cultures and societies.



Biography:

Doron Ashkenazi is a PhD student at the Department of Zoology, Tel Aviv University, and the Israel Oceanographic and Limnological Research Institute, Haifa, Israel. He works under the supervision of Prof. Avigdor Abelson and Prof. Alvaro Israel. Doron is a young, very enthusiastic marine researcher specializing in seaweeds aquaculture, ecology, and biotechnology. His research on a novel seaweed IMTA design was published in "Reviews in Aquaculture" (IF: 7.77). Doron received scholarships of excellence and honor from the Israeli Ministry of Agriculture and from the Israeli Oceanography Association.

He believes in the greater good and love, and advocates peace between peoples.

[15th International Conference on Aquaculture & Marine Biology | March 24-25, 2021 | Dubai, UAE](#)

Citation: Doron Ashkenazi; Enrichment of nutritional compounds in seaweeds via integrated multi-trophic aquaculture (IMTA); Aquaculture & Marine Biology 2021, March 24-25, 2021, Dubai, UAE