



## **Bioremediation Potential of Sugarkelp, *Saccharina Latissima*, Cultivated in a Commercial Off-Shore Integrated Multi-Trophic Aquaculture**

**Silva Marinho, Goncalo; Holdt, Susan Løvstad; Angelidaki, Irini**

*Publication date:*  
2015

*Document Version*  
Peer reviewed version

[Link back to DTU Orbit](#)

*Citation (APA):*

Silva Marinho, G., Holdt, S. L., & Angelidaki, I. (2015). *Bioremediation Potential of Sugarkelp, Saccharina Latissima, Cultivated in a Commercial Off-Shore Integrated Multi-Trophic Aquaculture*. Abstract from 5th Congress of the International Society for Applied Phycology, Sydney, Australia.

---

### **General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.



## **BIOREMEDIATION POTENTIAL OF SUGARKELP, SACCHARINA LATISSIMA, CULTIVATED IN A COMMERCIAL OFF-SHORE INTEGRATED MULTI-TROPHIC AQUACULTURE**

Authors

**G.S. Marinho**<sup>1</sup>, S. L. Holdt<sup>1</sup>, I. Angelidaki<sup>1</sup>

Presenting author's e-mail: [gosm@env.dtu.dk](mailto:gosm@env.dtu.dk)

*Affiliation*

<sup>1</sup> *Technical University of Denmark, Kgs. Lyngby, Denmark*

### **ABSTRACT**

#### **Introduction**

Several seaweed species have been successfully tested as biofilter in integrated multi-trophic aquaculture (IMTA). In this study, sugarkelp (*Saccharina latissima*) biofiltration potential in a commercial off-shore IMTA system was assessed year-round based on the yield, nitrogen (N) content and N removal of the produced biomass.

#### **Methods**

Sugarkelp was cultivated both in close proximity to a blue mussel and fishfarm and in a reference site, both outside Horsens fjord in Denmark. Sugarkelp production was measured by harvesting sporophytes (deployed in February 2013) from 1m rope droppers (n=3) at 2 m depth in 2013-2014. Biomass was weighed, followed by freeze drying, homogenizing and N content was found by Kjeldahl method.

#### **Results**

The highest biomass yield was achieved in August and September, whereas significantly higher yield was obtained for the seaweed cultivated at the IMTA site (respectively  $1.49 \pm 0.3$  and  $0.92 \pm 0.3$  kg fresh weight  $m^{-1}$  of cultivation line;  $p < 0.05$ ). The overall highest N removal was in September at both sites, and in addition the N removal at the IMTA was significantly higher than the reference site at this time of year (respectively 6.9 and 5.0 g N  $m^{-1}$  of cultivation line;  $p < 0.05$ ).

#### **Conclusion**

Sugarkelp biofilter proved to be effective on removing nitrogen at both cultivation sites, with environmental and potentially economic benefits (e.g. waste water management and for application of biomass). Sugarkelp biofiltration performance was enhanced by the proximity of the mussel and fishfarm. The harvest time should be settled around September in order to achieve maximum biofiltration efficiency.