Line 2 – Conservation and sustainability

Sustainable production of Biomolecules using microalgae

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Project description

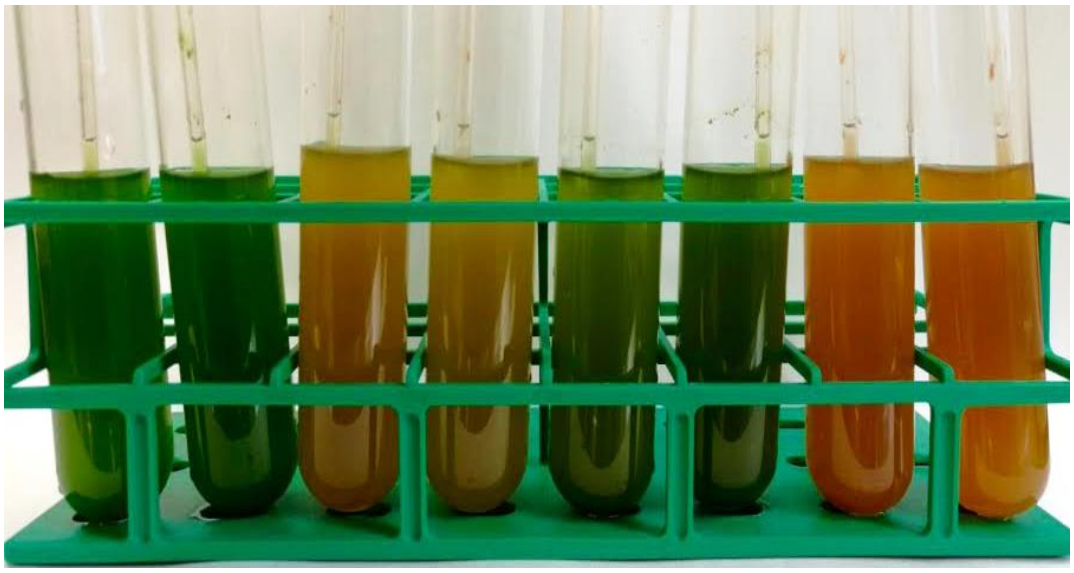
Global demand of biomass is continuously expanding and new sustainable technologies are needed to avoid overexploitation of natural resources, reduce environmental footprints and greenhouse-gas emissions. Algae represent a valuable alternative for the production of several bio-commodities going from biofuels to feed, food and chemicals. Thanks to their efficiency in carbon dioxide (CO_2) fixation, algae large scale cultivation can also contribute to the mitigation of anthropogenic greenhouse gas emissions.

Despite this potential algae large scale cultivation still present several limitations and only a few algae-based products are currently present on the market. Research at UniPD aims to screen new strains of microalgae and cyanobacteria for the production of valuable molecules, such as carotenoids, lipids and polysaccharides and optimize cultivation parameters for maximal productivity.

Investigation of molecular mechanisms of algae metabolic regulation are also investigated using multiple high throughput approaches. This information is instrumental to develop new, improved, strains

- figures –

Oil bodies in *Nannochloropsis gaditana*. This saltwater alga has the ability to accumulate large amount of lipids that can be exploited for the production of biofuels. Oil deposits in the cells are recognizable from the yellow fluorescence. From Corteggiani et al., Mol Plant 2014



Cultures of a carotenoid-producing alga. Cultivation in different light intensity and nutrient supply conditions can induce the enhanced synthesis of carotenoids, causing the red-orange pigmentation. Carotenoids produced by microalgae have a high commercial value thanks to their antioxidant properties.