MODEL DINAMIKA UDANG WINDU DAN MIKROALGA

INTISARI

Dinamika populasi erat kaitannya dengan pertumbuhan populasi, kesetimbangan populasi dan kestabilan. Titik kesetimbangan dalam model kompetisi dua populasi mewakili beberapa kondisi yaitu kondisi saat udang windu dan mikroalga populasi punah, kondisi saat hanya udang windu saja yang hidup, kondisi saat mikroalga saja yang hidup dan kondisi saat udang windu dan mikroalga hidup bersama. Titik kesetimbangan dalam dinamika populasi digunakan pada proses linearisasi sistem persamaan diferensial nonlinear untuk mendapatkan informasi kestabilan dari suatu sistem. Model dinamika udang windu dan mikroalga dianalisis untuk mendapatkan solusi berupa persamaan pertumbuhan populasi terhadap waktu. Nilai parameter yang digunakan yaitu $\mu_u = 16, \mu_a = 4, K_u = 8, K_a = 16, \rho = 0{,}02, \alpha = 0{,}5, m = 4, h = 0{,}2, r = 0{,}1$ dan rentang waktu $t = 0$ sampai 2 tahun. Simulasi model matematika menunjukkan bahwa udang windu dapat tetap hidup di alam meskipun jumlah populasi mikroalga tidak stabil. .

Kata Kunci: *Dinamika Populasi,Udang Windu, Mikroalga*

DYNAMIC MODEL OF TIGER SHRIMP AND MICROALGAES

ABSTRACT

Population dynamics is closely related to population growth, population equilibrium and stability. The equilibrium point in the two-population competition model represents several conditions, namely the condition when the tiger shrimp and Microalgae populations are extinct, the condition when only the tiger shrimp live, the condition when only the microalgae live and the condition when the tiger shrimp and microalgae live together. The equilibrium point in population dynamics is used in the linearization process of a nonlinear differential equation system to obtain stability information from a system. The dynamic model of tiger shrimp and microalgae was analyzed to obtain a solution in the form of an equation of population growth over time. The parameter values used are $\mu_u = 16, \mu_a = 4, K_u = 8, K_a = 16, \rho = 0{,}02, \alpha = 0{,}5, m = 4, h = 0{,}2, r = 0{,}1$ and the time span $t = 0$ to 2 years. The mathematical model simulation shows that tiger prawns can still live in nature even though the number of microalgae populations is unstable.

Keywords: *Population Dynamics, Windu Shrimp, Microalgae*