

1056-BA-1678      **Jim M. Cushing\*** ([cushing@math.arizona.edu](mailto:cushing@math.arizona.edu)). *Evolution of Competitive Co-existence.*

A long-held dogma of ecology is competitive exclusion, the assumption that only one species can survive in a specific ecological niche. A classic series of experiments with flour beetles in the 1960's confirmed this belief in every case but one. It was difficult to ignore an experiment in which two species of beetles coexisted in a container of flour for 30 generations. This apparent anomaly can be explained by taking into account small, evolutionary changes in one of the beetles. Population dynamics models of competition are inadequate to explain these changes but modifications introduced using evolutionary game theory (EGT) yield a model that is in agreement with experimental data. EGT provides a methodology for extending a population dynamic model so as to account for the evolution of phenotypic traits (with heritable components) subject to natural selection. An EGT version of a classic competition model will be used to investigate how evolution can change the outcome of the interaction. Specifically, we will use this approach to explain how a two-species system can evolve from competitive exclusion to coexistence, and also how it can evolve from exclusion of one species to exclusion of the other. (Received September 22, 2009)