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020 Scale-up for the production of astaxanthin from *Haematococcus pluvialis* Flotow in vertical photobioreactors

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The biotechnological potential of *Haematococcus pluvialis* Flotow has been the subject of considerable interest due to its tremendous commercial importance.
For the past two years a research project has been carried out under and association between the University of the Azores and Algicel, a local biotechnological company. The project is an integrated approach of astaxanthin production from the microalgae *H. pluvialis* to determine its industrial feasibility using vertical photobioreactors subjected to the climate conditions of the Azores. Different culture media concentrations, photobioreactor diameters and production methods were tested. The major problem detected during the trials was contamination of the cultures hence cleaning and sterilizing procedures are extremely important for the success of the production.
Results on the biomass and astaxanthin content indicate that the adopted system has potential for a larger scale production under the local climate conditions.
Further work is now at its starting stage aimed at optimizing the production of biomass using different photobioreactor models. This new model is expected to occupy one hectare with an estimated production of six tons of dry biomass per year, and will be able to be duplicated in the future.

021 Characterization of the bacterial community associated with *Nannochloropsis* cultures: influence on growth and productivity

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Microalgae in mass cultures are associated with different species of bacteria in the so called "phycosphere". Algal exudates influence the presence and activity of the bacterial community and the associated bacteria influence in turn algal health and growth.
In the present work the bacterial community associated with *Nannochloropsis* sp. F&M-M24 was characterized and its influence on the productivity of cultures grown either autotrophycally or mixotrophycally was investigated.
The total bacterial community associated with indoor and outdoor cultures was characterized by the T-RFLP technique. Culturable bacteria isolated from laboratory cultures were clustered into operational taxonomic units by ARDRA analysis and representative strains were identified through 16S rDNA sequencing.
Most of the isolated bacteria belong to the Alphaproteobacteria and to the *Cytophaga-Flavobacterium* group, as already reported in the literature for this microalgal genus. The study shows that, in laboratory conditions, bacteria negatively influence *Nannochloropsis* sp. F&M-M24 growth, especially in the presence of glycerol, a compound that the alga is unable to use as carbon source. Autotrophic growth, both in the laboratory and outdoors, reduces the diversity of the associated microbial communities. Ongoing studies aim to further clarify the relationships between bacteria and *Nannochloropsis* in mass cultures and individuate the influence of each of the most representative associated bacterial strains.

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