Sexual Selection

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Evolution and Natural Selection

Evolution - Changes in gene frequencies over time

Natural Selection – “survival of the fittest”

Pepper Moth Story
Sexual Selection

The evolution of extravagant characters (sexual selection) arises from differences in reproductive success caused by competition over mates.
Darwin (1868 and 1871)
Mechanisms of competition over mates

1) Scrambles
2) Endurance Rivalry
3) Contests
4) Mate Choice
5) Sperm competition

Males are usually the sex that competes because females normally invest more into reproduction.
Scrambles

Copulations are regulated by the ability of the male to find a mate. Males of species that breed through scrambles often have enlarged sensory organs for faster location of females.

Females release pheromones that are detected by hairs on the males antennae.
Endurance rivalry

The most persistent males are the most successful breeders

Extended effort into breeding activity shows that the animal is in good physical condition and is an efficient forager.
Contests

-Fights between males for the opportunity to mate.
-Male traits associated with fighting ability are referred to as “armaments.”
Contests cont.

Contests can be for direct access to females or to control a better territory.
Mate choice

Females choose a mate based on certain characters of the male.

These characters are referred to as ornaments.

Ornaments can also function in contests as well as in mate choice.
Mechanisms for female preference

- Fisher’s Runaway Process
- Zahavi’s Handicap Principle
- Sensory Exploitation (Ryan)
Runaway process

Female choice and male trait have a genetic correlation
Male traits are limited by natural selection

Irish Elk

Common Peafowl
Handicap principle

Females select males with the most elaborate displays or most conspicuous ornaments because it signals high quality.
Sensory exploitation (Ryan)

Females have a pre-existing bias for a particular trait and the males exploit that bias.
Sperm competition

Mate guarding, sequestering, frequent copulations, production of mating plugs

Examples: Primates, cuddlefish
Review

Sexual Selection mechanisms for competition over mates

1. Scrambles
2. Endurance Rivalry
3. Contests
4. Mate Choice – mechanisms for female preference
   1. Runaway process
   2. Handicap principle
   3. Sensory exploitation
5. Sperm Competition