

Pilot design and contribution of combined Aqua-culture and *Salicornia europaea* cultivation

Interview partner Dr. Ramon Perez and Dr. Jiwan Chettri, Alpha Aqua A/S



RAS unit holding rainbow trout (*Oncorhynchus mykiss*)

"Within this four-year project, what is your main task within this topic?"

Alpha Aqua is leading the work package 11 of the Aquacombine project. Our main task is the design and installation of demonstration units combining aquaculture and *Salicornia europaea* cultivation.

Looking at this topic what added value do you expect from the project?

The knowledge generated during the project period from growing *Salicornia* under different conditions to the extraction of valuable bioactive compounds - that find beneficial use in food, cosmetics, and feed - will be helpful in realizing the actual potential of *Salicornia*.

"The project has been running since October 2019 and will be completed by the end of the year 2023. Which results have surprised you the most so far?"

The *Salicornia* plants are very efficient in the uptake of nitrogenous compounds from the fish process water. It is remarkable to see the quick reduction (>50%) of ammonia, nitrite, and nitrate concentration in the fish process water after being in circulation in the aquaponic unit for a short period.





Salicornia europaea in aquaponic unit

Why is this topic important for your company Alpha Aqua?

When producing fish in an enclosed environment such as **Recirculatory Aquaculture System (RAS)**, the nitrogenous product generated in the system like ammonia and nitrite is the main concern to the operators due to both acute and chronic toxicity effects. Therefore, it is regarded as toxic waste in the aquaculture system and operators must ensure continuous removal of it using nitrifying bacteria in the biofilter unit.

However, the same waste can be used as a fertilizer for producing plants (in this case Salicornia). The addition of aquaponic units has also indirect positive benefits as depending on the local environmental regulation the farming permit quota of any aquaculture unit is also restricted by the amount of Nitrate and Phosphate waste it can discharge without causing adverse effects to the surrounding environment. The aquaponic setup helps in reducing the nutrient discharge thereby increasing the farming quota. The idea of using waste from one system (aquaculture) as a resource to produce another biomass (Salicornia) for food or feed components is incredibly important in today's context of a growing population, limited resources for food production, and under extremely variable climatic conditions. Therefore, it befits Alpha Aqua's core value 'sustainable food production for the future'.

One last question. If you could wish for something for the project, what would it be?

The AQUACOMBINE project consortium has generated an enormous amount of knowledge on the Salicornia plant and its beneficial compounds. I wish this knowledge hub to be converted into a research centre for halophytes which will allow research-valorisation of other under-utilized halophytes.

Alpha Aqua A/S is a young technology provider company established in 2017 with a vision to bring innovative turn-key solutions to the fast-growing land-based aquaculture industry (Recirculatory Aquaculture System (RAS)) and provide the best growing and welfare conditions for cultured species.





AQUACOMBINE



Dr. Ramon Perez

Ramon has a background as a veterinarian (DVM) with an MSc in Aquatic Vet Studies from the University of Stirling, Ramon has been working in the aquaculture industry during his whole career. In Alpha Aqua, Ramon works as COO bringing a hands-on fish farming perspective to all the engineering required in Land Based Aquaculture.

Ramon is in-charge of the Aquacombine project together with Dr. Jiwan Kumar Chettri.



Dr. Jiwan Kumar Chettri

Jiwan has a background in fish biology and holds a Ph.D. in fish health and welfare, specializing in fish vaccines, nutrition, and welfare. He has long experience in research and development and has been operating the Alpha Aqua test farm at Esbjerg, Denmark. Continuous development and testing/challenging different components of Alpha's equipment (NanoRAS, Alpha Line) and benchmarking sensors are some of the few things that are being investigated in the R&D farm.

