Module : Zoology (Zoo : animal ; logos : sciences)

VHG (60 heures) : Course (45 h) + 5 TP (15 h)

Presented by Pr. SOUTTOU Karim

Zoology course

Introduction

The Zoology aims to study a wide variety of animals.

It's interested in structures through the study of anatomy, cytology and histology. It's studies the relationships between living beings and their environment (ecology).

She is interested in the distribution of animals in the Environment where they live (biogeography).

It is interested in determining the functions specific to the various functions (physiology).

She is interested in studying the different characteristics that allow us to differentiate between species (systematic).

Fauna is a group of animals that populate a area.
It is directly related to the existing flora.

Animal taxonomy or zoology is the science that studies the classification of different animal species.
Taxonomy is composed of two Greek words :
Taxo = arrangement + nomos = laws, rule.

So it is science which is interested in the classification of animal species according to well-defined criteria.

For example, vertebrates include species that have a backbone. Invertebrates include all animal species that do not have a backbone.

Introduction

Origin of Zoological Classification

Linné (Linnaeus)

Carl von Linné

1707 - 1778

Author : Linné (Linnaeus)

Systema naturae (dixième édition)

Date : 1st January 1758

(arbitrarily)

Introduction

Taxon et Taxinomie (Taxonomie)

Taxon : Taxonomic unit

- **Species**
- **Gender**
- **Family**
- **Order**

Taxons

Taxonomy: Theory and practice of classification of organisms

Introduction

Species

Group of living beings (ou fossiles)

- **Boeing able to reproduc with each other (Interfertility)**
- **Whose offspring are fertile**

Introduction

The species

Taxon that brings together living beings that share a set of common characteristics :

- **morphological,**
- **anatomical,**
- **physiological,**
- **biochemical,**
- **genetic.**

***Fundamental entity of classification**

Introduction

The name of species

Binom : Genus - species

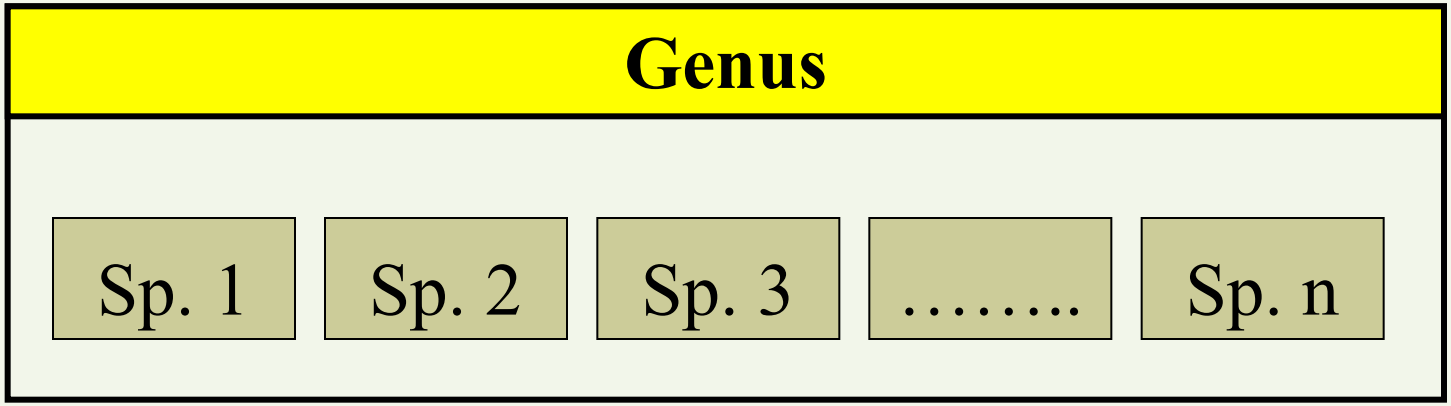
- In latin or grec language (universel)
- In italic or underlined
- Tracking the author's name + publication date

Homo sapiens Linnaeus, 1758

Introduction

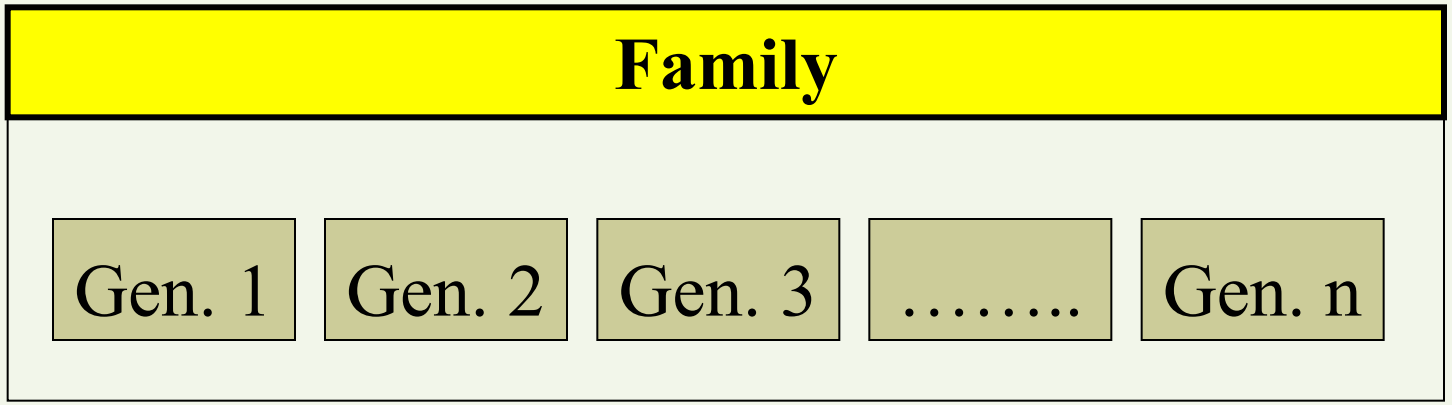
Genus

Grouping of species with common characteristics specific to this group.



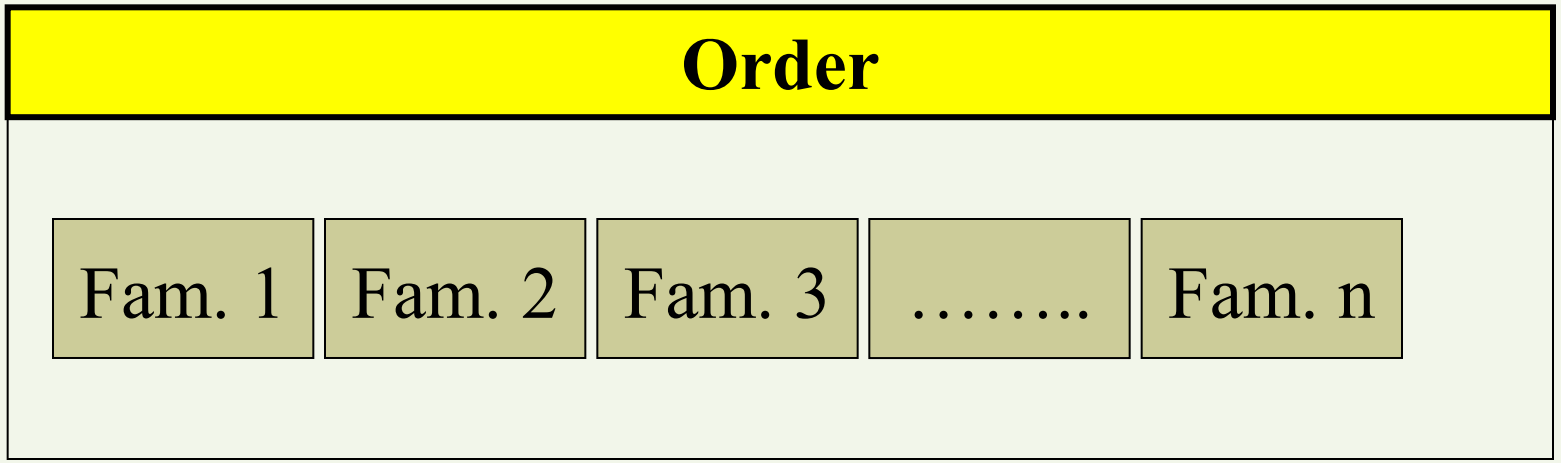
Family

Grouping of genus with common characteristics specific to this group.



Order

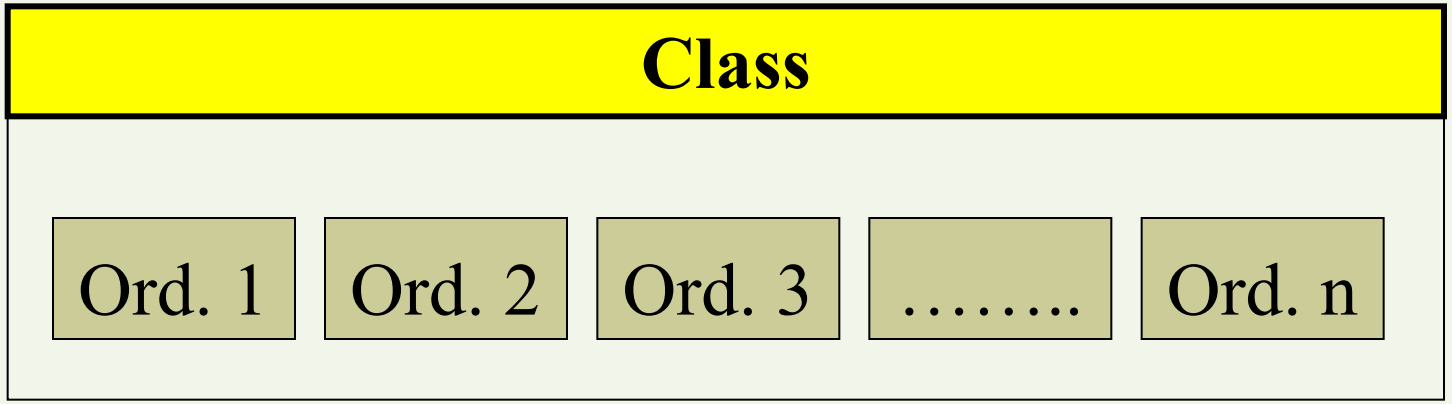
Grouping of Families with common characteristics specific to this group.



Introduction

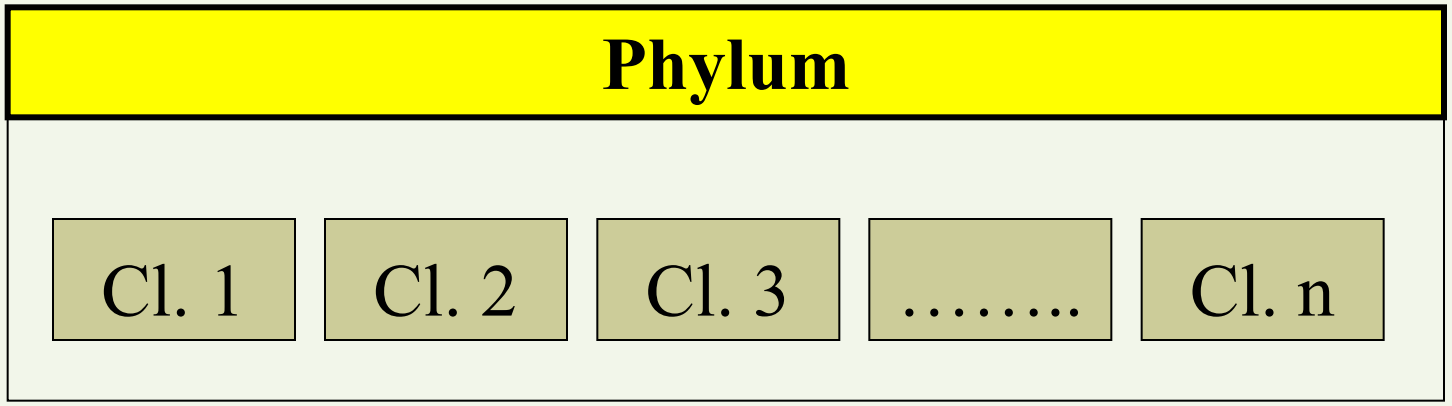
Class

Grouping of orders with common characteristics specific to this group.



Phylum

Grouping of Classes with common characteristics specific to this group.



Introduction

The kingdom

Highest rank category in the hierarchical classification.

Eucaryotes	➢ **Animal kingdom** ➢ **Vegetable kingdom** ➢ **Fungi**
Eubacteria et Archea	➢ **Bacteria** (Unicellular whithout nucleus)

Introduction

Kingdom
Subkingdom
Phylum
Subphylum
Class
Order
Family
Genus
Species

Expample : Classification of Honeybee

Kingdom: Animalia
Subkingdom : Metazoans triploblastic coelomates protostomes
Phylum : Arthropoda
Subphylum : Uniramia
Class : Insecta ou Hexapoda
Order : Hymenoptera
Family : Apidae
Genus : *Apis*
Species : *Apis mellifica*

The name of the species is always followed by the name of its discoverer and the year of its discovery. The genus is the grouping of all species exhibiting common characteristics; the dog, the wolf, and the jackal belong to the genus ***Canis***; the cat, the tiger, and the lion belong to the genus ***Felis***.

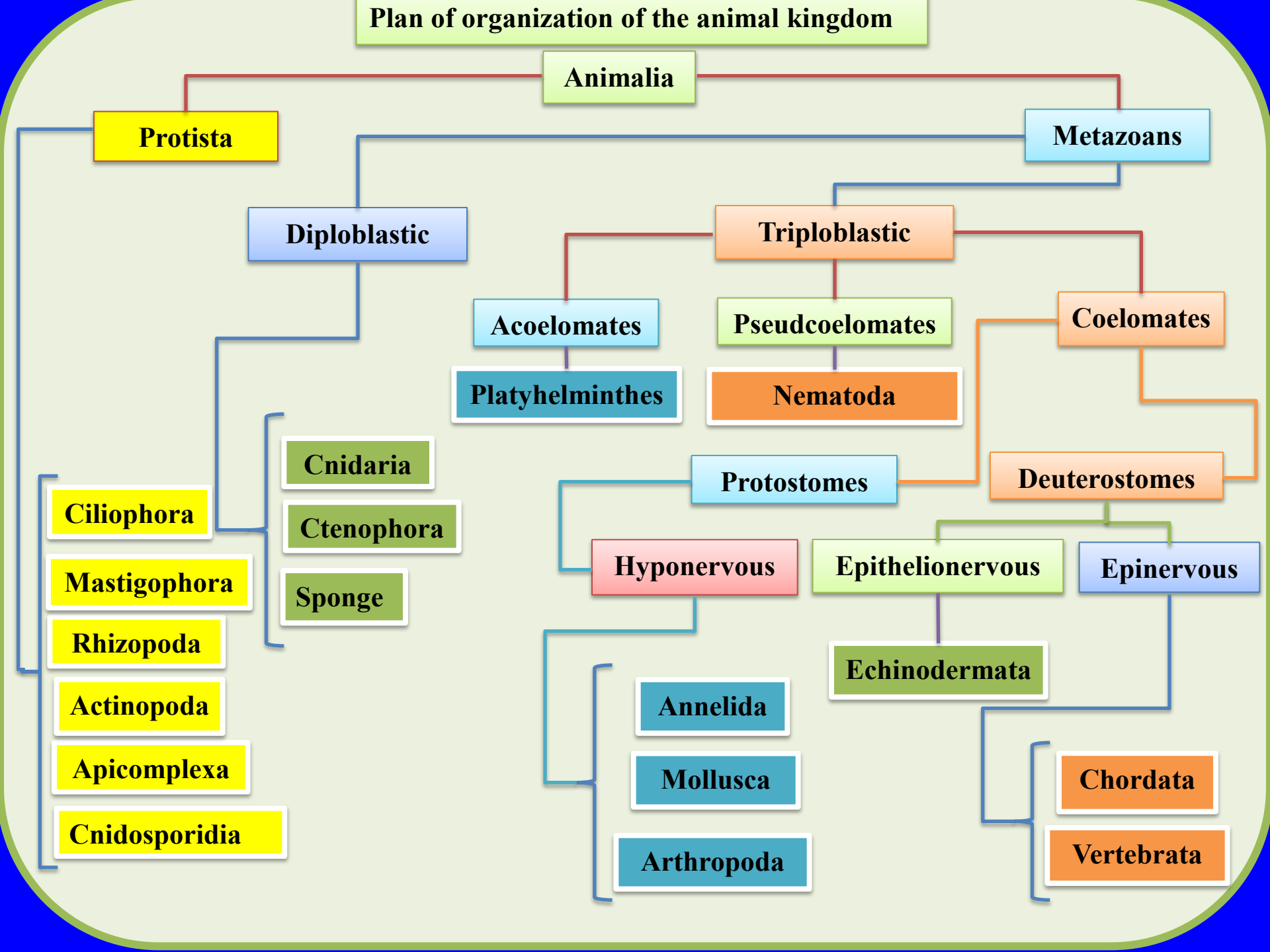
The thorough systematic study leads to the recognition of subspecies and the use of trinomial nomenclature (first used by Schlgele in 1844).

Example:

The subspecies of goldfinch, the gray-headed goldfinch : *Carduelis carduelis caniceps*.

Note (1): the species name is written in italics if the text is typed or underlined if the text is handwritten.

Note (2): If the genus is known but the species is unknown, write the genus followed by sp. (sp = specimen) for an unidentified species.
Example: *Monomorium* sp.


Plan of organization of the animal kingdom
Animalia
Protista
Metazoans
Diploblastic
Triploblastic
Acoelomates
Pseudcoelomates
Coelomates
Platyhelminthes
Nematoda
Cnidaria
Ctenophora
Sponge
Ciliophora
Mastigophora
Rhizopoda
Actinopoda
Apicomplexa
Cnidosporidia
Protostomes
Deuterostomes
Hyponervous
Epithelionervous
Epinervous
Echinodermata
Annelida
Mollusca
Arthropoda
Chordata
Vertebrata

Introduction

I. – Subkingdom Protozoa

1. – Phylum Mastigophora

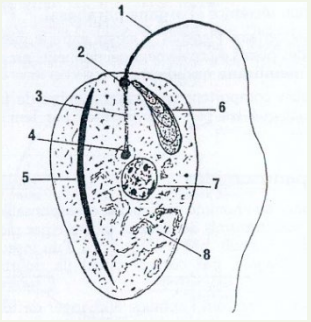
2. – Phylum Rhizopoda

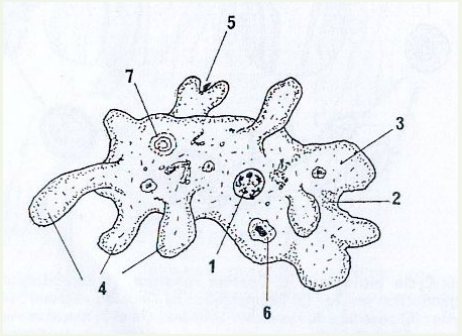
3. – Phylum Actinopoda

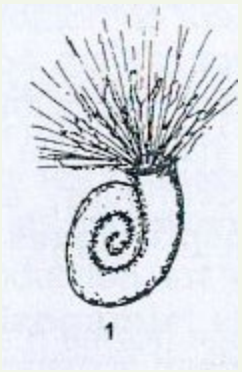
4. – Phylum Apicomplexa

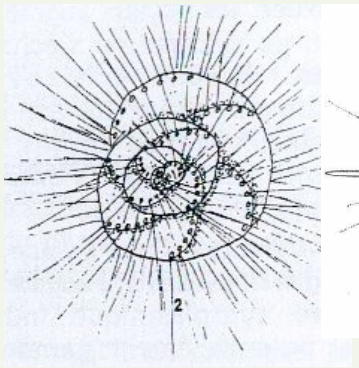
5. – Phylum Ciliophora

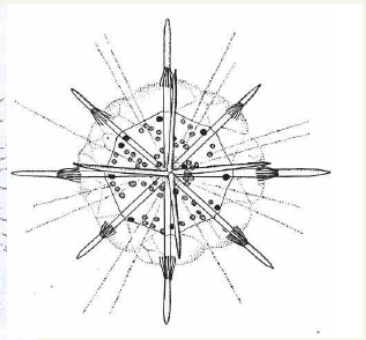
6. – Phylum Cnidosporidia

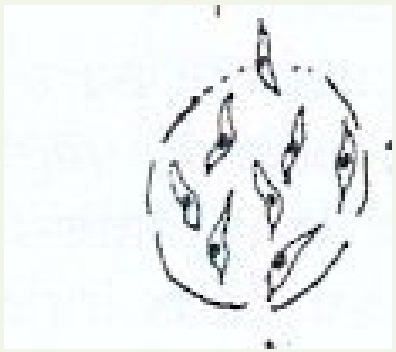


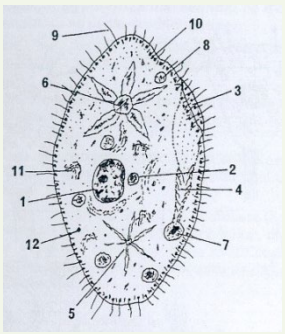


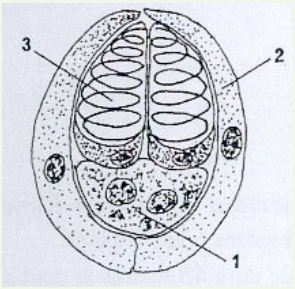


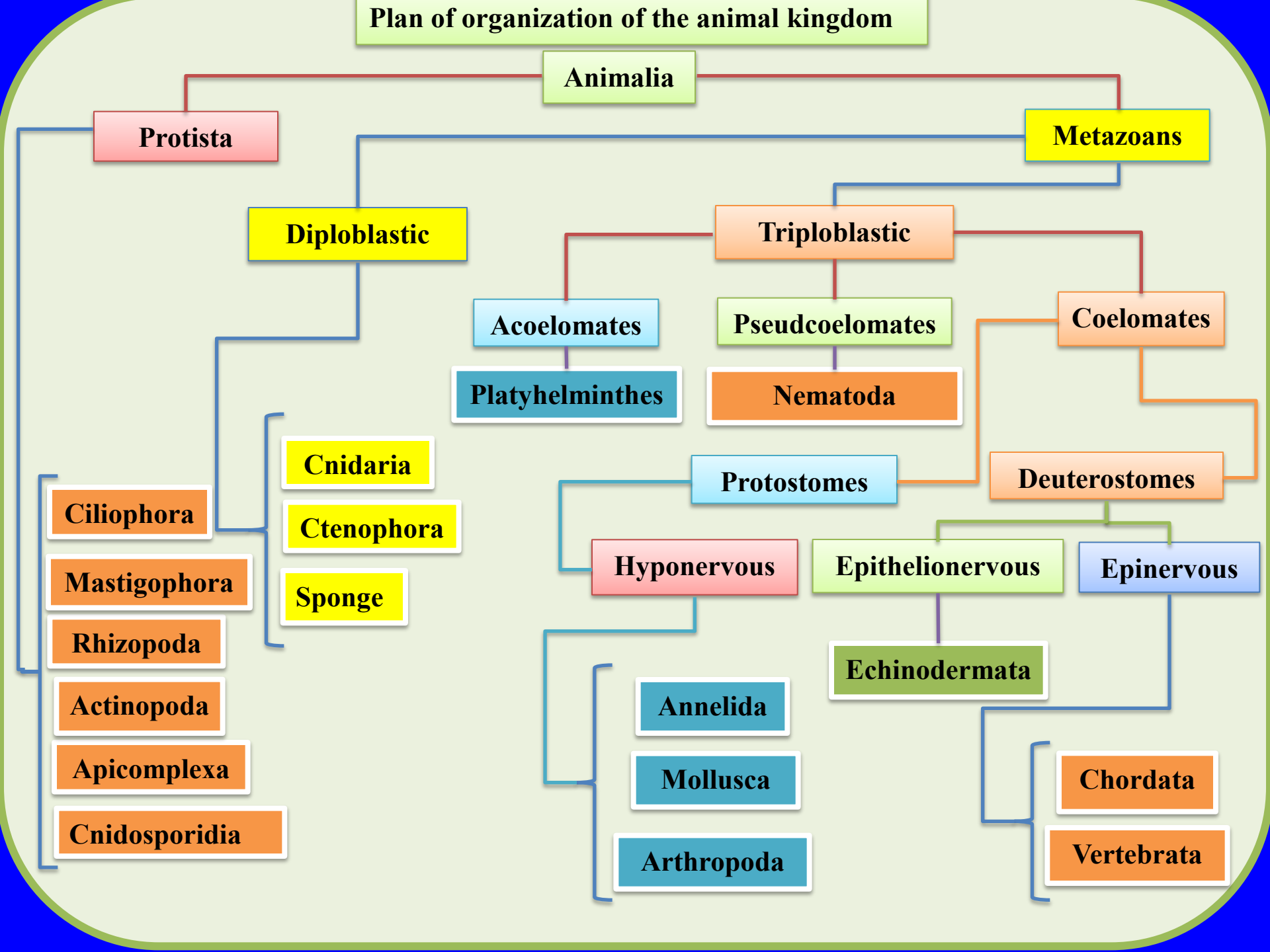




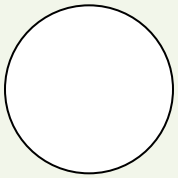




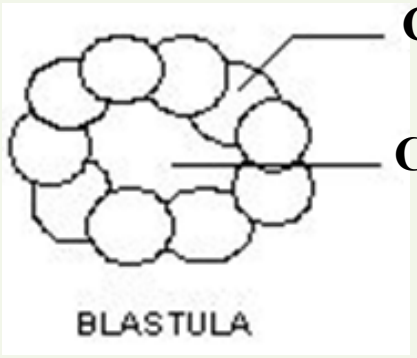


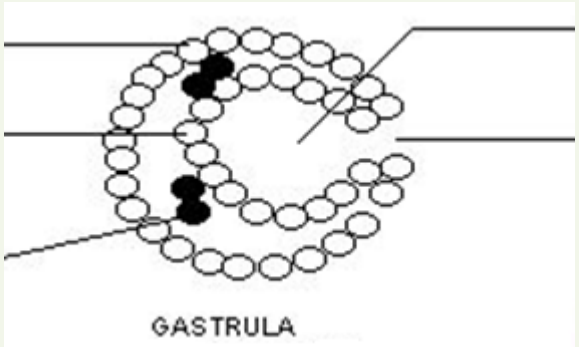

Plan of organization of the animal kingdom
Animalia
Protista
Metazoans
Diploblastic
Triploblastic
Acoelomates
Pseudcoelomates
Coelomates
Platyhelminthes
Nematoda
Cnidaria
Ctenophora
Sponge
Ciliophora
Mastigophora
Rhizopoda
Actinopoda
Apicomplexa
Cnidosporidia
Protostomes
Deuterostomes
Hyponervous
Epithelionervous
Epinervous
Echinodermata
Annelida
Mollusca
Arthropoda
Chordata
Vertebrata

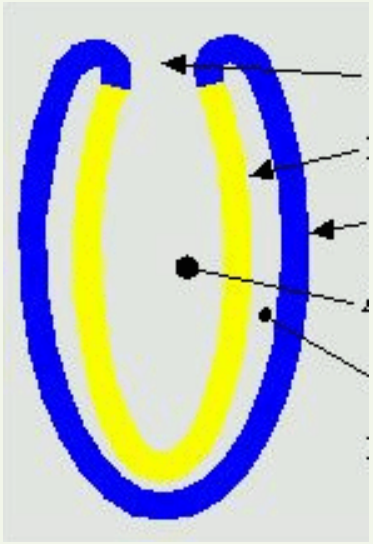
II. – Metazoans diploblastic (di = two, blaste = tissues)



Zygote





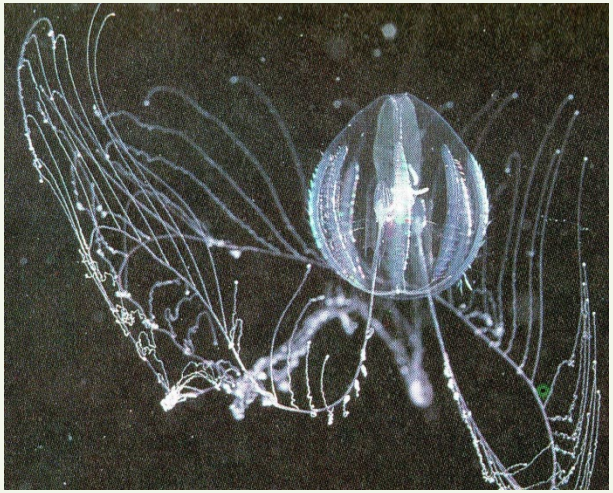


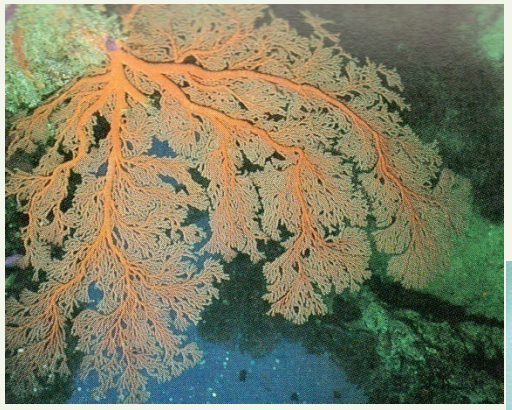
Metazoans diploblastic

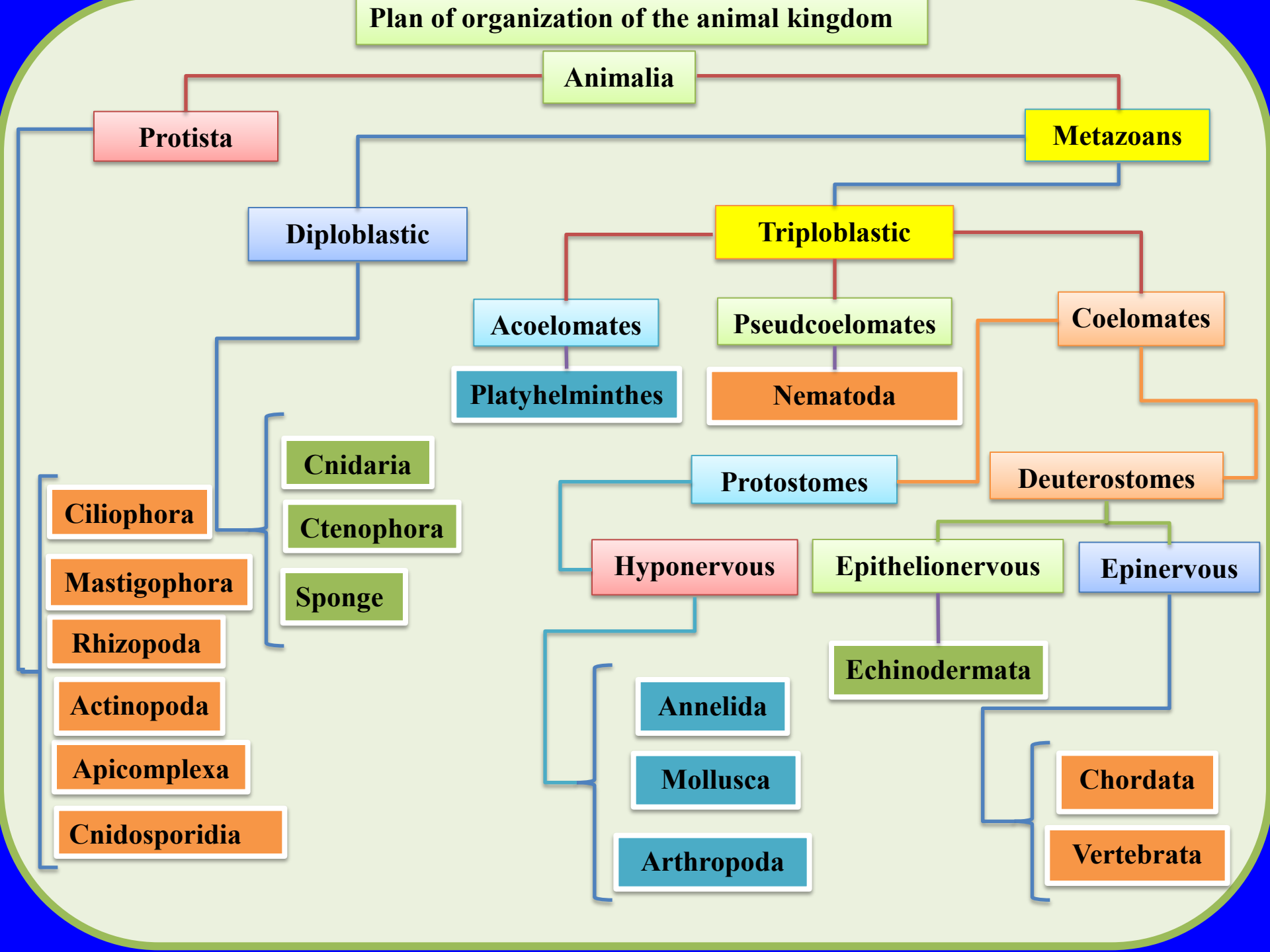
Introduction

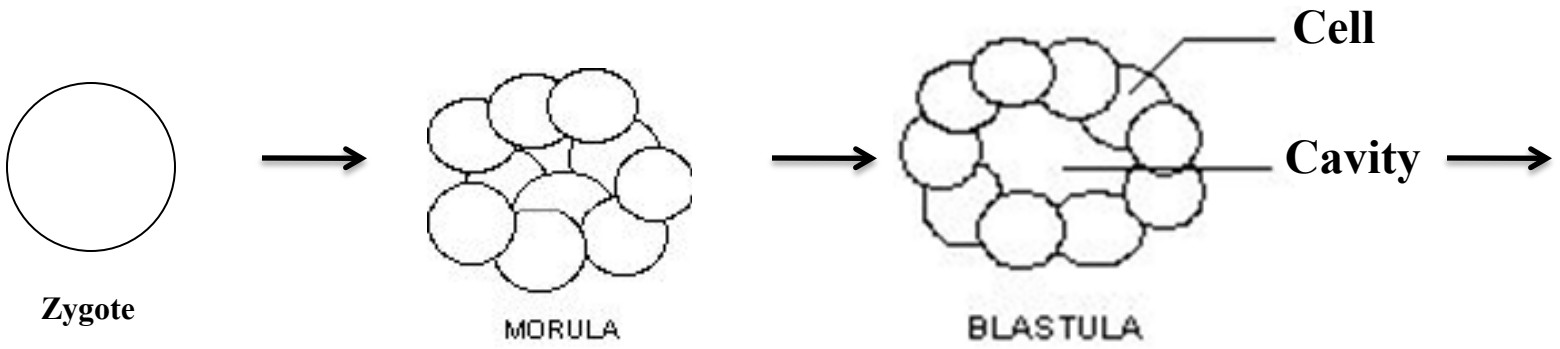
II. – Subkingdom Metazoans diploblastic
(di = two, blaste = tissues)

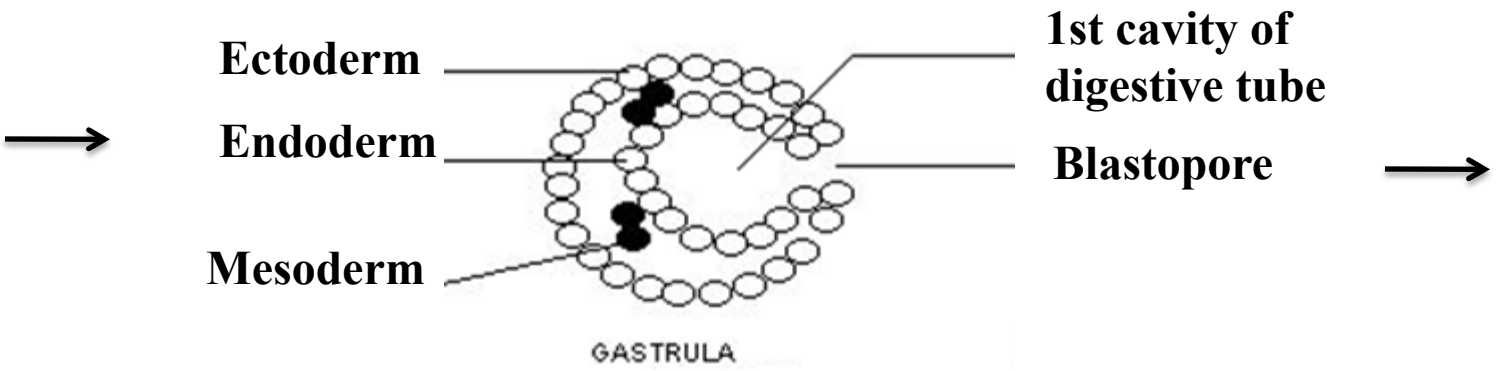
II. 1 – Phylum Sponge
II. 2 – Phylum Cnidaria
II. 3 – Phylum Ctenophora

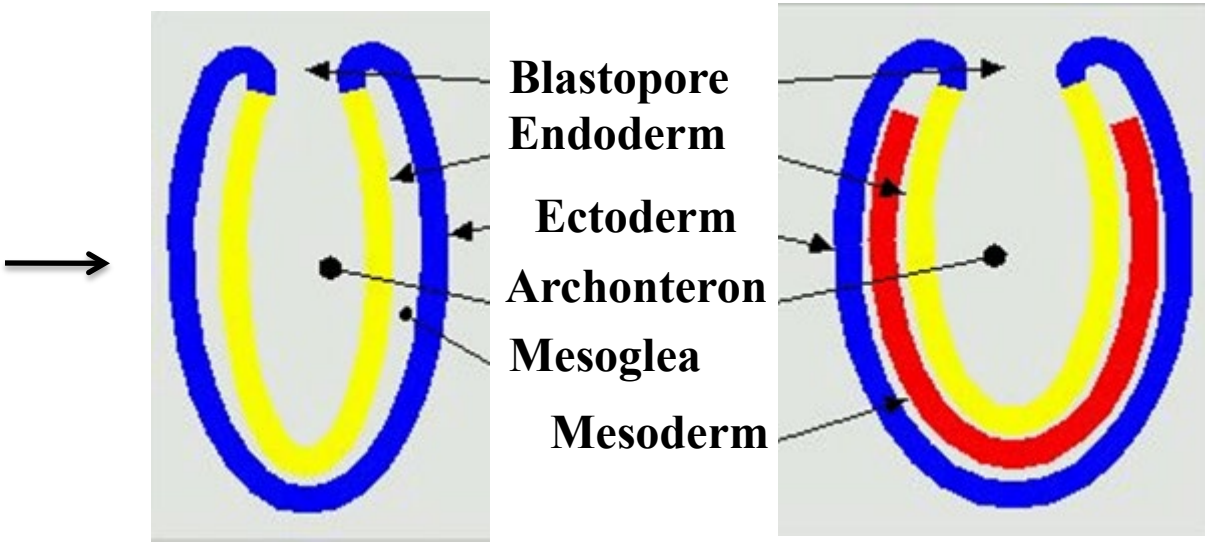





Plan of organization of the animal kingdom
Animalia
Protista
Metazoans
Diploblastic
Triploblastic
Acoelomates
Pseudcoelomates
Coelomates
Platyhelminthes
Nematoda
Cnidaria
Ctenophora
Sponge
Ciliophora
Mastigophora
Rhizopoda
Actinopoda
Apicomplexa
Cnidosporidia
Protostomes
Deuterostomes
Hyponervous
Epithelionervous
Epinervous
Echinodermata
Annelida
Mollusca
Arthropoda
Chordata
Vertebrata

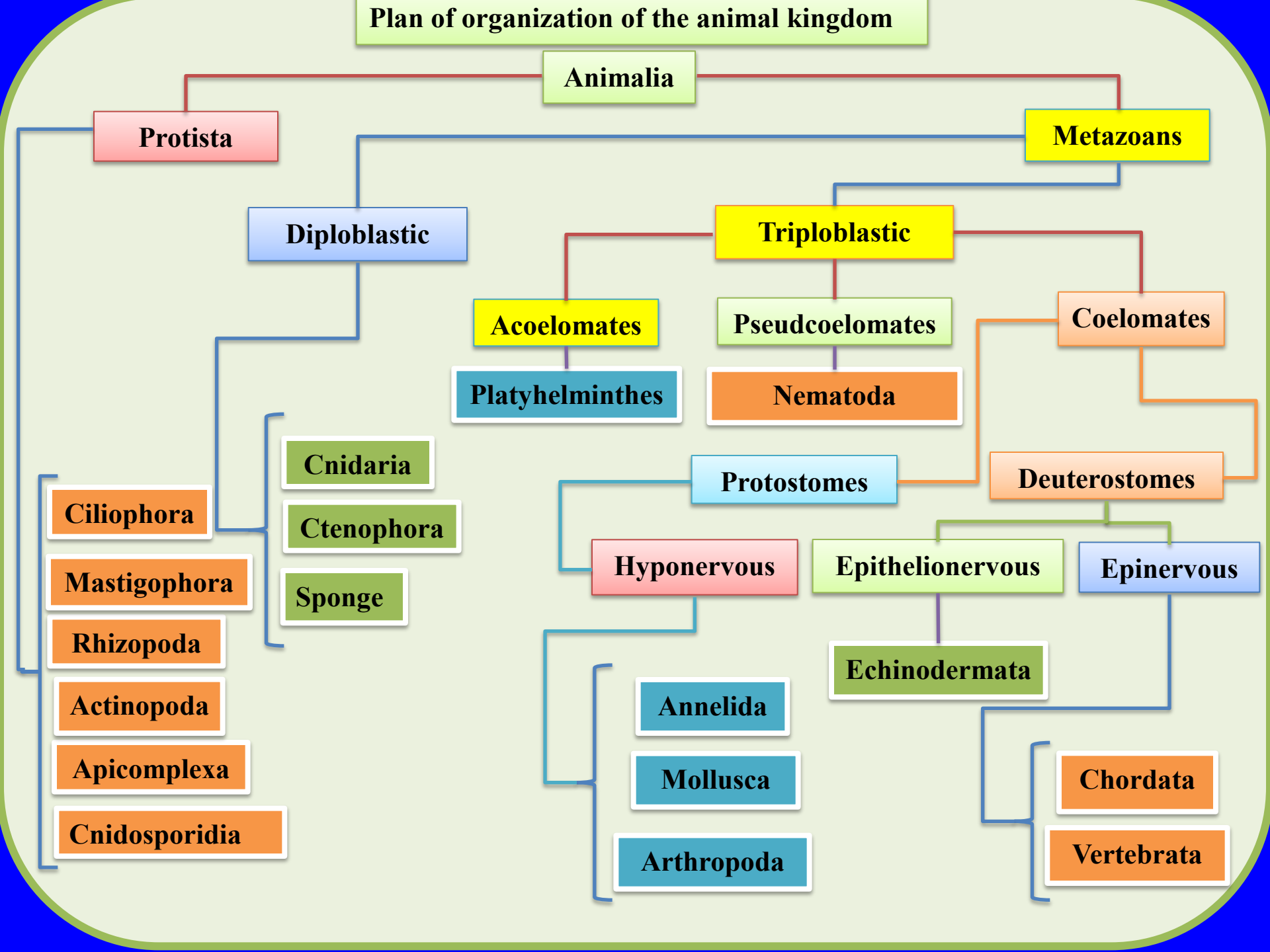


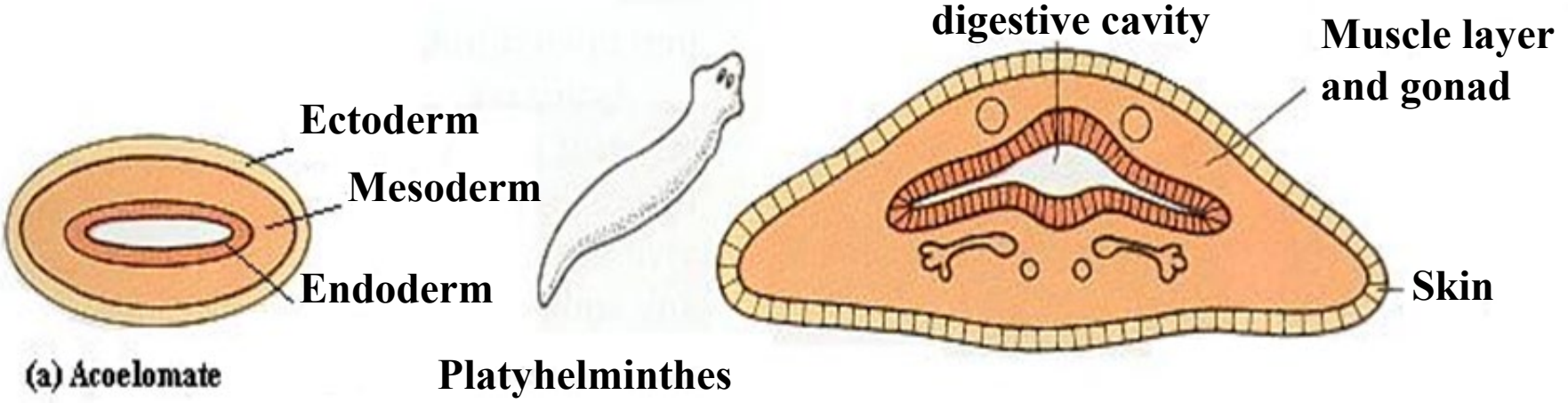




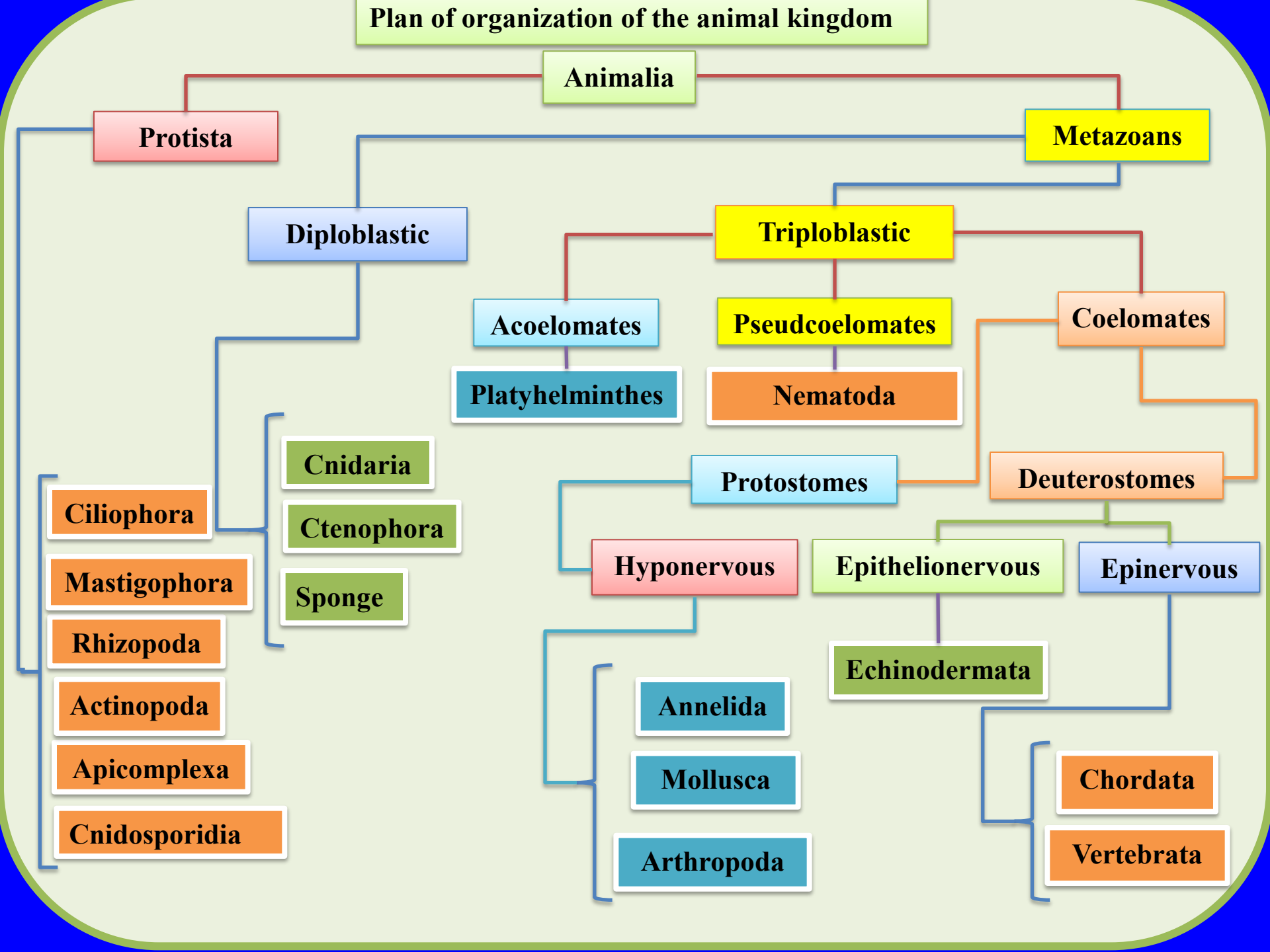
Metazoans diploblastic

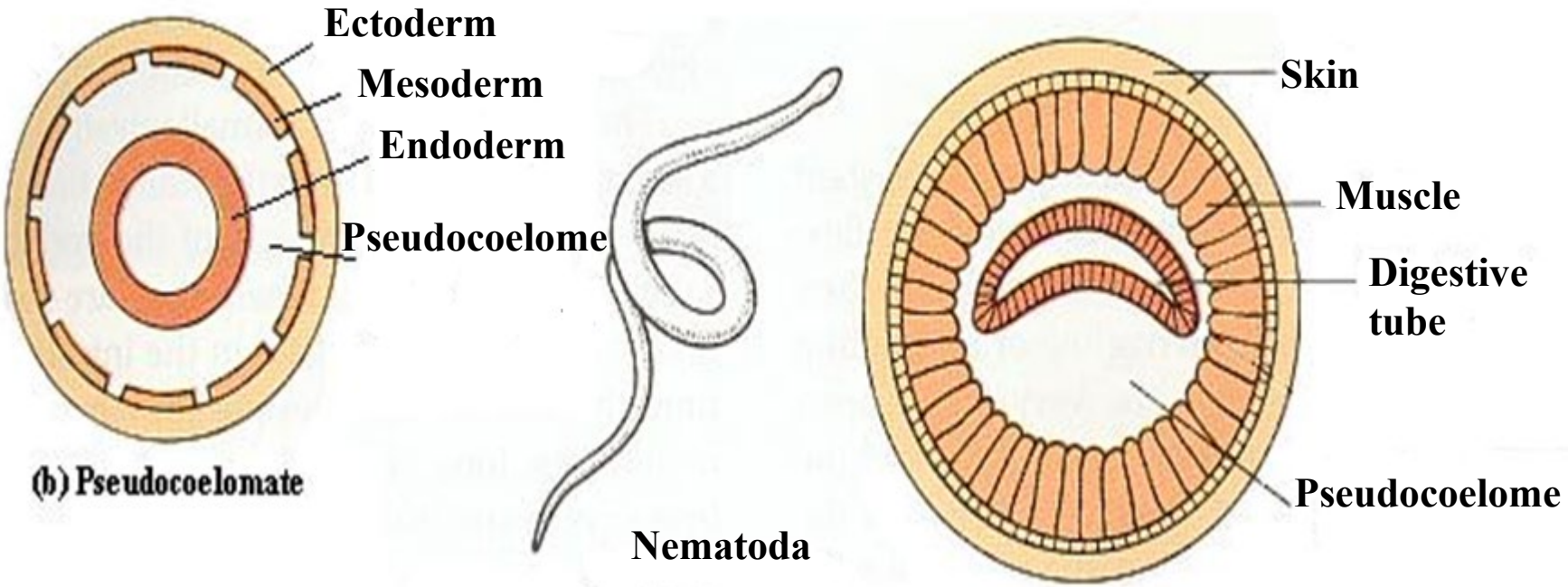
Metazoans triploblastic

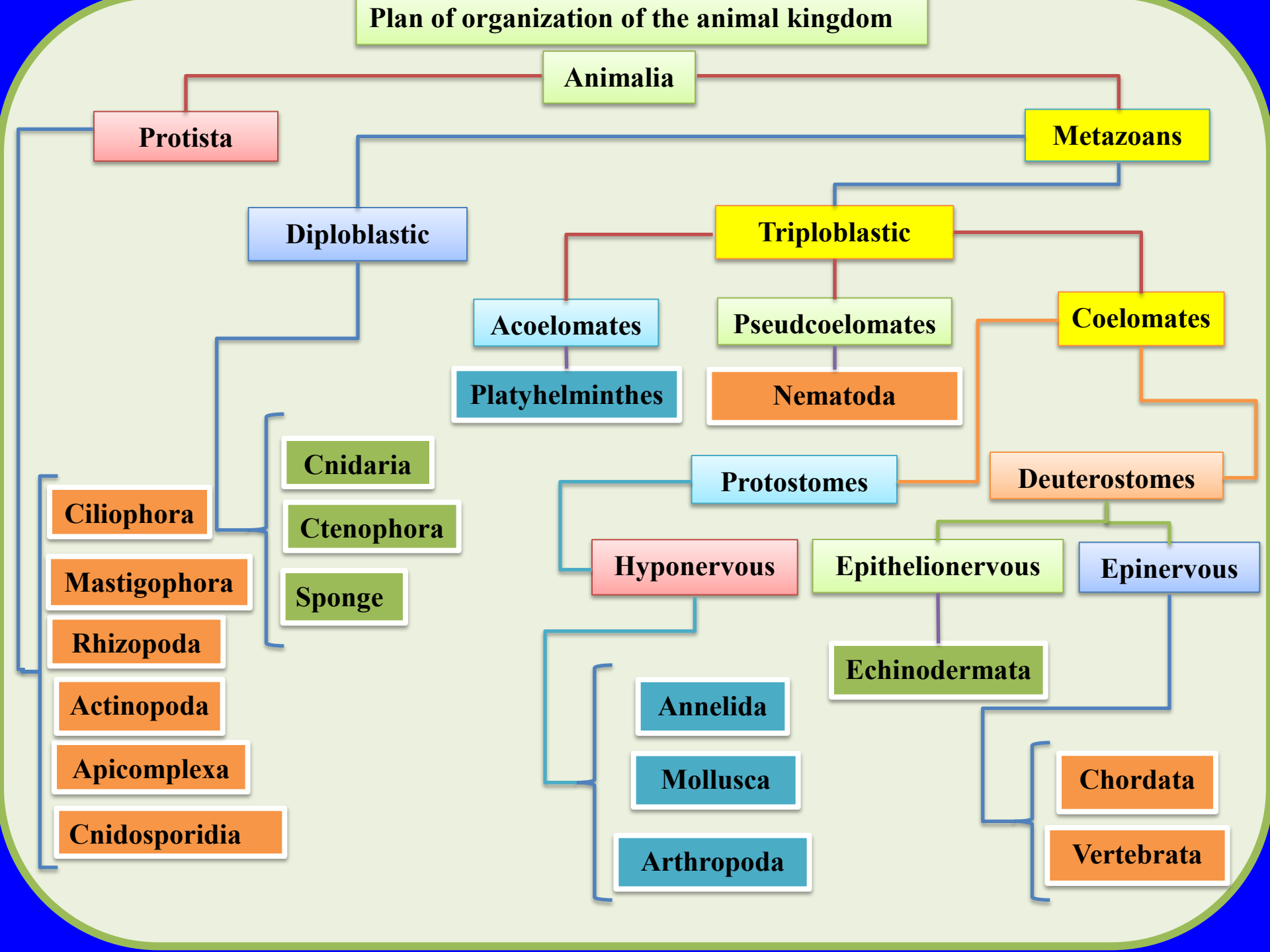

Plan of organization of the animal kingdom
Animalia
Protista
Metazoans
Diploblastic
Triploblastic
Acoelomates
Pseudcoelomates
Coelomates
Platyhelminthes
Nematoda
Cnidaria
Ctenophora
Sponge
Ciliophora
Mastigophora
Rhizopoda
Actinopoda
Apicomplexa
Cnidosporidia
Protostomes
Deuterostomes
Hyponervous
Epithelionervous
Epinervous
Echinodermata
Annelida
Mollusca
Arthropoda
Chordata
Vertebrata

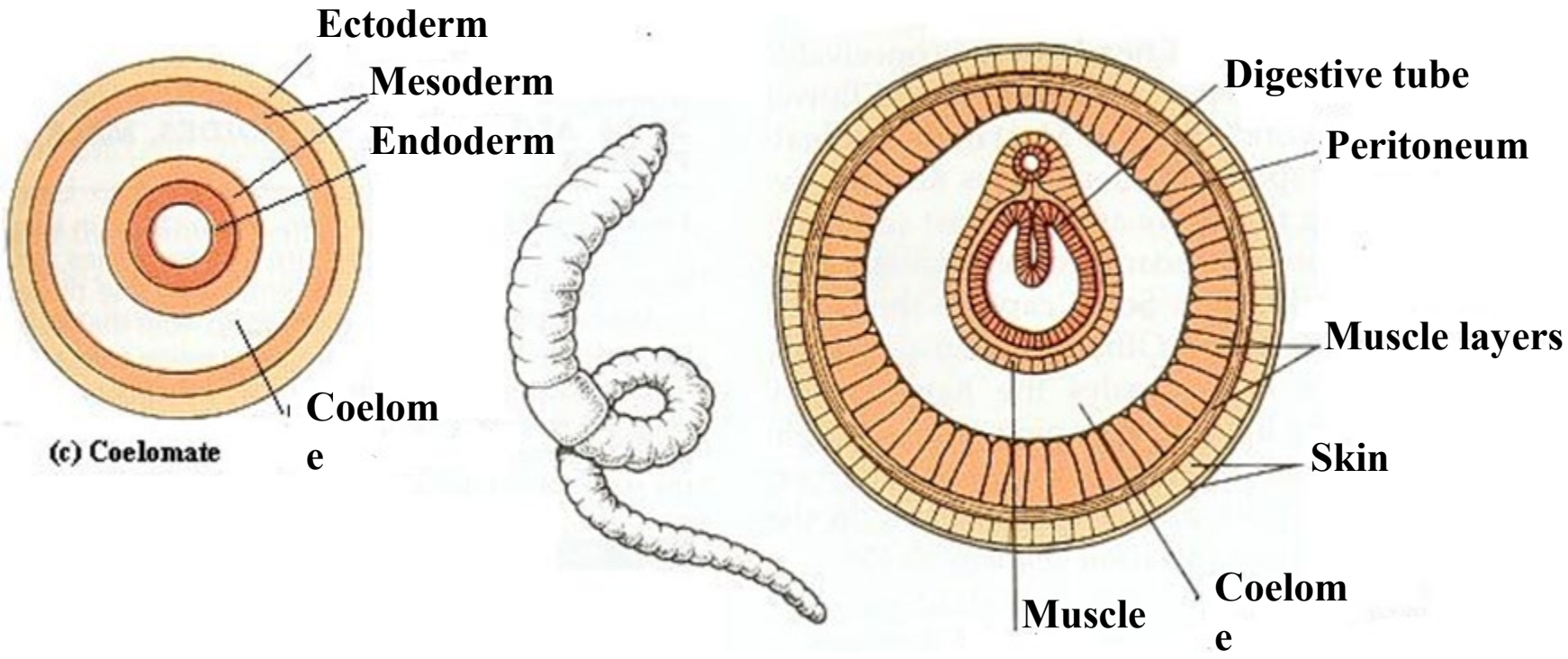


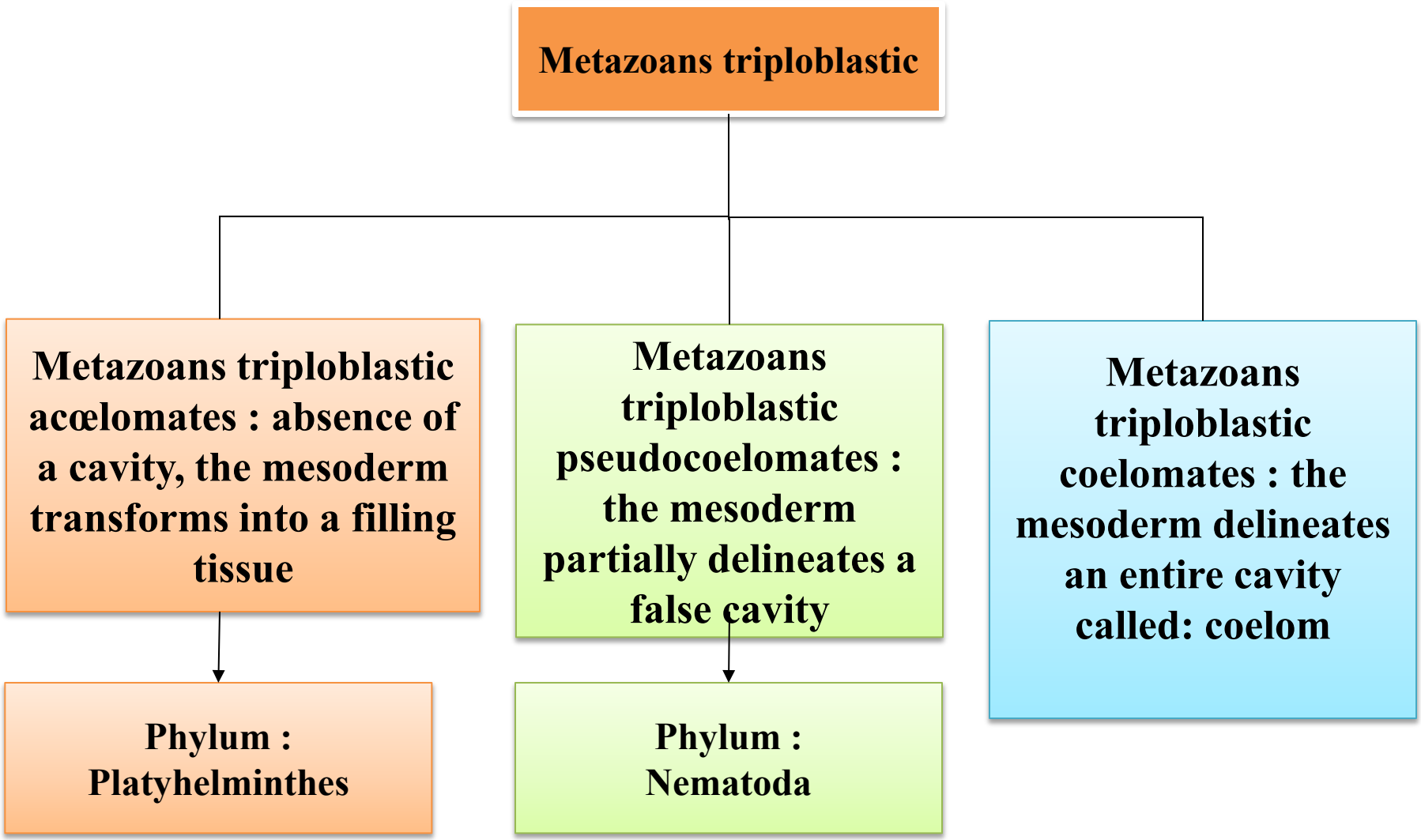
Platyhelminthes

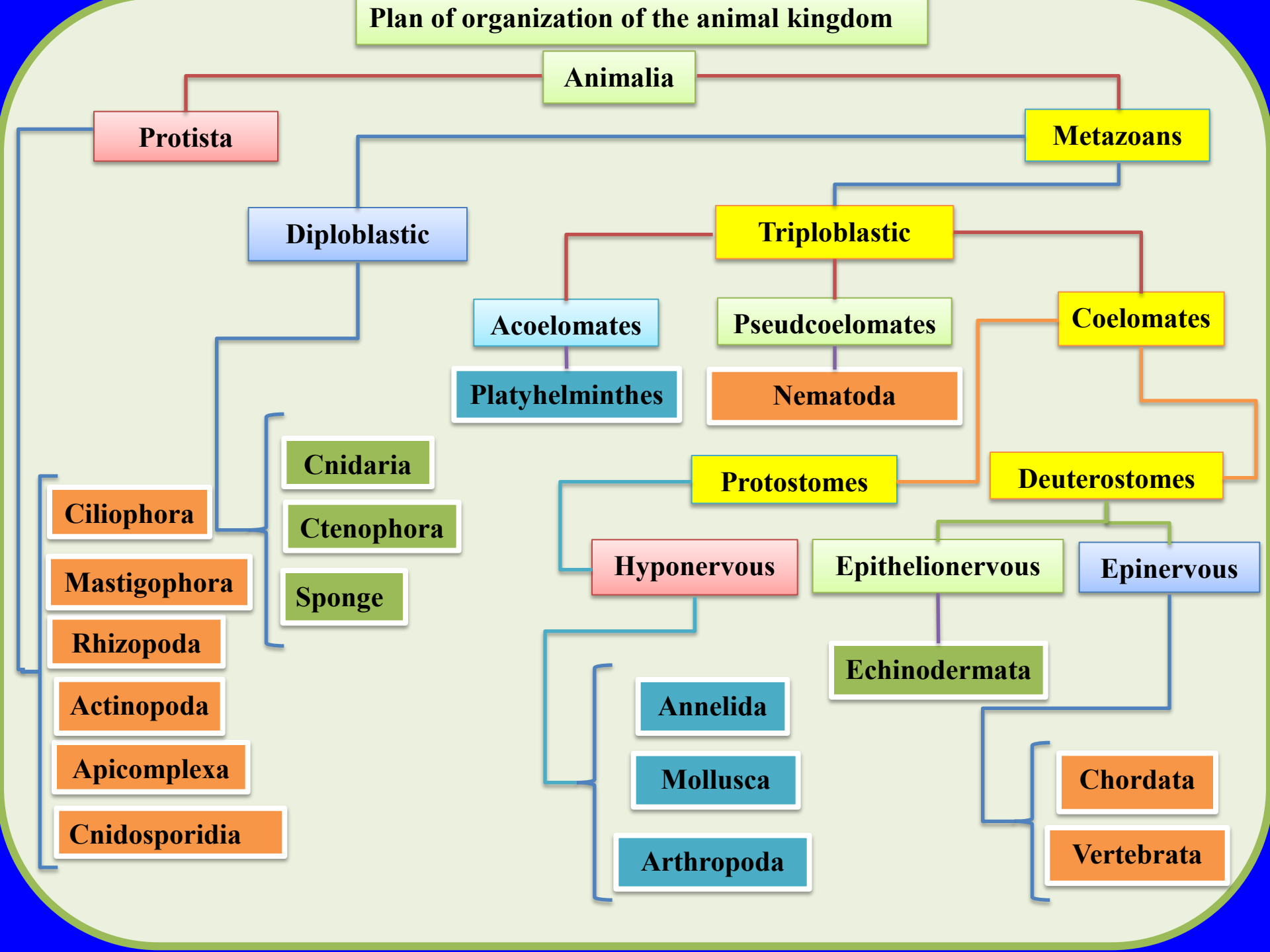

Plan of organization of the animal kingdom
Animalia
Protista
Metazoans
Diploblastic
Triploblastic
Acoelomates
Pseudcoelomates
Coelomates
Platyhelminthes
Nematoda
Cnidaria
Ctenophora
Sponge
Ciliophora
Mastigophora
Rhizopoda
Actinopoda
Apicomplexa
Cnidosporidia
Protostomes
Deuterostomes
Hyponervous
Epithelionervous
Epinervous
Echinodermata
Annelida
Mollusca
Arthropoda
Chordata
Vertebrata

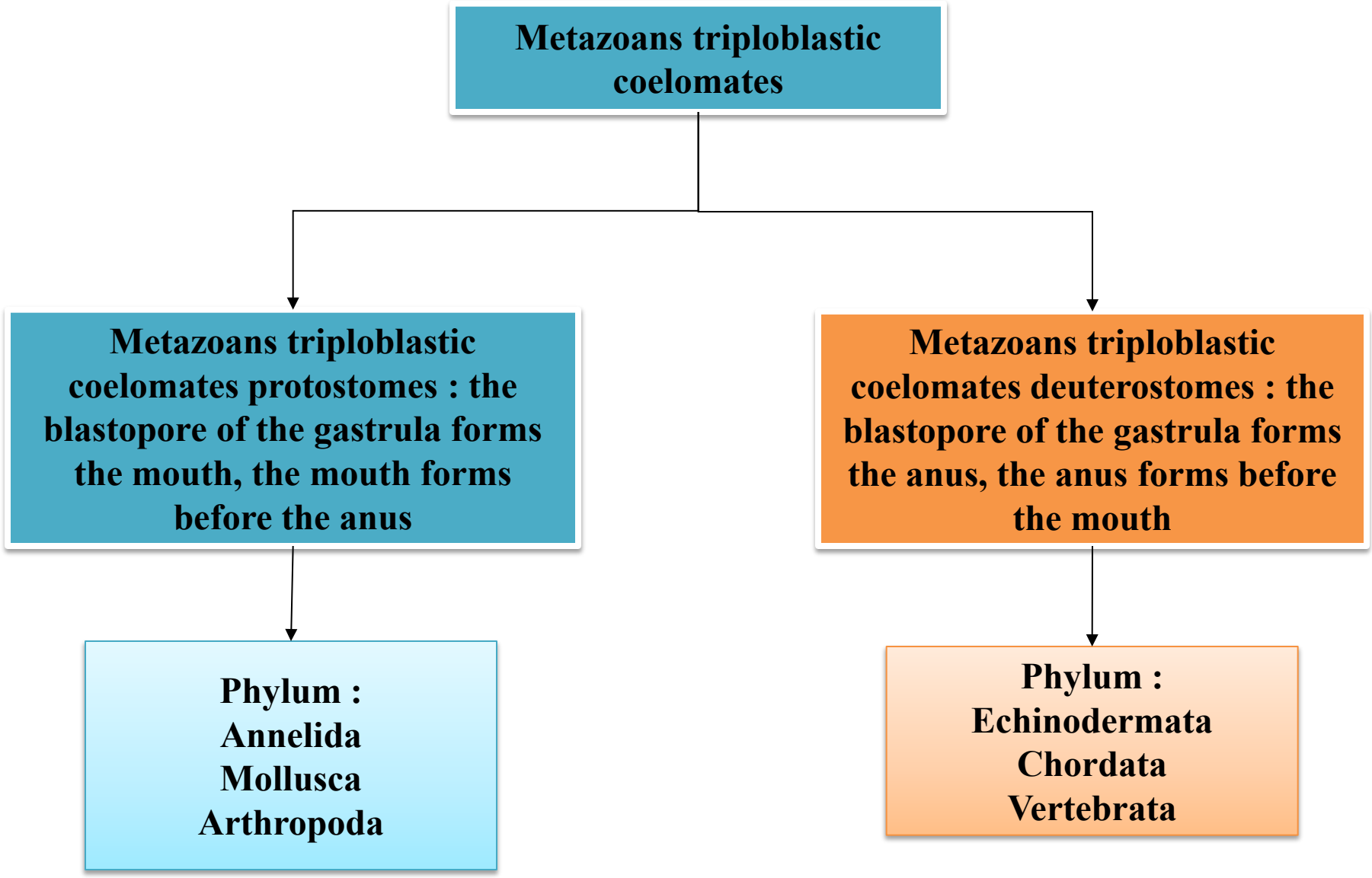

Ectoderm
Mesoderm
Endoderm
Pseudocoelome
(b) Pseudocoelomate
Nematoda
Skin
Muscle
Digestive tube
Pseudocoelome

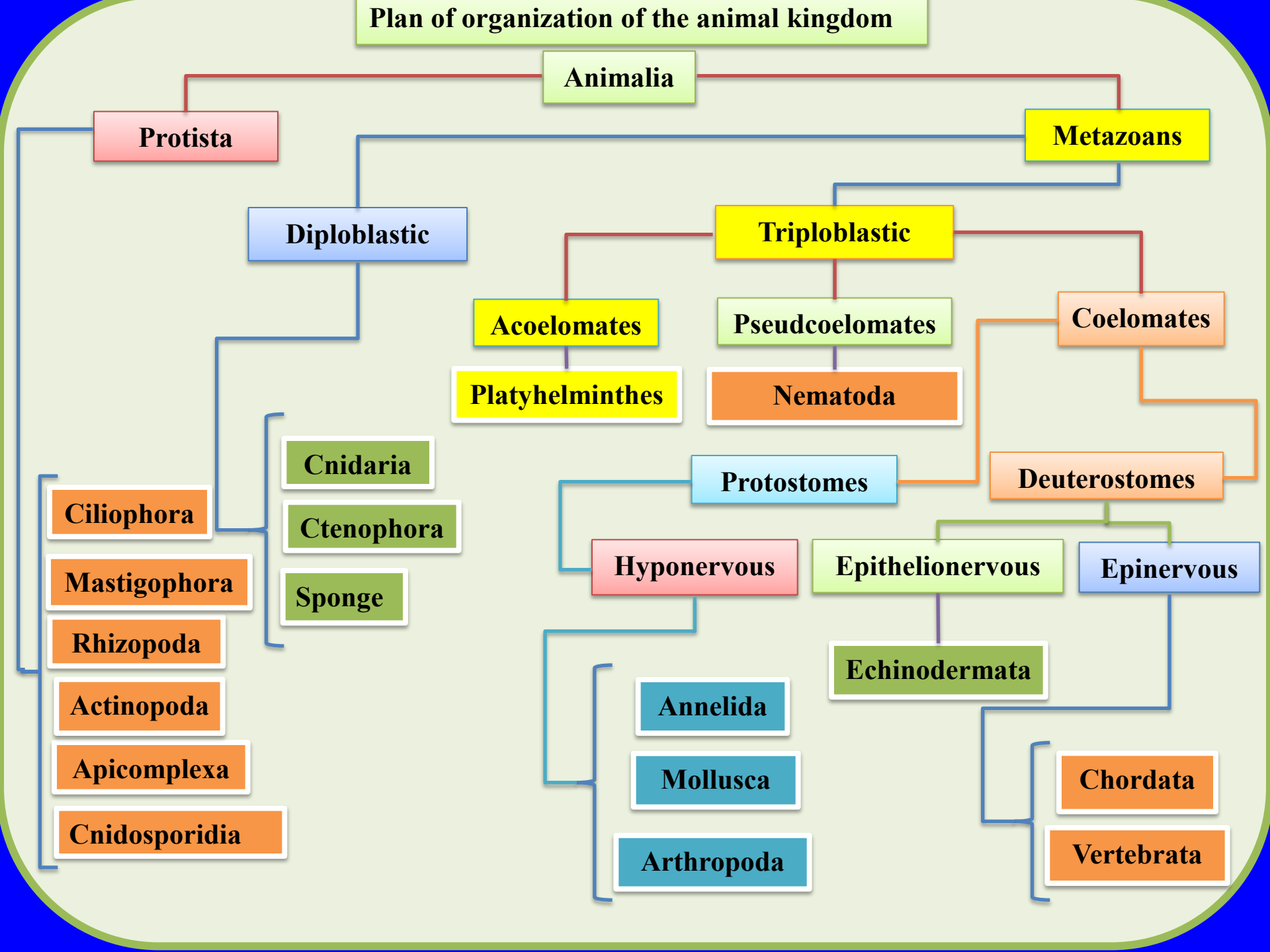

Plan of organization of the animal kingdom
Animalia
Protista
Metazoans
Diploblastic
Triploblastic
Acoelomates
Pseudcoelomates
Coelomates
Platyhelminthes
Nematoda
Cnidaria
Ctenophora
Sponge
Ciliophora
Mastigophora
Rhizopoda
Actinopoda
Apicomplexa
Cnidosporidia
Protostomes
Deuterostomes
Hyponervous
Epithelionervous
Epinervous
Echinodermata
Annelida
Mollusca
Arthropoda
Chordata
Vertebrata


Ectoderm
Mesoderm
Endoderm
Coelom
e
(c) Coelomate
Digestive tube
Peritoneum
Muscle layers
Skin
Muscle
Coelom
e


Metazoans triploblastic
Metazoans triploblastic acœlomates : absence of a cavity, the mesoderm transforms into a filling tissue
Metazoans triploblastic pseudocoelomates : the mesoderm partially delineates a false cavity
Metazoans triploblastic coelomates : the mesoderm delineates an entire cavity called: coelom
Phylum : Platyhelminthes
Phylum : Nematoda


Plan of organization of the animal kingdom
Animalia
Protista
Metazoans
Diploblastic
Triploblastic
Acoelomates
Pseudcoelomates
Coelomates
Platyhelminthes
Nematoda
Cnidaria
Ctenophora
Sponge
Ciliophora
Mastigophora
Rhizopoda
Actinopoda
Apicomplexa
Cnidosporidia
Protostomes
Deuterostomes
Hyponervous
Epithelionervous
Epinervous
Echinodermata
Annelida
Mollusca
Arthropoda
Chordata
Vertebrata


Metazoans triploblastic coelomates
Metazoans triploblastic coelomates protostomes : the blastopore of the gastrula forms the mouth, the mouth forms before the anus
Metazoans triploblastic coelomates deuterostomes : the blastopore of the gastrula forms the anus, the anus forms before the mouth
Phylum :
Annelida
Mollusca
Arthropoda
Phylum :
Echinodermata
Chordata
Vertebrata


Plan of organization of the animal kingdom
Animalia
Protista
Metazoans
Diploblastic
Triploblastic
Acoelomates
Pseudcoelomates
Coelomates
Platyhelminthes
Nematoda
Cnidaria
Ctenophora
Sponge
Ciliophora
Mastigophora
Rhizopoda
Actinopoda
Apicomplexa
Cnidosporidia
Protostomes
Deuterostomes
Hyponervous
Epithelionervous
Epinervous
Echinodermata
Annelida
Mollusca
Arthropoda
Chordata
Vertebrata

Introduction

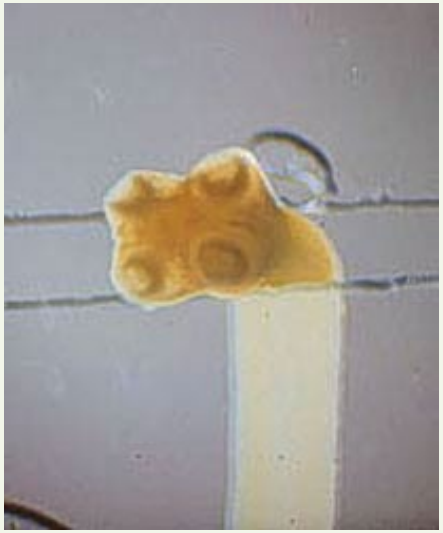
III – Subkingdom Metazoans triploblastic acoelomates

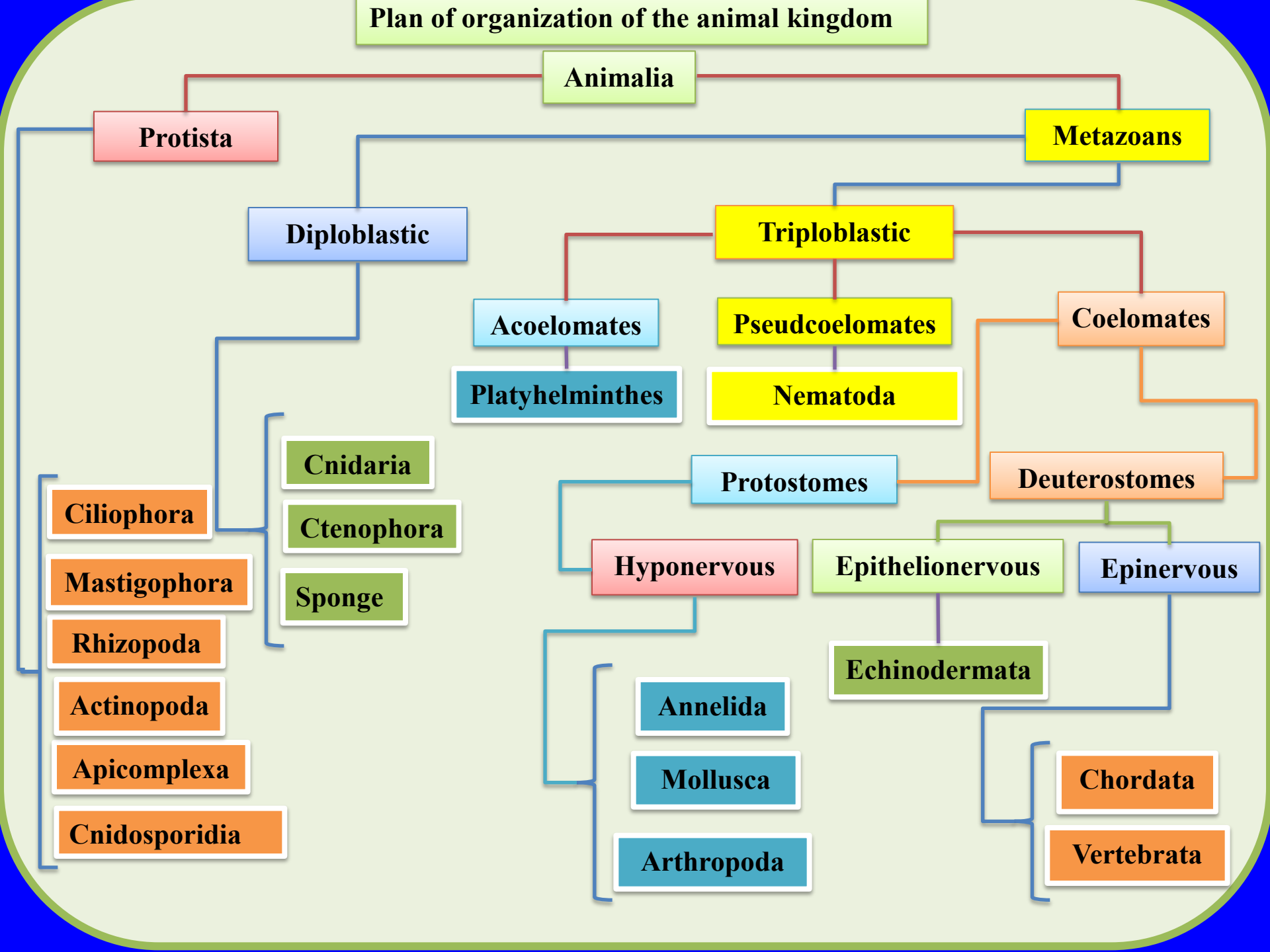
III. 1 – Phylum Platyhelminthes

III.1.1. – Class Planarians

III.1.2. – Class Trematoda

III.1.3. – Class Cestoda

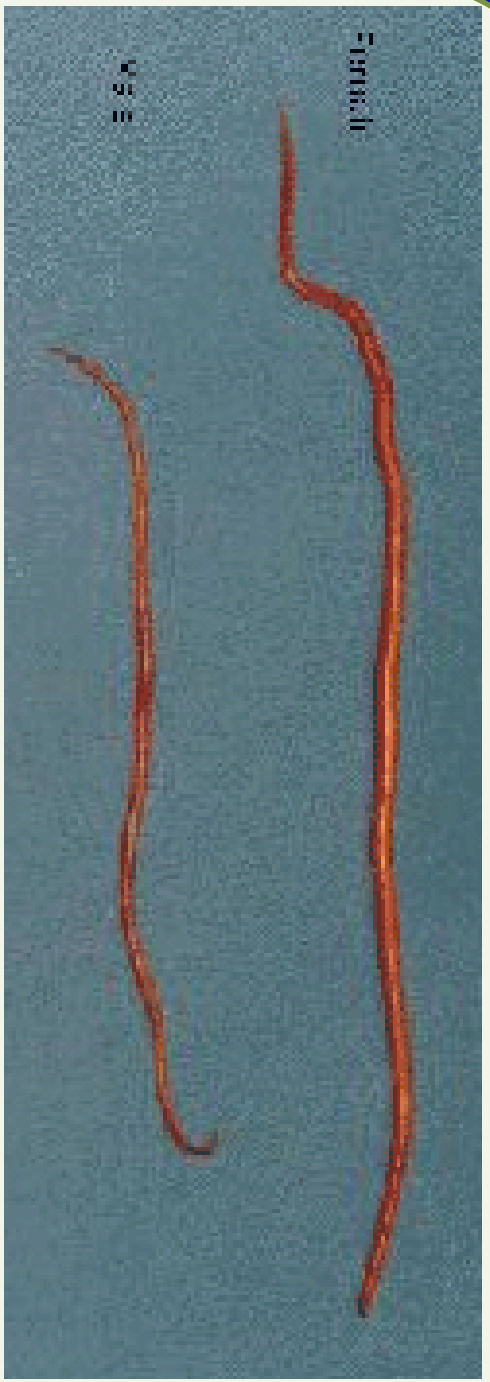


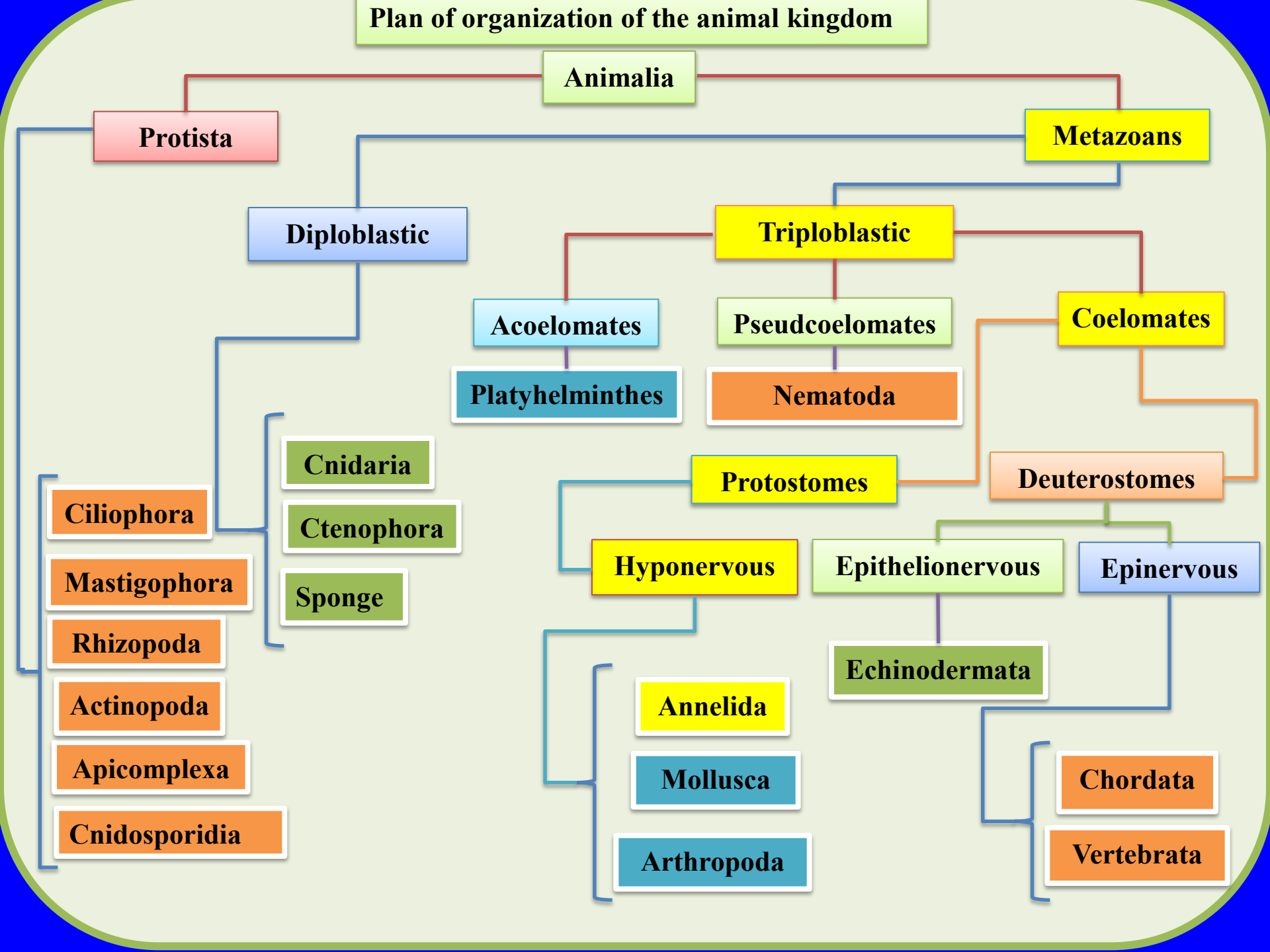

Plan of organization of the animal kingdom
Animalia
Protista
Metazoans
Diploblastic
Triploblastic
Acoelomates
Pseudcoelomates
Coelomates
Platyhelminthes
Nematoda
Cnidaria
Ctenophora
Sponge
Ciliophora
Mastigophora
Rhizopoda
Actinopoda
Apicomplexa
Cnidosporidia
Protostomes
Deuterostomes
Hyponervous
Epithelionervous
Epinervous
Echinodermata
Annelida
Mollusca
Arthropoda
Chordata
Vertebrata

Introduction

IV – Subkingdom Metazoans triploblastic pseudocoelomates

IV. 1 – Phylum Nematoda




Plan of organization of the animal kingdom
Animalia
Protista
Metazoans
Diploblastic
Triploblastic
Acoelomates
Pseudcoelomates
Coelomates
Platyhelminthes
Nematoda
Cnidaria
Ctenophora
Sponge
Ciliophora
Mastigophora
Rhizopoda
Actinopoda
Apicomplexa
Cnidosporidia
Protostomes
Deuterostomes
Hyponervous
Epithelionervous
Epinervous
Echinodermata
Annelida
Mollusca
Arthropoda
Chordata
Vertebrata

Introduction

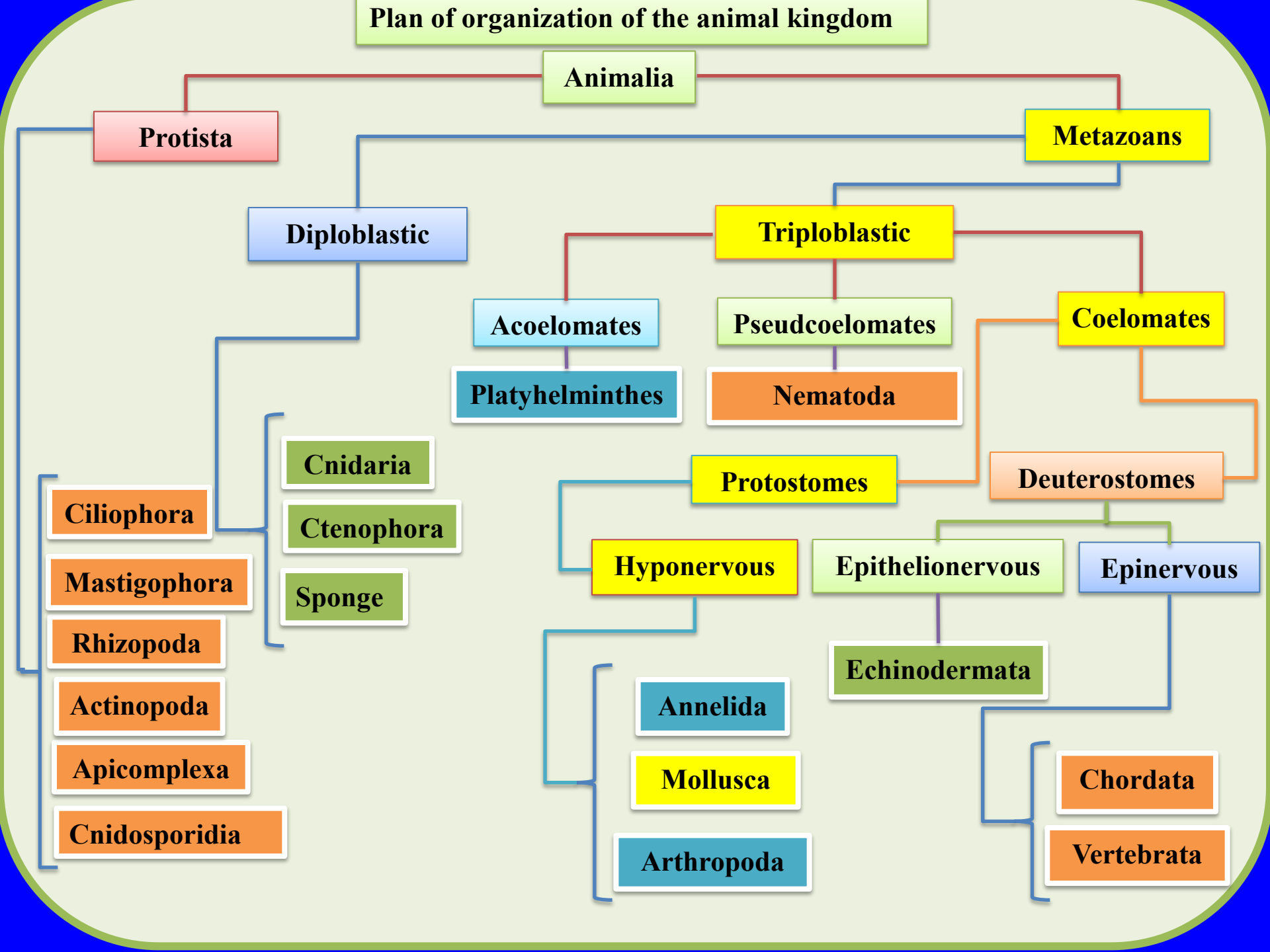
V – Subkingdom Metazoans triploblastic coelomates protostomes

V. 1 – Phylum Annelida

V. 1.1 – Class 1 Polychaeta

V. 1.2 – Class 2 Oligochaeta

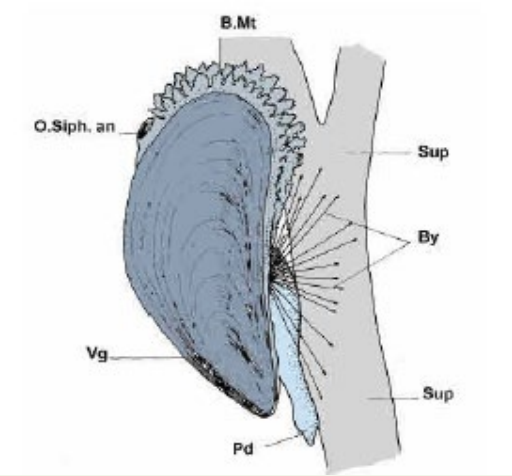
V. 1.3 – Class 3 Hirudinea

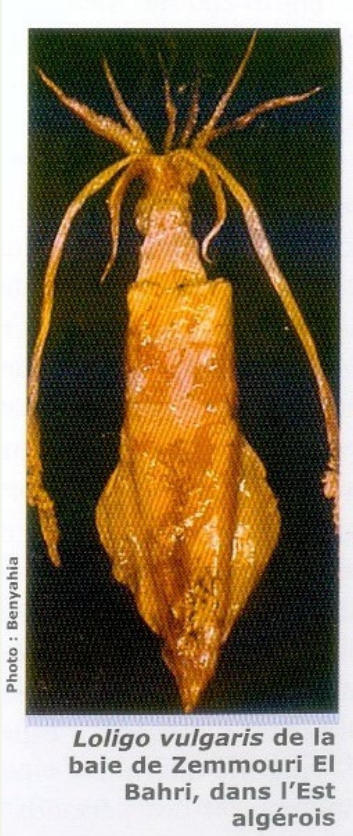

Plan of organization of the animal kingdom
Animalia
Protista
Metazoans
Diploblastic
Triploblastic
Acoelomates
Pseudcoelomates
Coelomates
Platyhelminthes
Nematoda
Cnidaria
Ctenophora
Sponge
Ciliophora
Mastigophora
Rhizopoda
Actinopoda
Apicomplexa
Cnidosporidia
Protostomes
Deuterostomes
Hyponervous
Epithelionervous
Epinervous
Echinodermata
Annelida
Mollusca
Arthropoda
Chordata
Vertebrata

Introduction

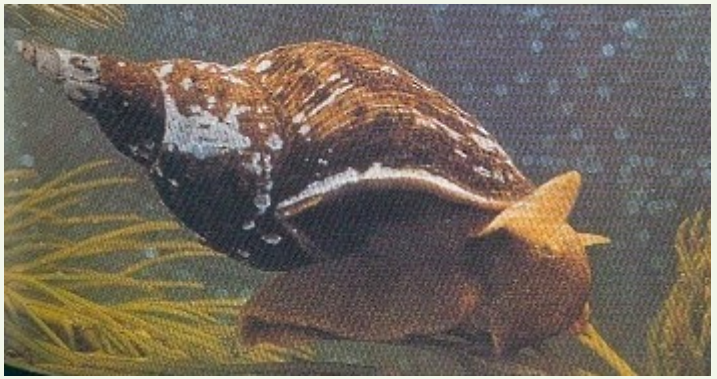
V – Subkingdom Metazoans triploblastic coelomates protostomes

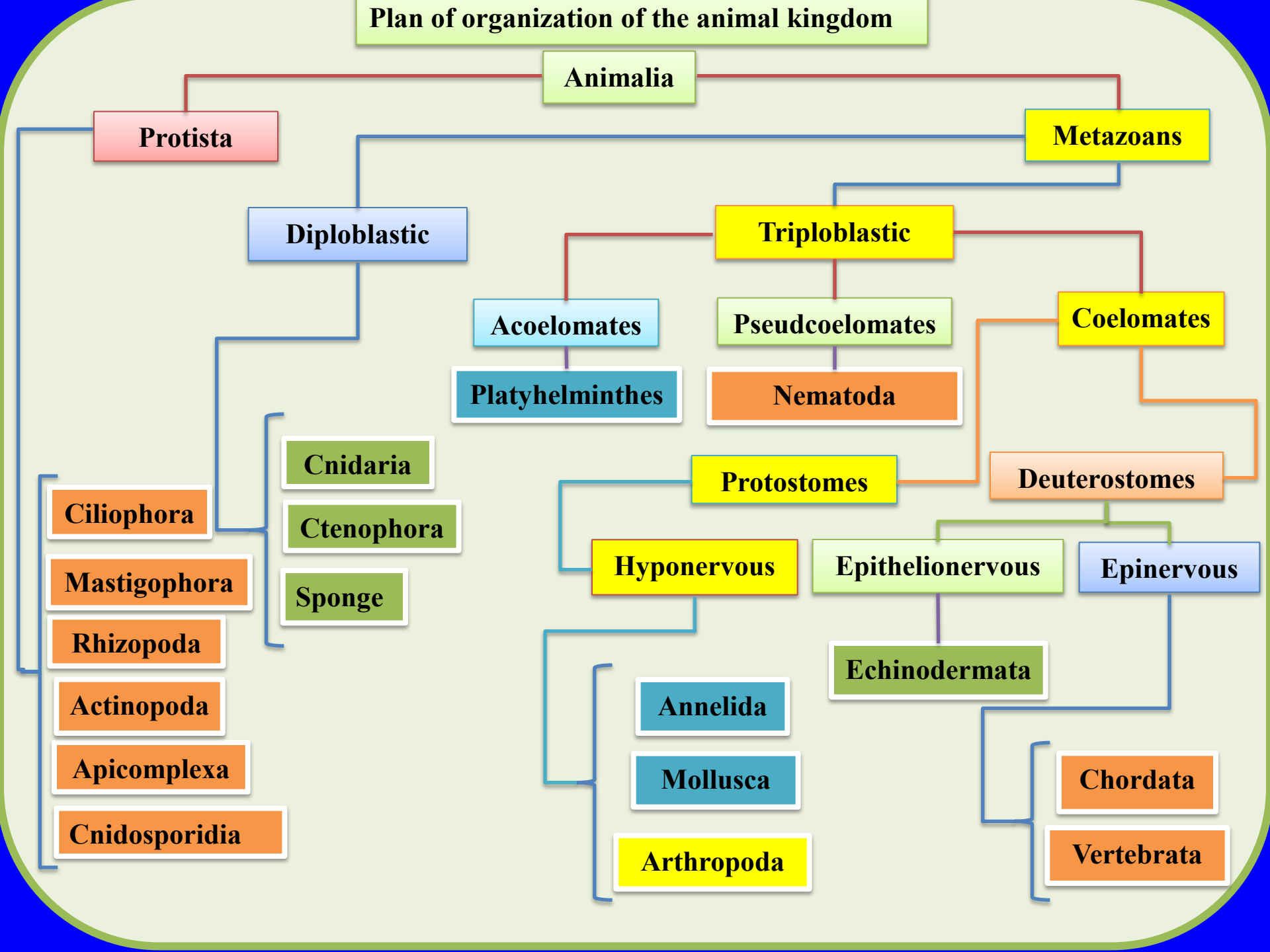
V. 2 – Phylum Mollusca





Loligo vulgaris de la baie de Zemmouri El Bahri, dans l'Est algérois

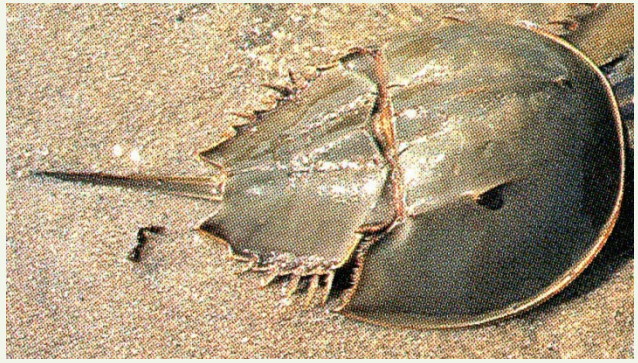



Plan of organization of the animal kingdom
Animalia
Protista
Metazoans
Diploblastic
Triploblastic
Acoelomates
Pseudcoelomates
Coelomates
Platyhelminthes
Nematoda
Cnidaria
Ctenophora
Sponge
Ciliophora
Mastigophora
Rhizopoda
Actinopoda
Apicomplexa
Cnidosporidia
Protostomes
Deuterostomes
Hyponervous
Epithelionervous
Epinervous
Echinodermata
Annelida
Mollusca
Arthropoda
Chordata
Vertebrata

Introduction

V – Subkingdom Metazoans triploblastic coelomates protostomes

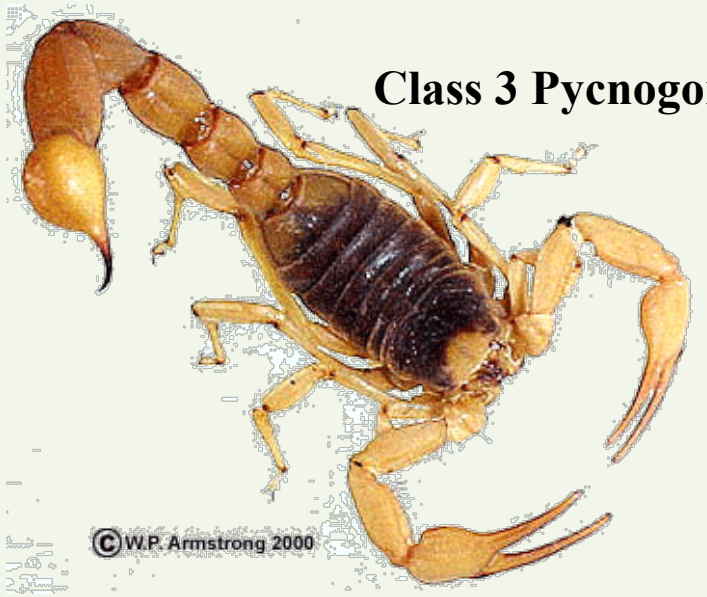
V. 3 – Phylum Arthropoda



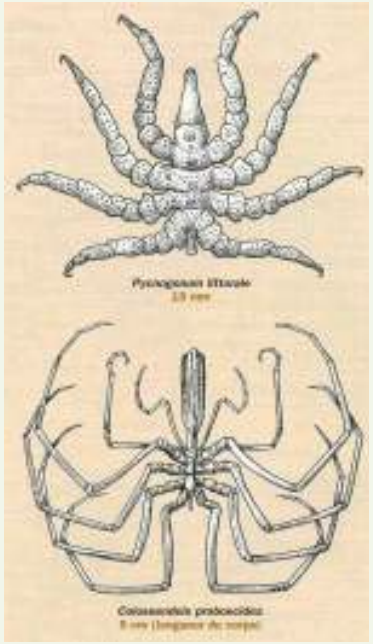
Subphylum 1 Chelicerata

Class 1 Merostomata

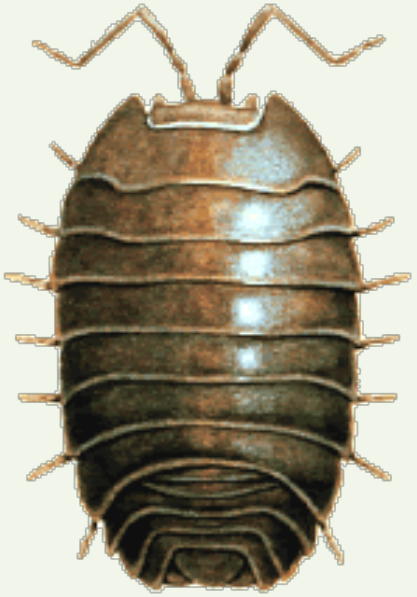
Class 2 Arachnida



Class 3 Pycnogonida



Introduction



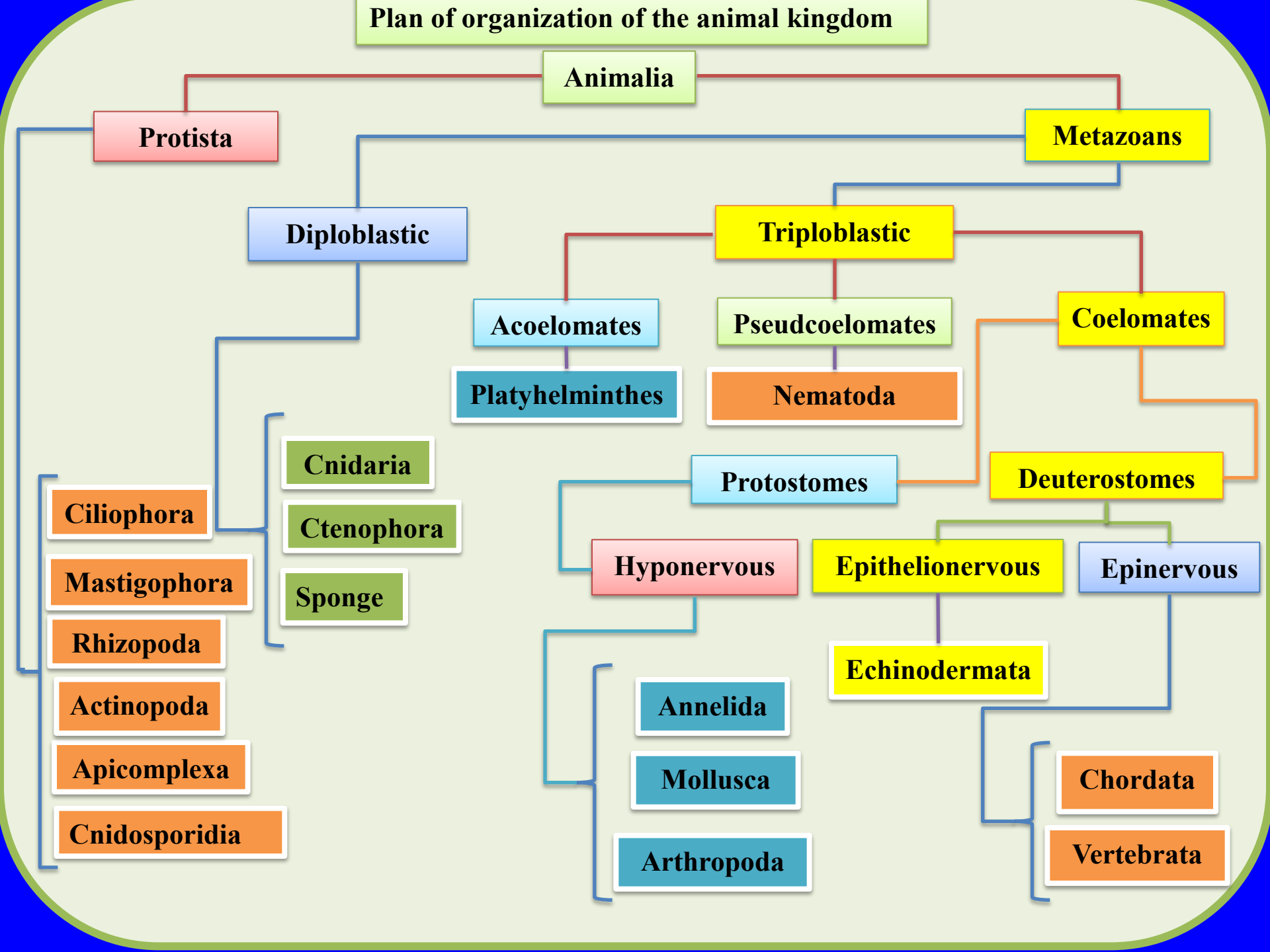
V. 3 – Phylum Arthropoda

Subphylum Mandibulata

Class 1 Crustacea

Class 2 Myriapoda

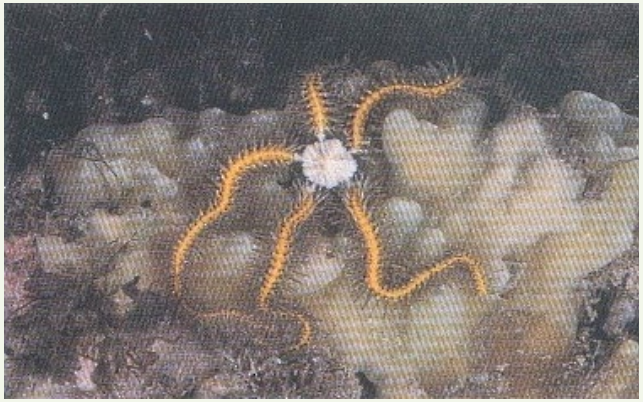
Class 3 Insecta

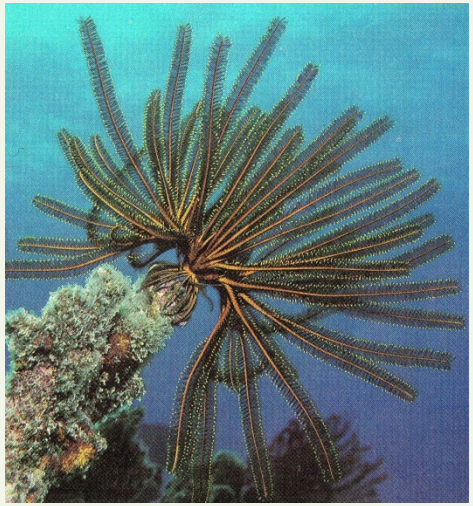

Plan of organization of the animal kingdom
Animalia
Protista
Metazoans
Diploblastic
Triploblastic
Acoelomates
Pseudcoelomates
Coelomates
Platyhelminthes
Nematoda
Cnidaria
Ctenophora
Sponge
Ciliophora
Mastigophora
Rhizopoda
Actinopoda
Apicomplexa
Cnidosporidia
Protostomes
Deuterostomes
Hyponervous
Epithelionervous
Epinervous
Echinodermata
Annelida
Mollusca
Arthropoda
Chordata
Vertebrata

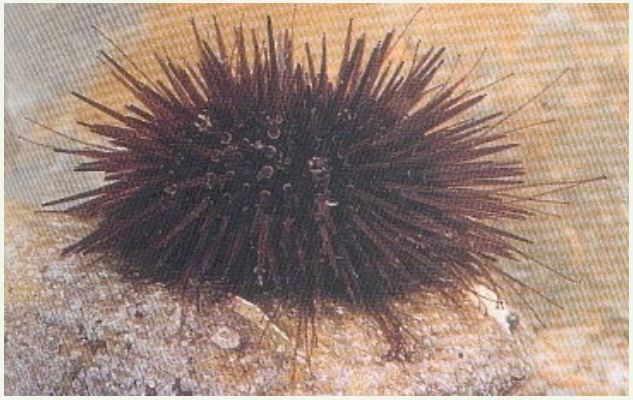
Introduction

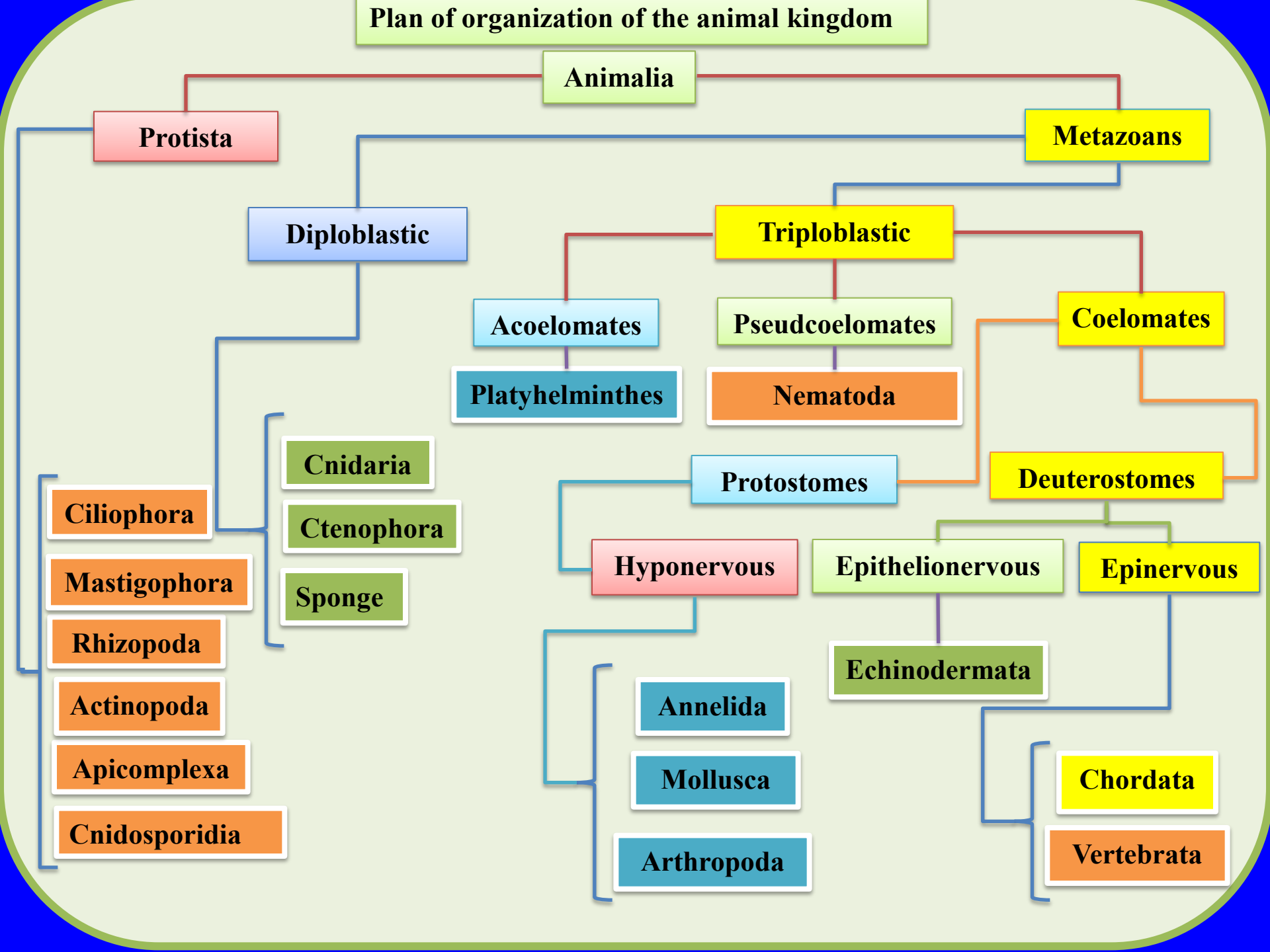
VI – Subkingdom Metazoans triploblastic coelomates deuterostomes

VI. 1 – Phylum Echinodermata



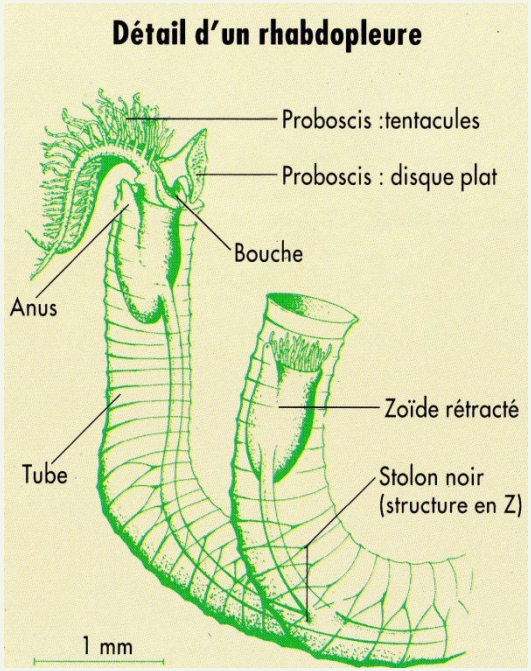





Plan of organization of the animal kingdom
Animalia
Protista
Metazoans
Diploblastic
Triploblastic
Acoelomates
Pseudcoelomates
Coelomates
Platyhelminthes
Nematoda
Cnidaria
Ciliophora
Ctenophora
Mastigophora
Sponge
Rhizopoda
Actinopoda
Apicomplexa
Cnidosporidia
Protostomes
Deuterostomes
Hyponervous
Epithelionervous
Epinervous
Echinodermata
Annelida
Mollusca
Arthropoda
Chordata
Vertebrata

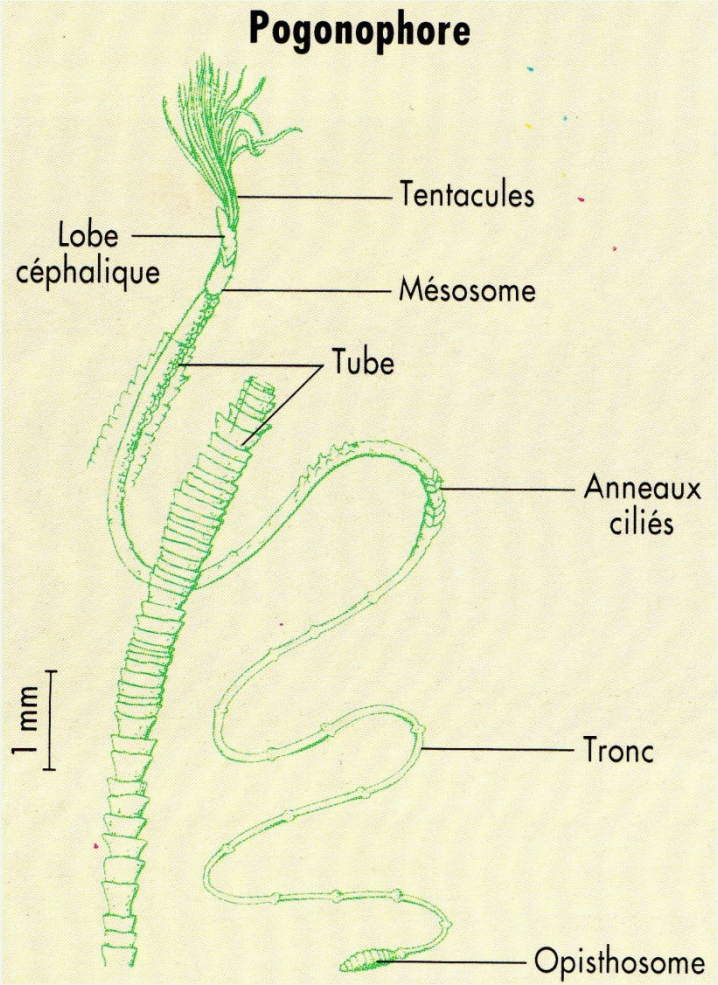
Introduction

VI. 2 – Phylum Stomochordata



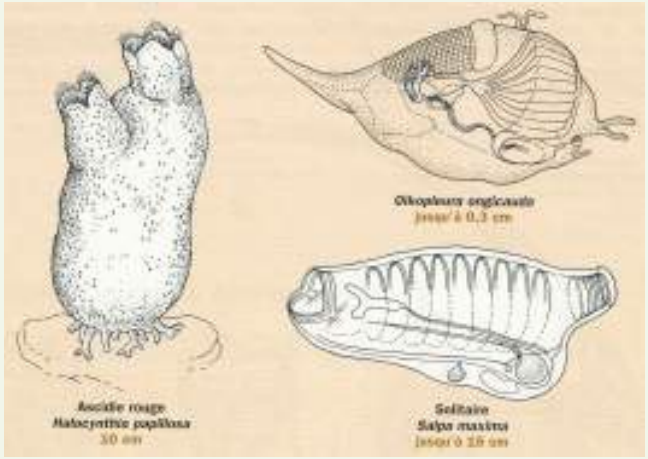
Introduction

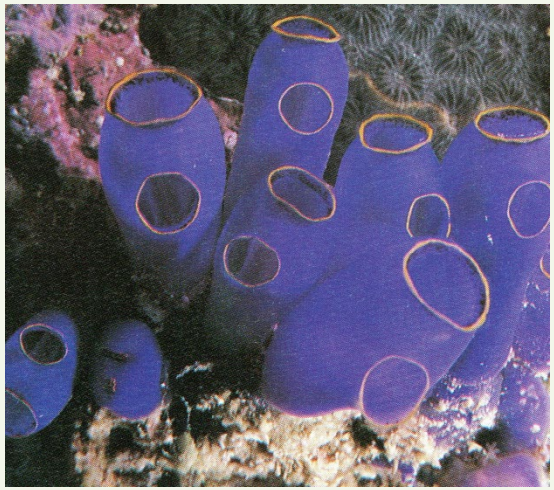
VI. 3 – Phylum Pogonophora



Introduction

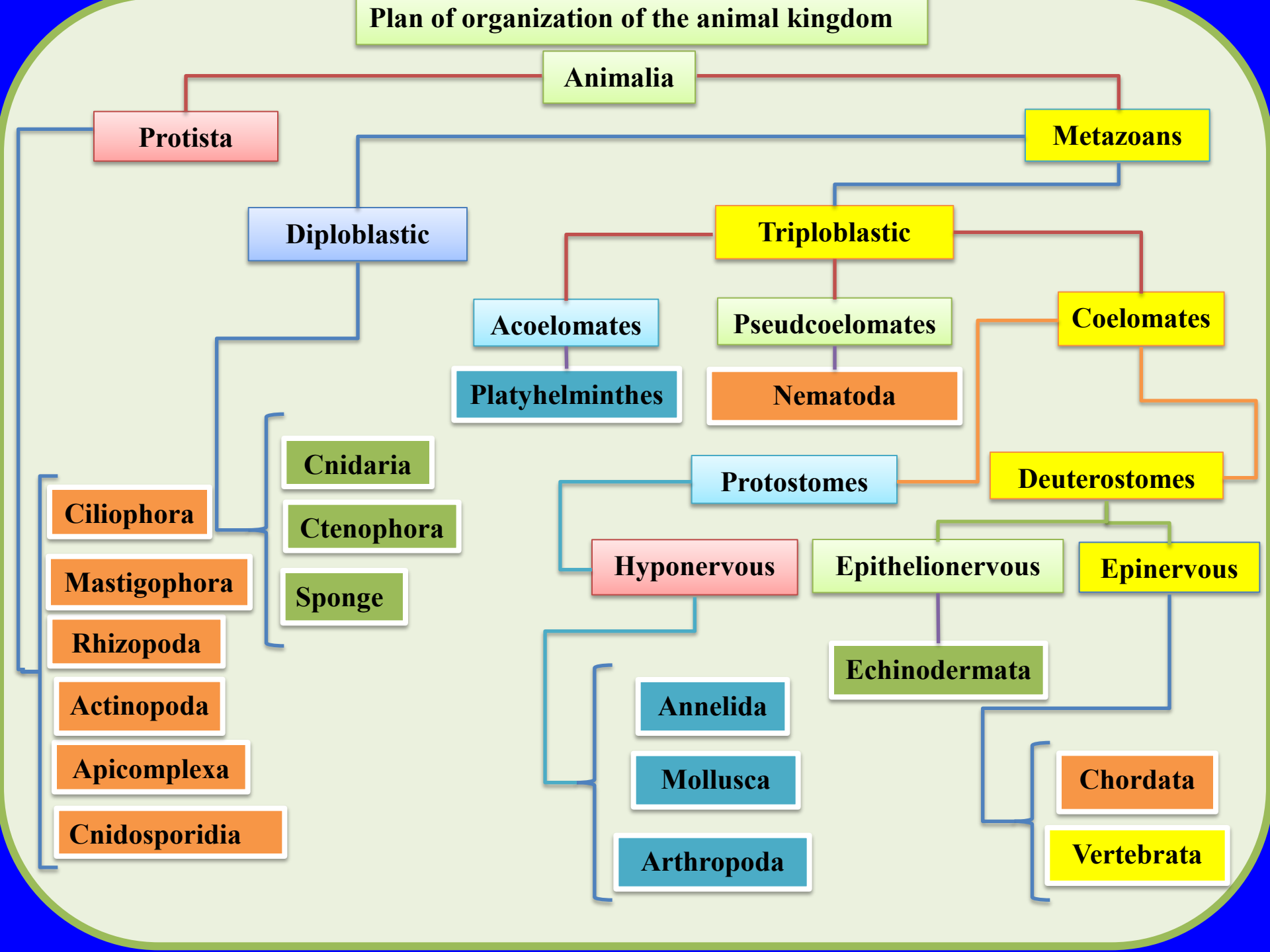
VI. 4 – Phylum Tunicata (Urochordata)





Introduction

VI. 5 – Phylum Cephalochordata

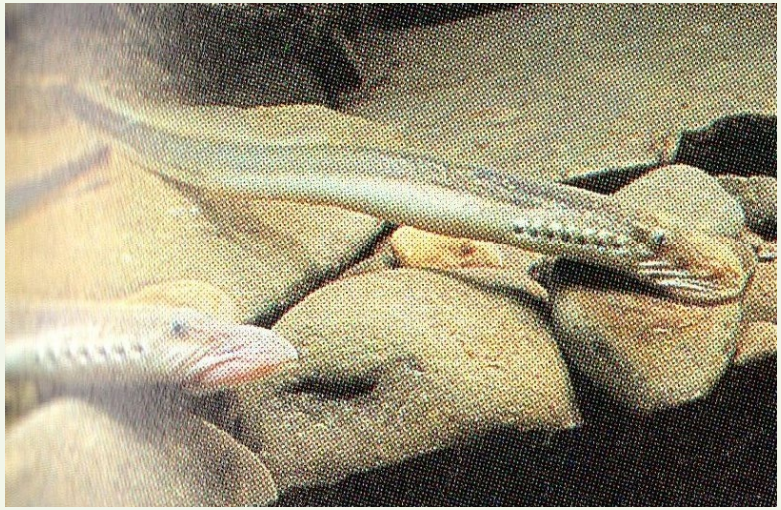

Plan of organization of the animal kingdom
Animalia
Protista
Metazoans
Diploblastic
Triploblastic
Acoelomates
Pseudcoelomates
Coelomates
Platyhelminthes
Nematoda
Cnidaria
Ctenophora
Sponge
Ciliophora
Mastigophora
Rhizopoda
Actinopoda
Apicomplexa
Cnidosporidia
Protostomes
Deuterostomes
Hyponervous
Epithelionervous
Epinervous
Echinodermata
Annelida
Mollusca
Arthropoda
Chordata
Vertebrata

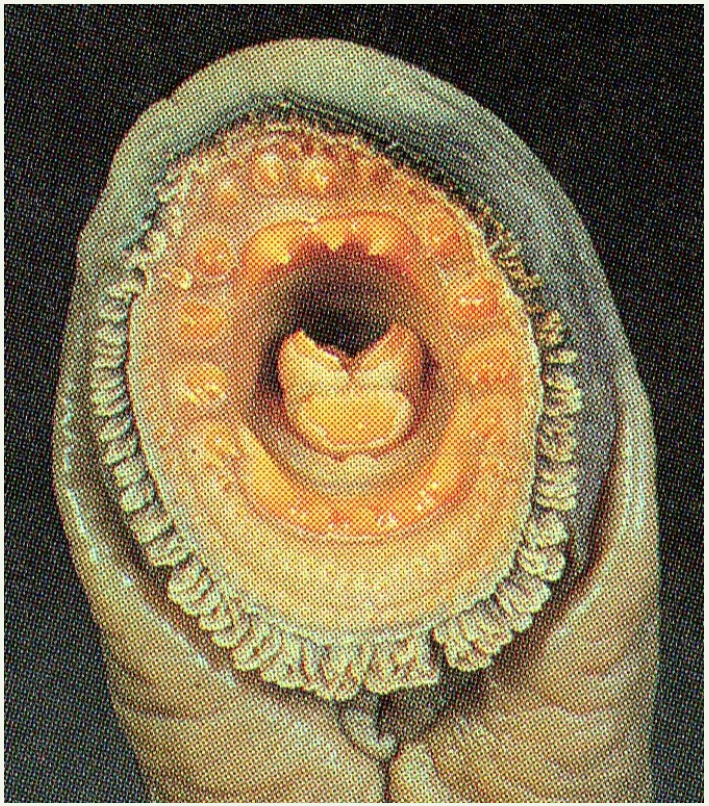
Introduction

VI. 6 – Phylum Vertebrata

Subphylum 1 Agnatha

Class Cyclostomata



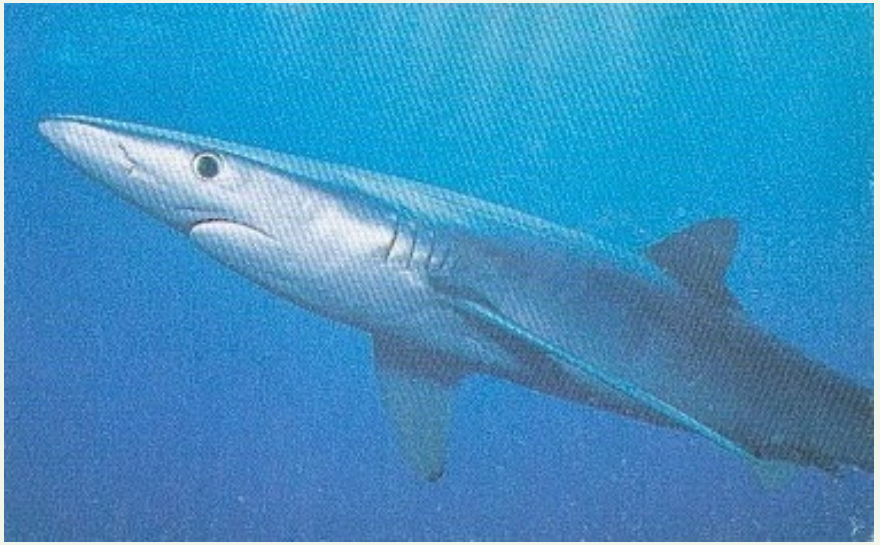


Introduction

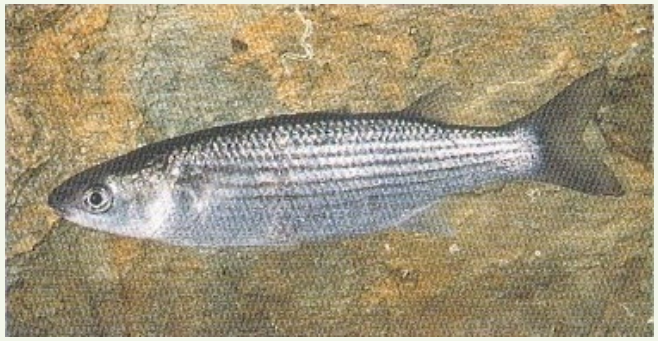
Subphylum 2 Gnathostomata

Superclass 1 Fishes

Class 1 Chondrichthyes



Class 2 Osteichthyes



Introduction

Superclass 2 des Tetrapoda

Class 1 Amphibia

Class 2 Reptilia

Introduction

Class 3 Aves

Class 4 Mammalia