Insect classification and biodiversity
ENT-304

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Collecting of Insects

Getting Started

- For collection, you'll need some equipment and skills

- Collecting & curating your insects will be a valuable 'hands on learning experience'

Getting Started

- Here are four very good sources for study, ready-made insect collection and monitoring equipment; there may be more…..

- Bioquip--- www.bioquip.com/html/catalog.htm
- Gemplers--- www.gemplers.com/insect-monitoring
- Great Lakes IPM--- www.greatlakesipm.com
- Ward's Natural Science--- www.wardsci.com/

What Equipment Could You Use to Make an Arthropod Collection?

- Nets, Aspirator
- Kill Jar
- Lights traps
- Pins
- Notebook
- Alcohol vials
- Hand lens
- Pitfall trap
- Data labels
- Pinning block
- Spreading boards
- Malaise Traps
- Berlese funnel
- Forcep
- Insect box

'Arthropods are everywhere'--- You will have to 'look everywhere' at different times of day or seasons, using a variety of tools and techniques for best results.

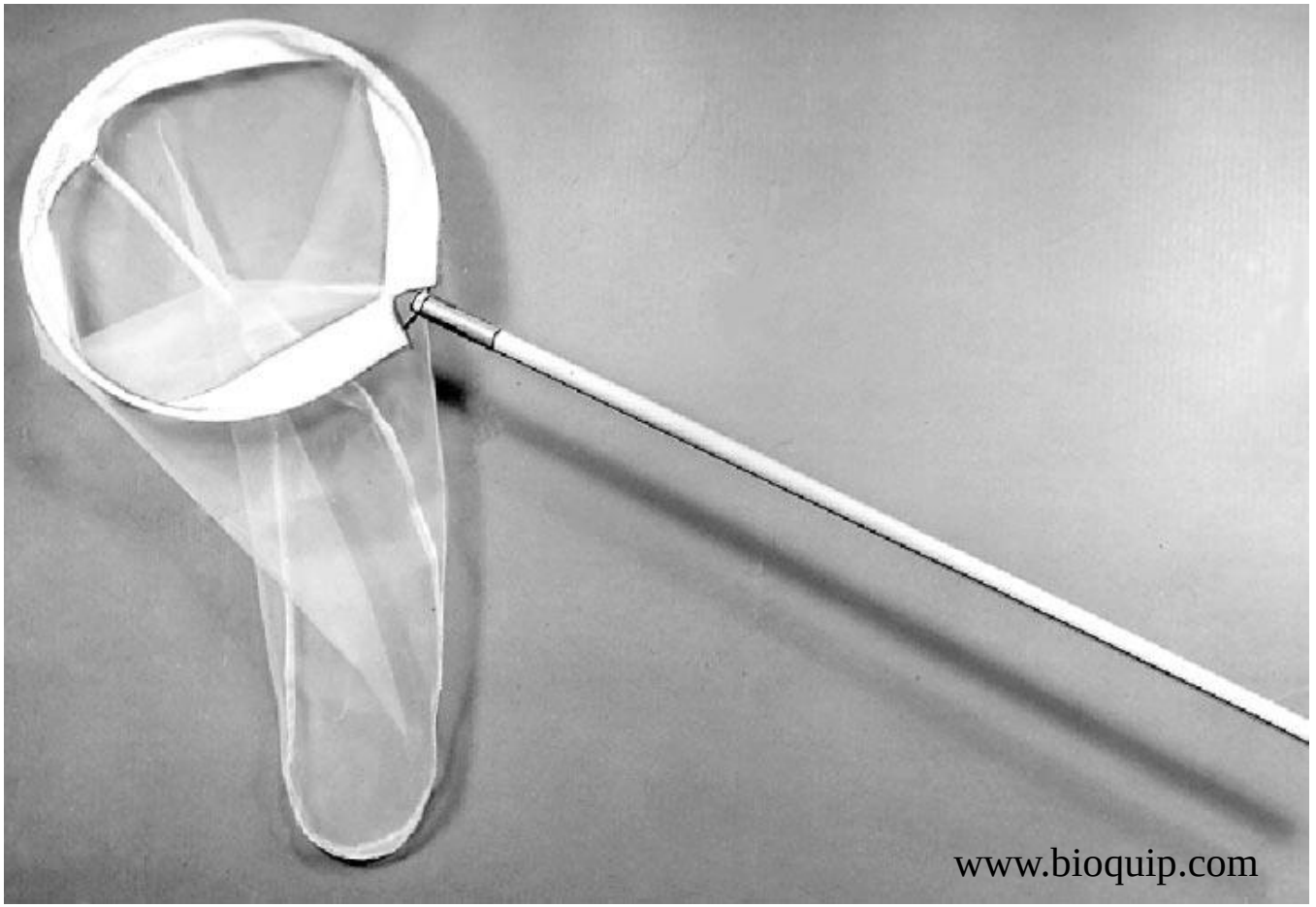
Be careful; stay safe

Collecting Equipment

Hand Picking
Grasshoper, beetles, bugs

Sweep net
---for vegetation

Aerial net
for butterflies, dragonflies



Sweeping usually will catch a variety of insects.

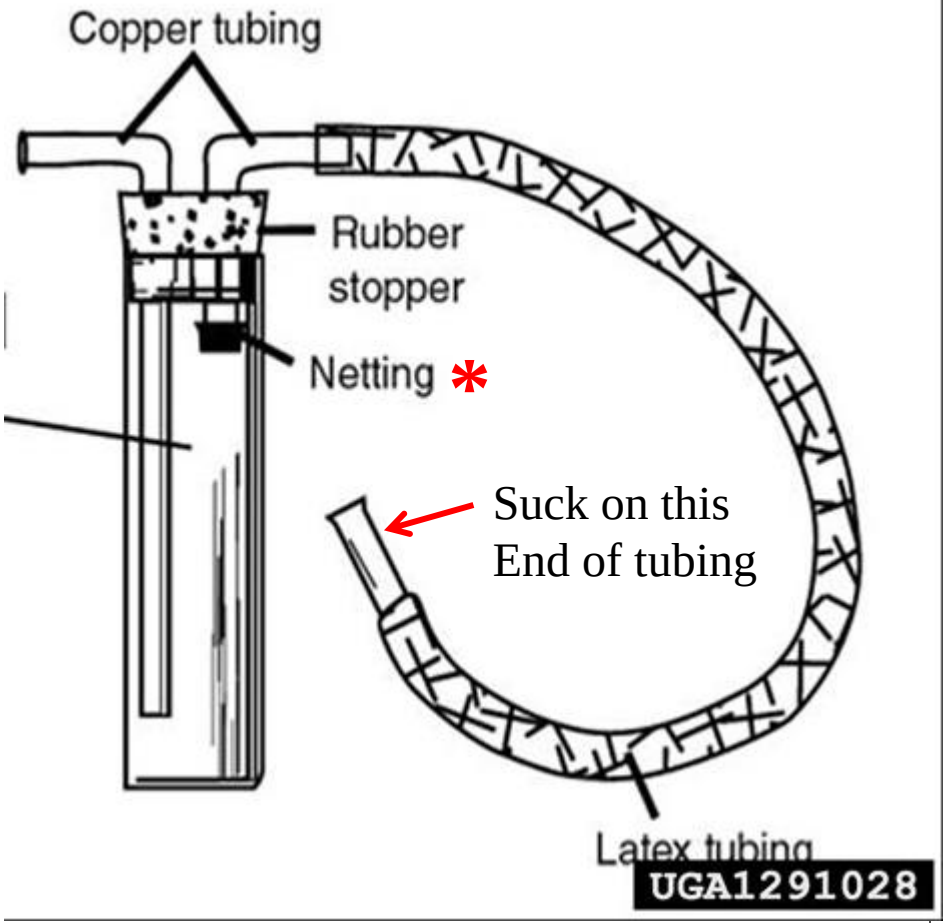
Avoid being stung by agitated bees and wasps

Uga5359069
HF Schwartz, CO State Univ, Bugwood.org

Aspirator

‘vacuum’ various small insects. Small diameter tubing, fine net and a container.

The net is **absolutely necessary** to keep you from sucking insects into your mouth and lungs.



K Loeffelman, Univ Idaho, Bugwood.org

Traps, Trapping

- Traps can be very simple and inexpensive
- Here are some simple and inexpensive ideas to try
- REMEMBER: Safety is of the utmost importance!!

Light traps

- Catch insects coming to the light at night or before dawn

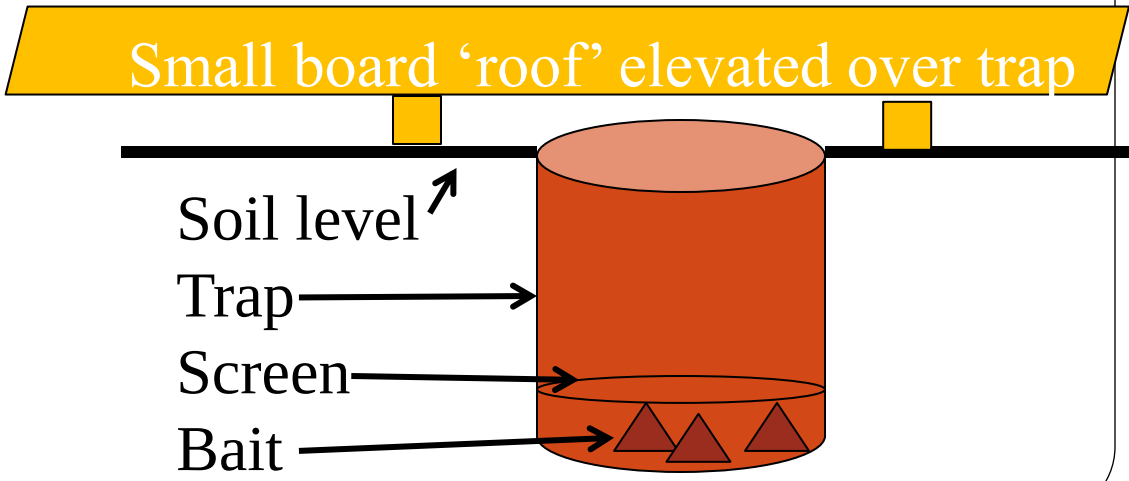
Sticky traps

Water Traps

- Shallow tray
- Few drops detergent

Pitfall Traps

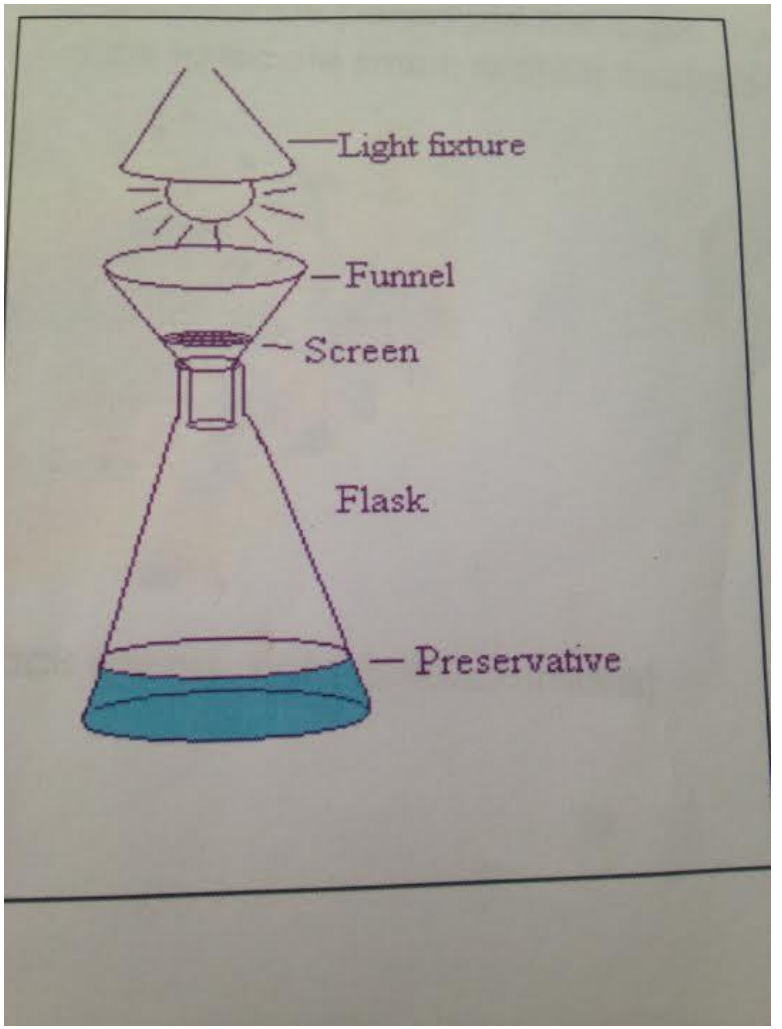
- ---can work well with different baits, or sometimes no bait, trapping insects that do not fly readily.



Pan Traps

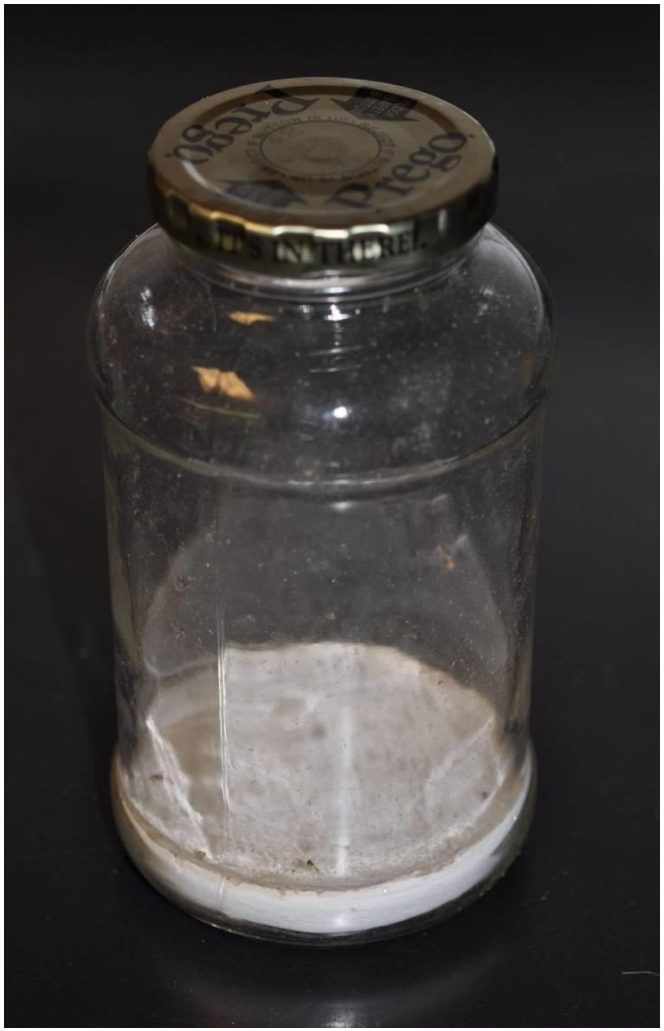
- Use disposable 'party bowls' in several colors
- Place sets of bowls (various colors) in different parts of the habitat (shade, sun, near animals, blooming plants, etc.)
- Put abt. 1" water + few drops of dish detergent in each bowl
- Leave traps several hrs or overnight---collect insects
-

Berles funnel



Malaise traps

Kill Jar



- Plaster of Paris
- Add acetone or ethyl acetate
- Chloroform, sodium or potassium cyanide

- Ethyl acetate is safe and efficient

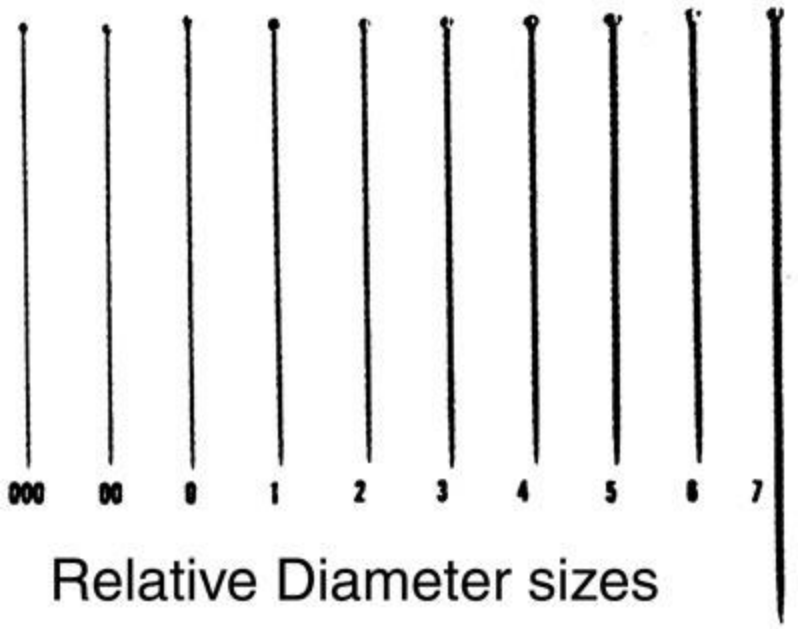
Once You Have Some Insects, You're Almost Ready to Pin

- Practice pinning on some of your larger, more common insects first---like grasshoppers, crickets, etc.
- Some larger beetles may have harder wing covers. Use a larger pin here; guide pin carefully to prevent punching out the legs
- Save smaller, delicate specimens, moths & butterflies for later

Insect Pins

- Stainless steel---purchase these
- Large and medium size insects --- (35-40mm Pin # 16)
- Small Insects (10-12mm Pin #20)

NOTE: Smaller pins will bend very readily



Relative Diameter sizes

Pinning Insects---Caution!

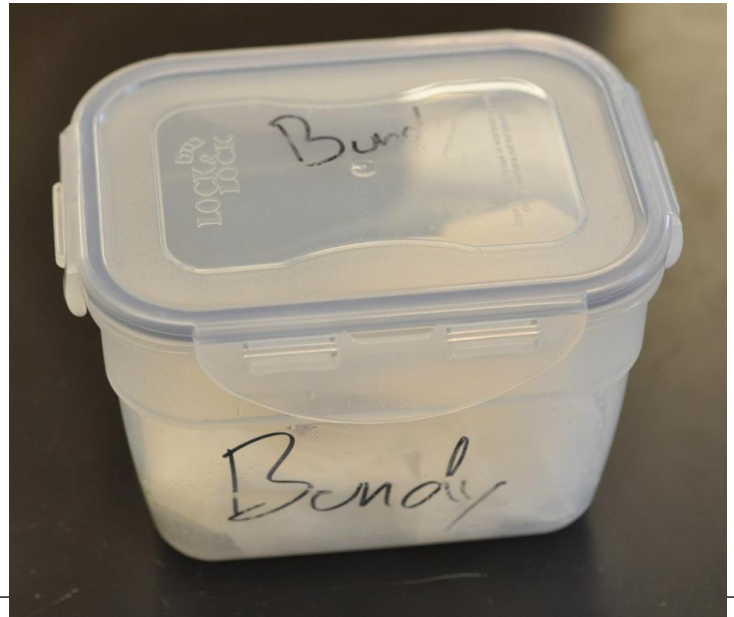
- Insects dry rapidly
- If you try to pin a dry insect---the legs will probably fall off---and worse

- If you cannot pin fresh specimens immediately, you will need to soften them or 'relax them'

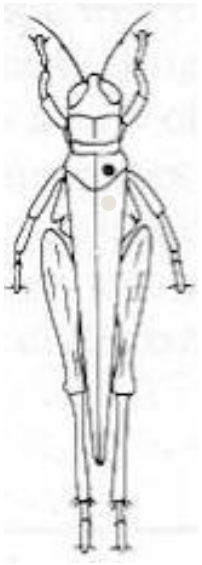
Relaxing chamber

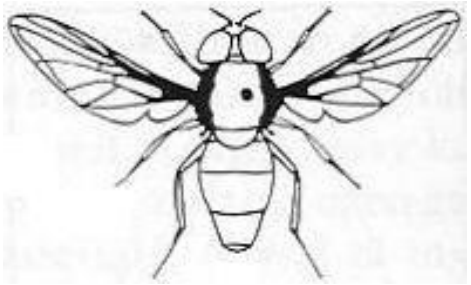
• Clean, tightly-sealing container
• Moisten paper towel with 1:1 mixture of water & alcohol; place in bottom of container
• Fold clean, dry paper towel to fit in container above the moist towel.
•Carefully place insects onto dry towel.
• Check flexibility of insects daily.

Be patient.

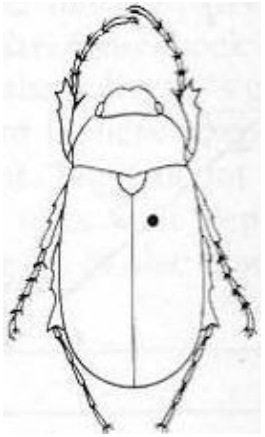


Pin Position---to the right of center





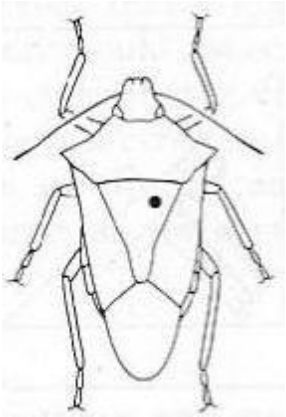
Diptera
Hymenoptera



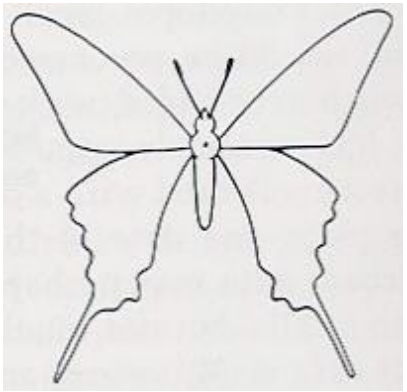
Coleoptera
Hemiptera

For larger specimens!

Orthoptera
Dermaptera

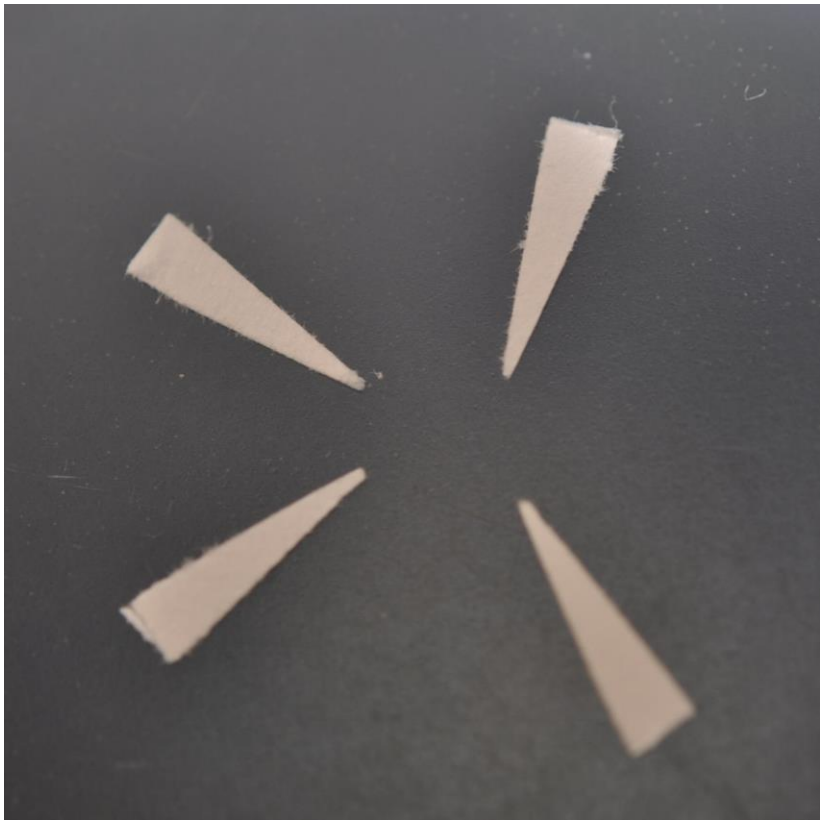


Hemiptera

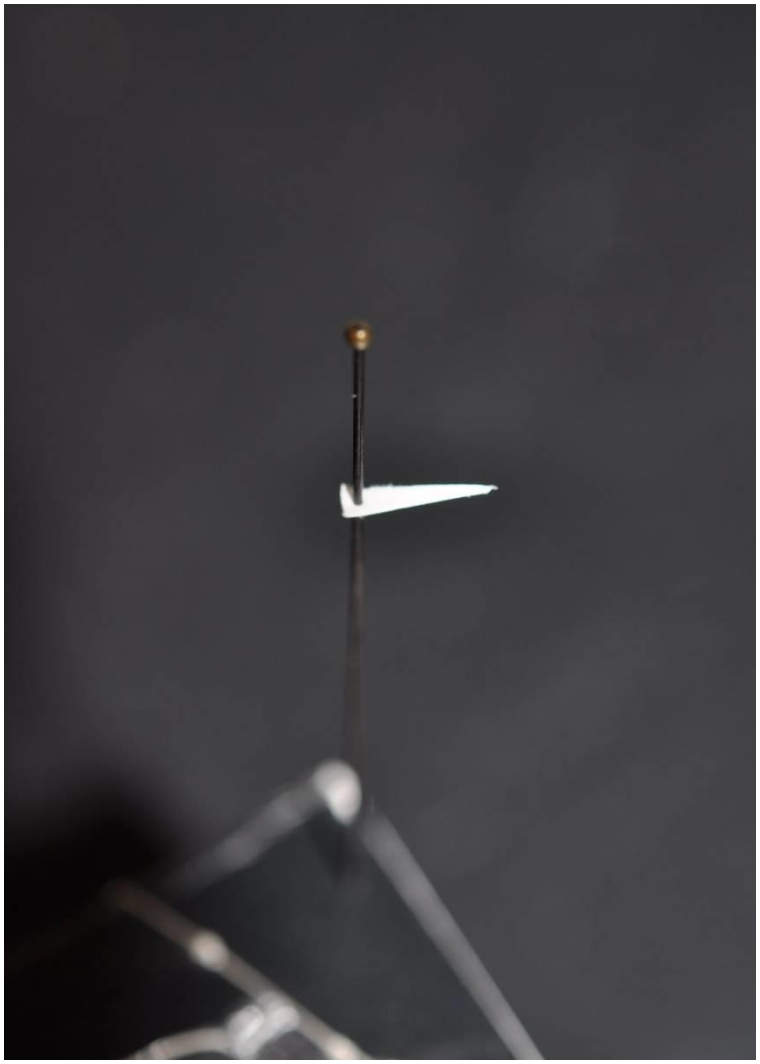


Lepidoptera
Odonata

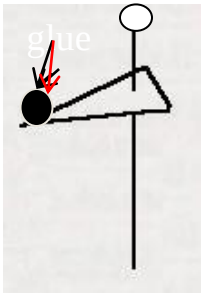
Pointing Small, Delicate Insects



Point in place on insect pin



Pointing Insects

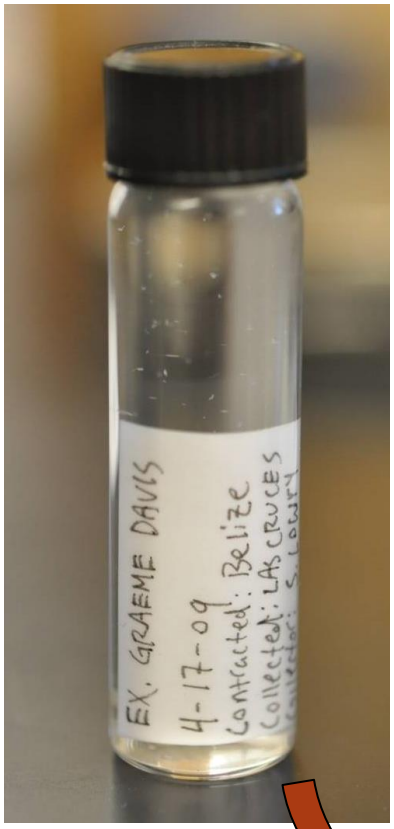


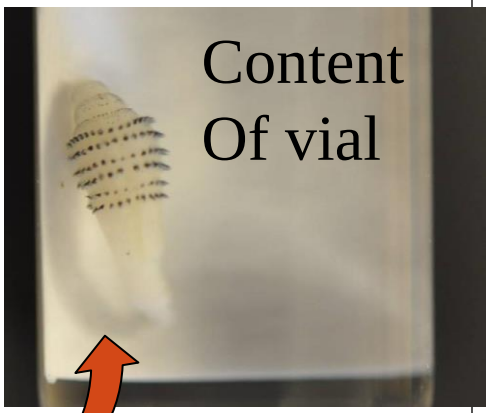
- Use pinning block to pin the point first.
- Bend the very tip of the point down, dot with glue.
- Glue point to insect's right side.
- Again, this works BEST if the insect is fresh or softened/'relaxed'.
- Use Elmer's Glue---effective, non-toxic, water soluble

This technique is used for insects too small or delicate to pin directly

Alcohol Vials?

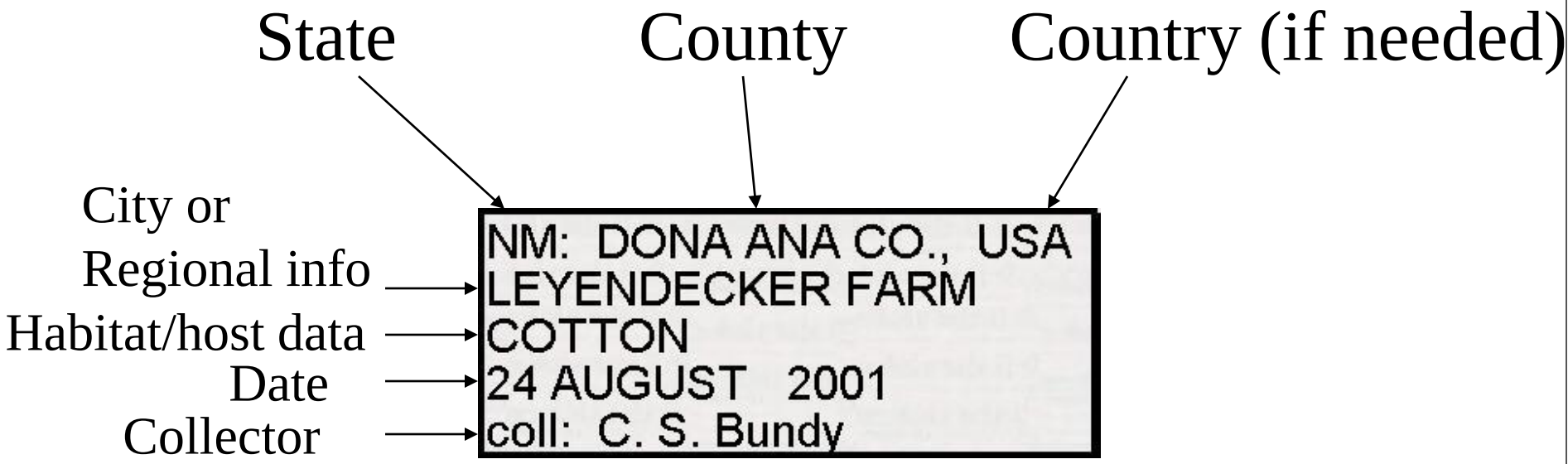
- Used for specialized collecting: immatures, nymphs, larvae; most arachnids, non-insects
- 80% alcohol
- Use screw cap vials with cap seals--- prevents evaporation
- Label with pencil or alcohol-proof ink.





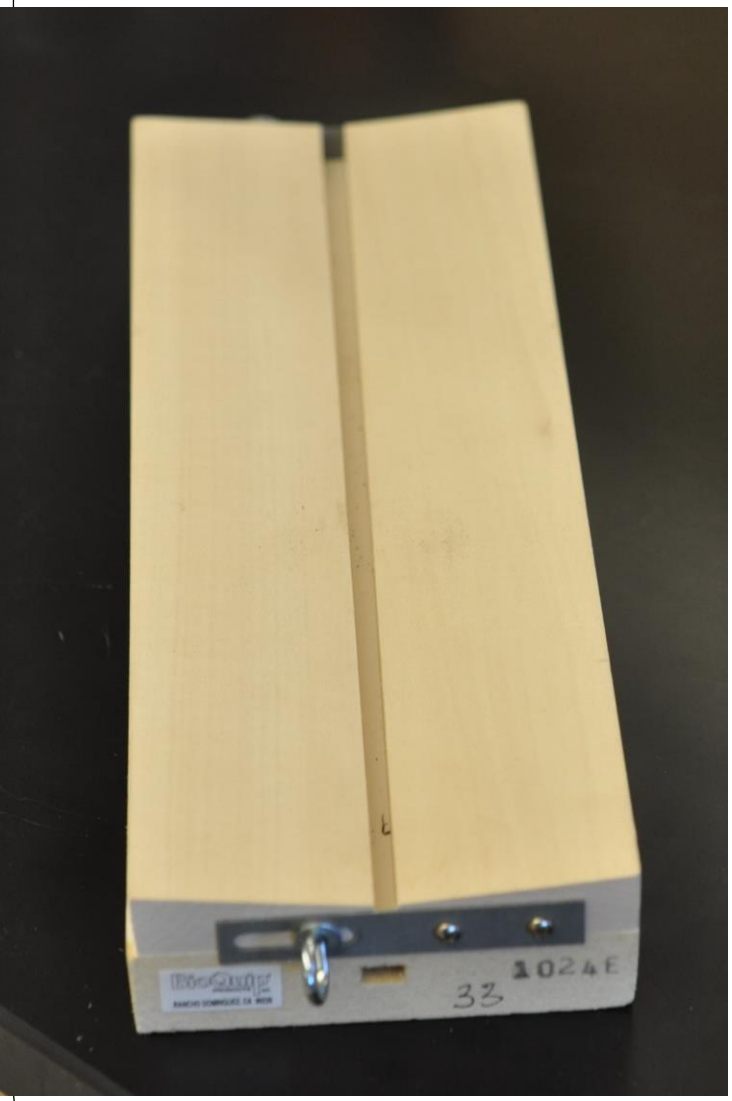
(It's the larva of
A human bot fly!)

Data Label



Keep labels small & neat

Spreading Board



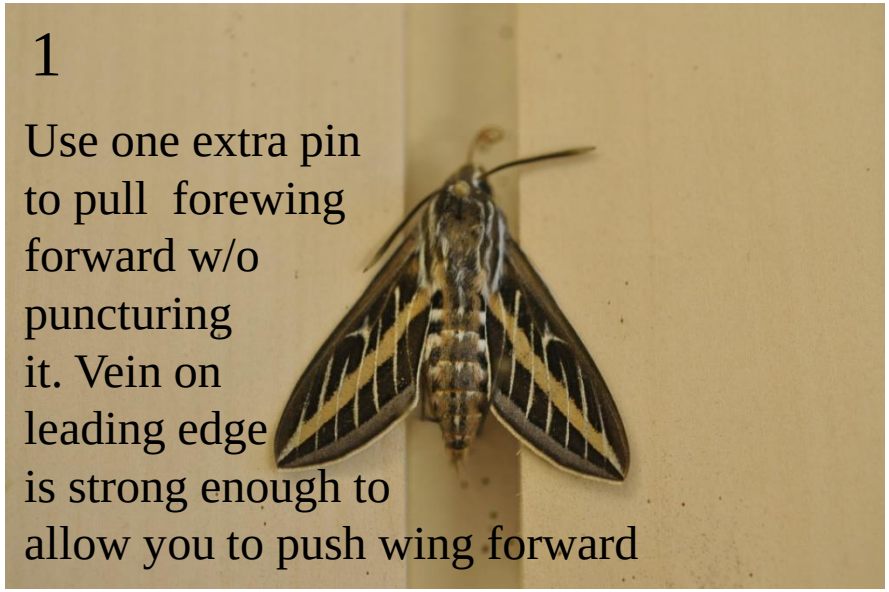
- For Lepidoptera, Odonata

- Pin your fresh or relaxed specimen first.

Get some extra pins & narrow strips of paper for next steps

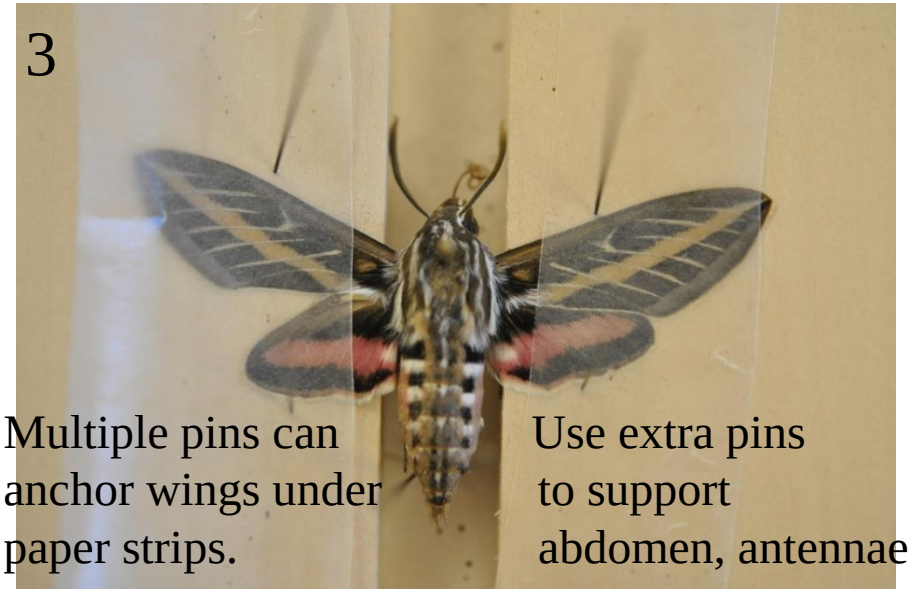
See next slide…

Spreading Lepidoptera



1

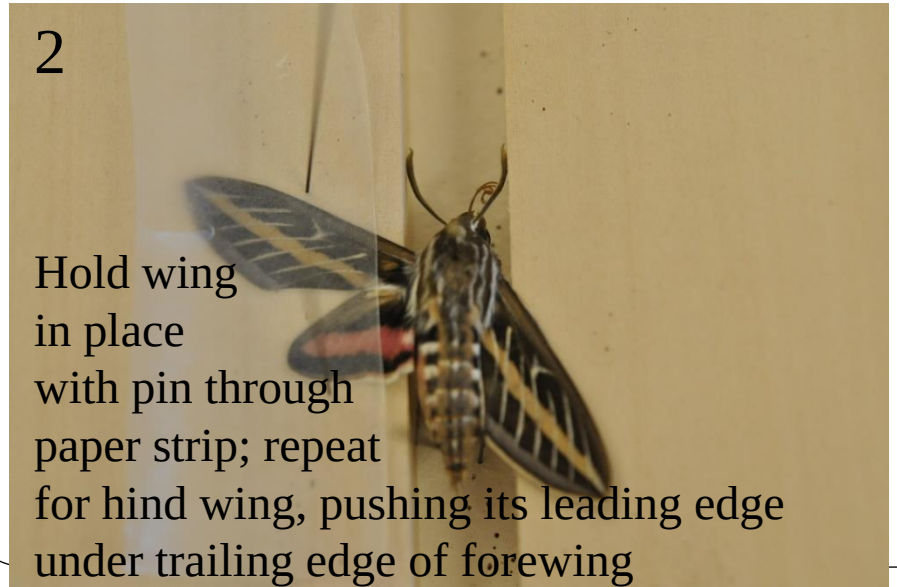
Use one extra pin to pull forewing forward w/o puncturing it. Vein on leading edge is strong enough to allow you to push wing forward



3

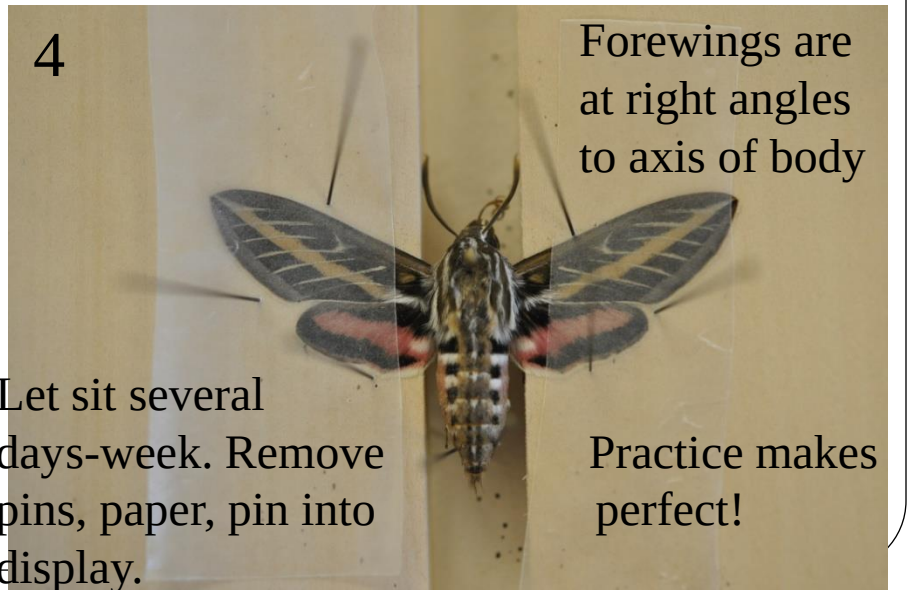
Multiple pins can anchor wings under paper strips.

Use extra pins to support abdomen, antennae



2

Hold wing in place with pin through paper strip; repeat for hind wing, pushing its leading edge under trailing edge of forewing



4

Forewings are at right angles to axis of body

Let sit several days-week. Remove pins, paper, pin into display.

Practice makes perfect!

Housing Your Insect Collection

Protect it from:

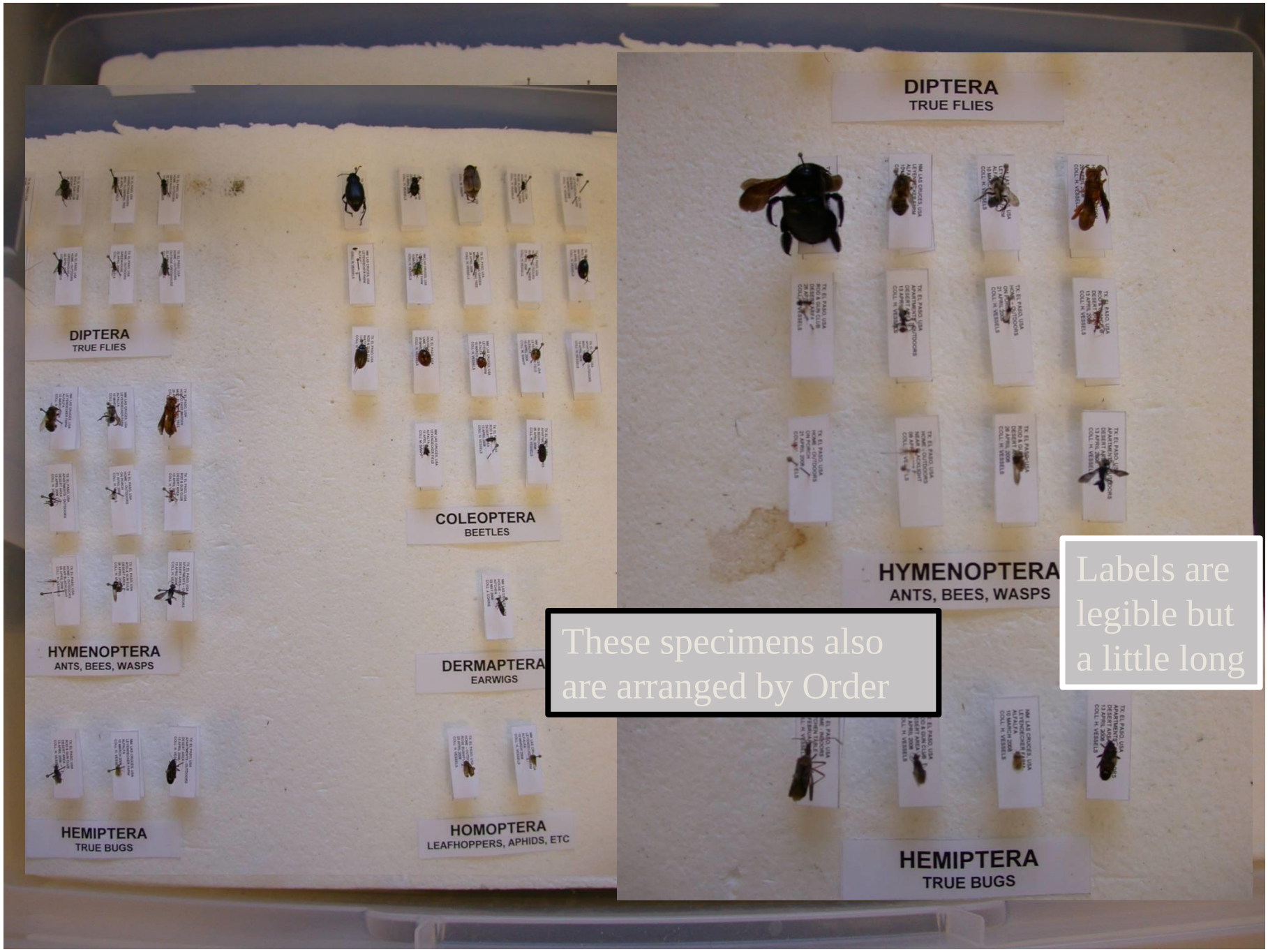
-Other damaging insects, fungi
-Too much light, heat, moisture
-Handling or touching, shaking, dropping

Housing Your Insect Collection

Housing Your Insect Collection

- Here are some examples to consider


LEPIDOPTERA
ORTHOPTERA
HYMENOPTERA
Formicidae:
See also vials 1-4
ODONATA
THYSANOPTERA
Thripidae:
See vial 6
ISOPTERA
Termitidae and Hodotermitidae:
See vials 7 and 8, respectively
DERMAPTERA
HOMOPTERA
Aphididae:
See vial 5
THYSANURA
Lepismatidae:
See vial 9
COLEOPTERA
HEMIPTERA
NEUROPTERA
DIPTERA
These specimens are arranged by Order


DIPTERA
TRUE FLIES
COLEOPTERA
BEETLES
HYMENOPTERA
ANTS, BEES, WASPS
DERMAPTERA
EARWIGS
HEMIPTERA
TRUE BUGS
HOMOPTERA
LEAFHOPPERS, APHIDS, ETC
DIPTERA
TRUE FLIES
HYMENOPTERA
ANTS, BEES, WASPS
HEMIPTERA
TRUE BUGS
These specimens also are arranged by Order
Labels are legible but a little long

ABLE I
Collection and Preservation of Insect Specimens for Insect Orders

Taxon	Habitat	Equipment to use	Collection method	Preparation
Protura, Diplura, and Collembola	Leaf litter, rotten logs and stumps, birds' nests, other detritus	Berlese funnel, aspirator, wet brush	Place in funnel for several days, jar of alco-hol beneath, light above	70% EtOH, mount on microslides
Thysanura and Microcoryphia	Buildings (silverfish), leaflitter, logs, seashores	Forceps, Berlese funnel	Same as above	70% EtOH
Ephemeroptera	Naiads: streams, rivers, lakes	Dip nets, grab samplers	Kick samples, pick off stones	70% EtOH
	Adults: fields and forests	Aerial nets, light traps	Pick off plants or from light sheet	
Odonata	Naiads: streams, lakes, ponds	Dip nets	Dredge or kick sample with net	70% EtOH, place in envelope, wings folded over back, and card with collecting data; spread for display
	Adults: fields, near streams and ponds	Aerial nets	Sweep fast from behind with net	
Plecoptera	Naiads: streams	Aquatic nets	Kick-netting in riffles, pick off stones, sweep shore vegetation	70% EtOH
	Adults: along streams at lights	Light trap, aerial and sweep nets, light trapping		
Orthoptera and other orthopteroids	Fields, forests, gardens, and other terrestrial	Sweep nets, light traps, aerial nets, hand	Sweep and aerial netting, light trap sampling	Mount on insect pins, support body until dry

Resources

Triplehorn, C.A. & N.F. Johnson. 2005. Borror And DeLong's Introduction to the Study of Insects, 7th ed. Thomson Brooks/Cole.

Entomological Society of America: www.entsoc.org