Gause, Luckinbill, Veilleux and What to Do: Distinguishing between the Prey-Dependent and Ratio-Dependent Limit Myths

Christopher X J. Jensen [1] and Lev R. Ginzburg[2] .

Both prey dependent and ratio dependent functional responses are limit myths: neither depicts the objective reality of predation. However, because these opposing conceptions of predation output very different qualitative and quantitative predictions, it is vital to distinguish which limit myth best accounts for the observed properties of predator-prey systems. While experimental work analyzing the functional response of various predator-prey systems has been used to compare the two limit myths, these results have failed to produce significant scientific consensus. For this reason, we seek answers in qualitative outcomes. In particular, we look at the question of predator-prey coexistence. We suggest that the simple, qualitative results of various historically-significant studies point in the direction of new and valuable empirical work. We propose several new lines of inquiry that we expect to illuminate the relative value of the two limit myths. The proposed studies distinguish the deterministic outcomes of dual extinction and coexistence in terms of: 1. changes in scale; 2. changes in the fundamental parameters of interaction; 3. initial conditions; and 4. geographic variations in the fundamental parameters of interaction.

[1]Department of Ecology and Evolution Stony Brook University (e-mail: cjjensen@life.bio.sunysb.edu).

[2]Department of Ecology and Evolution Stony Brook University (e-mail:).