AquaVitae

Case study 4 – Sea-based Integrated Multi-trophic Aquaculture (IMTA)

KEYWORDS

Sea-based, IMTA, algae, abalone, biosecurity, low trophic species

SPECIES

- *Haliotis midae* (South African abalone)
- *Haliotis tuberculata* (European abalone)
- *Gracilaria gracilis* (red algae)
- *Choromytilus meridionalis* (South African black mussel)
- *Mytilus edulis* (blue mussel)
- *Homarus gammarus* (European lobster)
- *Ostrea edulis* (European flat oyster)
- *Saccharina latissima* (sugar kelp)
- *Alaria esculenta* (winged kelp)
- *Palmaria palmata* (dulse)
- *Mimachlamys varia* (queen scallop)






GEOGRAPHICAL BOUNDARIES

Case study "Sea-based Integrated Multi-trophic Aquaculture (IMTA)" will take place in France, South Africa, Faroe Islands and Sweden. Industry partners from the respective countries will be working closely with universities in South Africa, Spain, Portugal, as well as research institutes in Sweden and the Faroe Islands.

GOALS

- Develop and refine sea-based IMTA systems, processes specific to species and conditions in four different locations at commercial level.
- Improve efficiency in the use of natural resources.

AT A GLANCE

- **Project period: 2019-2023**
- **Sea-based IMTA of shellfish and macroalgae in different latitudes in the Atlantic Ocean: Faroe Islands, Sweden, France and South Africa.**
- **Production of *aquafeeds* from IMTA algae for low-trophic species.**
- **Evaluation of ecosystem services by various IMTA approaches.**
- **Optimising nutrient utilisation and reducing solid waste.**
- **Collaborations between industry partners, universities and research institutes.**

Main activities take place in Faroe Islands, Sweden, France and South Africa.

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CHALLENGES

- Lack of validation of IMTA systems in Europe and South Africa.
- Integrated Multi-Trophic Aquaculture (IMTA) requires tailor-made systems adapted to local conditions. Likewise, IMTA systems have to balance the species nutrient requirements and by-products production.
- A need to increase productivity, diversity and environmental sustainability in sea-based aquaculture production.

EXPECTED RESULTS

- Methods to make IMTA algae biosecure before inclusion in an abalone feed.
- Inclusion of sea-based IMTA-grown algae in a formulated diet.
- Protocols for commercial sea-based co-culture systems.
- Several shellfish, bivalves and algae species produced in IMTA systems.
- Understanding the carbon and nitrogen dynamics of IMTA in a fjord ecosystem.

EXPECTED USERS

- Abalone, mussel and oyster farmers
- Aquatic feed producers
- Lobster producers
- Aquaculture industries

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WORKPLAN

The co-production of abalone and mussels with macroalgae will be trialed under commercial conditions in South Africa. Farmed abalone will be fed formulated feed with the inclusion of sea-based IMTA algae (developed in AquaVitae CS13 Low-trophic Aquafeeds) and their growth will be monitored. The methods for ensuring biosecure macroalgae for the inclusion in feed will be tested on the sea-based IMTA-grown algae and tested on abalone.

In Sweden, the co-culture of European lobster and European flat oyster will be evaluated, while the co-culture of salmon, mussels and macroalgae will be trialled in the Faroe Islands.

In France, several methods of deployment will be tested on three seaweed species, grown along abalone in sea-cages. In addition, the integration of queen scallop or flat oysters into existing abalone and kelp IMTA will be tested.

TEAM

1. France Haliotis (France)
2. Marifeed (South Africa)
3. Wild Coast Abalone (South Africa)
4. Ocean Rainforest (Faroe Islands)
5. University of Las Palmas de Gran Canaria (Spain)
6. IVL Swedish Environmental Research Institute (Sweden)
7. Bohus Havsburk (Sweden)
8. Fiskaaling (Faroe Islands)
9. Stellenbosch University (South Africa)
10. P/F Luna (Faroe Islands)
11. CCMAR - Centro Interdisciplinar de Investigação Marinha e Ambiental (Portugal)
12. Rhodes University (South Africa)

LINKS

Video - Leader of the case study introduces AquaVitae:

https://bit.ly/av-imta-south-africa

Webinar - "Optimising IMTA performance in South Africa – Case : Wild Coast Abalone"

https://bit.ly/av-webinar-imta-south-africa

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