CLASSIFICATION (Ch. 15)

1. SPECIES CONCEPTS

classification - estimated only 20% animals classified
1. nomenclature - assign names to species
2. taxonomy - determine species to receive names
3. phylogeny - link relationships among species

biological species
- "group of ... interbreeding natural populations that are reproductively isolated from other groups"
- problems - protozoans, extinct, polyploid plants

typological species
- similar within species & different from others
- problems - polymorphism

2. SCIENTIFIC NOMENCLATURE

common names
- problems - local & ethnic name not standard
- none for seldom seen animals, no standard language

binomial epithet - Latin (neutral & obsolete), also Greek
- scientific names for Genus (capitalized) + species (not)
- either ***italicize*** or **underline**
- established by international congress

trinomial epithet - includes subspecies epithet

3. TAXONOMY

taxonomic hierarchy

- Kingdom	Animalia
- Phylum	Chordata
- Class	Mammalia
- Order	Primata
- Family	Hominidae
• Genus	*Homo*
• species	*sapiens*

species - only taxon with any biological significance
- all others are subjective & difficult to define

splitting vs lumping - recognize different no. of species

4. PHYLOGENY

phylogeny or systematics
- diagram evolutionary relationships

ladder, tree, versus bush/shrub
- reconstruct branches relying only on tips

morphology - rely on shared anatomy
- homology - same structure evolved differences
- analogy - different structures evolved similarities

other sources - fossils, embryology, biochemistry

5. IDENTIFICATION KEYS

keys - instructions to identify unknown specimens
- select between pair of descriptions

6. MAJOR PHYLA

Protozoa	- unicellular animals
Porifera	- sponges
Cnidaria	- jellyfish
Platyhelminthes	- flatworms
Nematoda	- roundworms
Mollusca	- shelled inverts
Annelida	- segmented worms
Arthropoda	- jointed-leg inverts
Echinodermata	- seastars
Chordata	- vertebrates +

7. LEVELS OF COMPLEXITY

protoplasmic - unicellular, only organelles

cellular - multicellular, not coordinated

tissue - organize similar cells into layers

organ - organize similar tissues

organ system - organize similar organs

8. BODY SYMMETRIES

radial - divisible by many different planes
- organized around central axis

bilateral - divided by single plane only
- definite left-right & front-back sides
- cephalization (brain in front)

9. BODY SHAPE

unicellular - single cell only

cell aggregate - unorganized mass

blind sac - digestive cavity with single opening

tube within tube - digestive tract, separate mouth & anus

10. BODY CAVITIES

acoelomate - no internal cavity to organize organs

pseudocoel - body cavity around digestive tract
- not entirely lined with mesoderm

coelom - entirely lined with mesoderm

11. PATTERNS OF DEVELOPMENT

protostome - spiral & determinate cleavage
- blastopore becomes mouth
- (schizocoelous origin for coelom)

deuterostome - radial & indeterminate cleavage
- blastopore becomes anus
- (enterocoelous origin for coelom)

12. INVERTEBRATES

majority of species
- only 1 million identified (versus 42,500 vertebrates)
- estimated 30 million total worldwide

most small - half-inch or less, fills every niche

conservation - not glamorous but vital