Thesis Title	Analysis of a Mathematical Model of a Food Chain by the Singular Perturbation Method
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Date of Graduation	1 July B.E. 2537 (1994)

ABSTRACT

The behavior of a three-species food chain, in which two predators compete for the same prey while one of the predators feeds on the other, is analyzed in this thesis. Prey is logistic, while predators have the Holling type functional responses. The time responses of the trophic levels are assumed to increase from bottom to top. Using a singular perturbation approach, the structure of the corresponding attractors and the nature of the transients are analyzed. It is shown that the model system can exhibit low-frequency cycles with bursts of high-frequency oscillations developing when the two predators are fairly efficient. Explicit conditions are derived which separate the various dynamic structures and identify, in particular, the limit cycles composed of alternate slow and fast transitions. Computer simulations are then presented to support the theoretical predictions.