AquaVitae

Case study 7 - Sea cucumber species, site selection and key hatchery steps

KEYWORDS

Spawning, feeding ecology, integrated culture, sea cucumber

SPECIES

- *Neostichopus grammatus* (South African sea cucumber)
- *Holothuria grisea* (Brazilian sea cucumber)

GEOGRAPHICAL BOUNDARIES

Sea cucumber site analyses, species selection, feeding studies and breeding experiments will occur in the Eastern Cape region of South Africa, and in Rio Grande do Norte, Brazil, pending on the COVID-19 situation.

GOALS

- Select sea cucumber species suited to aquaculture and Integrated Multi-trophic Aquaculture (IMTA) in South Africa and Brazil.
- Conduct surveys and controlled feeding experiments to obtain data on the feeding ecology and preferred sites of the species.
- Test and apply established spawning and hatchery techniques on selected species.

AT A GLANCE

- **Project period: 2019-2023.**
- **First successful *Neostichopus grammatus* spawning in laboratory.**
- **Controlled feeding experiments with natural sediments, algal diets and abalone waste (faeces and diet) completed.**
- **Site surveying and sampling of sediments and gut content at coastal Eastern Cape (South Africa).**
- **Gonad development and breeding cycle followed at selected site.**
- **Selection of species agreed with stakeholders and local partners.**

Main activities take place in South Africa and Brazil.

This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 818173. This publication reflects the views only of the AquaVitae consortium, and the European Union cannot be held responsible for any use which may be made of the information it contains.

CHALLENGES

- Sea cucumbers are not commercially farmed outside Asia.
- Uncertainty on the suitability of target species for aquaculture.
- Need to test sea cucumbers adaptation to different IMTA systems (oysters-Brazil, abalone and seaweed- South Africa).

EXPECTED RESULTS

- Full datasets on sediment selectivity by sea cucumbers fed natural and aquaculture diets.
- Spawning protocols and reproductive cycle data for novel sea cucumber species.
- Proposed feeding rates and data on feeding effects of sea cucumbers fed abalone waste diets.
- Full feeding ecology and holding system data for *Neostichopus grammatus* culture.

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EXPECTED USERS

- Established abalone farms in South Africa
- Established oyster farms in Brazil
- Novel aquaculture developers in Europe

WORKPLAN

1. List and categorise potential culture species, confirm suitability in targeted interviews and obtain data for informed agreement on a final set of 1-2 species for commercial development.

2. Determine the feeding ecology, nutritional requirements and potential benthic site indicators for culture species. To determine basic growth rates to be expected.

3. Evaluate the suitability of standardised hatchery protocols for the production of larvae and juveniles at laboratory scale and determine basic growth rates for early juveniles.

TEAM

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2. Rhodes University (South Africa)
3. Wild Coast Abalone -WCA (South Africa)
4. Fort Hare (South Africa)
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