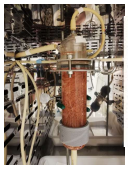

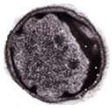

Alternative filtering technologies in RAS

Jonathan A.C. Roques

STINT
The Swedish Foundation for International Cooperation in Research and Higher Education

Stiftelsen Birgit och Birger Wåhlströms Minnesfond

FORMAS

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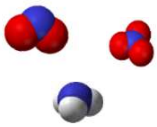
HELGE AX:SON JOHNSONS STIFTELSE

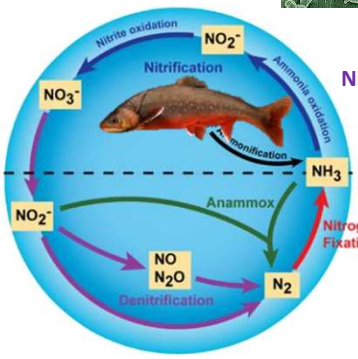
1

The nitrogen cycle

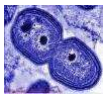


Water exchange

Nitrobacter/Nitrospira

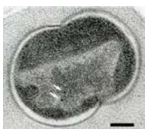


Nitrosomonas



Denitrifying bacteria

Anammox bacteria



Fish produce ammonia/ium (NH_3/NH_4^+) as a result of amino-acids catabolism

In (partial) RAS, ammonia is oxidized into nitrate (NO_3^-), via nitrite (NO_2^-), by nitrifying bacteria

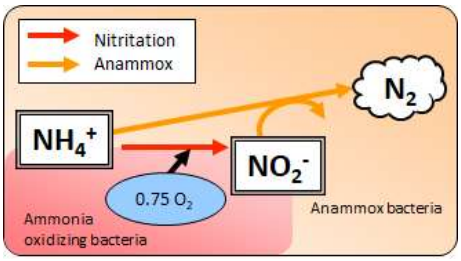
NO_3^- need to be removed either by regular water exchange or denitrification

2

What is anammox?

"anaerobic ammonium oxidation"

Candidatus scalindua



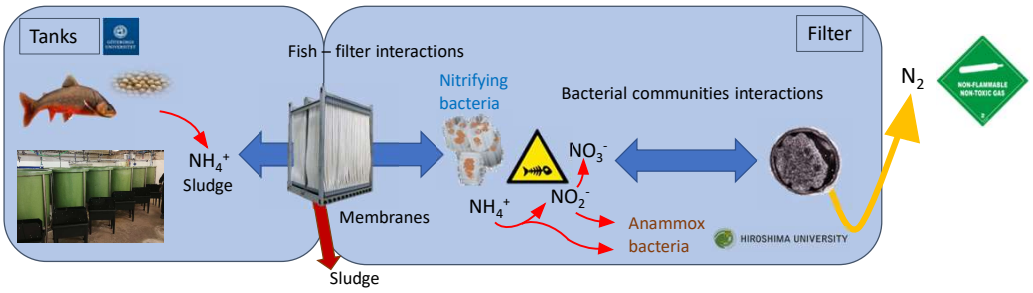
Important microbiological process of the nitrogen cycle where NH_4^+ and NO_2^- are converted into nitrogen gas, in the absence of oxygen

3

Candidatus Scalindua, a biological solution to treat saline recirculating aquaculture system wastewater

Developing sustainable aquaculture through collaboration between Swedish & Japanese universities

The project team, F. Micolucci, **J.A.C. Roques**, T. Kindaichi *et al.*



Results from laboratory experiments

Ca. scalindua is a good candidate for RAS

- Can be slowly acclimated to RAS wastewater enriched in NH_4^+ & NO_2^- (30 mg/L)
- Highly tolerant to high NO_3^- (> 400 mg/L)

Perspectives in real RAS conditions

- Test with NH_4^+ and NO_2^- concentrations found in RAS (< 1mg/L)
- Test the tolerance to O_2
- Test the impact on fish welfare

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