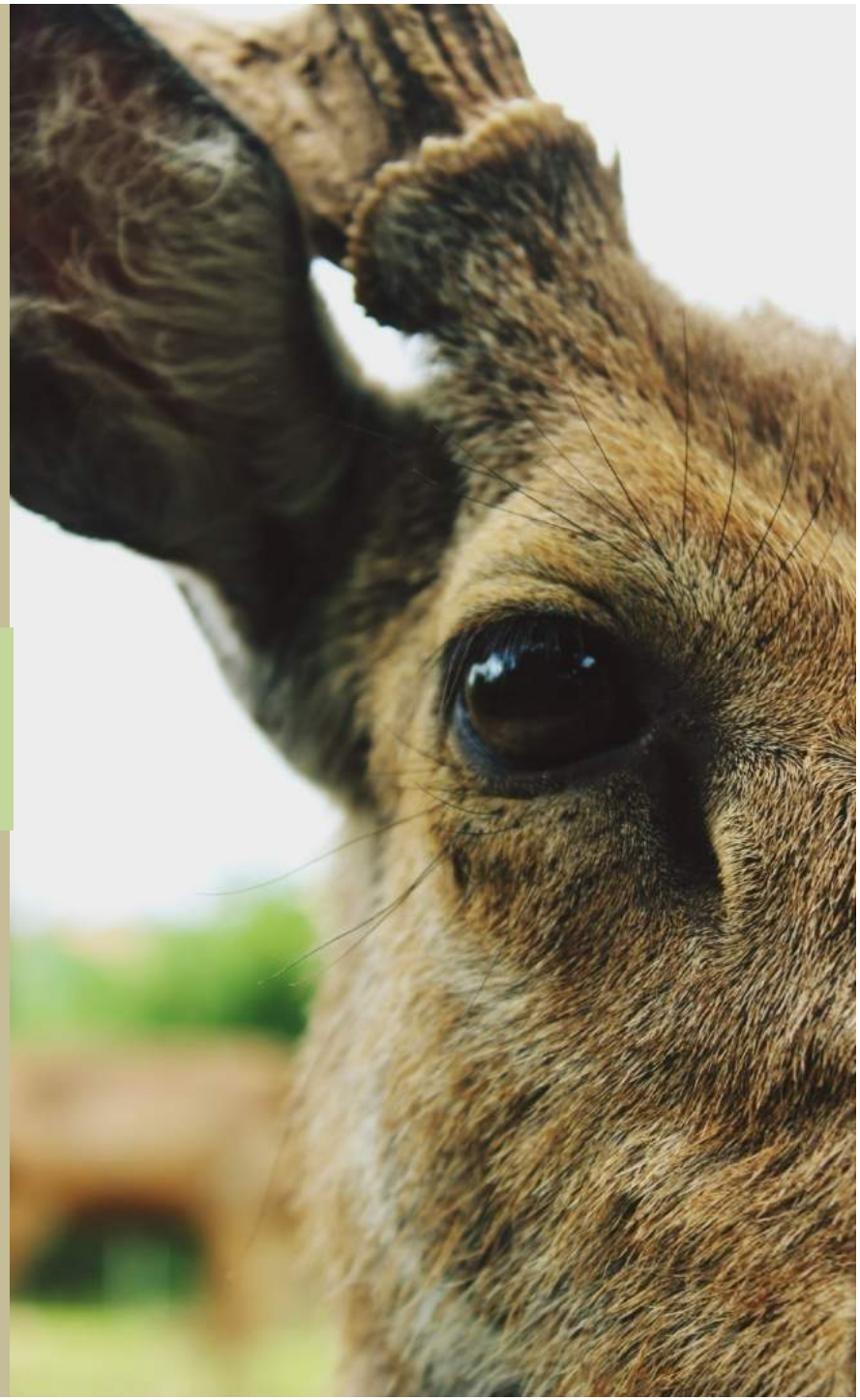
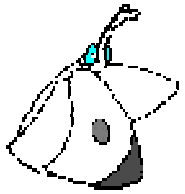
TAKSONOMI HEWAN

CHAPTER 9: ARTHROPODA

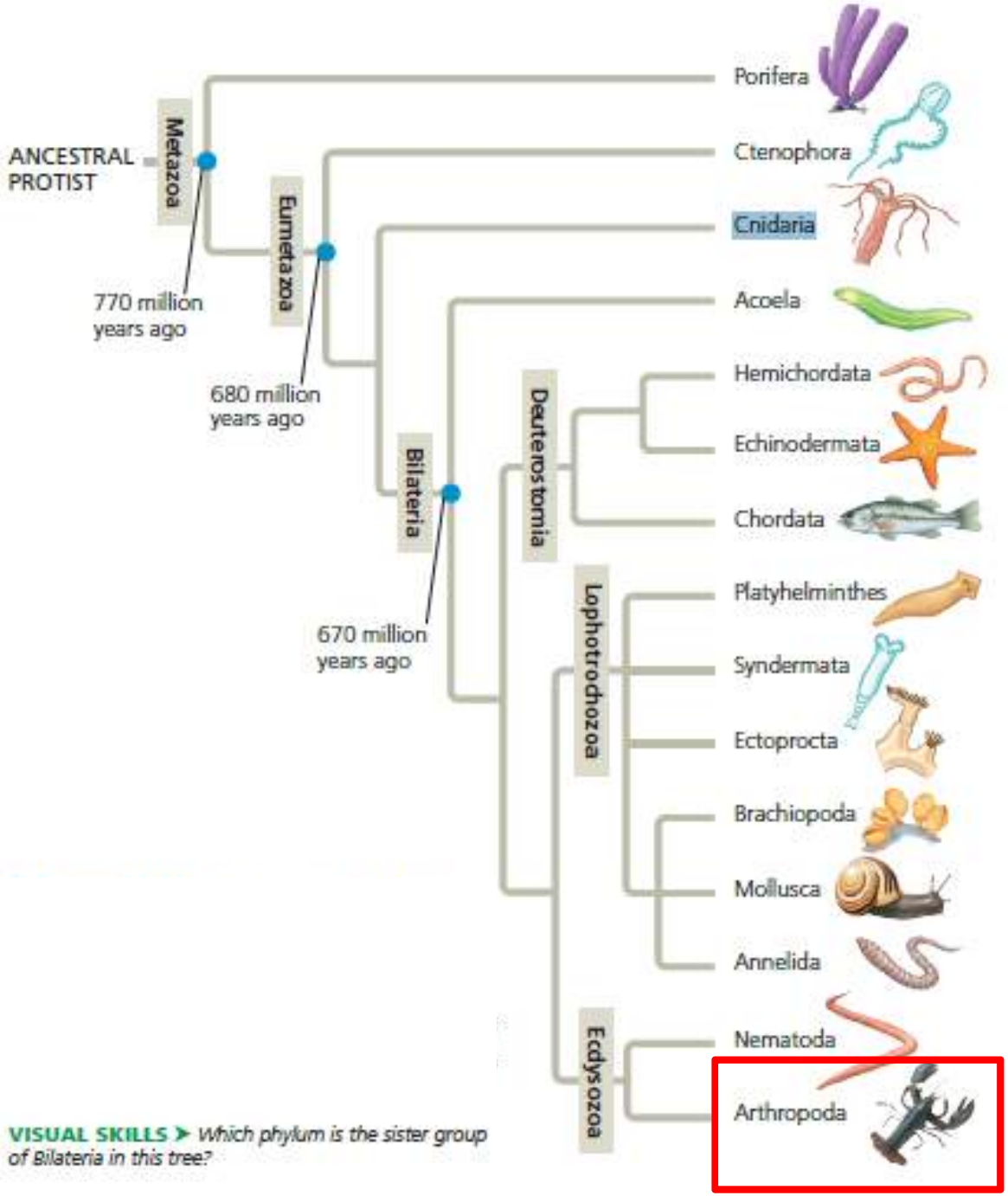


Husni Mubarok, S.Pd., M.Si.
Tadris Biologi
IAIN Jember



Ukuran organisme yang jantan
lebih kecil daripada yang betina

“Dadio pasangan koyo mimi lan mintuno”.



VISUAL SKILLS ➤ *Which phylum is the sister group of Bilateria in this tree?*

Ecdysozoa

Arthropoda (1,000,000 species)

Paling banyak spesiesnya, termasuk Insecta, Crustace dan Arachnid. Semua Arthropoda memiliki **eksoskleteon yang bersegmen (beruas-ruas)** dan **apendages yang bersatu.**

A spider (an arachnid)

Secrete **external skeletons (exoskeletons)**
The stiff covering of a cricket and the flexible cuticle of a nematode
It molts, squirming out of its old exoskeleton and secreting a larger one
The process of shedding the old exoskeleton is called ***ecdysis***

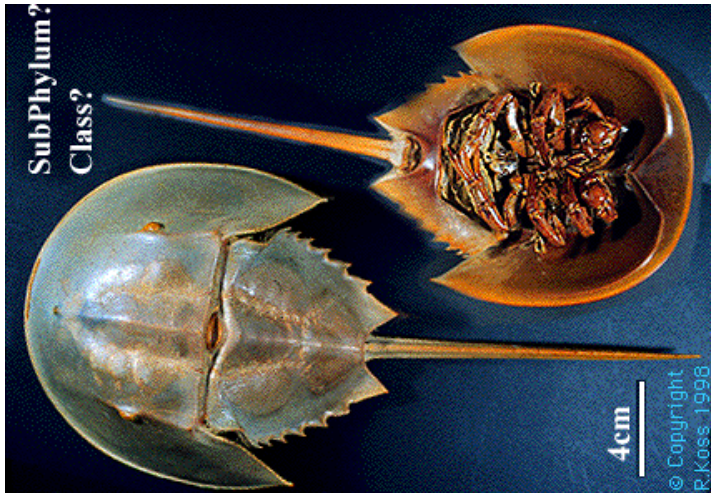
PHYLUM ARTHROPODA

General Characteristics

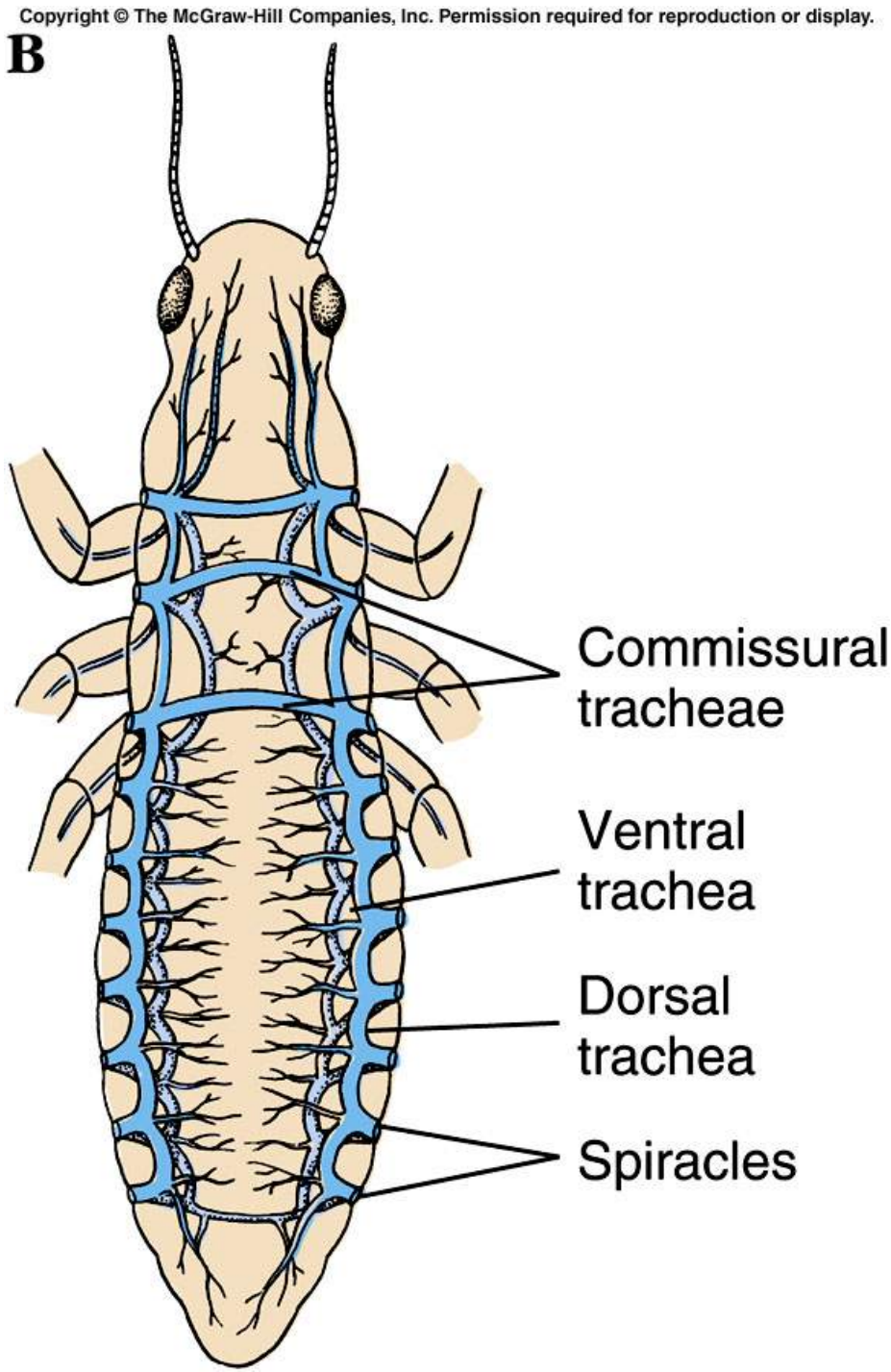
- "jointed foot"
- Largest phylum
- 900,000 species
  - 75% of all known species
- Insects, spiders, crustaceans, millipedes, scorpions, ticks, etc.

General Characteristics

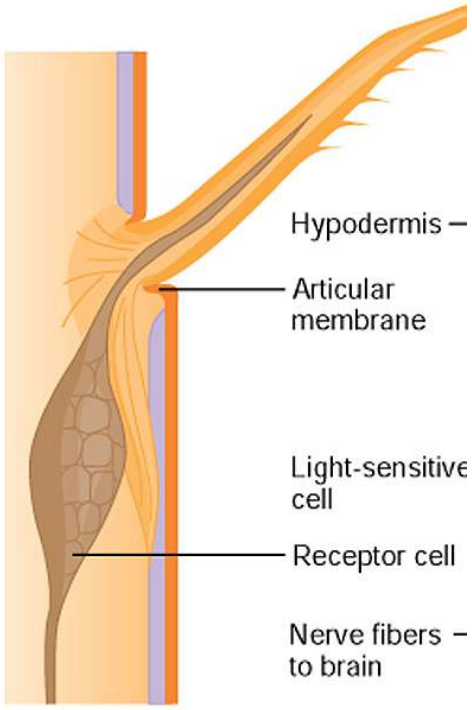
- Most successful phylum
  - Ecologically diverse
  - Present in all regions of the earth
    - Adapted to air, land, freshwater, marine, other organisms



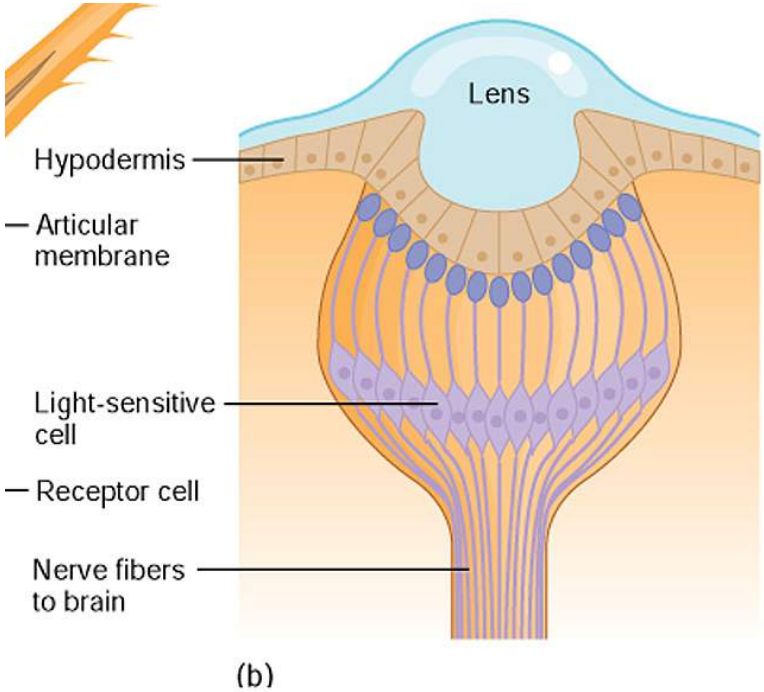
3. Air piped directly to cells
   - More efficient than most other invertebrates
   - Most have efficient tracheal system of air tubes; some breathe by gills
   - Limits size



4. Highly developed sense organs
   - Sight, touch, smell, hearing, balance, chemical reception



Displacement of seta initiates a nerve impulse in a receptor cell at its base

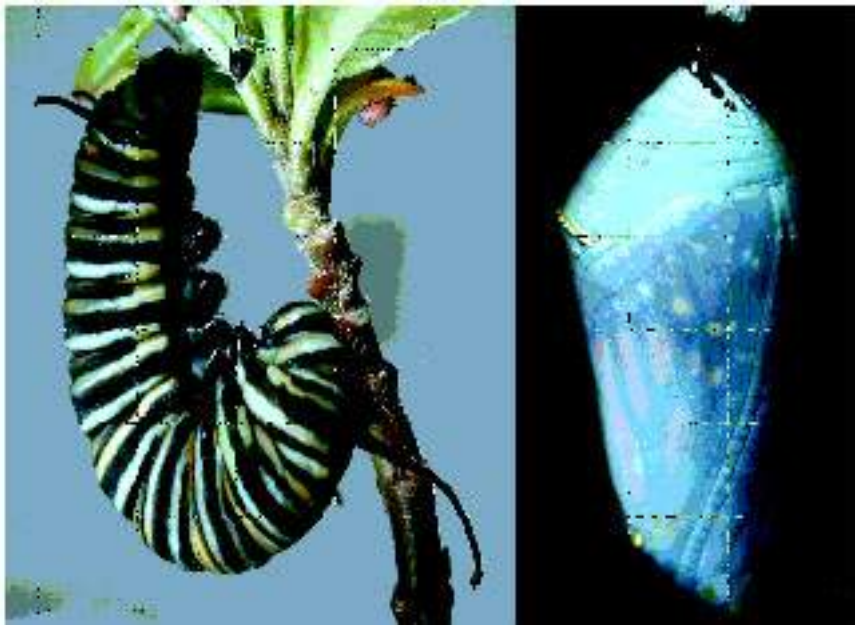


Eyes convert light energy into nerve impulses

5. Complex behavior patterns

- Complex, organized activities
- May be innate (unlearned) or learned

6. Limited <u>intra</u>specific competition
   - Many arthropods undergo metamorphosis
     - meta= between/after; morphē= form; osis= state of
   - Different stages (ie. larva, adult) have different nutrition/habitats
     ∴ no competition



Do these questions now

- What is metamorphosis and why has it contributed to arthropod success?
- What phylum is most closely related to Phylum Arthropoda?
- Which of the following is not an arthropod?
  - Beetle
  - Spider
  - Clam
  - Millipede
  - Caterpillar
  - leech
  - elephant

PLOS | ONE

CORRECTION

Correction: A Higher Level Classification of All Living Organisms

Michael A. Ruggiero, Dennis P. Gordon, Thomas M. Orrell, Nicolas Bailly, Thierry Bourgoin, Richard C. Brusca, Thomas Cavalier-Smith, Michael D. Guiry, Paul M. Kirk

OPEN ACCESS

Citation: Ruggiero MA, Gordon DP, Orrell TM, Bailly N, Bourgoin T, Brusca RC, et al. (2015) Correction: A Higher Level Classification of All Living Organisms. PLoS ONE 10(6): e0130114. doi:10.1371/journal.pone.0130114

Published: June 11, 2015

Rank
Superkingdom
Kingdom
Subkingdom
Infrakingdom
Superphylum
Phylum
Subphylum
Infraphylum
Superclass
Class
Subclass
Infraclass
Superorder
Order

Main ranks are in bold type; unnamed taxa are not counted.

doi:10.1371/journal.pone.0130114.t001

KLASIFIKASI ARTHROPODA

4 Subphylum
16 Class

SUBKINGDOM BILATERIA

INFRAKINGDOM PROTOSTOMIA

Superphylum Ecdysozoa

Phylum Arthropoda

Subphylum Chelicerata

Class Arachnida

Superorder N.N.

Order Amblypygi

Order Araneae

Order Opiliones

Order Palpigradi

Order Pseudoscorpiones

Order Ricinulei

Order Schizomida

Order Scorpiones

Order Solifugae

Order Uropygi

Superorder Acariformes

Order Sarcoptiformes

Order Trombidiformes

Superorder Parasitiformes

Order Holothyrida

Order Ixodida

Order Mesostigmata

Order Opilioacarida

Class Merostomata

Order Xiphosura

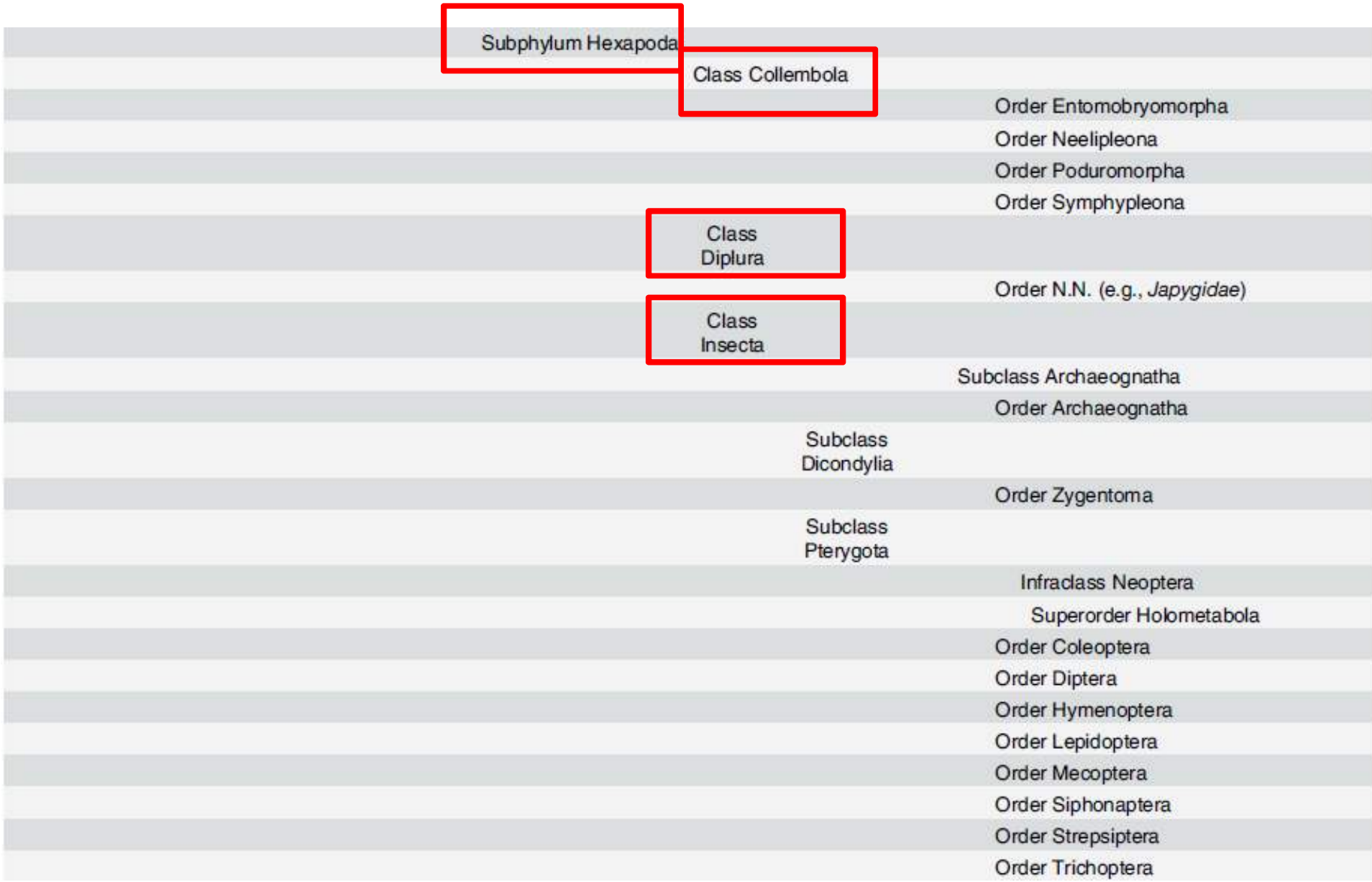
Class Pycnogonida

Order Pantopoda


Subphylum Crustacea
Class Branchiopoda
Order Anostraca
Order Diplostraca
Order Laevicaudata
Order Notostraca
Class Cephalocarida
Order Brachypoda
Class Malacostraca
Subclass Eumalacostraca
Superorder Eucarida
Order Amphionidacea
Order Decapoda
Order Euphausiacea
Superorder Peracarida
Order Amphipoda
Order Bochusacea
Order Cumacea
Order Isopoda
Order Lophogastrida
Order Mictacea
Order Mysida
Order Spelaeogriphacea
Order Tanaidacea
Order Thermosbaenacea
Superorder Syncarida
Order Anaspidacea

		Order Bathynellacea
		Subclass Hoplocarida
		Order Stomatopoda
		Subclass Phyllocarida
		Order Leptostraca
	Class Maxillopoda	
	Subclass Branchiura	
		Order Arguloida
	Subclass Copepoda	
		Infraclass Neocopepoda
		Superorder Gymnoplea
		Order Calanoida
		Superorder Podoplea
		Order Cyclopoida
		Order Gelyelloida
		Order Harpacticoida
		Order Misophrioida
		Order Monstrilloida
		Order Mormonilloida
		Order Siphonostomatoida
		Infraclass Progymnoplea
		Order Platycopioida
		Subclass Mystacocarida
		Order Mystacocaridida
		Subclass Pentastomida
		Order Cephalobaenida
		Order Porocephalida

	Subclass Tantulocarida (e.g., Basipodellidae)
	Subclass Thecostraca
	Infraclass Ascothoracida
	Order Dendrogastrida
	Order Laurida
	Infraclass Cirripedia
	Superorder Acrothoracica
	Order Cryptophialida
	Order Lithoglyptida
	Superorder Rhizocephala
	Order Akentrogonida
	Order Kentrogonida
	Superorder Thoracica
	Order Ibliformes
	Order Lepadiformes
	Order Scalpelliformes
	Order Sessilia
	Infraclass Facetotecta (*Hansenocaris*)
Class Ostracoda	
	Order Halocyprida
	Order Myodocopida
	Order Paleocopida
	Order Platycopida
	Order Podocopida
Class Remipedia	
	Order Nectiopoda


Subphylum Hexapoda
Class Collembola
Order Entomobryomorpha
Order Neelipleona
Order Poduromorpha
Order Symphypleona
Class Diplura
Order N.N. (e.g., *Japygidae*)
Class Insecta
Subclass Archaeognatha
Order Archaeognatha
Subclass Dicondylia
Order Zygentoma
Subclass Pterygota
Infraclass Neoptera
Superorder Holometabola
Order Coleoptera
Order Diptera
Order Hymenoptera
Order Lepidoptera
Order Mecoptera
Order Siphonaptera
Order Strepsiptera
Order Trichoptera

		Superorder Neuropterida
		Order Megaloptera
		Order Neuroptera
		Order Raphidioptera
		Superorder Paraneoptera
		Order Hemiptera
		Order Psocodea
		Order Thysanoptera
		Superorder Polyneoptera
		Order Blattodea
		Order Dermaptera
		Order Embioptera
		Order Grylloblattodea
		Order Mantodea
		Order Mantophasmatodea
		Order Orthoptera
		Order Phasmida
		Order Plecoptera
		Order Zoraptera
		Infraclass Palaeoptera
		Order Ephemeroptera
		Order Odonata
	Class Protura	
		Order Acerentomata
		Order Eosentomata
		Order Sinentomata
Subphylum Myriapoda		
	Class Chilopoda	
		Order Craterostigmomorpha
		Order Geophilomorpha

		Order Lithobiomorpha
		Order Scolopendromorpha
		Order Scutigeromorpha
	Class Diplopoda	
		Subclass Chilognatha
		Infraclass Helminthomorpha
		Superorder N.N.
		Order Platydesmida
		Order Polyzoniida
		Order Siphonocryptida
		Order Siphonophorida
		Superorder Juliformia
		Order Julida
		Order Spirobolida
		Order Spirostreptida
		Superorder Nematophora
		Order Callipodida
		Order Chordeumatida
		Order Stemmiulida
		Order Siphoniulida
		Superorder Merochaeta
		Order Polydesmida
		Infraclass Pentazonia
		Order Glomerida
		Order Glomeridesmida
		Order Sphaerotheriida
	Subclass Penicillata	
		Order Polyxenida
	Class Pauropoda	
		Order Hexamerocerata
		Order Tetramerocerata
	Class Symphyla (e.g., Scolopendrellidae)	

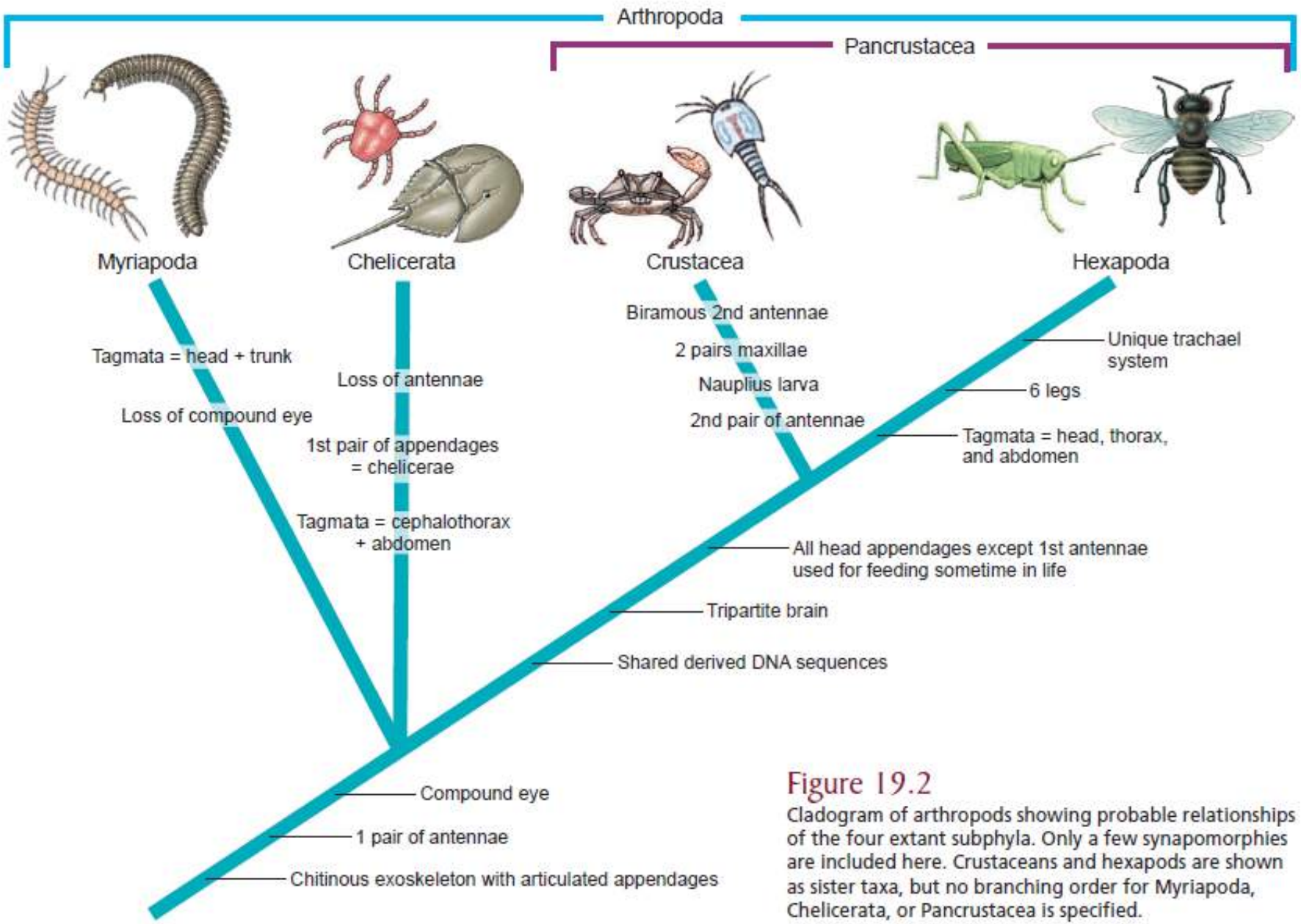
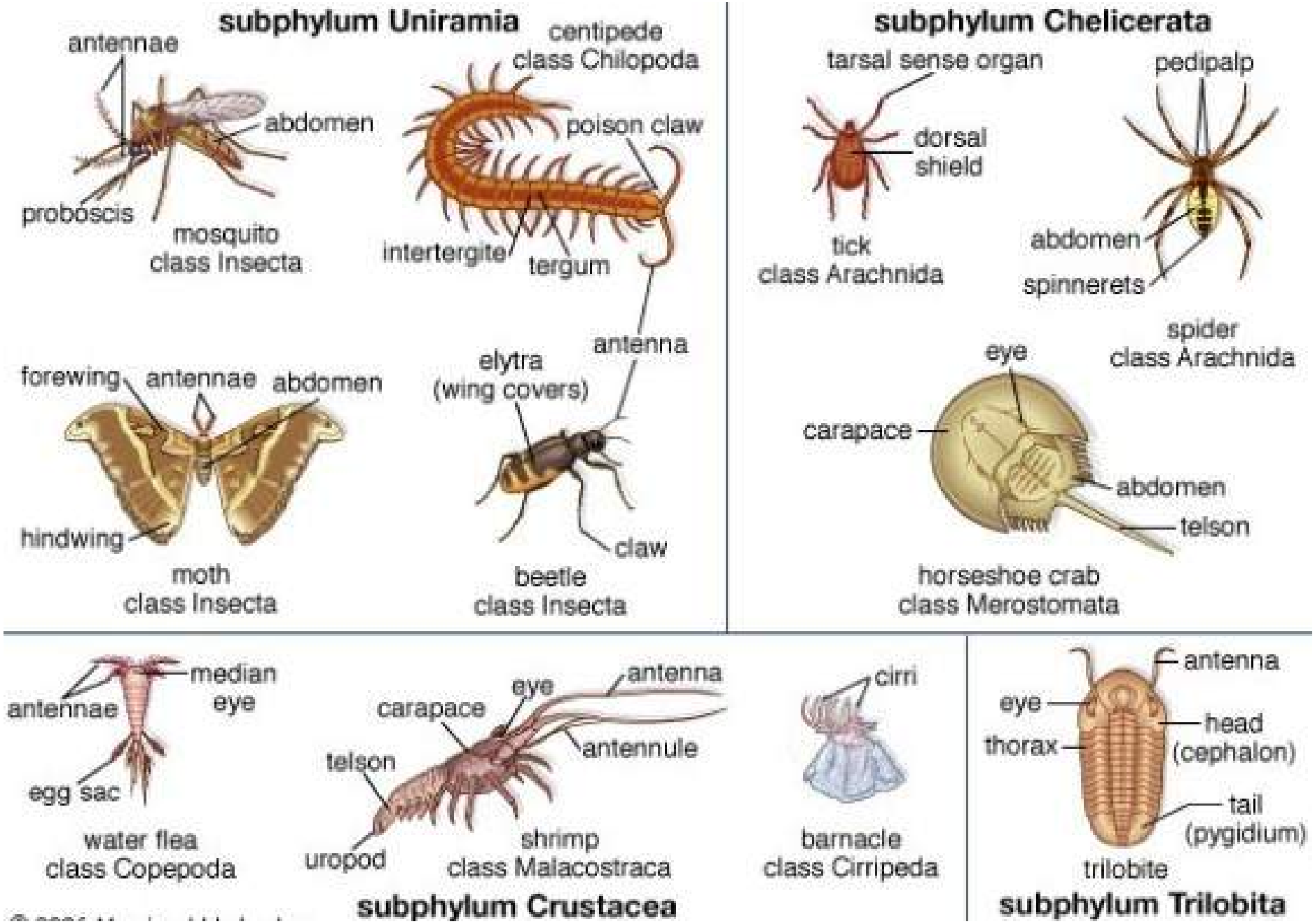


Figure 19.2

Cladogram of arthropods showing probable relationships of the four extant subphyla. Only a few synapomorphies are included here. Crustaceans and hexapods are shown as sister taxa, but no branching order for Myriapoda, Chelicerata, or Pancrustacea is specified.


subphylum Uniramia
antennae
abdomen
proboscis
mosquito
class Insecta
centipede
class Chilopoda
poison claw
intertergite
tergum
antenna
elytra
(wing covers)
claw
beetle
class Insecta
forewing
antennae
abdomen
hindwing
moth
class Insecta
subphylum Chelicerata
tarsal sense organ
dorsal
shield
tick
class Arachnida
pedipalp
abdomen
spinnerets
spider
class Arachnida
eye
carapace
abdomen
telson
horseshoe crab
class Merostomata
median
eye
antennae
egg sac
water flea
class Copepoda
eye
antenna
carapace
antennule
telson
uropod
shrimp
class Malacostraca
subphylum Crustacea
cirri
barnacle
class Cirripeda
antenna
eye
head
(cephalon)
thorax
tail
(pygidium)
trilobite
subphylum Trilobita

“Runtung-runtung rerentengan pindha mimi lan mintuna”