URN etd-0407109-183713-1100
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Statistics This thesis had been viewed 39 times. Download 9 times.
Department
Year 2003
Semester 1
Degree Master
Type of Document Master's Thesis
Language zh-TW.Big5 Chinese
Title An Analysis of the Steady States and Dynamics of the Prey-Predator Interaction in a Chemostat

Date of Defense 0000-00-00
Page Count 196

Keyword
Chemostat
Stable Steady State
Limit Cycle

Abstract
The study of steady state behavior and dynamics of biochemical reaction system is a very important topic in the research field of biochemical engineering. A study was conducted to analyze the steady state and dynamics of the prey-predator interaction in a chemostat. The specific growth rates of Substrate Inhibition model and Monod model were used for the prey and predator respectively. The dynamic equations were derived by assuming that the reaction was occurring in a perfectly mixed flow reactor (chemostat). It was assumed that the prey (such as the bacterium) was only fed with the substrate(such as the glucose) and the predator(such as the ciliate)was only fed with the prey and no other substance exchanged between the system and environment. There were three types of steady states for this system and the three types of steady states and stability were analyzed in detail. The dynamic equations of this system were solved by the numerical method and the dynamical analysis was performed by computer graphs. The graphs of predator, prey and substrate versus reaction time and three-dimensional graphs were plotted for dynamical analysis. The results showed that the dynamical behavior of this system consisted of stable steady states and limit cycles.
Advisory Committee Lin Hao - advisor

Files etd-0407109-183713-1100-001.pdf

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Date of Submission 2004-08-11