**Quiz 5**

Background: Flower color in a local roadside plant called ‘Dame’s rocket’ (*Hesperis matronalis*) has Mendelian inheritance. Plants with deep pink flowers are AA, plants with light pink flowers are Aa, and plants with white flowers are aa.

**When doing a problem like this, I recommend making a table:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Phenotype** | **Genotype** | **Ft (freq of genotype)** | **Ft+1** |
| **Deep Pink** | **AA** | **20/100 = 0.2** | **p2** |
| **Light Pink** | **Aa** | **20/100 = 0.2** | **2pq** |
| **White** | **Aa** | **60/100= 0.6** | **q2** |

1. The genetic system controlling flower color in Hesperis is therefore: (A) complete dominance, **(B) incomplete dominance**, (C) quantitative, (D) heterozygous advantage

**Note: you can tell this because there are 3 phenotypes corresponding to 3 separate genotypes. If there was complete dominance, there would only be 2 phenotypes.**

2. A local population has 20 deep pink flowered plants, 20 light pink flowered plants, and 60 white flowered plants. What is q, the frequency of the a allele?

q=F22+ (0.5\*F12) = 60/100 + (0.5\*(20/100)) = 0.6 + (0.5\*0.2) = 0.7

**Note: You cannot assume the population is in H-W equilibrium already (i.e., at q2; in fact, it is very clear if you apply the equation above, that it is not!). You should be able to apply the equation above, or the one for p, and determine the allele frequency, whether or not the population is already in H-W equilibrium.**

3. If H-W assumptions were met in forming the next generation, what would the frequency of white flowers be in the next generation?

Freq(white)=F22=q2=(0.7)2=0.49

**The key here is recognizing that in the NEXT generation (t+1) the population is conforming to H-W, and you have to recognize that to determine the frequency of white flowers we need F22. Another form of this question , would be to ask you how MANY white flowers there would be, if the total population was, e.g., 200 (it would be 0.49 x 200, right?)**

**NOTE: this is all very basic stuff. Try a few more problems on the Sample Exams page on the class website to get more practice. These should be very easy problems on the final (and GREs and MCATs and other standardized tests).**