

Aquaculture Water Treatment via Biofilms

Technology Overview

The worldwide aquaculture sector's average production rate has been steadily increasing. In Singapore, aquaculture has a critical role to meet the national goal of producing 30% of the population's nutritional needs by 2030. Water treatment and feeds are the most significant expenses in aquaculture farms. Aquaculture water treatment is the process of purifying and maintaining the quality of water in aquaculture systems, such as fish farms, shrimp farms, and other aquatic cultivation facilities. This is crucial for the health and well-being of aquatic organisms, as it helps maintain optimal water conditions and prevents the buildup of toxic substances such as ammonia and nitrite.

Conventional recirculating aquaculture system (RAS) has the limitation of nitrate accumulation, is expensive to operate and needs to be supplemented with partial water changes. Water treatment via biofilms technology is a promising solution as it is low-cost with ease of application. Biofilms with carefully designed constituents have been developed for facile water treatment in aquaculture. There are currently no commercially available biofilm systems for aquaculture water treatment, and the developed system can relieve farms of the high costs and labour-intensiveness associated with water treatment.

Features & Specifications

The biofilm serves to remove soluble nutrients in the waters and maintain the water quality through the action of bacteria and microalgae. Customisation of the biofilm would be via modulating the density of algae and bacteria embedded, based on an assessment of the actual water quality profiles. The applicability and efficacy of the proposed biofilm system in indoor tanks and field trials have been established.



Customer Benefits

The biofilm finds strong competitive edge through its low cost, holistic water treatment solution and convenient application. It reduces capital and operational costs (i.e. manpower, water and energy costs)

Potential Applications

The biofilm system can replace the conventional recirculating system as a low-cost water treatment solution for inland freshwater aquaculture farms including indoor vertical farming. This technology is ready for adoption. The project team will support the initial customisation for any specific application.

