DYNAMICS OF THREE COMPETING SPECIES SYSTEM

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE
(APPLIED MATHEMATICS)

IN THE
FACULTY OF GRADUATE STUDIES

OF
MAHIDOL UNIVERSITY

1986
ABSTRACT

The May-Leonard equations which describe the mutual competition between three species, is investigated. Hopf's bifurcation theory is used to establish that for $\alpha + \beta < 2$, $\alpha$ and $\beta$ being normalized parameters which describe how the ith species affects the jth species and how the same jth species affects the ith species, respectively the critical point is a stable point, for $\alpha + \beta = 2$, limit cycle behavior occurs and for $\alpha + \beta > 2$, quasi limit cycle behavior occurs for $\alpha + \beta$ just slightly larger than two. Numerical solution of the May-Leonard equations are obtained using the Gear's method.

These numerical solutions confirm the behaviors predicted for the three cases.