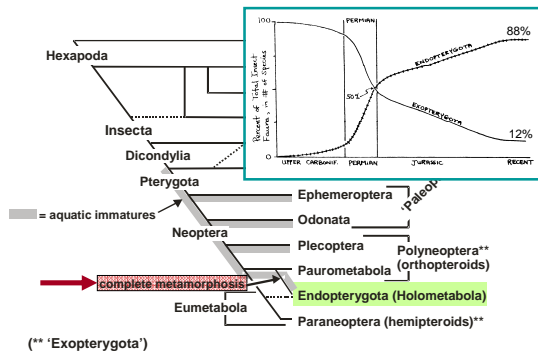
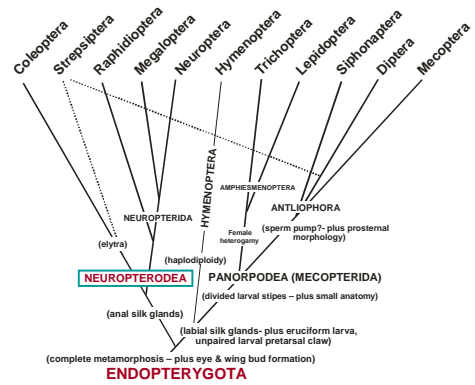


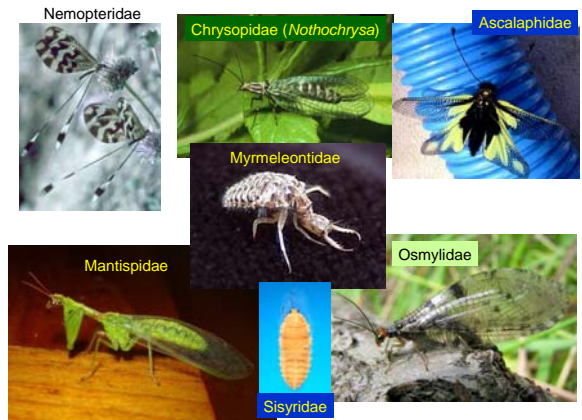
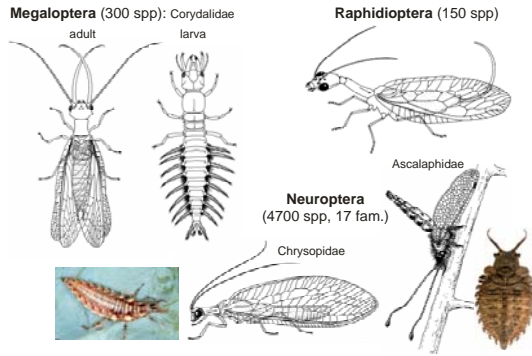
The Origin of Complete Metamorphosis: Endopterygota



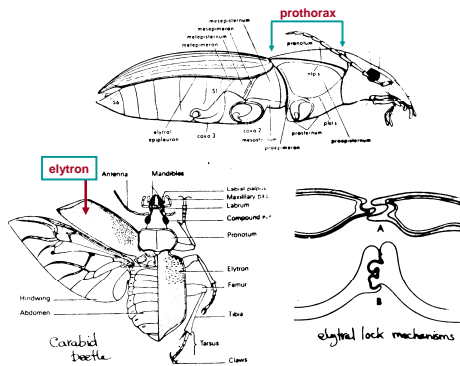
Neuropterodea (alderflies, snakeflies, lacewings, & beetles)



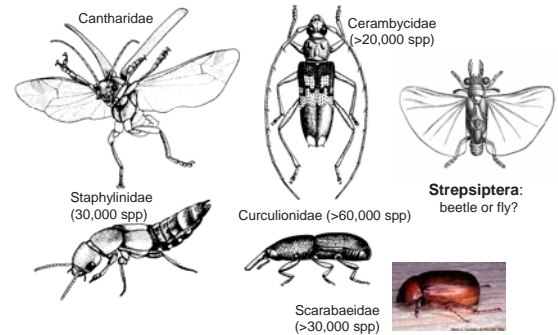
Pterygota, Neoptera, Eumetabola, Endopterygota: Neuropterodea Neuropterida (the smaller neuropteroid orders)



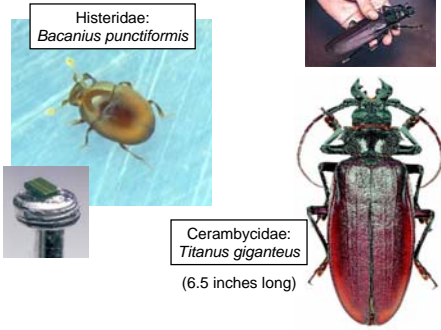
Pterygota, Neoptera, Eumetabola, Endopterygota: Neuropterodea Coleoptera (beetles) ~400,000 species in 158 families



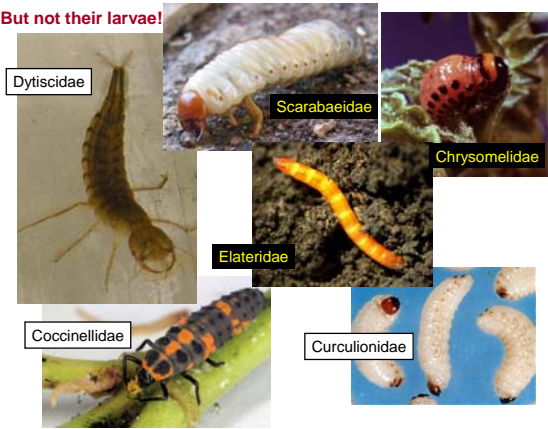
Some well-known families of beetles, plus the mysterious Strepsiptera



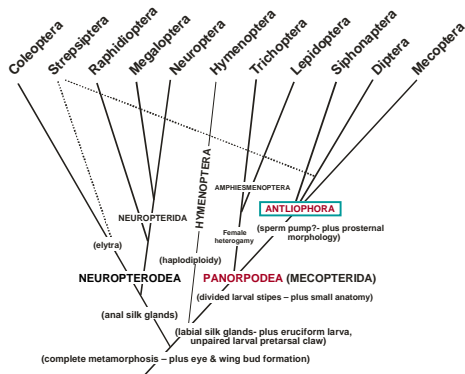
Big or little, beetles pretty much look like beetles...



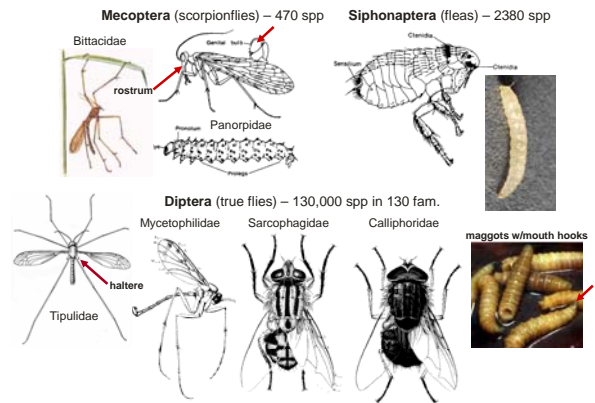
But not their larvae!



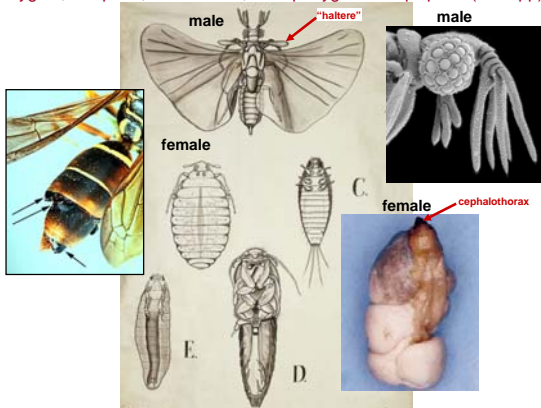
Panorpodea 1 – Flies, fleas, and scorpionflies



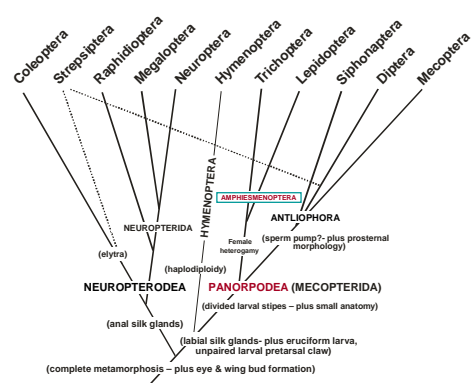
Pterygota, Neoptera, Eumetabola, Endopterygota: Antliophora



Pterygota, Neoptera, Eumetabola, Endopterygota: Strepsiptera (610 spp)



Panorpodea 2 – caddisflies, butterflies and moths

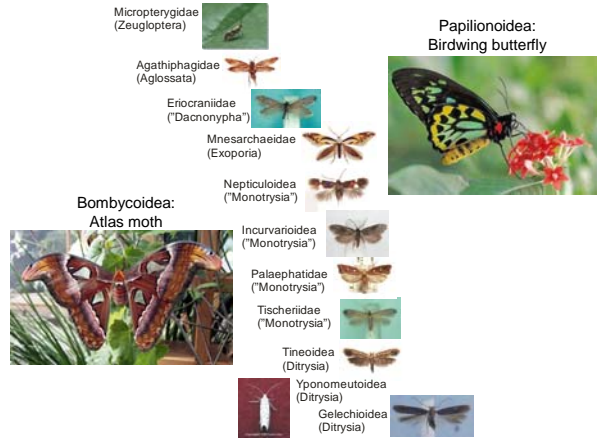
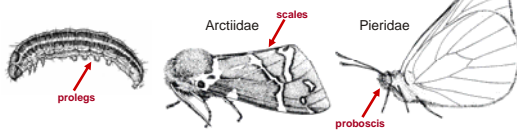


Pterygota, Neoptera, Eumetabola, Endopterygota: Amphimesenoptera

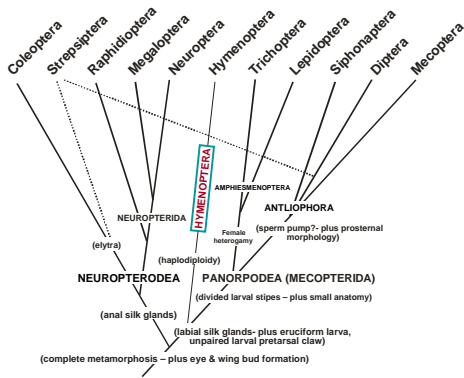
Trichoptera (caddisflies) – 10,000 spp



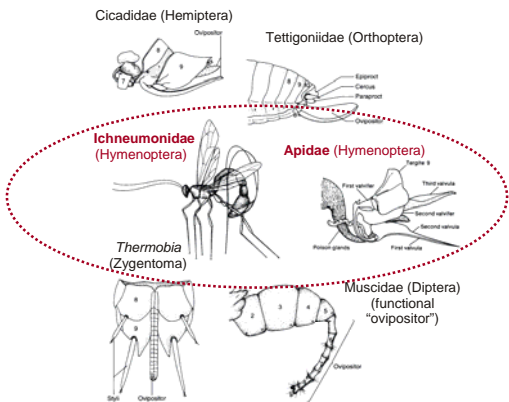
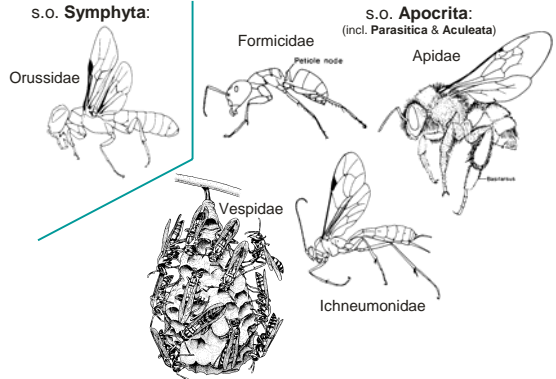
Lepidoptera (moths and butterflies) – 120,000 spp, 128 fam.



Hymenoptera – sawflies, woodwasps, wasps, ants & bees



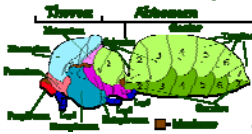
Pterygota, Neoptera, Eumetabola, Endopterygota: Hymenoptera (sawflies, bees, wasps & ants) – 180,000 spp in 91 fam.



s.o. Symphyta



Key adaptations:
The hymenopteran body is hard to crush;



Dolichovespula maculata

...but the key to the success
of the Hymenoptera is **eusociality**:



Honeybee (*Apis mellifera*)

