Extraction of Ulvan from the Green Macroalgae *Ulva rigida* by Enzymatic and Non-Enzymatic Methods

Master thesis in cooperation between the Institute of Environmental Technology and Energy Economics and the Institute of Technical Biocatalysis

Introduction

Green macroalgae are rich in biocompounds such as proteins, polysaccharides, vitamins and antioxidants. In addition, their polymeric fraction, constituted mainly by ulvans and proteins, represents a promising ingredient to form new biomaterials.

This is the main objective of this Master Thesis: to extract ulvan from *Ulva rigida* as a potential ingredient of biobased materials.

The structure and chemical composition of this biopolymer is influenced by several factors such as the species, growth location, harvesting season, etc. In addition, the extraction method and experimental conditions can significantly affect its chemical structure and extraction yield, thus affecting its biological properties and applications.

In this Master Thesis, enzymatic and non-enzymatic methods will be studied to extract the polysaccharide ulvan from *Ulva rigida.* The idea is to improve the extraction efficiency and optimize the process parameters. Furthermore, a detailed characterization of the extracted biopolymers is very important to understand the effect of the extraction method and study their suitability as ingredients of biomaterials.

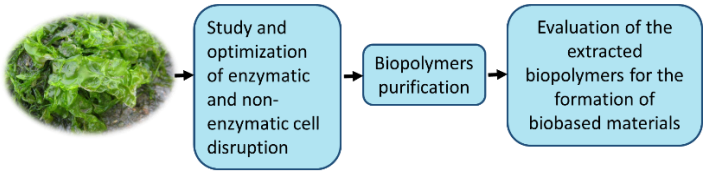

Figure 1: Schematic representation of the Master Thesis steps

Beginning: immediate

Content of the Thesis

- Identification of enzymes for the hydrolysis of *Ulva rigida* biomass
- Enzymatic cell disruption and study of process parameters
- Non-enzymatic cell disruption methods and study of aqueous or solvent extraction processes
- Comparison and evaluation of studied non-enzymatic methods and optimization of one method
- Biopolymers purification and characterization after enzymatic and mechanical processes
- Application of combined enzymatic and mechanical cell disruption methods

Contact

Ana Malvis Romero
Institute of Technical Biocatalysis
+49 40-42878-2890
ana.malvis.romero@tuhh.de

Sinah Kammler
Institute of Environmental Technology and Energy Economics
+49 40-42878-6023
sinah.kammler@tuhh.de