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I will briefly describe two exceptional occurrences of evolutionary adaptation observed in laboratory experiments involving two competing species of insects (flour beetles of the genus *Tribolium*). The adaptive changes in these experiments resulted in two types of reversals in the expected outcome of the competitive interaction: (1) from competitive exclusion (i.e., one species goes extinct) to competitive coexistence and (2) from the exclusion of one species to the survival of that species and the exclusion of the other species. To investigate these possibilities theoretically, we consider an evolutionary game theoretic (EGT) extension of the classic Leslie-Gower (discrete Lotka-Volterra) competition model. We show that this standard competition model can predict scenario (1) only if a "boxer effect" is present (i.e., maximal competitive intensity does not occur when the species are identical), but even then the evolutionary trait (strategy) is not an evolutionary stable strategy (ESS). We also show that scenario (2) can occur in the model, but only if one of the species (and not both) undergoes evolutionary adaptation. (Received September 10, 2008)