

Worksheet for Labs One and Two

Evolution: Natural Selection and Morphological Change in Green Algae

Questions from Manual (each answer is worth 1/3 pts., 12 points total)

1. a. How many alleles are present for this particular trait?
→2
b. How many of the total beads are colored and how many are white?
→200 black, 200 white
c. What color do the 40-60 individuals have?
→Black
d. How many beads represent the population?
→200 black + 200 white
2. a. Consider the Hardy-Weinberg equations. If the frequency of a recessive allele is 0.3, what is the frequency of the dominant allele?
→0.7
b. If the frequency of the homozygous dominant genotype is 0.49, what is the frequency of the dominant allele?
→0.7
c. If the frequency of the homozygous recessive genotype is 0.36, what is the frequency of the homozygous dominant allele?
→0.49
d. If the frequency of the homozygous dominant genotype is 0.49, what is the frequency of the homozygous recessive genotype?
→0.36
e. Which Hardy-Weinberg equation relates the frequencies of the alleles of a particular gene locus?
→ $p^2 + q^2 + 2pq = 1$
f. Which Hardy-Weinberg equation relates the frequencies of the genotypes for a particular gene locus?
→ $p^2 + q^2 + 2pq = 1$
g. Which Hardy-Weinberg equation relates the frequencies of the phenotypes for a gene?
→ $p^2 + 2pq + q^2 = 1$
3. a. The Hardy-Weinberg Principle predicts that genotype frequencies of offspring will be the same as those of the parental generation. Were they the same in your simulation?
→yes
b. If the frequencies were different, then one of the assumptions of the Hardy-Weinberg Principle was probably violated. Which one?
→There was selection pressure
4. a. Did the frequency of white individuals decrease with successive generations?
→yes