

TEXT SUPPLEMENT (Ch 6): A Brief Summary Classification of Organisms

I. KINGDOM ARCHAEA

Phylum ARCHAEA or ARCHAEBACTERIA. A small group of simple, bacteriallike organisms with procaryotic cells. Nucleic acid sequences set these organisms apart from all other kingdoms.

Methanogens. Methane-producing organisms.

Extreme Thermophiles. Organisms adapted to living in hot springs and similar environments, with high optimal growing temperatures.

Extreme Halophiles. Organisms adapted to extremely salty environments.

II. KINGDOM EUBACTERIA

This group includes the vast majority of procaryotic organisms, with nucleic acid sequences showing homology (similarity by common descent) to the nucleic acids of eucaryotic organisms.

Phylum BACTERIA. Procaryotic organisms that lack chlorophyll *a* and do not release oxygen.

Phylum CYANOBACTERIA. Procaryotic organisms structurally similar to bacteria, but possessing chlorophyll *a* and releasing oxygen during photosynthesis.

III. KINGDOM PROTISTA

Eucaryotic single cells lacking chloroplasts or other features of kingdoms IV through VI.

Phylum SARCODINA. Protists that move by extending pseudopods.

Phylum MASTIGOPHORA. Protists that move with the help of one or more whiplike flagella.

Phylum CILIATA. Protists that move by the beating of numerous hairlike cilia.

Phylum SPOROZOA. Nonmotile protists that reproduce using spores.

IV. KINGDOM PLANTAE

Eucaryotic organisms possessing chloroplasts and similar organelles. Most are multicellular and have cell walls. Nearly all carry out photosynthesis using at least one other pigment in addition to chlorophyll *a*.

Subkingdom Thallophyta. Eucaryotic algae: Fertilized eggs (zygotes) not surrounded by sterile nonreproductive tissue.

Subkingdom Embryophyta. Plants in which zygotes are surrounded by sterile nonreproductive tissue.

Bryophyta. Nonvascular embryophytes, including mosses and liverworts.

Tracheophyta. Vascular plants.

Divisions in which seeds are not present:

Phylum PSILOPHYTA. Psilophytes.

Phylum LEPIDOPHYTA. Club mosses and other lepidophytes.

Phylum ARTHOPHYTA or SPHENOPSIDA. Horsetails and their relatives.

Phylum PTEROPHYTA. Ferns.

Divisions possessing seeds:

Phylum PTERIDOSPERMOPHYTA. Seed ferns.

Phylum CYCADOPHYTA. Cycads.

Phylum GINKGOPHYTA. Ginkgos.

Phylum CONIFEROPHYTA. Pines, spruces, and other cone-bearing plants (conifers).

Phylum GNETOPHYTA. *Gnetum*, *Ephedra*, and *Welwitschia*.

Phylum ANGIOSPERMAE or ANTHOPHYTA. Flowering plants, the largest and most successful group.

V. KINGDOM MYCOTA (FUNGI)

Eucaryotic organisms possessing cell walls but no chloroplasts, usually reproducing by spores, and carrying out absorptive nutrition.

Subkingdom MYXOMYCOTA. Slime molds. Life cycle alternates between motile cells and creeping multicellular or multinucleated aggregates that form fruiting bodies.

Subkingdom EUMYCOTA. True fungi, usually possessing branched threadlike absorptive filaments (hyphae).

VI. KINGDOM ANIMALIA

Multicellular eucaryotic organisms lacking chloroplasts and developing from a hollow ball of cells (blastula).

Phylum PORIFERA. Sponges. Animals possessing specialized cells but no organized tissues.

Phylum MESOZOA. A small group of species, containing organisms with only a few cells each, without organized tissues.

Phylum CNIDARIA. The coelenterates or cnidarians, a diverse group possessing stinging cells, and including corals, anemones, hydroids, and jellyfish. Two tissue layers (endoderm and ectoderm) present.

Phylum CTENOPHORA. ‘Comb jellies’, animals with a ‘biradial’ symmetry, like that of a two-armed pinwheel.

Phylum PLATYHELMINTHES. Flatworms, including planarias, parasitic flukes, and parasitic tapeworms. Tissues formed by three germ layers (ectoderm, mesoderm, endoderm) but no body cavity present.

Phylum RHYNCHOCOELA or NEMERTEA. Ribbon worms; similar to flatworms but with a protrusible head structure (proboscis).

Phylum NEMATODA. Roundworms, an abundant group including both free-living and parasitic species. This and the next few phyla possess a body cavity bordered by endoderm as well as mesoderm.

Phylum KINORHYNCHA. Parasitic worms related to roundworms.

Phylum GASTROTRICHA. Small wormlike animals related to roundworms.

Phylum GORDIACEA. Elongated ‘horsehair worms’.

Phylum ROTIFERA. Microscopic aquatic organisms containing a ring of cilia that beat in a circular pattern resembling a wheel.

Phylum ACANTHOCEPHALA. A group of parasitic worms with hook-studded heads.

Phylum ENTOPROCTA. A small group of filter-feeders (animals that strain small particles from the water).

Note: Phyla listed from this point on have a true body cavity (*coelom*) lined with mesoderm throughout.

Phylum PHORONIDA. A small group of filter-feeding wormlike animals.

Phylum BRYOZOA. Small filter-feeding ‘moss animals,’ usually living in colonies.

Phylum BRACHIOPODA. Filter-feeding animals with a shell composed of two unequal parts and a stalk that attaches the adults to a fixed location.

Phylum MOLLUSCA. A large and diverse group of animals possessing a cavity lined with a layer of cells that usually secretes some kind of an inflexible shell of calcium carbonate. Includes snails, clams, octopus, squid, and related species.

Phylum ANNELIDA. Segmented worms, including earthworms and sandworms.

Phylum SIPUNCULIDA. Peanut-shaped worms.

Phylum ECHIURIDA. A small wormlike group.

Phylum PENTASTOMIDA. Small parasitic worms whose head and claws give the appearance of a five-branched head.

Phylum TARDIGRADA. Tiny aquatic ‘water bears,’ segmented animals with clawed appendages.

Phylum ONYCHOPHORA. Segmented, wormlike organisms with clawed appendages.

Phylum ARTHROPODA. Animals with jointed legs, protected by an external skeleton that permits hinge-like movements between its more rigid parts.

The largest phylum of all, including crabs, lobsters, barnacles, spiders, scorpions, centipedes, millipedes, insects, extinct trilobites, and other groups.

Phylum CHAETOGNATHA. Arrow worms.

Phylum ECHINODERMATA. Crinoids, starfishes, sea urchins etc. possessing a water-vascular system, numerous tube-like feet, and in many cases a five-fold radial symmetry.

Phylum HEMICHORDATA. Acorn worms, pterobranchs, and graptolites, related to the Chordata but not sharing all chordate characteristics.

Phylum CHORDATA. Animals with a notochord (a stiff, flexible rodlike structure), a dorsal hollow nerve cord, and gill slits, each at some stage of life.

Subphylum UROCHORDATA. Sea squirts (tunicates), salps, and their relatives, with actively swimming larval stages and generally with non-motile filter-feeding adults.

Subphylum CEPHALOCHORDATA. Sea lancets such as amphioxus, with motile filter-feeding adult stages.

Subphylum VERTEBRATA. Animals with a backbone. Includes fishes (four classes), amphibians, reptiles, birds, and mammals.