



Lab 6: An Introduction to Animal Diversity

Most people, when they think of animals, think of those similar to ourselves: dogs, cats, horses, apes, tigers and other mammals. However, the Kingdom Animalia is in fact a very diverse one, with mammals being just a minor group in terms of numbers of species. Actually, in terms of diversity and numbers, the Arthropods are far and away dominant and arguably the most important group ecologically. This lab features some of the more common animal Phyla. Work in pairs, using this handout as a guide to examine the names, characteristics and examples from each of the phyla represented. Major characteristics are provided. Also, space is available for you to

sketch representative members of this kingdom and take additional notes.

Kingdom Animalia Major Characteristics:

Major Ecological Roles:

Commercial, economic and medical importance to us:

Taxonomy:

Kingdom:

Phyla:

Class:

Order:

Family:

Genus:

Species:

There are purportedly hundreds of phyla in the Animal Kingdom. However, general agreement among taxonomists exists for only approximately 33 or 34. In today's lab, we will examine only some of those. At the end of today's lab you should be able to name these phyla, their general characteristics and be able to accurately place specimens into their correct phyla. In a few cases, we will show you various classes of a phyla.

Phyla Name	Description
Porifera (sponges)	No tissues, organs, nervous system, appendages Most asymmetrical (a few radial) Have internal skeleton of CaCO ₃ or silica Filter feeders by circulating water through pores
Cnidaria	Jellyfish, anemones, Hydra, corals Radial symmetry Polyp body plan: sessile (stalked as Hydra, anemones) or medusa body plan (jellyfish) Loose tissue layers Stinging cells for offense/defense (some stings are lethal to humans) Cnidaria= nettle Corals make reefs of CaCO ₃ which they secrete around their soft bodies: very, very important ecologically and economically.
Platyhelminthes	Flatworms, flukes, tapeworms Many parasitic, some free-living (usually aquatic) Primitive nervous system (except tapeworm) Incomplete digestive system (what goes in/comes out of same opening) 1 st to show bilateral symmetry with cephalization
Nematoda	Unsegmented round worms Both parasitic and free living No true body segmentation/ Trichinella (parasite of us, pigs) Ascaris (intestinal round worm) Tubatrix (the vinegar eel)

	<p>Soil nematodes such as <i>Caenorhabditis elegans</i> (genetics studies)</p> <p>Bilateral symmetry</p> <p>Complete digestive tract (mouth to anus)</p> <p>Primitive nervous system</p>
Mollusca	<p>Clams, snails, mussels, slugs, abalone, squid, octopus etc</p> <p>Body enclosed in a thin mantle which secretes a shell of one, two or eight parts. (ie: snail=1, clam=2, chiton=8)</p> <p>Have ventral muscular foot modified for crawling (as a snail), burrowing (as a clam, or swimming as a squid.</p> <p>Mollusca= stomach foot</p> <p>Complete digestive tract, nervous system with nerve ganglia, capable of fine, directed movement,</p> <p>Squid, octopi especially smart</p> <p>Most with a radula (feeding structure with rows of teeth)</p> <p>Used either for scraping up food (snail) or grasping prey (squid)</p> <p>Most free living, not parasitic, most marine</p>
Annelida	<p>Segmented worms, earthworms, leeches, marine worms</p> <p>Segmented bodies composed of many similar and ringlike segments, Annelida= little ring</p> <p>This segmentation is visible externally and internally</p> <p>Move by use of fluid filled hydrostatic skeleton, bilat. Symmetry</p> <p>Complete digestive tract, closed circulatory system (blood flows thru discrete vessels)</p> <p>Most free living: earthworms, marine worms,</p> <p>Some ectoparasitic: leeches</p>

Arthropoda	<p>85% of animal kingdom Biggest, most diverse and most important phylum Contains 1 million + species, body usually segmented Exoskeleton made of chitin (proteinaceous, hard, impermeable covering), bilateral symmetry, complete digestive tract, elaborately jointed appendages 3 major classes Crustacea: crabs, shrimps, lobsters, crayfish, barnacles, 10+ appendages, most marine Arachnida: spiders, scorpions, ticks, mites, body in 2 major segments, 8 legs, wingless Insecta: grasshoppers, flies, moths, butterflies, beetles, bees, lice, etc, most abundant, diverse & widespread of all animals, body in 3 major segments (head, thorax, abdomen), 6 legs, most winged as adults</p>
Echinodermata	<p>Seastars, urchins, sand dollars, brittle stars, sea cucumbers Radial symmetry as adults, larvae are bilateral, No head, brain segmentation, skin with tiny projections Show some chordate characteristics embryologically</p>
Chordate	<p>Fish, amphibians, reptiles, birds, mammals At some point in their life cycles, all chordates have a dorsal nerve cord running down the back, a notochord (cartilage supporting rod lying just beneath the nerve cord), pharyngeal gill slits</p>

Subphylum: Vertebrata	Most chordates are in this group Backbone or vertebral column' INCLUDES THE FOLLOWING CLASSES
CLASSES of Chordates	<p>Chondrichthyes: sharks and rays. Fish w/ cartilaginous skeletons, not bone</p> <p>Osteichthyes: trout, salmon, goldfish, Have a bony skeleton, gills covered by operculum</p> <p>Amphibia: frogs, toads, newts, salamanders Have dual life: adults usually terrestrial, larvae are aquatic with gills, most thin skinned, eggs without shells, First vertebrates to live out of water, new features for life on land include legs, lungs (not in all), nostrils, Ectothermic (body temp varies according to outside, environmental temp)</p> <p>Reptilia: lizards. Snakes, turtles, tortoises, crocs and alligators, dinosaurs, 1st vertebrates completely adapted to terrestrial living Shelled, amniotic eggs (no need for water) Thick, scaly skin, retards water loss Limbs capable of rapid locomotion (lacking in snakes) Ectothermic with behavioral temperature regulation Internal fertilization (why important for land dwellers)</p>

	<p>AVES: birds, feathers (same derivation as reptile scales, Endothermic (constant body temp maintained at high cost)</p> <p>Front limbs modified for flight in most</p> <p>Skeleton with hollow, air filled bones (reduces weight)</p> <p>No teeth (have less weighty beaks)</p> <p>Sternum enlarged, with median keel for muscle attachment to wings</p> <p>Very efficient lgs/air sac system useful for energy costs of flight</p> <p>Usually show high parental investment</p> <p>Internal fertilization</p> <p>Mammalia: rodents, bats, cats, dogs, horses, cattle, pigs</p> <p>Mammary gland on females provide milk, (also on males but not functional), have fur/hair (even on whales), usually show high parental investment</p> <p>Endothermic with generally stable body temp</p> <p>Except in hibernators</p>
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QUESTIONS

Name the phyla to which each animal below belongs.

- 1. black widow spider**
- 2. Siberian tiger**
- 3. tape worm**
- 4. seagull**
- 5. sea urchin**
- 6. sponge bob**

Describe an ecological role for the following organisms:

- a) earthworms**
- b) coral**
- c) sea anemone**

Your friend tells you that they are confused between 2 words: arachnid and arthropod. Explain to them the difference.

What class of mammal do each animal below belong?

- a) Horse
- b) sting ray
- c) bald eagle
- d) dolphin
- e) dinosaur

Name 1 more class of mammals not mentioned above and give an example.

What characteristics define the term “Mammal”?

What general characteristics are possessed by both animal kingdom and plant kingdom? What characteristics do they not share?