Research and Development of Aquaculture Wastewater Treatment Technology and Equipment

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ABSTRACT

This paper is based on the research of microorganism preparation and new high efficiency solid-liquid separation equipment. We developed integrated wastewater treatment equipment by MBR process. The equipment can remove more than 95% of solid pollutants. After treatment, the wastewater can be returned to the pigsty, rinsing the ground, greening, etc., so as to realize the recycling of water resources.¹

INTRODUCTION

With the rapid development of livestock and poultry industry in China, the pollution of aquaculture sewage is increasing. So the prevention and control of aquaculture sewage pollution is imminent. At present, the treatment methods of large-scale aquaculture wastewater at home and abroad mainly include comprehensive utilization and treatment. Comprehensive utilization of biomass is through multilevel utilization, ecological agriculture and harmonious coexistence between agriculture and environment. Post-treatment standard emissions are in the range of daily allowed emission concentrations after multistage treatment such as fish ponds, farmland or orchards, within the allowed daily emission concentration range, in order to minimize the extent of environmental pollution.

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RESEARCH ON MICROBIOLOGICAL AGENTS OF FARMING WASTEWATER

Microbial preparations are using normal-microorganisms substances that promote the growth of microorganisms to make live microbial preparations. This paper studied microbiological preparations mainly including photosynthetic flora, lactic acid flora, yeast flora, actinomycetes and other bacteria. Microorganisms in microbial preparations in aquaculture wastewater are easy to be planted, stored, mass-produced, and insensitive to environmental changes. By studying different kinds of microbial agents in aquaculture wastewater to identification of species genus of functional bacteria of microbial preparations, and to ensure that microorganisms in microbial preparations of farmed wastewater have the required specific functions, and further optimize the proportion of different strains in microbial preparations. Thus, the optimal application ratio of functional bacteria of different species in microorganism preparation of aquaculture wastewater was determined.

THE RESEARCH AND DEVELOPMENT OF NEW HIGH EFFICIENCY SOLID-LIQUID SEPARATION EQUIPMENT

Solid-liquid separation is a process of removing suspended solids from water or wastewater. Solid-liquid separation technology is widely used in various industries, such as mineral processing, paper making, medicine and health, environmental protection and food. The traditional solid-liquid separation equipment is mainly focused on filtration, pressure filtration, gravity settling and flotation. With the development of science and technology, the clarity and filter residue content of solid-liquid separation equipment are more and more stringent, which makes the whole technology of solid-liquid separation facing unprecedented challenges.

The high-efficiency solid-liquid separator filter developed by us is consists of a series of vertical mounted rotating filter discs which are mounted on the central drum. Each turntable is consists of two semicircular fans. The module is equipped with a membrane wrapped with a stainless steel mesh filter cloth. The average pore size of the filter cloth can be selected from 5 to 200 microns according to the actual requirements of customers. During the whole operation, the filtration is continuous, even during the cleaning process, the filtration is still in progress. The slag water mixture after washing is discharged from the system through a slag discharging trough installed in the middle drum.

Features of this stage: complete sets of equipment, easy installation and operation; in the use of chemicals to select PM-7 (1) water purifier, in the removal of SS at the same time, greatly reduce total phosphorus.
DEVELOPMENT OF INTEGRATED AQUACULTURE WASTEWATER TREATMENT EQUIPMENT

The solid pollutants in livestock and poultry wastewater can be removed more than 95% by using high efficient solid-liquid separation equipment with proper addition of bacteria. The process of integrated biochemical treatment is divided into three steps. The first step is anaerobic biochemical treatment, which mainly removes a large number of organic substances from water and converts organic ammonia into inorganic ammonia. The second step is aerobic biochemical treatment, which further removes organic matter from water and converts ammonia nitrogen into nitrate nitrogen. After sterilization, it can be used for raising pigsty, washing the ground, greening and so on.

Characteristics of this stage: through the combination of Anaerobic + aerobic + MBR + disinfection biochemical technology to ensure that the effluent reaches the reuse standard.

CONCLUSIONS

Reproductive wastewater treatment technology realizes the production test and market application of microbial agents to reduce sludge and raise water quality standards in the process of sewage treatment. Especially in livestock and poultry farms, the solid-liquid separation technology can greatly reduce the concentration of pollutants in animal husbandry wastewater, and at the same time reduce the separated feces and suspended solids. The implementation of dynamic composting can turn waste into treasure.

The new integrated aquaculture wastewater treatment equipment developed by our institute can remove more than 95% of the organic matter and 90% of the total ammonia nitrogen and phosphorus. The effluent after treatment meets the first class B standard of pollutant discharge standard of urban sewage treatment plant.
REFERENCES


2. Livestock and Poultry Breeding Wastewater Treatment Process; China Sewage Treatment Works Network.


