

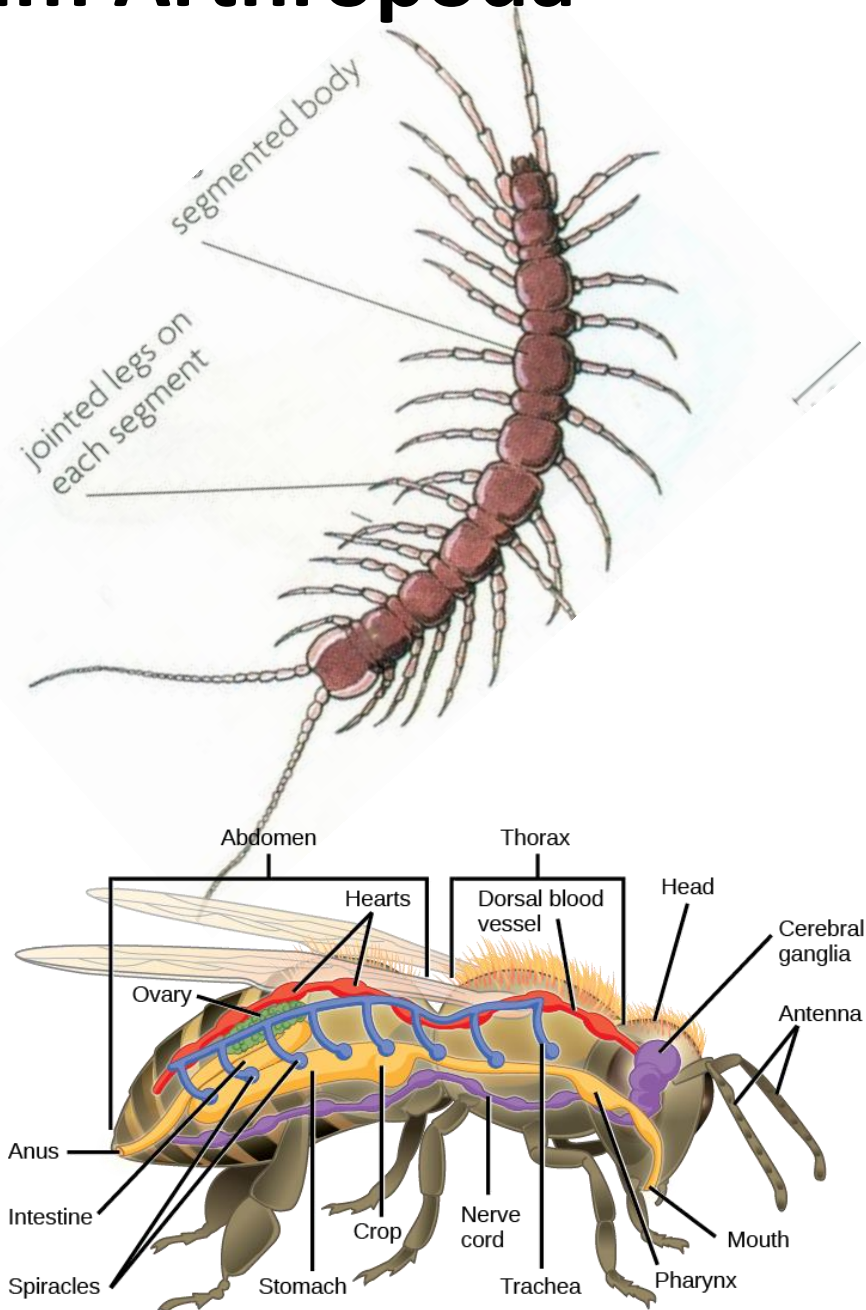
Introductory Entomology

ENT-302

3(2-1)

Characters of Phylum Arthropoda

- Segmented body
- Sclerotized exoskeleton
- Paired jointed appendages
- Bilateral symmetry
- Body cavity
- Division of gut
- Dorsal blood vessel
- Ventral nervous system
- Striated muscles



Phylum Arthropoda and its classification

All arthropods have:

- A hard skeleton on the outside of their body
- Jointed legs

Arthropods

2 pairs of antennae
5 or more pairs of legs

Crustaceans



3 pairs of legs
1 or two pairs of wings

Insects



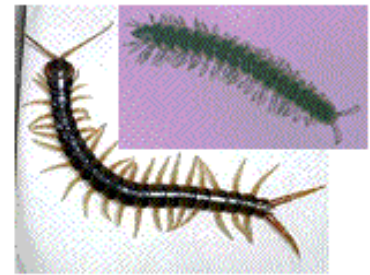
No antennae
4 pairs of legs

Spiders



Many segments
with legs on

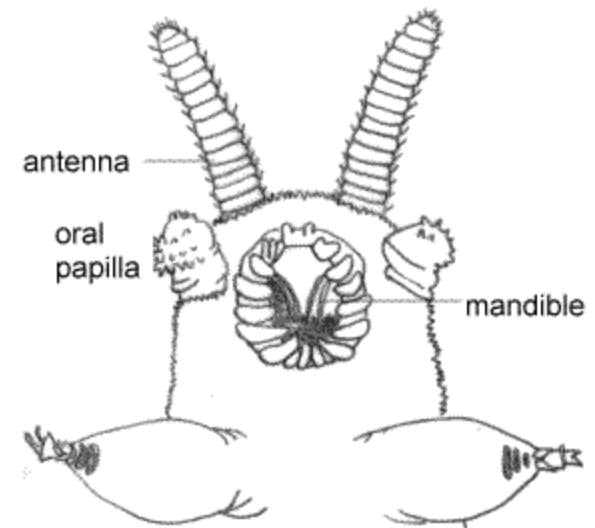
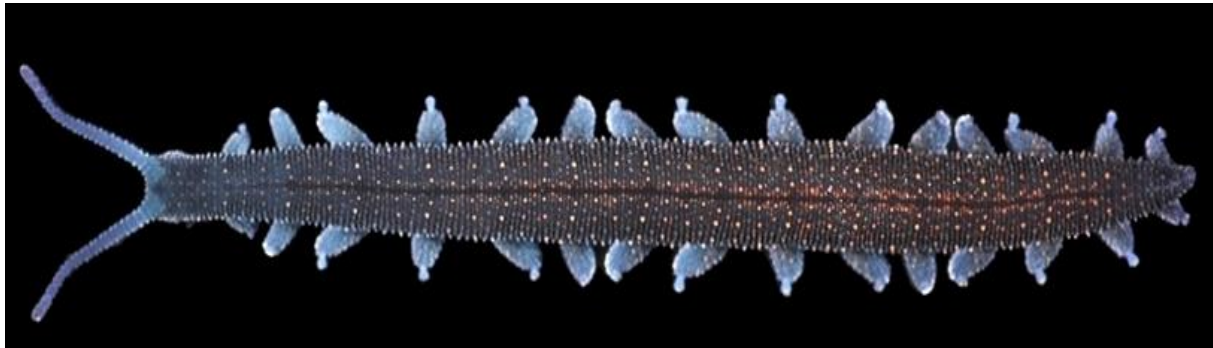
Centipedes Millipedes



Classes of Phylum Arthropoda

Class Onychophora:

- The body is almost cylindrical.
- Apparently unsegmented and differentiated into head and trunk.
- The head contains a pair of short, thick, ringed antennae, a pair of simple eyes, a pair of oral papillae and a circular mouth below.
- The trunk bears at least 15 pairs of stumpy legs.
- The respiration is through tracheae.
- It include *Peripatus*, etc.



Classes of Phylum Arthropoda

Class Chilopoda:

- The body is long, flattened and divided into head and trunk.
- The head bears pair of long antennae and usually two clusters of simple eyes.
- The trunk carries 15 or more pair of legs on each segment, the first pair modified as poison-claws.
- They respire through tracheae.
- It include centipedes or hundred-legged worms, etc.



Classes of Phylum Arthropoda

Class Diplopoda:

- The body is long, cylindrical and divided into head and trunk.
- The head contains a pair of short antennae and usually two clusters of simple eyes.
- The trunk bears two pairs of legs on each segment, except first four segments (1st is without and 2-4 each with a pair of legs).
- They respire through tracheae.
- It includes millipedes or thousand-legged worms.



Classes of Phylum Arthropoda

Class Symphyla:

- These are very small arthropods in which the body is divided into head and trunk.
- The head contains a pair of long antennae and no eyes.
- The trunk has 12 pairs of legs and ends in a pair of stout cerci.
- Tracheae are the respiratory organs.
- It includes symphylans.



Classes of Phylum Arthropoda

Class Pauropoda:

- These are minute arthropods with body divided into head and trunk.
- The head bears a pair of 3-branched antennae and no eyes.
- The trunk has 9 pairs of legs.
- Tracheae are the respiratory organs.
- It includes pauropods.



Classes of Phylum Arthropoda

Class Arachnida:

- The body is divided into cephalothorax (head + thorax) and abdomen (both division fused into a single structure in a mite).
- The cephalothorax bear a pair of very small chelicerae, a pair of pedipalpi (having pincers in scorpion), four pairs of walking legs, two to eight simple eyes and no antennae.
- The abdomen is long, segmented and with a terminal sting (in scorpion) or short, unsegmented and fused with the cephalothorax (in mite).
- They respire through book-lungs (i.e. leaf like external gills present on the base of ventral side of abdomen), tracheae or body wall.
- It includes scorpions, spiders, ticks and mites.



garden spider



water spider



tick



scorpion



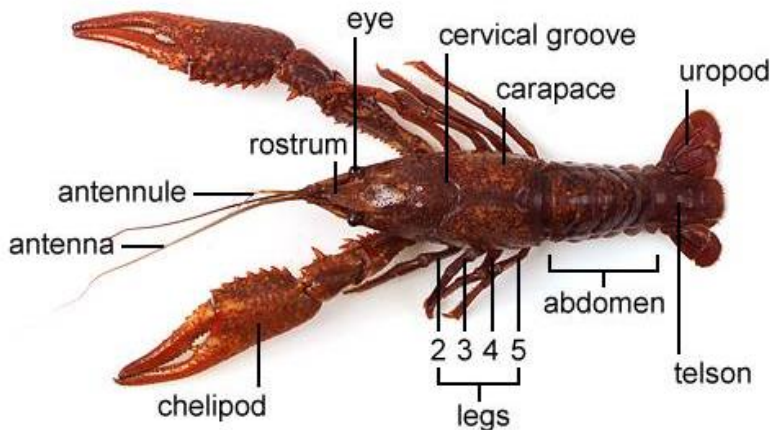
Pavel Kravinsky

www.natureinfo.com

Classes of Phylum Arthropoda

Class Crustacea:

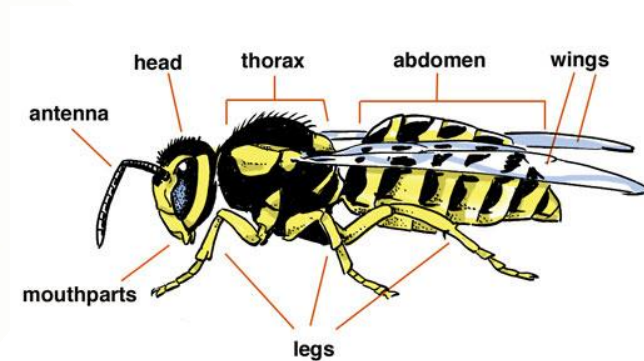
- The body is divided into cephalothorax and abdomen.
- The cephalothorax is covered by a hard carapace and bears two pairs of antennae (long antennae and short antennules), a pair of stalked compound eyes and five pairs of walking legs (the first pair is modified into chelipeds having chelae or pincers at the end).
- The abdomen carries five pairs of swimming legs or swimmerets, a telson and uropods (absent in crab).
- They respire through gills or body wall.
- It includes crayfish, crabs, prawns, lobster, barnacles, etc.



Classes of Phylum Arthropoda

Class Insecta (Hexapoda):

- The body of an adult insect is divided into head, thorax and abdomen.
- Head contains a pair of antennae (absent in order Portura), Usually a pair of compound eyes and mouthparts.
- Thorax bears three pairs of legs and usually one or two pairs of wings.
- The abdomen carries generally a pair of cerci and genitalia.
- The respiration is through tracheae which open out by means of spiracles.
- It includes grasshoppers, bugs, butterflies, house flies, wasps and beetles, etc.

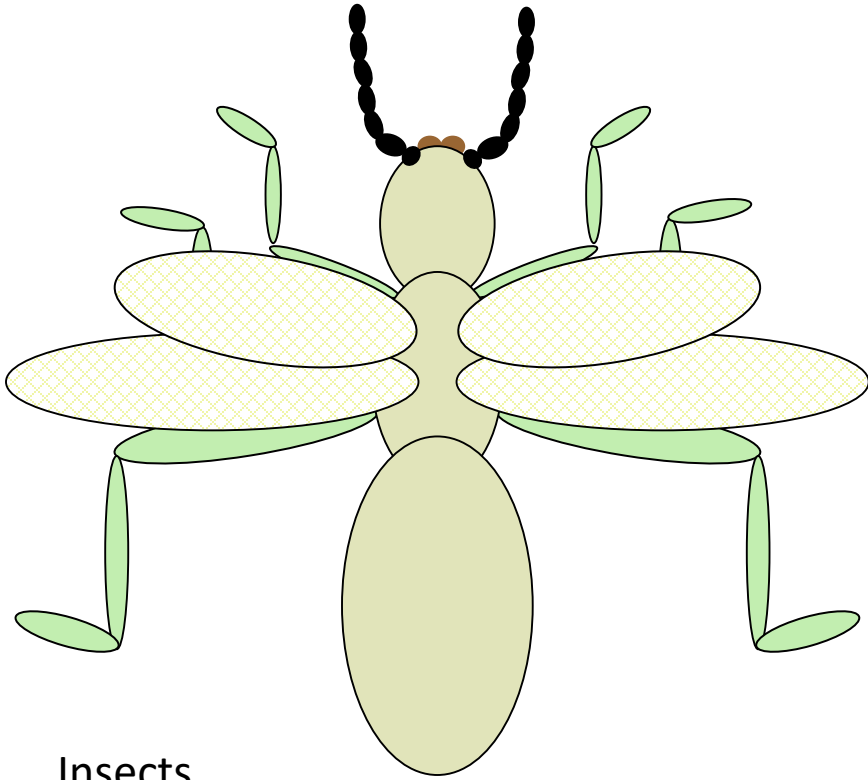


Definition of Entomology

Entomology (from Greek έντομος, entomos, "that is cut into pieces or segmented", hence "insect"; and -λογία, -logia is to discuss) is the scientific study of insects.

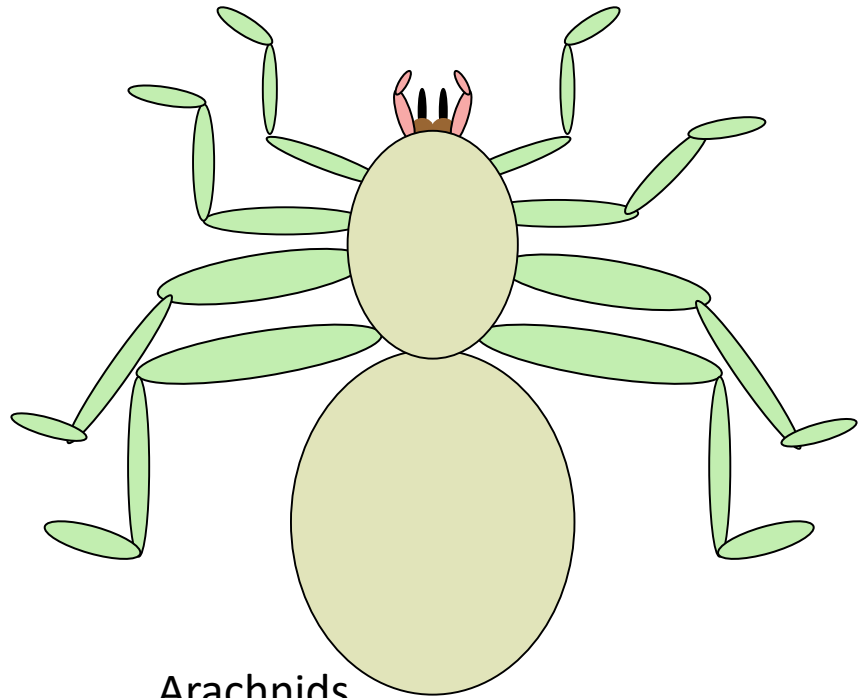


Insects vs Arachnids



Insects

- 3 body regions
- 1 pair of antennae
- 3 pair of legs
- 2 pair of wings



Arachnids

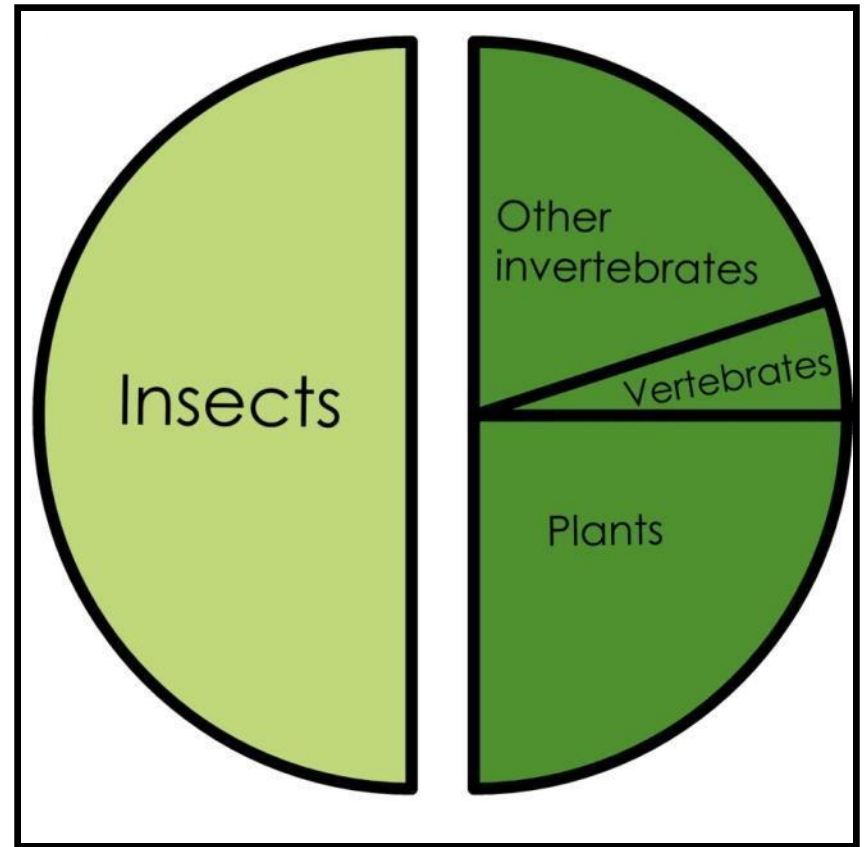
- 2 body regions
- No antennae
- 4 pair of legs
- No wings

Are these insects?



Insects rule the world!

- There are more insects than all other plants and animals combined
- There are more than 1 million different species
- 1 out of every 5 animals is a beetle!



Why are insects so successful?

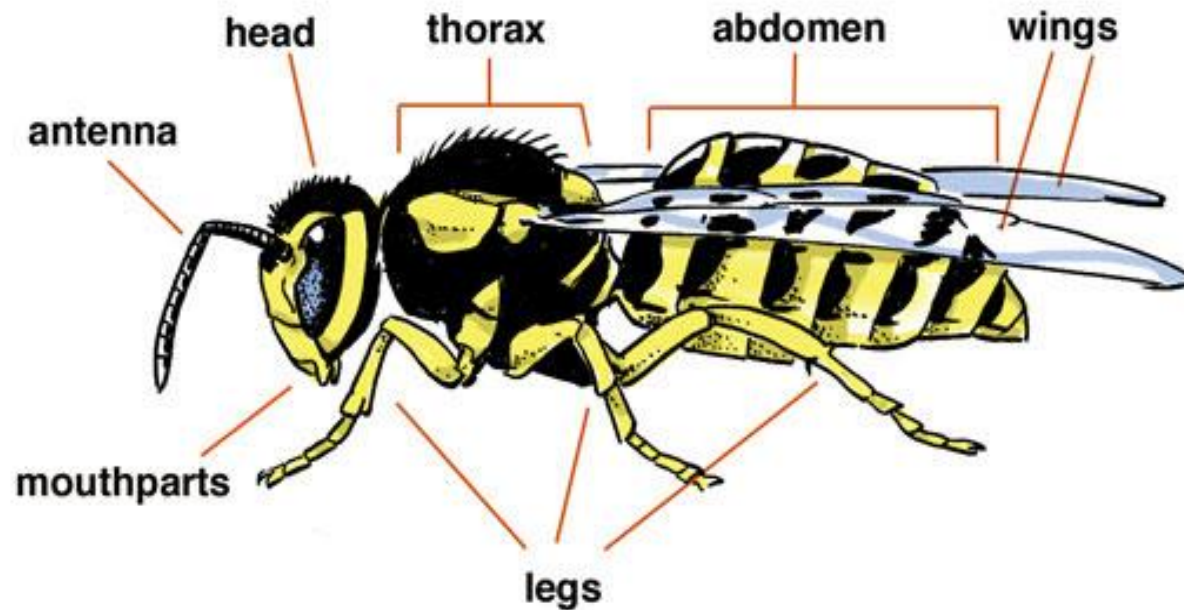


- Small Body size
- Multigenerational
- Flight
- Metamorphosis
- Wide variety in food choices
- Wide variety in habitat resources

Insects eat everything

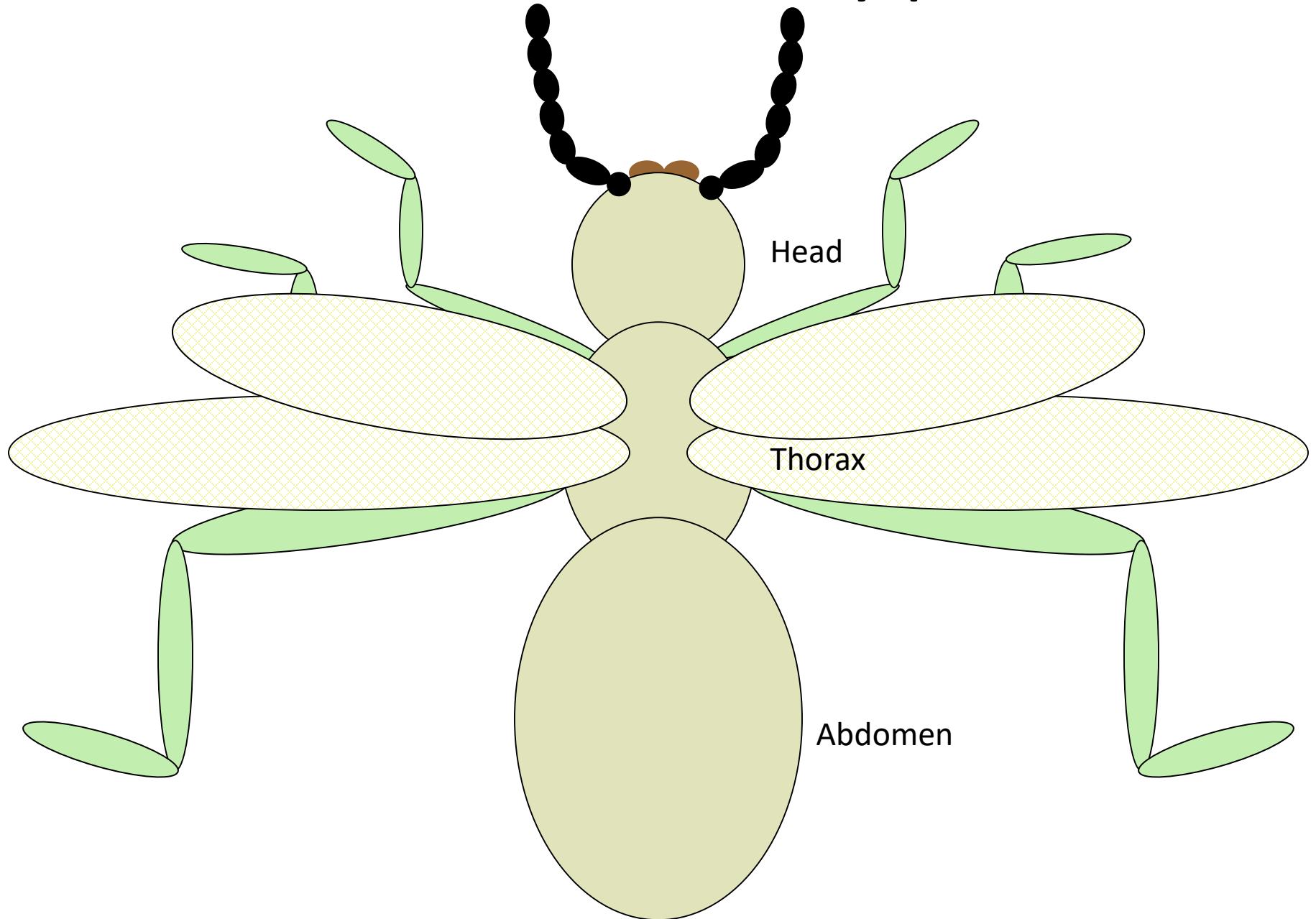
- Carnivore, animal matter
- Herbivore, plant matter
- Omnivore, plant and animal matter
- Detrivore, organic matter
- Saprophore, decaying matter

Definition of Insect



An arthropod member (of class insecta) with body divided into three regions i.e. head bearing a pair of antennae , a pair of compound eyes and mouthparts ; thorax bearing three pairs of legs and usually two pairs of wings; and abdomen that bears genitalia.

Basic insect body plan



Basic insect body plan

Abdomen

Thorax

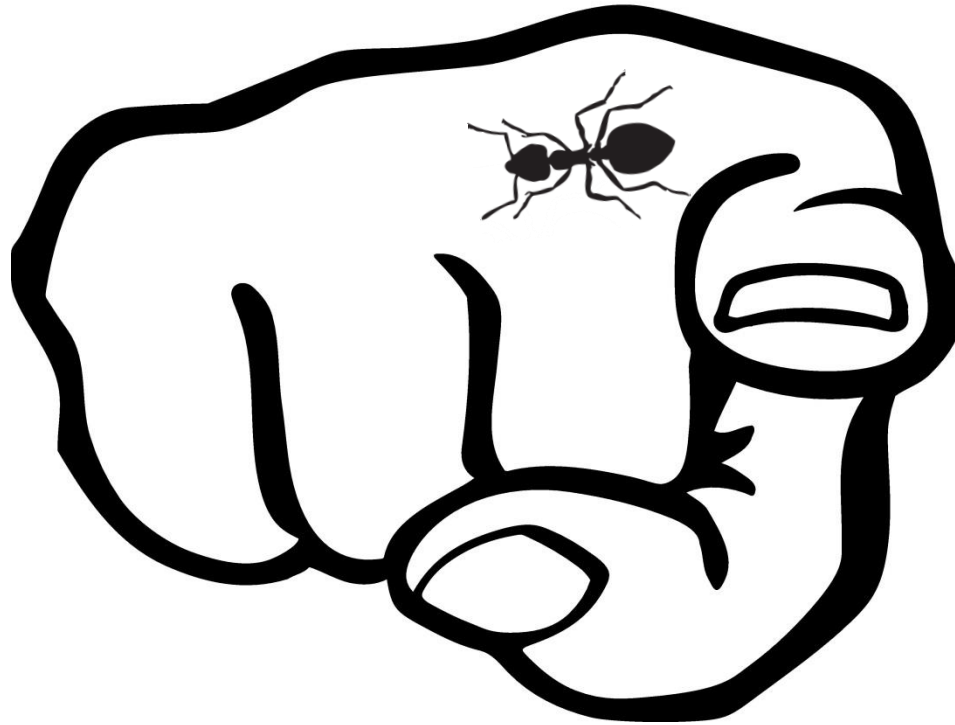
Head



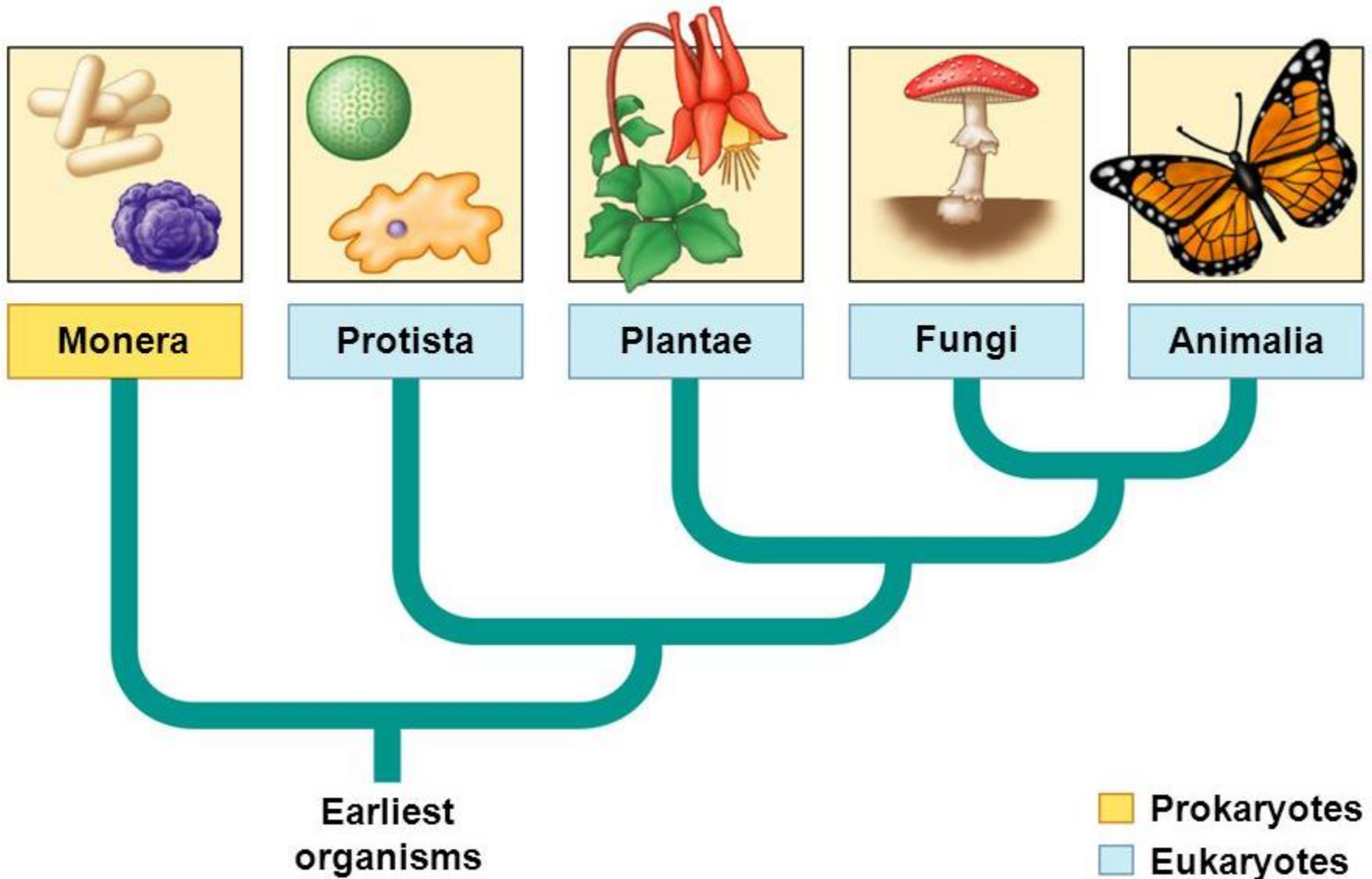
Joseph Berger, Bugwood.org

5393436

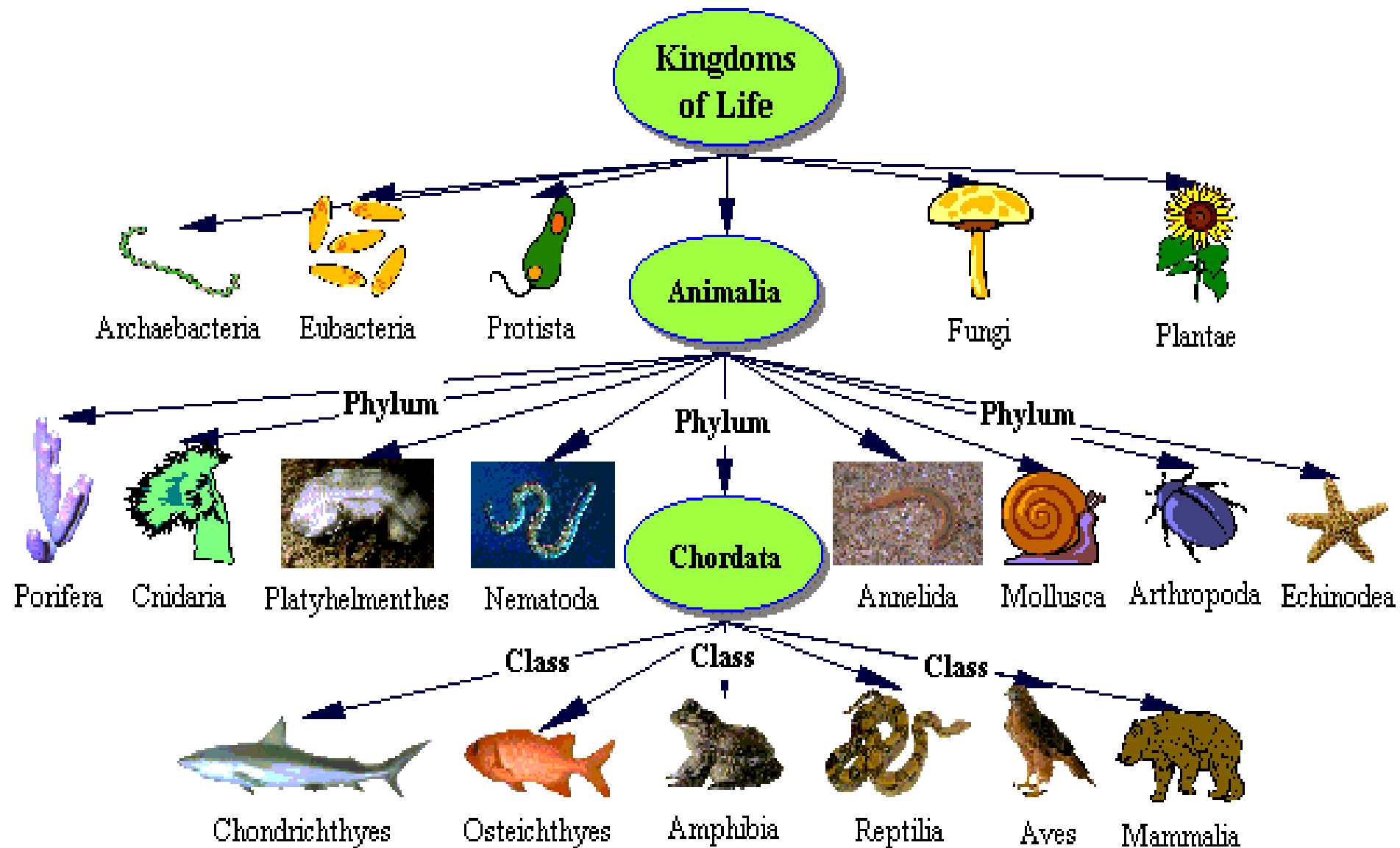
**Can you name some different
types of insects?**



Classification of Living things



Classification of Living things



Classification of Insects

Kingdom:	<u>Animalia</u>
Phylum:	<u>Arthropoda</u>
Class:	<u>Insecta</u>
Order:	<u>Diptera</u>
Section:	<u>Schizophora</u>
Family:	<u>Muscidae</u>
Genus:	<u>Musca</u>
Species:	<i>M. domestica</i>

