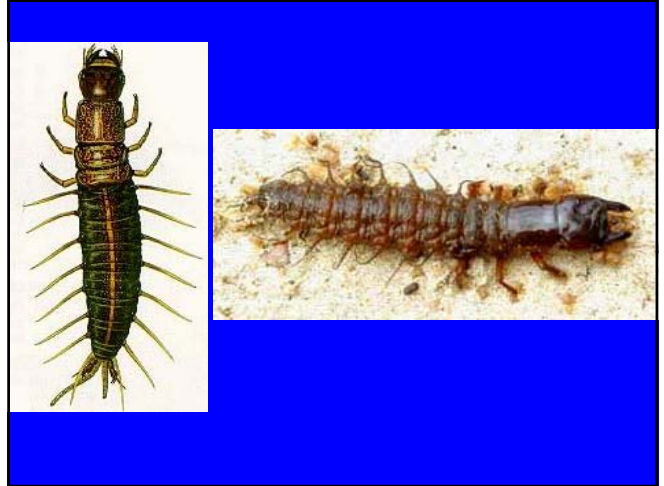


Megaloptera

300 known species

Chewing mouthparts, however, many species do not eat,
Larvae aquatic, carnivorous, with 7 pairs of tracheal gills,
metamorphosis – primitive form of holometaboly, long lasted
(several years)

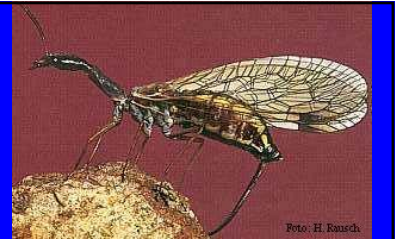


Raphidioptera -

About 150 species allied to Neuroptera
Larvae and adults are predators
Chewing mouthparts



Megaloptera,
Raphidioptera and
Neuroptera are
closely allied –
supraorder
Neuropterida – pupa
dectica



Larvae under bark,
move forwards and
backwards equally
well,
Pronotum binate and
sclerotized as adults



Neuroptera

About 4 000 species worldwide

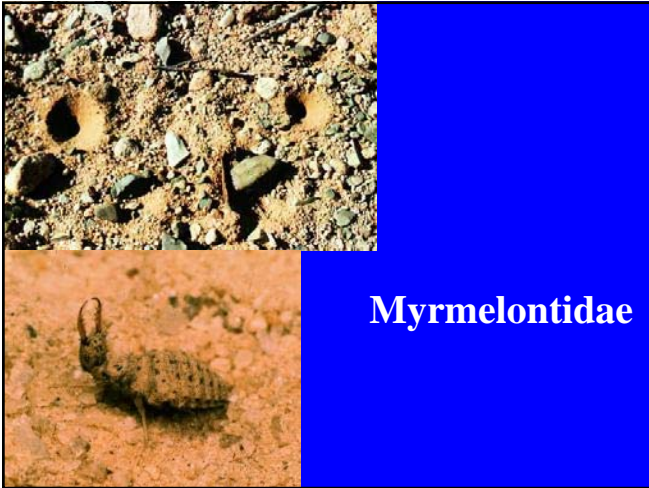
Many veins, chewing mouthparts,
holometaboly, pupa dectica
larvae are predators

Important bioregulators even in
agroecosystems, used often for
biocontrol especially aphids



Larvae predatory,
mandibles + maxillae
jointed, between them is
channel for sucking partly
predigest food





Myrmelontidae



Ascalaphidae



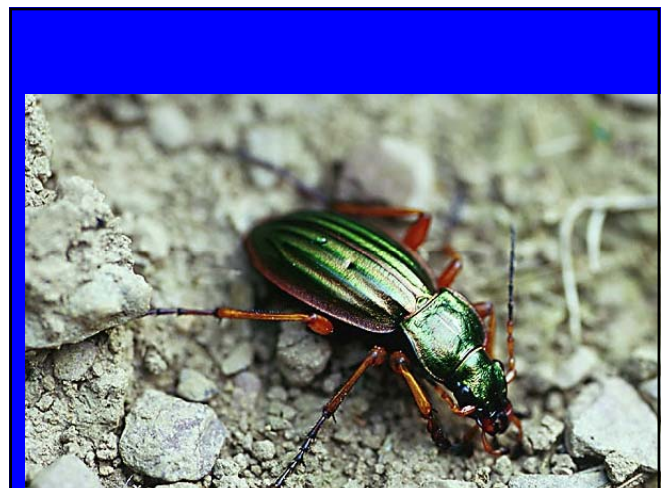
Mantispidae

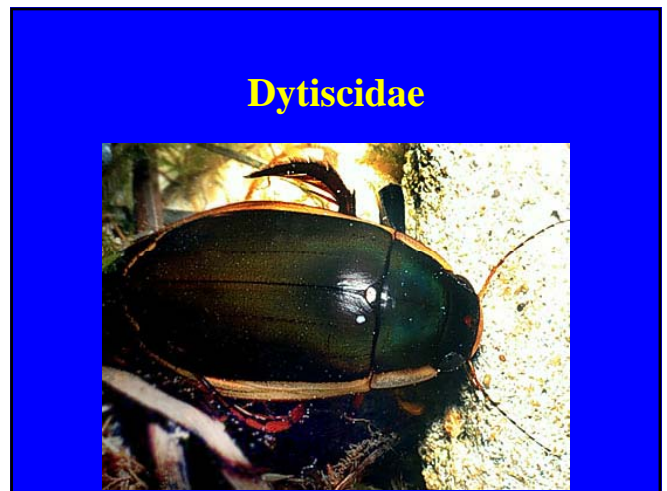
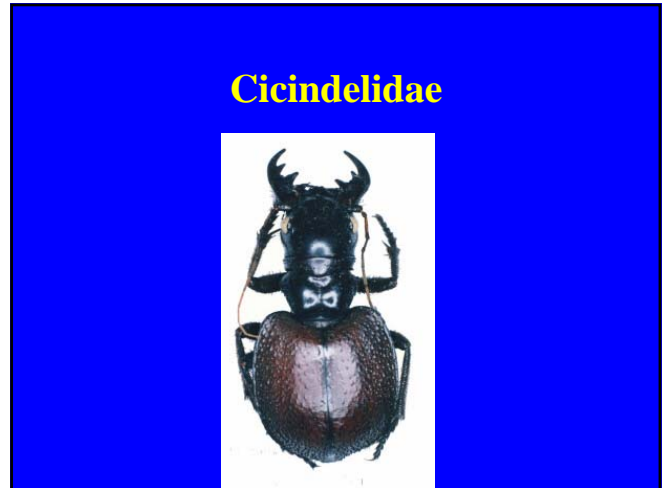
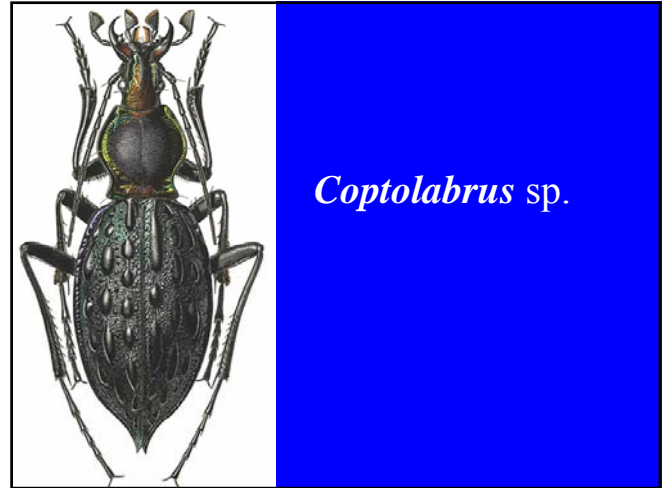


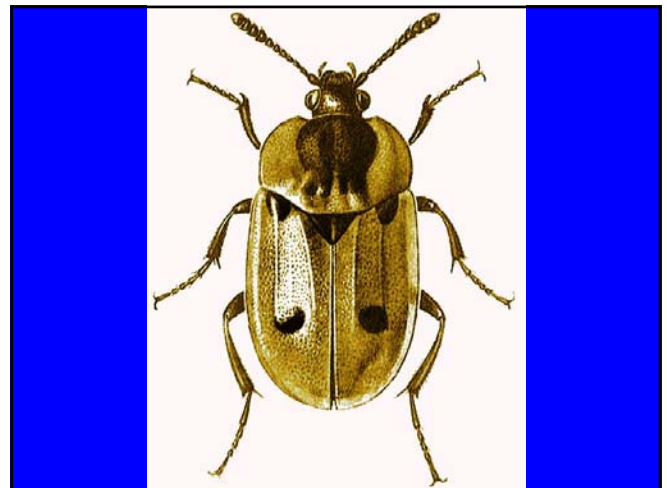
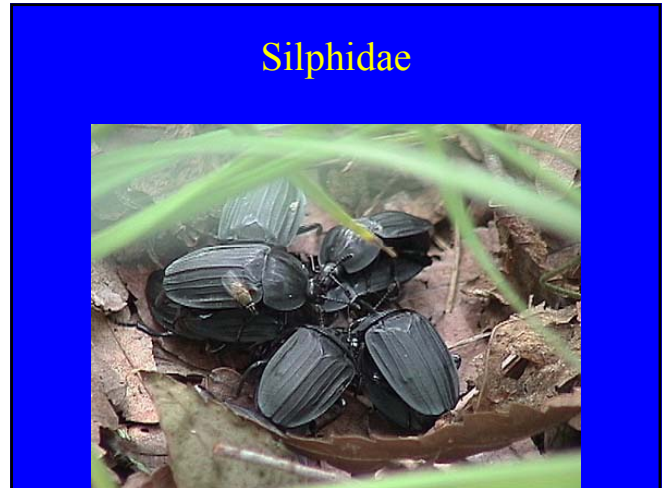
Chrysopidae

Coleoptera

Largest group of living organisms with more than 350 000 species
 Live everywhere except seas and polar regions
 Diverse feeding habits: detritus feeders, herbivores, mycetophagous, predatory, parasites, many are serious pests (fields, households) or bioregulators (Coccinellids)
 Hardened shield-like forewings
 Flattened body, ventral position of legs

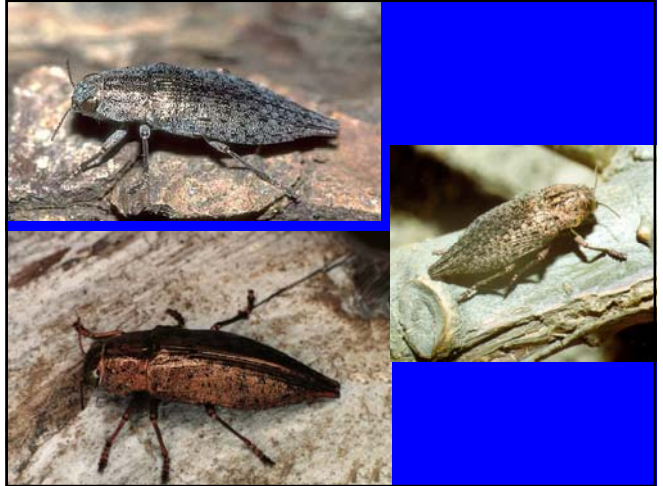








Buprestidae



Elateridae



Tenebrionidae



Cerambycidae





Chrysomelidae

Curculionidae

Hymenoptera

Membraneous wings, females with ovipositor sometimes modified for piercing (stinger), chewing mandibles, but sometimes modified (tongue), large compound eyes

Two suborders: Symphyta (sawflies) who have no discernible waist and the Apocrita (ants, bees and wasps) who have a distinct waist.

Tenthredinidae

Lepidoptera

a napadna stemata na mave

Hymenoptera

panozky na 1. članku zadečku

panozky na 2. članku zadečku

Siricidae



Vespidae



Apidae



Trichoptera

Nearly 15 000 species, similar to Lepidoptera, however, with setae on wings (not scales)

Aquatic larva, many species make protective cases of silk decorated with gravel, sand, twigs or other debris








Lepidoptera – moths and butterflies

Nearly 200 000 species, holometaboly, larva up to 5 abdominal prolegs

Adults: wings almost always covered with scales, long antennae, sucking proboscis (maxillary galeae)






Beautiful colours – many people collect them
Some are useful (producing silk), some pests




Mecoptera – scorpionflies


550 species, males with genitalic structures similar to scorpion stinger, mostly predators or eat dead insects, narrow wings often ornamented, mouthparts often elongated, chewing type, larvae herbivores, rarely predators, look like caterpillars, pupa dectica exarata




Diptera

200 000 species, one pair of wings, second – halteres
 Many are nectar feeders, predators, parasites, many pests, great hygienic importance (myiasis)
 2 suborders:
 Nematocera (long multisegmented antennae) Brachycera (short antennae)



Culicidae



James L. Castner, U. Fla. Ent. Dep.

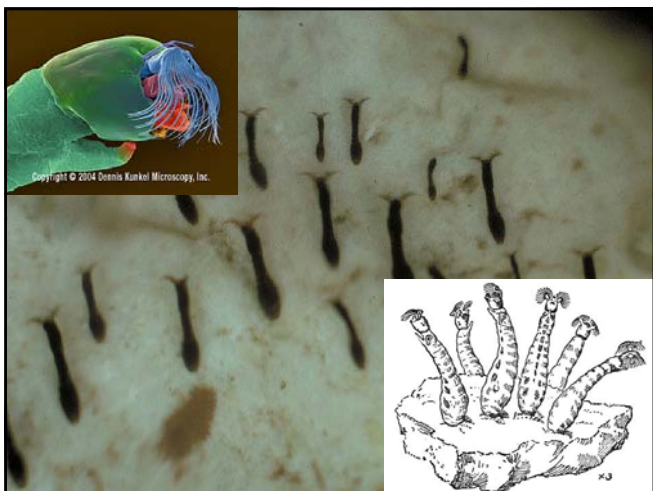


Simuliidae

Black fly feeding damage after 15 min



After 24 h



Tipulidae



Chironomidae



Brachycera

Asilidae



Tephritidae



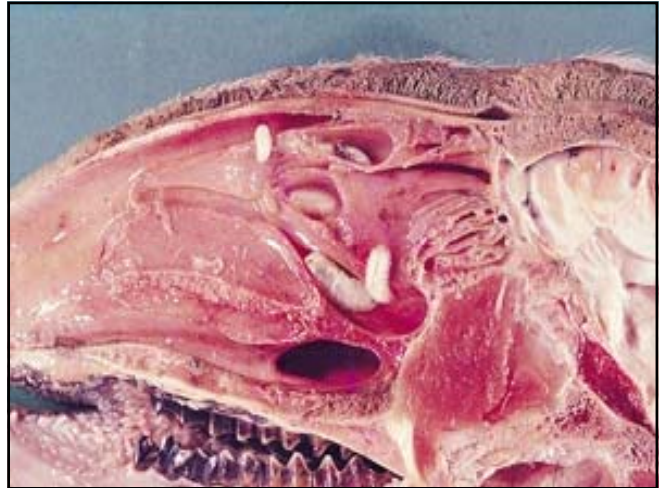
Syrphidae



Calliphoridae



Oestridae



Siphonaptera (= Aphaniptera)

2000 species of wingless insects whose mouthparts are adapted for piercing skin and sucking blood. Fleas are external parasites, living by hematophagy off the blood of mammals (including humans) and birds



After feeding blood female lays eggs, larvae feed on organic materials (no parasites!!!), larva pupates and emergence of adults usually connected to host presence on nest (CO2, vibrations)

Important parasites:

- Pulex irritans,
- Ctenocephalites felis, C. canis,
- Xenopsylla cheopis,
- Tunga penetrans

Transmission of diseases
(bubonic plague, typhus)

