PlastiSea

Novel enhanced bioplastics from sustainable processing of seaweed

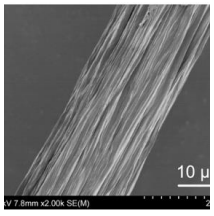
The main objective of PlastiSea was to develop new bioplastic materials from sustainable processing of cultivated brown algae.
The consortium was coordinated by SINTEF Industry, and consisted of two research institutes, two universities, and two SMEs from Norway, Sweden, Spain, and Denmark.
The project was concluded in 2023 with presentations at the ERA-BlueBio end-term meeting (Lisbon, PT), and at the 2nd *Seaweed Applications* conference (Inderøy, NO). In addition to this factsheet, the project is summarized in the PlastiSea video

Main Research Activities

- Cultivation of brown algae *S. latissima* and *A. esculenta,* development of preservation methods maintaining biomass quality for material applications, utilization of harvesting and processing side streams.
- Development of efficient and low-cost processing methods to make alginate- and cellulose-rich fractions
- Development of innovative seaweed-based materials, including food packaging materials, bioplastic composites, and advanced micro- and nanomaterials
- Physical and mechanical characterization of novel materials, and pilot-scale trials for production of prototypes
- Environmental assessment of utilizing cultivated seaweed for packaging materials, and carbon footprint of new products

Key results and outcomes

- Characterization of seasonal variations in cultivated seaweed, focusing on properties for material applications
- Protocols for acid preservation of seaweed to maintain biopolymer quality
- Processes for generating low-cost crude biopolymer fractions, and tailoring of alginate structure during extraction from seaweed
- Prototypes of transparent flexible films based on solution casting, and from thermoforming.
- Utilization of residual seaweed fibers for PLA composite materials
- New alginate-cellulose nanofibers for coating applications
- LCA and end-of-life analyses for seaweed-based packaging materials



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The work was supported by the ERA BlueBio co-fund, which has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992