A simple phylogeny

Figure 7.1

A cladogram showing relationships of four species
(a) three monophyletic groups
(b) two of four possible (ABC, ABD, ACD, BCD) paraphyletic groups
(c) one of four possible (AC, AD, BC, and BD) polyphyletic groups that could be recognized based on this cladogram.

Example insect phylogeny

Class | Order | example
--- | --- | ---
Insect | Odonata | damselfly
| Orthoptera | grasshopper & cricket
| Coleoptera | beetle
| Lepidoptera | butterfly
| Diptera | fly

Five major lineages of P. Arthropoda
- Trilobita – extinct
- Chelicerata – spiders, ticks, mites
- Myriapoda – centi-, millipedes
- Crustacea – crustaceans
- Hexapoda - insects

Animal phylogeny
Further support in 2010 paper

- From Regier et al. (2010)
  - Arthropod relationships revealed by phylogenomic analysis of nuclear protein-coding sequences. Nature. DOI: 10.1038/nature08742

Box 7.2: neither scenario here is supported by Regier et al.'s data

Regier et al. (2010)

- 75 arthropod species, broadly chosen
- 62 nuclear protein-coding genes sequenced; can resolve deep evolutionary relationships in animals.
- Supports Pancrustacean clade (Hex + Crust)
- Supports Pancrustacea as sister to Myriapods, forming Mandibulata.
- Refutes Paradoxopoda
- 4 clades within Pancrustacea. The Hexapod clade is upheld and nested within Crustacea.
- Crustacea consist of 3 paraphyletic clades
- Xenocarids are sister group to Hexapods

Note: Atelocerata = Tracheata