general thorax

well-developed wings obscure the abdomen or are held above body

Hymenopterans: fusion of 1st abdominal segment with thorax to form mesosoma (middle body)

six leg articles

variation in forelegs
Figure 2.20

Diagrammatic lateral view of a wing-bearing thoracic segment, showing the typical sclerites and their subdivisions.

Wing articulation

Anterior nodal process

Posterior nodal process

1st axillary sclerite

2nd axillary sclerite

3rd axillary sclerite

Medial plates

similar to Figure 2.20

Wing articulation

Scutum

Scutellum

Anterior phragma

Postphragma

Postnotum

Pleural suture

Wing edge

Besalar

Pleural process

Posterior nodal process

Subalar

Wing Articulation -- schematic views

PALEOPTERA (no wing-folding)

NEOPTERA (wing folding)

moving and folding the wings

raptorial forelegs of Mantodea

Walking mid and hind legs

http://www.uoguelph.ca/arboretum/PhotoGallery/Large/Recent/PrayingMantis06.jpg

leg modifications

- Ambulatory or gressorial (walking)
- Saltatorial (jumping)
- Raptorial (grasping)
- Natatorial (swimming)
- Fossorial (digging)
- Cursorial (running)
- Pollen collection
Wings

- two layers of cuticle with rigid framework of veins
  - veins: tracheae, hemolymph & nerves
  - active & passive bending

Figure 2.24

The left wings of some insects showing wing modifications: (a) fore wing of a butterfly (Lepidoptera); (b) fore wing of a dragonfly (Odonata); (c) fore wing or tegmen of a cockroach (Blattodea); (d) fore wing or elytron of a beetle (Coleoptera); (e) fore wing or hemelytron of a mirid bug (Hemiptera); (f) fore wing and haltere of a fly (Diptera).

Variation in shape and size: some forewings thick and rigid - beetles (Coleoptera) and grasshoppers (Orthoptera)
- Butterflies (Lepidoptera) have scales on wings
- Caddisflies (Trichoptera) have hairs on wings

Diptera (flies) have halteres, modified hind wings that serve as sensory structures. They work like gyroscopes and measure accelerations.
**Figure 2.23:** wing venation color-coded

**general abdomen**

**larval prolegs**

- Scarab grub
- Syrphid fly larva
- Crane fly larva

**abdominal appendages**

- filaments: thread-like processes located at the end of the abdomen
- cerci: shorter, usually sclerotized appendages of the last segment
- anal gills: some aquatic nymphs

**genitalia**

- We will examine in more detail in lab and when we discuss reproduction.