

# Biogeography. Lecture 20

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# Insects: Arthropoda/Insecta

## Hexapoda/Insecta



# Hexapods: very short overview

1) Entognatha (springtails etc.)

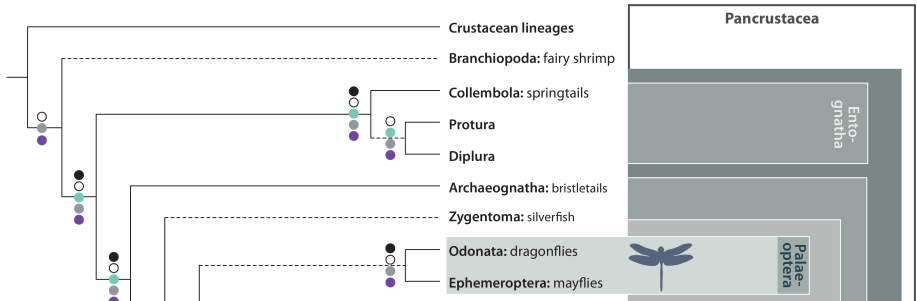
2) Insecta:

- ▶ Apterygota
- ▶ Pterygota
  - ▶ Palaeoptera
  - ▶ Neoptera
    - ▶ Polyneoptera
    - ▶ Paraneoptera
    - ▶ Holometabola: Hymenoptera, Neuropteroidea, Mecopterida

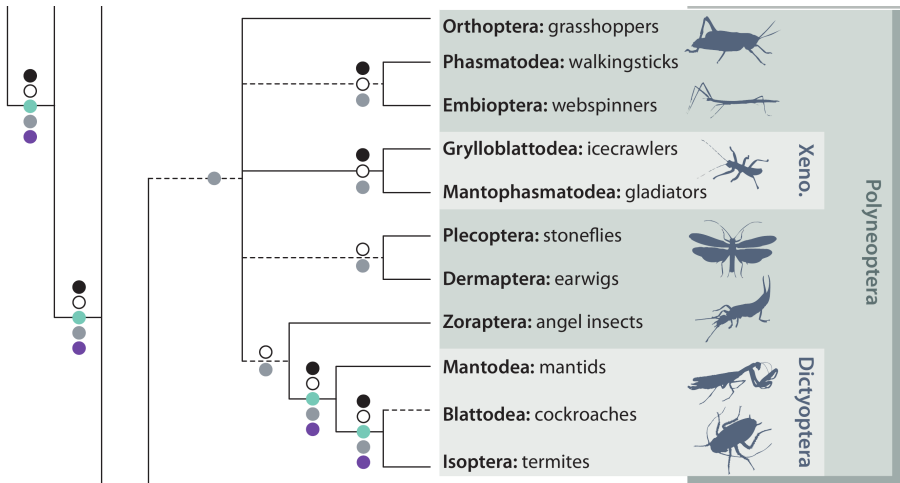


The phylogenetic tree illustrates the evolutionary relationships among various insect orders. The tree is rooted at the bottom and branches upwards. Major clades are labeled at the top: Holometabola, Neoptera, and Palaeoptera. Holometabola includes Mecopterida (Siphonaptera, Mecoptera, Diptera, Trichoptera, Lepidoptera) and Neuropterida (Coleoptera, Strepsiptera, Neuroptera, Raphidioptera, Megaloptera, Hymenoptera). Neoptera includes Paraneoptera (Phthiraptera, Psocoptera, Hemiptera, Thysanoptera) and Polyneoptera (Dictyoptera: Isoptera, "Blattaria", Mantodea; Zoraptera, Dermaptera, Plecoptera, Orthoptera; Mantophasmatodea, Grylloblattodea, Embioptera, Phasmatodea; Ephemeroptera, Odonata, Zygentoma; and Archaeognatha). Palaeoptera is represented by a single branch at the top right. Representative illustrations of insects are provided for each terminal group, showing morphological diversity across the tree.

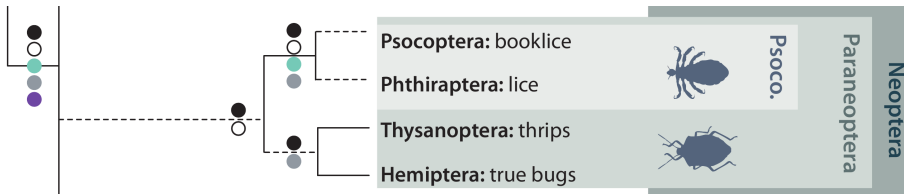
# A: Basal groups



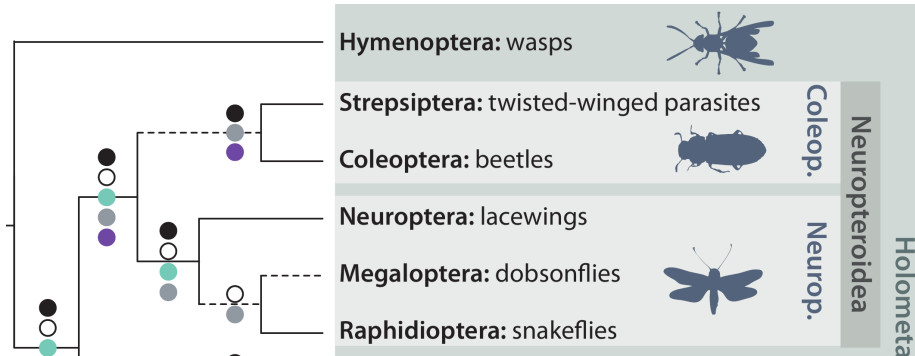
## B: Polyneoptera



# C: Paraneoptera

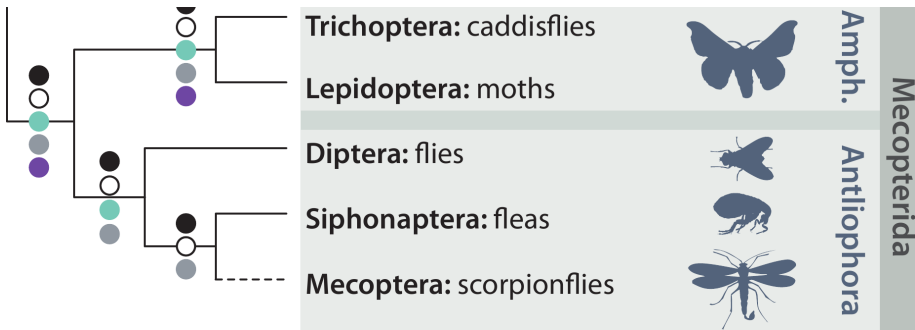


# D: Hymenoptera and Neuropteroidea





# E: Mecopteraida



# Mollusca

## Terrestrial mollusks



# Short overview

Mollusks belong to the phylum Mollusca in Lophotrochozoa. There are many classes of mollusks but only one, gastropods (Gastropoda) was successful enough to conquer land.

- ▶ Gastropoda
  - ▶ Cycloneritimorpha (e.g., *Helicina*)
  - ▶ Littorinimorpha (e.g., *Pomatias*)
  - ▶ Pulmonata (most of land gastropods belong here)



## Cycloneritimorpha: *Helicina*



# Littorinimorpha: *Pomatias*



# Pulmonata: *Caracolus*



# For Further Reading



A. Shipunov.

*Biogeography* [Electronic resource].

2014—onwards.

Mode of access:

[http://ashipunov.info/shipunov/school/biol\\_330](http://ashipunov.info/shipunov/school/biol_330)



Gastropoda.

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

