

Investigating the Effects of Carbon Dioxide and Temperature on *Nannochloropsis oceanica* Using a Hemocytometer Counting Method

Yao, Tsai-Yu (School: Kang Chiao International School - Hsinchu Campus)

Chiang, Wei-Wei (School: Kang Chiao International School - Hsinchu Campus)

Climate changes that include ocean acidification and global warming are serious problems in the ecosystem, affecting marine phytoplankton, including *Nannochloropsis oceanica*. In the effort to further explore the impact of rising temperature and carbon dioxide (CO₂) concentrations on oceanic ecosystems, the phytoplankton *Nannochloropsis oceanica* was used as a model organism. This study explored the effect of temperature change and CO₂ concentration on the growth of *Nannochloropsis oceanica*, achieving 243 samples that were tested with three different temperatures (24 degrees Celsius (°C), 28°C, 32°C) and CO₂ flow rates (0 milliliter (ml)/min, 0.4 ml/min, 0.6 ml/min), utilizing a hemocytometer counting method. Results indicate that the CO₂ concentration has a significant effect on the population of *Nannochloropsis oceanica*. But compared to the CO₂, temperature didn't affect a lot. The *Nannochloropsis oceanica* in the lowest temperature and highest concentration of CO₂ in its environment had the highest population growth, and in the highest temperature and lowest concentration of CO₂, it had the lowest population growth. Results show the serious negative effect of climate change on the ecosystem and the importance of environmental protection. Population blooms due to excess CO₂ taking up ocean resources causing dangerous ecological imbalances.

Awards Won:

