

RASbiome

Microbial management in RAS for sustainable aquaculture production

About the project

In the RASbiome project, we aim at improving the sustainability of fish production in freshwater recirculating aquaculture systems (RAS) by introducing new and innovative approaches for microbiological water treatment. We will implement two fundamentally distinct biological water treatment strategies, new to RAS, to improve the management of nitrogen compounds. The first strategy involves anaerobic ammonia-oxidizing (anammox) bacteria, and results in almost complete removal of nitrogen from the water. Compared to current treatment methods for nitrogen removal in RAS, this strategy excludes the need for external organic carbon; it entails reduced energy consumption, and reduced CO₂ production. The second strategy takes advantage of bioflocs formed by heterotrophic bacteria, assimilating nitrogen. This approach allows for harvesting nutrient rich microbial biomass, and is therefore compatible with recovery and recycling of nitrogen from in

RAS water. These new biological water treatment approaches will be implemented in well-considered treatment designs for optimized microbial and chemical water quality. The project is highly multidisciplinary, involving experts from Belgium, Denmark, and Norway in fields of environmental engineering, biotechnology, microbiology, microbial ecology, and aquaculture. Industry partners, including two large commercial producers of salmon smolt and rainbow trout, play a crucial role in the project. We expect the proposed project to promote sustainable fish production by improving fish welfare and productivity due to stable and optimized chemical and microbiological water quality, by reducing environmental impact through nitrogen removal from discharged water, and finally, by reducing operational costs.

Thus, the project contributes in developing European aquaculture in a direction characterized by the 3R principle: reducing, reusing and recycling of waste material.



Project Overview

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Project Partners:

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Exploring new bioresources

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