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A Discrete-time Predator-Prey Model with Selection and Mutation

We study a discrete-time predator-prey system with selection and mutation in the prey population where individuals are distributed over a finite number of phenotypic traits. For the pure selection case, we establish conditions for competitive exclusion between individuals with different traits in the prey population and we show that the system converges to a boundary equilibrium representing the predator and the fittest prey trait. For the full selection mutation model, we explore the coexistence and persistence. Finally, we offer some examples of numerical simulation.