4-8-13

DARWIN’S MECHANISM

2 OBSERVATIONS

* Overpopulation
  + Populations have potential to produce more offspring than the environment can support
* Individual Variation
  + Individuals in a population vary in many heritable traits

FROM THOSE OBSERVATIONS A BRILLIANT INERENCE!

Differential reproductive success

Those individuals with traits best suited to the local environment generally leave a larger share of surviving fertile offspring (Fitness)

This is the Definition of: NATURAL SELECTION

WHAT IS REQUIRED FOR EVOLUTION TO OCCUR?

1. TIME!

2. VARIATION IN A POPULATION

MECHANISMS OF EVOLUTION

Evolution is defined as:

1. change in allele fx

2. In a given population

3. Over time

AT LEAST 4 WAYS WE CAN DOCUMENT THE CHANGING OF ALLELE FREQUENCIES

NATURAL SELECTION

* Natural selection cannot fashion perfect organisms

WALLACE 1860’S

* Individuals whose characteristics are best adapted to their environment are more likely to survive and reproduce
* The unequal ability of individuals to survive and reproduce leads to a gradual change in the characteriscs of a population over generations.

NON RANDOM MATING

* Mates Selection for specific characteristics
* Almost always the female
* Behavioral, physical or chemical

GENETIC DRIFT – SEWALL WRIGHT 1920’S

* Essentially a subset of the genes in a population get isolated from the complete gene pool
* THE RESULT IS LOSS OF GENETIC DIVERSITY
* The new population (even if rebuilt) has to only have the genes from the founders

2 ways genetic drift can occur

* Bottleneck effect
* Founder effect

GENE FLOW

* The movement of Individuals or gametes between populations

Can alter allele freq. in a population

Tends to reduce differences between populations

Humans are the best example of this!

ALL OF THESE INTERACT

To have effects on populations

EVOLUTION CAN ALTER VARIATION IN A POPULATION IN TREE WAYS

* Stabilizing selection:
* Directional selection
* Disruptive selection