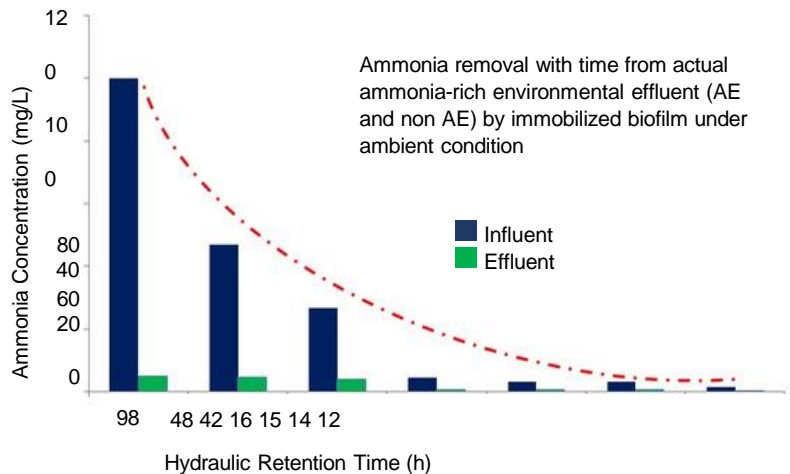


Microbial treatment of ammonia rich aquaculture and refinery effluent

Technology

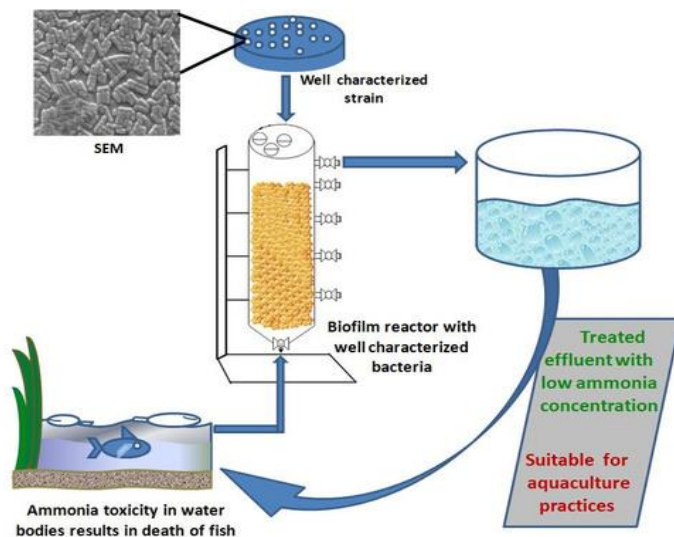
This technology consists of a bio property, which performs a microbial process for removing ammonia, nitrate and nitrite from waste water. The time of microbial incubation depends on the initial load of the pollutants. It is a sludge free, stable biofilm based system with sustained performance that can be used for aquaculture, food industry and refinery waste water treatment. The biofilm system remains stable if run as per standard operating procedure for years before requirement for replacement/maintenance.

Moreover, it can be effectively used as a self-cleaning system in aquaria and ensures that the water does not need to be replaced despite of normal fish feed addition.



Ammonia removal with time from actual ammonia-rich environmental effluent (AE and non AE) by immobilized biofilm under ambient condition

Process Workflow



Inventor

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Potential market

- Aquaculture Industry
- Aquarium suppliers
- Refinery

Categories of this invention

- Wastewater Treatment
- Aquaculture Treatment

Intellectual Property

ShaonRay Chaudhuri. A process and system for ammonia removal from wastewater. 202131002964 dated 21st January 2021

Problem Addressed

Aquaculture industry produces large volume of effluent which needs to be treated before discharge and replacement with fresh water. Maintaining this practice while ensuring environmental safety becomes a central focus for the industry. Currently, the treatment of water is cost intensive and also receiving a substantial amount of fresh water with the global fresh water crisis is a major concern for the industries. This technology provides an innovative and environmental-friendly alternative to adequately treat the water and reuse the same, avoiding the need for fresh water replacement.

Advantages

- Sludge free system
- Stable for years if run as per SOP
- Needs one-time bacterial inoculation.
- Till date the fastest aquaculture wastewater treatment system using microbes from environmental origin.

Publications

- Mandakini Gogoi, Indranil Mukherjee, Shaon Ray Chaudhuri. 2021. Characterization of ammonia remover *Bacillus albus* (ASSF01) in terms of biofilm formation ability with application in aquaculture effluent treatment. Environmental Science and Pollution Research. DOI: 10.1007/s11356-021-16021-8. (IF: 4.223)
- Mandakini Gogoi, Pinaki Bhattacharya, Sudip Kumar Sen, Indranil Mukherjee, Shashi Bhushan, Shaon Ray Chaudhuri 2021. Aquaculture effluent treatment with ammonia remover *Bacillus albus* (ASSF01). Journal of Environmental Chemical Engineering, 9(4): 105697. <https://doi.org/10.1016/j.jece.2021.105697> (IF: 5.909)

Applications in the field

This technology can be applied to the field of aquaculture waste water treatment, refinery waste water treatment and can also be used by ornamental fish industries that manufacture, sell and maintain aquaria for personal use and in public areas. It would save water and therefore makes it suitable for reuse in aquaculture/suitable for discharge (in refinery).



Aquarium after 20 days (normal fish feeding & algal growth)



Aquarium with self-cleaning system after 3 months (with normal fish feeding)