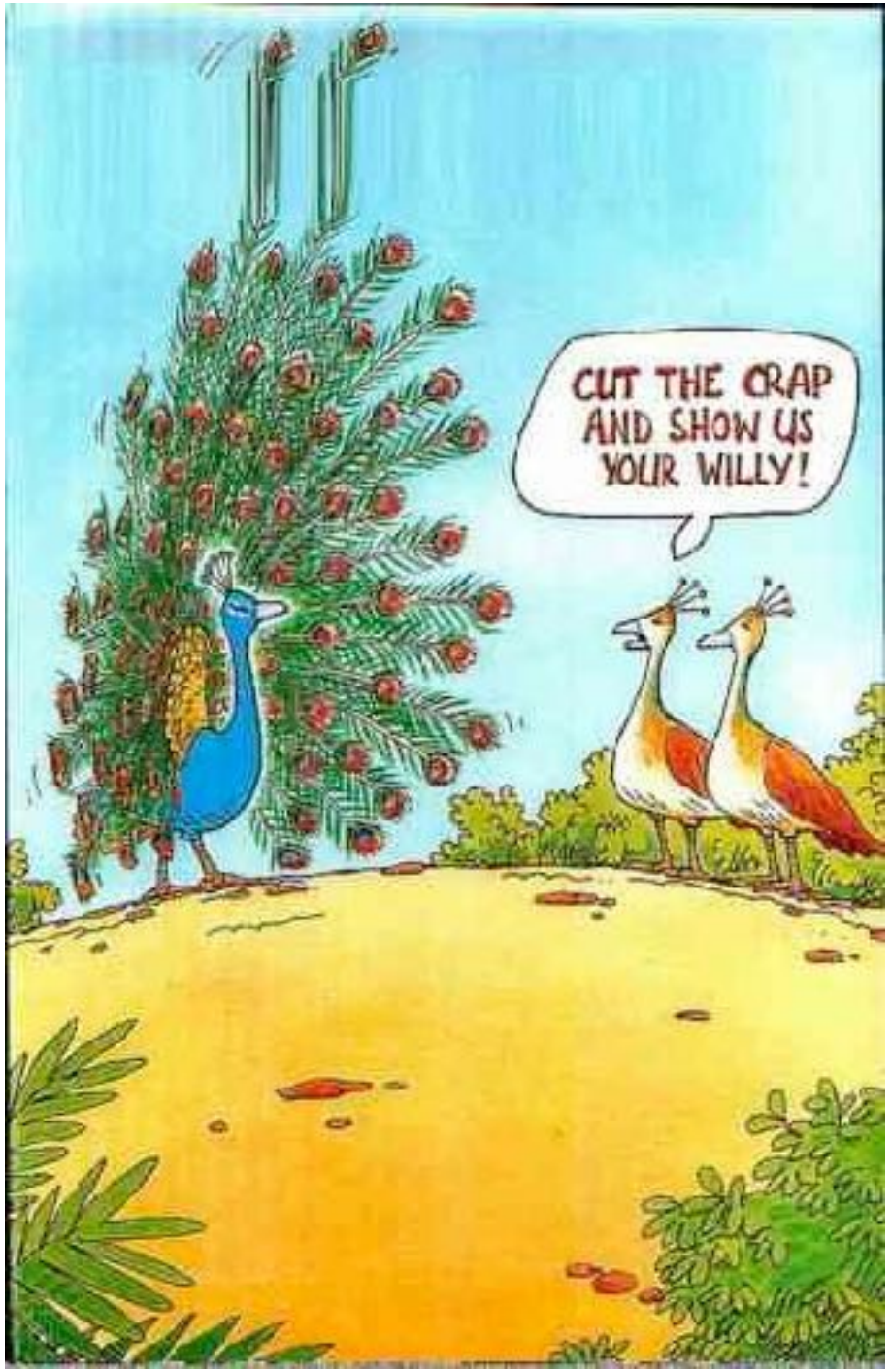
Sexual selection, part 3



Sexual selection

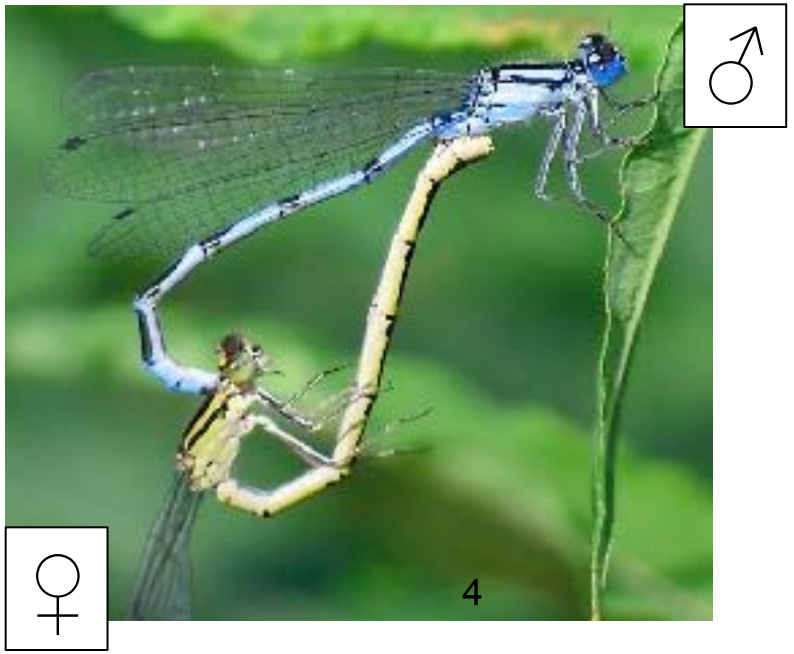
- Sexual selection
  - Differential reproduction due to competition over access to mates (SS is a subset of natural selection)
    1. Intrasexual selection
       - Members of one sex compete for access to the other sex (contest competition)
         - » Usually male-male contests
    2. Intersexual selection
       - Members of one sex compete to attract the other (advertising competition)
         - » Usually female choice

Intrasexual selection

- Pre-copulatory
  - Controlling access to females
- Mate guarding (pre and post-copulatory) and sperm competition
  - Increasing probability of paternity

Intrasexual selection: Sperm competition

- Sperm competition
  - Copulatory plugs
    - Male mice plug immediately after mating
  - Sperm scoops
    - Male damselfly organ to scrape out sperm during mating



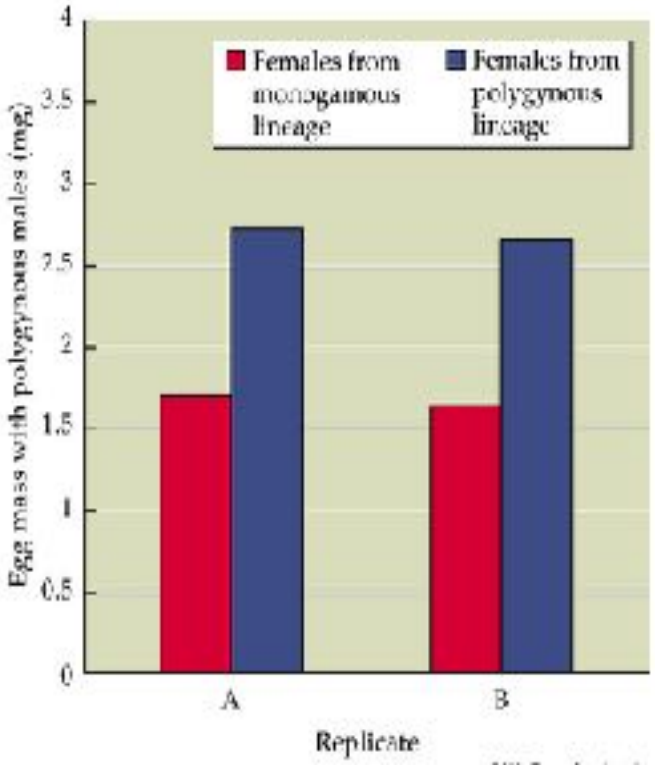
Intrasexual selection: Sperm competition

- Sperm competition

  Chemical Warfare

  - Males often put chemicals in their spermatophore that enhance siring chances
    - (1) Kill competitor's sperm
    - (2) Reduce female receptivity
    - (3) Induce oviposition

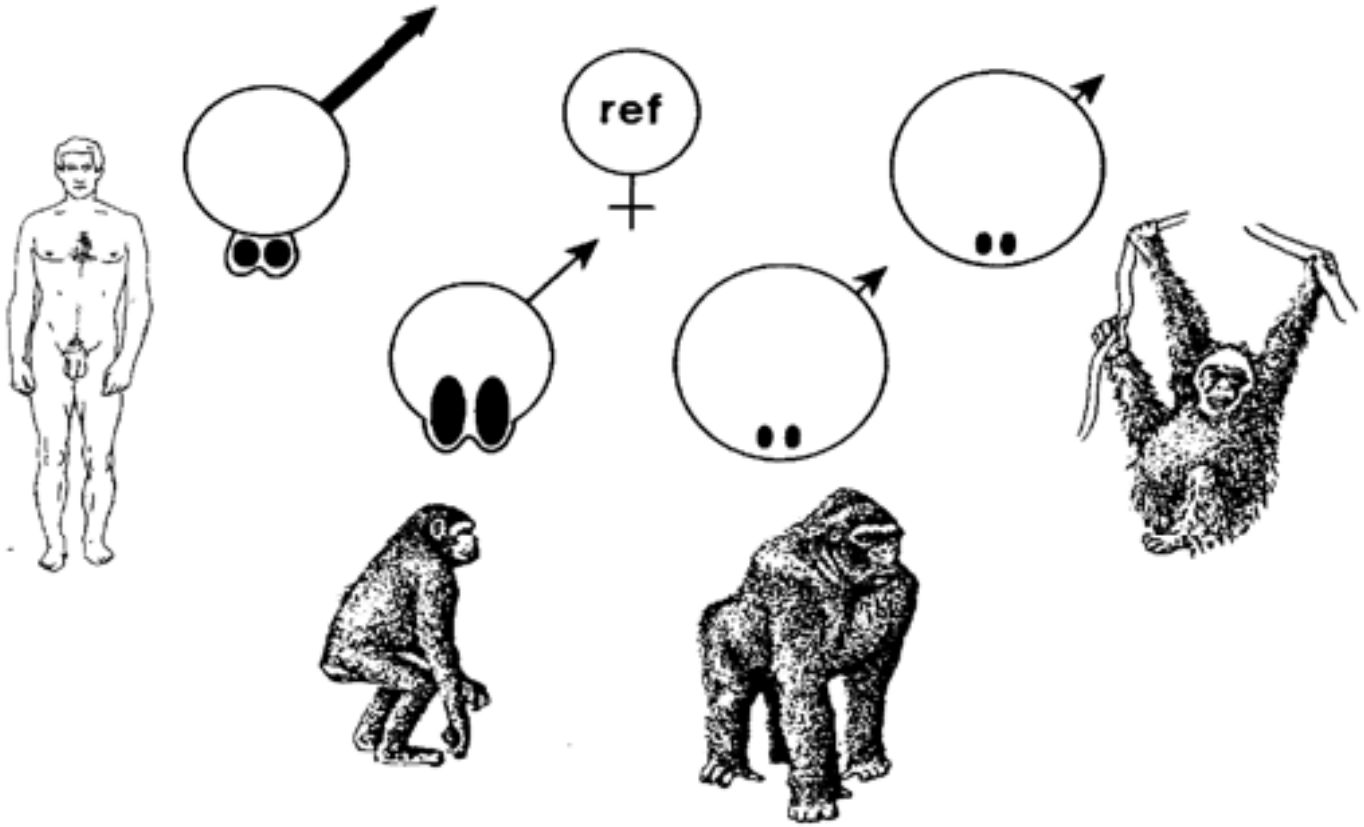
  - Ex. Chemicals in accessory of *Drosophila* harm female!
    - – When mated to polygynous ♂♂, monogamous females do poorly (they are not adapted to deal with the toxins of these males)



Intrasexual selection: Sperm competition

Increased sperm count

- Body size vs. testes size dimorphism in primates



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Intersexual selection

- Precopulatory mate choice
  - Which individual to mate with?
    - Assessment through signals
      - » Visual (e.g., bowerbirds)
      - » Acoustic (e.g., frogs)
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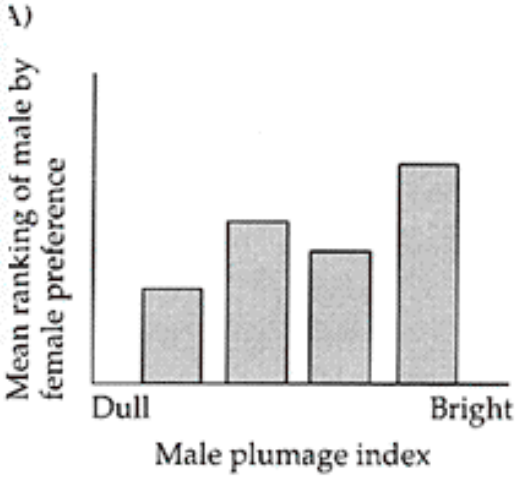
Why be choosy? Direct benefits

- Direct benefits = non-genetic resources from mate
  - Examples of direct benefits
    - 1) Food provisioning for offspring

Why be choosy? Direct benefits

House finches signal with carotenoids



Carotenoids cannot be synthesized, so their display by males provides an honest measure of a male's foraging ability

Why be choosy? Direct benefits

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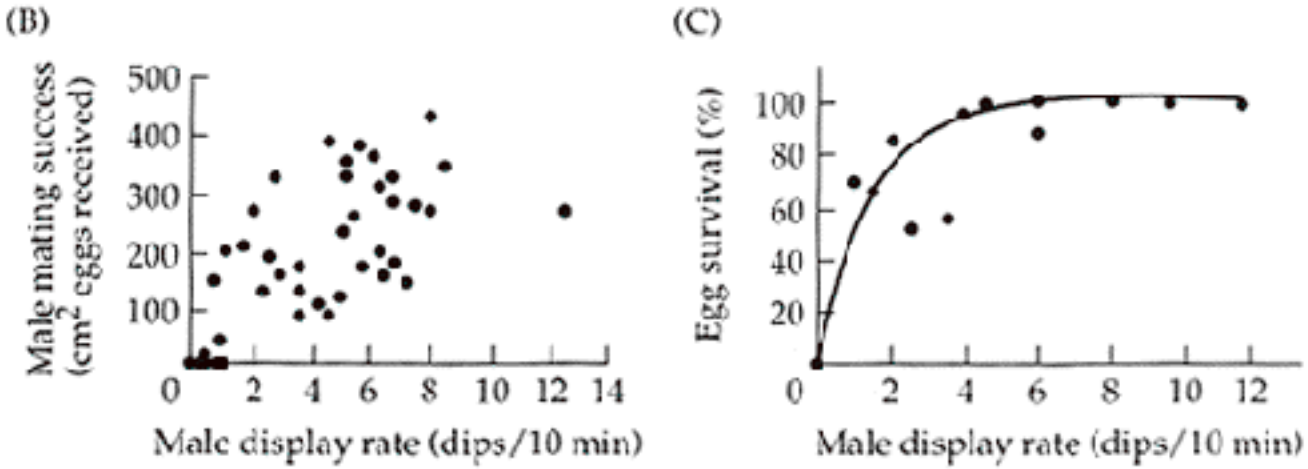
    - 1) Food provisioning for offspring
    - 2) Protection of female/ offspring from predators

Why be choosy? Direct benefits

Male damselfish display rate correlates with paternal care



Honest courtship displays by male damselfish (*Stegastes partitus*).

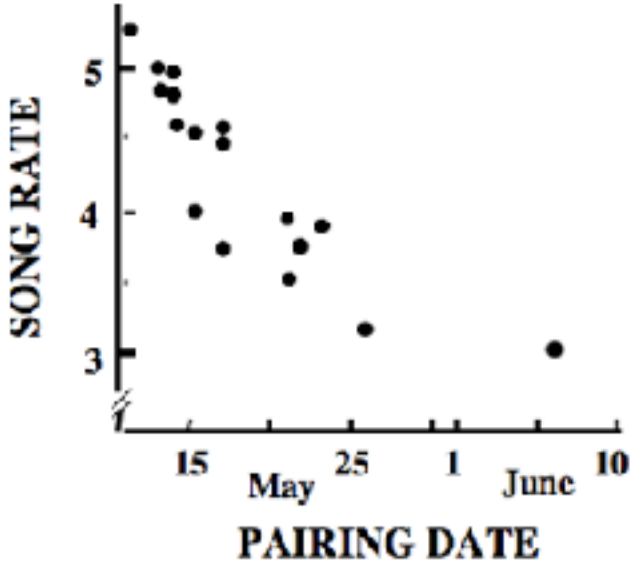
Why be choosy? Direct benefits

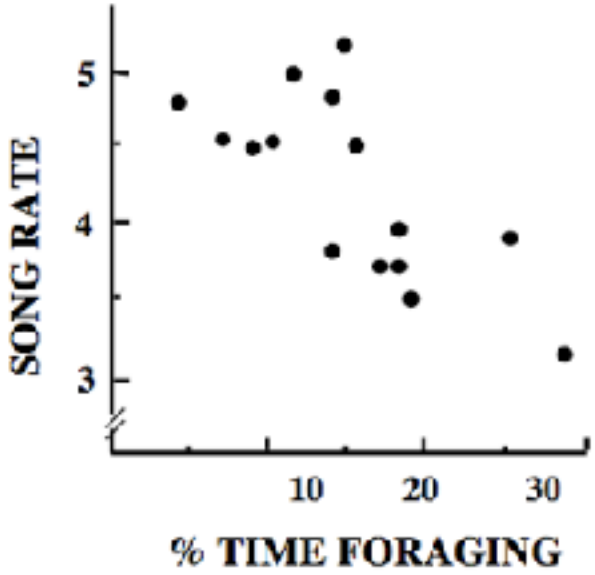
- Direct benefits = non-genetic resources from mate
  - Examples of direct benefits
    - 1) Food provisioning for offspring
    - 2) Protection of female/ offspring from predators
    - 3) Territory use

Why be choosy? Direct benefits

- Females prefer males with higher song rate; better singers are on better territories
    - Female choosing attractive male song get best territories

Willow warbler





Why be choosy? Direct benefits

- Examples of direct benefits
  - 4) Nuptial gifts given at mating
    - Spermatophores (crickets, moths)
    - Self (redback spider, praying mantis)
    - Hangingflies give food gift at mating
      - Longer female copulation with larger nuptial gift

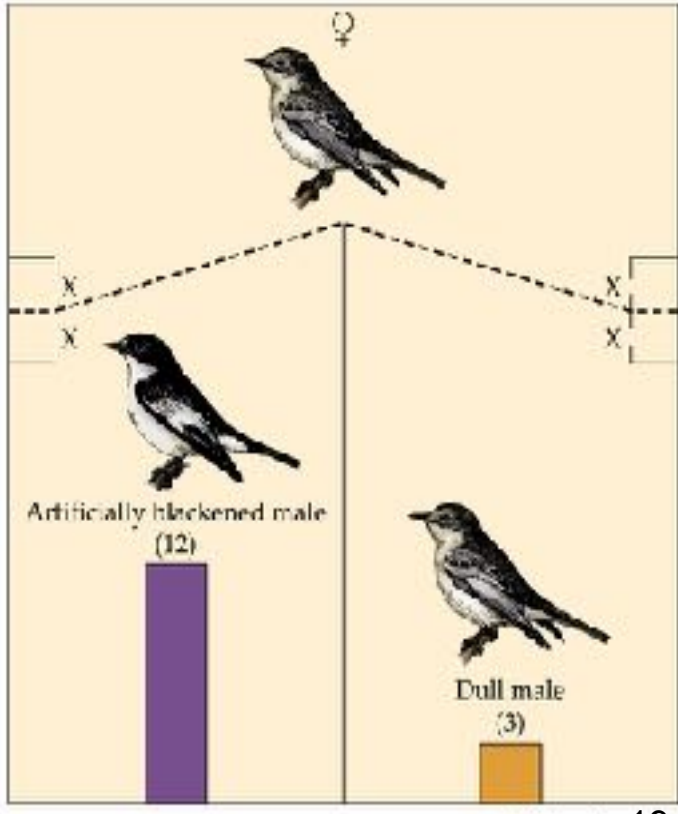
http://www.youtube.com/watch?v=OHZBNtlxbys&feature=fvw

watch 0:20 forward

Why be choosy? Direct benefits

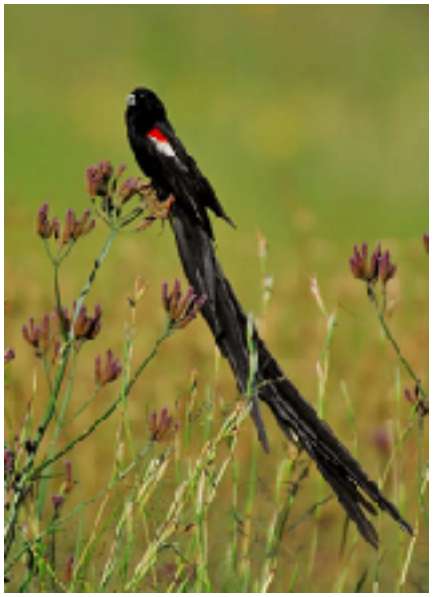
- Examples of direct benefits
  - 5) Avoid males with parasites/STDs
    - Females don't want themselves – or their offspring – to get sick through direct transmission of disease
    - ex. Plumage signals disease
      - » Dull males have more parasites
      - » Dull males made more colorful were preferred

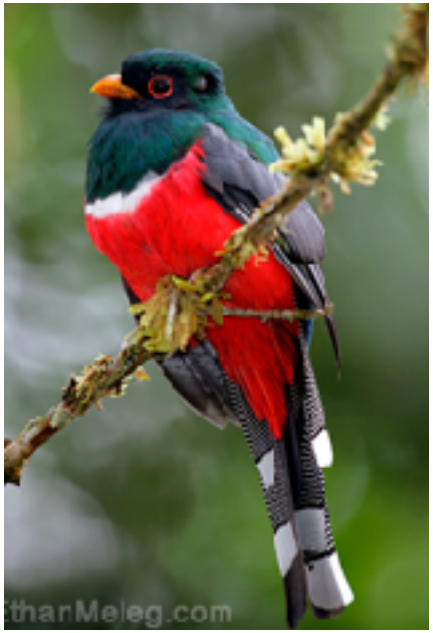
Pied Flycatcher



Why be choosy? Indirect benefits

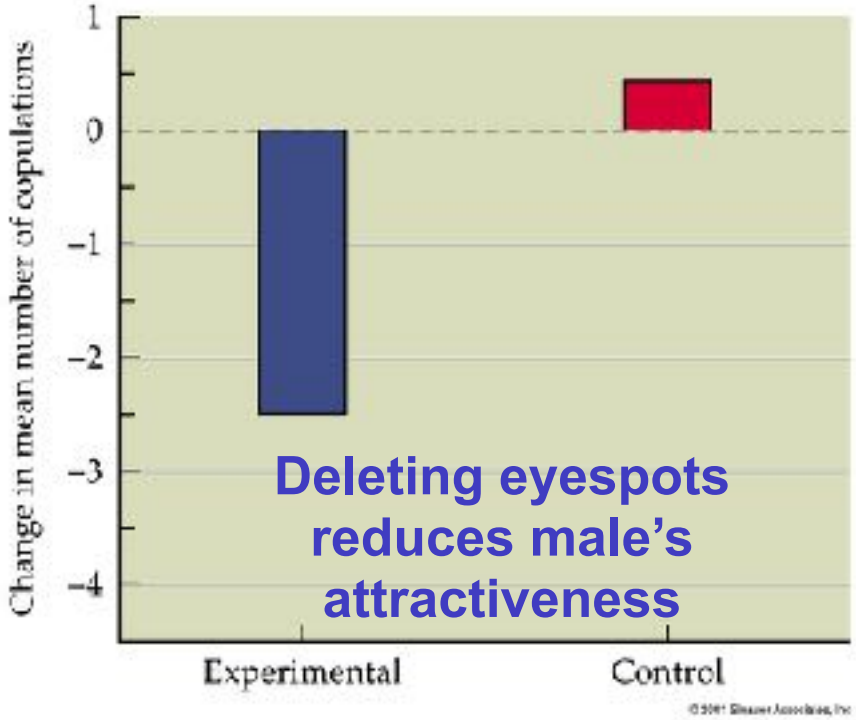
- Indirect benefits = genetic contribution from mate
  - "Good genes" hypothesis
    - Genes that give offspring a good chance of surviving and reproducing (viability genes)

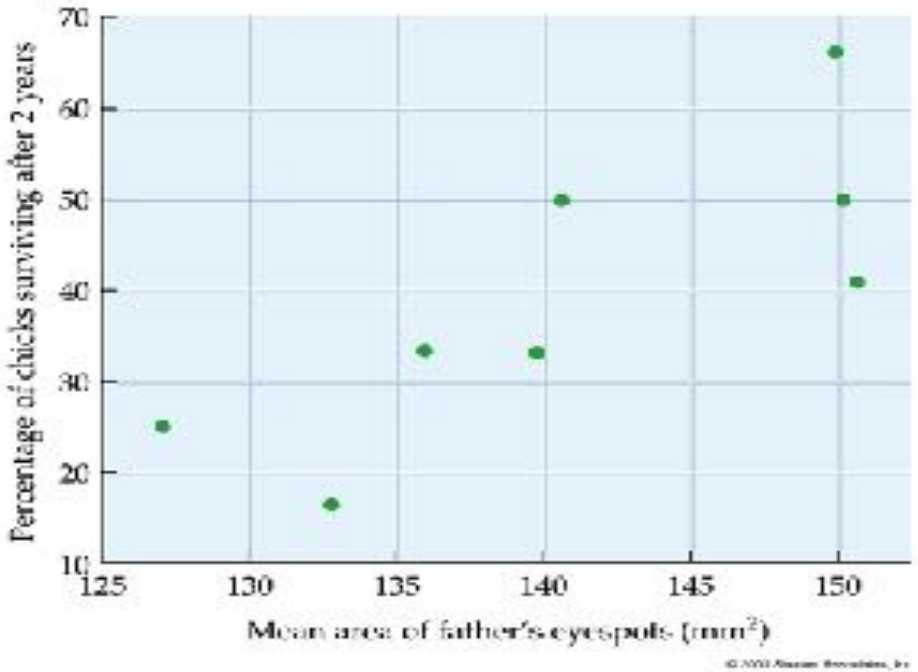




Why be choosy? Indirect benefits

- Good genes
  - Peacock train size indicate survival of young (note that males contribute zero parental care)

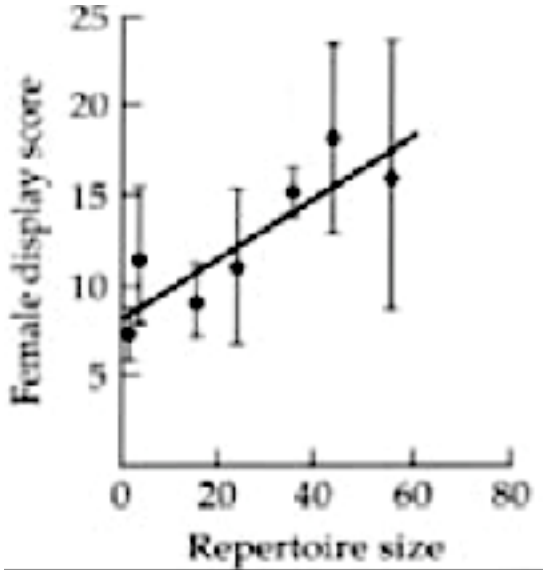


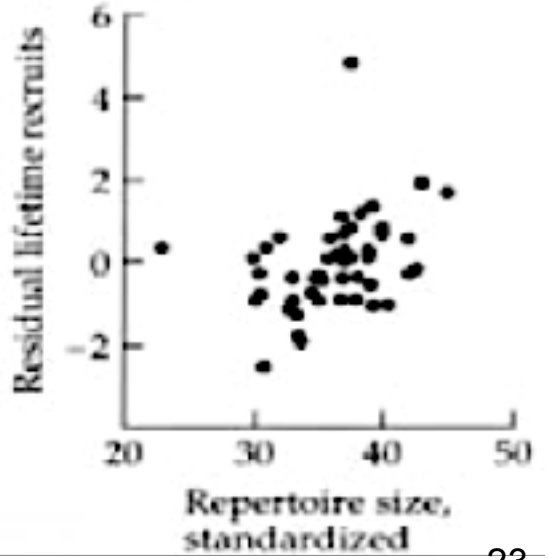


Why be choosy? Indirect benefits

- Good genes
  - Females prefer males with large repertoires; repertoires increase with age
    - Offspring of males with larger repertoires are more likely to survive (only looked at extra-pair copulation to control for direct benefits)

Great Reed Warbler

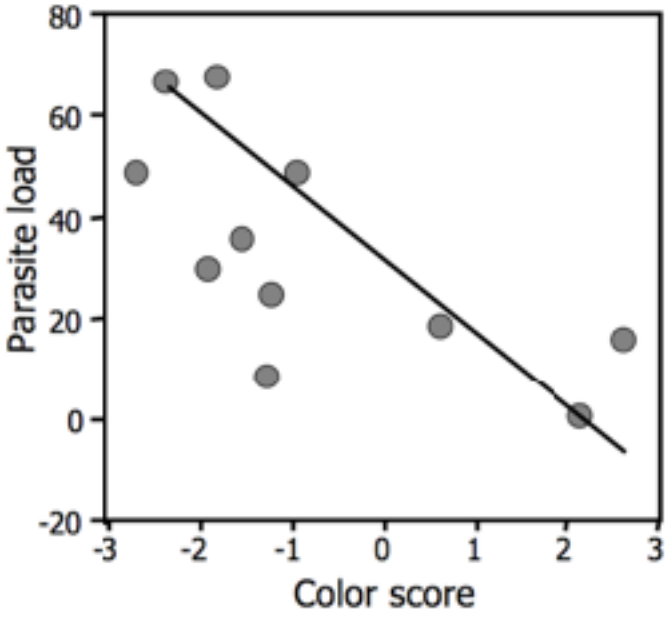




Why be choosy? Indirect benefits

- Good genes
  - Plumage brightness predicts blood parasite infection (i.e., indicates genes for good immune system)

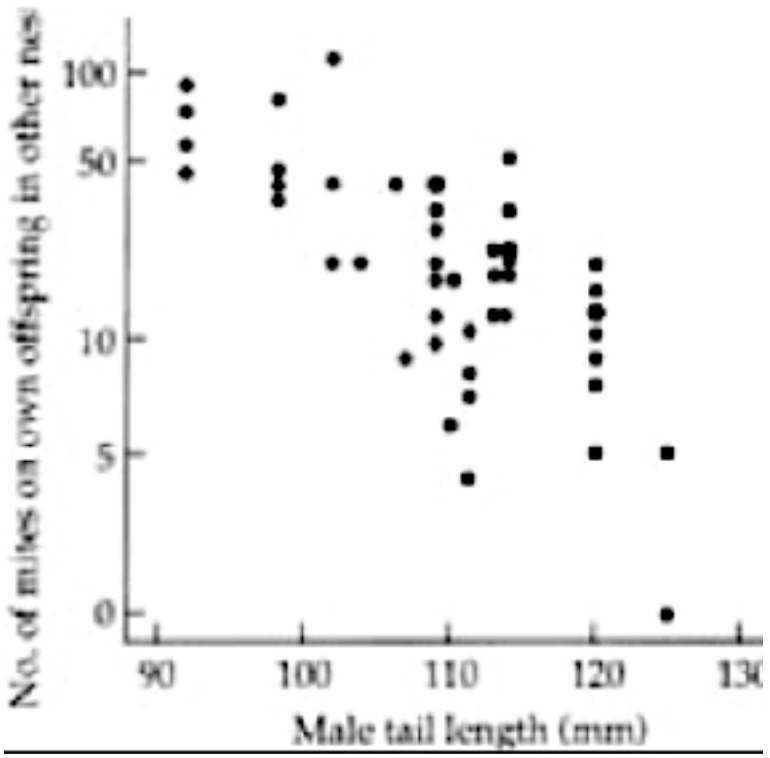
Satin Bowerbird



Why be choosy? Indirect benefits

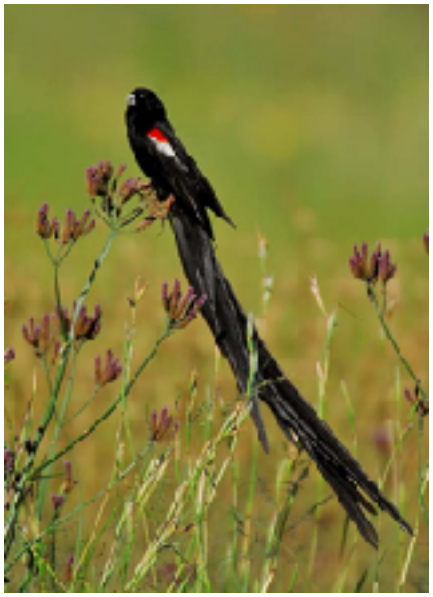
- Good genes
  - Tail growth is limited by parasite load, and parasite resistance has a non-zero heritablility

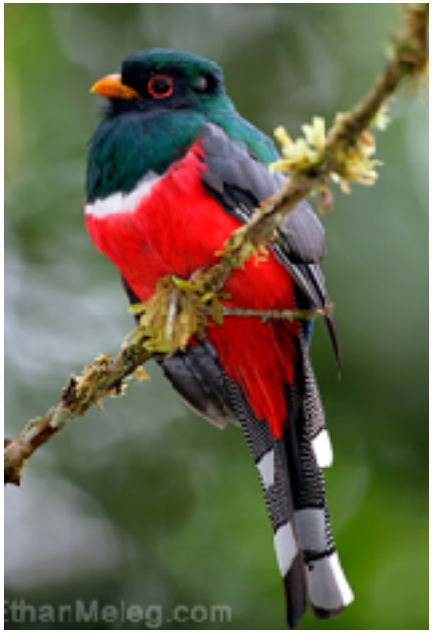
Barn Swallow



Why be choosy? Indirect benefits

- Indirect benefits = genetic contribution from mate
  - "Good genes" hypothesis
    - Genes that give offspring a good chance of surviving and reproducing (viability genes)
  - "Sexy sons" or "run-away" hypothesis
    - Genes that give sons traits that will make them attractive to females (and therefore more likely to mate), but do not increase offspring viability





Why be choosy? Indirect benefits

- "Sexy sons" or "Run-away sexual selection"
  - No fitness advantage other than mating advantage
  - Genetic linkage of male trait and female preference
    - Females have genes for preference, males have genes for trait
    - Stops exaggeration only when counter selection acts against (cost of trait outweighs mating benefits)



Intersexual selection

- Precopulatory mate choice
  - Which individual to mate with?
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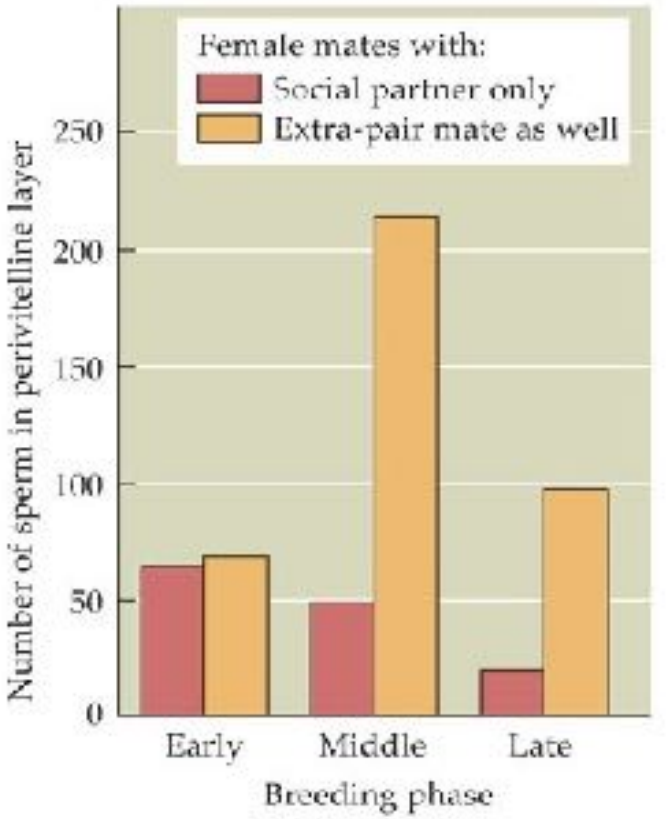
- Postcopulatory “Cryptic” sexual selection by females

Intersexual selection: Post-copulatory

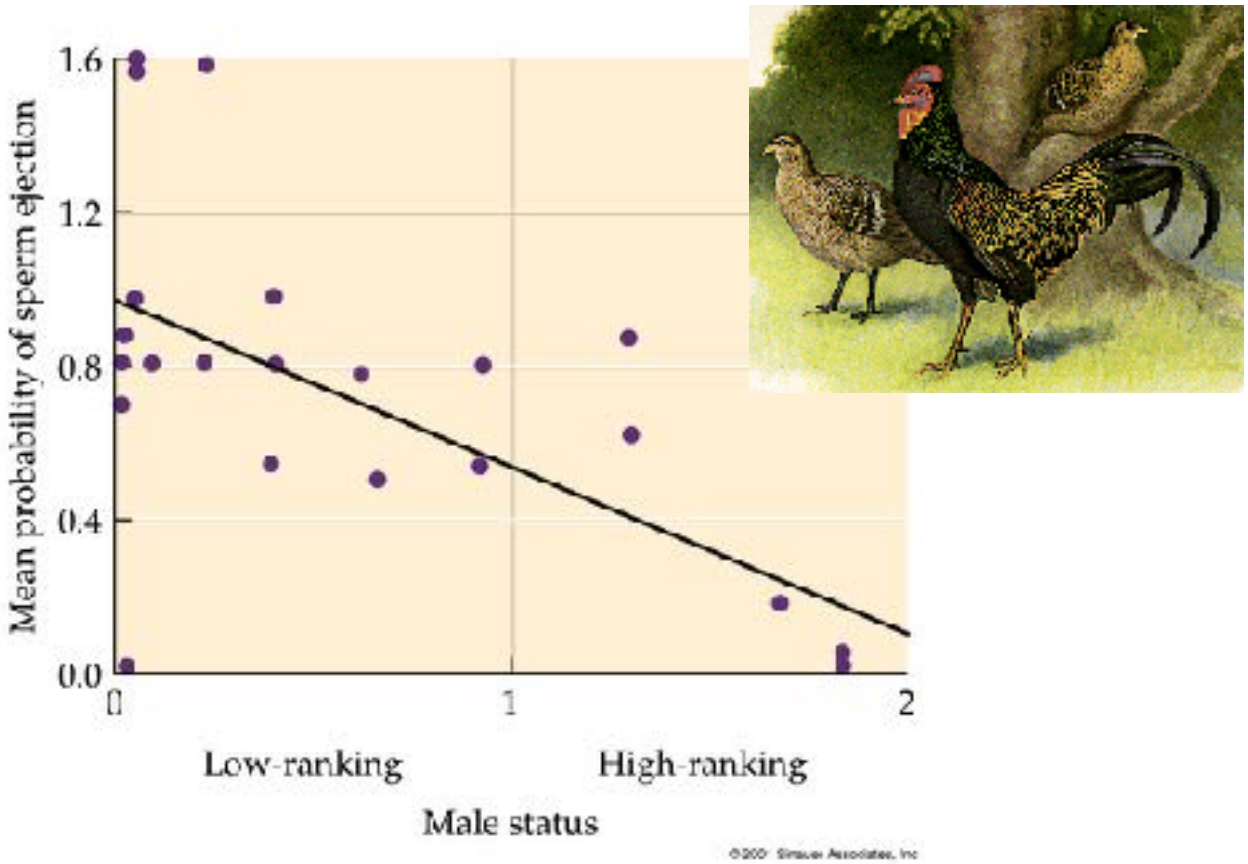
- Postcopulatory “Cryptic” sexual selection by females
  - Competition can continue after copulation
    - What matters is which male actually fathers the offspring
  - Success can depend on sequence
    - First-male sperm precedence (mammals)
    - Last-male sperm precedence (birds)
  - Can involve female control
    - Sperm storage and differential “use”

Collared flycatcher



Intersexual selection: Post-copulatory

- Female control over who fathers her kids … even after multiple males have copulated
  - Free-living hens eject sperm of subdominant males



http://www.youtube.com/watch?v=36p46WnWJLc

watch :20-30