Diversity of Life - Animals

Animals

- eukaryotes
- multicellular
- heterotrophs
  - acquire nutrients by ingestion (internal digestion)
- tissues (nervous tissue and muscle tissue)
Diversity of Life - Animals

Animal Evolution

- inward folding / specialization of cells  --> digestive cavity
Diversity of Life - Animals

Animal “Body-Plan” Evolution

- Radial-bilateral distinction

Radial symmetry  Bilateral symetry
Diversity of Life - Animals

Animal “Body-Plan” Evolution

- Body Cavity

Protista  Plantae  Fungi  Animalia

Eukarya

No body cavity  “True” body cavity (coelom)
Diversity of Life - Animals

95% of all animals are **invertebrates**
“no backbone”
Diversity of Life - Invertebrates

**Phylum: Porifera “sponges”**
- simplest animals
- no nerves or muscles
- 9000 species (most marine)
- Filter feeders
Phylum: Cnidarians “Jellyfish”, “Sea Anemones”

- show radial symmetry
- body has a single cavity
- stinging tentacles
- 10,000 species (most marine)
- carnivores
Diversity of Life - Invertebrates

**Phylum: Platyhelminthes “Flatworms”**
- bilateral symmetry
- 20,000 species
- some are parasitic (blood flukes, tape worms)
Diversity of Life - Invertebrates

**Phylum: Nematoda “Roundworms”**
- cylindrical bodies
- 90,000 species
- some are parasitic (pinworms, hookworms)
Diversity of Life - Invertebrates

**Phylum:** Mollusca “Snails”, “Clams”, “Octopuses”

- soft-bodied animals
- some protected by a hard shell
- 150,000 species (mostly marine)
- feed by scraping up food
**Phylum: Annelids** “Earthworms”, “Leeches”

- segmented bodies
- 15,000 species
Diversity of Life - Invertebrates

**Phylum: Arthropods**

“Crustaceans”, “Insects”, “Spiders”

- jointed appendages
- hard exoskeleton (exterior)
- 1 million species
Diversity of Life - Invertebrates

**Phylum: Echinoderms** “Sea Stars”, “Sea Urchins”

- spiny surfaces
- all marine
- endoskeleton (interior)
- most closely related to chordates (vertebrates)
Diversity of Life - Vertebrates

Features unique to vertebrates:

- cranium
- backbone
Diversity of Life - Vertebrates

Fish
- ecto-therms
- egg layers
- respire by passing water over their gills

Bony fish (Bass)
- stiff, bone skeleton
- marine / freshwater species
- swim bladder (buoyancy)

Cartilaginous fish (Sharks)
- flexible, cartilage skeleton
Diversity of Life - Vertebrates

Amphibians (Frogs, Salamanders)
- “two-lives”
  - tadpole (aquatic with gills)
  - adult (terrestrial with lungs)
- egg layers (eggs lack shells)
- Omnivores
- Tetrapods (four legs)
Diversity of Life - Vertebrates

Reptiles (Turtles, Lizards, Snakes, Alligators)
- egg layers (terrestrial, amniotic eggs)
- ectotherms
- scales
- lungs
Diversity of Life - Vertebrates

- **Birds**
  - terrestrial, amniotic eggs
  - scales on legs
  - feathers
  - body modified for flight
  - endotherms

- **Reptilian traits**

- **Fishes**

- **Amphibians**

- **Reptiles**

- **Mammals**
Diversity of Life - Vertebrates

Mammals
- posses hair
- mammary glands
- diaphragm
- endotherms

Monotremes (egg layers)

Marsupials (pouched)

Eutherians (placental)