Upcoming Events

- **Exam 1:** handed back on Thursday @ end of lecture
- **This week's tutorials**:
  - Peer review 1st draft (bring 3 copies)
- **Next week:**
  - Final draft written review DUE (in tutorial)
  - Tip: Work on your presentation as you write your final draft

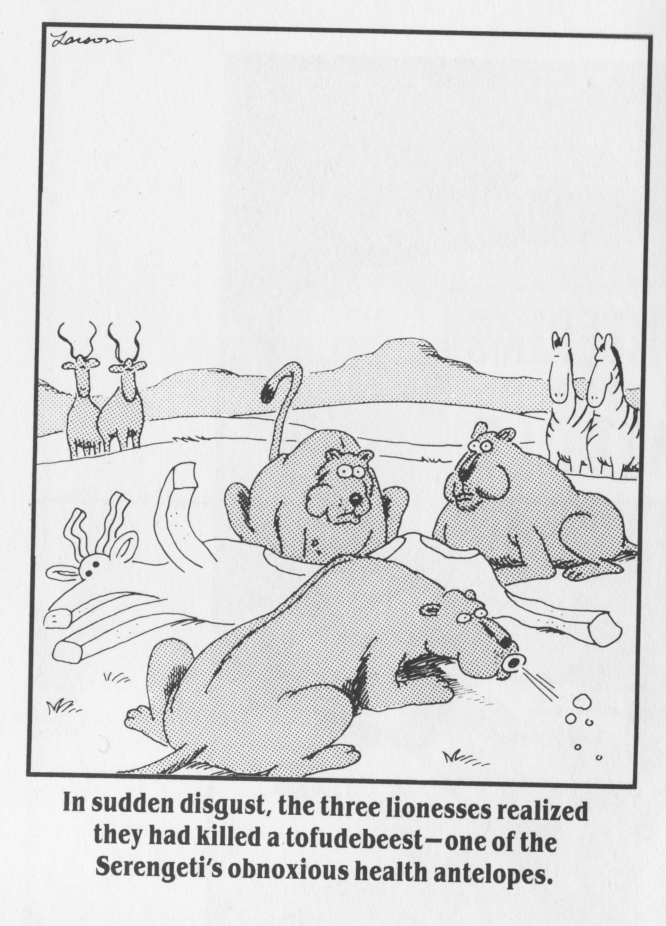
Categorizing species based on sources of energy

Producers (Autotrophs)		Mixed Nutrition (Mixotrophs)	Consumers (Heterotrophs)	
 Chemosynthetic archaea and bacteria	 Cyanobacteria	 Many algae	 Fungi	 Bacteria
 Most algae	 Most plants	 Other protists Some plants Some animals	 Herbivore	 Carnivore

Predators, Herbivores, Parasites

All organisms are both consumers and victims

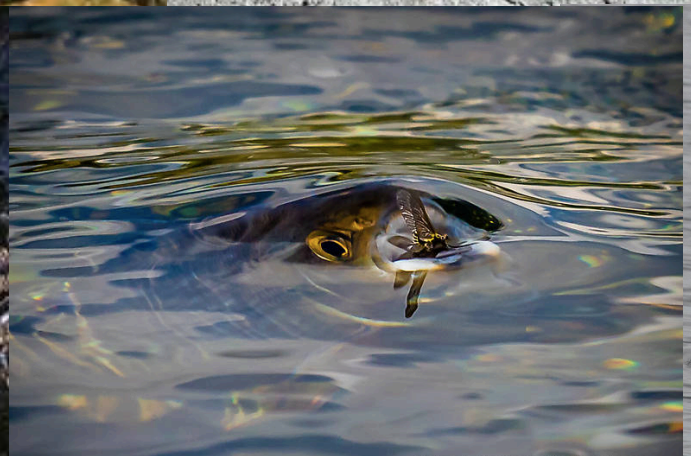
We classify consumers according to their functional roles in ecosystems



In sudden disgust, the three lionesses realized they had killed a tofudebeest—one of the Serengeti's obnoxious health antelopes.

Predators

* Special case:
Cannibalism



Predators

* Special case:
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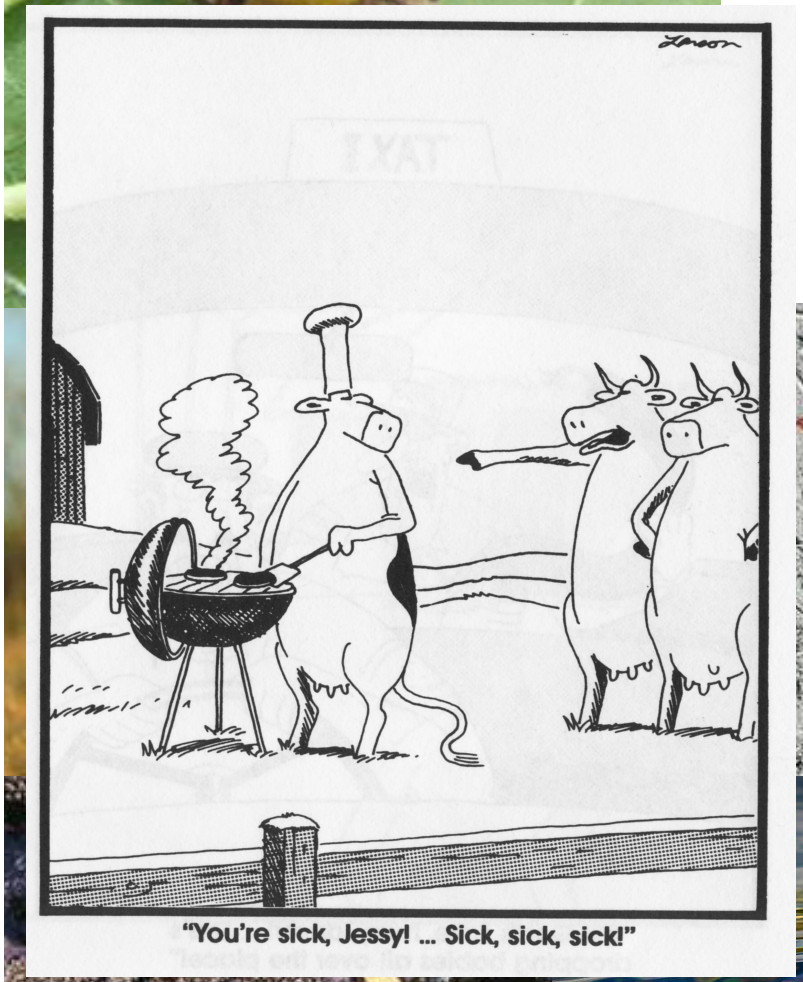
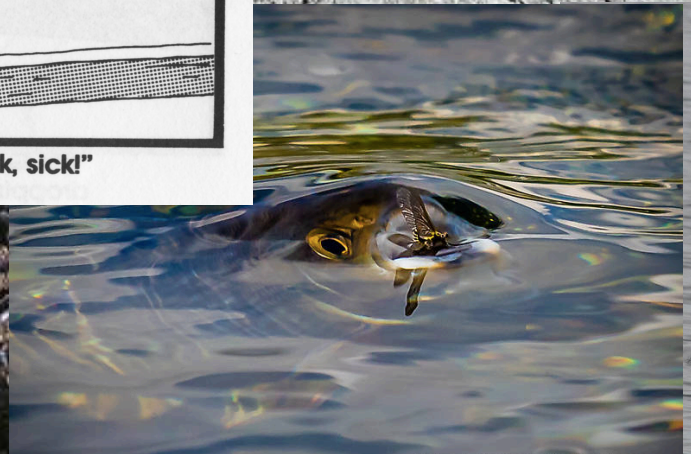
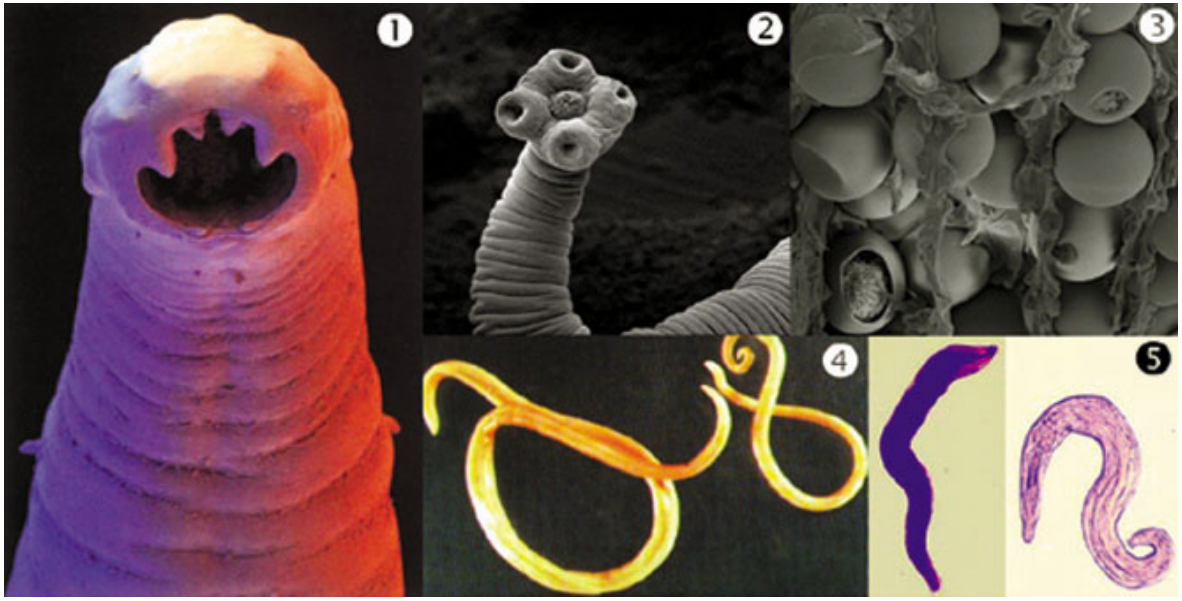




Parasites (and their associated hosts)

Consume parts of their hosts



Parasitoids

Wasps and flies whose larvae consume the tissues of other (host) insects

Have similarities to both parasites and predators

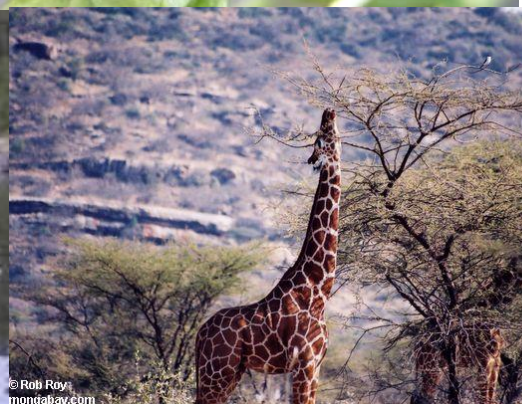
http://www.youtube.com/watch?v=soXTHG07dCo

http://www.youtube.com/watch?v=p_cL4ZiE81E&feature=related

Herbivores

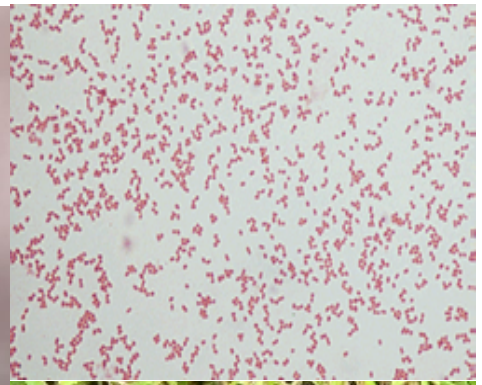
- Consume parts of plants and other autotrophs (predator or parasite?)

- Also called grazers (herbaceous veg & algae) and browsers (woody vegetation)



Detritivores/scavengers

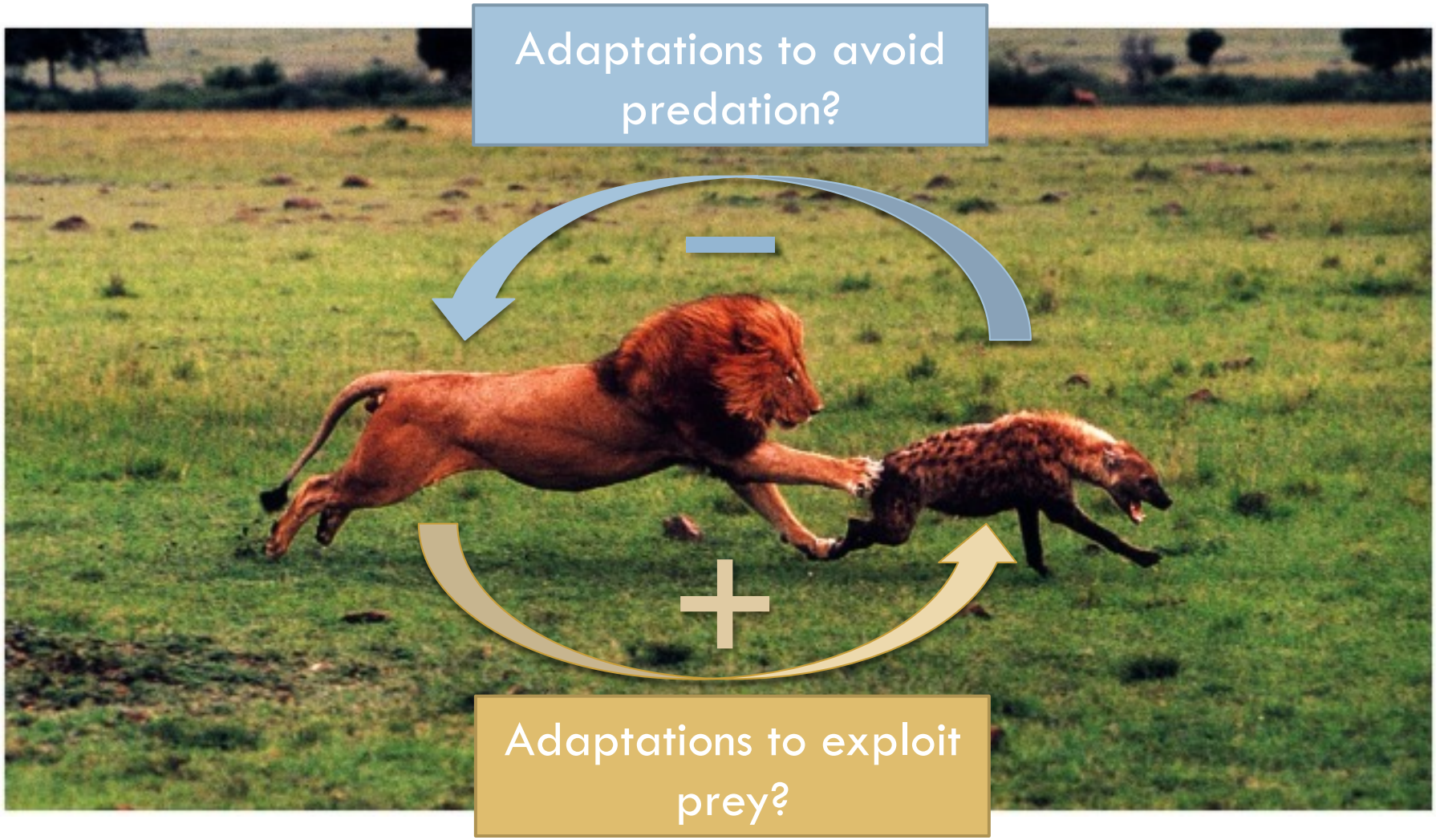
- Consume tissues of dead organisms
- Are there direct feedbacks to the dynamics of their prey?
- Indirect feedbacks?



Detritivores/scavengers

- Consume tissues of dead organisms
- No direct feedbacks to the dynamics of their prey
- Indirect feedbacks?

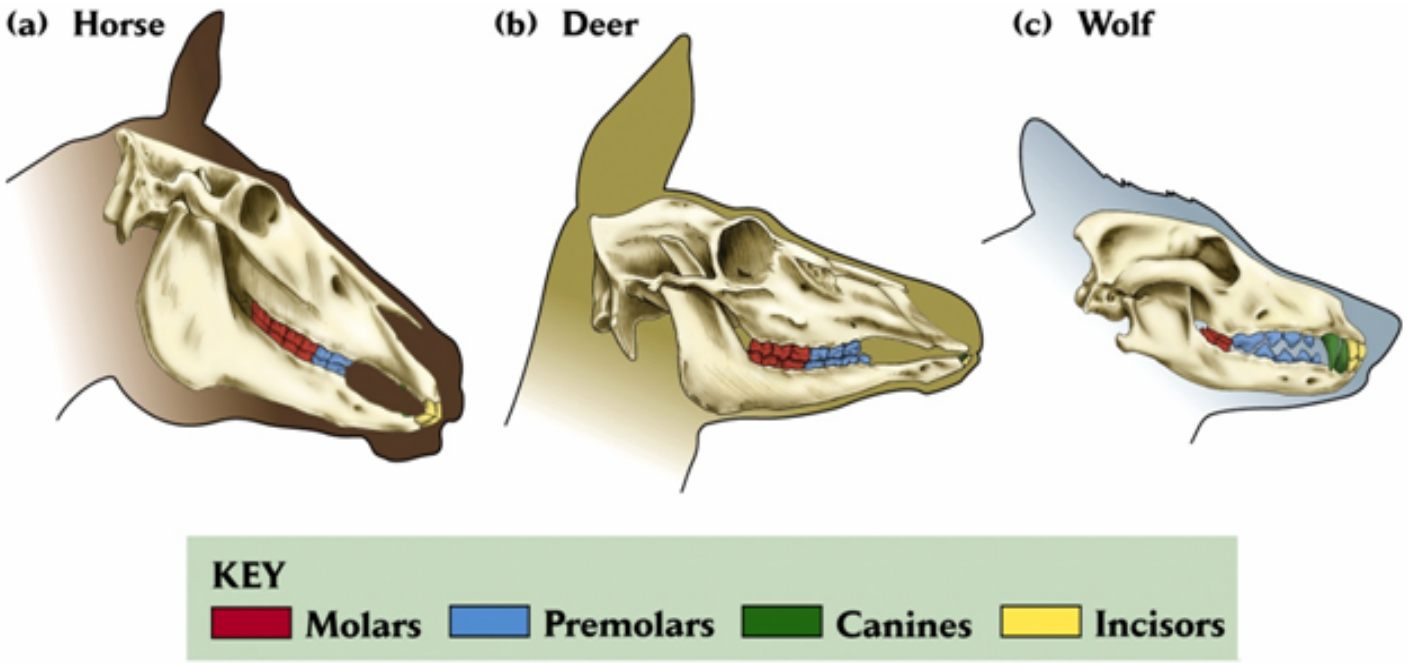
Morphology (physical defense), chemical, crypsis, mimicry, behaviour



Morphology (jaws, claws, dentition, digestion), behaviour

Consumers have adaptations for exploiting (catching!) their prey

Example 1 - Dentition



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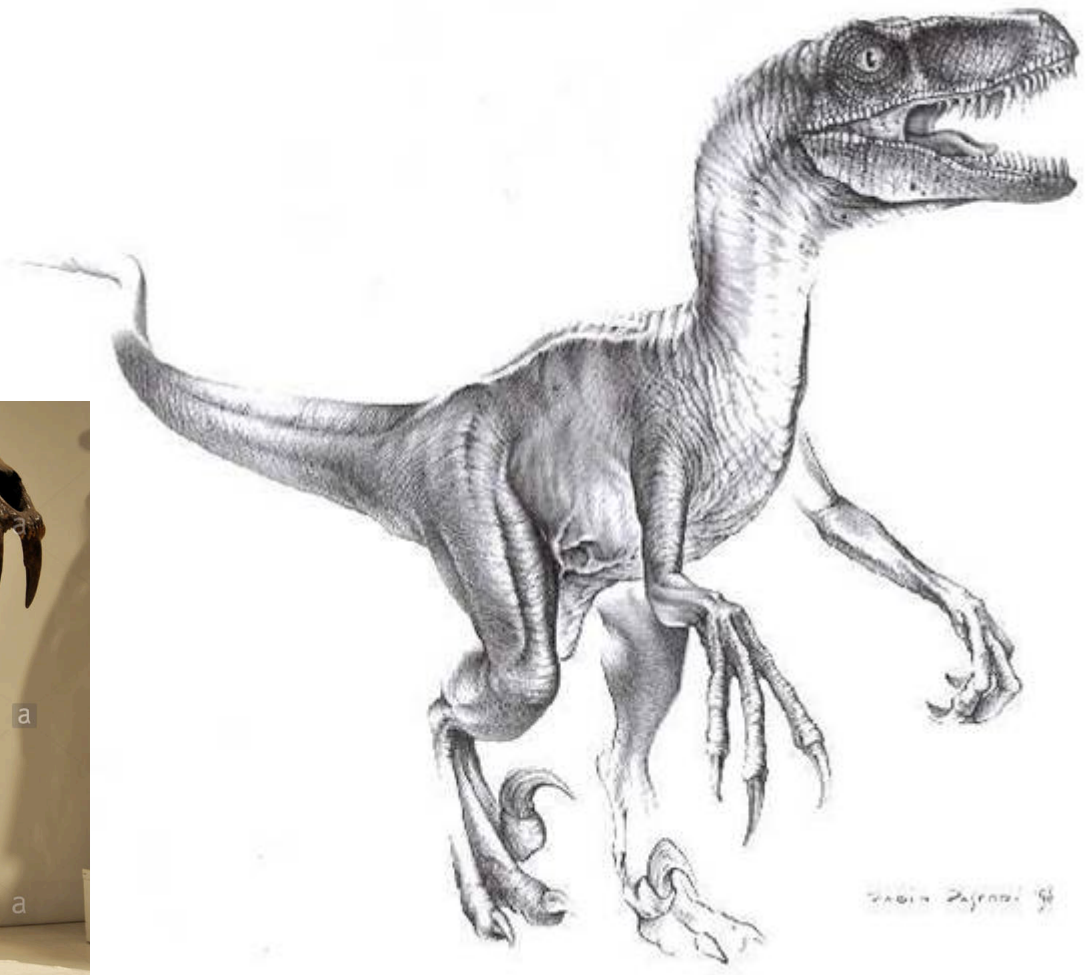
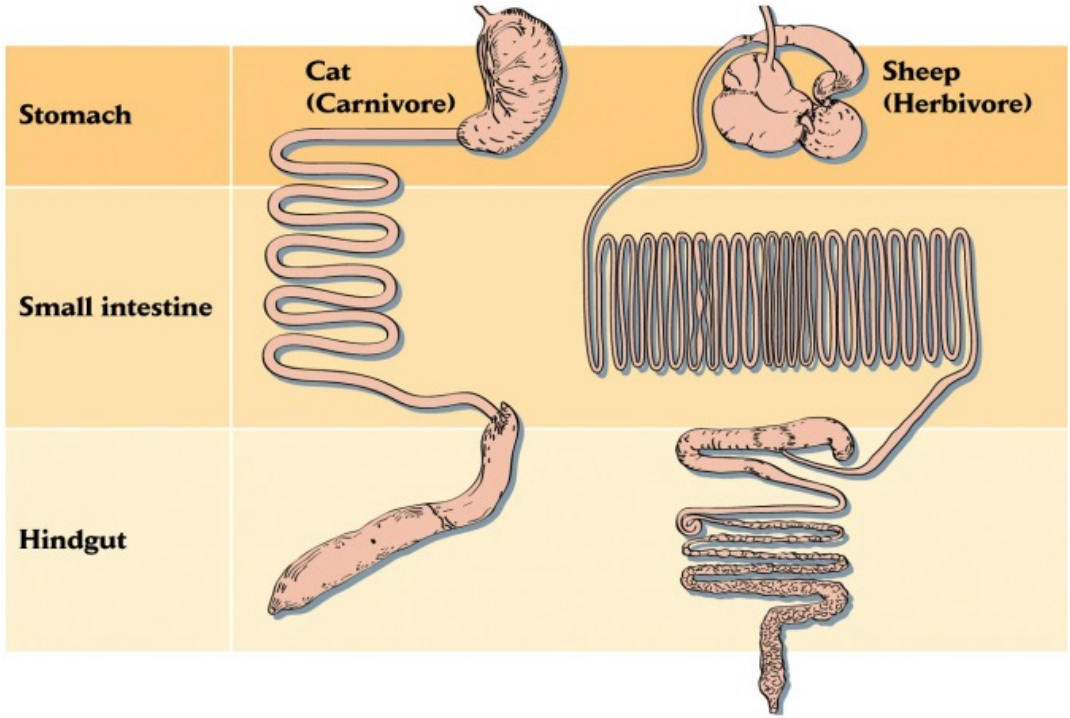
Example 1 - Dentition



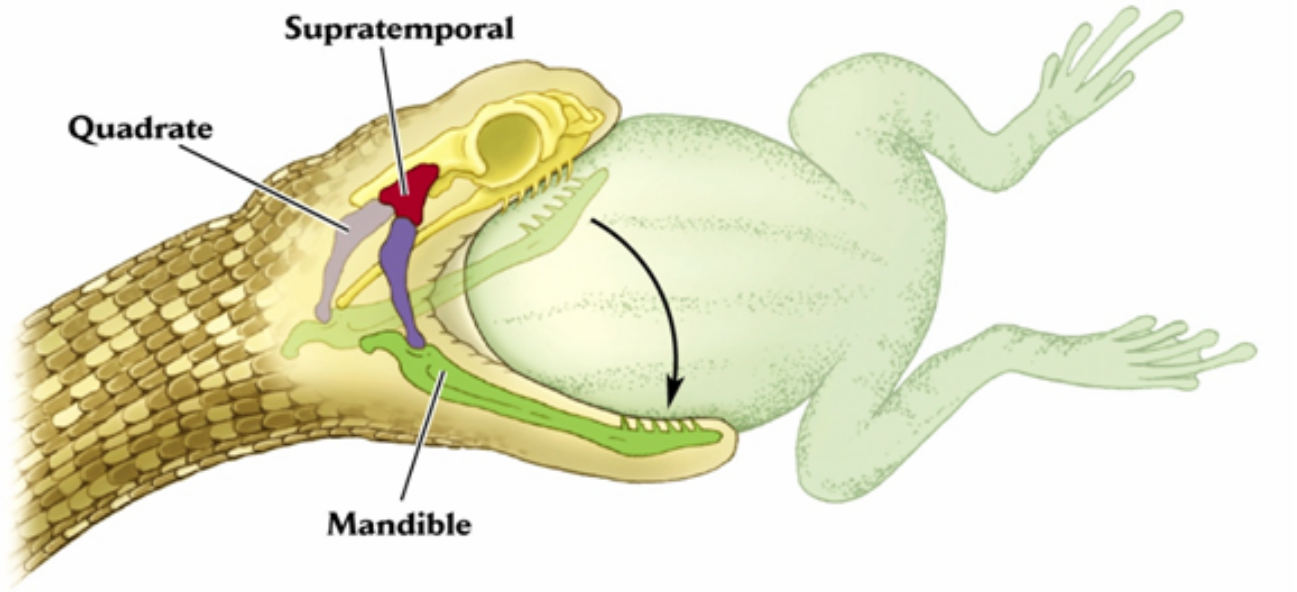
Consumers have adaptations for exploiting (digesting) their prey

Example 2 - Digestion



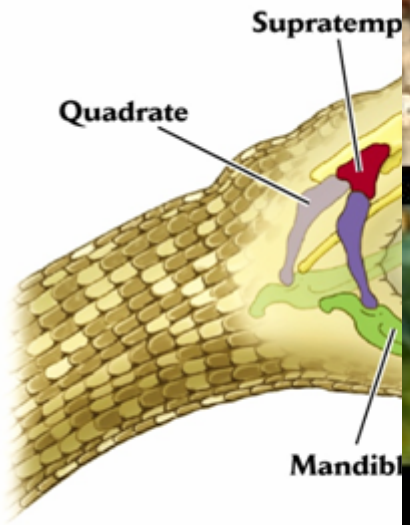
Consumers have adaptations for exploiting (catching!) their prey

Example 3 – Jaw/mouth morphology



Consumers have adaptations for exploiting (catching!) their prey

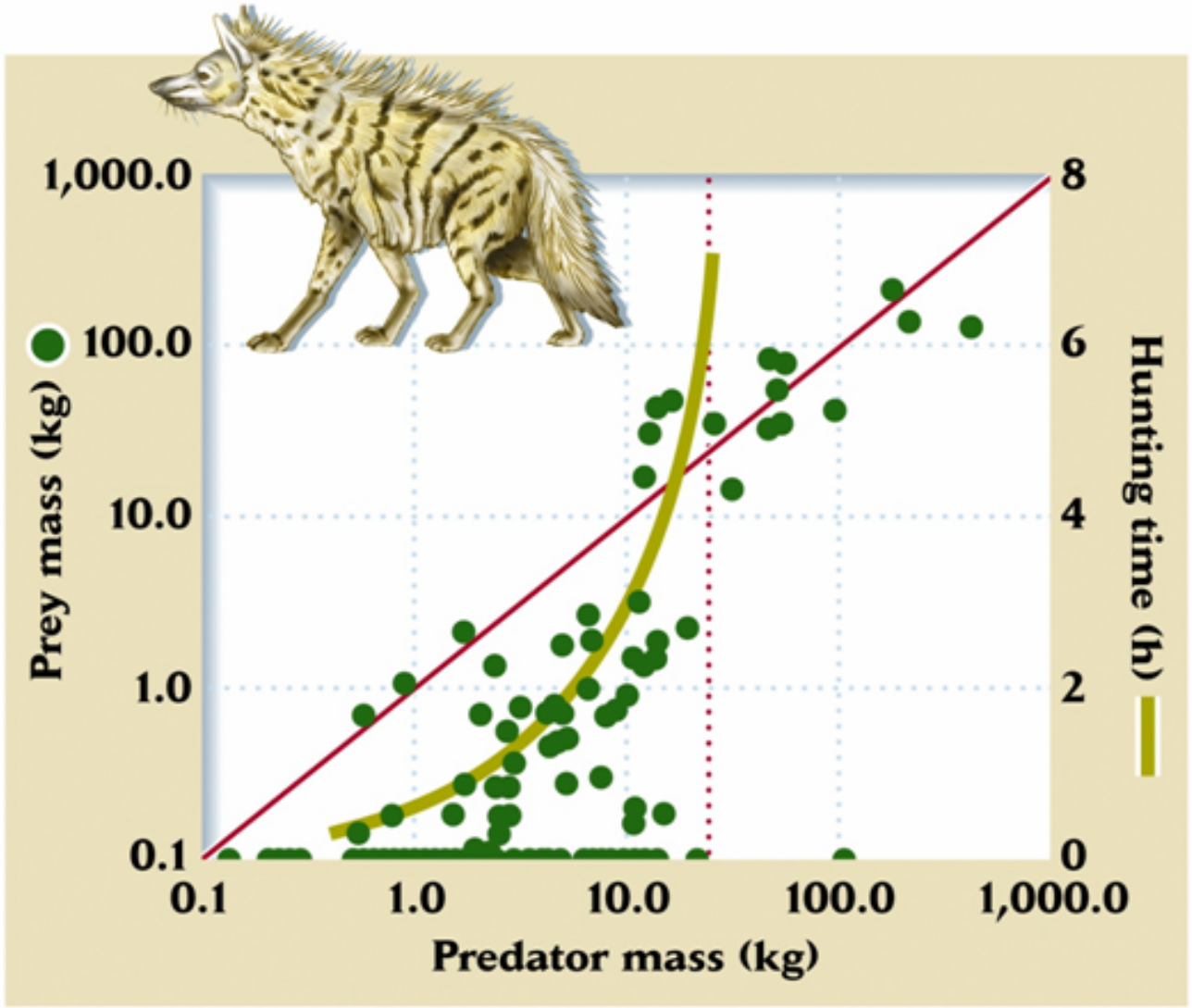
Example 3 – Jaw/mouth morphology



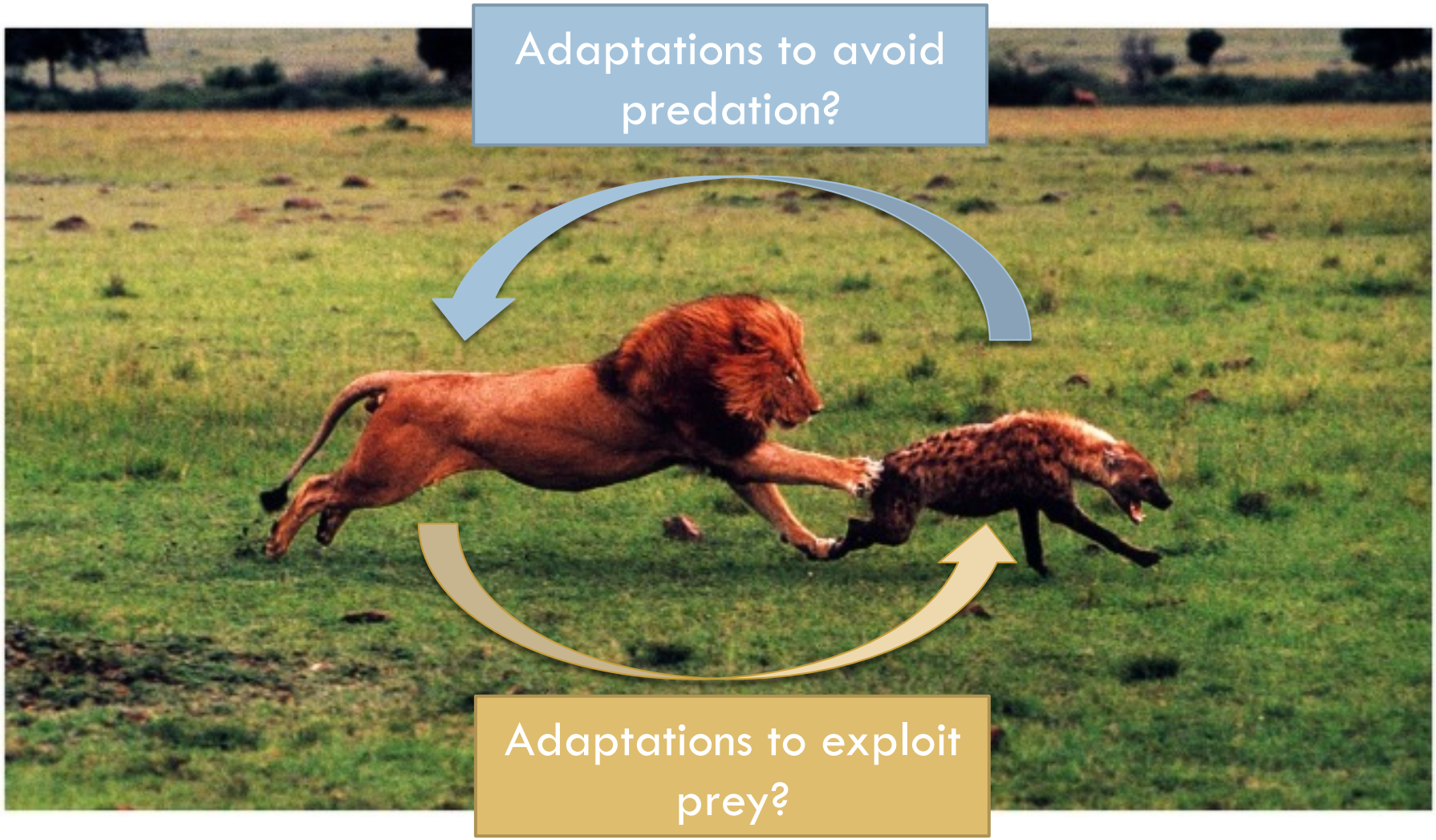
Consumers have adaptations for exploiting (catching!) their prey

Example 4 - Behavior

Mammalian predator size vs. prey size



Morphology (physical defense), chemical, crypsis, mimicry, behaviour



Morphology (jaws, claws, dentition, digestion), behaviour

Prey have adaptations for escaping their predators

Example 1. Crypsis and coloration

(a) mantid

(b) Lantern fly

(c) Stick insect

Prey have adaptations for escaping their predators

Example 1. Crypsis and coloration

Prey have adaptations for escaping their predators

Example 2. Chemistry

Prey have adaptations for escaping their predators

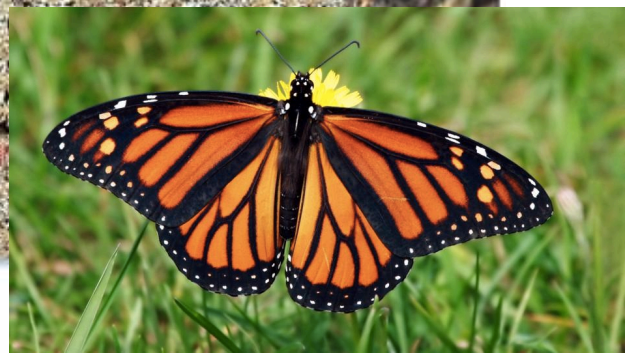
Example 2. Chemistry

(a)

(c)

Warning coloration

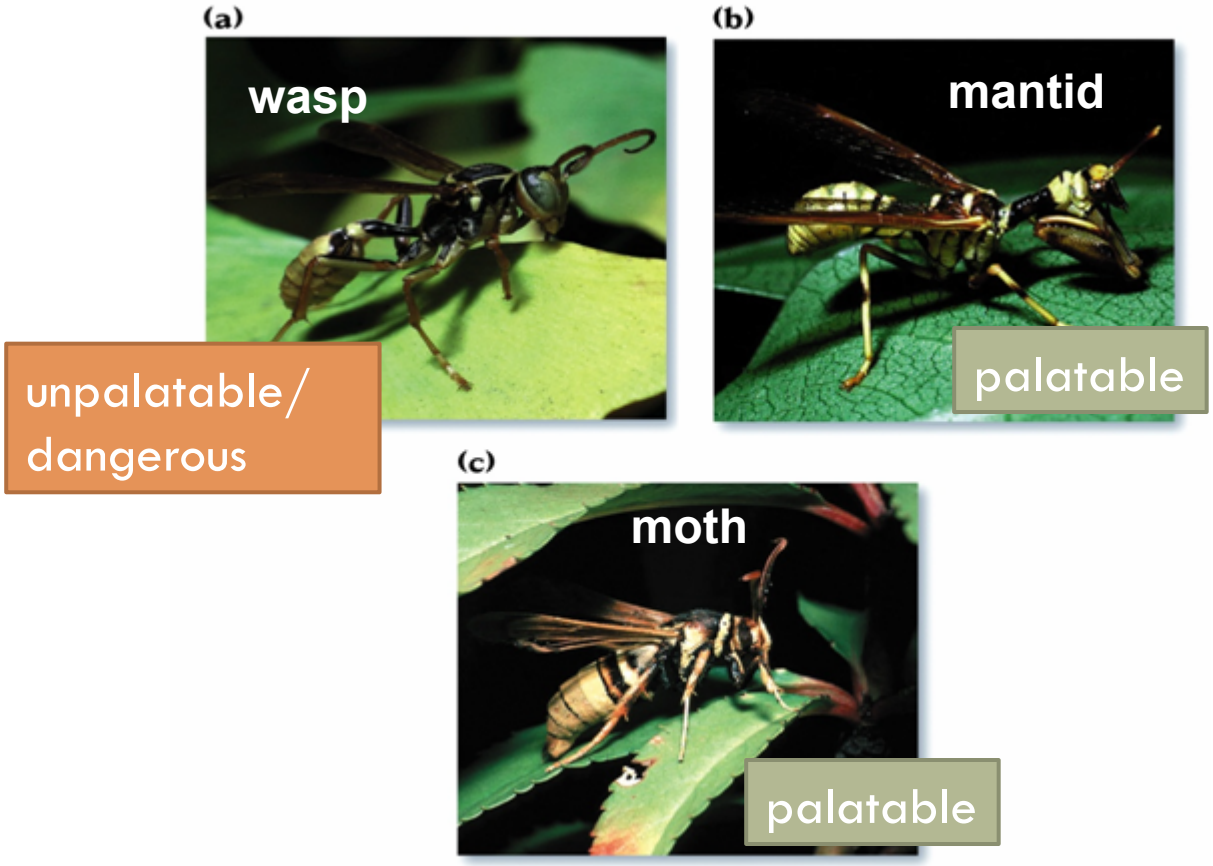
(b)



Prey have adaptations for escaping their predators

Example 3. Mimicry

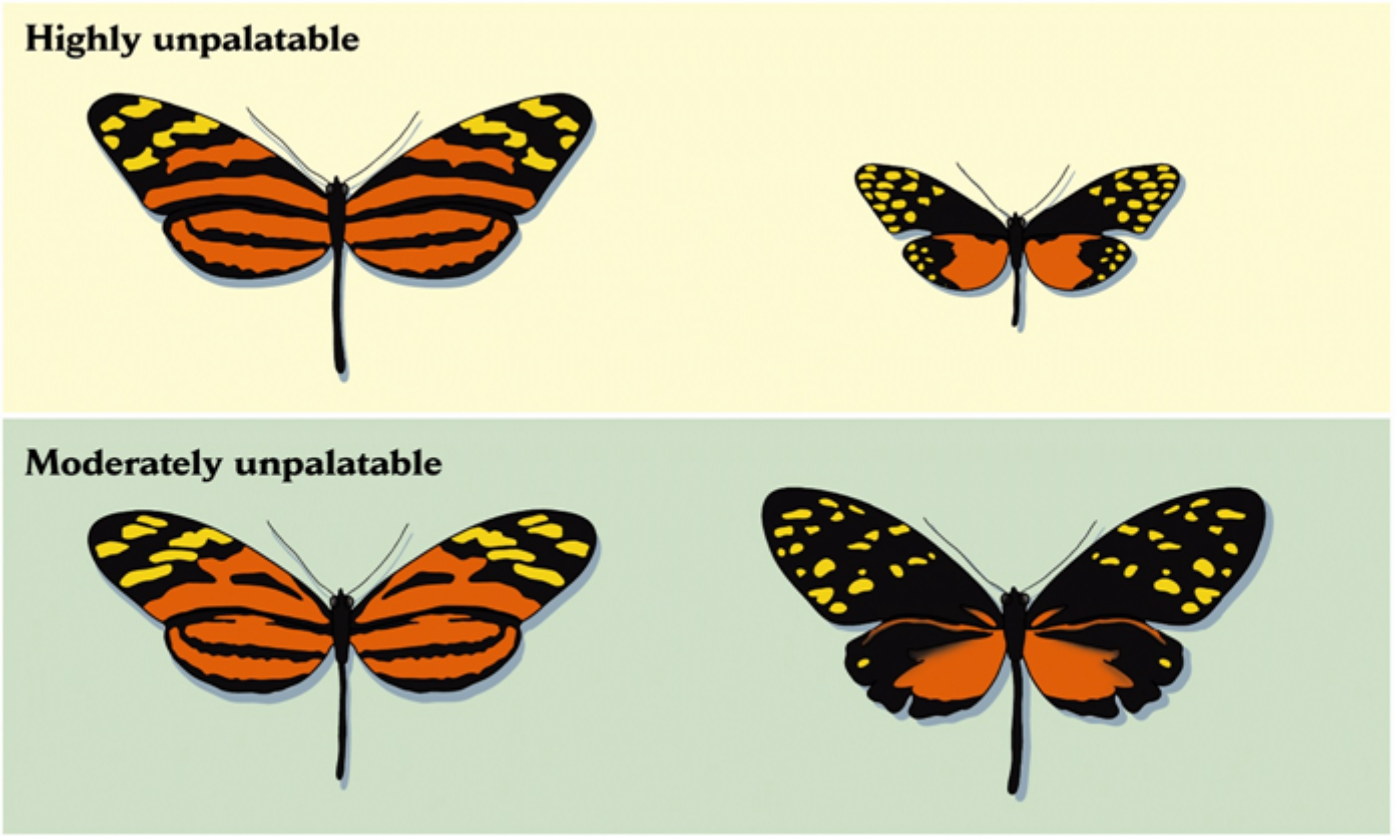
Batesian mimics are palatable organisms that look like noxious ones



Prey have adaptations for escaping their predators

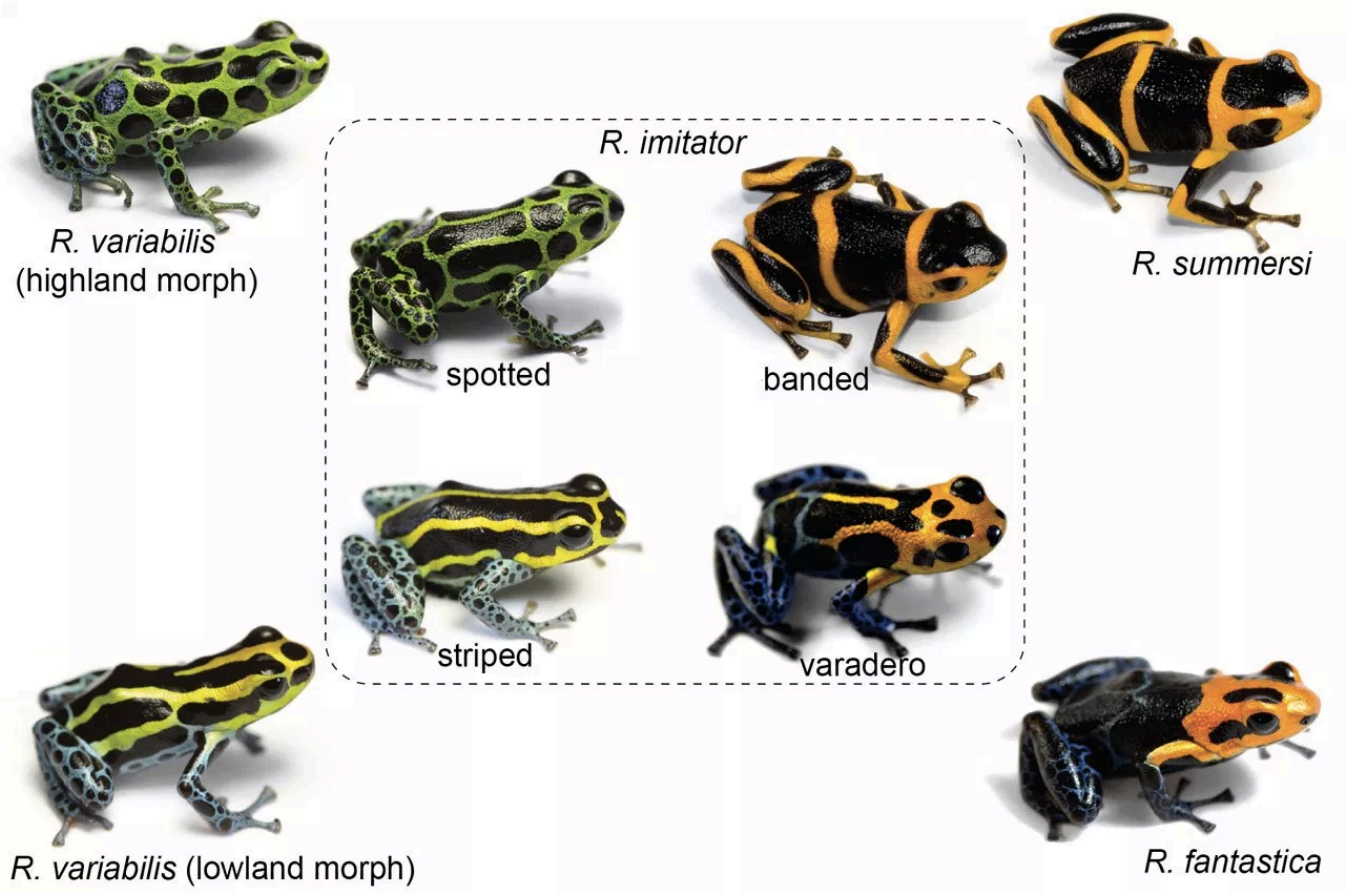
Example 3. Mimicry

Mullerian mimics are noxious organisms that share warning coloration



Heliconias butterflies

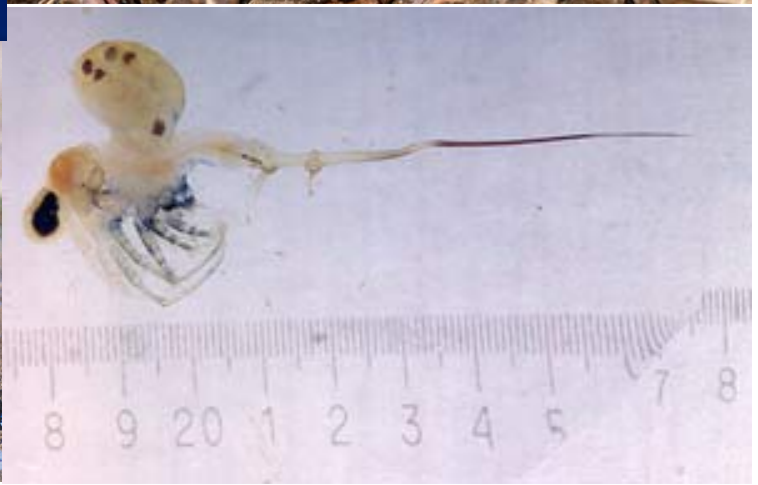
Mullerian mimicry: *Ranitomeya* frogs in Peru



Twomey et al. 2016. The American Naturalist 187:205–224.

Prey have adaptations for escaping their predators

Example 4. Mechanical and morphological defenses



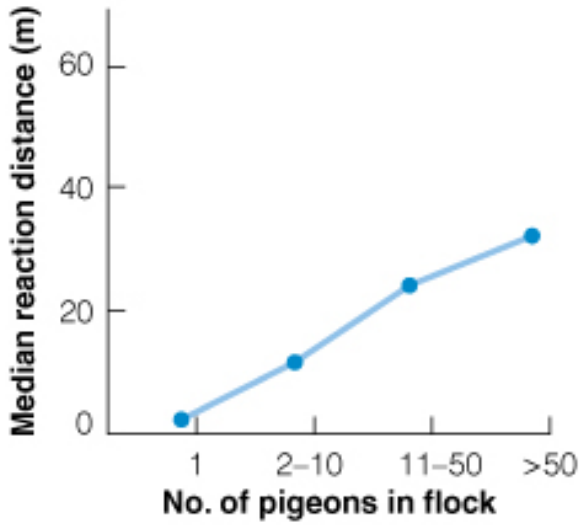
Prey have adaptations for escaping their predators

Example 5. Behavior

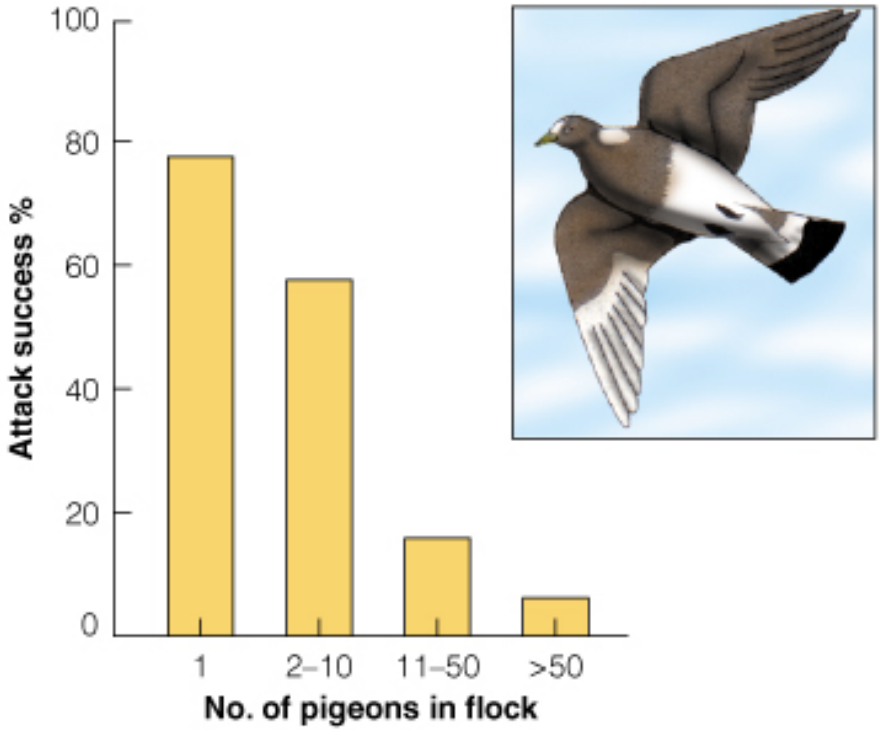
Dunlin sandpipers

Prey have adaptations for escaping their predators

Example 5. Behavior



(a)



(b)

Prey have adaptations for escaping their predators

Example 5. Behavior

Copepod migration in lakes and the ocean

"Diel Vertical Migration"