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Seaweed Aquaculture and marine Biotechnology

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Abstract

Macroscopic marine algae, typically known as macroalgae or seaweeds, form an important living resource of the oceans, as primary producers. People have collected seaweeds for food, both for humans and animals for millennia. They also have been a source of nutrient rich fertilizers, as well as a source of gelling agents known as phycocolloids. More recently macroalgae are playing significant roles in medicine and biotechnology. Although Biotechnology and in particular marine biotechnology may have different meanings for different people, under the present context we will consider a broader definition. Marine biotechnology consists on the use of biological knowledge and/or the application of biological techniques on marine organisms, for the development of products in some way beneficial for humans. Seaweed aquaculture is, therefore a biotechnology activity. It is also one that can allow for further development of the industry. Today, seaweed cultivation techniques are standardized, routine and economical. Several factors, including understanding the environmental regulation of life histories and asexual propagation of thalli, are responsible for the success of large-scale seaweed cultivation. Presently, seaweed aquaculture represents approximately 23% of the world's aquaculture production, including fish, crustaceans and other animals. A promising approach for the development of seaweed aquaculture, and aquaculture in general, is the integrated multi-trophic aquaculture (IMTA). In these systems, fed-aquaculture is combined with extractive organisms like bivalves and/or algae. The constraints and advantages of IMTA will be discussed. In particular, land based IMTA systems allow for much greater environmental and input controls. Traceability, security of supply, high-quality standards and safety should be the future of seaweed aquaculture and contribute for the development of marine biotechnology.