



HAL
open science

Recovery of soluble proteins from *Chlorella V.* by bead-milling and microfiltration

Shuli Liu, Imma Gifuni, Hugo Mear, M. Frappart, Estelle Couallier

► **To cite this version:**

Shuli Liu, Imma Gifuni, Hugo Mear, M. Frappart, Estelle Couallier. Recovery of soluble proteins from *Chlorella V.* by bead-milling and microfiltration. *Algaeurope 2020*, Dec 2020, Rome (online), Italy. hal-04212185

HAL Id: hal-04212185

<https://hal.science/hal-04212185>

Submitted on 20 Sep 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Recovery of soluble proteins from *Chlorella V.* by bead-milling and microfiltration

- ✔ Modification during the cell disruption
- ⚙ Concentration
 - different rheological behaviour
- ⚙ pH, maceration time & temperature, ionic strength modifications
 - Physicochemical conditions
- ? Effect on the whole process

Presenting Author: Liu Shuli

Co-Author: Gifuni Imma, Mear Hugo


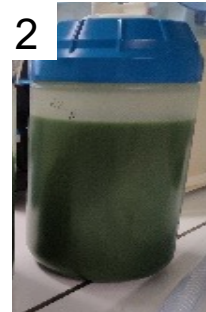

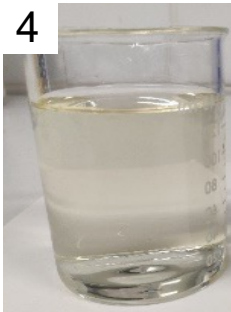

Frappart Matthieu, Couallier Estelle

1-3, December 2020

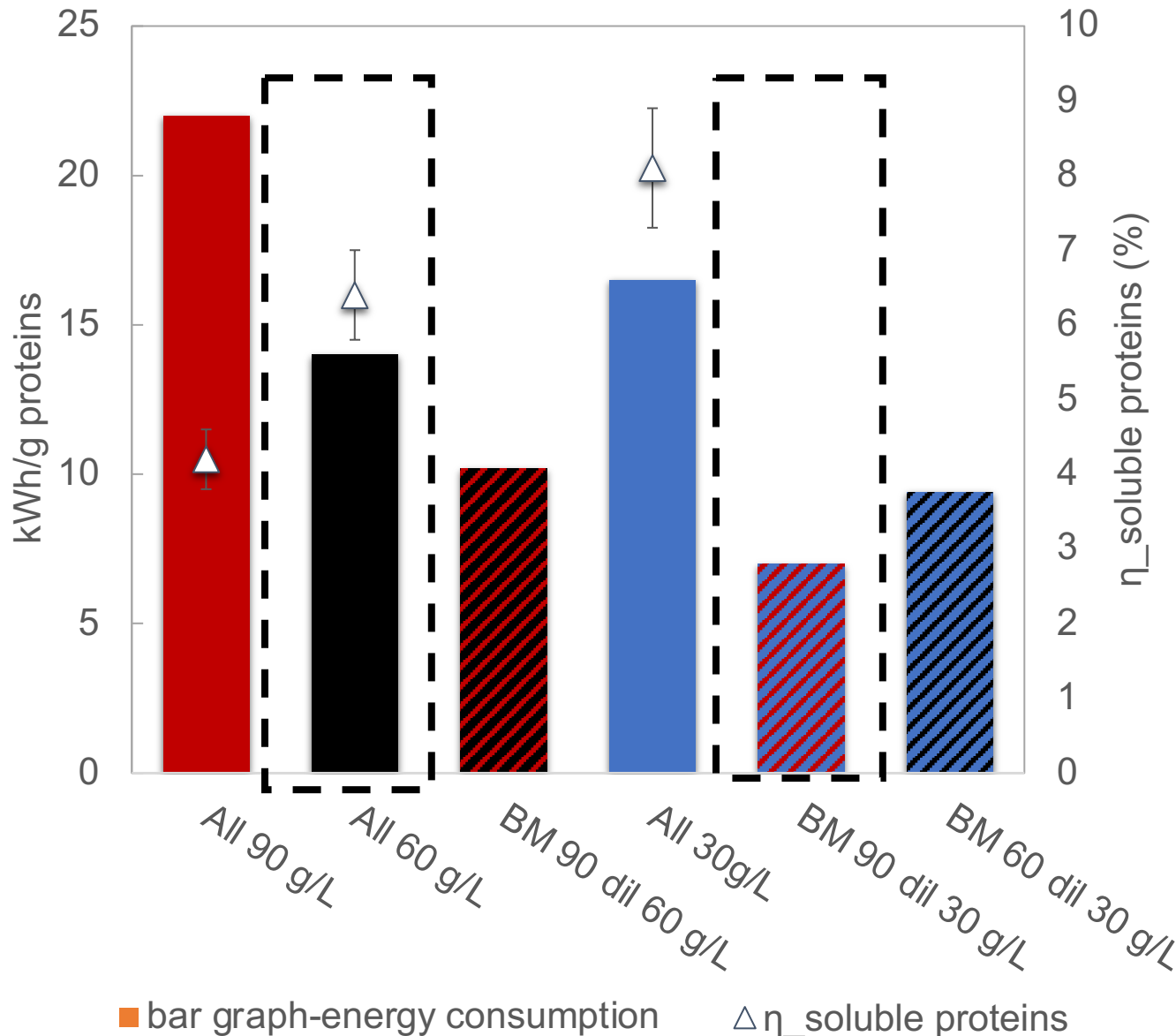
Process flow applied for the recovery of soluble proteins

! Ensure the integrity of the molecules

! Limit energy consumption

Process	Fraction i	Tested conditions	Real product
	0: Frozen paste ↓		0 
Bead milling	1: Diluted biomass ↓ 2: Lysate	Biomass dilution 30 - 60 - 90 g/L	2  3 
Centrifugation	↓ 3: Supernatant 3bis: Pellet	Lysate dilution, pH, maceration time & temperature, ionic strength modifications	
Microfiltration	↓ 4: Permeate 4bis: Retentate	Supernatant dilution	4  4bis 

Overall process balance and energy consumption



Best scenario:

- ✓ Dilution before process: 60 g/L
- ✓ Dilution between process:
90 g/L(milling) + 30 g/L(centrifugation, filtration)
- ✓ VRR=20 → 3.5 kWh/g
- A maceration at pH 7, 20 °C and NaCl 0.1M allowed soluble proteins recovery

The key point:

- decrease the soluble proteins retention rate during filtration.
- understand the organization of all compounds during the processes

- **Format:** e-Poster presentation files will be accepted in **MPEG-4 Video format only**. Macintosh presentations (i.e. Keynote) cannot be accommodated.
- Language: All e-Posters should be prepared in **English**
- **Versions:** Your presentation must be prepared in **MS PowerPoint**
- The size of your e-Poster presentation should **not exceed 250 MB**.
- Audio and movies: Make sure that all of your **audios and videos are embedded** into the power point file.
- Fonts: **Do not use special fonts**. Use easy-to-read fonts such as Arial and Times New Roman • Use a font size of 20 or bigger • Keep text to a minimum (6-8 lines per slide, no more than 30 words per slide)
- Presenter contact information should be included on the last slide, so that attendees may reach you should they have additional questions.
- **File name:** The name of the presentation file should include the presenter's name and the presentation number. To avoid any compatibility problems, please do not use special characters (e.g. «, Ö, Ø, ñ, ε, ®, ý, }, {, etc.) to name your presentation.
- **Do not use any passwords or encryption** for your presentation.
- Please note that **macros should not be used** and **flash-animations are not supported**.
- Aspect ratio of your presentation should be **16:9 landscape (Mandatory)**.
- Your presentation **cannot exceed more than 6 slides / 2 minutes**