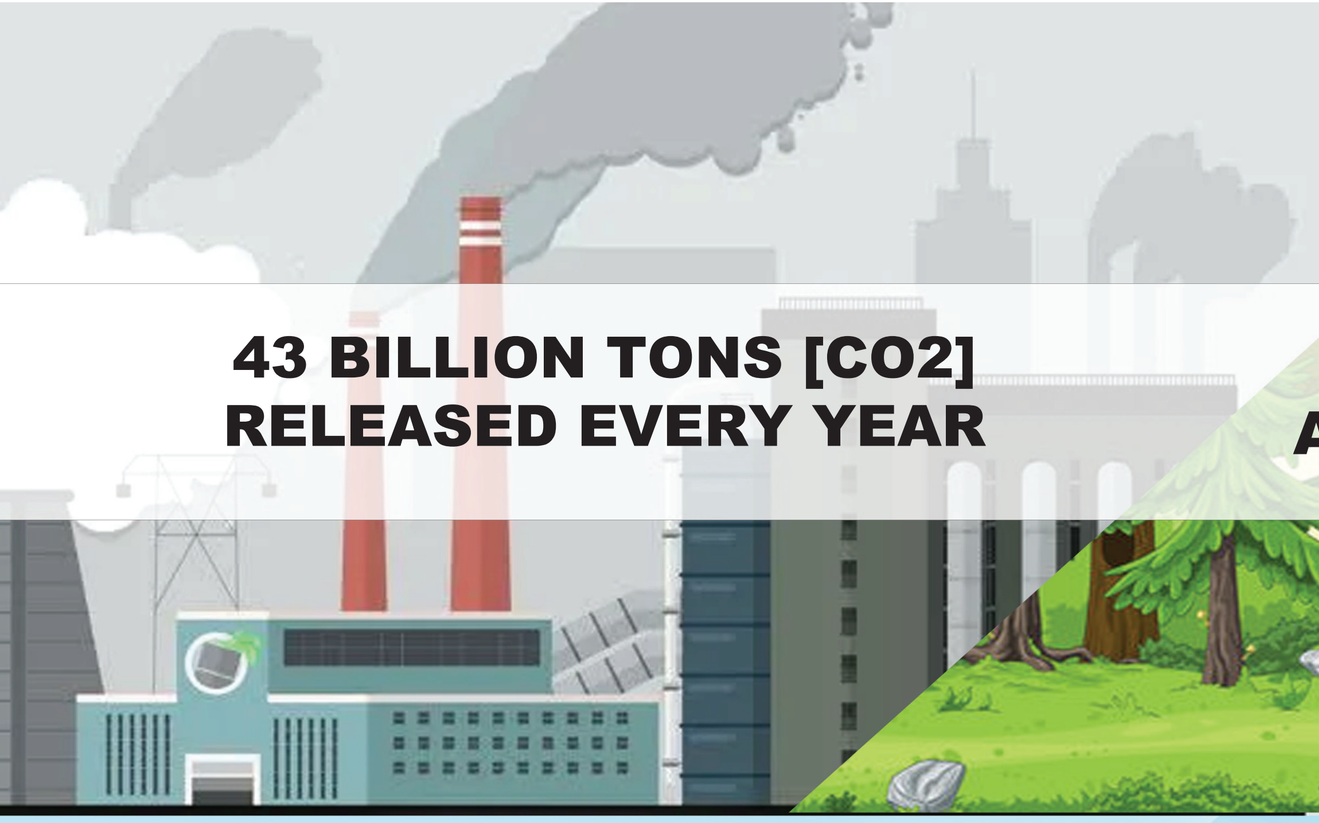
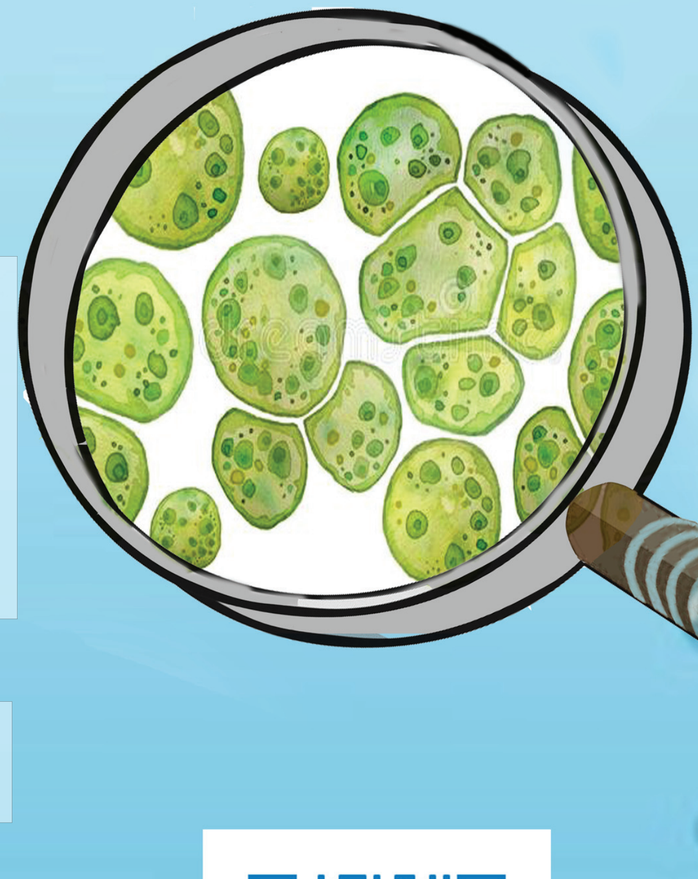


**43 BILLION TONS [CO2]
RELEASED EVERY YEAR**

**10 - 50 TIMES LESS EFFECTIVE
AT CO2 FIXATION THAN MICROALGAE**

A MICRO SOLUTION TO A BIG PROBLEM

Every year billion tons of is released to the atmosphere, making CO2 the biggest contributor to global warming. As a result attention has been raised towards sequencing CO2 from the atmosphere, where microalgae has been named the most effective CO2 reutilisation technique. Compared to terrestiale plants, microalgae are more effective. They have higher photosynthetic efficiency, faster regeneration time, can grow in less space and are independent of climatic changes.



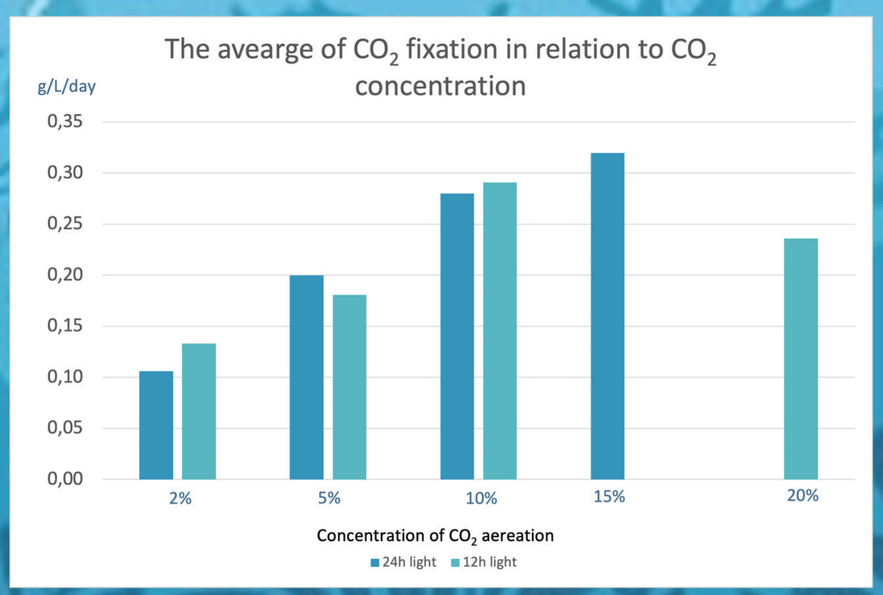
AIM

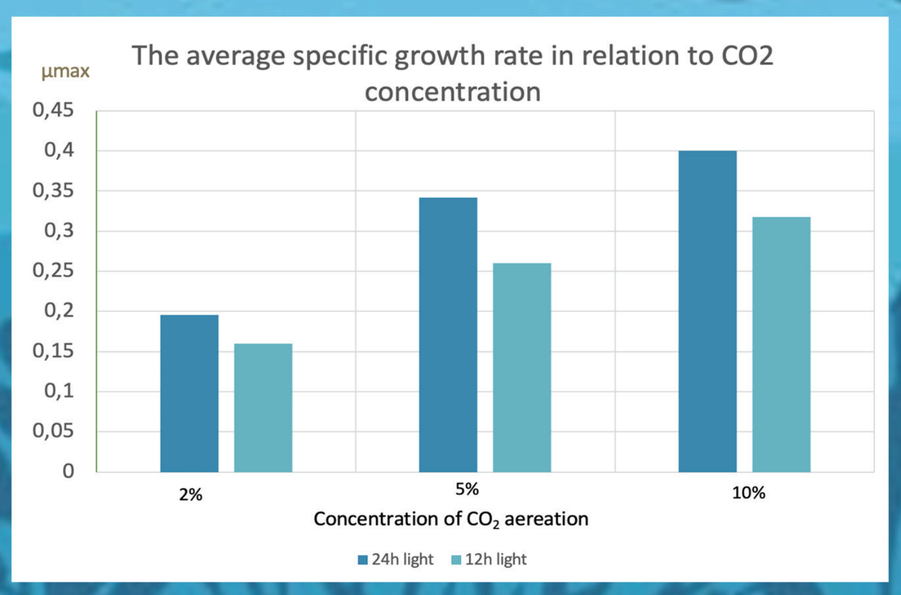
How does different CO2 concentrations and light regimes affect the growth- and CO2 fixation rate in microalgae, Chlorella vulgaris?

METHOD

Data was gathered from 5 scientific articles, investigating the optimal CO2 concentrations for growth and CO2 fixation in microalgae. All articles used photobioreactors, a bioreactor that utilizes a light source to cultivate phototrophic microorganisms. In addition, two different light regimes were used, 24h- and 12h light.

SCAN ME





RESULTS

The highest specific growth rate was reached with an aeration of 10% CO2.

OPTIMUN

12 hour light	24 hour light
10% areation	15% areation

The result showed that the CO2 fixation rate in microalgae increased with increasing CO2 concentrations until it reached its optimal rate at an inclusion of 10% and 15% CO2. When higher concentrations of CO2, like 20% is added, the water becomes more acidic leading to a lower pH. Low pH inhibits the effect on the carbon fixation enzyme and thereby lowering both the fixation- and growth rate.

Furthermore, there were no major changes in CO2-fixation rate when comparing 12-h light to 24h-light at different CO2 concentrations. However, as light is the energy source for photosynthesis, the specific growth was higher when exposed to 24h-light compared to 12h.

Potential microalgae biomass products