

Study Questions 0 - Review Set

1. Define "evolution."
2. Define "anagenesis."
3. Define "cladogenesis."
4. List five requirements for a population to be in Hardy-Weinberg equilibrium.
5. If a population of a diploid organism has two alleles for a single gene, B and b, and it satisfies the requirements for Hardy-Weinberg equilibrium, what proportion of the population should have each of the genotypes BB, Bb, and bb? Assume that the frequency of the B allele is p and the frequency of the b allele is q.
6. If a population has three genotypes for a single gene and the genotypes and frequencies are $f(RR) = 0.3$, $f(Rr) = 0.5$, and $f(rr) = 0.2$. What is the frequency of each allele?
7. Given the information in the previous question, what should the genotypic frequencies be if the population was in Hardy-Weinberg equilibrium?
8. If a population has three genotypes for a single gene and the genotypes and the numbers of each genotype are $RR = 486$, $Rr = 108$, and $rr = 6$. What is the frequency of each allele?
9. What about the genotypic frequencies would tell you that a population is not mating randomly?
10. If the genotypic frequencies in a population are $f(RR) = .16$, $f(Rr) = .59$ and $f(rr) = .25$, does the population appear to be mating randomly? Show how you can know.
11. Explain the following statement: "Evolution depends on mutation but mutation is not a significant cause of evolution."
12. How can immigration result in evolution?
13. Define "genetic drift."
14. What makes small populations more likely to experience genetic drift than large populations?
15. Define "selection" in an evolutionary context.
16. List the three requirements for selection to produce evolution.
17. What is an adaptation? (Notice this use of adaptation is a noun and not a verb.)
18. Give an example of a feature of an organism that is an adaptation.
19. In microbiology "selective media" are often used. Explain what this means.
20. Do "selective media" produce evolution?
21. Why is "survival of the fittest" a bad definition of natural selection?
22. How does the sickle cell allele produce "heterozygote advantage" in areas where malaria is common?
23. Explain how a large amount of melanin in your skin is an adaptation in some environments.
24. Explain how a small amount of melanin in your skin is an adaptation in some environments.
25. Define "sexual selection."
26. How does sexual selection result in an adaptation like antlers or large body size?
27. How does sexual selection result in an adaptation like a long tail or bright colors?
28. How does determining the age of a rock layer above a fossil layer put a minimum age on the fossil?
29. How does determining the age of a rock layer below a fossil layer put a maximum age on the fossil?
30. What does it mean for structures in two different organisms to be homologous?
31. What is a "vestigial structure?"
32. Define "biological species."
33. Define "reproductive isolation."
34. Describe how allopatric speciation occurs.