

# MacroFuels WP2: Conditioning, pre-treatment and storage

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# Tasks

- WP 2: Conditioning, pre-treatment and storage
  - Task 2.3: Enzymatic degradation of macro-algal polysaccharides (M3-36)
  - Task 2.4: Fractionation and mild chemical treatment (M3-36)
  - Task 2.5: Purification and concentration of algal sugar syrups (M12-24)
- WP 5: Fuel suitability and by-product application tests
  - Task 5.2: Assessment of the minerals (M20-40)
  - Task 5.3: Assessment of the protein rich fraction (M20-40)

# Task 2.3

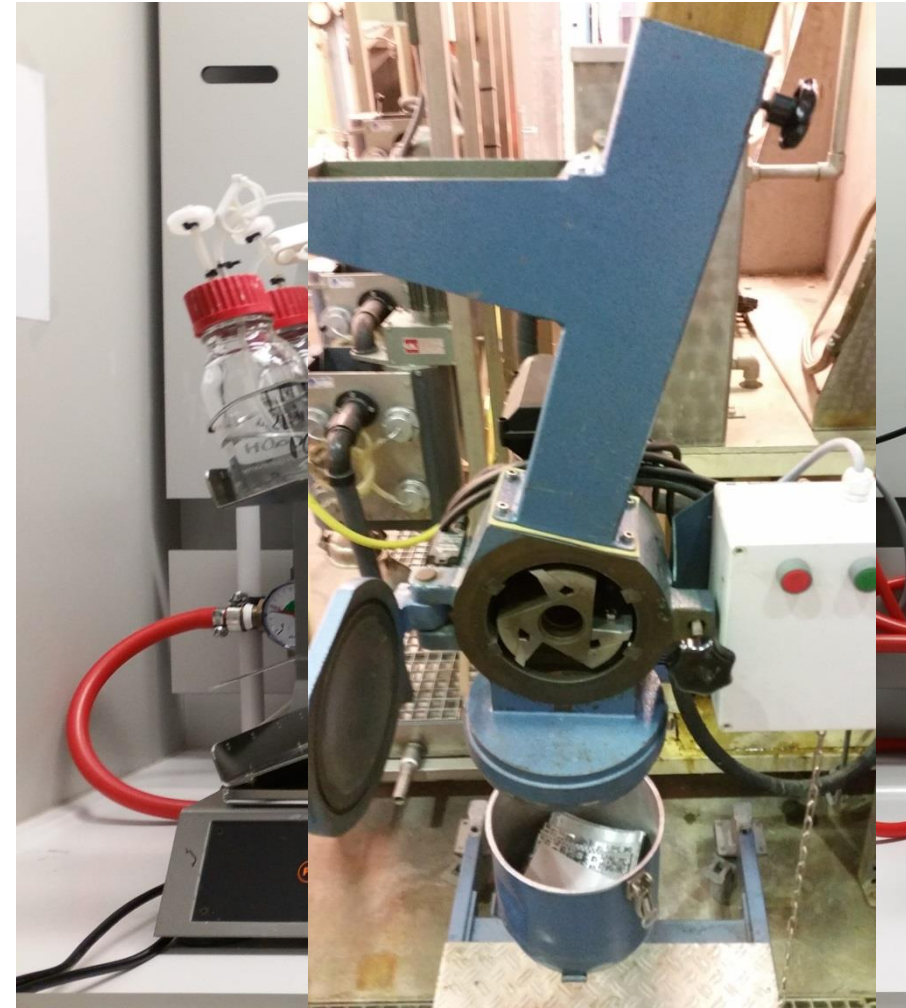
- Task 2.3: Enzymatic degradation of macroalgal polysaccharides (M3-36)

– 2.3.3: Enzymatic hydrolysis for production of sugar syrups for WP3

– Upscale enzymatic hydrolysis with seaweed-specific enzymes (Matis)

# Task 2.3: Enzymatic hydrolysis (1)

- 1L-reactor Infors reactor
  - pH-stat
- 1:10 biomass:liquid
- Cellulase mix (with alginate lyase)
  - Multifect GC or GC220 (Genencor)
- Combine with pre-treatment
  - Cut or ground
  - With acid pretreatment
    - (50 oC, pH 4)



# Task 2.3: Enzymatic hydrolysis (2)

- Analysis
  - HPAEC for sugars
  - Commercial kits (Megazyme) for mannitol and glucose
  - Kjeldahl for protein analysis
  - Dry weight (105 °C) and ash (550 °C)

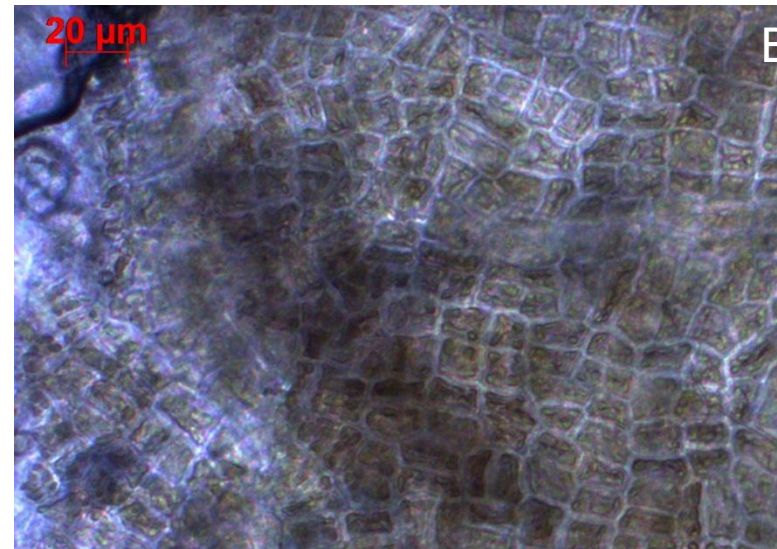
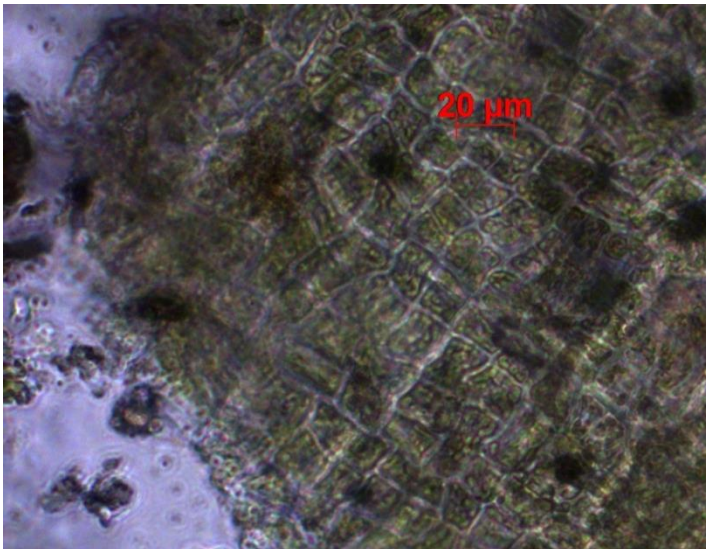


Species	Dry weight	Ash	Protein	Carbohydrates	Sulfate	Gap
	% of ww	% of dw	% of dw	% of dw	% of dw	Calculated
<b>S. Latissima</b>	84.5%	43.0%	13.3%	14.2%	3.8%	26%

Species	Glucose	Xylose	Galactose	Fucose	Rhamnose	Glycerol	Mannitol
	% of dw	% of dw	% of dw	% of dw	% of dw	% of dw	% of dw
<b>S. Latissima</b>	5%	0%	1%	2%	0%		7%

# Task 2.3: Enzymatic hydrolysis (3)

- Cut or ground Saccharina
- Multifect GC cellulase
- 48h, 55 °C, pH 4
- Analysis ongoing



# Conclusions and future work

- Data still under analysis
  - No apparent influence of milling
  - ~20% glucose release with only cellulase
- Upscaling task 2.3.1: Enzymes from Matis
- Combine enzymatic treatment with washing and pressing

# Acknowledgement



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