

Production potential of mussels and algae in the Estonian coastal waters and their valorization

Summary

Novel aquaculture activities such as macroalgal and mussel farming could be a promising measure for eutrophication control in the brackish Baltic Sea. The aim is to develop Baltic Sea region specific macroalgae and mussel production and valorization technologies to create novel feed and food products of these small-sized plants and animals.

Research field:	Mechanical engineering
Supervisors:	Prof. Dr. Ulla Pirita Tapaninen Jonne Kotta Loreida Timberg
Availability:	This position is available.
Offered by:	Estonian Maritime Academy
Application deadline:	Applications are accepted between September 01, 2021 00:00 and September 30, 2021 23:59 (Europe/Zurich)

Description

When macroalgae and mussels are farmed and harvested we also remove a significant share of nutrients from the marine ecosystems and thereby make a positive contribution to regional eutrophication reduction and providing a valuable regulative ecosystem service in eutrophic waters.

To date, the macroalgae and mussel production is still widely in its infancy in the Baltic Sea region because there is a lack of in-depth knowledge on the production potential of the farmed species in coastal waters as well as we are largely unaware which farm technologies lead to high algal and mussel growth. Importantly, because the size of farmed plants and animals is generally smaller in the Baltic Sea region than their counterparts growing in the ocean, there is a need to develop specific valorisation technologies with the aim of creating novel feed and food products of these small-sized plants and animals.

To deal with the challenges above, this thesis aims to build capacity on macroalgae and mussel cultivation and processing as well as to share this know-how among public authorities and other relevant stakeholders across the Baltic Sea region. As such the project also contributes to sustainable blue growth of coastal communities.

The plan of this doctoral thesis can be partitioned as follows:

- First, in this project the production potential of mussels and algae is assessed in their best farming areas in the Estonian coastal waters.
- Second, the most important part of the thesis, novel products based on algae and mussels farmed in the Baltic Sea region are advanced. Here, the most effective valorization models based on the cost of production, size of the organism and their biochemical content are established.

In this thesis the planned articles are as follows:

- Assessing the growth rate and farm yield in a pilot mussel and algal farms of the NE Baltic Sea
- Biochemical potential of farmed mussel for food in the Baltic Sea region
- Valorization of farmed mussels and algae for food

Applicants should fulfil the following requirements:

A suitable background may come from earlier experience in mussel farming and product valuation process either through thematic postgraduate studies and/or participation in research groups targeting related disciplines. Prior experience in working in chemistry laboratories is a significant advantage. The candidate should prove his/her capabilities in writing the technical report and scientific papers in high quality journals. The applicant for the position must have a Master's degree and must fulfill the requirements for doctoral students at the Tallinn University of Technology



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