

Evolution Review Cards Pt 1

Natural Selecon

- Major mechanism of change over me – Darwin's theory of evoluon
- There is variaon among phenotypes – genec mutaons play a role in increasing variaon
- Compeon for resources results in differenal survival, with individuals with the most favorable traits surviving to reproduce offspring

- An adaptaon is a genec variaon that is favored by selecon and is manifested as a trait that provides an advantage to an organism in a parcular environment.
- Fitness is the ability to survive and reproduce

Hardy-Weinberg Equilibrium

- A mathematical model used to calculate changes in allele frequency, providing evidence for the occurrence of evolution in a population.
- 5 conditions must be met for a population to be in HW equilibrium – conditions are seldom met
 - Large population
 - No migration
 - No mutations
 - Random mating
 - No natural selection

Equations

- p = the frequency of dominant alleles in a population
- q = the frequency of recessive alleles in a population
- p^2 = the frequency of homozygous dominant individuals in a population
- q^2 = the frequency of homozygous recessive individuals in a population
- $2pq$ = the frequency of heterozygous individuals in a population
- $p + q = 1$
- $p^2 + 2pq + q^2 = 1$

The screenshot shows a quiz interface with a question: "Which of the following is not part of a HW population?". There are four options: A (no mutations), B (small population), C (no natural selection), and D (random mating). Option B is highlighted with a red box and a green checkmark, indicating it is the correct answer.

Speciation

- An evolutionary process by which 2 or more species arise from 1 species and 2 new species can no longer breed and reproduce successfully
- Many mechanisms by which it can occur
 - Geographic isolation
 - Species separated by physical barrier

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(2) Reproductive isolation

- Different behaviors limit mating
 - Different habitats limit mating
 - Different mating seasons limit mating
 - Different anatomical structures limit mating
- Can take place over millions of years or rapidly (after extinction events, for example)