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 (CO_2) concentrations on oceanic ecosystems, the phytoplankton Nannochloropsis oceanica was used as a model organism. This study explored the effect of temperature change and CO_2 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 CO_2 flow rates (0 milliliter (ml)/min, 0.4 ml/min, 0.6 ml/min), utilizing a hemocytometer counting method. Results indicate that the CO_2 concentration has a significant effect on the population of Nannochloropsis oceanica. But compared to the CO_2, temperature didn't affect a lot. The Nannochloropsis oceanica in the lowest temperature and highest concentration of CO_2 in its environment had the highest population growth, and in the highest temperature and lowest concentration of CO_2, 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 CO_2 taking up ocean resources causing dangerous ecological imbalances.

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