Ch 23.4 Notes

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Vocab

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Relative Fitness: The contribution an individual makes to the gene pool of the next generation relative to the contributions of other individuals

Directional Selection: Occurs when conditions favor individuals exhibiting one extreme of a phenotypic range

Disruptive Selection: Occurs when conditions favor individuals at both extremes of a phenotypic range over individuals with intermediate phenotypes

Stabilizing Selection: Acts against both extreme phenotypes and favors intermediate variants

Sexual Selection: A process in which individuals with certain inherited characteristics are more likely than other individuals of the same sex to obtain mates

Sexual Dimorphism: A difference in secondary sexual characteristics between males and females of the same species

Intrasexual Selection: Meaning selection within the same sex, individuals of one sex compete directly for mates of the opposite sex

Intersexual Selection: Also called mate choice, individuals of one sex (usually the females) are choosy in selecting their mates from the other sex.

Balancing Selection: This type of selection includes frequency-dependent selection and heterozygote advantage

Frequency Dependent Selection: The fitness of a phenotype depends on how common it is in the population

Heterozygote Advantage: Individuals who are heterozygous at a particular locus have greater fitness than do both kinds of homozygotes.

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Notes

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Outcome of natural selection is NOT random.

Increases frequency of alleles that provide reproductive advantage.

* Lead to adaptive evolution

Fitness

Contribution an individual makes to the gene pool of the next generation RELATIVE to the contribution of other individuals

Selection acts more on phenotype than genotype

* Indirectly on genotype since it’s the genotype that affects the phenotype.

Natural selection and distribution of traits

Normal distribution= bell curve

* Most frequent= average
* Frequency decreases as you go to extremes.

Phenotypes in a population usually follow normal distribution

* average= phenotype you see most often in the population
* IF the environment changes, the curve will shift to whatever trait is now most favorable

Natural selection CHANGES the distribution of traits.

Directional selection

* One side/extreme is favorable.
* Shifts average (once was rare, now is common)
* Example: drug-resistant bacteria

Stabilizing selection

* Common phenotype is favored.
* Extremes are picked off (predators/environment)
* Decrease genetic diversity.

Disruptive/divergent selection

* Extremes favored.
* Can lead to speciation.

Sexual selection

Certain traits increase mating success= become more prevalent

Females tend to be choosy with who they mate with, males not so much

Sexual dimorphism

* Different structures in males and females

Intrasexual selection= males compete, winner gets to mate with female

Intersexual selection= males try to impress females to mate

Balancing selection

Graphical user interface, text, application, chat or text message

Description automatically generated

Can only act on existing variations.

* Trash variations? Too bad.
* Can only pick from whatever is there already.

Evolution limited by historical constraints.

* Adapts EXISTING structures to new situations.
* Can’t just grow new appendage because it would be beneficial

Adaptations are often compromises.

* What works in one scenario may sacrifice function in another (seals)