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Azmy S. Ackleh, Md Istiaq Hossain, Amy Veprauskas* (amy.veprauskas@louisiana.edu)
and **Aijun Zhang**. *Evolution in a discrete-time predator-prey model*.

Interactions between species may change over time due to various reasons, including small evolutionary changes called microevolution. In this talk, we construct a discrete-time predator-prey model in which the prey is assumed to evolve in response to an environmental stressor. We model this evolution using a Darwinian dynamics approach which describes changes in a mean phenotypic trait. Here we assume this trait measures prey resistance to the environmental stressor. We provide thorough analysis of this model to understand how prey evolution may impact predator-prey dynamics. In particular, we establish conditions for stability of equilibria and system persistence and explore the existence of cycles and chaotic attractors. All together, we find that, when evolution is slow, the evolutionary dynamics are nothing but a continuous perturbation of the non-evolutionary system. However, when the speed of evolution is increased, evolution may introduce rich dynamics that are not observed when evolution is absent. (Received March 03, 2020)