Higher invertebrates
P. Mollusca

- clams, oysters, scallops, abalone, squid, octopus, snails
- Body plan—head, foot (classified by this), visceral mass w/ organs (digestive, circulatory, reproductive)
- Many have shell (secreted by mantle)
- Gills to obtain oxygen from water
Class Gastropods

• “Stomach foot”
• limpets, snails, slugs, abalone, whelks, nudibranches
• 1 shell (except seahares, one)
• radula—tongue w/ teeth
• herbivores and eat algae & plants
• some are predators (use radula to drill hole in oysters; others poison fish)
Helix aspera (garden snail)
Class Bivalves

- clams, oysters, mussels, scallops
- 2-part shell
- foot used for anchoring and burrowing
- does not have a head, radula, or eyes
- uses gill for oxygen and filter-feeding
Class Cephalopods ("head foot")

- octopus, squid, nautilus
- some have shell
- head modified → tentacles
- radula to draw prey in mouth
- beak for crushing prey
- advanced eyes (like vertebrates)
- most intelligent invertebrates
P. Annelida “segmented worms”

- annelida = little rings
- earthworms, leeches
- marine, fresh water, and land
- *advancement—segments (repeating units) and hydrostatic skeleton
- setae/bristles for movement
- skin breathers (no respiratory system)
- well-developed digestive, circulatory, reproductive, and nervous systems
Class Oligochaetes—earthworm

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- all monoecious
- clittelum to make cocoon
- digestive tract—mouth, pharynx, esophagus, crop, gizzard, intestine, anus
Class Hirudinea—leeches

- fresh water ectoparasites
- use suckers to attach to host’s skin and then use jaws and anesthetic
- secretion anticoagulant (hirudin)
- old remedy—used for blood letting
- new remedy—improve healing and circulation after reconnection of appendages
Class polychaeta—“many bristles”

- marine
- some predators, others filter feeders
- head w/ tentacles, eyes, jaws
- paired appendages/segment = parapodia “paired feet”
- for swimming and burrowing, water circulation
P. Arthropods “jointed foot”

• crustaceans, crabs, lobsters, shrimp, arachnids (spiders, ticks, scorpions), insects, centipedes, and millipedes

• related by segmentation, exoskeleton, jointed appendages

• jointed appendages paired and used for feeding, movement, senses, and reproduction
Class Crustaceans

- *Daphnia* (water flea), pill bugs (land), barnacles, copepods, lobster
- 2 pair antenna, carapace (hard exoskeleton), 5 pairs of legs (first pair = claws)
Class Insects

• 3 body regions—head, thorax, abdomen
• compound eyes, 1 pair antenna/head, 2 pairs wings/thorax
• metamorphosis
Class Arachnids

- 2 body regions—cephalothorax and abdomen
- cephalothorax has several eyes, chelicerae (mouth parts, pincer like or fangs in spiders), sensory pedipalps, 4 pairs of walking legs
- spiders have spinneret appendages to weave webs of silk
- spiders’ fangs can have venom
- no antennae or wings
• Sorry but have arachnid phobia. Dangerous ones in USA are recluse and black widow. In memory of Cleo the tarantula who passed away recently this semester.
• **Class Centipedes**
  - long segmented bodies
  - 1 pr legs/segment
  - flat body
  - aggressive predators
  - prey on earthworms
  - and insects
  - Venomous fangs/claws

• **Class millipedes**
  - long segmented bodies
  - 2 pr legs/seg.
  - cylindrical body
  - scavengers