ECOLOGY AND THE ENVIRONMENT (BIOL 354) – Spring 2021

Predator-Prey Simulation Lab

Each question is worth **1 point.**

1. In the above figure, which line (dotted or dashed) represents the hare population. Explain.
2. In the lynx and hare example, are the lynx considered specialists or generalists? Explain.
3. Describe the population growth (or decline) patterns for Plant A and Herbivore A.
4. Do you expect this trend to continue? Explain.
5. Hypothesize: What do you predict will happen to the herbivore and plant populations after 100 days?
6. Was your hypothesis correct? Explain.
7. Describe the population trends for each species. Why do you think these trends occur?
8. Hypothesize: Predict what will happen to each population after 100 days.
9. Run the scenario for 100 days. Were your predictions correct? Explain.
10. Describe what happened to the population of plant A. Why do you think this pattern occurred?
11. What happened to the population of each plant species?
12. Inferring from this scenario ,which plant is the most competitive when an herbivore is present? Which one is the least competitive? Explain.
13. Hypothesize: Compared to the previous scenarios, do you expect the population size of the herbivores to be higher or lower in this scenario? What about the plant population? Explain.
14. Run the scenario for 100 days. Was your hypothesis correct? Explain.
15. Can you think of an environment where there may be a simple food chain like this? Why or why not?
16. Hypothesize: How do you expect the addition of the omnivore to change the outcomes of the scenario? Do you expect any species to go locally extinct? Explain.
17. Run the simulation for 100 days. Describe what happened to each species. Which species went extinct? Which species reached equilibrium?
18. Based on this scenario, what can you conclude about the competition and predation effects that omnivores can contribute to the food web?
19. After 4 days, describe the general trend of each species. Hypothesize: What species will be dominant at the end of 100 days? Explain.
20. Run the scenario for 100 days and describe what happened to each species. Was your hypothesis correct? Explain.
21. Based on this scenario, what can you infer about generalist versus specialist feeders? In the real world, why do you think specialists have not gone locally extinct?

22. Many humans are omnivores, how do you think human food consumption changes the food web?
23. Hypothesize: Choose two organisms and predict what will happen to their populations at the end of 100 days.
24. Run the simulation for 100 days. Was your hypothesis correct?
25. What would happen in this imaginary ecosystem if all the producers (plants) were to die out? Explain.
26. One group is missing from this simulation-- decomposers. What role do decomposers play in the energy transfer within ecosystems?
27. List the interactions you chose for your scenario.
28. Describe what happened to the populations of each species involved in your simulation. What were the population sizes at the end of 100 dyas? Did any species go extinct?
29. Come up with theories about why the patterns you observed existed. These theories may be about competition, diet selection, or any other process that may affect the interactions.
30. How can humans who may not directly live in this ecosystem still manage to alter the flow of energy within the web?