



Numerical Study of Biological Problems in a Predator- Prey System

By Chakraborty, Aspriha

Condition: New. Publisher/Verlag: VDM Verlag Dr. Müller | Mathematical biology | The logistic Lotka-Volterra predator-prey equations with diffusion based on Luckinbill's experiment with *Didinium nasutum* as predator and *Paramecium aurelia* as prey, have been solved numerically along with a third equation to include prey-taxis in the system. The effect of prey-taxis on the dynamics of the population has been examined using three initial conditions, four response functions and three data sets. The stability of the points of equilibria have been established for each model using Routh-Hurwitz conditions and the variational matrix criteria. This has further been verified through numerical simulations. The effect of bifurcation value of the prey-taxis coefficient on the numerical solution has been examined in each case. It has been observed that as the value of the prey-taxis coefficient becomes considerably higher than the bifurcation value, chaotic dynamics develop. As diffusion in predator velocity is incorporated in the system, it returns to a cyclic pattern. A brief study of coexistence of low population densities both with and without prey-taxis has also been done. | Format: Paperback | Language/Sprache: english | 229 gr | 164 pp.



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