
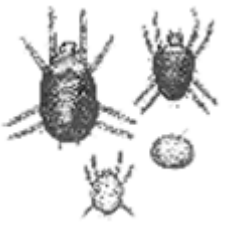



Introduction to Phylum Arthropoda

Table 1: Classes of Phylum Arthropoda

Phylum Arthropoda	Common name/ examples	Characteristics
Phylum Arthropoda jointed legs Class Arachnida Class Chilopoda Class Diplopoda Class Crustacea Epiclass Hexapoda Class Entognatha Class Insecta (Ectognatha)	spiders, mites, insects	1. Segmented body. 2. Paired segmented appendages. 3. Bilateral symmetry. 4. Chitinous exoskeleton. 5. Tubular alimentary canal with mouth and anus. 6. Open circulatory system, a tubular dorsal blood vessel. 7. Body cavity or coelom. 8. Nervous system of anterior ganglia and paired nerve cords. 9. Striated muscles in skeletal system. 10. Respiration by gills, tracheae, or spiracle.
Class Arachnida		
Order Araneae: spiders 	Common families: wolf spiders, jumping spiders, crab spiders, trap door spiders, orb weaver spiders (pictured), funnel web spiders, cobweb weavers, ground spiders All spiders are beneficial, and most are harmless to humans. Potentially dangerous spiders include brown recluse spider and black widow spider, but bites are uncommon.	Book lungs; two body regions (cephalothorax, abdomen) and chelicerae or fangs with venom glands. Most make webs. Poor eyesight, so hairs compensate for it. Wolf spiders and jumping spiders have excellent eyesight.
Order Acari: ticks and mites 	Common species: spruce spider mite, two spotted spider mite, honeylocust spider mite, European red mite, clover mite, cyclamen mite, broad mite, rust mite, eriophyid mite, etc.	Book lungs; mites have only one noticeable body region. Newly hatched larvae 3 pairs of legs; after first molt four pairs of legs. Instars are called nymphs. Many are microscopic or close to it.
Order Opiliones: daddy longlegs 	Common species: daddy longlegs	Book lungs; very long legs; one apparent body region; abdomen and cephalothorax short; active at night; detritus feeders; some predators. Harmless; commonly encountered. Feed in leaf litter; feed on fruit such as blackberries, raspberries, and strawberries.



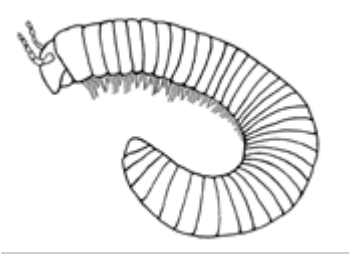
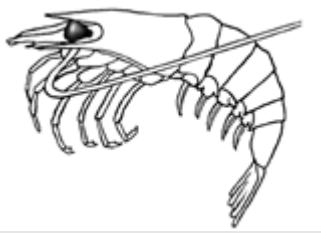
<p>Order Scorpiones: scorpions</p> 	<p>Common species: bark scorpions (pictured), desert hairy scorpions, vaejovid scorpions; most are harmless.</p>	<p>Book lungs; long tail ending in stinger; venomous; pedipalps modified as pinchers. Nocturnal predators of other small animals.</p>
<p>Class Chilopoda: Centipedes</p>		
 <p style="text-align: center; font-size: small;">University of Sydney</p>	<p>Common species: centipedes</p>	<p>Many body segments; 1 pair of legs per body segment; 1 pair of antennae; 1st pair of legs modified into venomous fangs; predators.</p>
<p>Class Diplopoda: Millipedes</p>		
 <p style="text-align: center; font-size: small;">University of Sydney</p>	<p>Common species: millipedes</p>	<p>Many body segments; 2 pair of legs per body segment; 1 pair of antennae; detritivores.</p>
<p>Class Crustacea: Crabs, Lobsters</p>		
 <p style="text-align: center; font-size: small;">University of Sydney</p>	<p>Common species: crayfish, crabs, shrimp, isopods</p>	<p>Several body regions - head, thorax and abdomen; segments may be fused; varied number of legs; 2 pairs of antennae.</p>

Table 2: Classes of Epiclass Hexapoda

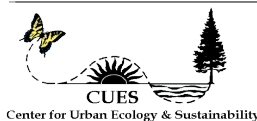
Epiclass Hexapoda					
General Characteristics:					
1. Three distinct head regions: head, thorax, abdomen					
2. One pair antenna,					
3. One pair of mandibles,					
4. One pair of maxillae.					
5. Three pairs of legs on thorax; tracheal respiratory system- composed of tubes, with holes (spiracles) through body that admit air.					
Mouthparts	Metamorphosis	Order/Meaning	Common Name	Morphological Characteristic	Ecology/ Food
Class Entognatha					
Apterygota/wingless Entognatha: mouthparts withdrawn in head	ametabolous/ no metamorphosis	Order Protura	proturans	no eyes; no antennae; very small; wingless adults; difference between nymphs and adults is size	detritivores
Apterygota/wingless mouthparts withdrawn in head	ametabolous/ no metamorphosis	Order Collembola	springtails	furcula or fork-like springing structures; simple eyes; antennae; wingless adults; difference between nymphs and adults is size	detritivores
Apterygota/wingless mouthparts withdrawn in head	ametabolous/ no metamorphosis	Order Diplura	diplurans	two caudal filaments; compound eyes; antennae; wingless adults; difference between nymphs and adults is size	detritivores

Class Insecta (Ectognatha)					
Apterygota/wingless Ectognatha: protruding mouthparts Ametabolous/ no metamorphosis	ametabolous/ no metamorphosis	Order Thysanura s. str. (Zygentoma)	silverfish	three tail like appendages body flattened and covered with scales; wingless adults; difference between nymphs and adults is size	detritivores
Pterygota means winged Paleoptera: Members of paleopterous insects cannot fold their wings back over their abdomens. protruding mouthparts hemimetabolous/ incomplete metamorphosis	hemimetabolous/ incomplete metamorphosis	Order Ephemeroptera live for a day	mayflies	wings at rest held over body; 2-3 caudal filaments; winged adults; nymphs and adults in different habitat; nymphs and adults different in appearance	herbivores
Pterygota Paleoptera protruding mouthparts	hemimetabolous/ incomplete metamorphosis	Order Odonata toothed mandibles	dragonflies and damselflies	winged adults; nymphs and adults in different habitat; nymphs and adults different in appearance	predators
Pterygota means winged Neoptera: Neopterous insects	hemimetabolous/ incomplete metamorphosis	Order Plecoptera folded wings	stoneflies	winged adults; nymphs and adults in same habitat;	herbivores detritivores predators

can fold wings with structures at the base of wings protruding mouthparts				nymphs and adults different in appearance	
Pterygota Neoptera protruding mouthparts Incomplete metamorphosis: Egg, nymph, adult	paurometabolous/ gradual/ incomplete metamorphosis	Order Phasmatodea phantom	walking sticks	winged adults; nymphs and adults in same habitat; nymphs and adults similar in appearance	herbivores
Pterygota Neoptera protruding mouthparts	paurometabolous/ gradual/ incomplete metamorphosis	Order Orthoptera straight wings	grasshoppers, crickets, katydids	winged adults; nymphs and adults in same habitat; nymphs and adults similar in appearance	herbivores
Pterygota Neoptera protruding mouthparts	paurometabolous/ gradual/ incomplete metamorphosis	Order Mantodea soothsayer	mantids	winged adults; nymphs and adults in same habitat; nymphs and adults similar in appearance	predators
Pterygota Neoptera protruding mouthparts	paurometabolous/ gradual/ incomplete metamorphosis	Order Blattaria	cockroaches	winged adults; nymphs and adults in same habitat; nymphs and adults similar in appearance	detritivores
Pterygota Neoptera protruding mouthparts	paurometabolous/ gradual/ incomplete metamorphosis	Order Isoptera equal wings	termites	winged adults; nymphs and adults in same habitat; nymphs and adults similar in appearance	wood feeders
Pterygota Neoptera protruding mouthparts	paurometabolous/ gradual/ incomplete metamorphosis	Order Dermaptera skin-like front wings	earwigs	winged adults; nymphs and adults in same habitat; nymphs and adults similar in appearance	detritivores
Pterygota Neoptera protruding mouthparts	paurometabolous/ gradual/ incomplete metamorphosis	Order Zoaptera pure wingless	zoapterans	winged adults; nymphs and adults in same habitat and similar appearance	detritivores
Pterygota Neoptera protruding mouthparts	paurometabolous/ gradual/ incomplete metamorphosis	Order Psocoptera rubbing or gnawing	psocids	winged adults; nymphs and adults in same habitat and similar appearance	detritivores
Pterygota Neoptera protruding mouthparts	paurometabolous/ gradual/ incomplete metamorphosis	Order Phthiraptera without wings Mallophaga, chewing lice; Anoplura, sucking lice	lice	nymphs and adults in same habitat and similar appearance	parasites
Pterygota Neoptera protruding mouthparts	paurometabolous/ gradual/ incomplete metamorphosis	Order Hemiptera/ suborder Heteroptera half wings; basal portion usually thickened and distal membranous	bugs	winged adults; nymphs and adults in same habitat and similar appearance	herbivores predators parasites
Pterygota Neoptera protruding mouthparts	paurometabolous/ gradual/ incomplete metamorphosis	Order Hemiptera/ suborders Auchenorrhyncha Sternorrhyncha	cicadas, tree hoppers, plant hoppers, psyllids,	winged adults; nymphs and adults in same habitat and similar appearance	herbivores

		front wings uniform in texture	whiteflies, aphids, scales		
Pterygota Neoptera protruding mouthparts	paurometabolous/ gradual/ incomplete metamorphosis	Order Thysanoptera fringed wings	thrips	winged adults; nymphs and adults in same habitat and similar appearance	herbivores
Pterygota Neoptera protruding mouthparts Complete metamorphosis: Egg, larva, pupa protruding mouthparts	holometabolous/ complete metamorphosis	Order Neuroptera nerve winged	lacewings, antlions owlflies	winged adults; nymphs and adults in same habitat; not in similar appearance	predators
Pterygota Neoptera protruding mouthparts	holometabolous/ complete metamorphosis	Order Coleoptera sheath or covered wing; elytra	beetles	winged adults; nymphs and adults in same habitat; not similar appearance	herbivores predators detritivores
Pterygota Neoptera protruding mouthparts	holometabolous/ complete metamorphosis	Order Mecoptera long wings	scorpionflies	winged adults; nymphs and adults in same habitat; not similar appearance	predators
Pterygota Neoptera protruding mouthparts	holometabolous/ complete metamorphosis	Order Siphonoptera tube and wingless	fleas	winged adults; nymphs and adults in same habitat; not similar appearance	parasites
Pterygota Neoptera protruding mouthparts	holometabolous/ complete metamorphosis	Order Diptera two wings, 2nd pair of wings halteres	flies	winged adults; nymphs and adults in same habitat; not similar appearance	herbivores predators detritivores parasites parasitoids
Pterygota Neoptera protruding mouthparts	holometabolous/ complete metamorphosis	Order Trichoptera hair wings	caddisflies	winged adults; nymphs and adults in same habitat; not similar appearance	predators
Pterygota Neoptera protruding mouthparts	holometabolous/ complete metamorphosis	Order Lepidoptera scale wings	moth and butterflies	winged adults; nymphs and adults in same habitat; not similar appearance	herbivores
Pterygota Neoptera protruding mouthparts	holometabolous/ complete metamorphosis	Order Hymenoptera union front back wings by hamuli (on hind wings)	sawflies, parasitic, wasps, ants, bees	winged adults; nymphs and adults in same habitat; not similar appearance	herbivores predators parasitoids

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