

Natural Sciences 360

Legacy of Life

Lecture 07

Dr. Stuart S. Sumida

ANIMALIA

(More Similar to Fungi than
Plants)

ANIMAL SIMILARITIES

PLANTS

FUNGI

Cell Walls

-

Immobile

-

Often need

-

substrate

-

Heterotrophs

-

Not photosynthetic

Important things to remember from Dr.
Polcyn's talk:

GERM LAYERS

and

SEGMENTATION

Eumetazoa has:

Germ Layers

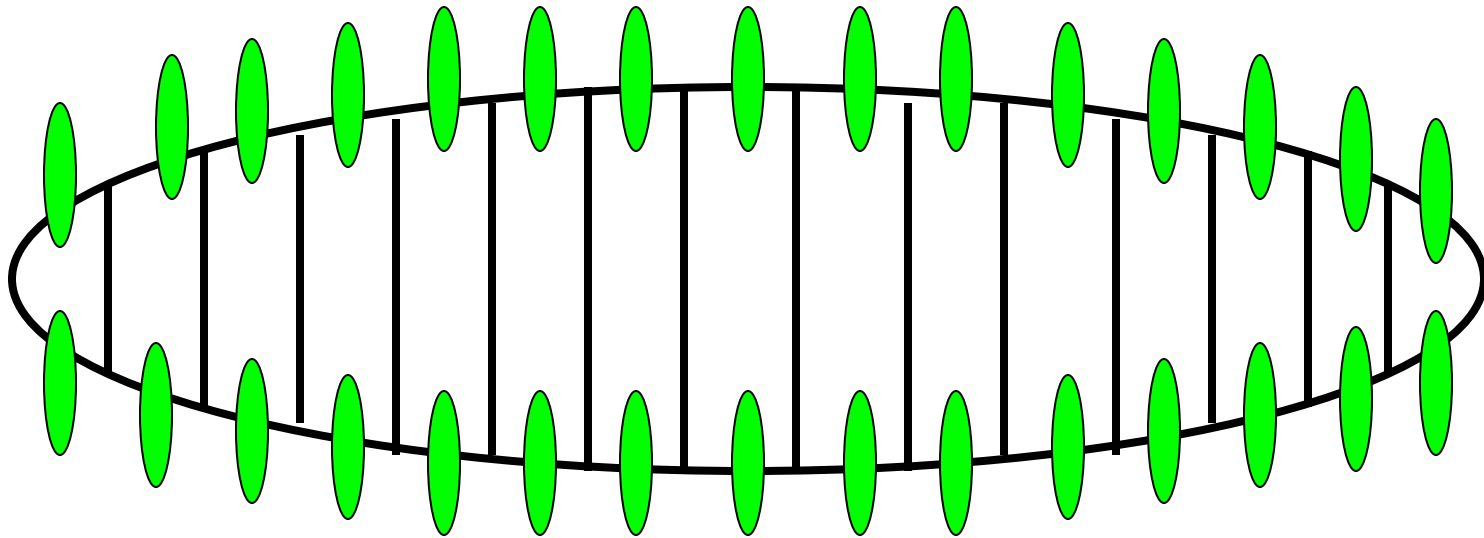
Endoderm

Ectoderm

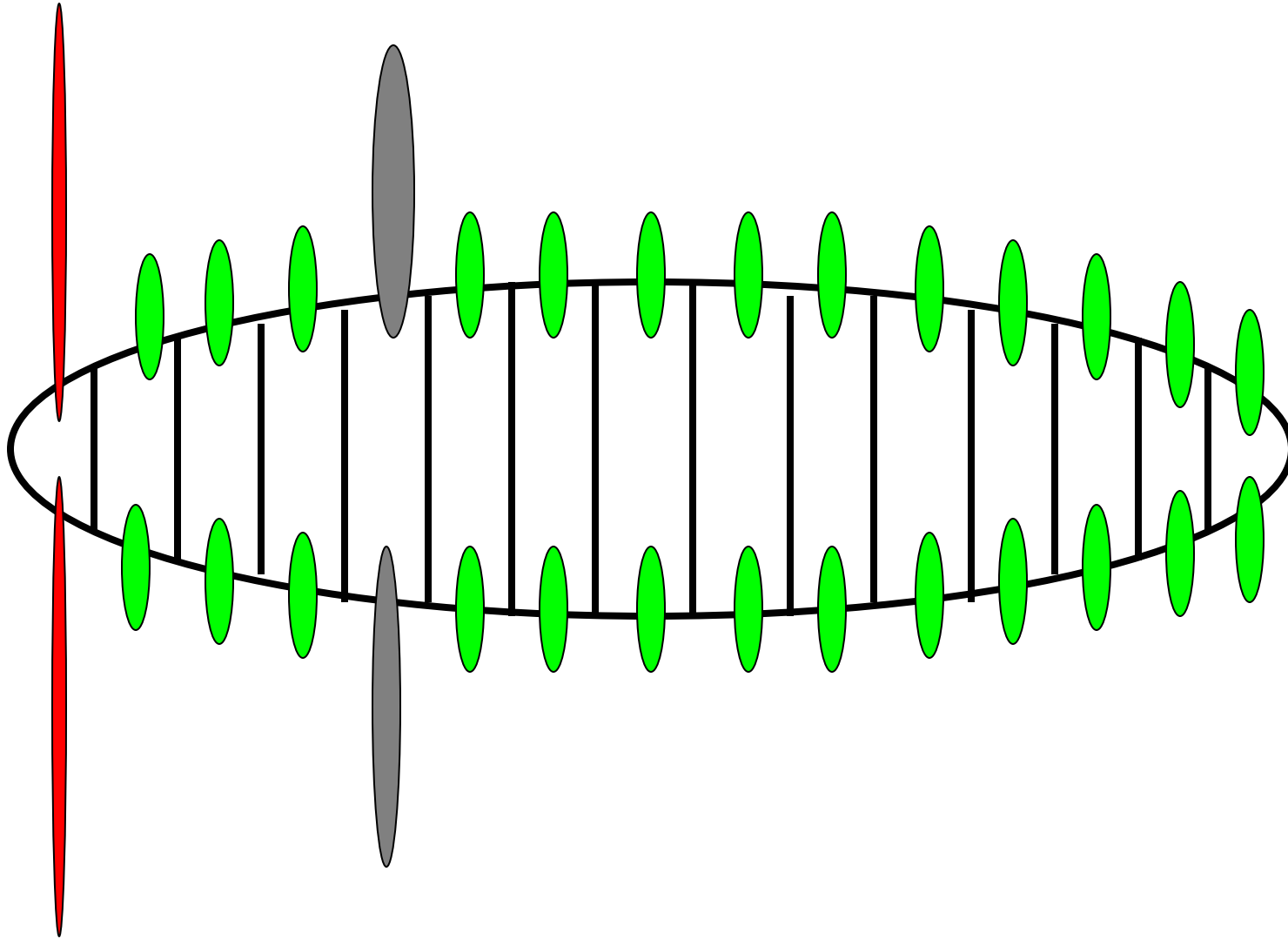
Tissues

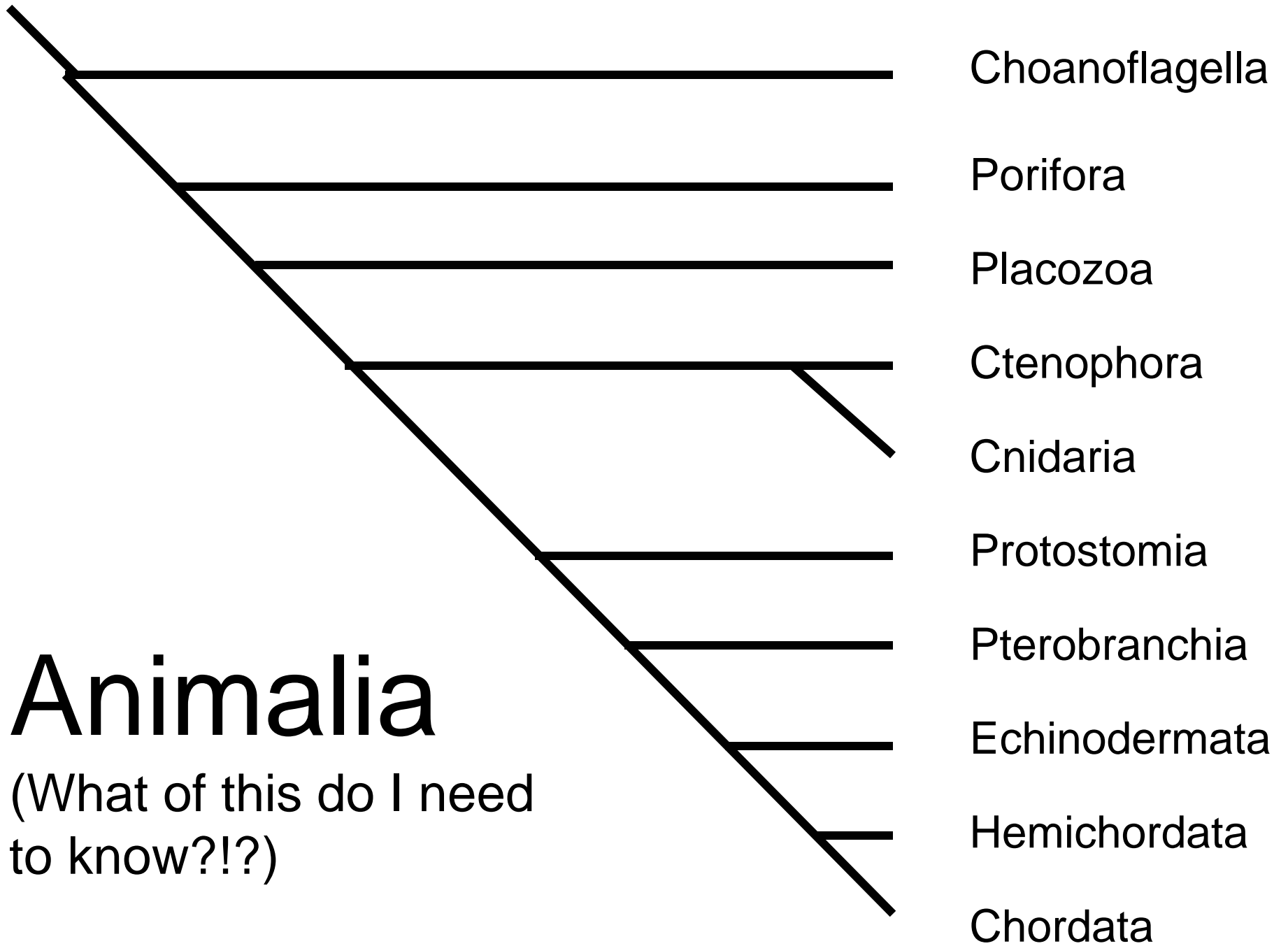
Segmentation: an example:

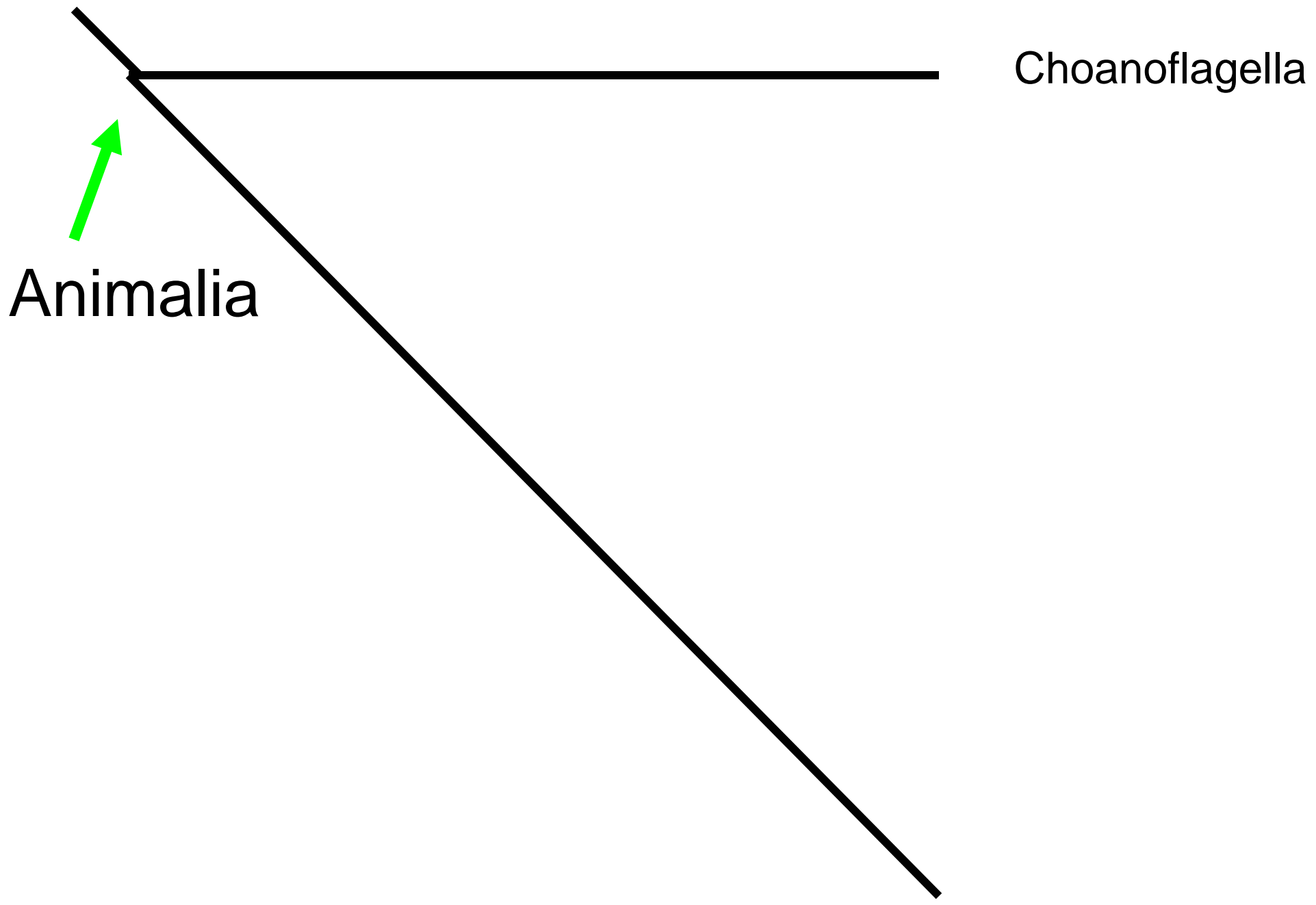
A simplified arthropod larva with multiple segments, each with appendages, or the genetic ability to develop appendages.



Different kinds of arthropods can elaborate upon different segments and appendages. This provides an enormous versatility.

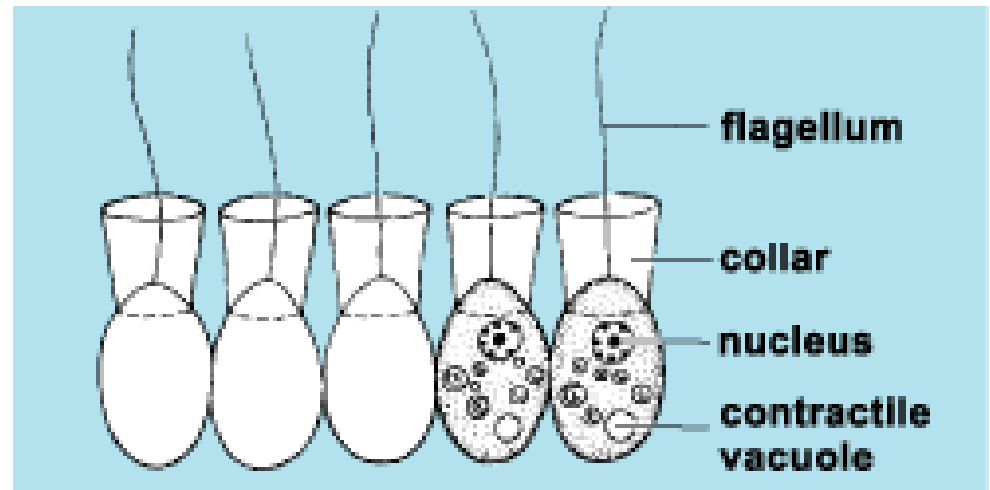
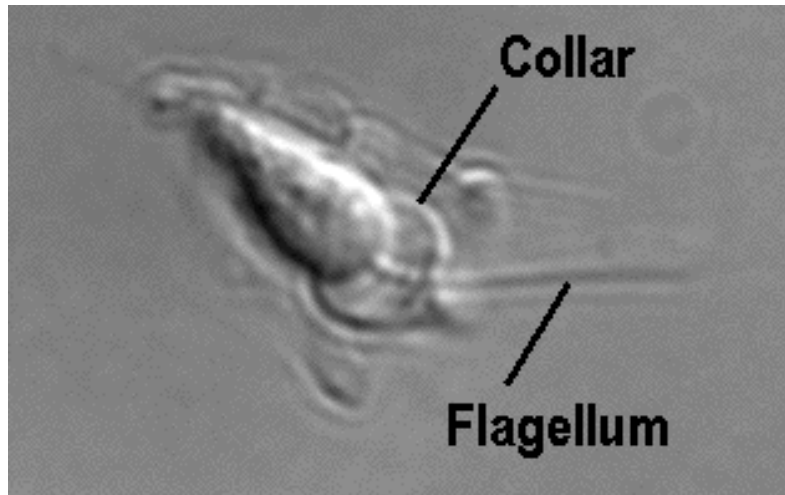






Choanoflagella

Animalia

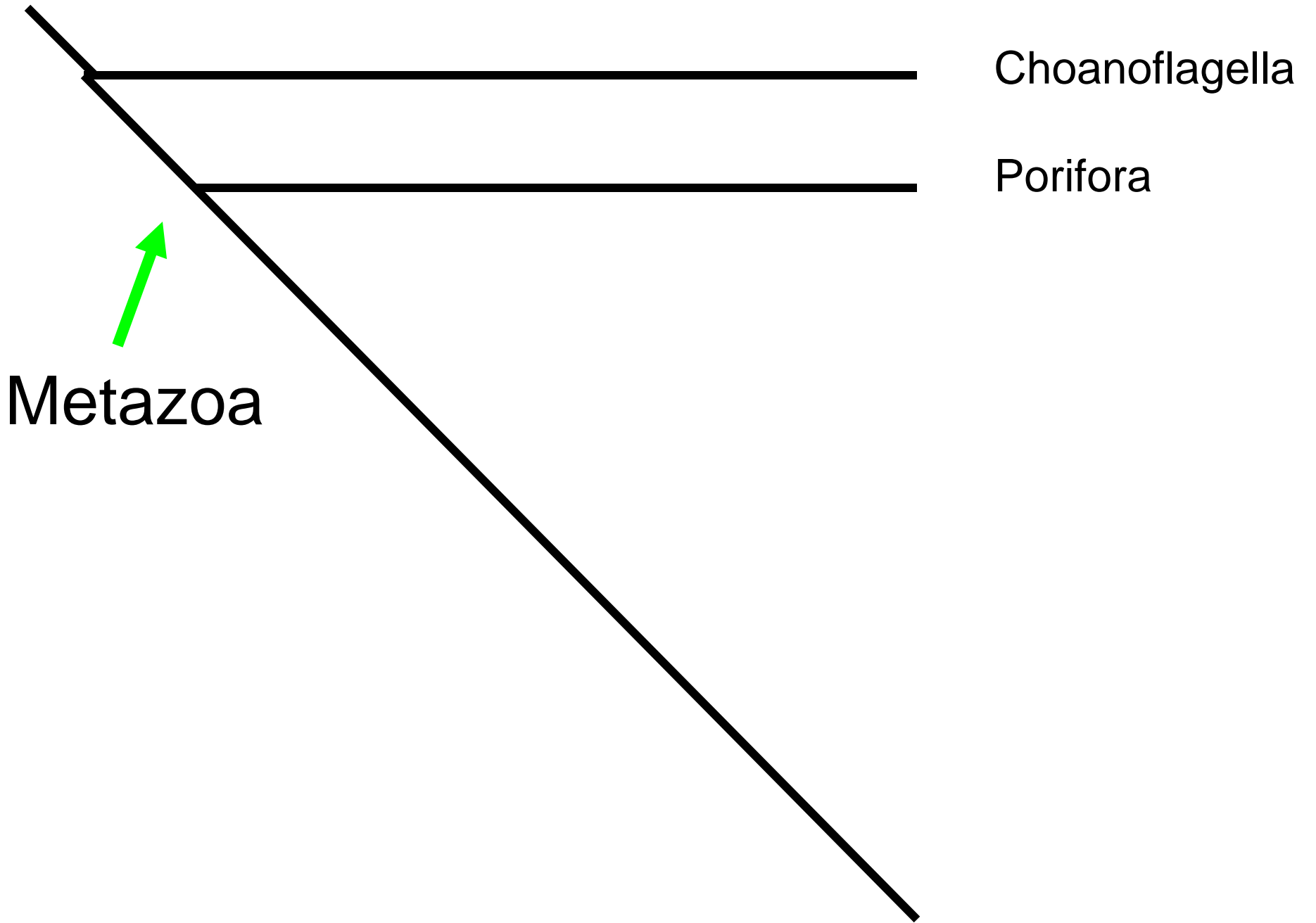


Choanoflagellates have no fossil record. It is likely that choanoflagellates existed on the Earth since the Late Precambrian, because they are the closest living relatives of the sponges, the most primitive metazoans.

Choanoflagellates are almost identical in shape and function with the choanocytes or “collar cells” of sponges; these cells generate a current that draws water and food particles through the body of a sponge, and they filter out food particles.

Animalia

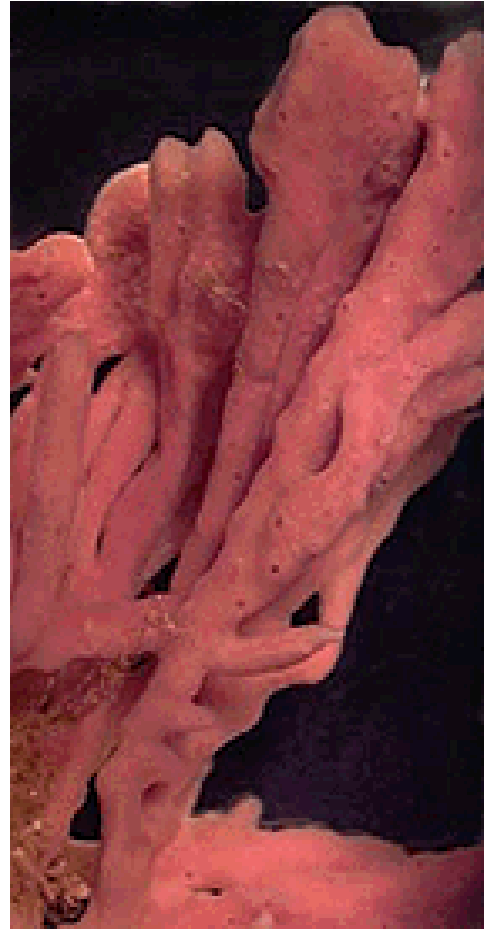
**Multicellular
heterotrophs**



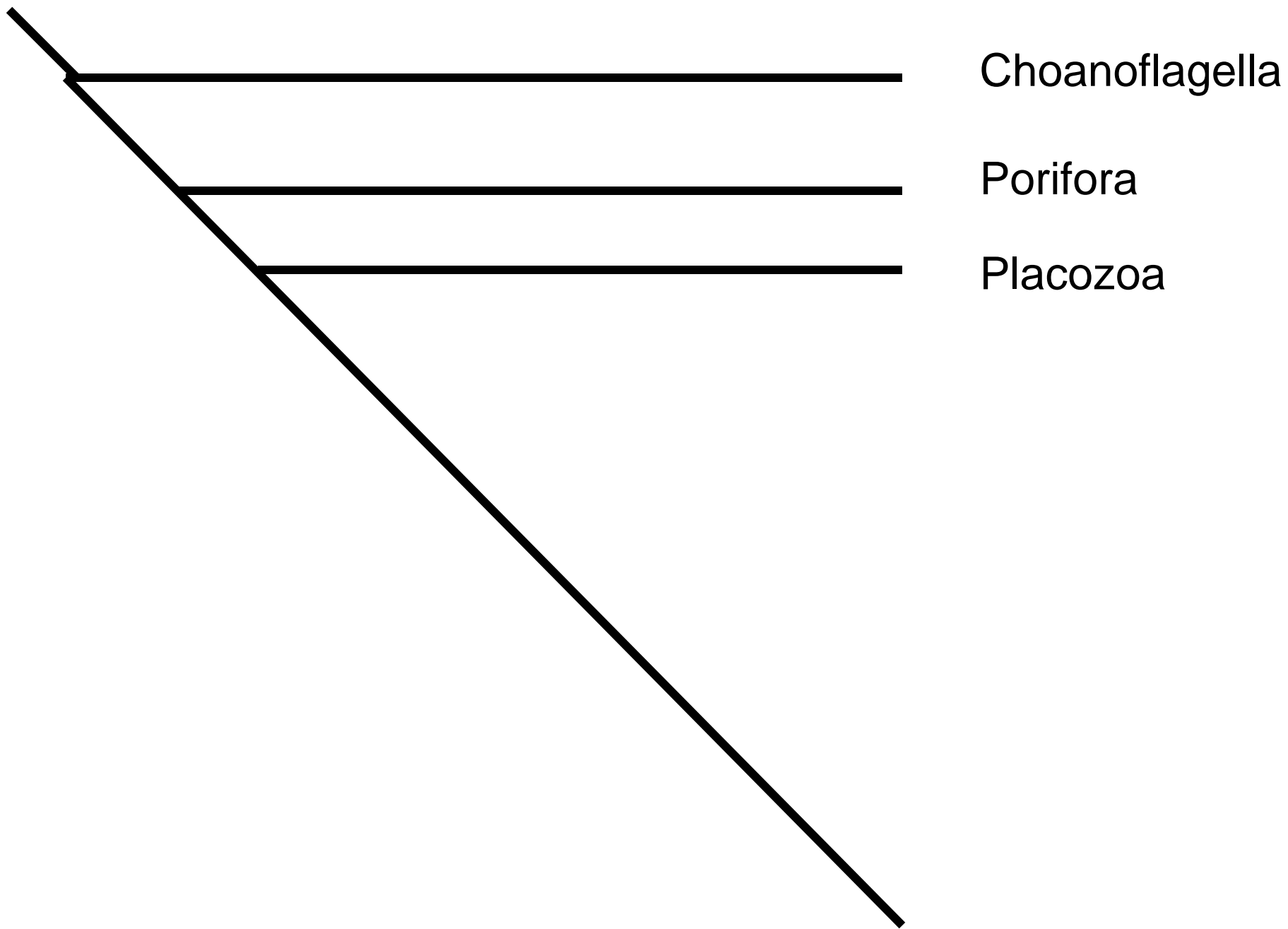
Porifera (Sponges):

Known as far back as
PreCambrian

600 million years ago.



Example: Porifera (Sponges): No true tissues



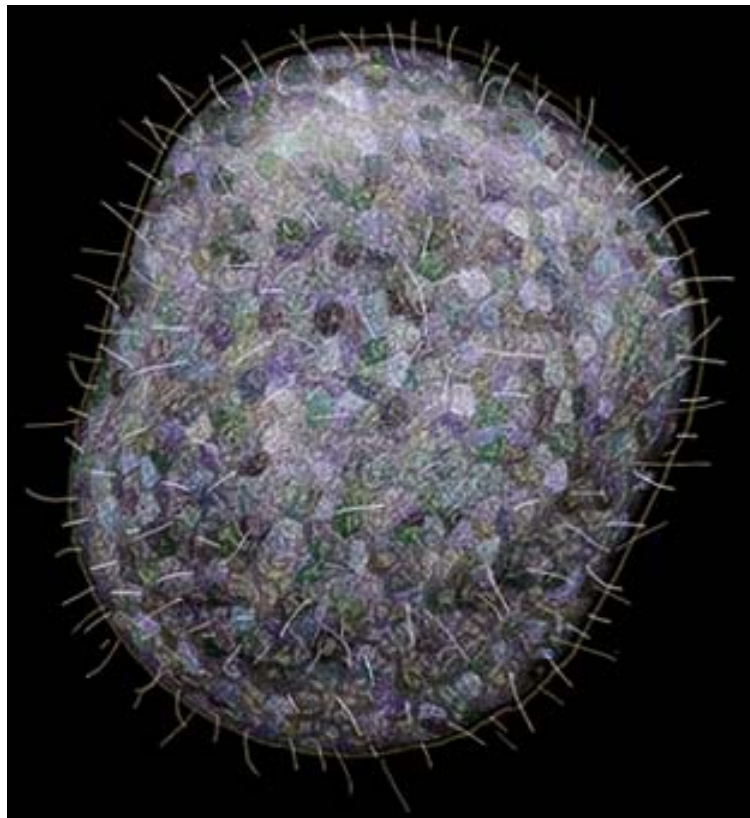
Choanoflagella

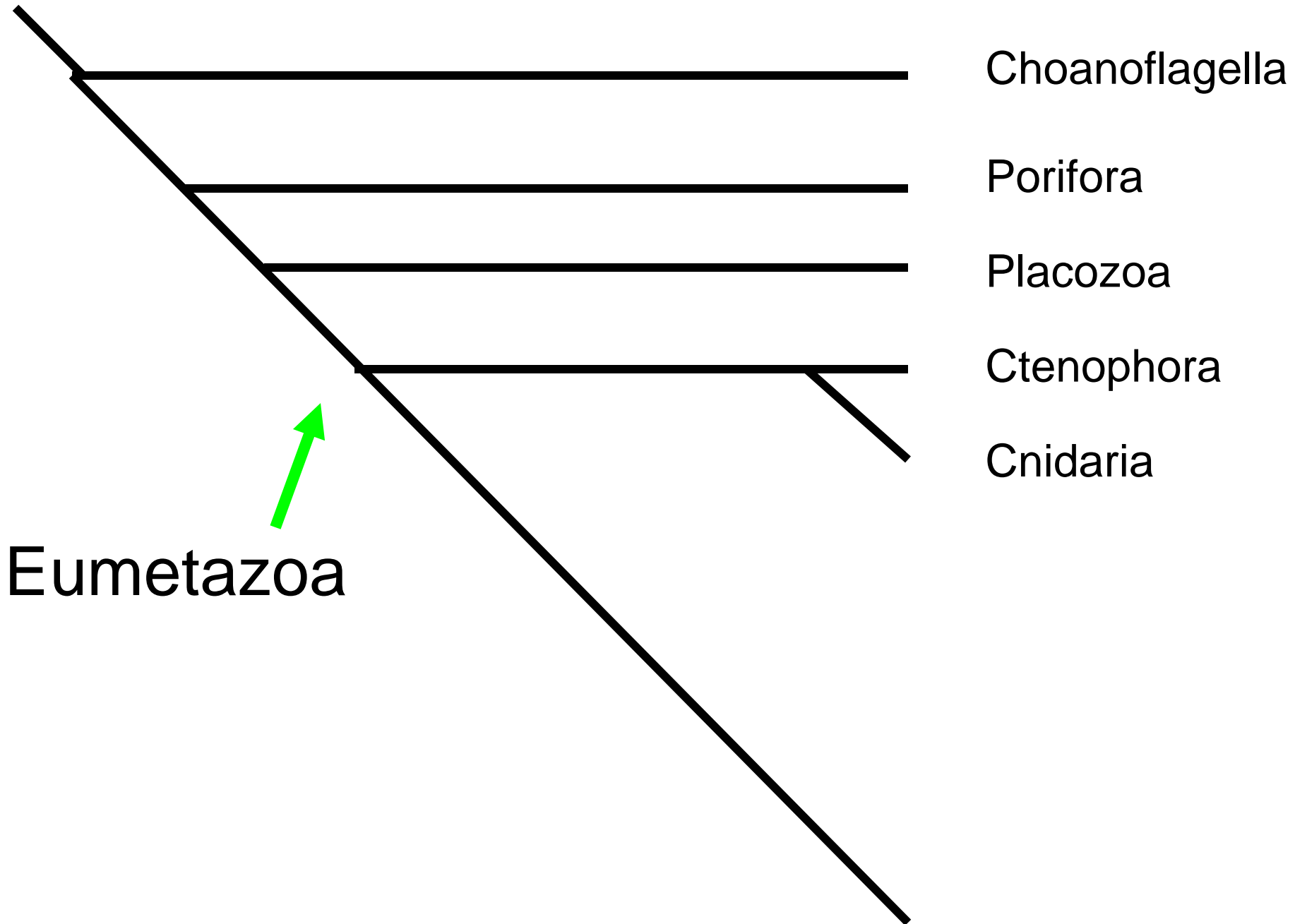
Porifora

Placozoa

Placozoa: Only one species:

Trichoplax adhaerens





Eumetazoa

Germ Layers

Endoderm

Ectoderm

Tissues

Ctenophores and Cnidarians

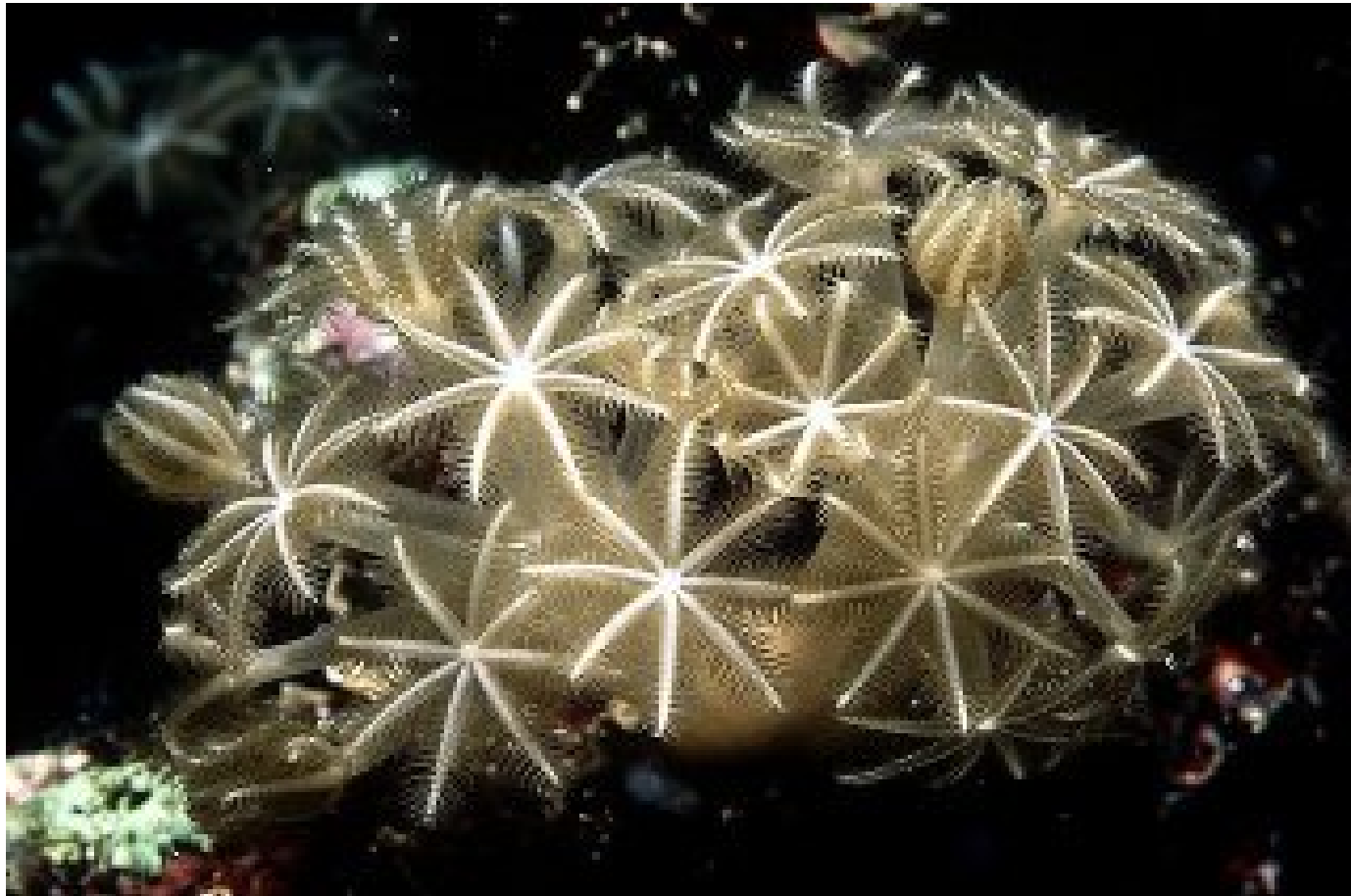
Two germ layers

Only one opening into gut.

Ctenophores and Cnidarians

Known as far back as
PreCambrian “Ediacarian
Faunas”.

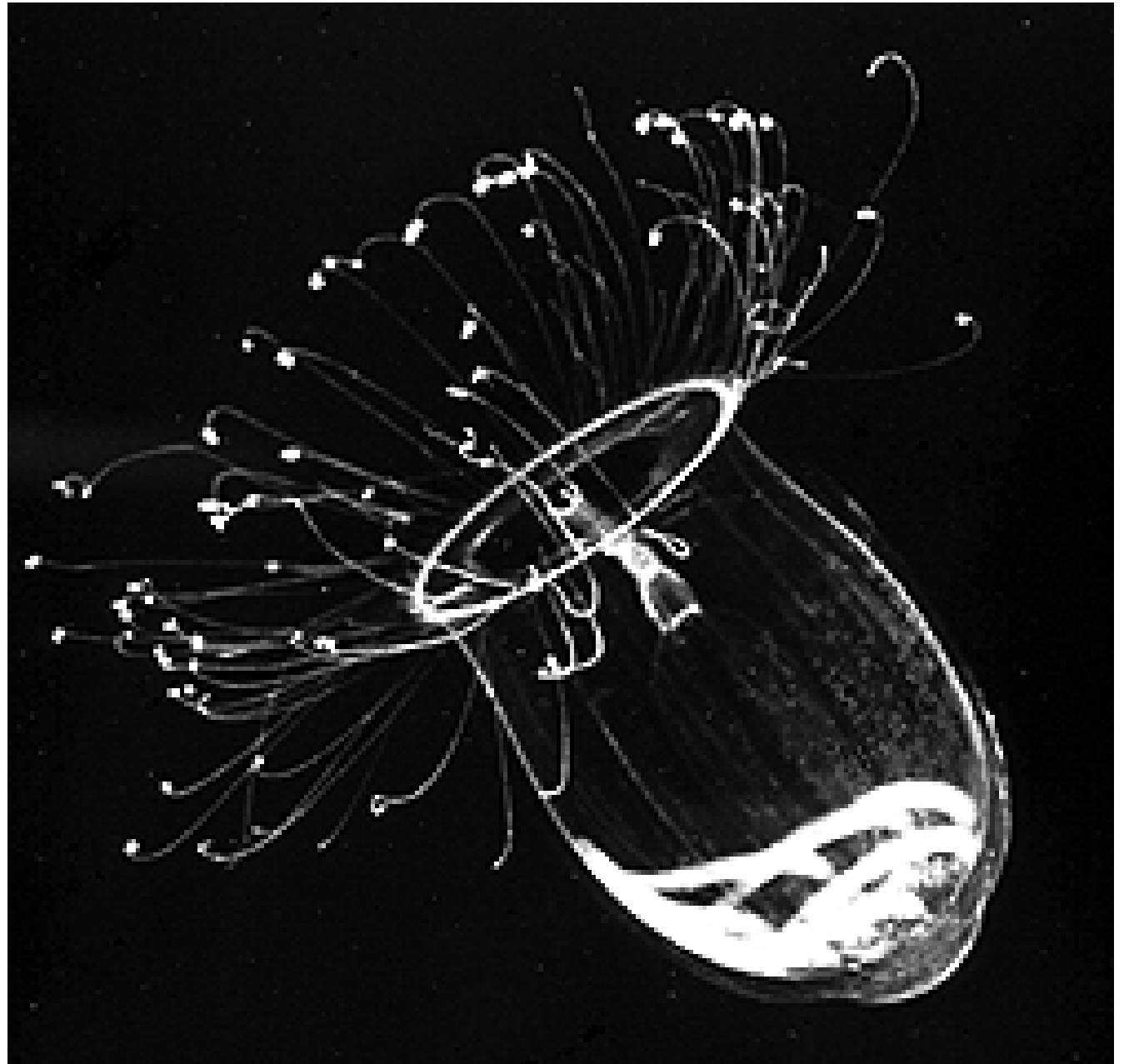
Cnidaria: Corals

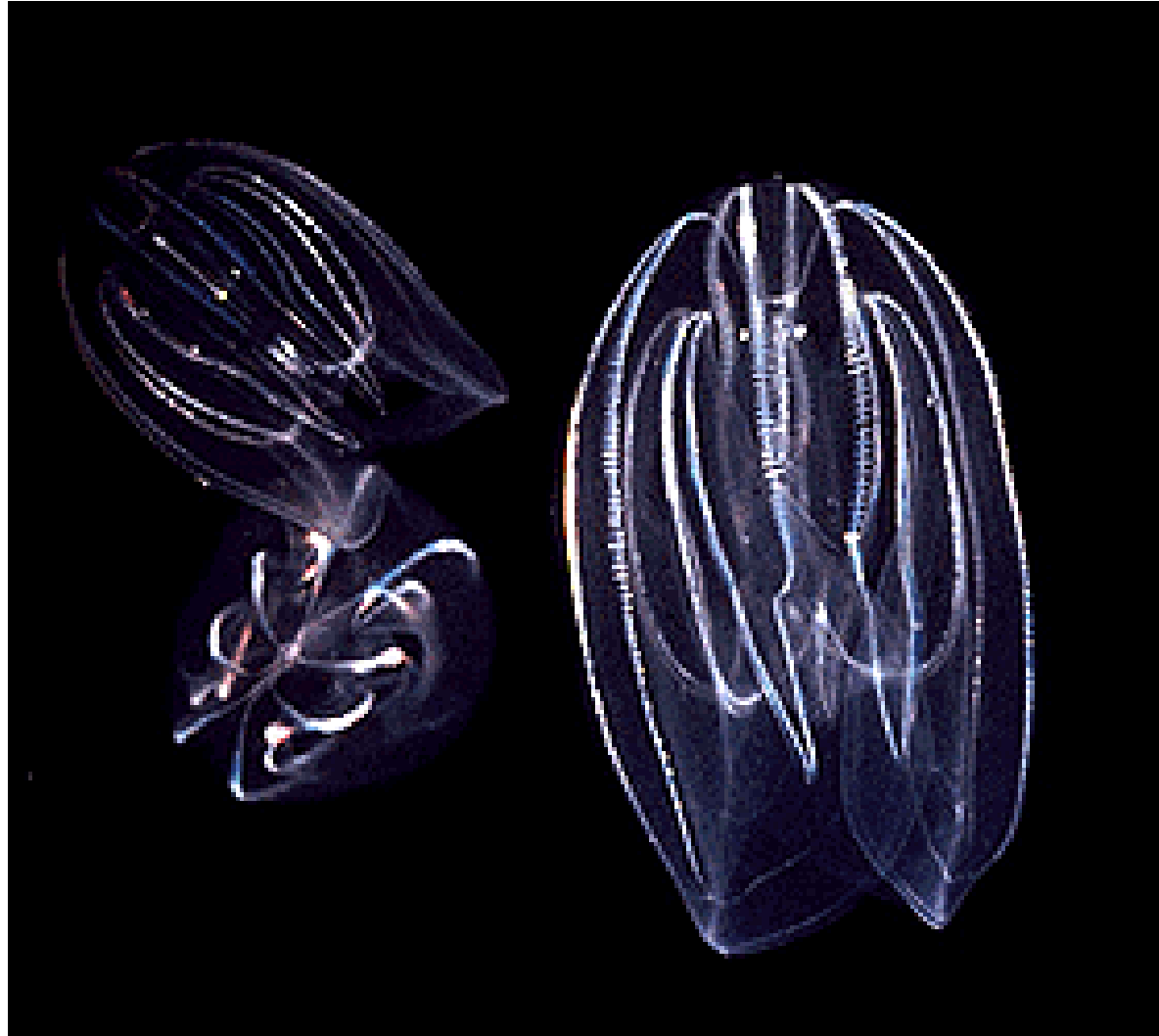




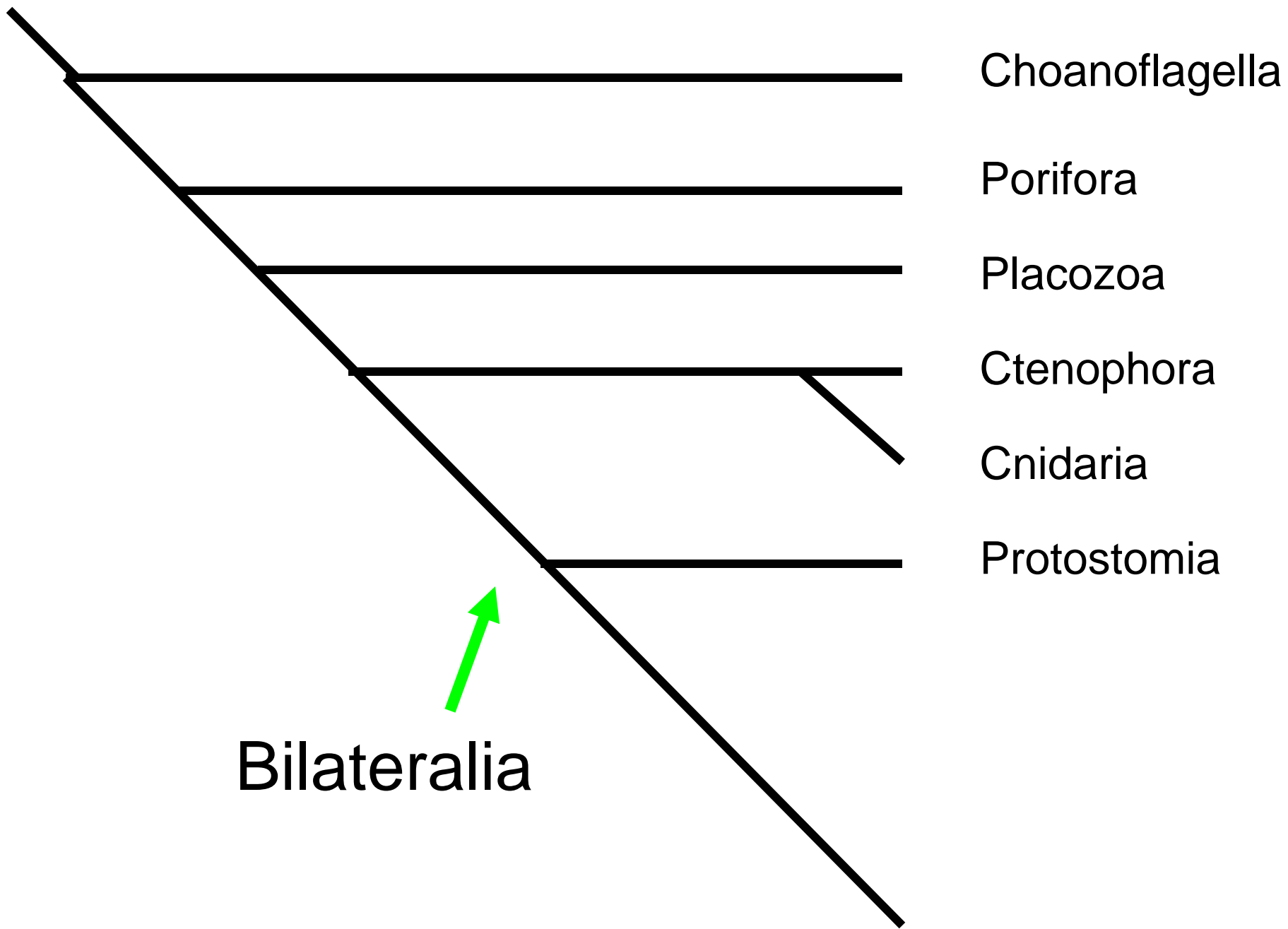
Cnidaria: Anenomes

Cnidaria:
Jelly fish





Ctenophora (Comb Jellies)



Bilateralia

Bilaterally symmetrical at some point during ontogeny

(“Ontogeny” = lifecycle from conception to death)

Bilateria

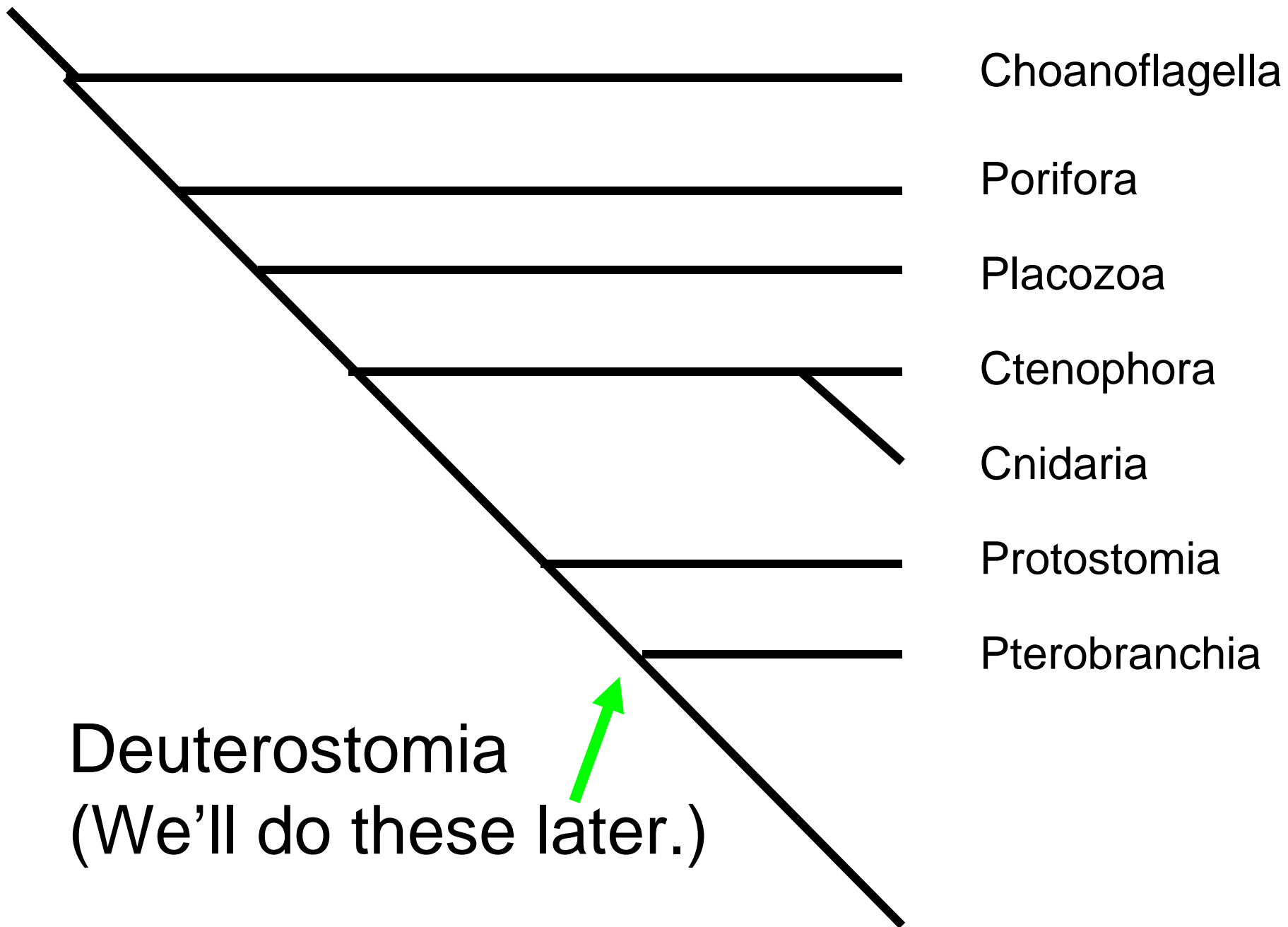
Includes two great groups of animals:

Protostomia (means 1st mouth)

Deuterostomia (means 2nd mouth)

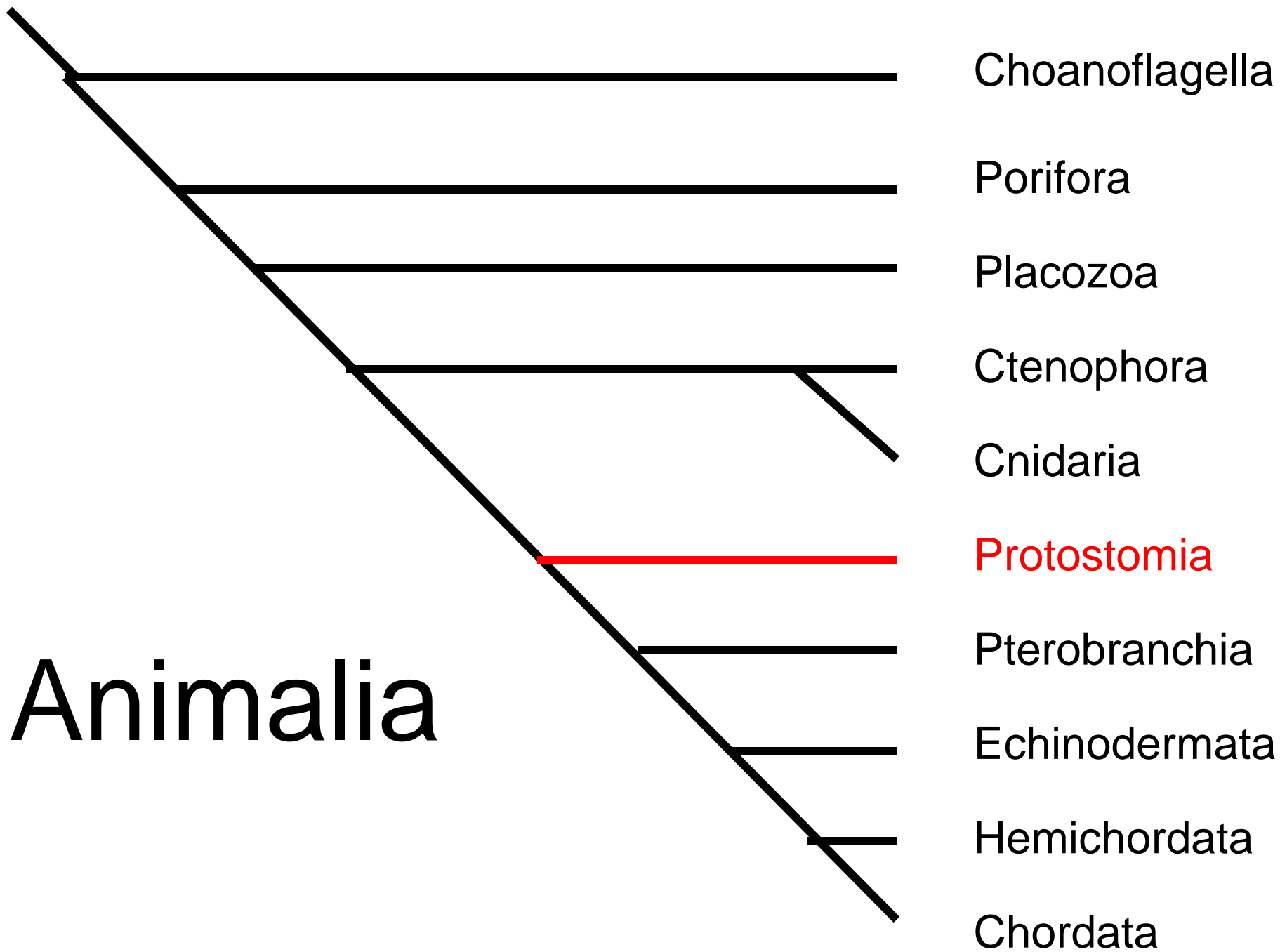
Protostomia includes many phyla, including:

- Arthropoda
- Mollusca
- Annelida (segmented worms)
- Many others



PROTOSTOMIA

Bilateria – Part 1



Recall : Bilateria –

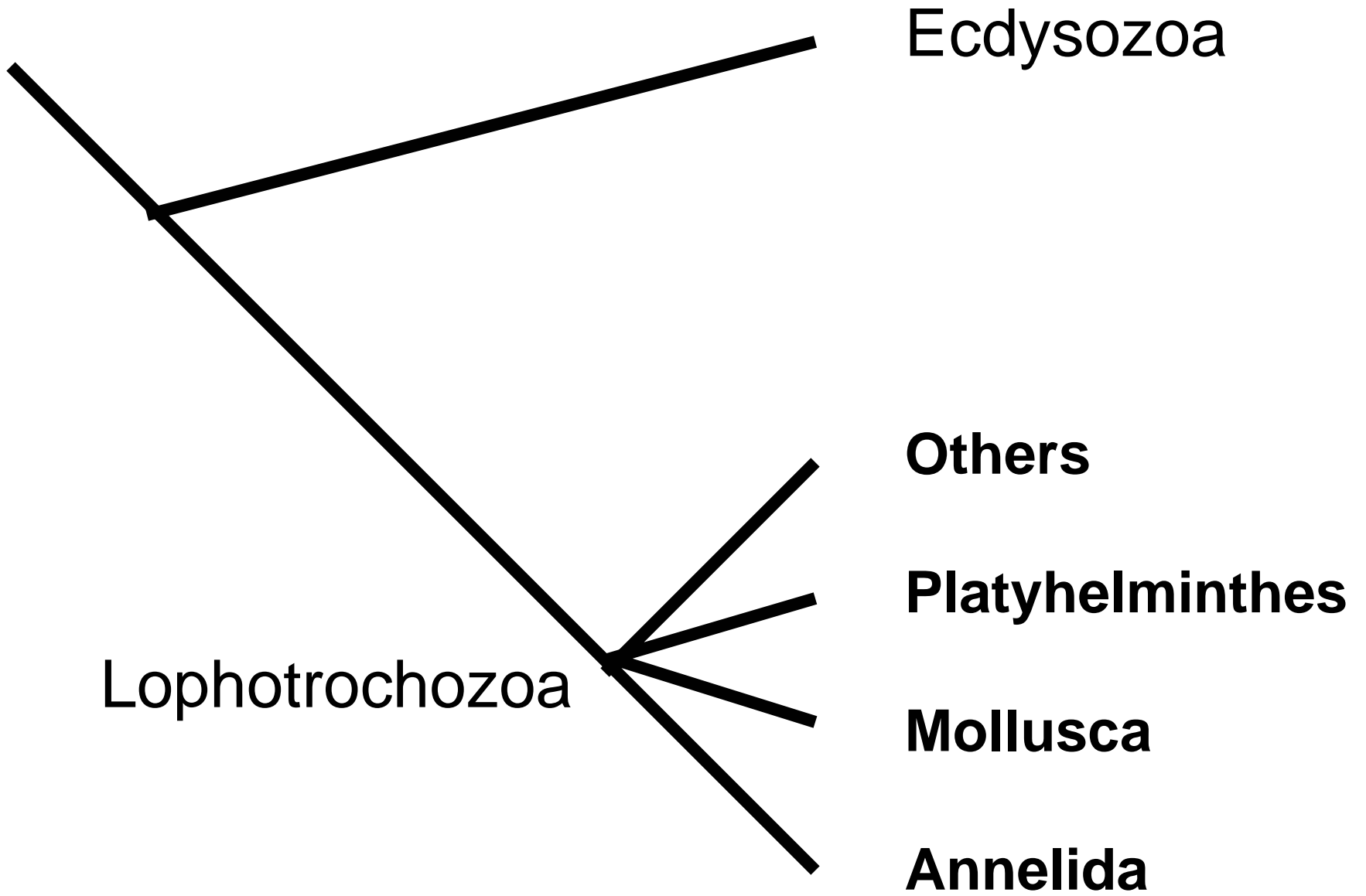
Includes two great groups of animals:

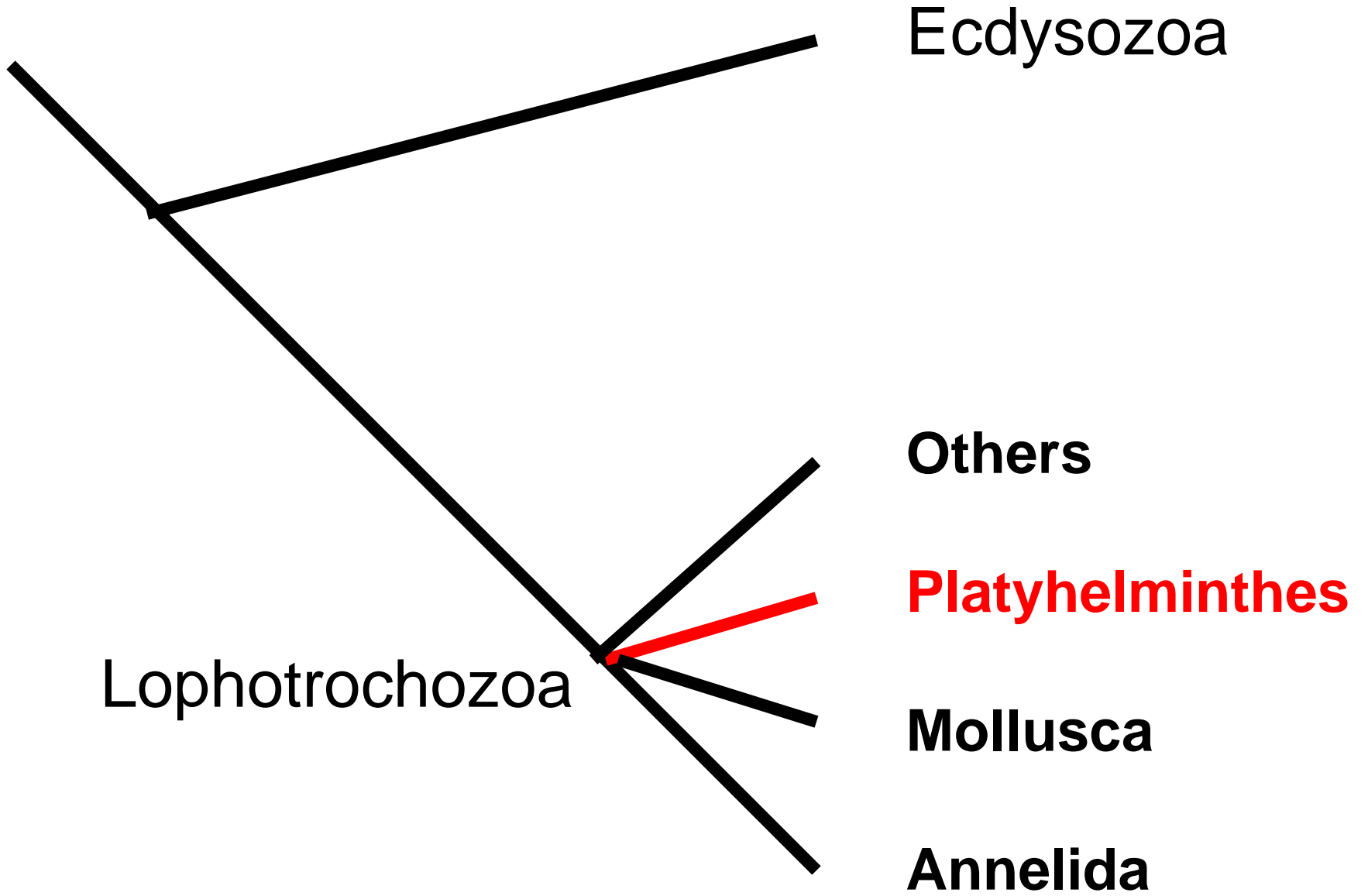
Protostomia (means 1st mouth)

Deuterostomia (means 2nd mouth)

Protostomia includes many phyla, including:

- Arthropoda
- Mollusca
- Annelida (segmented worms)
- Many others

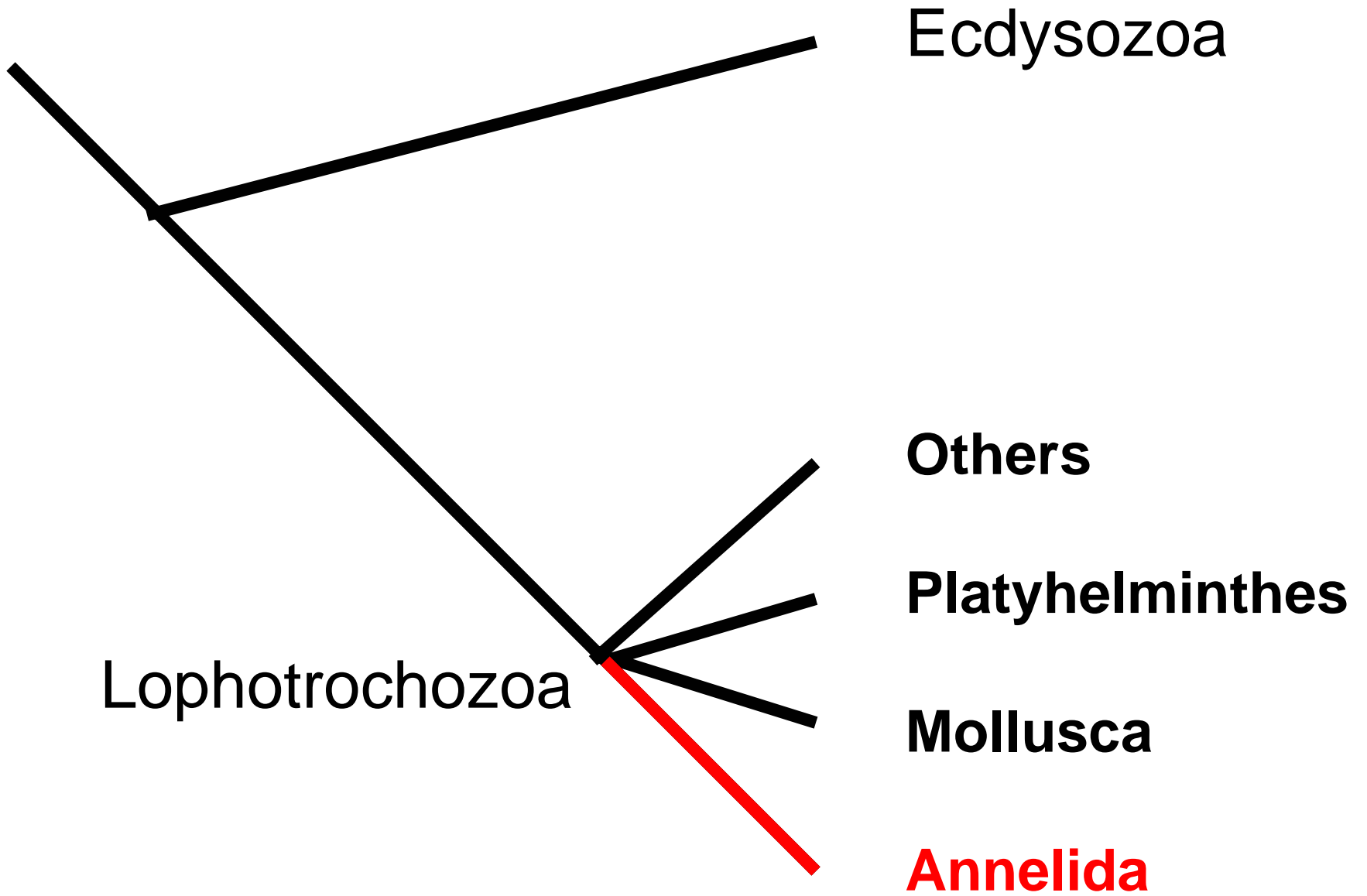




Platyhelminthes – flatworms thought to be a primitive member of this grouping.



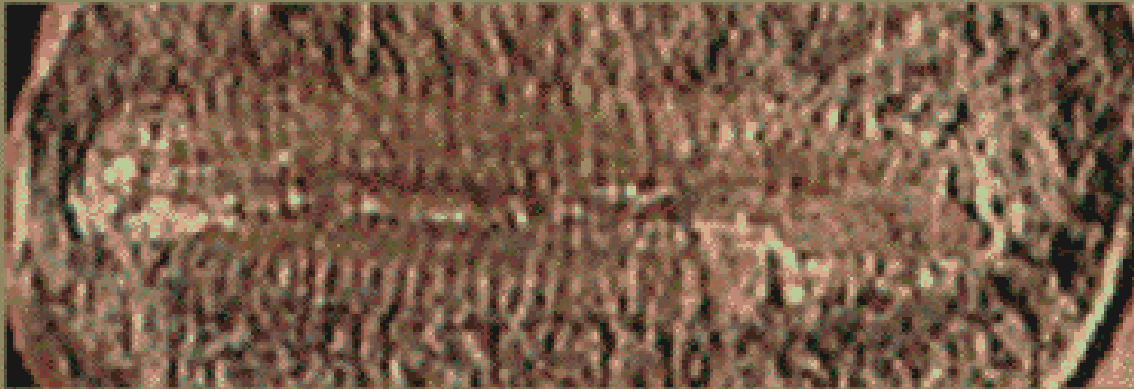
Lack a coelom – a fluid-filled space between gut tube and body wall.



Annelid Worms:

Annelid-like organisms are known from PreCambrian (over 600 million years old) Ediacarian Faunas.

Key Innovation: Segmentation



Annelid worms thought to be possibly primitive to Mollusca.

MOLLUSCA

Most groups known back to
Cambrian or PreCambrian

Includes:

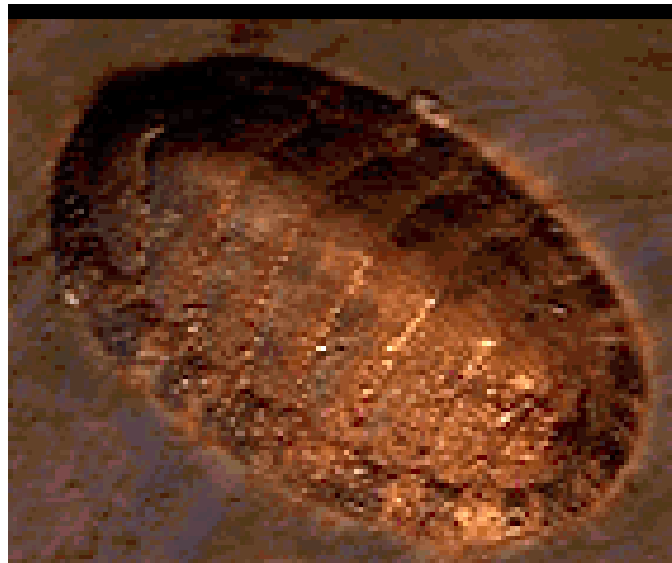
- Polyplacophora (chitons)
- Bilvavia
- Cephalopoda
- Gastropoda

Features of MOLLUSCA

Four key synapomorphies:

- Shell
- Mantle (secretes shell)
- Radula (feeding apparatus)
- Muscular foot

POLYPLACOPHORA



Chitons – Molluscs with segmented shells



BIVALVES – Two shells joined by strong adductor muscle (closing muscle)

Gastropods:

All gastropods
have some
degree of
TORSION
(twisting).



Cephalopoda – includes:

- Nautiloids
- Ammonoids*
- Cuttlefish
- Squid
- Octopi

*found by Mary Anning





