

Natural Selection Lab (“O’hau Nukupu’u Lab”)

SB5 b,d



On a distant island there exists four phenotypes of a bird called the O’hau Nukupu’u. The O’hau Nukupu’u are all similar except their beaks have variations. All O’hau Nukupu’u eat beans. Some O’hau Nukupu’u have a clothespin mouth, some have a tweezer mouth and some have a needle mouth. One year a rare phenotype was discovered, this was called the spoon-mouth O’hau Nukupu’u. The purpose of this lab is to simulate the conditions that can lead to genetic change over time in a population as a result of variation in survival and reproduction.

Procedure: You will run through several timed trials. Each trial you must eat at **least 20 beans** or you will not survive. Eat as many beans as possible and count them at the end of each trial. When a O’hau Nukupu’u dies it will return as the offspring of a surviving individual.

Copy down the following data table on your own paper:

Time Trial	# Tweezer Mouth	# Needle Mouth	# Clothespin Mouth	# Spoon Mouth
Round 1 (45 seconds)				
Round 2 (30 seconds)				
Round 3 (20 seconds)				
Round 4 (10 seconds)				
Round 5 (5 seconds)				

Record your number of beans and phenotype for each trial (ex., spoon; 42 beans):

45s _____ 30s _____ 20s _____ 10s _____ 5s _____

Post lab questions on your own sheet of paper:

1. Create a graph for your data. Label each axis and create a title for your graph. There are many ways to create this graph just make sure you clearly label everything.
2. Explain how the data show a change in the populations over time.
3. Sometimes animals that are introduced into an area that they never lived in before (invasive species) out-compete and endanger resident species, why do you think this happens?
4. If only one species is considered the "fittest", why do we still have so many variations among species? Why do some birds have very long pointy beaks, while other birds have short flat beaks?
5. How do you think diseases can affect natural selection?
6. What are some possible density-dependent factors that “time” could have simulated in this lab? Justify your answers.
7. In general, how does biodiversity impact the rate of evolution? Was there ever a time of punctuated equilibrium in this lab? Please support you answer with evidence from the data.