

# THE WET PRESERVATION OF NANNOCHLOROPSIS GADITANA CONCENTRATES

Verspreet J., S. Kreps and L. Bastiaens

VITO, Conversion and Separation Technologies department, Boeretang 200, 2400 Mol, Belgium. [leen.bastiaens@vito.be](mailto:leen.bastiaens@vito.be)

## Introduction and aim

Wet preservation of algae allows to bridge the time period between algae harvest and processing while avoiding the costs and nutritional losses associated with algae drying. This study aimed to identify suitable storage conditions for the wet preservation of *Nannochloropsis gaditana* concentrates.

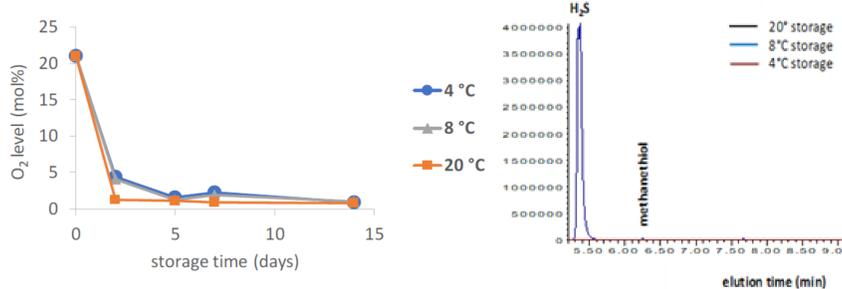
## Materials & methods

*Nannochloropsis gaditana* cultivated in brackish medium (1.2%w/v NaCl) was concentrated by membrane filtration until an organic matter content of 5-6%. *N. gaditana* concentrates were stored at different temperatures (4, 8 or 20°C) in closed or open (i.e. sealed with cotton plug) tubes. The effect of adding acetic acid (50 mM) was tested at 8°C.

## Results

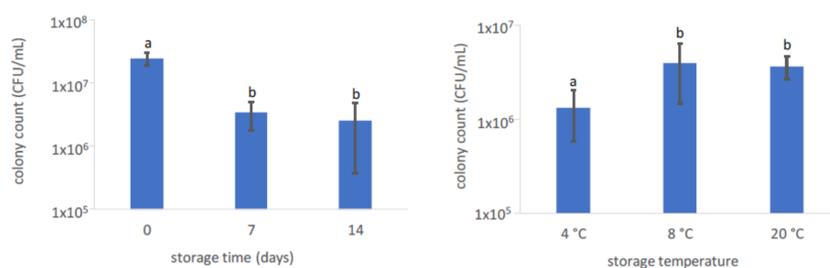
### Effect of temperature on odorous metabolites

Storage at 20°C in closed recipients led to rapid O<sub>2</sub> consumption, accumulation of malodorous short-chain fatty acids (acetic acid, propionic acid, butyric acid & branched short-chain fatty acids) above their odor thresholds, and the production of H<sub>2</sub>S and methanethiol. These odorous metabolites were not formed or to a much lower extent during 4°C and 8°C storage in closed recipients.



### Total microbial count

Overall, the aerobic microbial count decreased by approximately one log unit after 14 days of storage without acetic acid addition. This was probably related to the changing O<sub>2</sub> levels in the algae concentrate, since a clear O<sub>2</sub> decrease was observed in the headspace of closed tubes during algae storage. Storage at 4°C resulted in lower microbial counts than 8°C and 20°C storage.



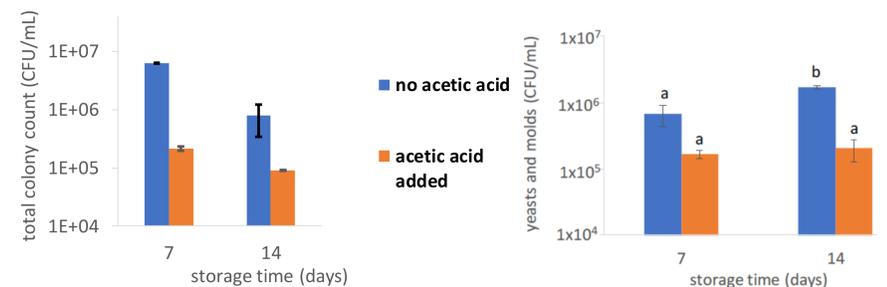
## Conclusions

- Cooling (to 4°C) reduced the formation of malodorous metabolites and reduced the microbial load.
- Acetic acid addition is a promising approach when *N. gaditana* concentrates are stored for a short period. Yet, acid dosage should be set based on storage time and the intended end application to avoid side effects such as lipid hydrolysis.

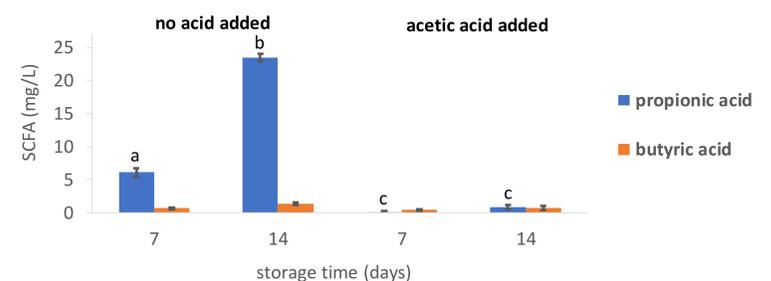


### Effect of acetic acid addition

As expected, the microbial count and the number of yeasts and molds were significantly reduced by acetic acid addition (50 mM).



Acetic acid addition also suppressed fermentation and almost completely prevented propionate and butyrate formation.



Unfortunately, acetic acid addition was found to induce lipid hydrolysis when concentrates were stored for more than one week. Acetic acid supplementation also had a negative effect on chlorophyll levels when algae concentrates were stored for longer than 7 days.

### Publication details

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