

# Leica EZ4D Scope Training

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UPPDL

Fine tuning your photographic skills, and  
taking pictures of what's important



# Training Outline

## Lecture

- Preparing insects for photographing
- Ways to reduce glare
- Using color backgrounds
- Important pictures by order

## Hands-On Exercises

- Using scope and key to ID insect orders
- Taking pictures of actual insects
- Hobo spider challenge



# Today's Focus

## 7 Orders of Insects

1. Beetles
2. Flies
3. Grasshoppers, katydids, crickets, cockroaches, etc.
4. Hemiptera: boxelders, squash bugs, cicadas, aphids
5. Bees, ants, wasps
6. Moths, butterflies and skippers
7. Termites

# Preparing Insects for Photography

## Pinning insects

How was the specimen collected?

- Ethanol
- Dry: in bag or other

Pin while moist (relaxed)

Look at general form of insect to know where to pin

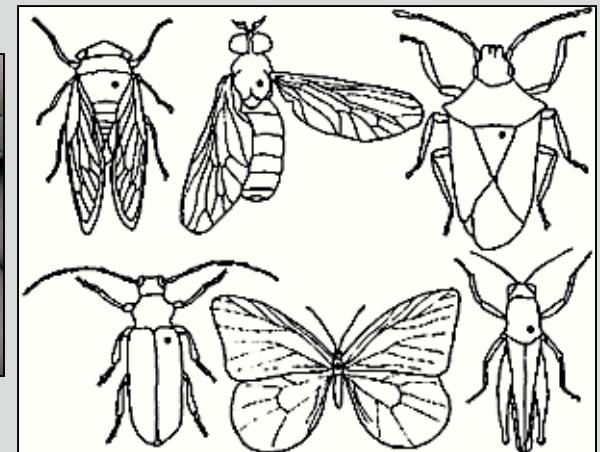
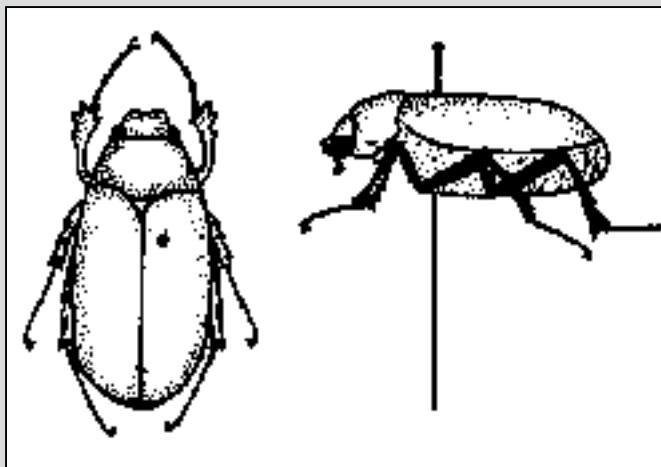


# Preparing Insects for Photography

## Pinning insects

Where do I put the pin?

- Beetles
  - Pinned near the front margin of the right wing near the midline

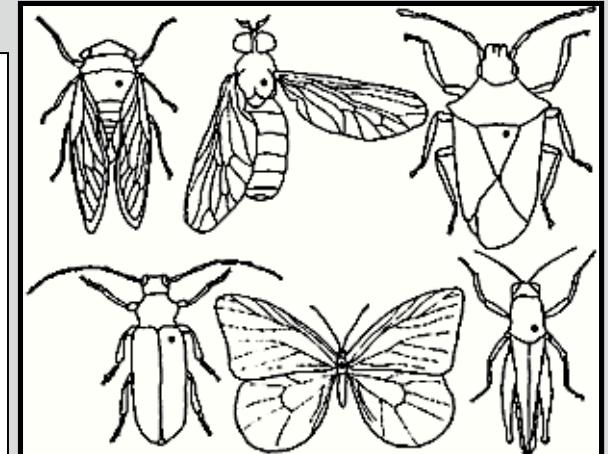
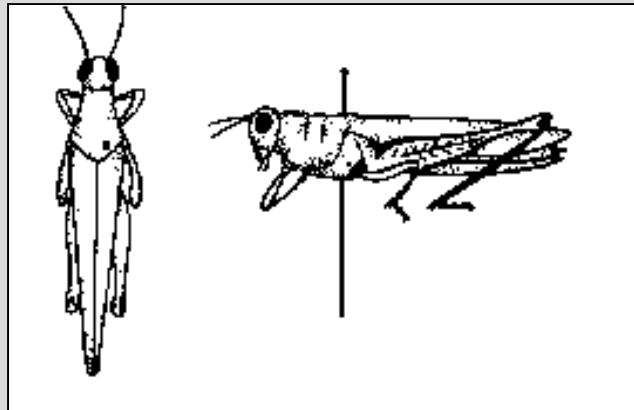


# Preparing Insects for Photography

## Pinning insects

Where do I put the pin?

- Grasshoppers, crickets, katydids
  - Pinned through the right side of prothorax near the midline

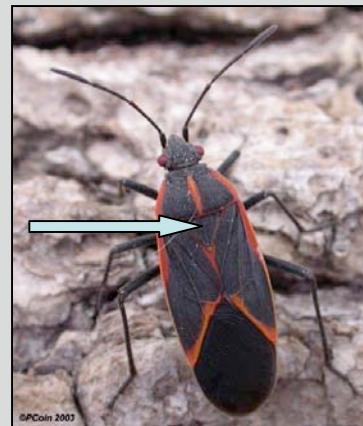


# Preparing Insects for Photography

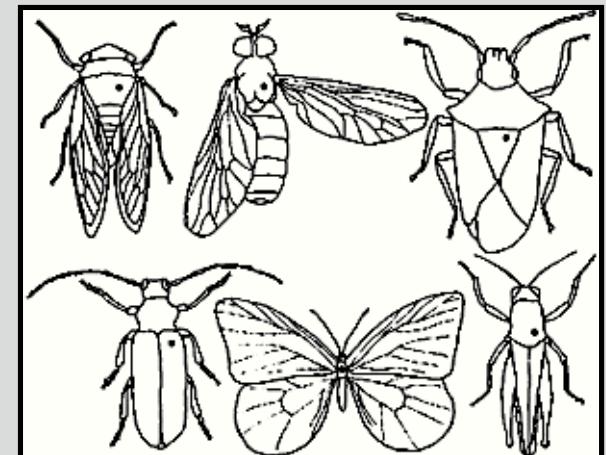
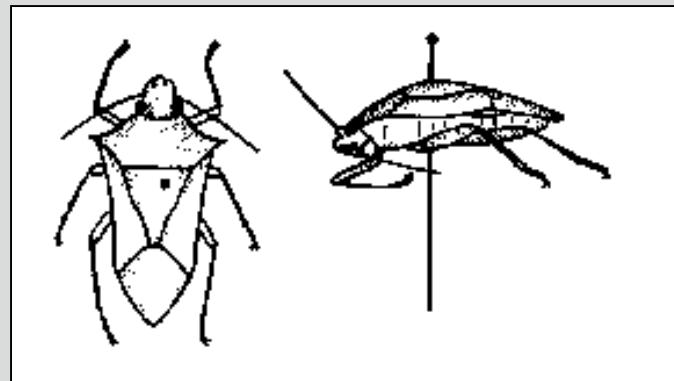
## Pinning insects

Where do I put the pin?

- True bugs



- Pinned through the right side of scutellum near the midline



# Preparing Insects for Photography

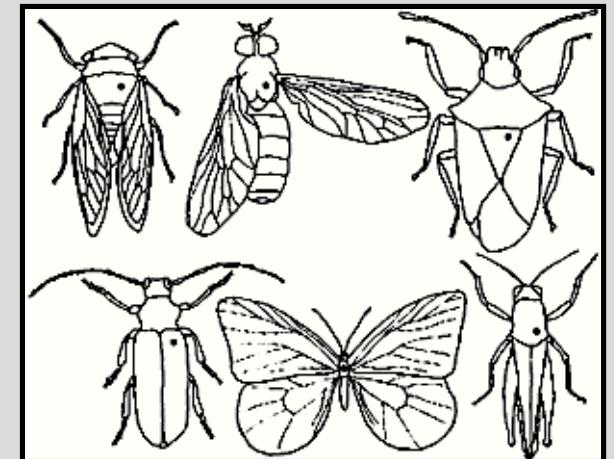
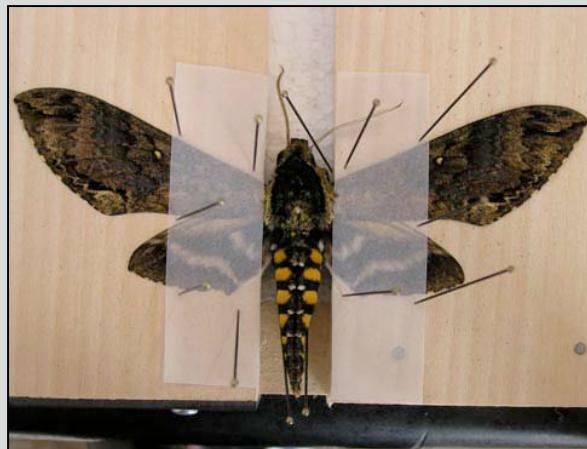
## Pinning insects

Where do I put the pin?

- Butterflies, moths, damsel bugs, dragonflies



- Pinned through middle of thorax

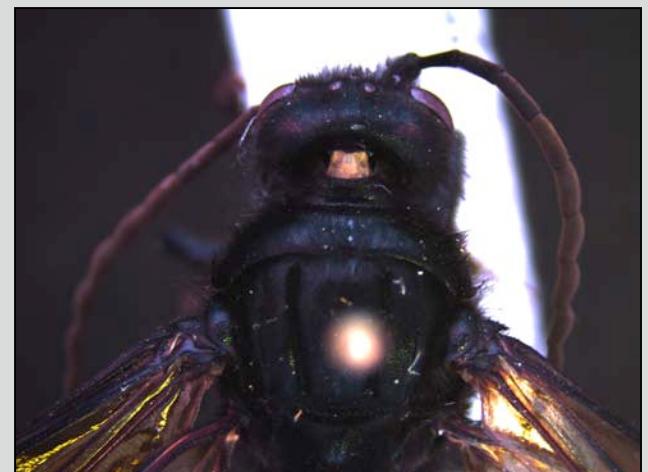


# Preparing Insects for Photography

## Pinning insects

Where do I put the pin?

- Other groups: bees, wasps, ants, flies
  - Pinned through thorax between wing bases to the right of center



# Preparing Insects for Photography

## Labeling

- Make labels on computer and print
- Trim labels with scissors into *neat* rectangles
- Put 2 labels on pin below each bug
- Labels should be the same size

# Preparing Insects for Photography

## Labeling

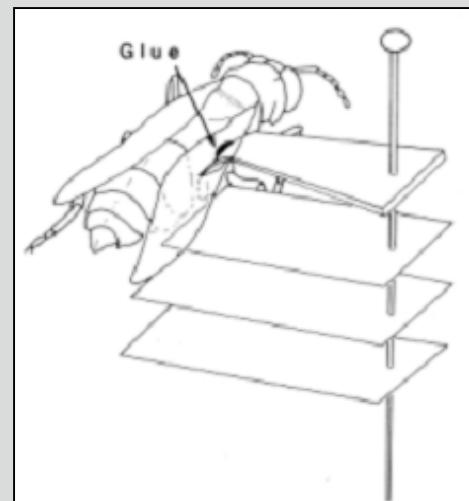
- Parallel to the insect body
- Insect head toward left of label
- Label text left to right
- For pointed bugs, label parallel to length of point

# Preparing Insects for Photography

## Labeling

### Top label

- County and State
- Date Collected
- Your Name

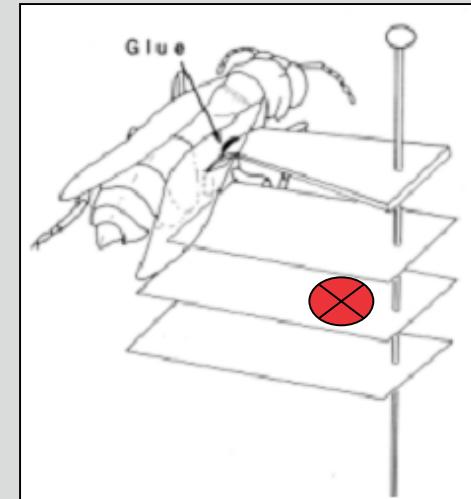


# Preparing Insects for Photography

## Labeling

### Lower Label

- Order Name

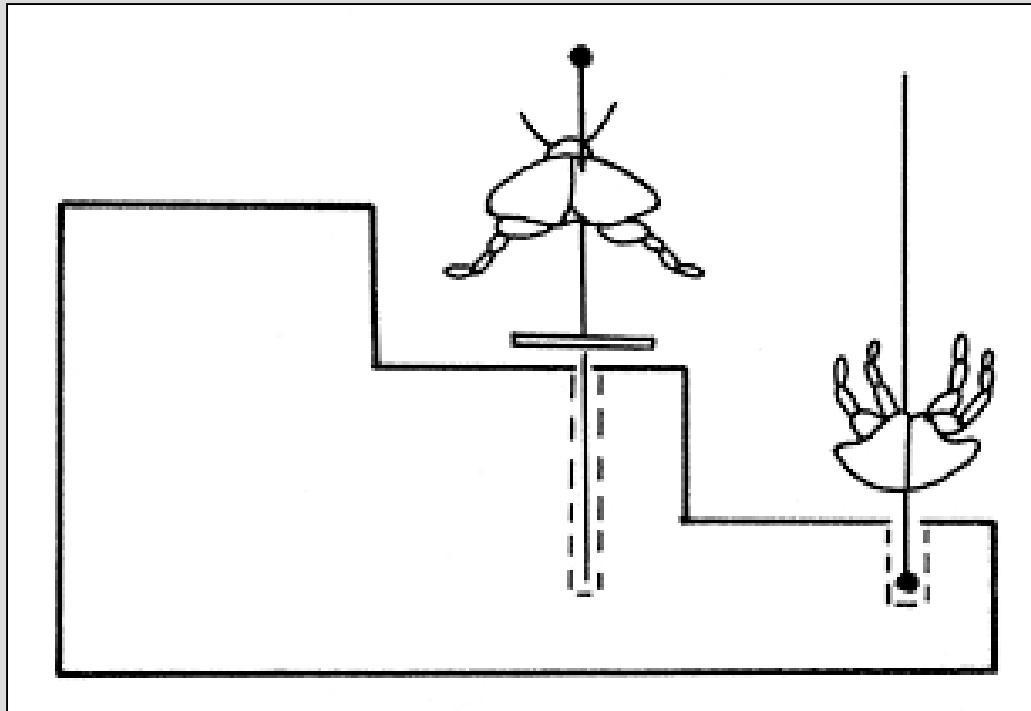


### Middle Label (optional)

- Host Label (i.e. plant, habitat)

# Preparing Insects for Photography

## Labeling



# Make Your Own Insect Collection

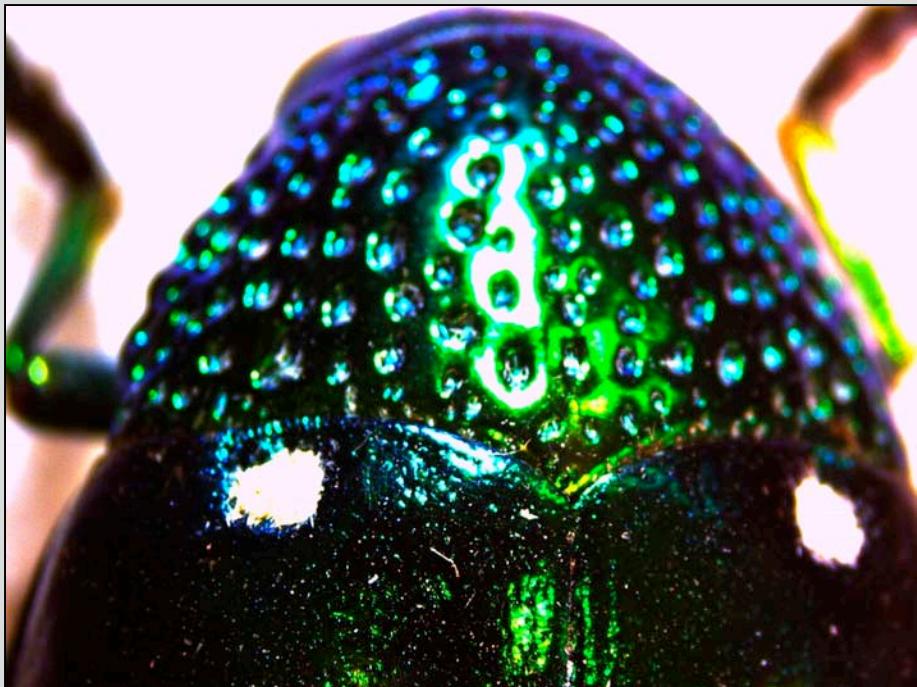
Why do you care?

1. Create a reference collection of insects for your office, could save you work in the long run
2. Doesn't have to be fancy, use a cigar box with foam at the bottom
3. If you need help with ID'ing I'd be glad to help
4. Get help from a master gardener

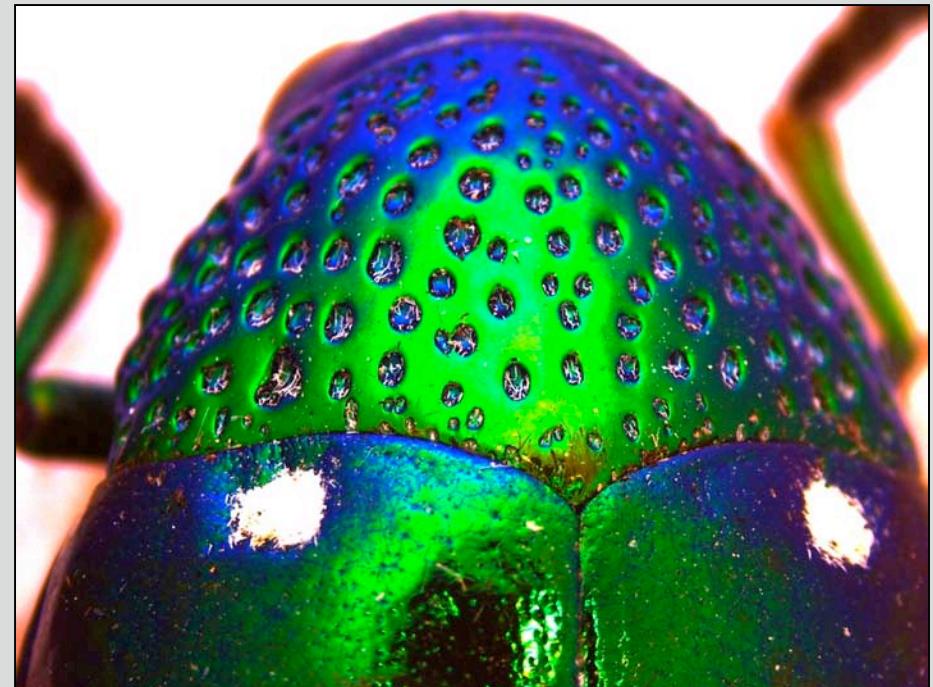
# Preparing Insects for Photography

## Reducing Glare

Muting light with foam cup



Unmuted

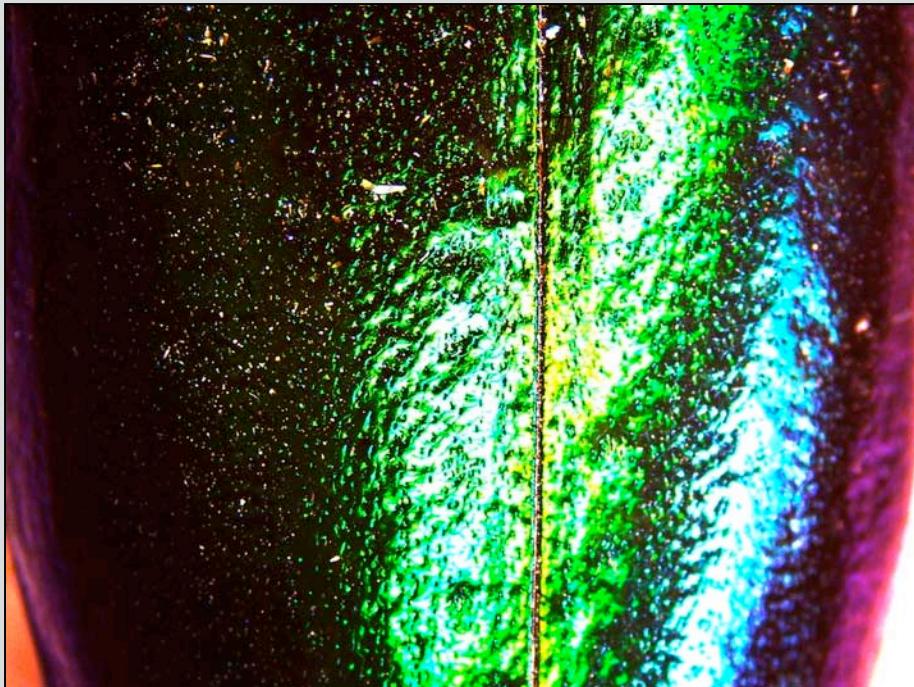


Muted

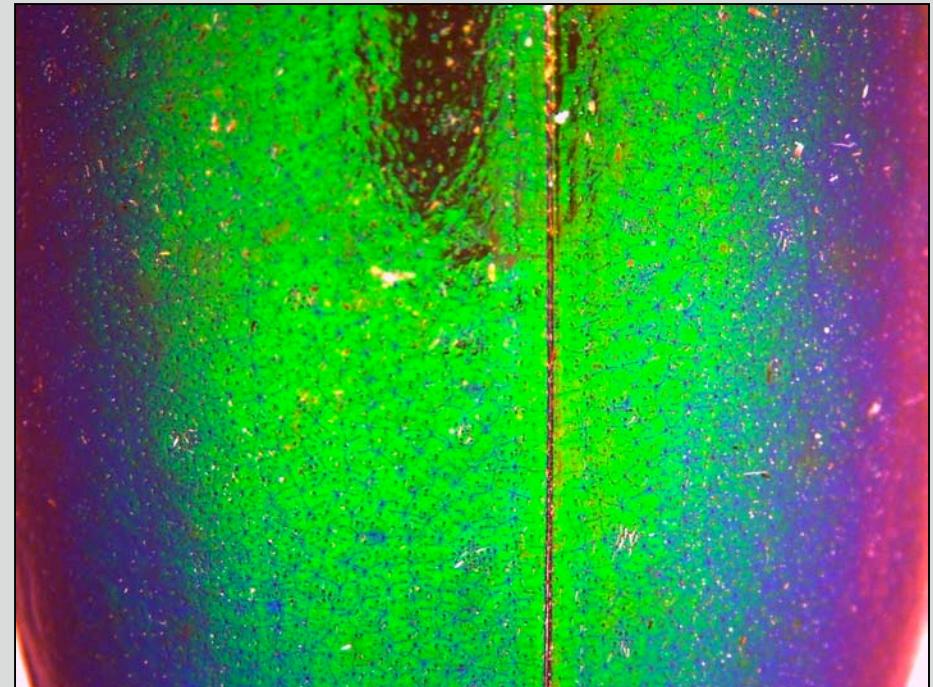
# Preparing Insects for Photography

## Reducing Glare

Muting light with foam cup



Unmuted



Muted

# Preparing Insects for Photography

## Reducing Glare

Muting light with foam cup



Unmuted



Muted



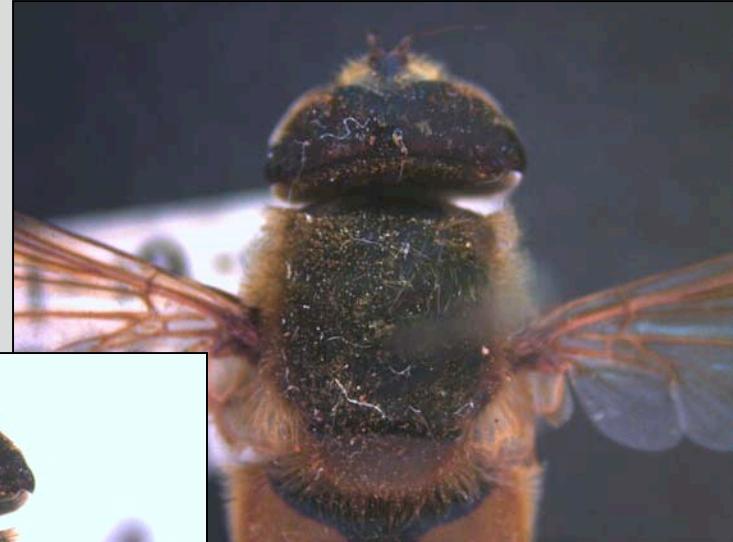
Muted Black Background

# Colored backgrounds can improve picture quality

Green



Black



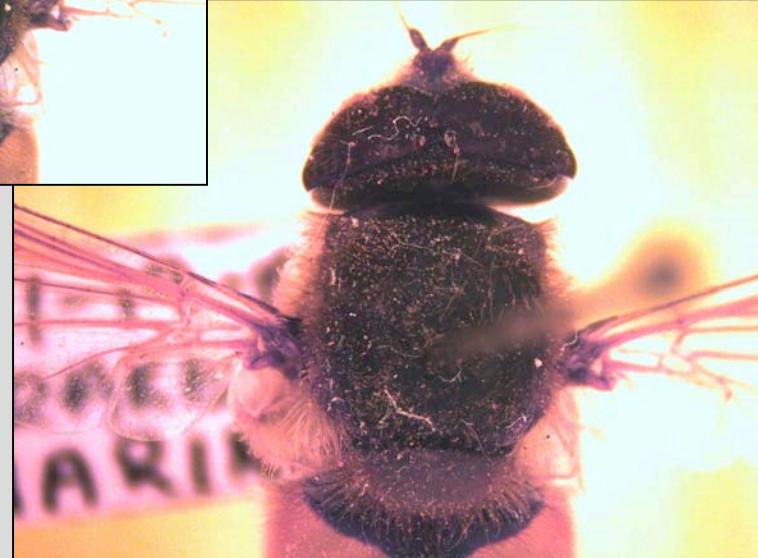
None



Red



Yellow



# Taking the Proper Pictures

Important diagnostic characters for  
major orders

1. Beetles
2. Flies
3. Grasshoppers, katydids, crickets, cockroaches, etc.
4. Hemiptera: boxelders, squash bugs, cicadas, aphids
5. Bees, ants, wasps
6. Moths, butterflies and skippers
7. Termites

# Identifying Coleoptera

## Beetles

1. Elytra: hardened outer wings that meet in a straight line down the middle of back; 2 membranous wings beneath elytra
2. Chewing mouthparts: usually well-developed mandibles

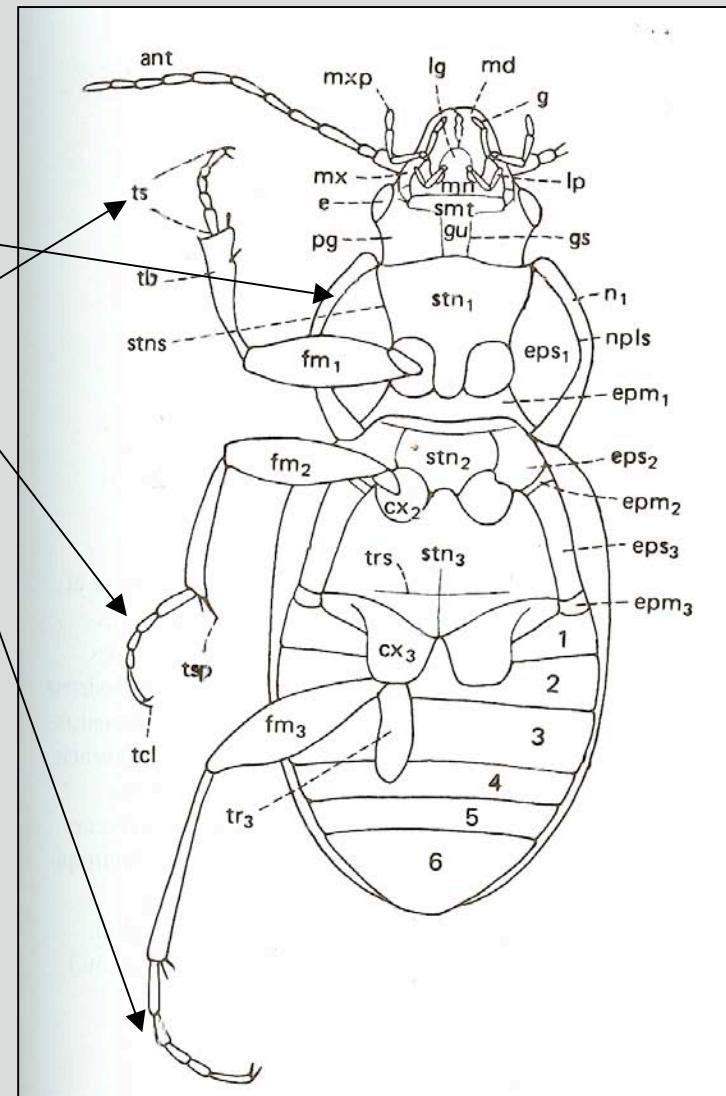
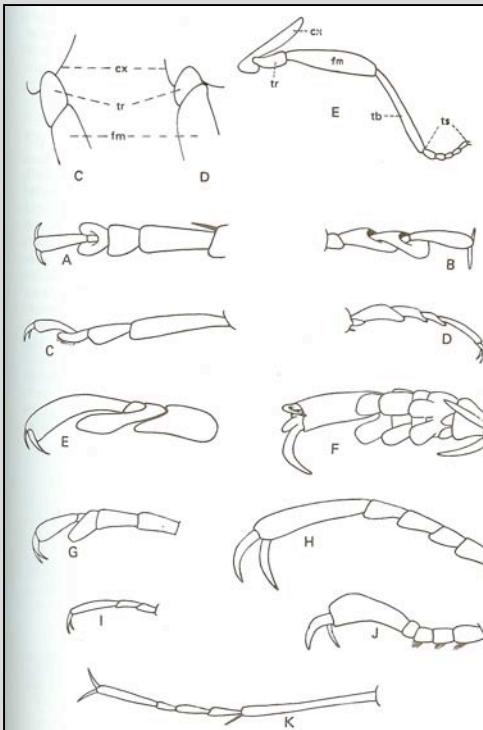


# Taking the Proper Pictures

## Important diagnostic characters: Beetles

1. Elytra
2. Notopleural sutures
3. Pre-, meso-, and metatarsi

Types of tarsi →



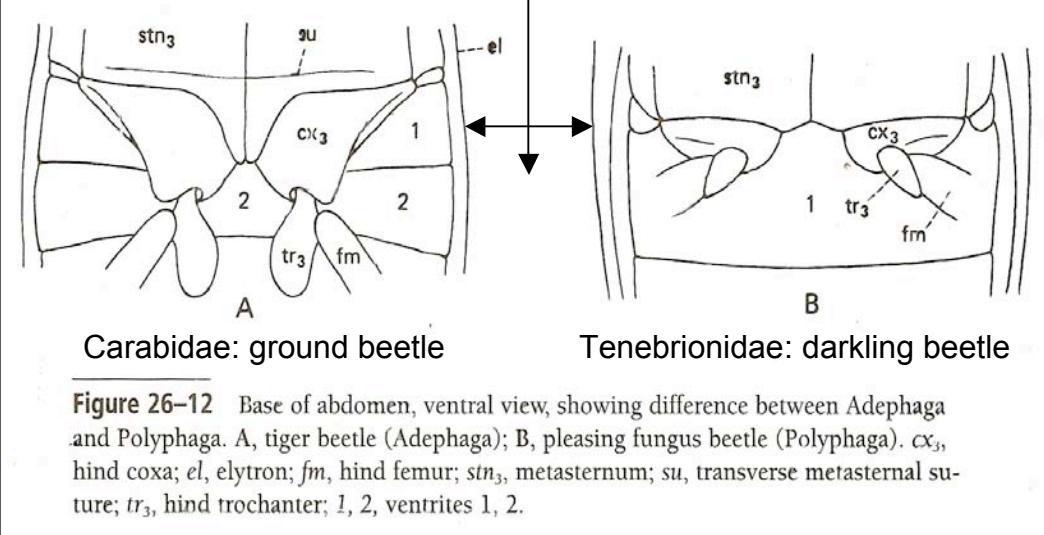
# Taking the Proper Pictures

## Important diagnostic characters: Beetles

4. Antenna

5. Top of head: ocelli present?

6. Metasternum, 1st & 2nd ventrite:  
coxa, trochanter, femur



Carabidae: ground beetle

Tenebrionidae: darkling beetle

Figure 26-12 Base of abdomen, ventral view, showing difference between Adephaga and Polyphaga. A, tiger beetle (Adephaga); B, pleasing fungus beetle (Polyphaga). cx<sub>3</sub>, hind coxa; el, elytron; fm, hind femur; stn<sub>3</sub>, metasternum; su, transverse metasternal suture; tr<sub>3</sub>, hind trochanter; 1, 2, ventrites 1, 2.

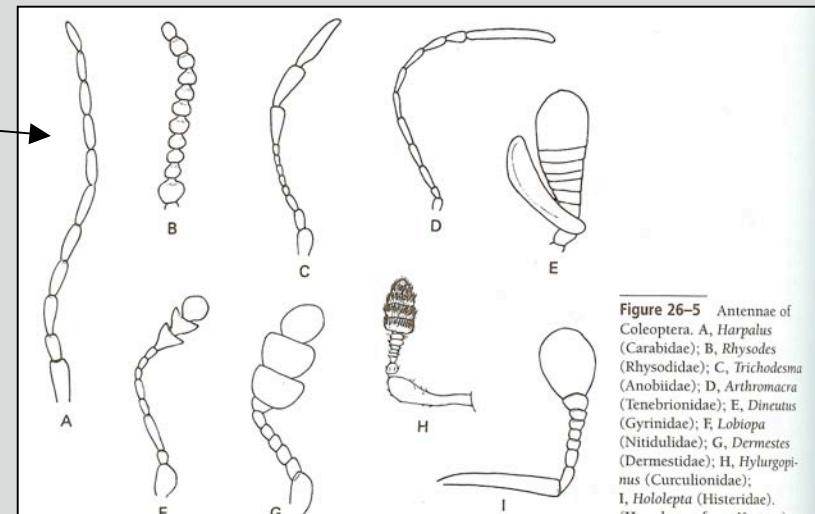


Figure 26-5 Antennae of Coleoptera. A, Harpalus (Carabidae); B, Rhysodes (Rhysodidae); C, Trichodesma (Anobiidae); D, Arthromacra (Tenebrionidae); E, Dineutus (Gyrinidae); F, Lobiopa (Nitidulidae); G, Dermestes (Dermestidae); H, Hylurgopinus (Curculionidae); I, Hololepta (Histeridae). (H, redrawn from Kaston.)

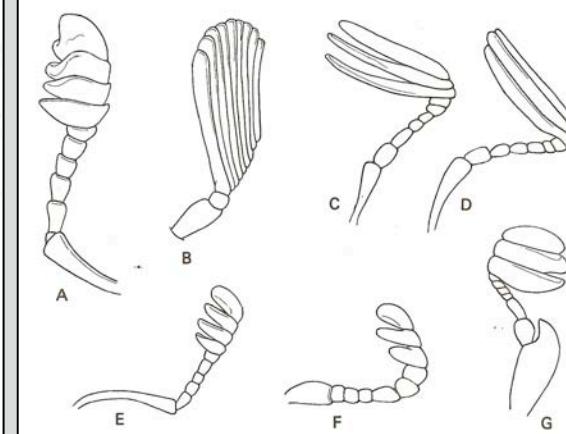
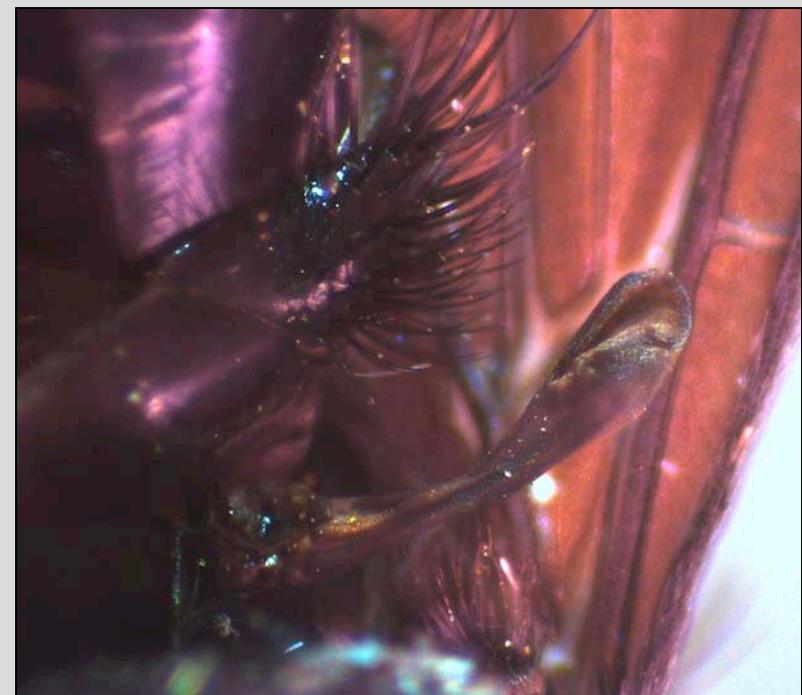
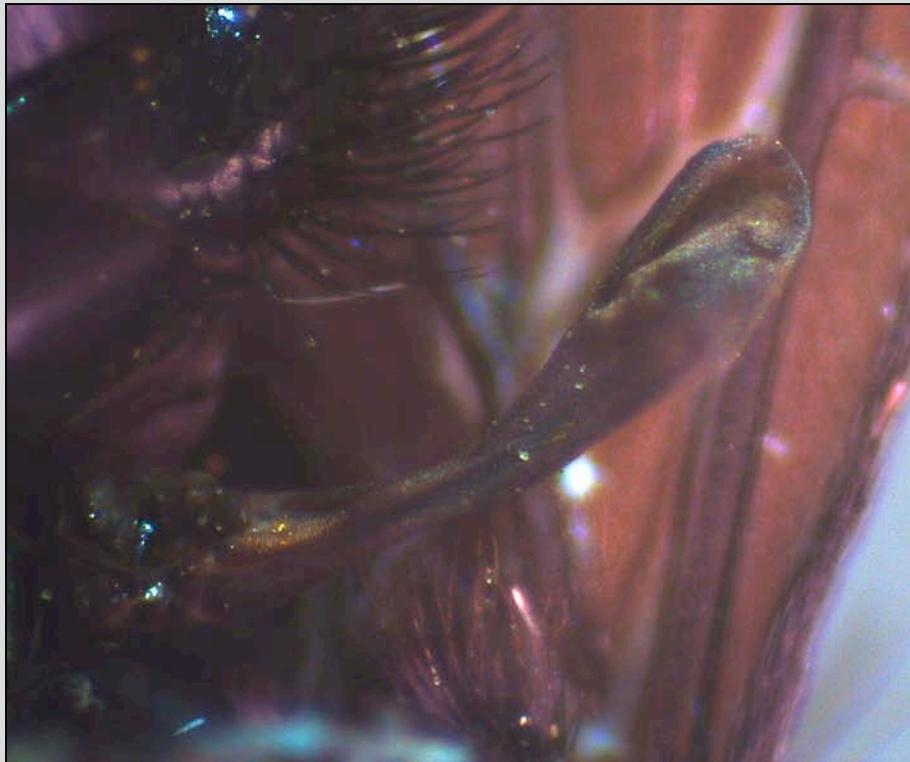


Figure 26-6 Antennae of Coleoptera. A, Nicrophorus (Silphidae); B, Sandalus, male (Rhypiceridae); C, Phyllophaga, (Scarabaeidae), the terminal segments expanded; D, same, terminal segments together forming a club; E, Lucanus (Lucanidae); F, Odontotaenius (Passalidae); G, Trox (Trogidae).

# Identification: Diptera

## Flies

1. Two WINGS!
2. Halteres



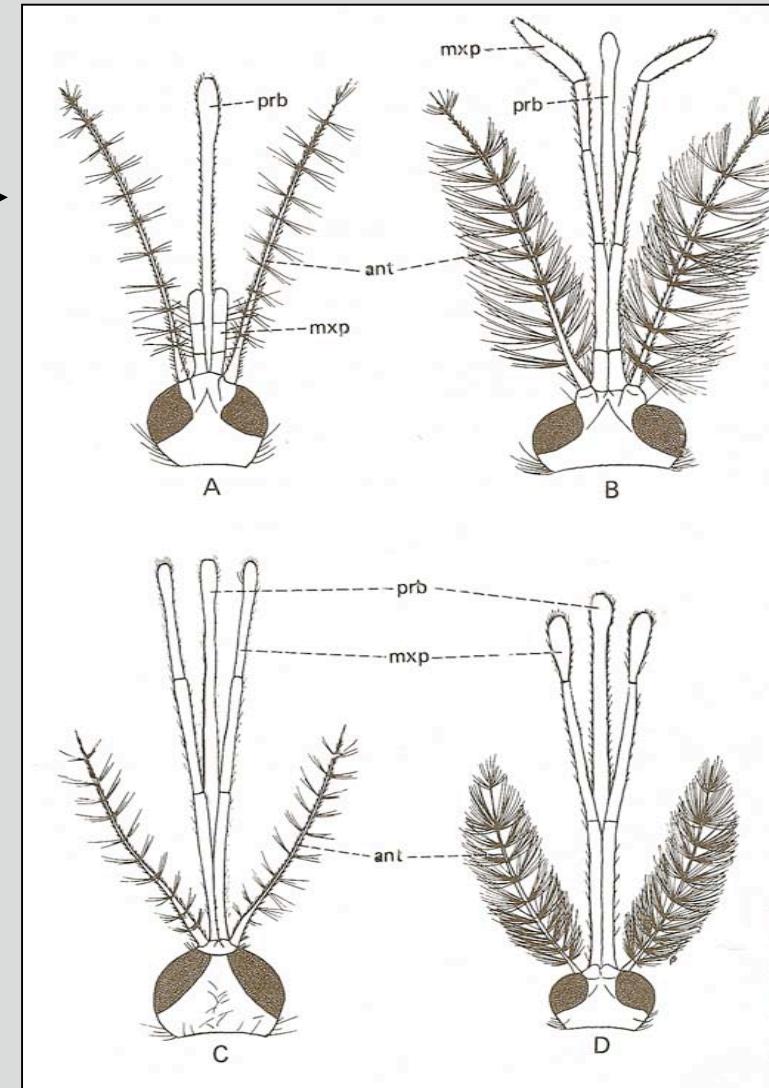
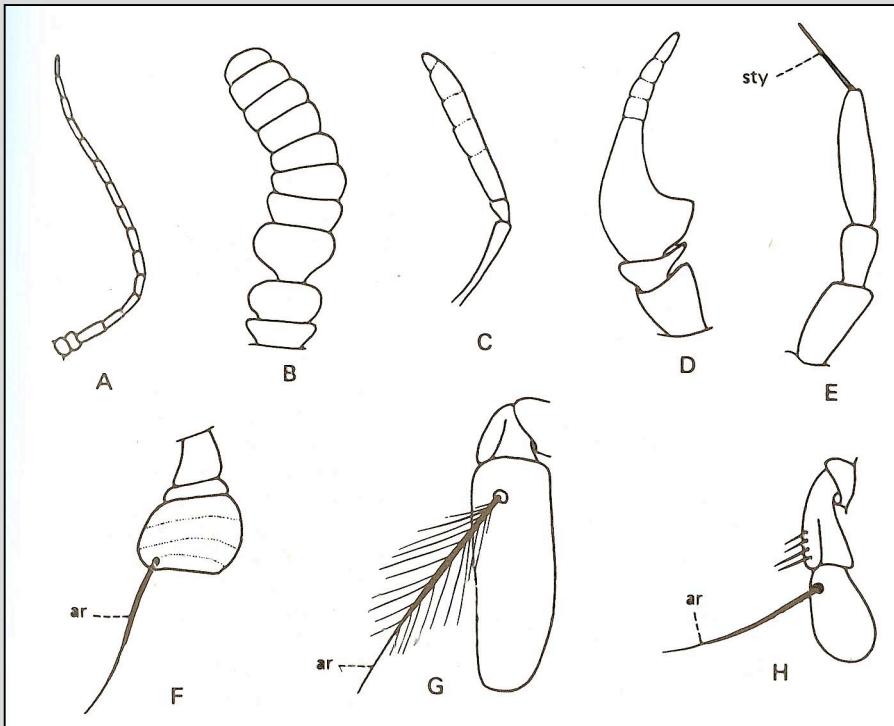
# Taking the Proper Pictures

Important diagnostic characters: Flies

1. Antenna

2. Mouthparts

3. Wings



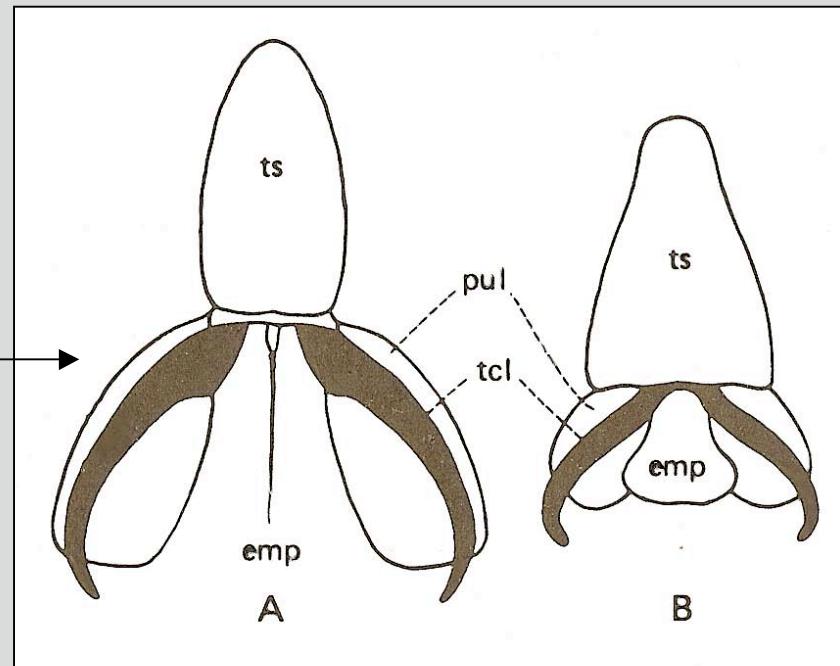
# Taking the Proper Pictures

Important diagnostic characters: Flies

4. Tarsi: and tarsal spurs/claws

5. Head: Ocelli present?

6. Mesonotum



# Identification: Orthoptera

## Grasshoppers, crickets, katydids

1. Mouthparts: mandibulate,  
chewing
2. Wings variable
3. Antenna usually long



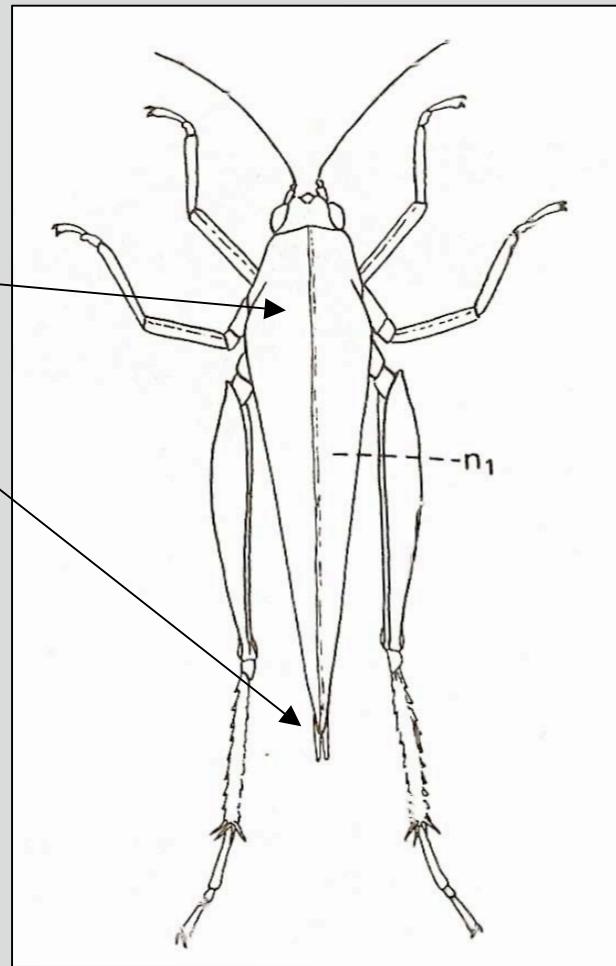
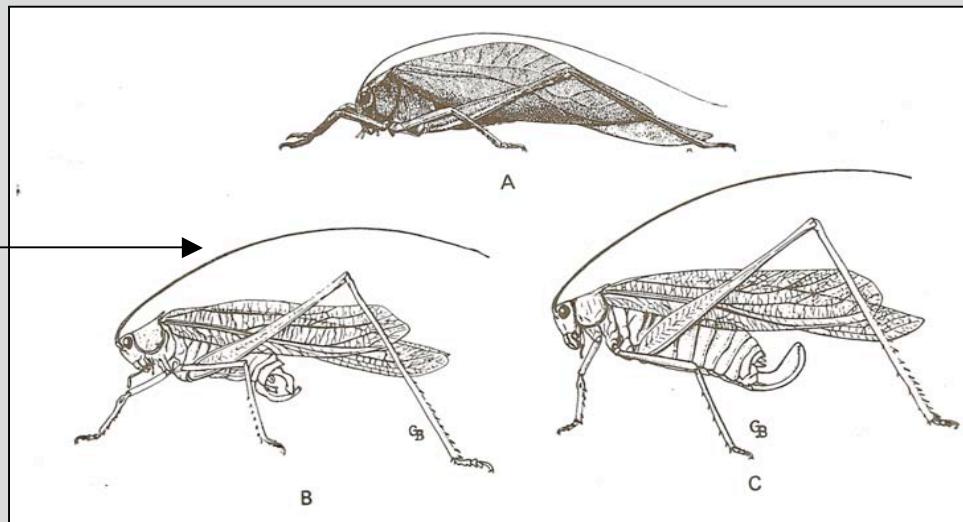
# Taking the Proper Pictures

Important diagnostic characters: Grasshoppers, crickets, katydids

1. Antenna

2. Pronotum

3. Ovipositor, cerci, the Butt!



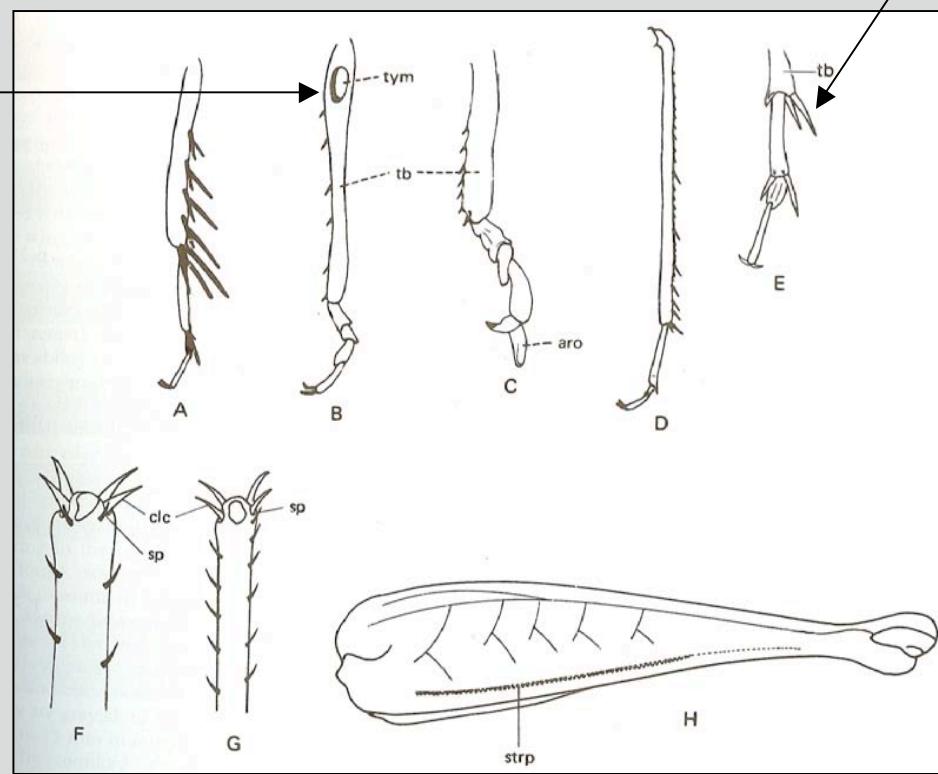
# Taking the Proper Pictures

Important diagnostic characters: Grasshoppers, crickets, katydids

4. Legs: representative from front, middle and back
  - emphasis on ending segments (tarsi) and spurs

5. Tympana: if present...

6. General wing shot



# Identification: Hemiptera

Aphids, cicadas, scales, whiteflies, hoppers, etc.

1. Mouthparts: piercing, sucking



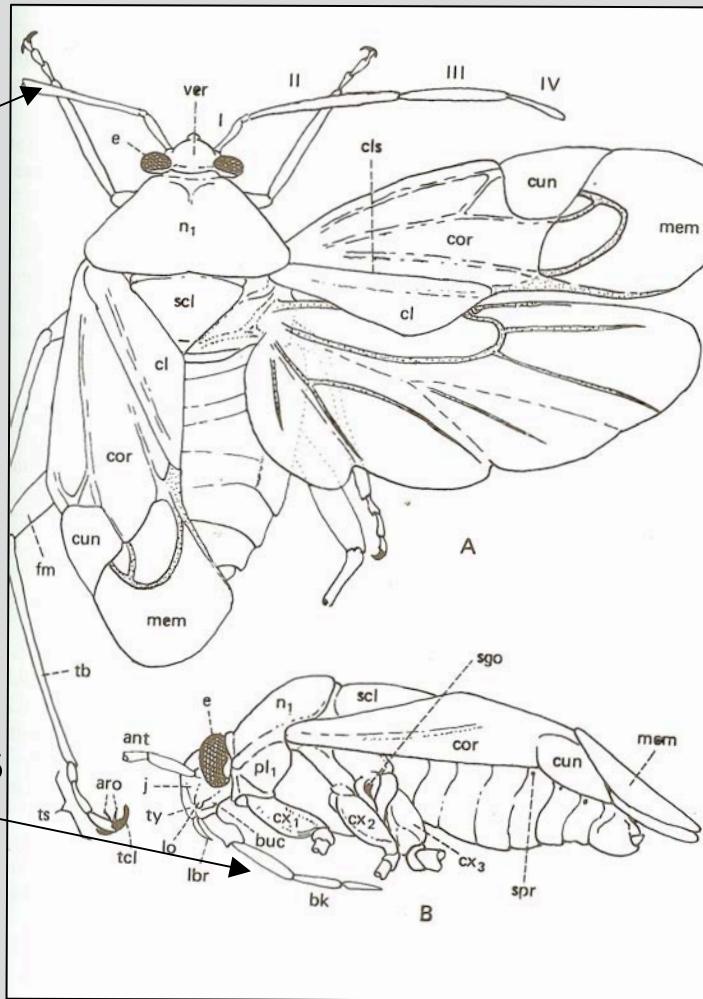
2. Wings: Hemelytra in Sternorrhyncha;  
membranous in Auchenorrhyncha



# Taking the Proper Pictures

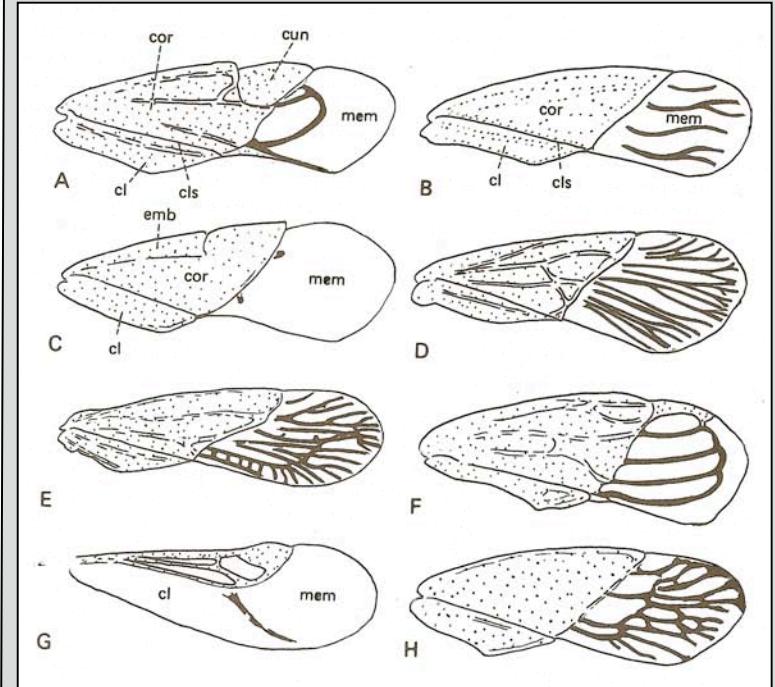
Important diagnostic characters: Aphids, cicadas, scales, whiteflies, hoppers, boxelders

1. Antenna



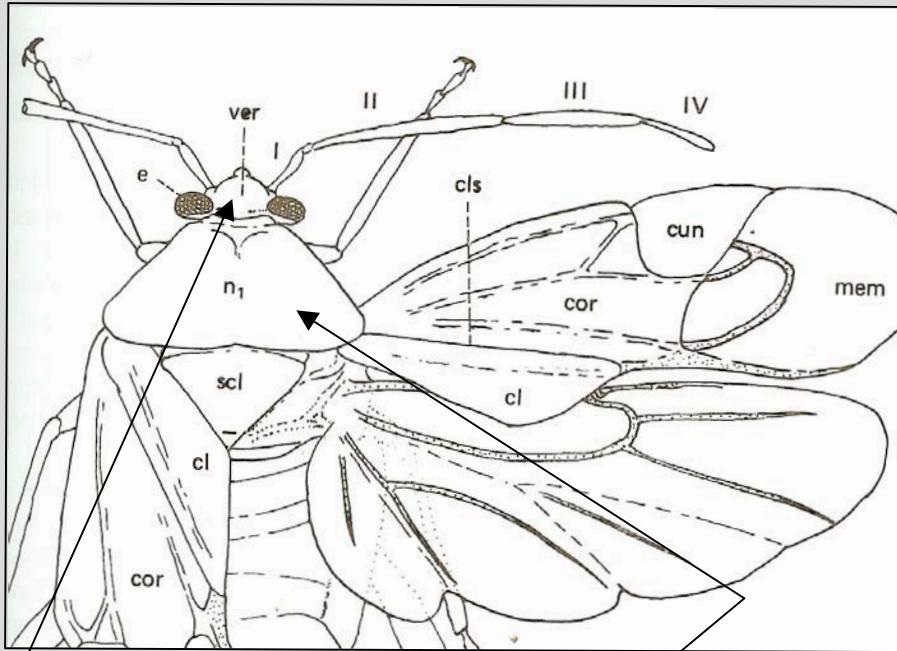
2. Mouthparts

3. Wings: leathery part (hemelytra) and the membranous part



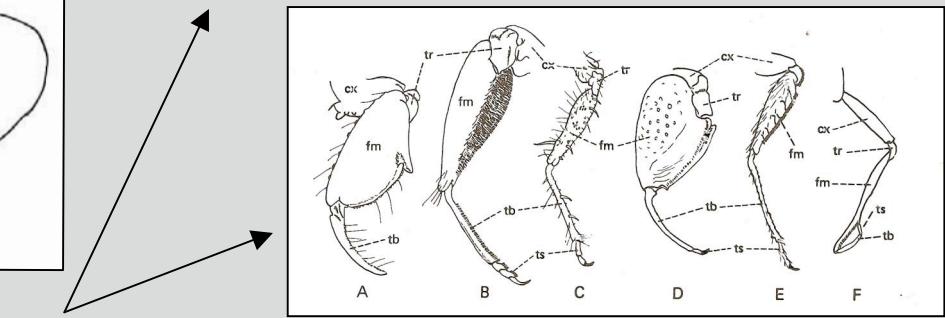
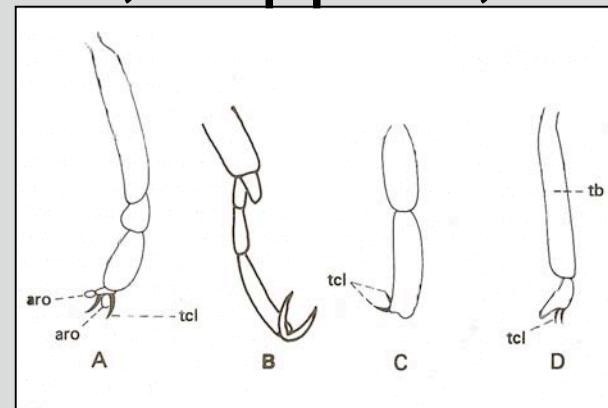
# Taking the Proper Pictures

Important diagnostic characters: Aphids, cicadas, scales, whiteflies, hoppers, boxelders



4. Head: shape and ocelli

5. Pronotum



6. Legs: representative from front, middle and back--emphasis on ending segments (tarsi) and general form

# Identification: Hymenoptera

## Bees, wasps and ants

1. Wings: front larger than hind wing
2. Mouthparts: usually mandibulate, but in bees maxillae and labium form tonguelike feature
3. Ovipositor usually well developed, sometimes into a sting



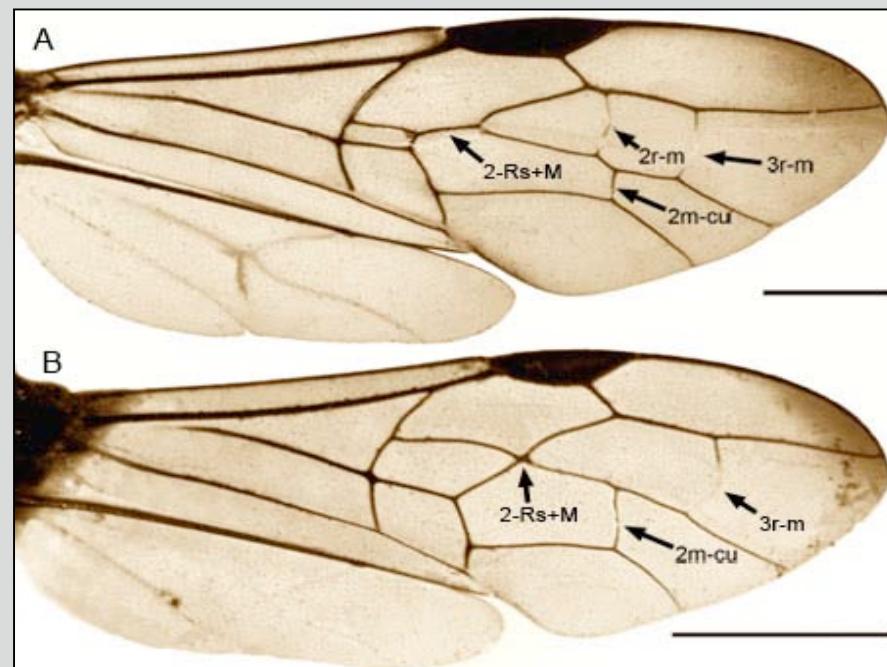
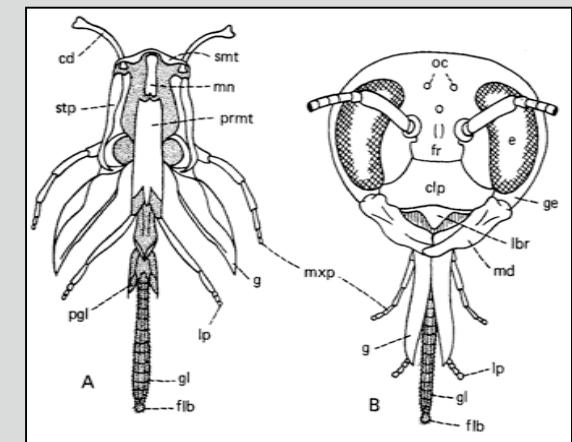
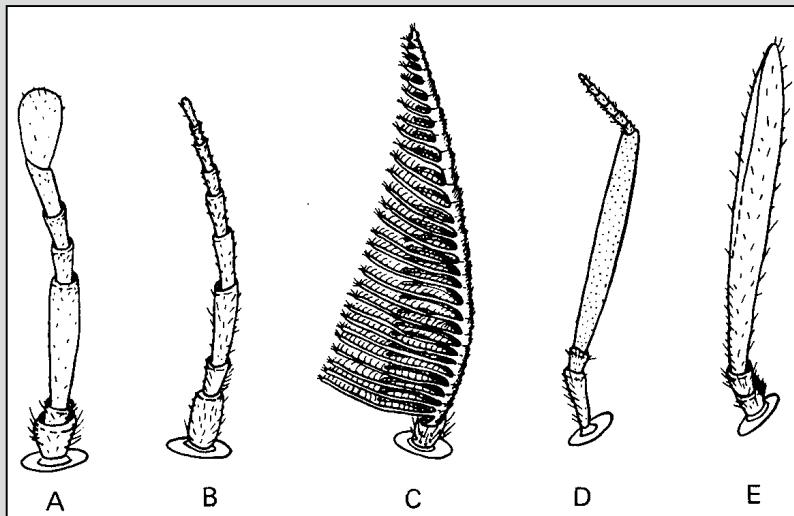
# Taking the Proper Pictures

Important diagnostic characters: Bees, wasps and ants

1. Wing venation: front and hind wing

2. Legs: trochanter, tibial spurs and tarsal segments

3. Antenna



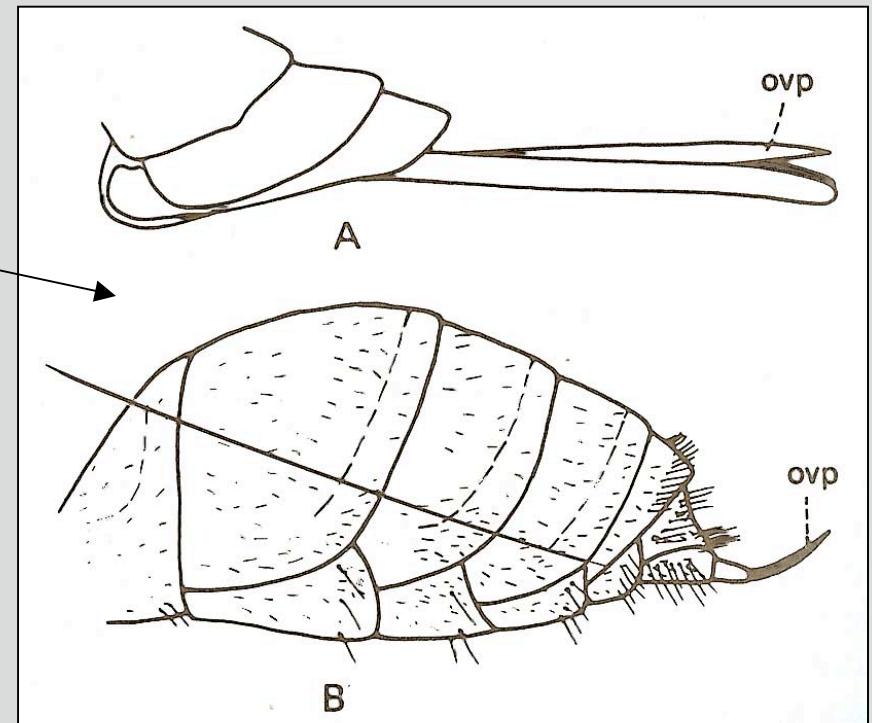
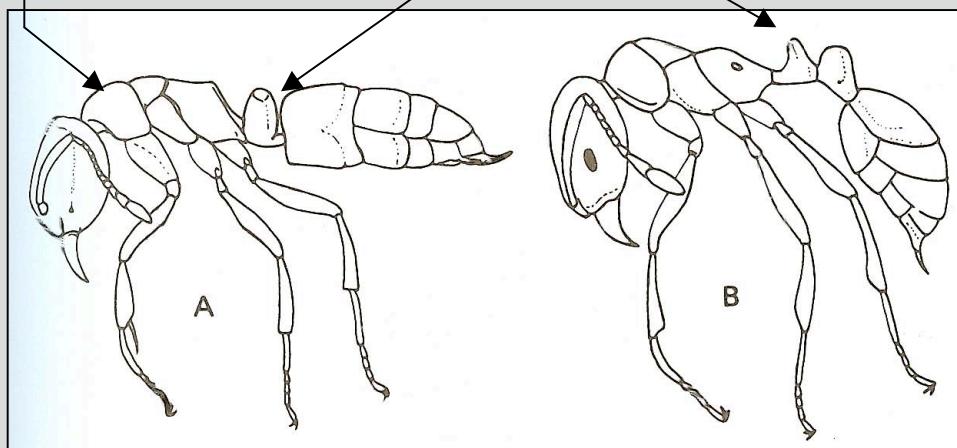
# Taking the Proper Pictures

Important diagnostic characters: Bees, wasps  
and ants

4. Pronotum

5. Ovipositor

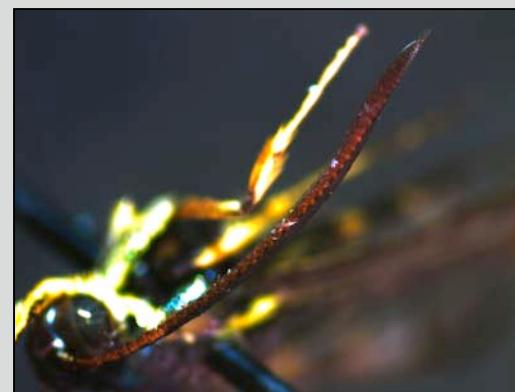
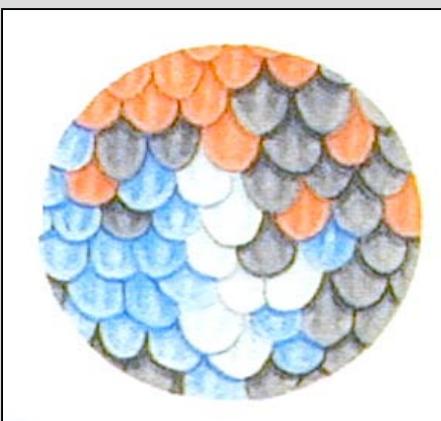
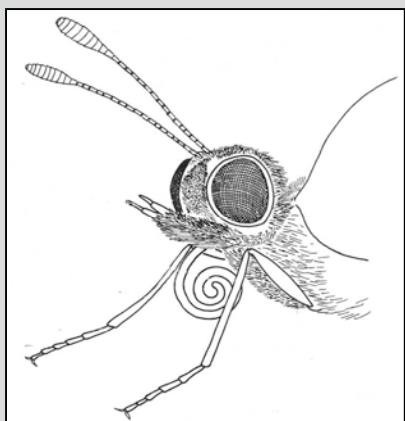
6. Metasoma: pedicil



# Identification: Lepidoptera

## Butterflies, Moths and skippers

1. Wings: 4 wings usually covered in scales
2. Body usually covered in scales
3. Antenna: clubbed in butterflies; variable in moths
4. Mouthparts: sucking or vestigial; Labial palps protrude
5. Head: usually with large compound eyes and 2 ocelli



# Taking the Proper Pictures

Important diagnostic characters: Butterflies,  
Moths and skippers

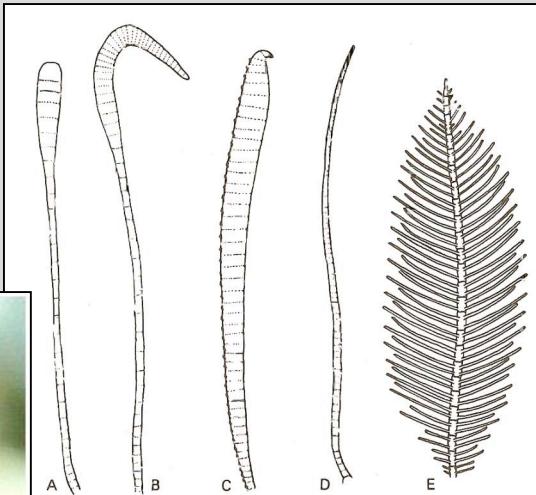
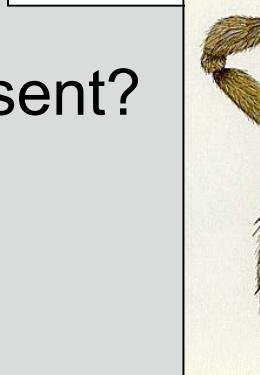
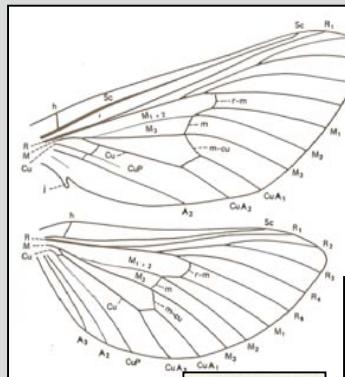
1. Wing venation: front and hind wing; difficult b/c of scales
2. Legs: tibial spurs, tarsal claws, and presence or absence  
of spines

3. Antenna

4. Mouthparts

5. Head: ocelli present?

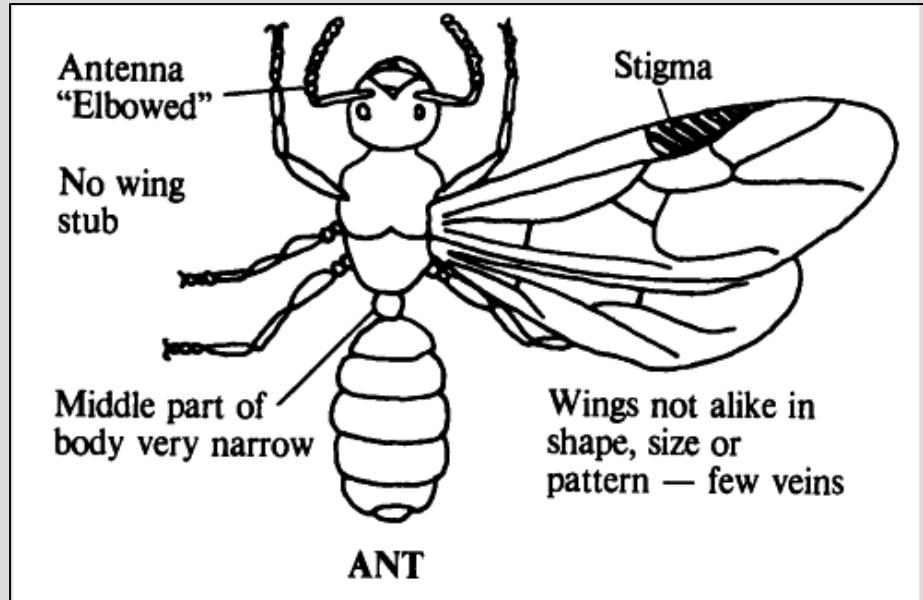
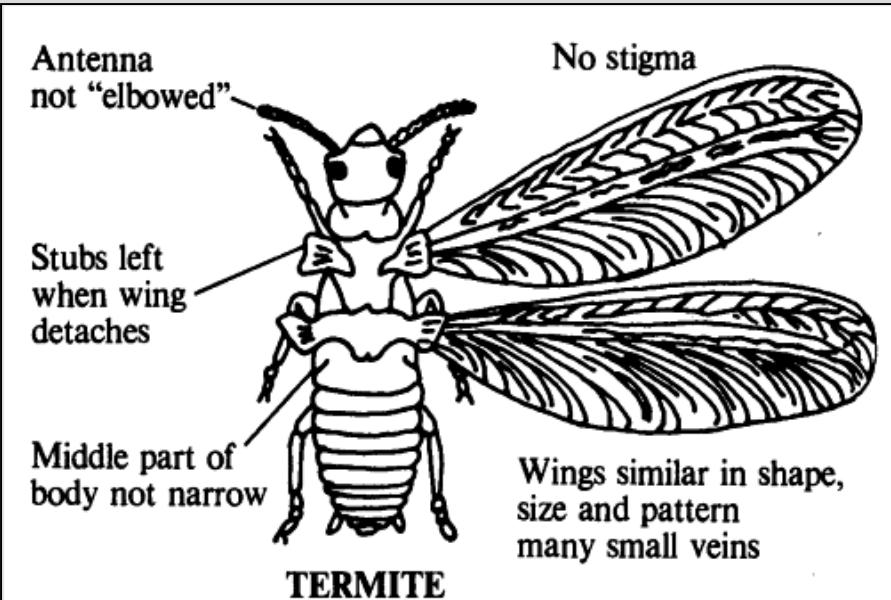
6. Coloration



# Identification: Termitidae

## Termites

### Differences between termites and ants

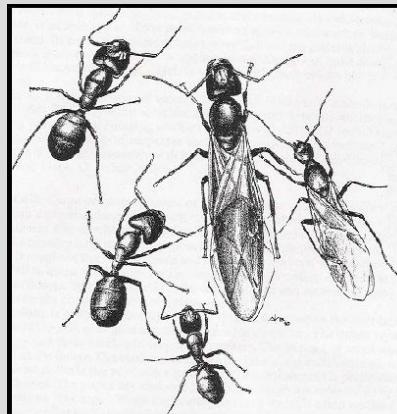


# Taking the Proper Pictures

## Important diagnostic characters: Termites

Differences between termites and ants

1. Wings: front and back;  
for size comparison
2. Thorax and abdomen: where  
they meet; do they constrict?
3. Take picture of top of head:  
fontanelle present?
4. Antenna



# Identification: Aracnida

Bonus taxon: Spiders!

1. 8 legs: don't confuse with...



# Identification: Aracnida

Cool Picture of the Day



# Taking the Proper Pictures

## Bonus taxon: Spiders!

1. Eyes
2. Close-up of minute setae: are they plumose?
3. Mouthparts from beneath
4. Underside of abdomen: book lungs, spiracles, epigynum
5. End of abdomen: spinnerets and cribellum
6. Underside of sternum
7. Tarsal claws and leg spines: if possible

# Taking the Proper Pictures

ALWAYS...if nothing else!

Take pictures of the whole insect with  
a regular digital camera!!!

Take pictures from the top, side, front  
and back...

# Useful Links

[www.utahpests.usu.edu](http://www.utahpests.usu.edu)

[www.insectnet.com](http://www.insectnet.com)

[www.bugguide.net](http://www.bugguide.net)

[www.butterfliesandmoths.org](http://www.butterfliesandmoths.org)

[www.ipmimages.org](http://www.ipmimages.org)

[www.bioquip.com](http://www.bioquip.com)

[www.insectimages.org](http://www.insectimages.org)

<http://mothphotographersgroup.msstate.edu/MainMenu.shtml>



# Exercises

Exercise 1: Identify the 5 insects to order

- please use the key and ask for my help

Exercise 2: Try to ID the Hobo spider and  
other common household spiders

- key provided in binder
- only one display, so please share

Exercise 3: Try taking some pictures of key  
insect features.. (do while you ID)

Exercise 4: Lunch!