

# Identifying Some Pest and Beneficial Insects on Your Sticky Cards

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[http://ipm.uconn.edu/pa\\_greenhouse/](http://ipm.uconn.edu/pa_greenhouse/)

# Sticky Cards

- Blue sticky cards may be more attractive to thrips and shore flies
- However, yellow cards are best for general monitoring.



# Scouting

- Use yellow sticky cards to trap adult whiteflies, fungus gnats, winged aphids, leafminers, & shore flies



# Use in Retail Greenhouses



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# Pest Infested Indicator Plants



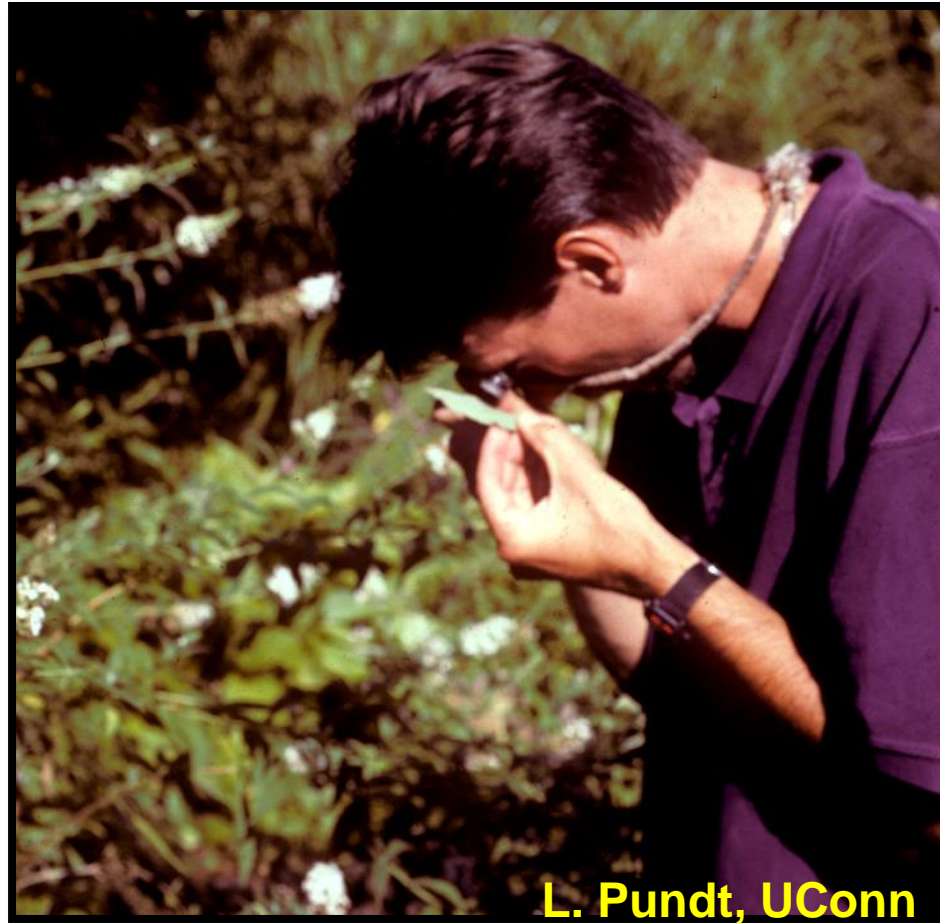
**Poinsettia plant tagged as pest infested indicator plant.  
There are immature whiteflies on the tagged leaf.**

# Pest Infested Indicator Plants



Can be used to track whitefly development, monitor effectiveness of biological or chemical controls.

# Random plant inspections



**Needed to find spider mites, broad mites, mealybugs, scale insects, immature stages of aphids, whiteflies, thrips.**

# Random Plant Inspections

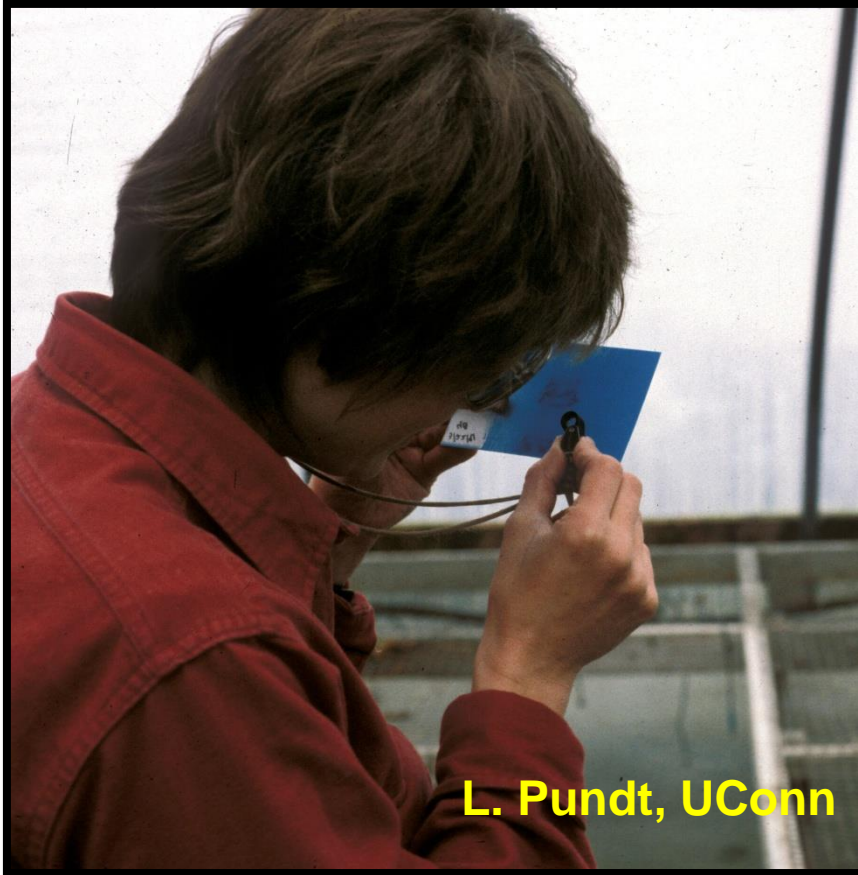


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Inspect roots to see if they are white and healthy.



# Magnification Needed



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Use a 10x-20x hand lens to see identifying characteristics of insects on sticky cards.

# A hands free Optivisor™ helps you see the entire card



# Vertical Placement



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# Horizontal Placement



**More effective to catch fungus gnat adults.**

# **Pest Insects Trapped on Sticky Cards**

- **Aphids**
- **Fungus Gnats**
- **Shore Flies (nuisance pests)**
- **Leafminers**
- **Leafhoppers**
- **Thrips**
- **Whiteflies**

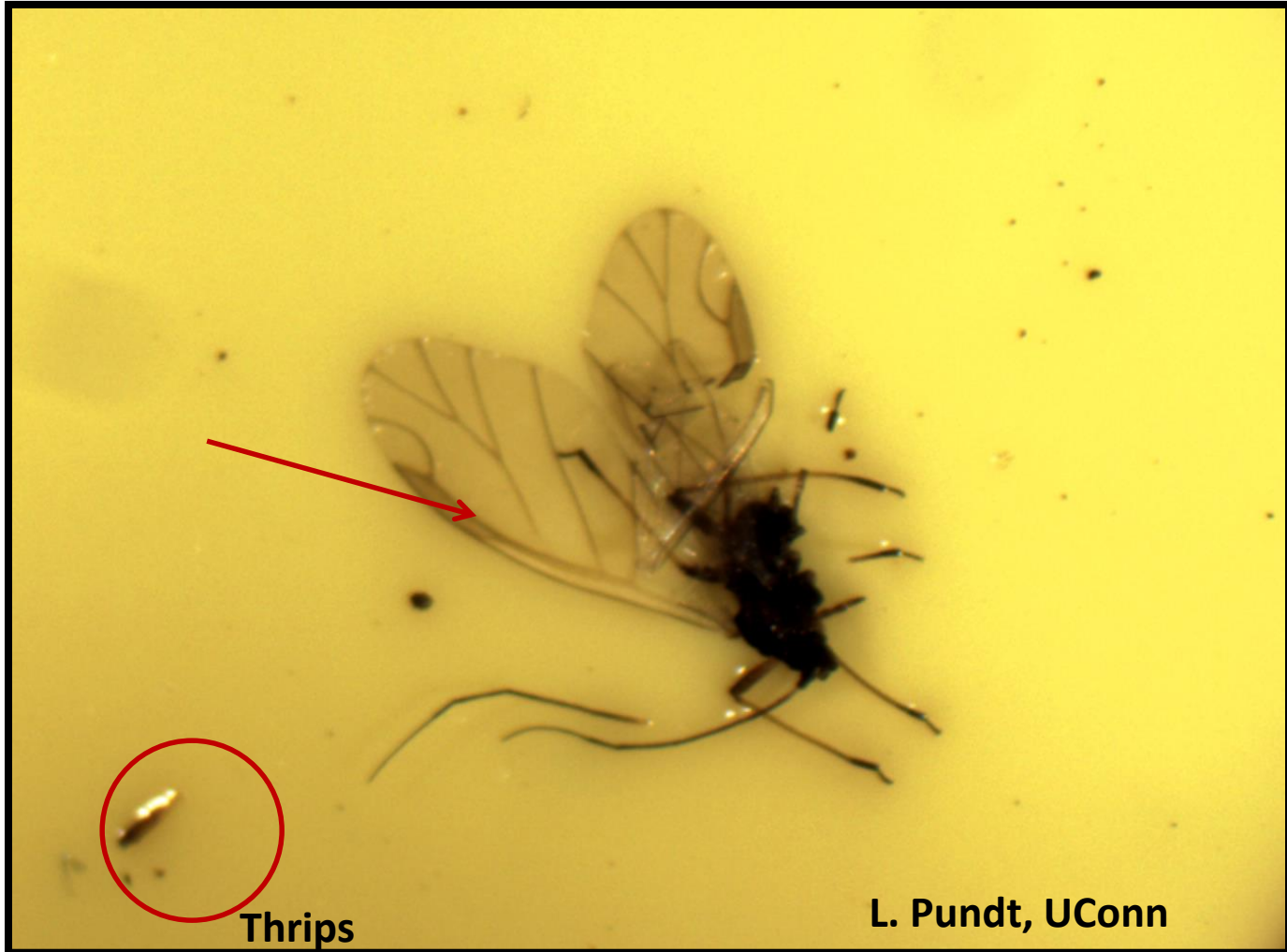
# Winged Aphids

- **Aphids have pear shaped bodies with two cornicles or “tailpipes” at their rear.**
- **Legs & antennae are long and thin.**
- **Trapped aphids may give birth to several nymphs before they die.**

# Winged Aphids

- **Wings tend to be spread on either side of their body on the sticky cards.**
- **Wings are longer than their body.**
- **Look for two parallel veins close to the edge with a darkened area.**

# Winged Adult Aphid

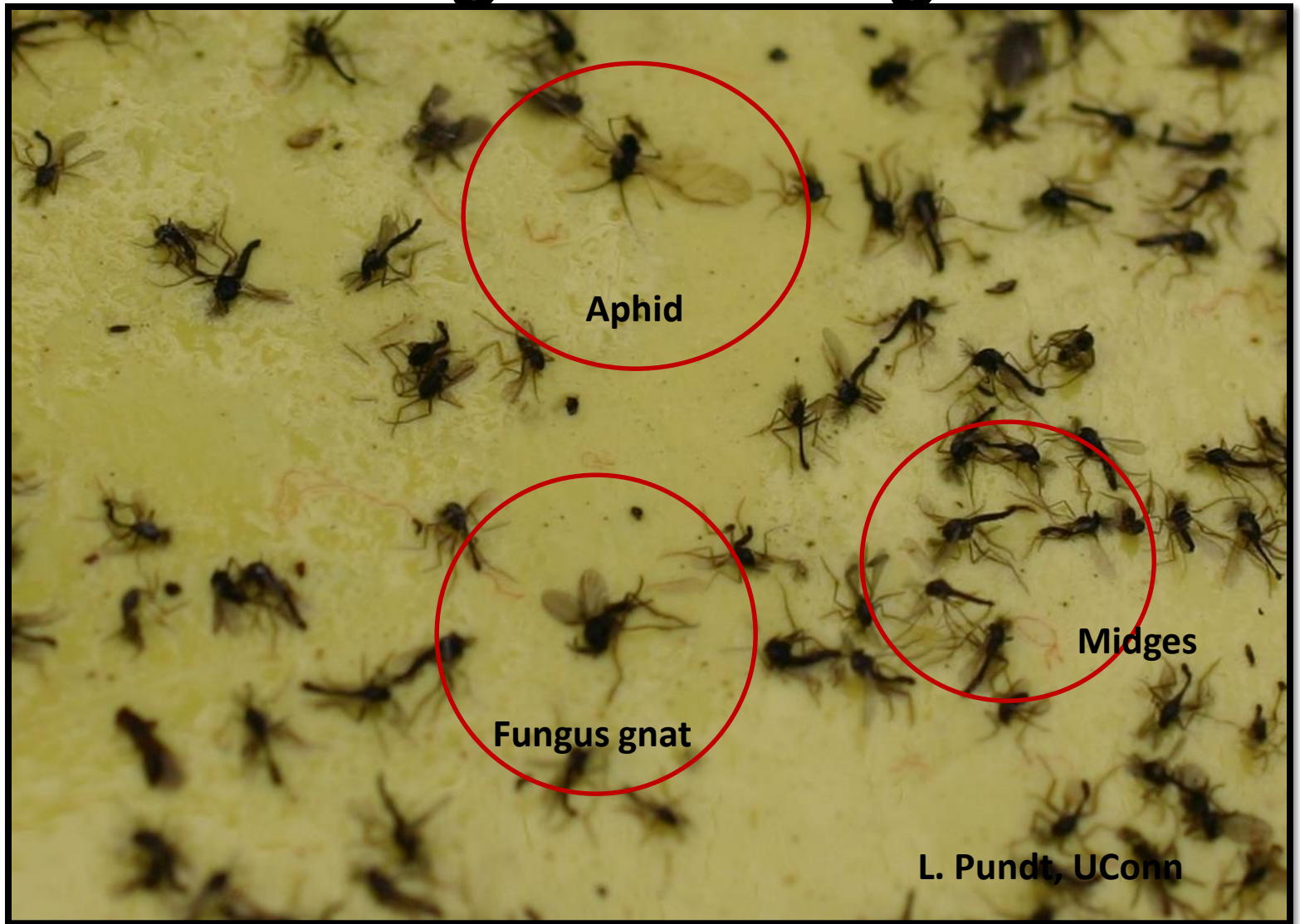


Thrips

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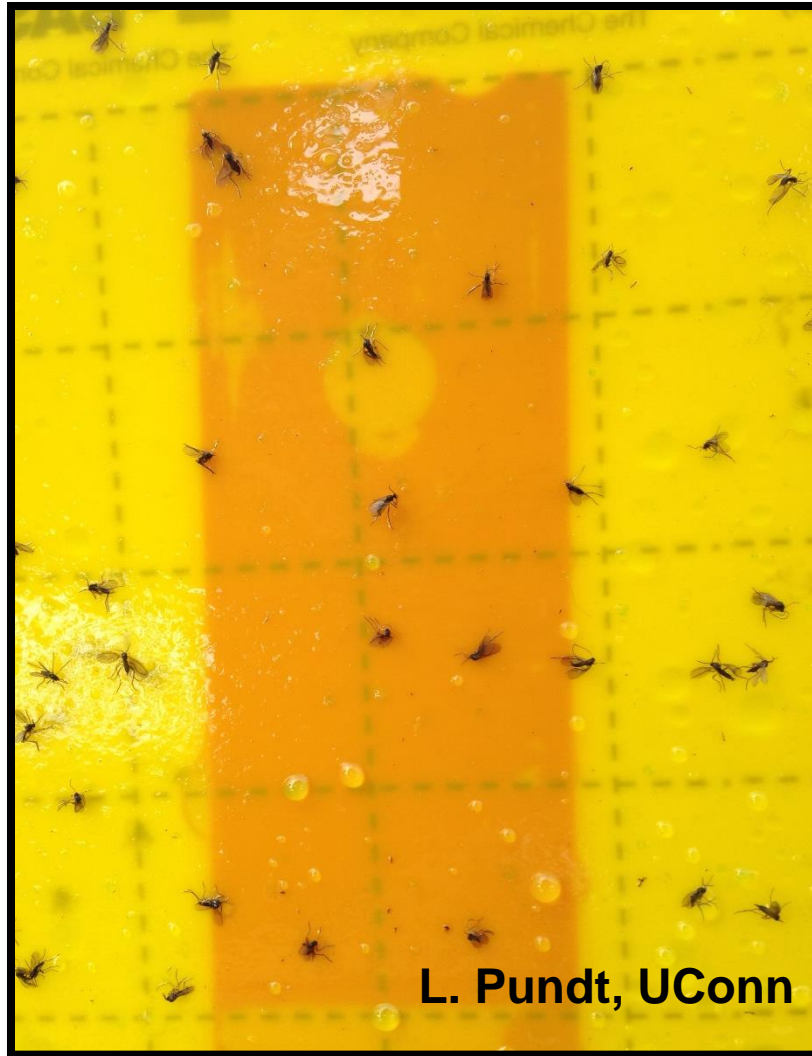
# Aphids vs. Midges vs. Fungus Gnats



# Adult Fungus Gnats

- **Small, dark mosquito-like flies with grayish wings.**
- **Have long, slender legs and antennae.**
- **Look for distinct Y-shaped vein at the tip of the single pair of wings.**
- **Bodies may be hump-backed (depends upon species).**

# Adult Fungus Gnats



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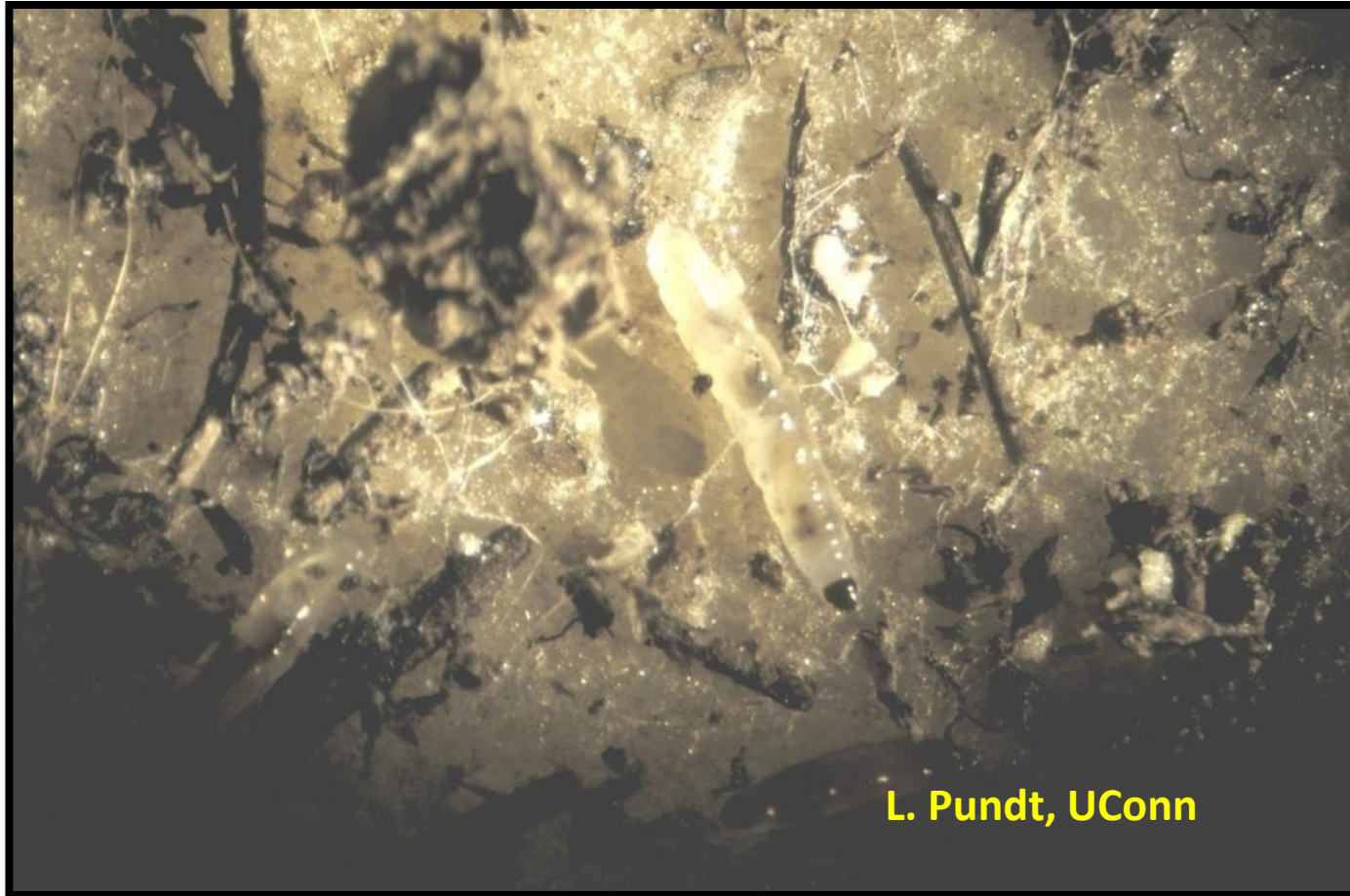
# Adult Fungus Gnat



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**Look for distinct Y-shaped vein at the tip  
of the single pair of wings.**

# Fungus Gnat Larvae



Potato slices or chunks can be used to monitor for larvae.

# Shore Flies

- **Look for:**
  - three to five pale spots on their grayish wings.
  - short bristle-like antennae.
  - moderately long legs.
- **Have robust, stout body compared to fungus gnats.**
- **About the size of fruit flies.**

# Fungus Gnats vs. Shore Flies



# Shore Flies



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Often found near algae, their food source.



# Adult Shore fly



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# Adult Leafminers

- **Small, robust flies with noticeable yellow patch on their body.**
- **Have short antennae and two transparent wings.**
- **Have a large cannon-shaped structure at the end of the abdomen that is used to puncture leaves and lay eggs.**
- **Often confused with shore flies (look for yellow on their body) plus plant damage.**

# Leaf miner adults & egg-laying punctures



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# Adult Shore Flies vs. Leafminer Adults

## Adult leafminers



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Adult shore fly



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# Shore flies vs. Leafminers



**Mines from leafminer larvae**



**Fecal droppings from shore flies**

# Leafhoppers

- **Slender insects with short bristle like antennae.**
- **Wings are held roof like over the abdomen.**
- **Wedge shaped, tapering to the rear.**
- **No antennae visible.**
- **Color vary depending upon species.**

# Adult Leafhopper



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# Adult Leafhopper



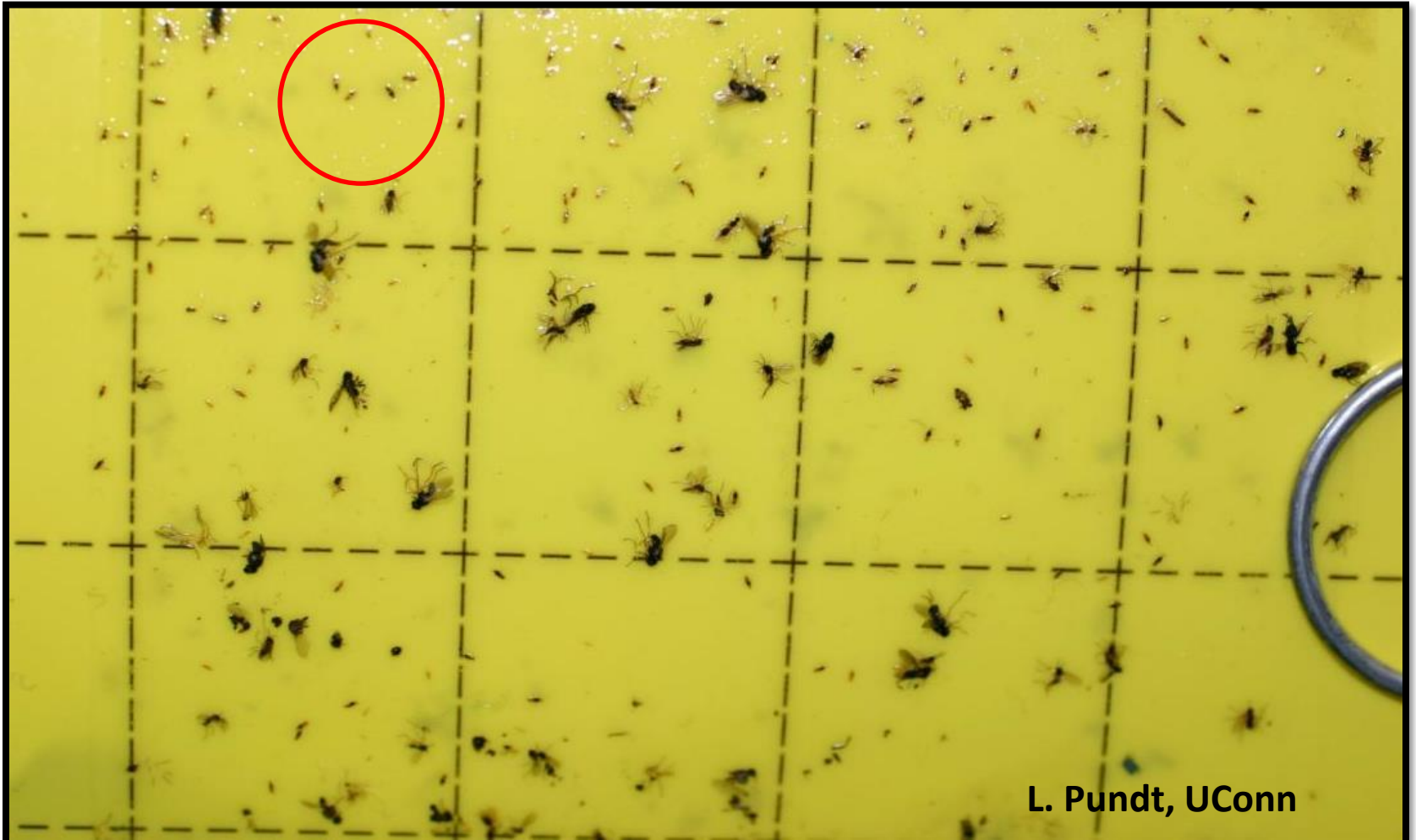
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# Thrips

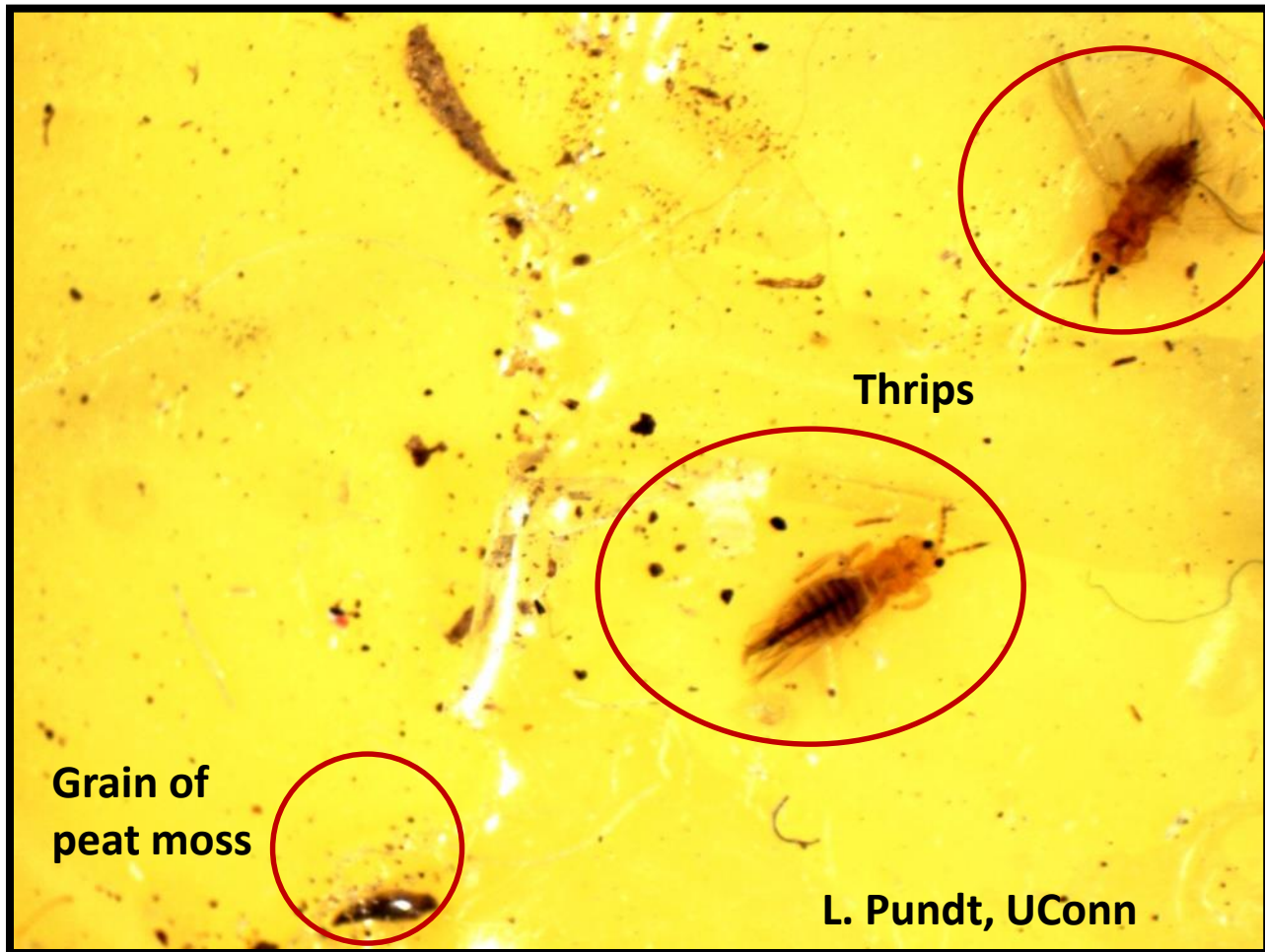
- **Generally, the smallest insects you will see on the cards.**
- **Narrow and cigar shaped.**
- **Look for red eyes, short antennae fringed wings with hairs on end to distinguish from grains of peat moss.**

# Thrips



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# Thrips



# Whiteflies

- **Look for whitish bloom which tends to disappear after a few days.**
- **Whiteflies becomes orange in color as they blend into the sticky material on the trap.**
- **Slightly larger than thrips.**

# Whiteflies



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# Adult Whitefly



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# **Banded Winged Whiteflies**

- **Similar to greenhouse whiteflies.**
- **Look for two grayish bands that form a zigzag pattern across each front wing.**
- **Entering greenhouses from outdoor weeds (especially pigweed & ragweed) in the fall.**
- **Not a pest of poinsettias, do not include in whitefly card counts.**

# Banded Winged Whitefly



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# Greenhouse Whitefly Pupae



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Dried, discolored pupae infected with *Beauveria bassiana* on underside of greenhouse tomato leaf.



## Greenhouse Whitefly Pupae

White pupae with straight elevated sides and a fringe of wax filaments around the edge. Red eyes indicate adults are ready to emerge.

# Sweet potato whitefly pupae



**Bright yellow without fringe of wax filaments around its edge.  
Red eyes indicate adults are ready to emerge.**

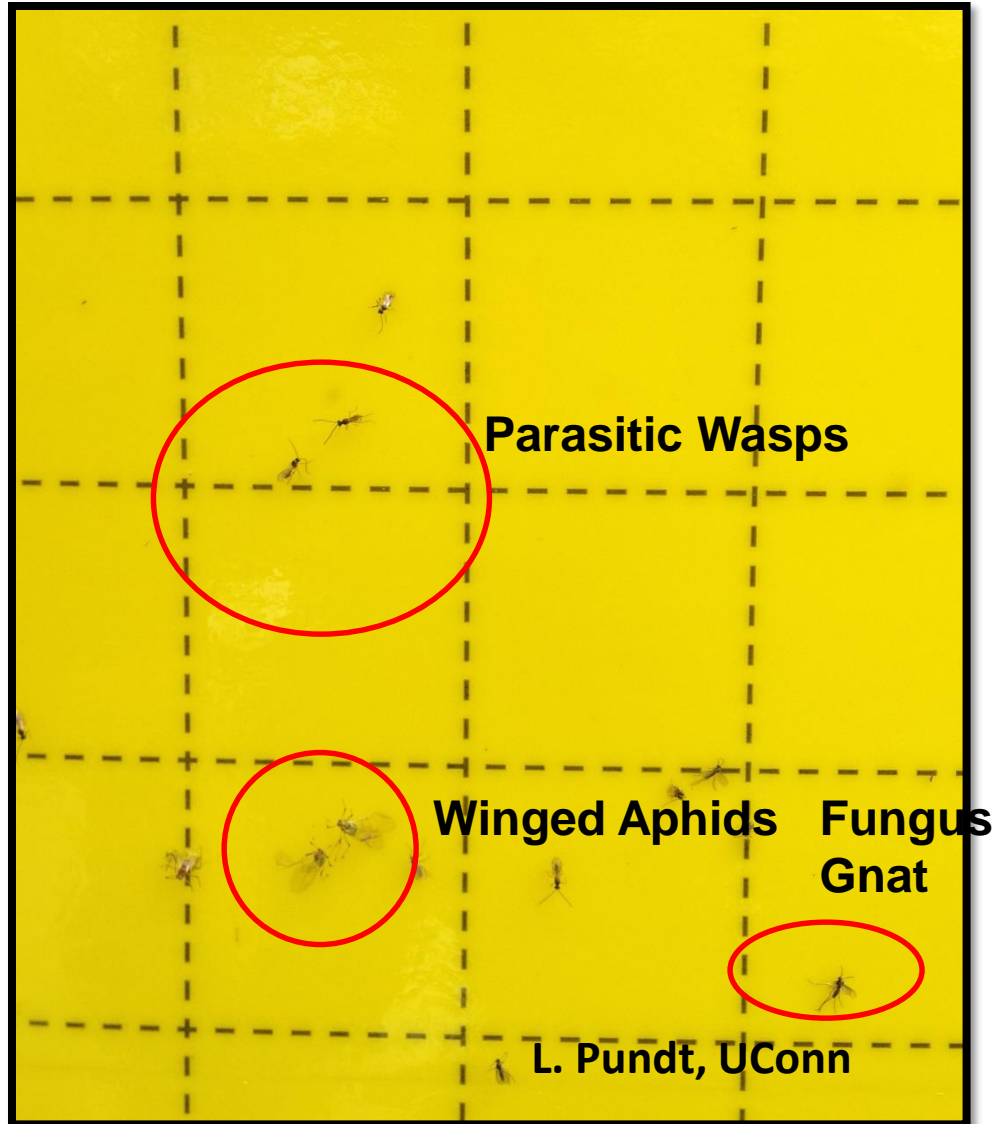
# **Some Beneficial Insects Trapped on Cards**

- **Parasitic Wasps (many different types)**
  - Often attracted to yellow sticky cards
- **Hunter flies, syrphid flies (or hover flies) and other beneficial flies**

# Parasitic Wasps

- Often *Hymenoptera* species.
- May be stout or slender.
- In comparison with flies, often have longer, elbowed antennae and bodies may be more pointed toward the rear.
- Many have clear wings with only one distinct, angular vein along the front of each forewing.

# Parasitic Wasps





R. McGaughey

***Aphidius colemani* is a commercially available parasitic wasp.**

# ***Encarsia formosa***

- **Commercially available parasitic wasps used to control whiteflies (especially greenhouse whiteflies).**
- **Small, parasitic wasp with black head and thorax and yellow abdomen.**
- **May look like tiny black dots on yellow card.**



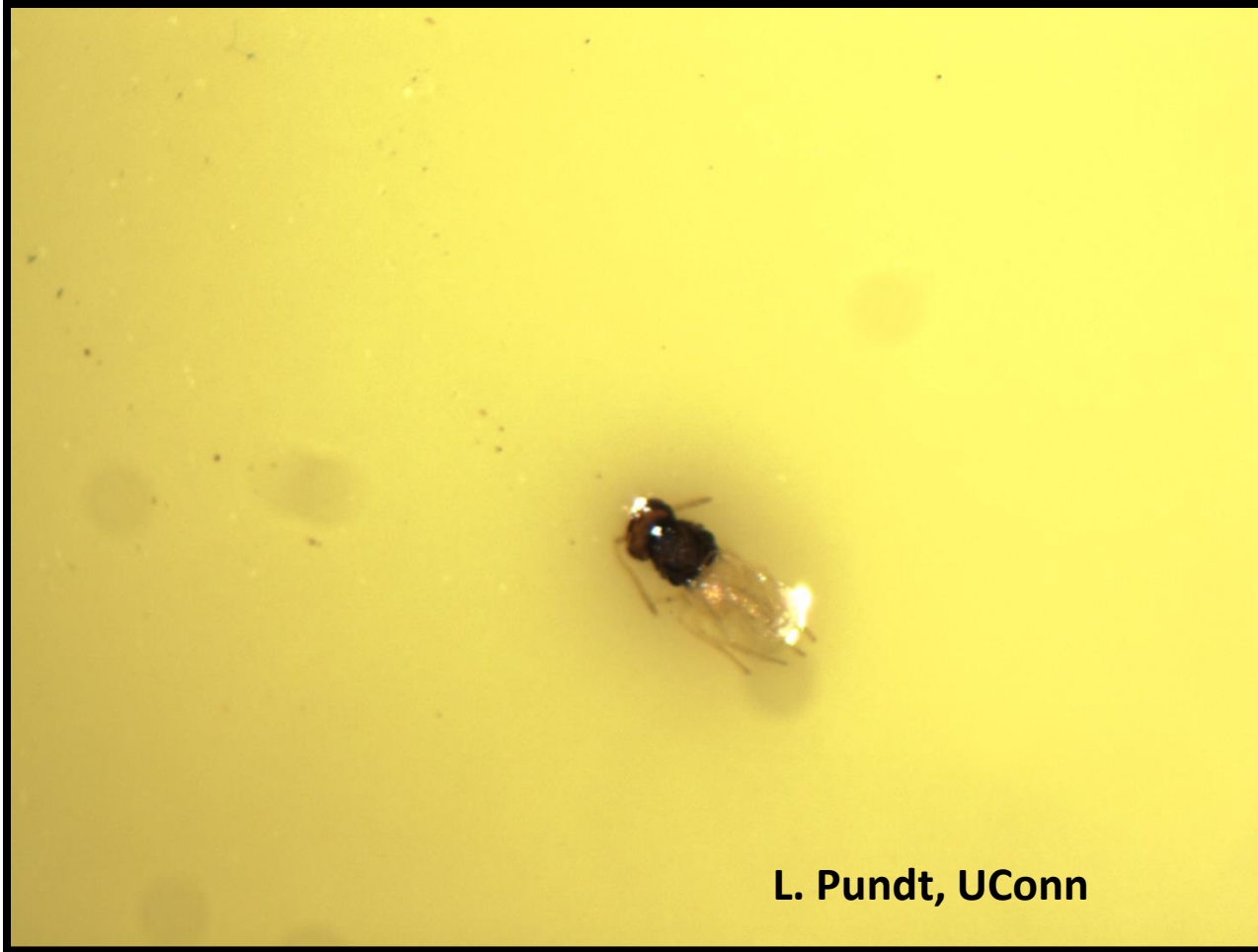
# *Encarsia formosa*



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**Note: This card was used for quality control of a shipment and NOT found in a greenhouse.**

# *Encarsia formosa*

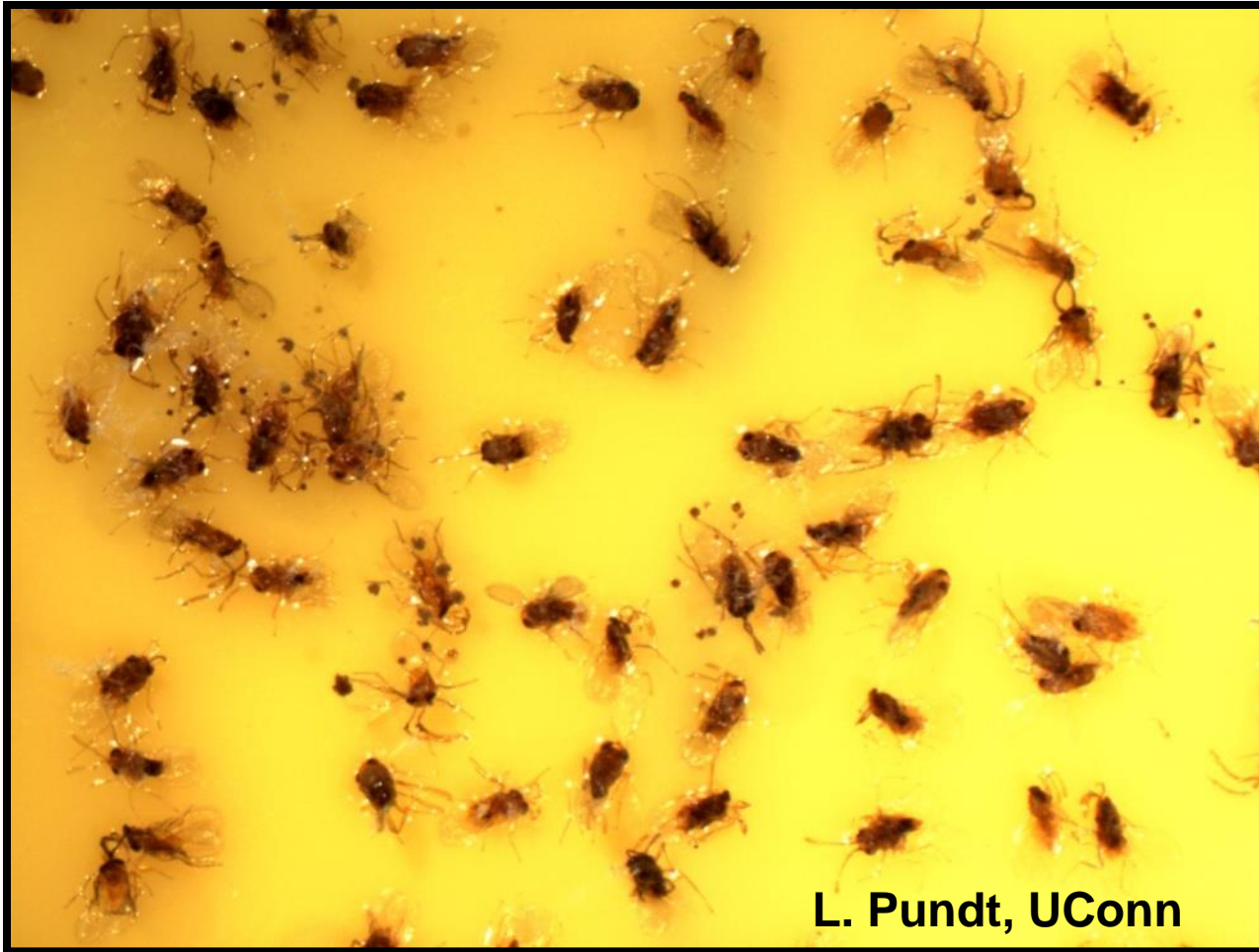


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# ***Eretmocerus sp.***

- **Commercially available parasitic wasp used against whiteflies (especially sweet potato whiteflies).**
- **Yellow or straw colored.**
- **With elbowed antennae.**

# *Eretmocerus sp.*



**Note: This was part of quality control by the grower and sticky card was not found in the greenhouse.**



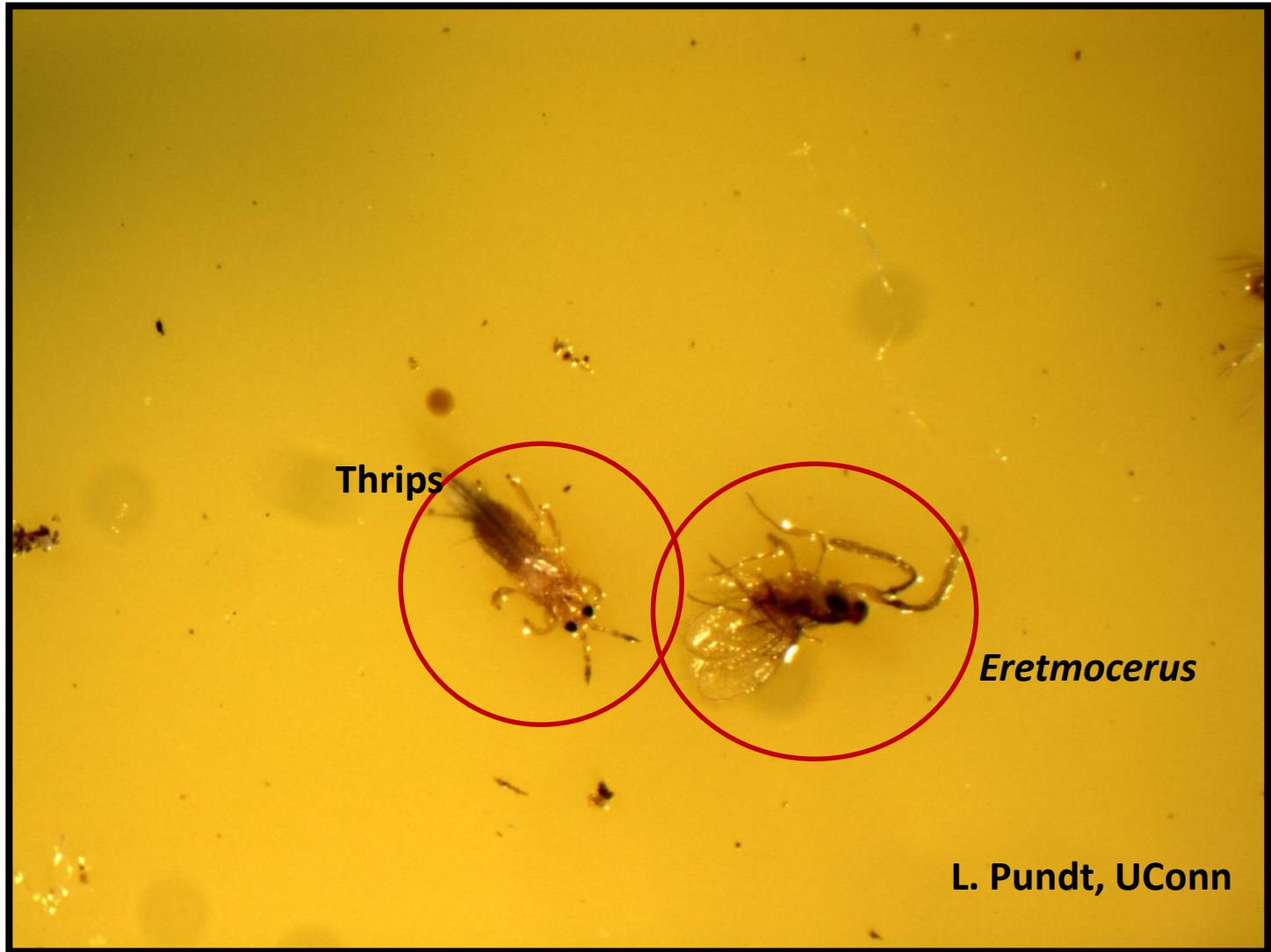
*Encarsia*

*Eretmocerus*

*Encarsia*

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# *Eretmocerus* compared to thrips



# Shore Fly Parasitoid



***Hexacola* sp. is a parasitic wasp that lays its eggs into shore fly larvae.**

**From: Fungus Gnats and Shore flies in Greenhouse Crops**  
<http://www.omafra.gov.on.ca/english/crops/facts/14-003.htm>

# *Synacra pauperi*

- **Naturally occurring parasite of fungus gnats.**
- **Adults are about the same size as fungus gnats.**
- **Look for narrowing between the head and thorax & between thorax & abdomen.**
- **Abdomen tapers to a sharp tip.**
- **Antennae are beaded & elbowed.**
- **May be seen in unsprayed greenhouses.**



# Fungus Gnat Parasitoid – *Synacra pauperi*



# Hunter Flies

- Same family as house flies but are smaller.
  - Males are a lighter gray than females.
  - Wings are uniformly clear (unlike shore flies).
- (Shore flies are about  $\frac{1}{2}$  the size of hunter flies)
- Hunter flies prey on fungus gnats, shore flies, leafmining flies.

# Hunter Flies



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# Hunter Fly

**Note: Shiny wings without spots**



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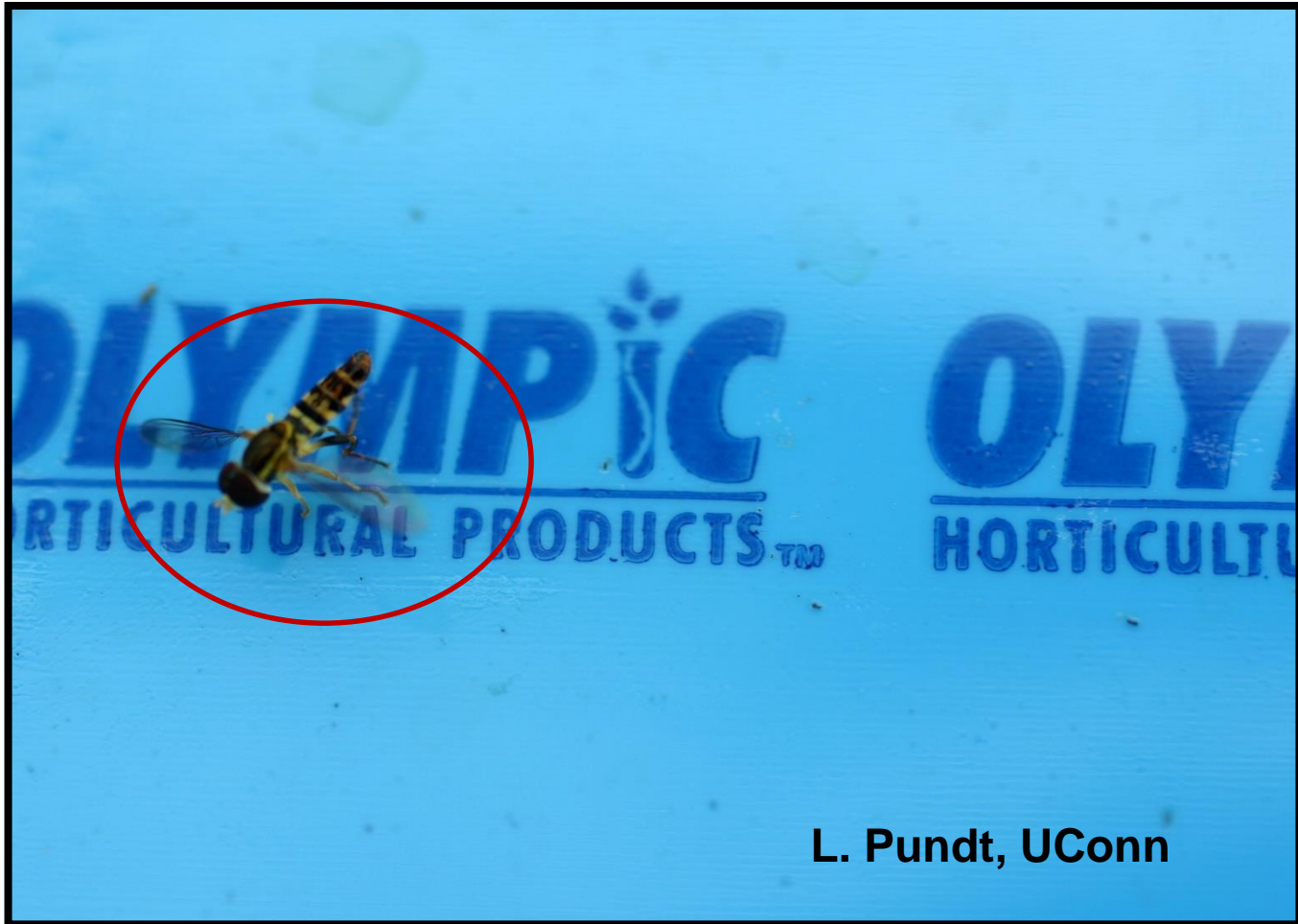
**This shows the size comparison between a shore fly on the left and hunter fly on the right.**

From: Fungus Gnats and Shore flies in Greenhouse Crops  
<http://www.omafra.gov.on.ca/english/crops/facts/14-003.htm>

# Syrphid Flies

- **Also known as flower flies or hover flies**
- **Have clear yellow and black markings.**
- **Only a single pair of wings.**
- **Have short antennae.**
- **Adults feed on pollen and nectar.**
- **Larvae feed on aphids and other soft-bodied insects.**

# Syrphid fly



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# Syrphid fly larvae



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# **Some Miscellaneous Insects Observed on Cards**

- **Midges (not a plant pest).**
- **Moth flies (not a plant pest).**
- **Springtails (not a plant pest).**

# Midges

- **Small, delicate insects resembling mosquitoes.**
- **Narrow, elongate body may be confused with fungus gnats.**
- **Males have very feathery, plumose type antennae.**
- **Not a plant pest, seen in areas with poor drainage where fungus gnats and shore flies occur.**



Fungus gnat

Midge

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# Midge Adult



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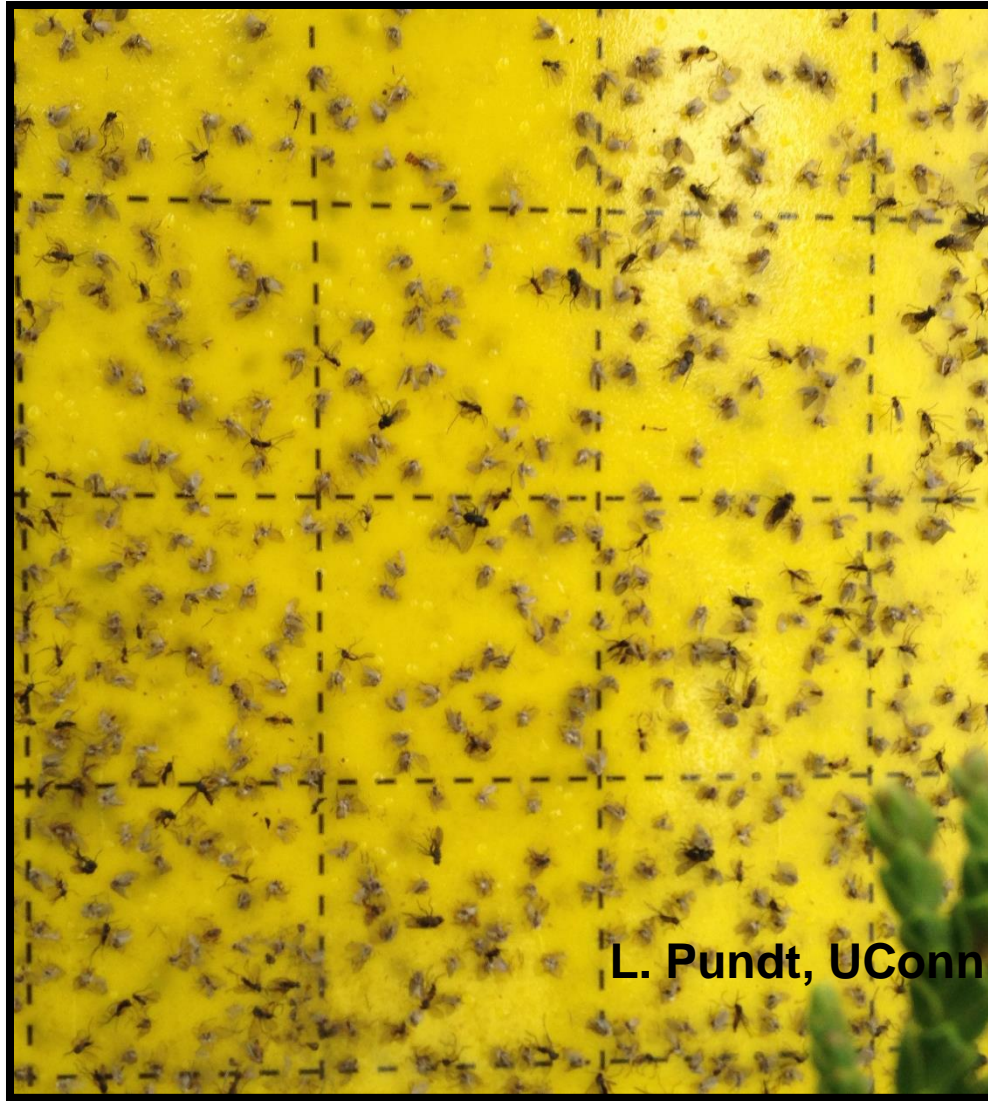
# Moth or Drain flies

- **Adult drain flies are small ( $\frac{1}{6}$  to  $\frac{1}{5}$  inch long), fuzzy, dark colored insects with the body and wings densely covered with hairs.**
- **Their wings are held roof-like over the body when at rest, giving them a moth-like appearance.**

# Moth Flies

- **Small, gray insect with a single pair of very large broad wings.**
- **Wings have a fringed, hair like appearance similar to moth wings.**
- **Antennae are beaded.**
- **Not a plant pest, seen in areas with poor drainage where fungus gnats and shore flies occur.**

# Moth Flies



# Adult Moth Fly



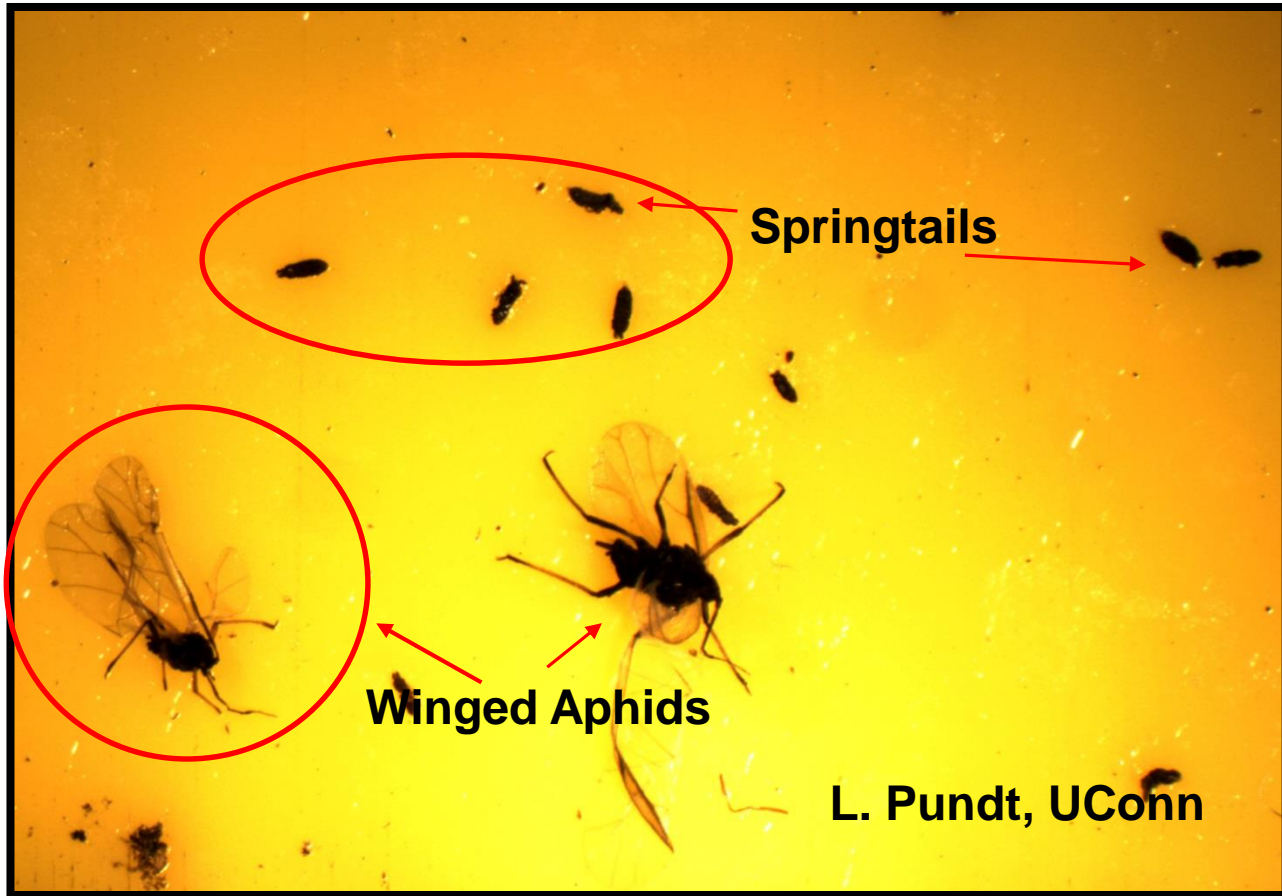
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# Springtails

- **Very small, (~1/16 inch in length), primitive insects without wings.**
- **Many have a specialized fork like structure known as a “furcula” so they can jump or hop, which you may see after watering.**
- **Feed upon fungi, algae and organic matter in the growing media.**

# Springtails



# Springtails



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# References

- **Ball Identification Guide to Greenhouse Pests and Beneficials**
- **Greenhouse IPM with an Emphasis on Biocontrols PA IPM Program**
- **Sticky Trap Monitoring of Insect Pests**
  - Univ. of California Publication 21572