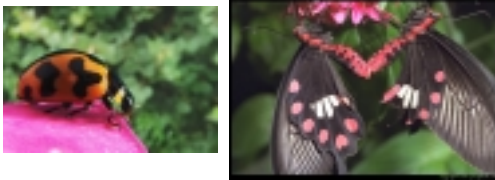


### Collecting and Preserving Insects



## Phylum Arthropoda

- Segmented body
- Segmented appendages
- Chitinous exoskeleton



### Subphylum Chelicerata Class Arachnida spiders, ticks, mites, scorpions



### Subphylum Crustacea Class Malacostraca pillbugs and sowbugs



### Subphylum Uniramia Class Diplopoda millipedes







### Subphylum Uniramia Class Chilopoda centipedes




### Subphylum Uniramia Class Hexapoda - Insects

- 3 body parts
- 3 pairs legs
- 2 pairs wings
- 1 pair antennae

### Subclass Apterygota



- Small, primitive, wingless
- Orders
  - Protura
  - Collembola
  - Diplura
  - Microcoryphia
  - Thysanura



Thysanura - silverfish




### Ephemeroptera mayflies

- Wings held above body at rest
- Antennae inconspicuous
- Often have 'tails'
- Found near streams
- Preserve adults and nymphs in alcohol

### Odonata dragonflies and damselflies

- Immature stages aquatic, adults often near water
- 4 elongate, many-veined membranous wings
- Antennae small, bristle-like
- Pin adults, preserve nymphs in alcohol

### Orthoptera grasshoppers, katydids, crickets



- Hindlegs adapted for jumping
- Forewings thickened, narrow
- Hindwings membranous
- Adults pinned
- Nymphs in alcohol






### Dictyoptera mantids, cockroaches

- Legs adapted for running
- Forewing thickened
- Hindwing membranous
- Most fly poorly
- Adults pinned
- Nymphs in alcohol

## Dermaptera earwigs

- Elongate, slender
- 'pincers' at end of abdomen
- Winged or wingless
- Find under rocks, logs
- Pin or point adults
- Nymphs in alcohol



## Isoptera termites

- Usually pale, soft-bodied
- Winged and wingless forms, weak fliers
- Wings same size and shape, held flat over body at rest
- Find under logs, stumps
- Adults and nymphs in alcohol



## Plecoptera stoneflies

- Somewhat flat, drab-colored
- Wings at rest flat over abdomen, weak fliers
- Long antennae
- Near streams and rocky shores, find on bridges, vegetation
- Adults, nymphs in alcohol

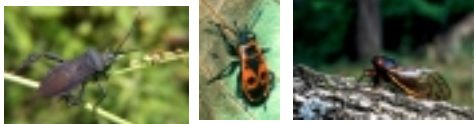


## Thysanoptera thrips

- Minute, slender-bodied
- 4 fringed wings (if present)
- Find by shaking flowers over paper
- Preserve in alcohol



## Hemiptera homoptera and heteroptera

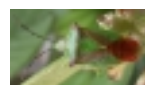
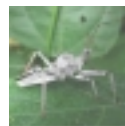


- Sucking mouthparts
- For field ID, divide into two suborders

## Heteroptera true bugs



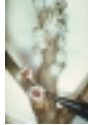
- Sucking mouthparts, beak arises from front of head
- Triangle on back
- Basal portion of forewings thickened



## Homoptera whiteflies, scale, aphids, cicadas, planthoppers, treehoppers



- 2 pairs of wings held roof-like at rest
- Beak arises from back of head
- Soft-bodied adults  
In alcohol



## Neuroptera snakeflies, lacewings, antlions

- Soft-bodied
- 4 membranous wings, lots of veins
- Wings held rooflike at rest
- Antennae long
- Several families found near water
- Adults and nymphs in alcohol



## Coleoptera beetles



- Hard forewings, membranous hindwings
- Wings meet in line down back
- Pin or point adults, larvae and minute adults in alcohol



## Mecoptera scorpionflies

- 4 membranous wings
- Elongated face
- Some forms wingless
- Pin adults, larvae in alcohol
- Males have scorpion-like tail

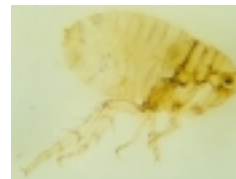


## Trichoptera caddisflies



- Adults resemble moths, but have long slender antennae
- Larvae case-building aquatic
- Wings held roof-like at rest
- Adults and larvae in alcohol

## Siphonaptera fleas



- Small wingless insects
- Find on animals
- Adults and larvae in alcohol

## Lepidoptera moths and butterflies



- 4 membranous wings covered in scales
- Pin and spread adults, larvae in alcohol



## Diptera flies



- 1 pair of wings
- Hind wings are 'knobs'
- Pin or point adults
- Larvae in alcohol

## Hymenoptera bees, wasps, ants



- 4 membranous wings, held flat over abdomen at rest
- Hindwing smaller than forewing
- Antennae usually fairly long

