

Pengaruh Intensitas Cahaya Yang Berbeda Terhadap Pertumbuhan, Produktivitas Biomassa dan Lipid Mikroalga Laut *Skeletonema* sp.

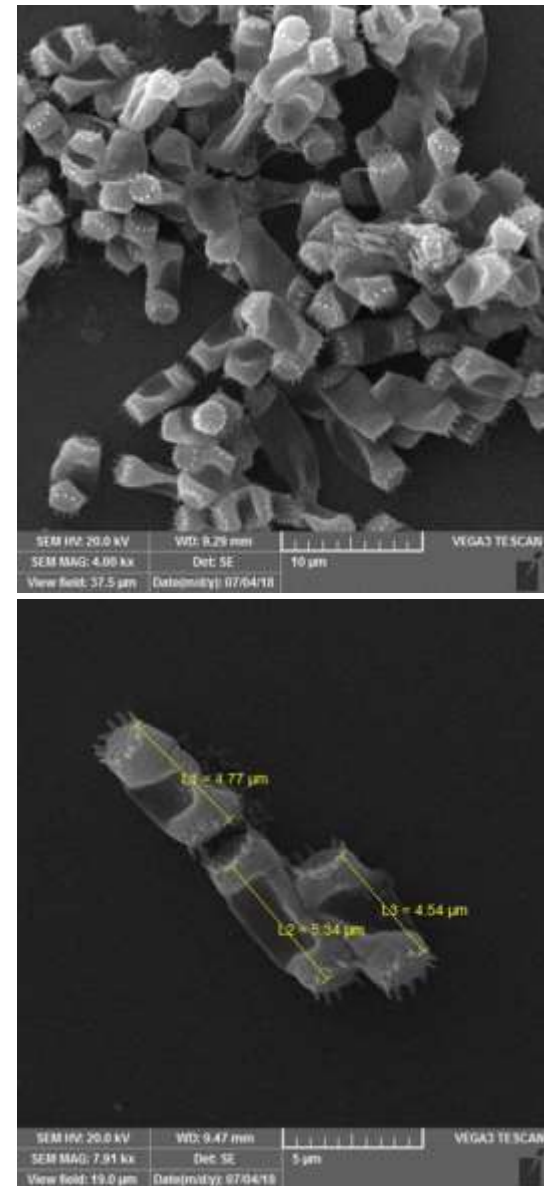


Oleh
Indrayani, Haslianti, Asmariani
Fakultas Perikanan dan Ilmu Kelautan-UHO

**Dipresentasikan pada Simposium Nasional IV Kelautan dan Perikanan
Fakultas Ilmu Kelautan dan Perikanan
Universitas Hasanuddin
21 Juni 2019
Hotel Claro, Makassar**

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)
- Light affects growth and biochemical composition of microalgae
- Aim : to determine the effect of different light intensities on the growth, biomass and lipid productivity of marine microalga *Skeletonema* sp.



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

Materials and Methods

Culture conditions

- Three different light intensities (20, 60 and 110 $\mu\text{mol}\cdot\text{photon}\cdot\text{s}^{-1}$)
- 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 Neaubar 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

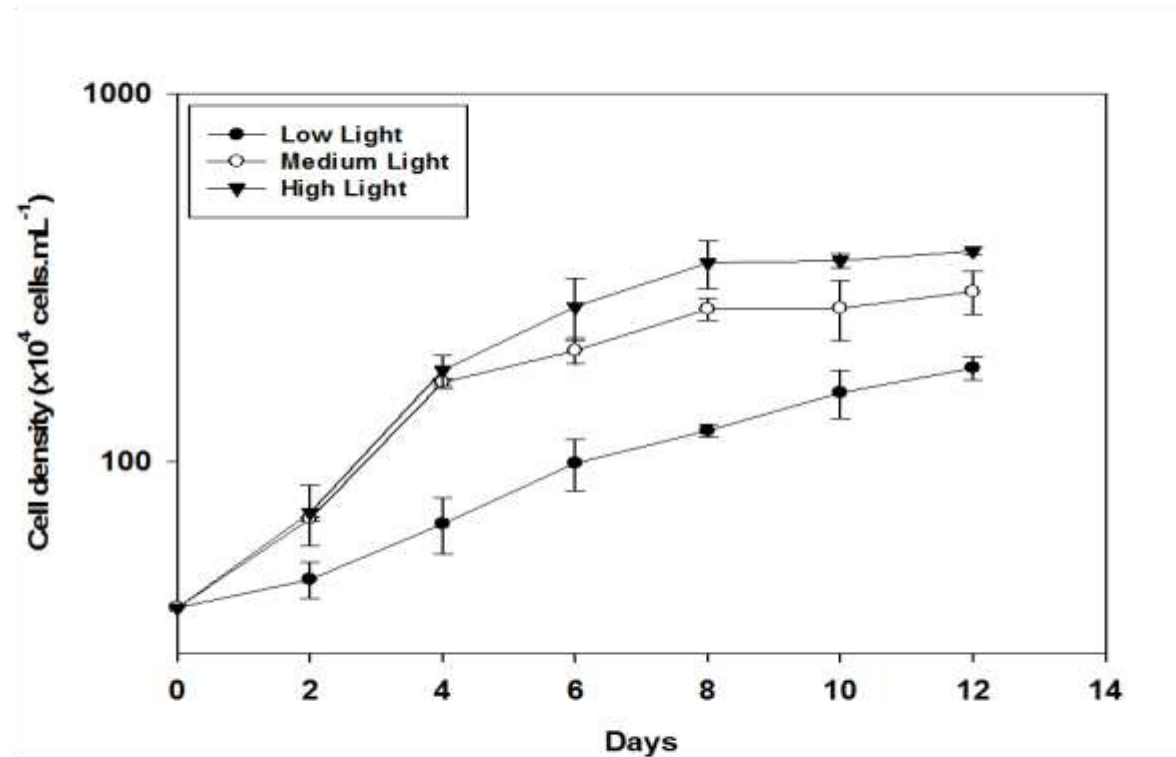


Figure 1. Growth Curve of *Skeletonema* sp. Under Different Light Intensity ; Low light ($20 \mu\text{mol photon m}^{-2} \text{s}^{-1}$), Medium Light ($60 \mu\text{mol photon m}^{-2} \text{s}^{-1}$) and High Light ($110 \mu\text{mol photon m}^{-2} \text{s}^{-1}$). Error Bar represents mean \pm SD (n=3)

Specific Growth Rate

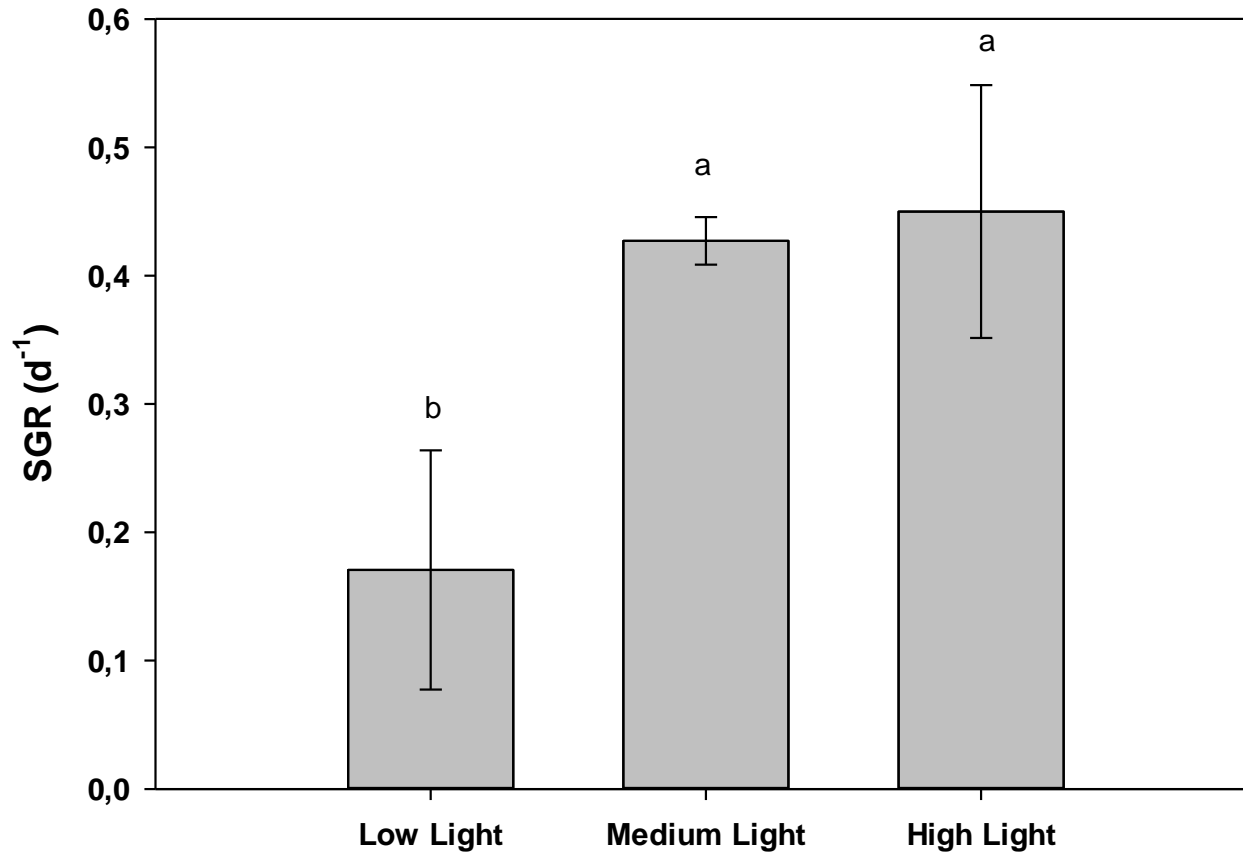


Figure 2. Specific Growth Rate (d⁻¹) of *Skeletonema* sp. Under Different Light Intensity ; Low light (20 $\mu\text{mol photon m}^{-2} \text{s}^{-1}$), Medium Light (60 $\mu\text{mol photon m}^{-2} \text{s}^{-1}$) and High Light (110 $\mu\text{mol photon m}^{-2} \text{s}^{-1}$). Error Bar represents mean \pm SD (n=3)

Biomass Yield and Biomass Productivity

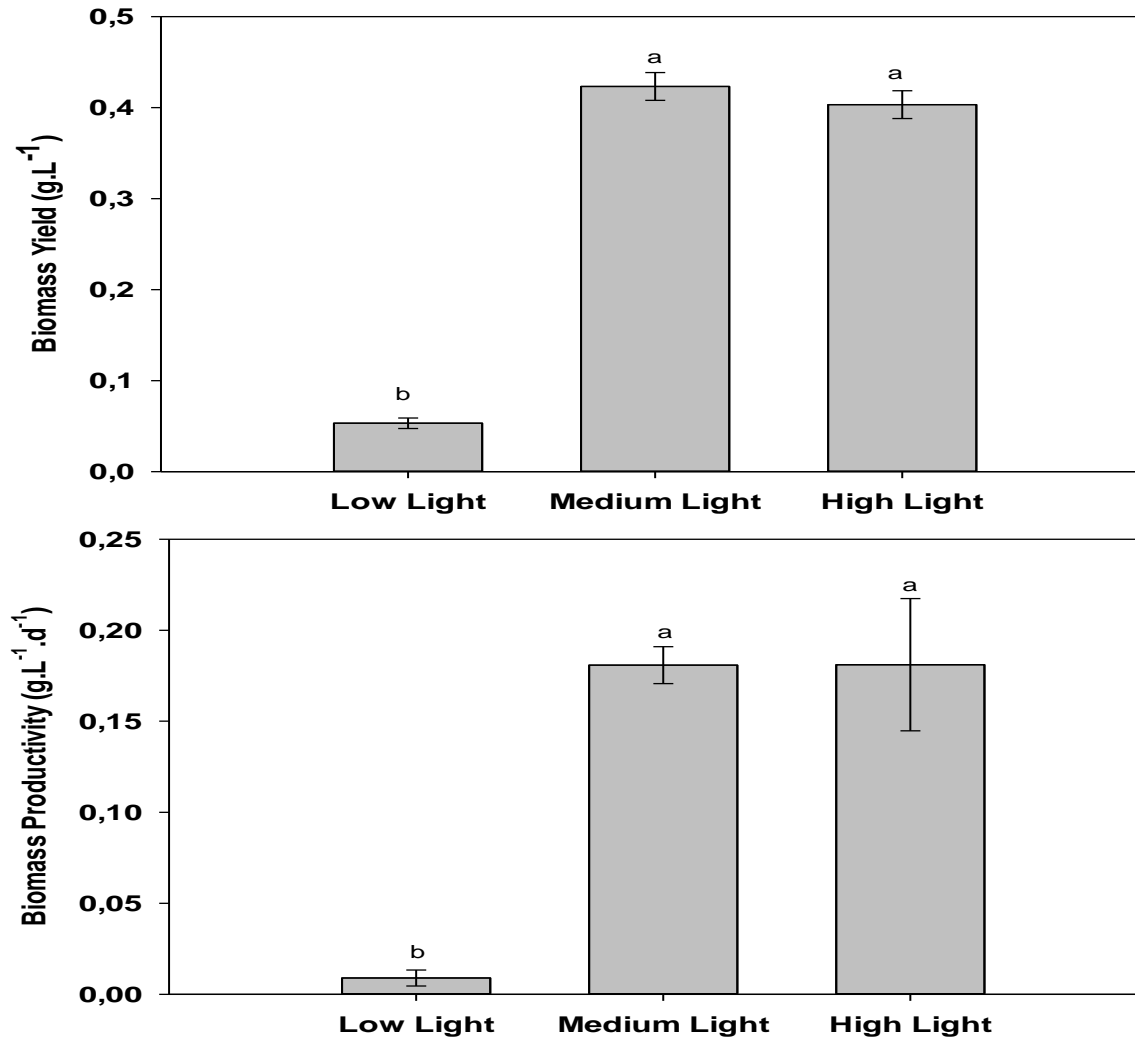


Figure 3. Biomass Yield (g.L⁻¹) and Biomass Productivity (g.L⁻¹.d⁻¹) of *Skeletonema* sp. Under Different Light Intensity ; Low ight (20 $\mu\text{mol photon m}^{-2} \text{s}^{-1}$), Medium Light (60 $\mu\text{mol photon m}^{-2} \text{s}^{-1}$) and High Light (110 $\mu\text{mol photon m}^{-2} \text{s}^{-1}$). Error Bar represents mean \pm SD (n=3)

Lipid

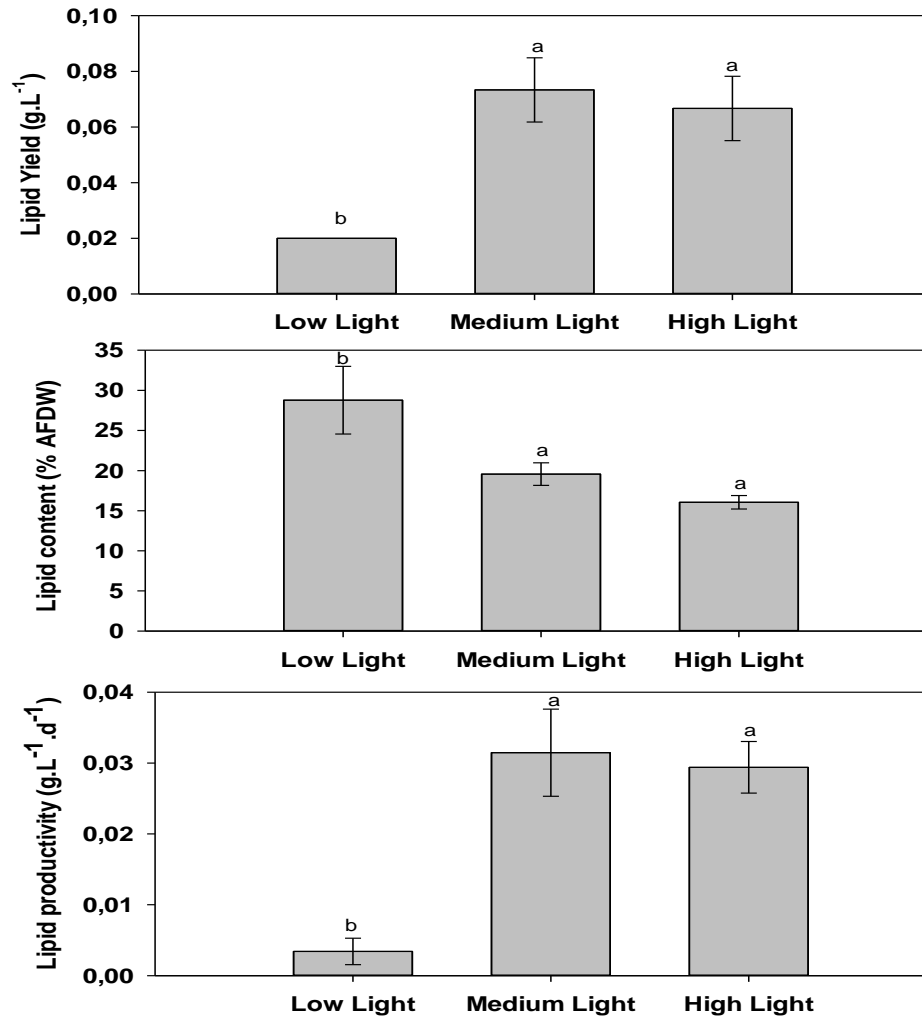
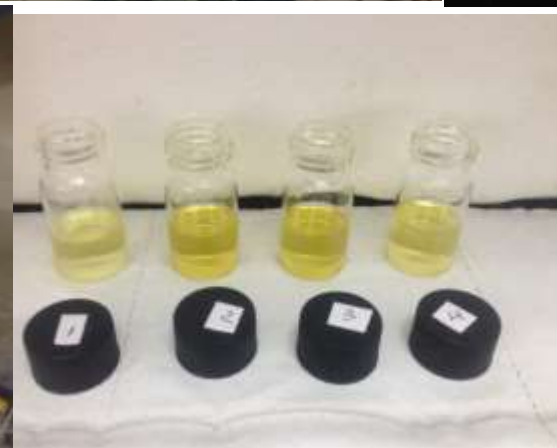


Figure 4. Lipid Yield (g.L⁻¹), Lipid Content (% AFDW) and Lipid Productivity (g.L⁻¹.d⁻¹) of *Skeletonema* sp. Under Different Light Intensity ; Low ight (20 $\mu\text{mol photon m}^{-2} \text{s}^{-1}$), Medium Light (60 $\mu\text{mol photon m}^{-2} \text{s}^{-1}$) and High Light (110 $\mu\text{mol photon m}^{-2} \text{s}^{-1}$). Error Bar represents mean \pm SD (n=3)

Conclusion

- The highest growth rate and biomass productivity achieved at the highest light intensity
- The highest lipid productivity achieved at the medium light intensity



Thank You