



Università degli Studi di Napoli Federico II

PhD in Biotechnology - 37th cycle

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Microalgal Cultivation on Saline Growth Media for Value Metabolites Production

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Saline waters are the principal water resource on the planet. There are natural saline waters like lakes, seas and oceans, and saline water of anthropic origin, like brines¹. Microalgae are eukaryotic and prokaryotic cellular organisms, capable to perform oxygenic photosynthesis² and able to grow on wastewaters of different origin. Every algal strain has its optimal salinity growth range, with respect they are classified as low saline, marine, halotolerant and halophilic algae. Microalgae use two main mechanisms to adapt their cellular growth cycle to high salt concentration: Biosorption and Bioaccumulation³. The main object of this research project is to develop a biorefinery process on laboratory scale. The aim is to cultivate selected microalgae strains on ad hoc prepared saline culture media, for the production of metabolites of potential industrial interest and for desalination of salty waters. The principal work steps are:

- Selection of algal strain from ACUF (Algal Collection University Federico II);
- Preparation of ad hoc saline culture media;
- Massive algal cultivation and screening of value metabolites biosynthesized;
- Tuning of cultivation parameters to maximize salt removing and production of the selected metabolites.

References

1. Qadir, M., et al., 2019. *Sci. Total Envir.*, 657, 1343-1356.
2. Yousuf, A., 2020. *Microalgae Cultivation for Biofuel Production*, Elsevier.
3. Li, M., et al., 2021. *ACS Sustainable Chem. & Eng.*, 9, 8663–8678.