

Photobioreactor for high quality microalgae culture

Vizhinjam, Kerala. Mass production of different species of high-quality microalgae in required quantities is key to the successful operation of a bivalve or finfish hatchery. For this purpose, a photobioreactor has been developed and set up by Vizhinjam Regional Centre of ICAR-CMFRI in its National Brood Bank facility which is used for live feed production to feed finfish and shell fish larvae. Production of 500 litres of culture with 3-4 billion cells / ml could be harvested per day from the system that was directly used for larval rearing in tanks or for outdoor inoculation of production systems employed in the nursery stage. This photobioreactor technology will be highly beneficial in hatcheries for bivalves, finfish and shrimp.



PROMISING TECHNOLOGIES

The system has 3 components: LED lit production station, Water filtration unit and Air-CO₂-mix filtration unit. The production unit has 3 structural units in which 54 polythene bags of 12.5 cm diameter and 125 cm length can produce 15 litres of high-density microalgal culture up to 4 billion cell/ml. The LED light usage saves lot of energy compared to traditional fluorescent lamps. The seawater is first filtered using a cartridge filter; then pumped under low pressure through ultrafilter units and stored in a plastic tank. The stored water is again passed through a UV filter unit before injecting into the reactor bags. The air/CO₂ mixture is nano-filtered before injecting into the system to avoid contamination of the system by air-borne bacteria and other pathogens.

The required amount of CO₂ is injected in a controlled manner into the system by using a bubble counter. Many hatcheries, including those from the government sector, have showed keen interest in setting up similar units. An MoU will be signed soon with the State Fisheries department of Kerala for installing the same in their hatcheries. The National Brood bank facility is currently producing egg /seed 14.28 million per year for supplying to Government /Private hatcheries and to the farmers from various states of India.

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