

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 seeds are colored and how many are white?
-200 black, 200 white
- c. What color do the 400 individuals have?
-Black
- d. How many seeds represent the population?
-200 black + 200 white
2. a. Complete 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?
-0.6
- d. If the frequency of the homozygous dominant genotype is 0.49, what is the frequency of the homozygous recessive genotype?
-0.3
- 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?
-that no selection pressure
4. a. Did the frequency of white individuals decrease with successive generations?
-yes