1069-92-241   **James A Vance*** (`jav6e@uvawise.edu`), One College Avenue, Wise, VA 24266, and **Derek Fields**. *Sensitivity Analysis of the Three-Species Linear Response Omnivory Model.*

We investigate a three-species omnivory model with linear functional and numerical responses consisting of a coupled system of nonlinear differential equations. As estimates from natural systems, the model parameters are subject to natural intrinsic variability and measurement error. We use sensitivity analysis to determine how infinitesimal changes in parameters, corresponding to variability and error, affect the population densities. Our analysis allows us to determine which parameters must be estimated with as much accuracy as possible to ensure reasonable population density estimates. We apply theorems on continuous dependence and differentiability with respect to parameters to our model to derive sensitivity equations. Solving the sensitivity equations using an adaptive step numerical integration method and the use of a weighted norm allow for a comparison of sensitivities. We show that small changes in the predator mortality rate cause the greatest change in the model solution. Thus, biologists should take extra care in the field to accurately collect data to determine the predator mortality rate. Also, we determine the least sensitive parameter to be the biological carrying capacity of the basal resource. (Received January 24, 2011)

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