

**Hubungan Konsentrasi Amonium, Nitrat, dan Fosfat  
dengan Pertumbuhan Fitoplankton di Tambak Intensif  
Udang Vaname (*Litopennaeus Vannamei*, Boone 1931)  
di Kalurahan Karangsewu, Kabupaten Kulonprogo**

**INTISARI**

Penelitian ini bertujuan untuk mengetahui hubungan amonium, nitrat, dan fosfat terhadap pertumbuhan fitoplankton pada masa budidaya setelah *blind feeding* di tambak intensif udang vaname (*Litopennaeus vannamei*) di Pesisir Kalurahan Karangsewu, Kapanewon Galur, Kabupaten Kulonprogo. Pengamatan dilakukan pada 4 tambak yaitu P1 dan P2 (masing-masing dengan luas  $\pm 960 \text{ m}^2$ ) serta P4 dan P5 (masing-masing dengan luas  $\pm 450 \text{ m}^2$ ). Pengamatan dilakukan dari bulan Desember 2022 sampai Januari 2023, dengan waktu pengambilan data/sampel setiap 7 hari. Hasil penelitian dibahas secara deskriptif dan dianalisis dengan analisis regresi linear berganda. Hasil penelitian menunjukkan kadar amonium berkisar antara 0,23 – 4,04 mg/l dengan rata-rata sebesar 1,5 mg/l. Kadar nitrat berkisar antara 1,13 – 30,22 mg/l dengan rata-rata 13,11 mg/l. Kadar fosfat berkisar antara 0,19 – 1,38 mg/l dengan rata-rata 0,64 mg/l. Densitas fitoplankton antara 67 – 1.891 sel/ml dengan rata-rata 667 sel/ml. Diversitas fitoplankton berkisar antara 0,37 – 1,94 dengan rata-rata 1,25. Hubungan kandungan amonium ( $X_1$ ), nitrat ( $X_2$ ), dan fosfat ( $X_3$ ) terhadap densitas ( $Y_1$ ) dan diversitas ( $Y_2$ ) fitoplankton ditunjukkan oleh persamaan  $Y_1 = 213,987 + 336,817.X_1 + 1,806.X_2 - 119,254.X_3$  ( $R^2$ : 0,396) dan  $Y_2 = 1,197 + 0,221.X_1 + 0,001.X_2 - 0,452.X_3$  ( $R^2$ : 0,184).

Kata kunci: amonium, fitoplankton, fosfat, nitrat, udang

**The Relation of Ammonium, Nitrate, and Phosphate Concentration  
with Phytoplankton's Growth  
in Intensive Whiteleg Shrimp (*Litopennaeus vannamei*, Boone 1931) Ponds  
on Karangsewu Village, Kulonprogo Regency**

**ABSTRACT**

This study aims to determine the relationship of ammonium, nitrate, and phosphate to phytoplankton growth during the post-blind feeding period in intensive ponds of vaname shrimp (*Litopennaeus vannamei*) on the coast of Karangsewu Village, Galur District, Kulonprogo Regency. Observations were made on 4 ponds, namely P1 and P2 (each with an area of  $\pm 960$  m<sup>2</sup>), P4 and P5 (each with an area of  $\pm 450$  m<sup>2</sup>). Observations were conducted from December 2022 to January 2023 with sample collection every 7 days. The results of research was discussed descriptively and analyzed by multiple linear regression analysis. Ammonium levels ranging from 0,23 – 4,04 mg/l with average of 1,5 mg/l. Nitrate levels ranging from 1,13 – 30,22 mg/l with average of 13,11 mg/l. Phosphate levels ranging from 0,19 – 1,38 mg/l with average of 0,64 mg/l. The density of phytoplankton ranging from 67 – 1,891 cells/ml with average of 667,5 cells/ml. Phytoplankton diversity ranging from 0,37 – 1,94 with average of 1,25. The relationship between ammonium ( $X_1$ ), nitrate ( $X_2$ ), and phosphate ( $X_3$ ) to phytoplankton density ( $Y_1$ ) and diversity ( $Y_2$ ) is shown by the equations  $Y_1 = 213,987 + 336,817.X_1 + 1,806.X_2 - 119,254.X_3$  ( $R^2$ : 0,396) and  $Y_2 = 1,197 + 0,221.X_1 + 0,001.X_2 - 0,452.X_3$  ( $R^2$ : 0,184).

Keyword: ammonium, phosphate, phytoplankton, nitrate, shrimp