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In Vitro and *In Silico* Modulation of *Microcystis aeruginosa* and *Chlorella sorokiniana* Growth and Physiology by Volatile Extracts of the lichen *Pseudevernia furfuracea*

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INTRODUCTION & AIM

Harmful Cyanobacterial Blooms → Consequences:
- Oxygen Depletion
- Toxins Production
- Decreased Water Quality
- Health and Environmental impact

Control Strategies

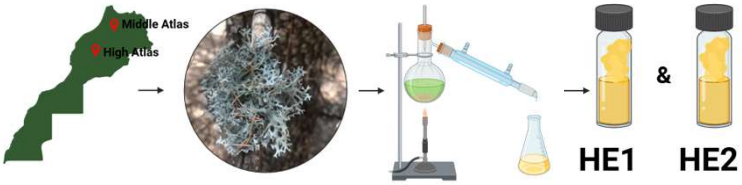
Traditional Chemical Algaecides (i.e Copper Sulfate) → Need → New Algicides

Traditional Chemical Algaecides (i.e Copper Sulfate):
- Low Selectivity
- Persistence
- Environmental Impacts

New Algicides:
- Selective
- Biodegradable
- Low cost

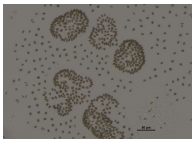
METHODOLOGY

- **Lichen Sampling and Extraction**

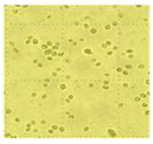


Pseudevernia furfuracea **(L.) Zopf.** — **Hydrodistillation**

- **Tested Strains**



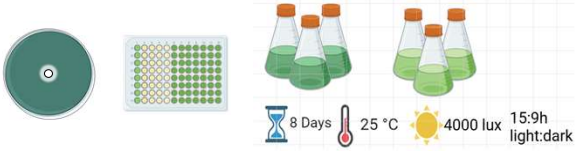
Microcystis aeruginosa
Harmful cyanobacteria
From Lalla Takerkoust
Lake Reservoir,
Morocco



Chlorella sorokiniana
Beneficial microalgae,
from an artificial pond

- ***In Vitro* Assays**

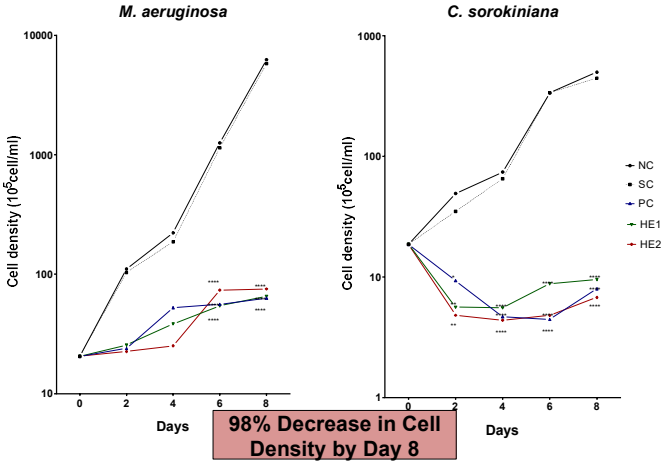
DDM **MIC** **Growth Monitoring (at MIC)**



- ***In Silico Study : Molecular Docking***

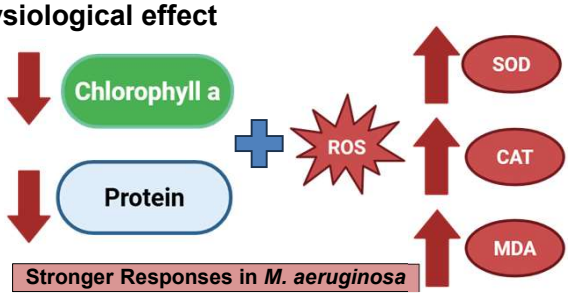
RESULTS & DISCUSSION

- **Effect on cell count**



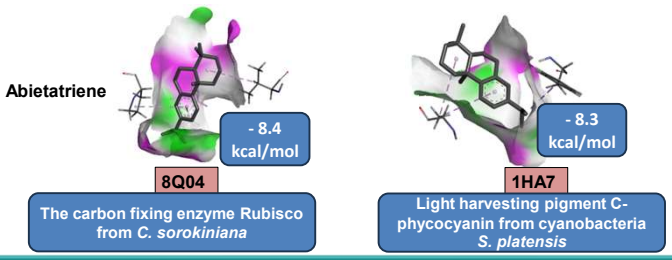
98% Decrease in Cell Density by Day 8

- **Physiological effect**



Stronger Responses in *M. aeruginosa*

- **Molecular Docking**



CONCLUSIONS

- *P. furfuracea* volatile extracts (HE1 and HE2) offer a high-bioavailability, low-toxicity biocide.
- HE1 is a promising candidate for sustainable, species-specific phytoplankton management.

FUTURE WORK / REFERENCES

- More detailed information is available by scanning the QR code or at the following link : https://www.mdpi.com/1422-0067/27/11/4790

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