Measuring Genetic Diversity and Change in a Predator Prey Relationship

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Computer modeling allows for simulating unknown events of the past and the future. Since specific details about the evolutionary process are unknown, I created a model to analyze predator and prey behavior in respect to energy, speed, reproduction and vision. A Surface B2 was used and coding was performed in GM2 using GM Language. I created a three category model involving trees (representing energy), predators and prey. I analyzed the emerging natural patterns, genetic diversity, and genetic change of tree reproduction, prey's tree consumption as energy for speed, vision, and reproduction and predators consumption of prey as energy to mutate their own genes. The simulation indicates that the prey population, predator population, and tree population are directly correlated and relate to each other in cycles, Trees and prey population are inversely correlated. Predator vision genetics and Prey vision genetics were inversely correlated. Furthermore, prey speed was optimum in the middle two quartiles. Finally, Genetic diversity was lowest when prey population was high. My model shows a clear correlation in the population graphs of Tree, Prey, and Predator in cycles over time. Prey population is most closely related to trees as energy in an inverse correlation indicating that if there is a large number of prey the increased tree consumption results in a reduction of prey due to a resulting famine. Prey Vision Length and Precision were inverse to the Predator's, indicating that when Predators hunting ability improved, prey prioritized energy for reproduction over vision to regain a higher overall prey population