1106-92-2256 **Gunog Seo*** (gseo@colgate.edu), Department of Mathematics, Colgate University, 13 Oak Dr, Hamilton, NY 13346, and **Gail S.K. Wolkowicz** (wolkowic@mcmaster.ca). *Sensitivity of the dynamics of the general Rosenzweig-MacArthur model to the mathematical form of the functional response: a bifurcation theory approach.*

The equations in the Rosenzweig-MacArthur (RM) predator-prey model have been shown to be sensitive to the mathematical form used to model the predator response function even if the forms used have the same basic shape: zero at zero, monotone increasing, concave down, and saturating. Here, to explain this sensitivity, we revisit the RM model with three functional responses, Holling type II, Ivlev, and Trigonometric response functions, that are phenomenologically similar. We consider both the local and global dynamics and determine the possible bifurcations with respect to variation of the carrying capacity of the prey, a measure of the enrichment of the environment. We give an analytic expression that determines the criticality of the Andronov-Hopf bifurcation, and prove that although all three forms can give rise to supercritical Andronov-Hopf bifurcations, only the trigonometric form can also give rise to subcritical Andronov-Hopf bifurcation and has a saddle node bifurcation of periodic orbits giving rise to two coexisitng limit cycles, providing a counterexample to a conjecture of Kooij and Zegeling. (Received September 16, 2014)