

Growth, Biomass and Lipid Productivities of A Newly Isolated Marine Diatom *Skeletonema* sp. Under Different N:P Ratio

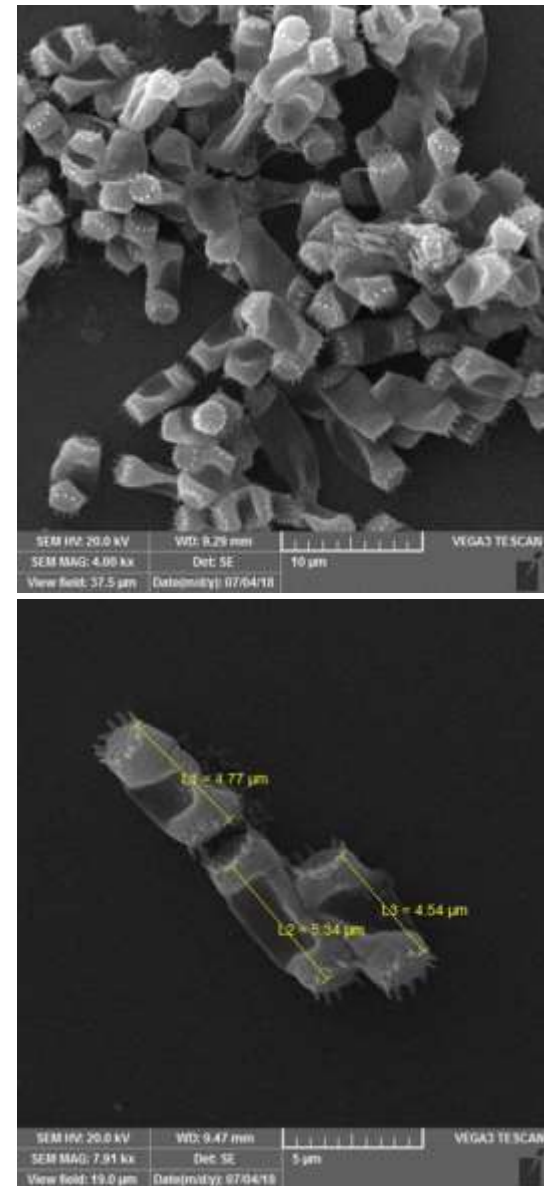


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Introduction

- The *Skeletonema* sp. is a newly isolated diatom from a coastal area in Kendari
- Diatoms are well known as lipid producers - Potential as biodiesel feedstocks
- The need to determine its growth characteristics and lipid productivity under different growing conditions to optimize the growth and productivities (biomass and lipids)
- Nutrients affect growth and biochemical composition of microalgae
- Aim : to determine the growth, biomass and lipid productivity of marine microalga *Skeletonema* sp. Under different N and P ratio



Scanning Electron Microscopy Images of the *Skeletonema* sp IND-UHO 029 at 4000x Magnification (top) and 8000x Magnification (bottom)

Materials and Methods

Culture conditions

- Different N and P Ratio (1N:1P, 2N:1P, 3N:1P, 1N:2P)
- light intensity 100 $\mu\text{mol}\cdot\text{photon}\cdot\text{s}^{-1}$
- Using f/2 medium
- Ambient room temperature
- 12 h light and 12 h dark cycle
- Batch mode for 2 weeks

Analytical methods

- Cell counting using Neubauer Haemocytometer
- SGR
- Biomass Yield
- Biomass Productivity
- Lipid Yield
- Lipid Content
- Lipid Productivity

Statistical analysis

- One Way ANOVA
- Using Sigmaplot 14 Package

Results and Discussion

Growth

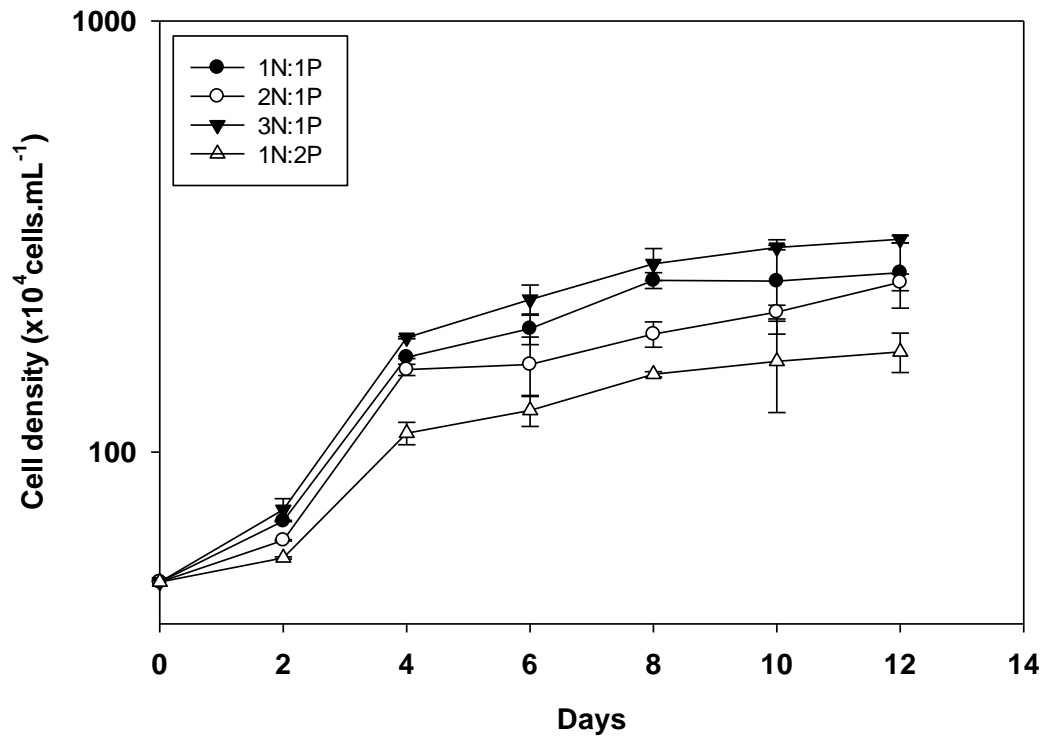


Figure 1. Growth Curve of *Skeletonema* sp. Under Different N and P Ratio. Error Bar represents mean \pm SD (n=3)

Specific Growth Rate

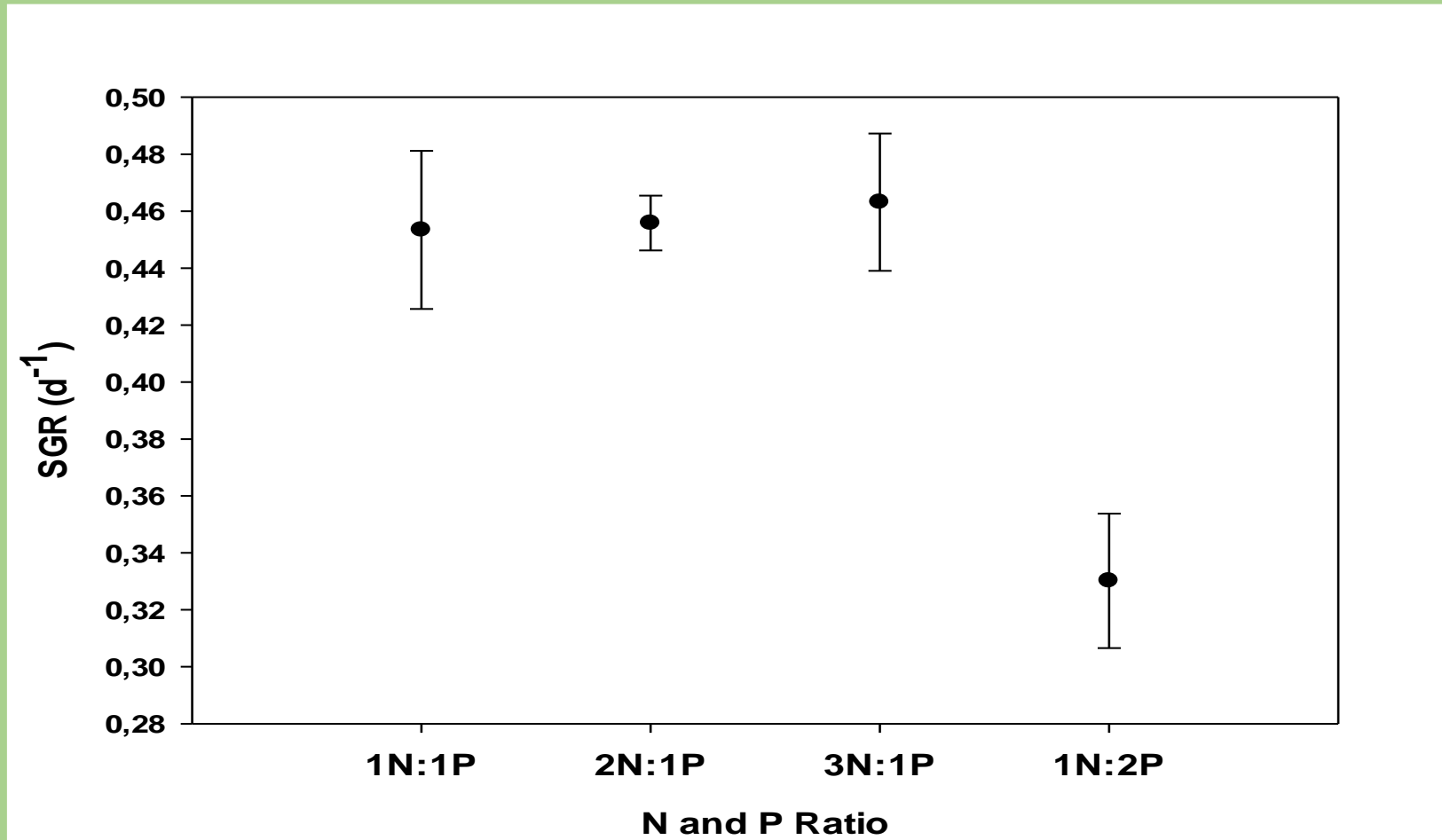


Figure 2. Specific Growth Rate (d^{-1}) of *Skeletonema* sp. Under Different N and P Ratio. Error Bar represents mean \pm SD (n=3)

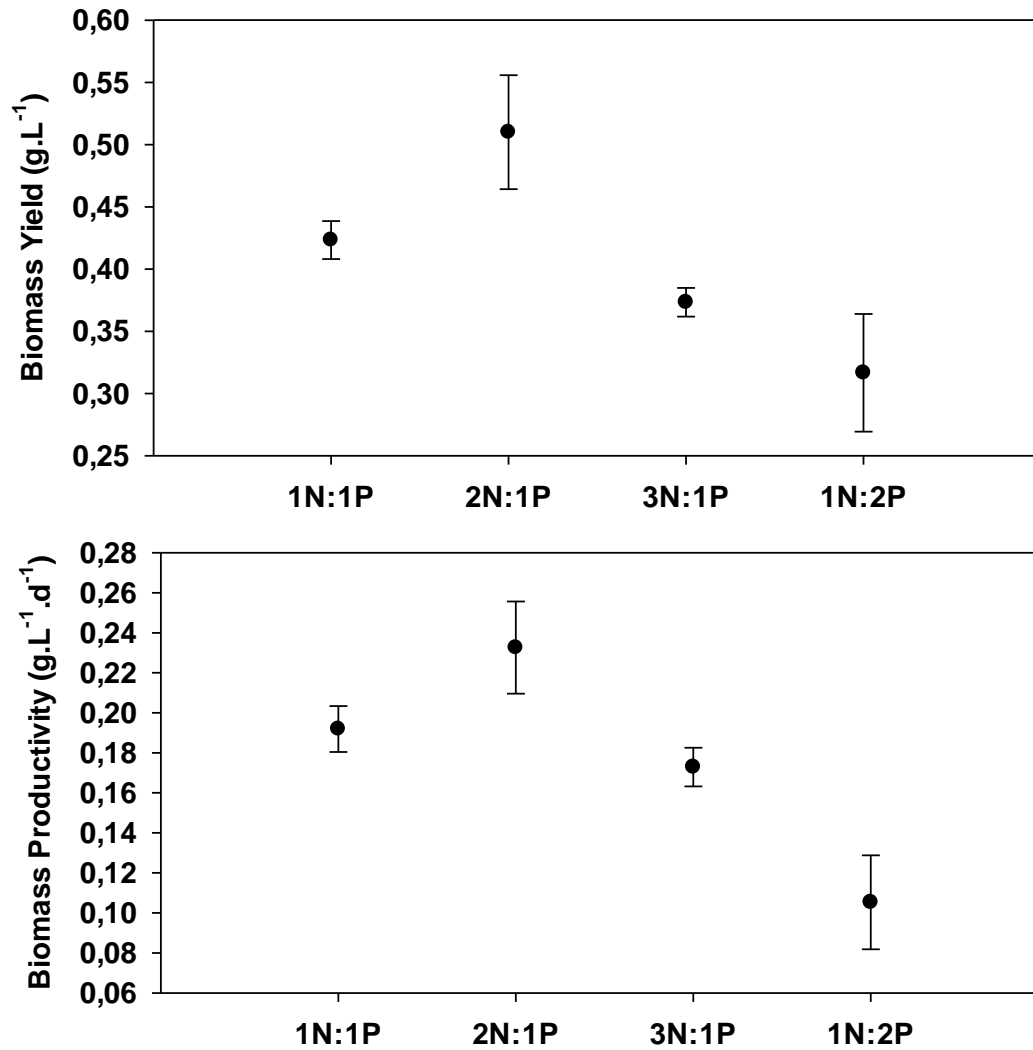


Figure 3. Biomass Yield (g.L⁻¹) and Biomass Productivity (g.L⁻¹.d⁻¹) of *Skeletonema* sp. Under Different N and P Ratio. Error Bar represents mean±SD (n=3)

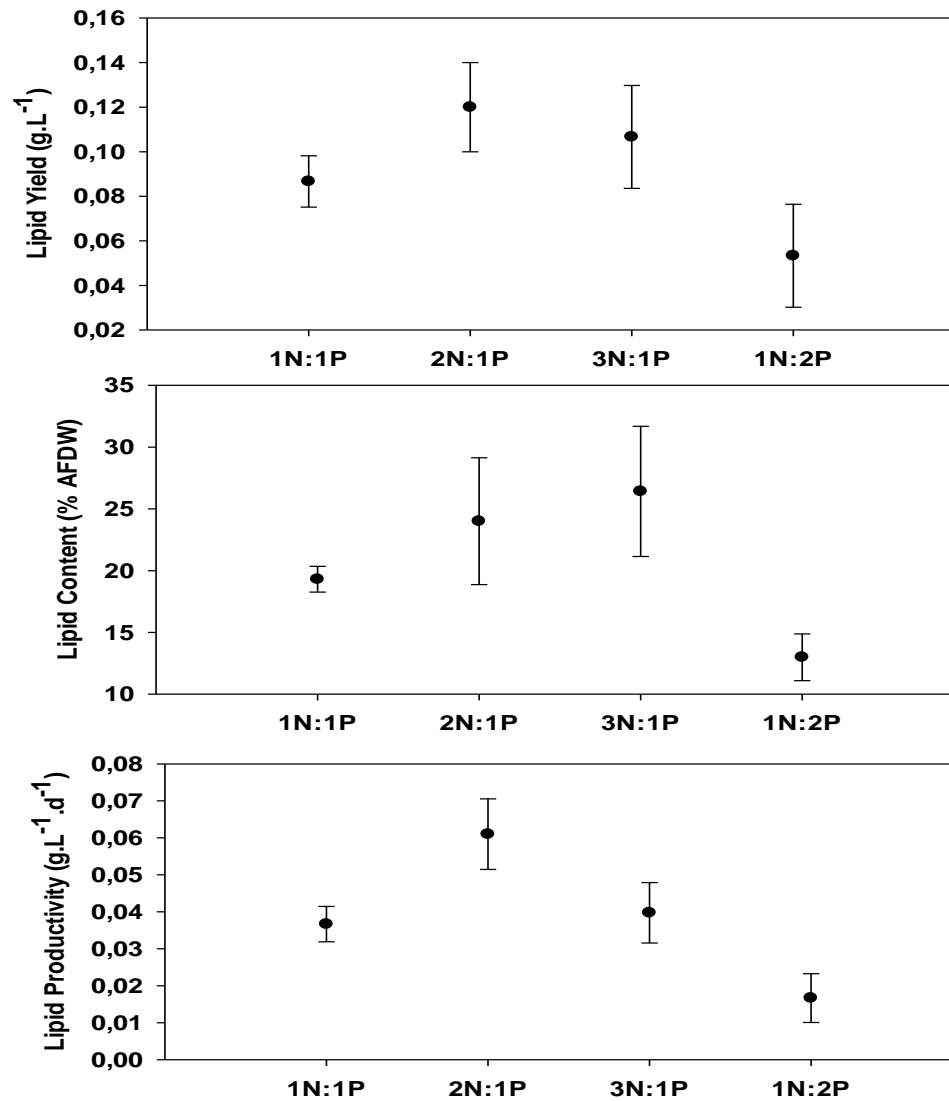
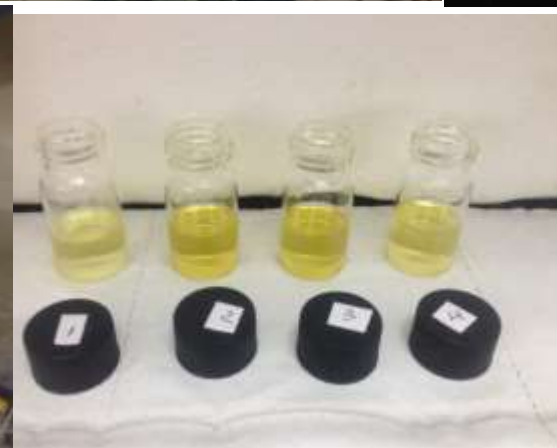


Figure 4. Lipid Yield (g.L⁻¹), Lipid Content (% AFDW) and Lipid Productivity (g.L⁻¹.d⁻¹) of *Skeletonema* sp. Under Different N and P Ratio. Error Bar represents mean±SD (n=3)

Conclusion

- The highest growth rate achieved at the highest N concentration (3N:1P)
- The highest biomass and lipid productivities achieved at 2N:1P ratio



Thank You