

# Introduction to Biology. Lecture 23

Alexey Shipunov

Minot State University

March 24, 2017



## 1 Animals

- Animal phyla and their phylogeny
- Classes of chordates and their phylogeny



# Animals

## Animal phyla and their phylogeny



# Where we are?

- Basic organ systems of animals are responsible for
  - locomotion and support;
  - feeding, excretion and osmoregulation;
  - circulation and gas exchange;
  - signaling and reception;
  - reproduction.



# Three subkingdoms

- Spongia: asymmetric filtrators
- Cnidaria: radial stinging predators
- Bilateria: bilateral



# Ten phyla

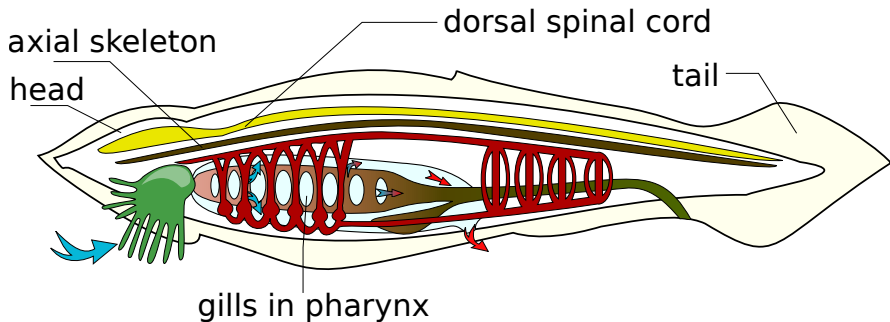
- Spongia
  - Porifera
- Cnidaria
  - Anthozoa: sitting, colonial, with skeleton
  - Medusozoa: swimming, [solitary], soft
- Bilateria
  - Mollusca: shell, body straight
  - Annelida: segmented worms
  - Lophophorata: [shell], body curved
  - Nematelminthes: worms with cuticle and primary cavity
  - Arthropoda: segmented body and appendages
  - Echinodermata: small-plate exoskeleton, secondary radial, water-vascular
  - Chordata: head and tail, gills in pharynx, axial skeleton



*Ten phyla = ten body plans*

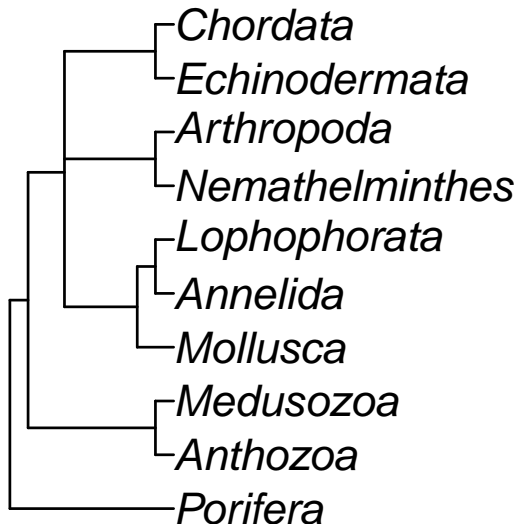


# Chordate body plan





# Phylogeny of nine phyla



# Animals

## Classes of chordates and their phylogeny



# Eight classes of Chordata

## **Acrania:**

Class 1. Leptocardii: lancelet with no eyes and jaws

## **Vertebrata:**

- Pisces:

Class 2. Chondrichthyes: cartilaginous

Class 3. Actinopterygii: boned, rayed fins, [gills]

Class 4. Dipnoi: boned, thick, leg-like fins, [gills and lungs]

- Tetrapoda:

Class 5. Amphibia: metamorphosis

\*Amniota:

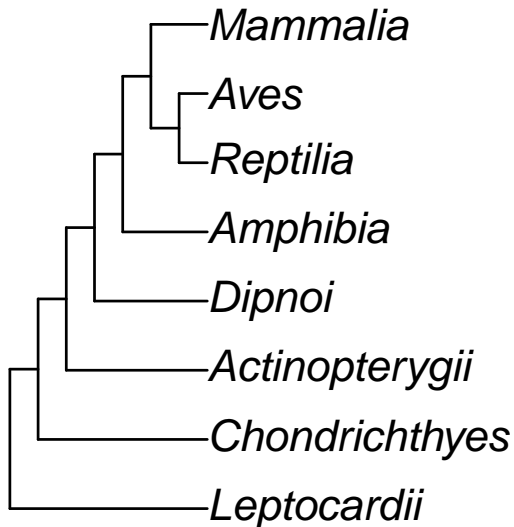
Class 6. Reptilia

Class 7. Aves: feathers, bipedal

Class 8. Mammalia



# Phylogeny of eight classes



# Optional homework: in preparation for the 3rd test, fill this table:

	1	2	3	4	5	6	7
Porifera							
Anthozoa							
Medusozoa							
Annelida							
Lophophorata							
Mollusca							
Nemathelminthes							
Arthropoda							
Echinodermata							
Chordata							

Characters: 1 ...; 2 ...

*Characters should not be necessary relevant to **all** members of phylum!*

**Make the same table for 8 chordate classes**



# Summary

- Classes of vertebrates differ mostly in overall optimization of their body functions and in adaptations to the specific environment



# For Further Reading



## Animal phyla.

[http://en.wikipedia.org/wiki/Phylum#Animal\\_phyla](http://en.wikipedia.org/wiki/Phylum#Animal_phyla)



## Vertebrates.

<http://en.wikipedia.org/wiki/Vertebrate>



## Fishes.

<http://en.wikipedia.org/wiki/Fish>

