1086-VG-858    **Joon Hyuk Kang\*** (`kang@andrews.edu`), Department of Mathematics, Andrews University, Berrien Springs, MI 49104. *Existence and Uniqueness of steady state solution for a general population model.*

Multiple species of animals are competing in the same environment. Under what conditions do they coexist peacefully? Under what conditions do they coexist in a unique pattern? Or under what conditions does either one of the species species become extinct, that is, is either one of the species excluded by the other? It is natural to say that they can coexist peacefully if their rates of reproduction and self-limitation are relatively larger than those of competition rates. In other words, they can survive if they interact strongly among themselves and weakly with others. We investigate this phenomena in mathematical point of view.

There are a lot of results regarding the questions I raised up in the simple Lotka-Volterra population model with linear groth rates. We develope their results to more generalized model.

The techniques used are elliptic theory, upper-lower solutions, maximum principles and spectrum estimates. The arguments also rely on some detailed properties for the solution of logistic equations. (Received September 14, 2012)