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Long term exposure to a toxicant may result in evolutionary responses in a population to develop resistance for this toxicant. These responses may impact other species with which the evolving species interacts. In this talk, we present a discrete-time model describing the interaction of predator and prey populations. We then extend this model to an evolutionary model which couples the population dynamics with the dynamics of an evolving phenotypic trait that represents the mean toxicant resistance attained by the prey population. We provide results concerning the long term dynamics of this model including persistence, stability of boundary and interior equilibria and existence of cycles. We show that the evolution to develop toxicant resistance in the prey may allow both the predator and prey to persist when, without the evolution, both may go extinct. (Received September 10, 2019)