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Effects of Temperature on Growth and Biochemical Composition of Arctic *Pseudanabaena* sp. and Tropical *Synechococcus* sp.

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ABSTRACT

This study examines the effect of temperature on the growth and biochemical composition of two cyanobacteria: *Pseudanabaena* sp. from the Arctic region and *Synechococcus* sp. from a tropical region. Cyanobacterial isolates were cultivated under three different temperatures: 4±2°C, 15±2°C and 25±2°C. The growth rate of *Pseudanabaena* sp. at 4±2°C, 15±2°C and 25±2°C was 1.61 day^{-1}, 1.62 day^{-1} and 1.53 day^{-1}, while the doubling time was 0.11, 0.18 and 0.08 days, respectively. The growth rate of *Synechococcus* sp. was slightly lower. At 4±2°C, 15±2°C and 25±2°C, the growth rate was recorded at 0.65 day^{-1}, 0.94 day^{-1} and 1.06 day^{-1}, while the doubling time was 0.003, 0.07 and 0.25 days, respectively. Total carbohydrate for *Pseudanabaena* sp. at 4±2°C, 15±2°C and 25±2°C was 207.16±10.03 mg/L, 329.57±189.65 mg/L and 63.32±41.02 mg/L, respectively. At the same temperature, the total carbohydrate for *Synechococcus* sp. was 269.44±81.29 mg/L, 321.15±73.31 mg/L and 1556.84±243.38 mg/L, respectively. It illustrates higher total carbohydrate in *Synechococcus* sp. compared to *Pseudanabaena* sp. At 4±2°C, 15±2°C and 25±2°C, total protein for *Pseudanabaena* sp. was recorded as 5.59±0.09 mg/L, 5.23±0.21 mg/L, and 4.34±0.47 mg/L. Meanwhile, for *Synechococcus* sp., total protein recorded at temperatures 4±2°C, 15±2°C and 25±2°C was 0.47±0.01 mg/L, 0.45±0.01 mg/L and 0.39±0.05 mg/L, respectively. This study shows that the growth rate and biochemical composition of Arctic *Pseudanabaena* sp. and tropical *Synechococcus* sp. were influenced by different temperature levels.

Keywords: Arctic, cyanobacteria, growth, tropical, temperature

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