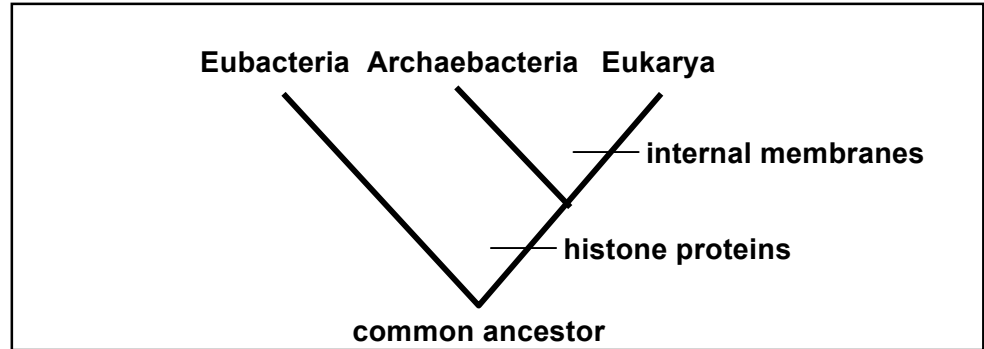


REVIEW UNIT 7: BIODIVERSITY (CLASSIFICATION / TAXONOMY / SYSTEMATICS)

DOMAINS

1. Cladogram or phylogenetic tree (an evolutionary tree diagram) illustrating the relationship between the three domains.



2. Key characteristics that distinguish the three domains.

DOMAIN	CHARACTERISTICS	EXAMPLES
Bacteria (Eubacteria)	unicellular prokaryotes peptidoglycan cell wall, cell membrane, ribosomes no membrane-bound organelles naked DNA, single circular chromosome, asexual reproduction = binary fission heterotrophs, photoautotrophs, chemoautotrophs rods, spheres, spirals; Gram positive & negative stain	Bacillus, <i>E. coli</i> , Streptococcus Cyanobacteria = “blue-green algae”
Archaeobacteria	unicellular prokaryotes cell wall (no peptidoglycans), cell membrane, ribosomes, no membrane-bound organelles DNA + histone proteins, single circular chromosome asexual reproduction = binary fission extremophiles: halophiles, thermophiles, methanogens	<i>Methanococcus</i> , <i>Halobacterium</i> , <i>Thermoproteus</i>
Eukarya	unicellular & multicellular eukaryotes membrane-bound organelles: nucleus, mitochondria, chloroplasts, Golgi complex, ER, lysosomes heterotrophs, autotrophs	animals, plants, protists, fungi

EUKARYOTIC KINGDOMS

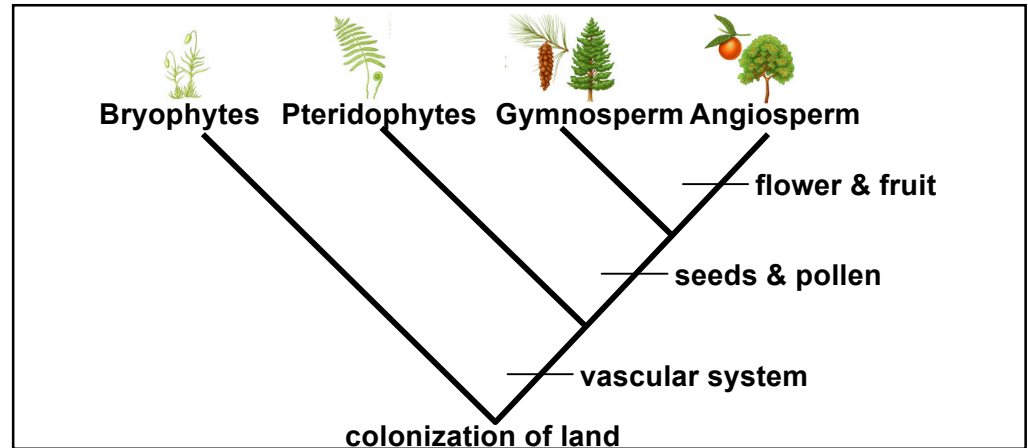
3. Key characteristics that distinguish the four kingdoms of the Domain Eukarya.

KINGDOM	MODE OF NUTRITION	CELL WALL	REPRODUCTION	OTHER
Protista	autotrophs (algae) heterotrophs (predators)	<ul style="list-style-type: none"> • some have cell wall • some have only cell membrane • diatoms & forams have silica (glass) cell walls 	<ul style="list-style-type: none"> • mostly asexual <ul style="list-style-type: none"> - binary fission - budding • sometimes sexual 	<ul style="list-style-type: none"> • photoplankton & zooplankton • locomotion via flagella, cilia, pseudopods • mostly unicellular & some multicellular • examples: Euglena, Amoeba, Paramecium, kelp
Fungi	heterotrophs (by absorption)	Cell wall (chitin)	<ul style="list-style-type: none"> • mostly sexual <ul style="list-style-type: none"> - + and - strains • asexual for unicellular yeast 	<ul style="list-style-type: none"> • multi-nucleated cells • Basidiomycetes = mushrooms • bread mold • yeast
Plantae	autotrophs (photosynthesis)	Cell wall (cellulose)	<ul style="list-style-type: none"> • sexual <ul style="list-style-type: none"> - alternation of generations - spores & seeds • asexual <ul style="list-style-type: none"> - cuttings, tubers, etc. 	<ul style="list-style-type: none"> • mosses • ferns • gymnosperm • angiosperm
Animalia	heterotrophs (by ingestion)	No	sexual (gametes)	<ul style="list-style-type: none"> • all multicellular • invertebrates: sponges, worms, molluscs, arthropods • vertebrates: fish, amphibians, reptiles, birds, mammals

Name _____

EUKARYOTES: PLANTS

4. Cladogram or phylogenetic tree (an evolutionary tree diagram) illustrating the relationship between the four groups of land plants.

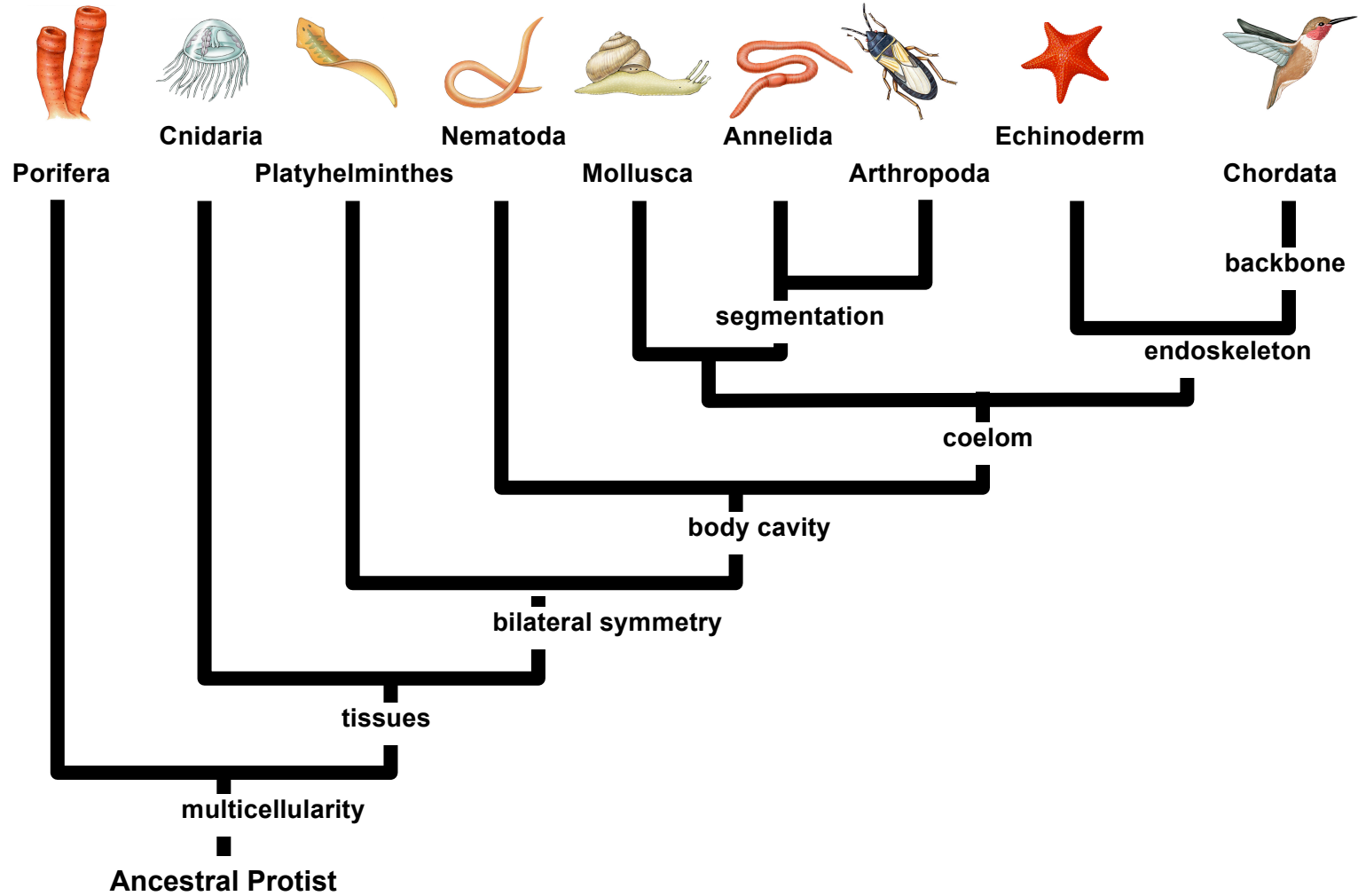


5. Key characteristics that distinguish the four groups of land plants.

PLANT GROUP	VASCULAR SYSTEM	GAMETOPHYTE & SPOROPHYTE	REPRODUCTION	OTHER
Bryophytes (mosses)	No	<ul style="list-style-type: none"> • dominant gametophyte • dependent sporophyte 	<ul style="list-style-type: none"> • spores • motile sperm 	mosses, liverworts
Pteridophytes (ferns)	Yes "tracheophytes"	<ul style="list-style-type: none"> • dominant sporophyte • independent fragile gametophyte 	<ul style="list-style-type: none"> • spores • motile sperm 	ferns & horsetails
Gymnosperm (conifers)	Yes "tracheophytes"	<ul style="list-style-type: none"> • dominant sporophyte • highly reduced gametophyte <ul style="list-style-type: none"> - male gametophyte in pollen - female gametophyte in ovule 	<ul style="list-style-type: none"> • heterospory • cones • pollen in male cones <ul style="list-style-type: none"> - wind pollinated • egg & seeds in female cones 	pinus, spruce, fir, redwood, cycads, Ginkgo
Angiosperm (flowering plants)	Yes "tracheophytes"	<ul style="list-style-type: none"> • dominant sporophyte • highly reduced gametophyte <ul style="list-style-type: none"> - male gametophyte in pollen - female gametophyte in ovule 	<ul style="list-style-type: none"> • heterospory • flowers <ul style="list-style-type: none"> - animal pollinators • pollen in anthers • seeds in female ovule • fruit 	monocots dicots (eudicots)

EUKARYOTES: ANIMALS

6. Cladogram or phylogenetic tree (an evolutionary tree diagram) illustrating the relationship between the groups of animals.



7. Key characteristics that distinguish the nine groups of animals.

ANIMAL GROUP	SYMMETRY	COELOM	SEGMENTATION	BODY	GUT OPENINGS	OTHER	EXAMPLES
Porifera	none	No	No	soft body	0	no specialized tissues	sponges
Cnidaria	radial	No	No	soft body	1	stinging cells nematocysts	jellyfish
Platyhelminthes	bilateral	No	No	soft body	1	many parasites	flatworms, Planaria, tapeworms
Nematoda	bilateral	No	No	soft body	2	many live in soil, pests of crops & animal parasites	roundworms, pinworm. hookworm
Mollusca	bilateral	Yes	No	soft body, shells	2	terrestrial & marine open circulatory system (except squid & octopus) protostome	snails, oysters, octopus
Annelida	bilateral	Yes	Yes	soft body	2	protostome closed circulatory system	earthworms, leeches
Arthropoda	bilateral	Yes	Yes jointed appendages	exoskeleton (chitin)	2	open circulatory system protostome	insects, crabs, (crustaceans), spiders (arachnids)
Echinodermata	radial	Yes	No	endoskeleton (Ca plates)	2	regenerate body parts open circulatory system deuterostome	starfish. sea urchins, sand dollars
Chordata	bilateral	Yes	Yes	endoskeleton backbone	2	notocord, dorsal nerve cord, tail, pharyngeal slits closed circulatory system deuterostome	fish, amphibians, reptiles, birds, mammals

EUKARYOTES: ANIMALS: VERTEBRATES

8. Key characteristics that distinguish the five subgroups of the Vertebrates.

VERTEBRATE SUBGROUP	BODY	GAS EXCHANGE	HEART	ECTO- VS. ENDOTHERM	FERTILIZATION	DEVELOPMENT	OTHER	EXAMPLES
Fish	scales, fins, tail	gills	2 chambers	ectotherm	external	external, aquatic egg	aquatic	trout, salmon, shark
Amphibian	wet skin	lungs & skin	3 chambers	ectotherm	external	external, aquatic egg, metamorphosis	first land animals, first tetrapods	frogs, salamander
Reptiles	dry skin, some are armored	lungs	3 chambers	ectotherm	internal	external, amniotic egg	first animals to remain out of water whole life	turtle, lizards, alligator
Birds (Aves)	feathers, wings, hollow bones	lungs & air sacs	4 chambers	endotherm	internal	external, amniotic egg	flight	eagles, robin, parrots
Mammals	hair	lungs	4 chambers	endotherm	internal	internal, placenta	live young, produce milk, specialized teeth	humans, rabbits, lions

EUKARYOTES: ANIMALS: VERTEBRATES: MAMMALS

9. Key characteristics that distinguish the three subgroups of the Mammals.

MAMMAL SUBGROUP	CHARACTERISTICS	EXAMPLE
Monotremes	egg-laying mammals, no mammary glands = ooze milk from skin	duck-billed platypus, echidna
Marsupials	pouched mammals, short-lived placenta so babies must develop further in pouch	kangaroo, koala, opossum
Placentals	fully developed placenta = supplies nutrients to baby in uterus & removes waste. Babies can develop to full term.	rodents, primates, elephants, canines, felines