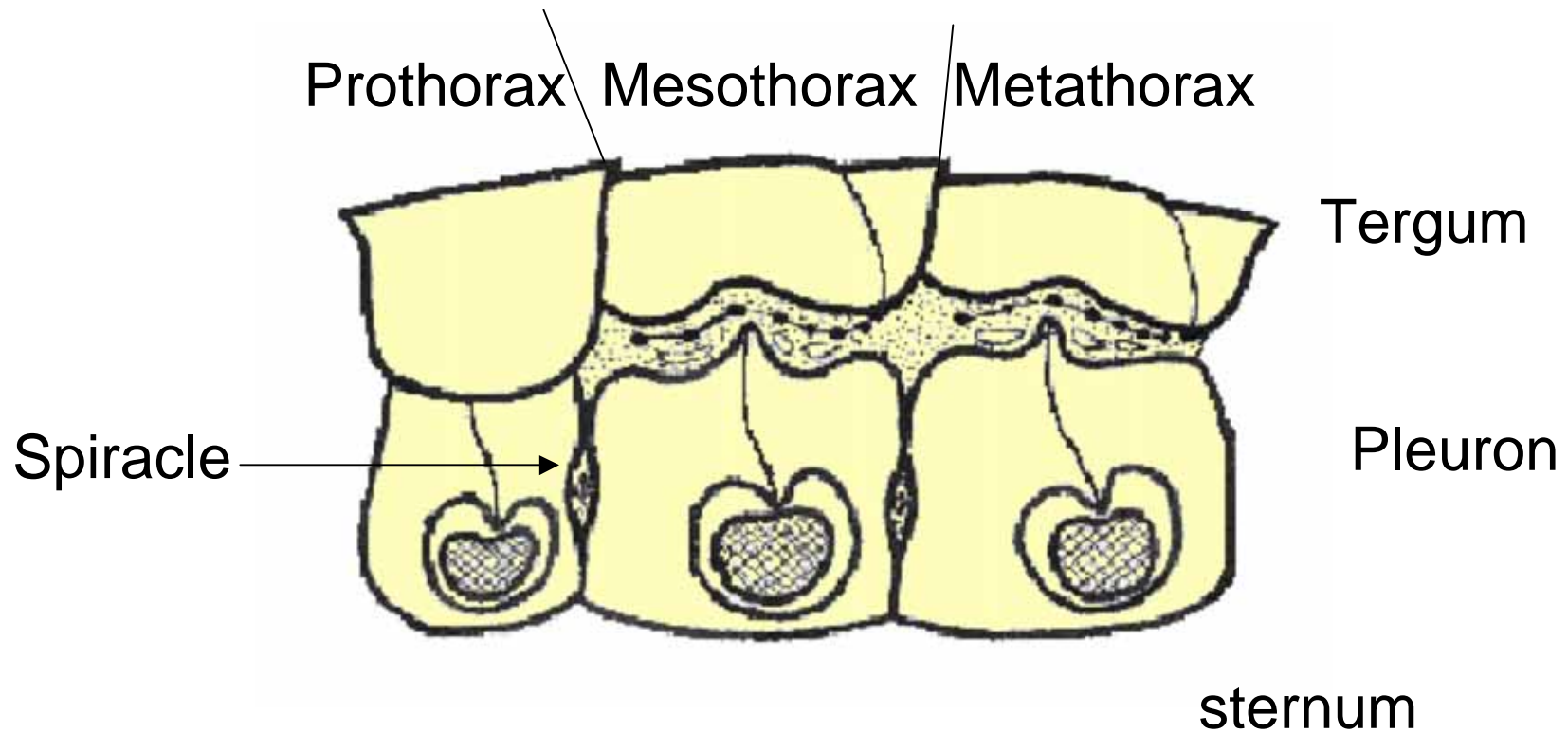


# Why Study the Insect Thorax?

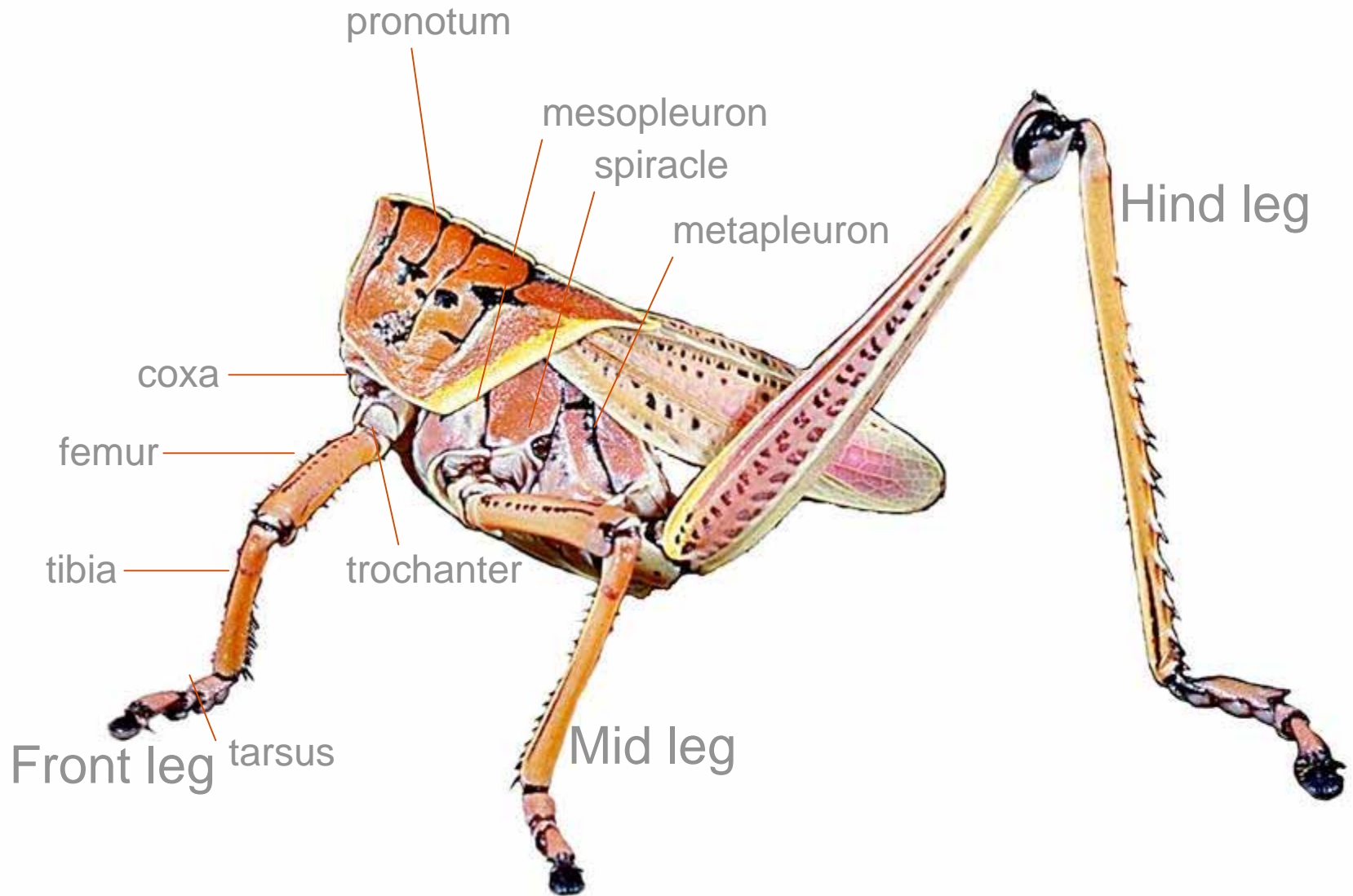
- Structure determines how an insect moves through its habitat.
- Wings determine flight capability
- Legs determine how it moves and digs on land

# Insect Thorax



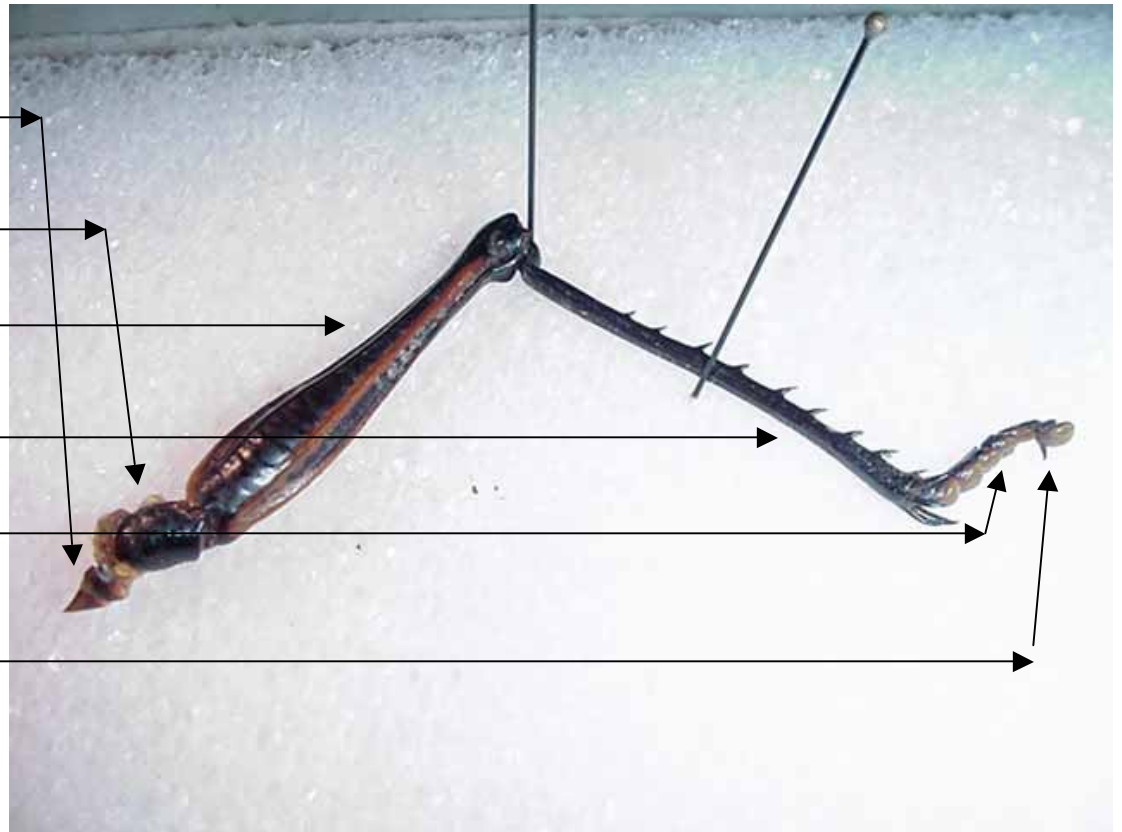
<http://www.cals.ncsu.edu:8050/course/ent425/tutorial/thorax.html>

# Intact Thorax

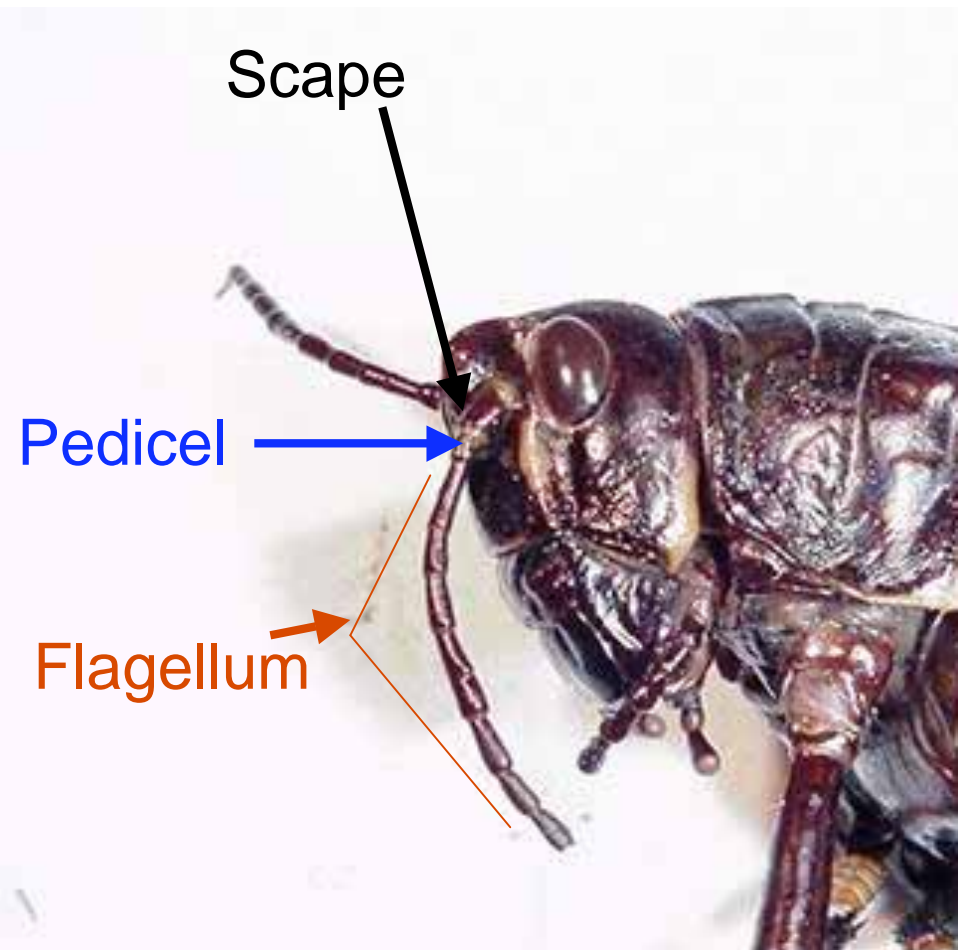
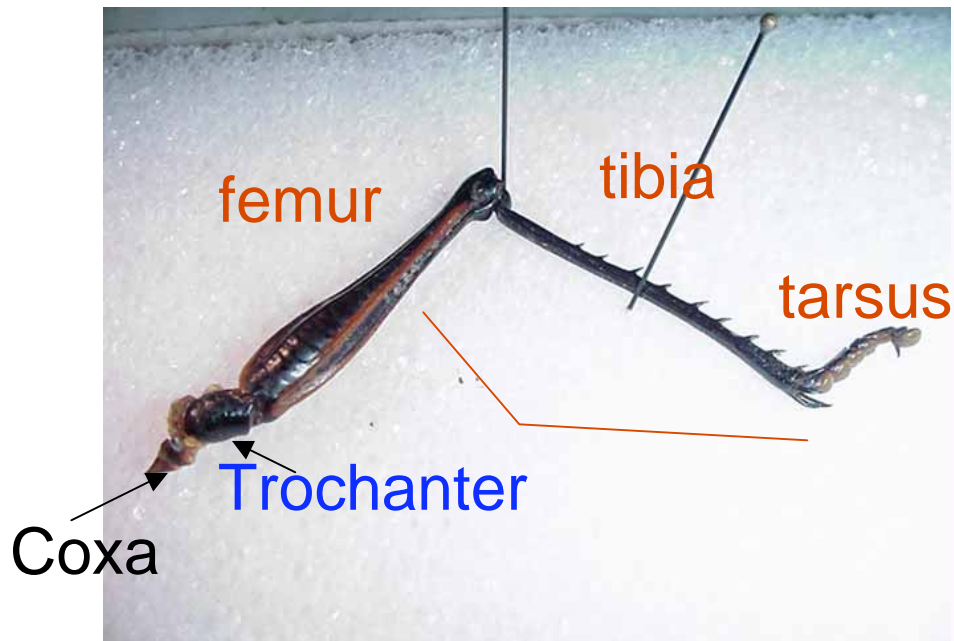


# Leg parts to know

- Coxa
- Trochanter
- Femur (thigh)
- Tibia (shin)
- Tarsus (foot)
- Pre-tarsus (claw)



# Do legs resemble antennae?



# Leg Modifications

1. Walking - basic model (cockroach or aphid)
2. Jumping - leg with enlarged femur (grasshopper, or leaf hopper)
3. Grasping – leg armed with opposing spines on femur and tibia (Mantid, or Ambush bug foreleg)
4. Clasping- leg with tibia and tarsus formed into a pincer like structure (head and pubic lice)
5. Swimming – leg with some part of tibia or femur flattened into a paddle like organ (water boatman)
6. Digging – leg with tibia or tarsus modified into scraper like organ (mole cricket, or Japanese beetle grub)

# Insect Leg Tutorial



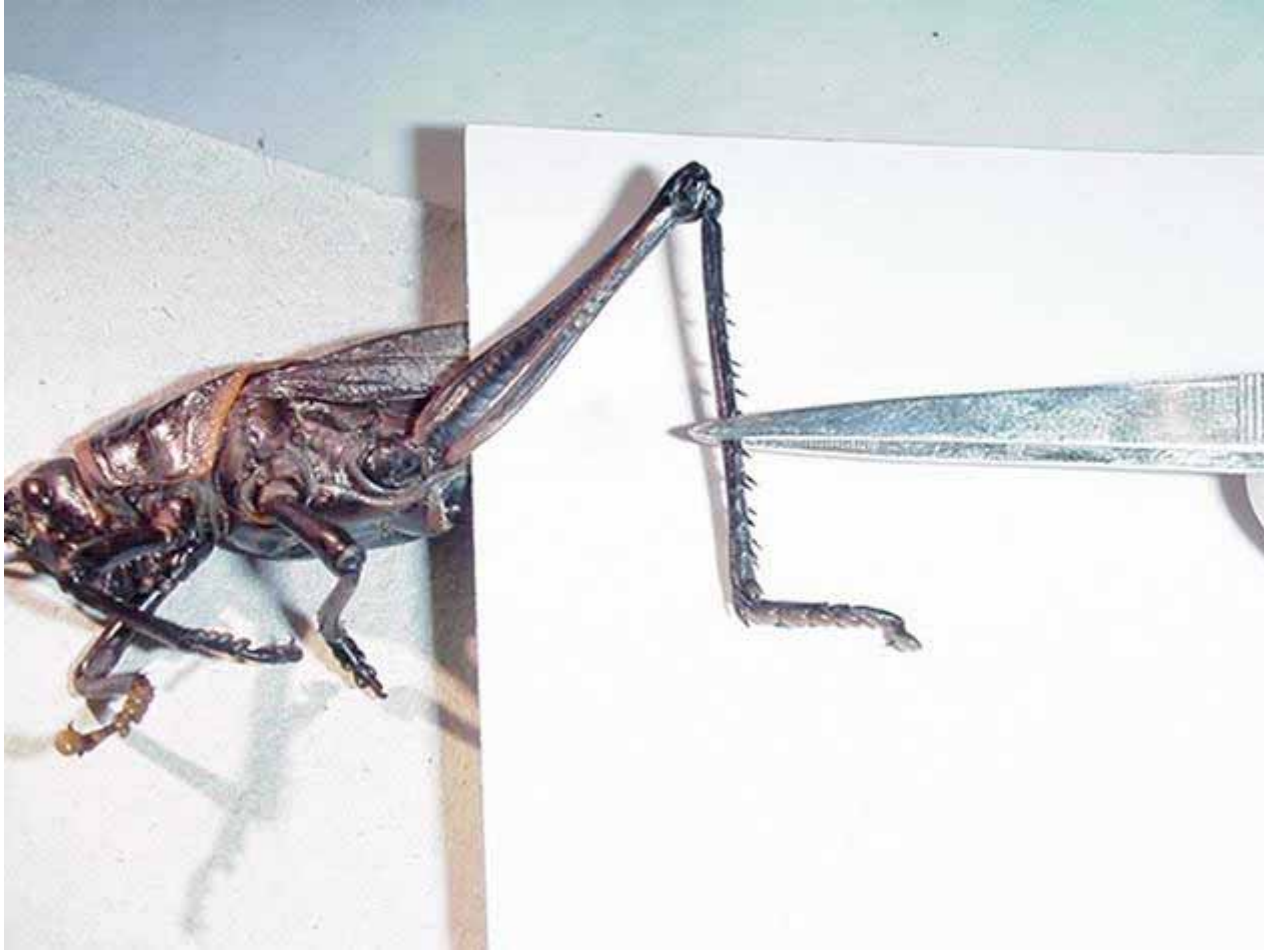
<http://www.cals.ncsu.edu:8050/course/ent425/tutorial/legs.html>

# Walking adaptation (cursorial)





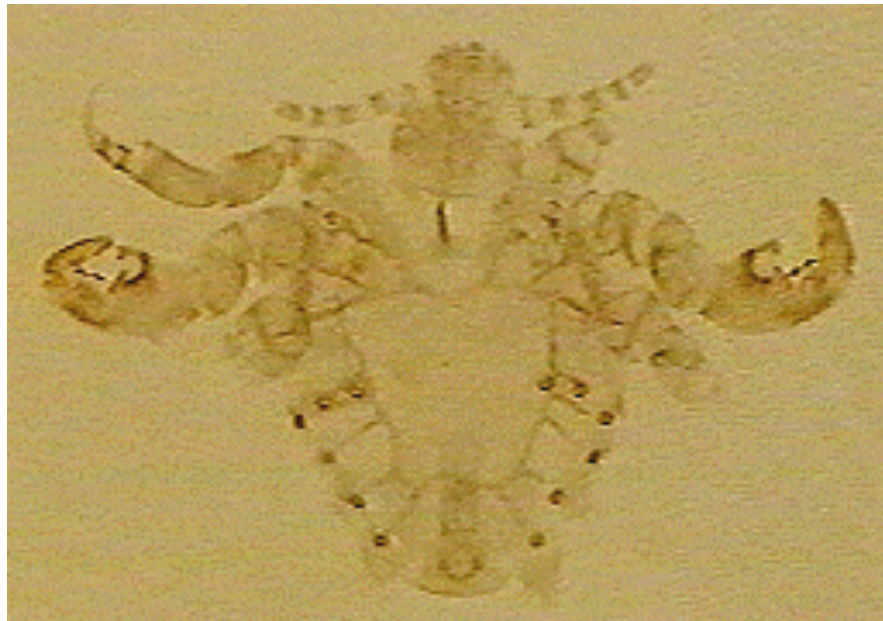
# Jumping (saltatorial)



# Grasping adaptation (raptorial)



# Clasping adaptation (pubic louse)



# Digging Adaptation (fossorial)



# Swimming leg(natatorial)



# The Insect Wing

- Forewing attached to mesothorax, hindwing to metathorax
- Veins serve as support struts
- Meso and metathoracic segments are reinforced to help support wing muscles during flight
- Wings useful identifying insects
  - Many order names are based on wing characteristics
    - » Diptera – flies - two wings
    - » Lepidoptera- moths and butterflies scaly wings.
    - » Thysanoptera (thrips= fringed wings)

# Fore and Hind Wings



# Wing Adaptations to know

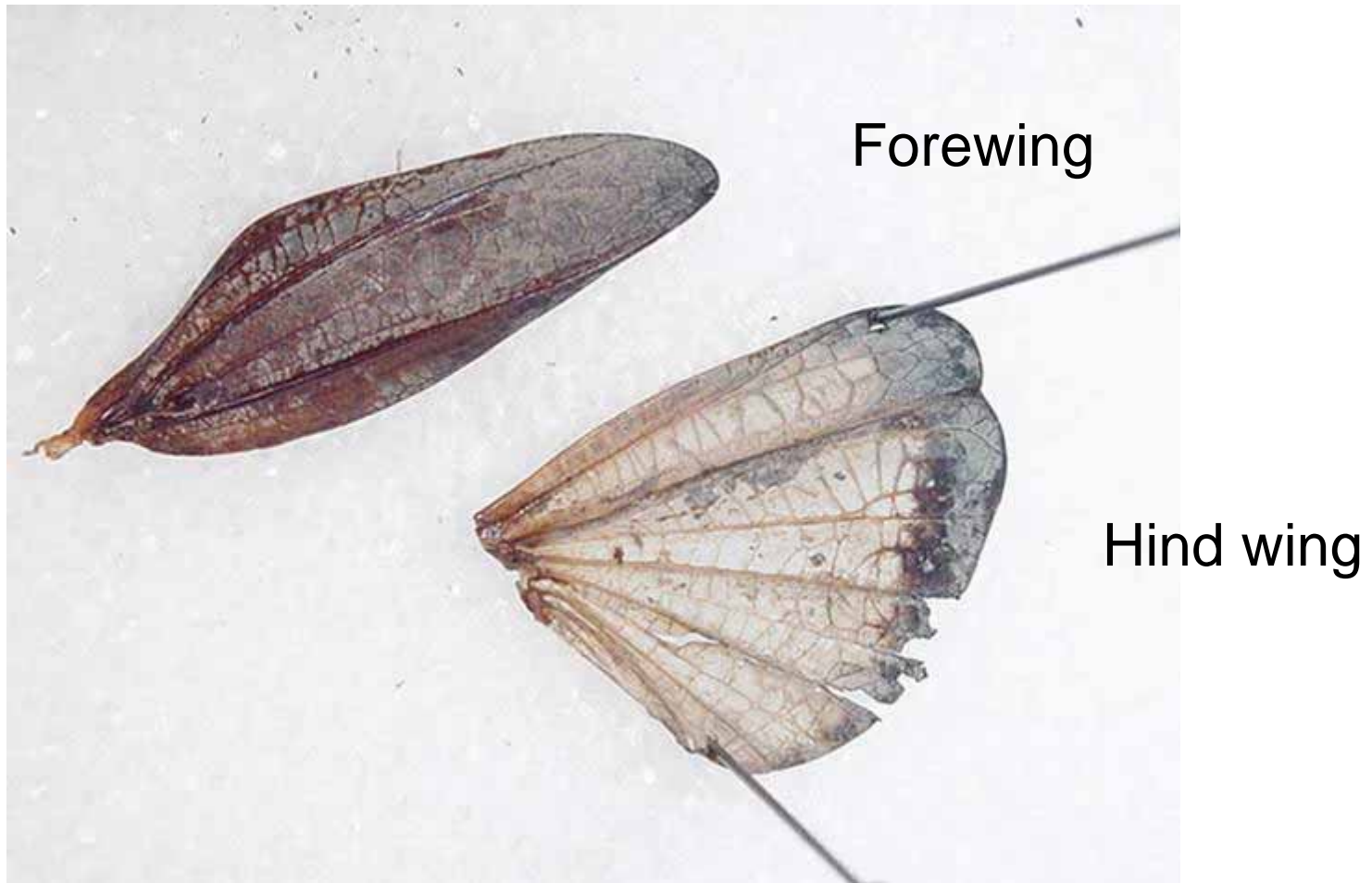
- Elytra
- Hemelytra
- Tegmina
- Halteres
- Fringed wings
- Scaly wings

tutorial

<http://www.cals.ncsu.edu/course/ent425/tutorial/wings.html>



# Tegmina= Leather forewing of grasshopper



# Elytra

Leathery forewings of beetles

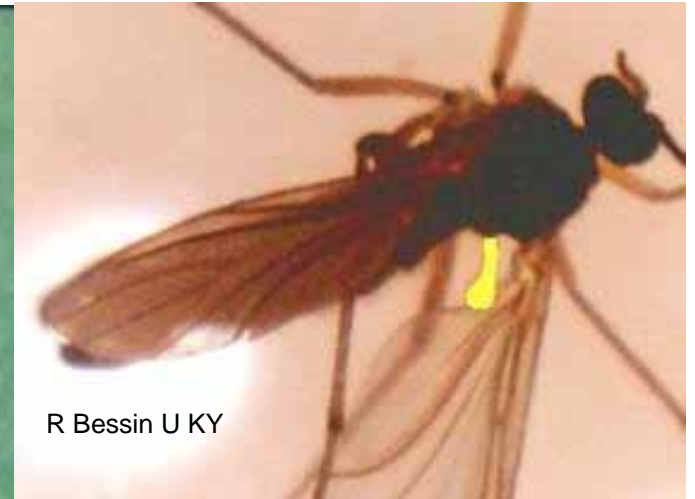
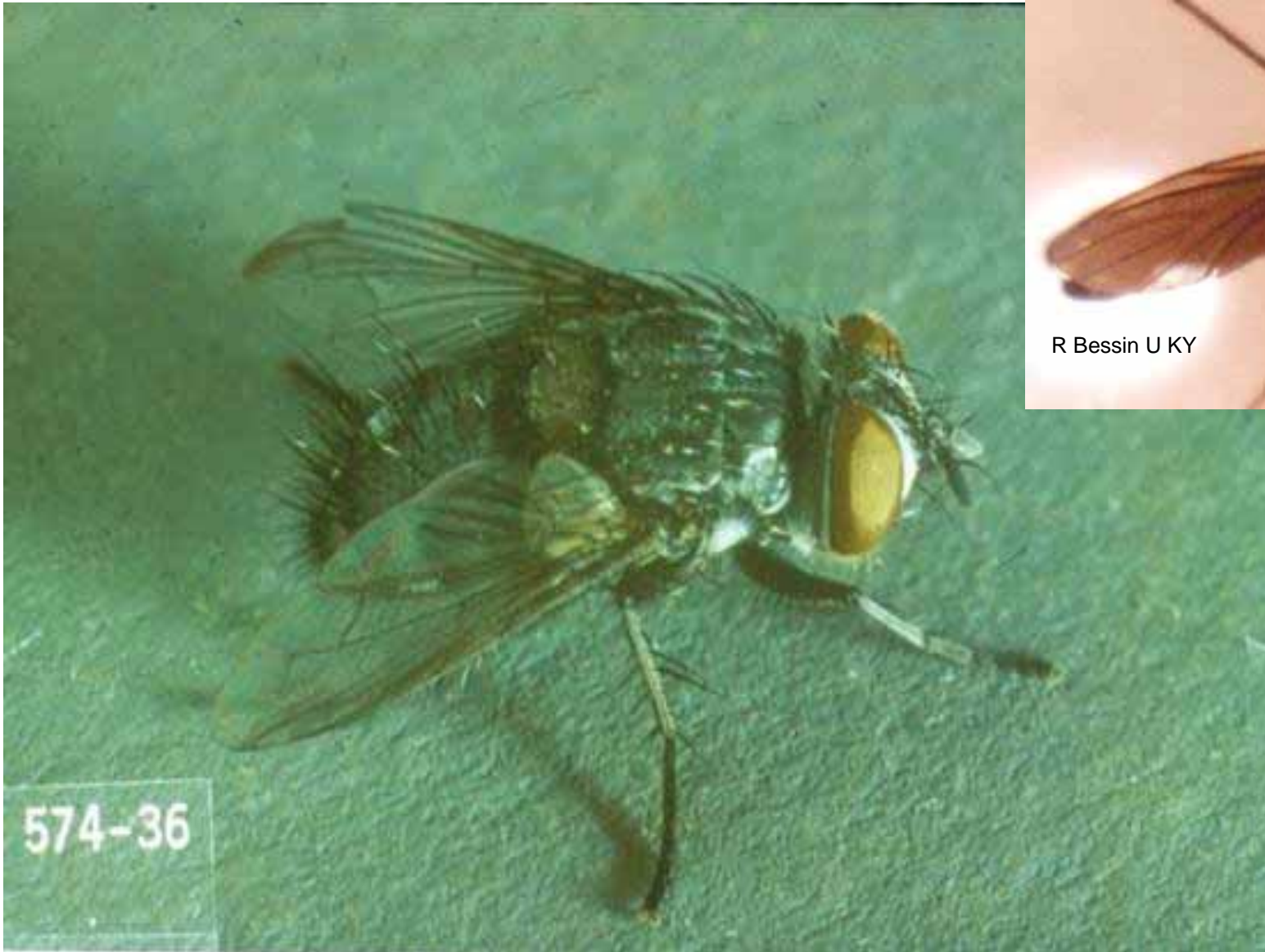




Hemelytra= half membranous  
forewing of true bugs



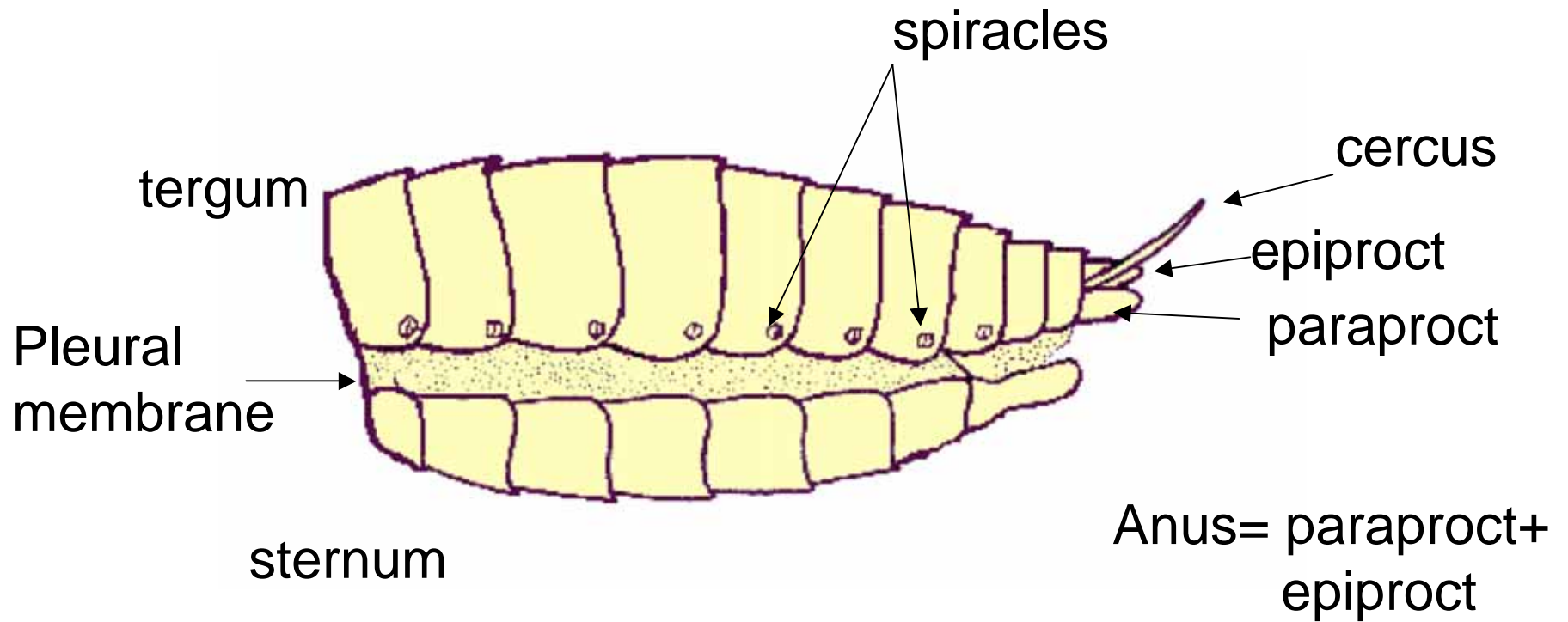
Haltere= reduced hind wing of fly



# Fringed wings of Thrips



# Insect Abdomen



# Abdominal Structures to Know

- Spiracle – respiration
- Cercus – hind sensor
- Anus = paraproct + epiproct
- Claspers – Male reproductive structure
- Ovipositor – Female egg laying can be modified into stinger in some wasps and bees

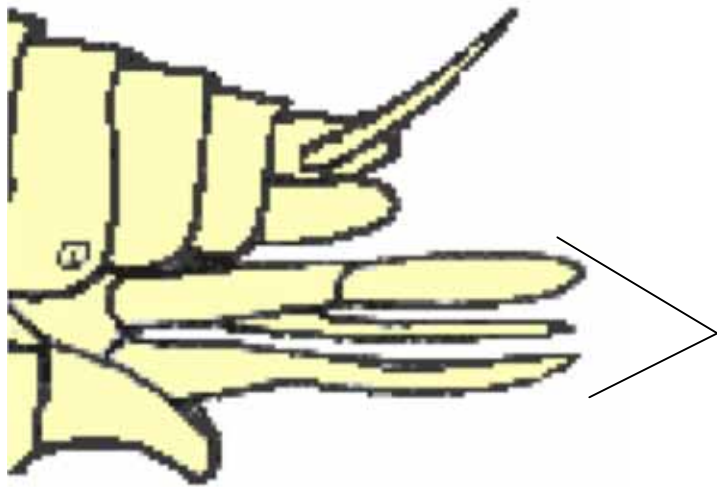


# Posterior Male Anatomy



Aeadeagus (penis) is internal and retractable

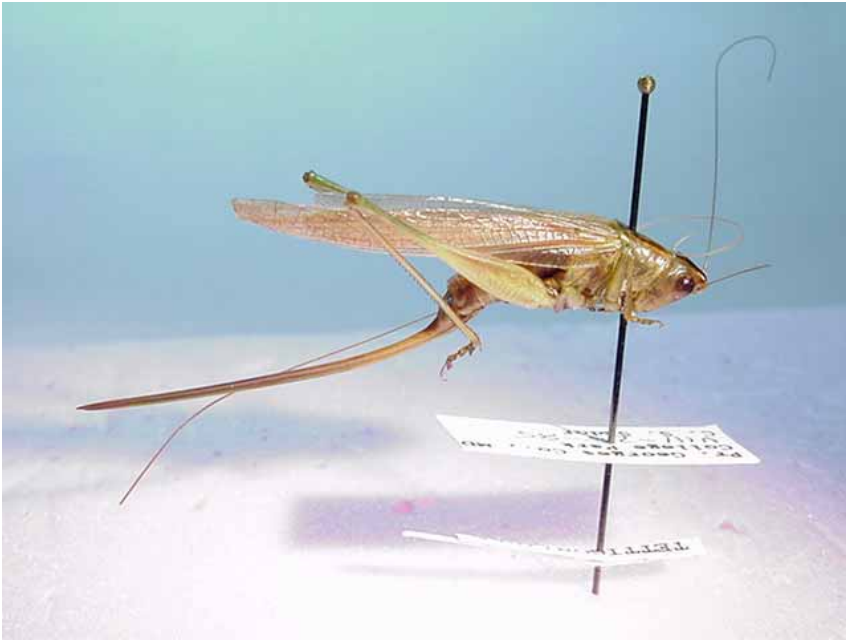
# Posterior Female Anatomy



ovipositor

**FEMALE**

# Ovipositors



Katydid



Sawfly

# Stinger on abdomen of female cicada killer wasp





**Ovipositor places egg inside caterpillar**

# Pair of Cerci on earwig abdomen



# Other Abdominal Facts

- Store fat
- House internal reproductive structures
- Lack true legs (immature stages)
  - The false legs that protrude from the abdomen of caterpillars and some wasps are called prolegs

# Prolegs vs True legs



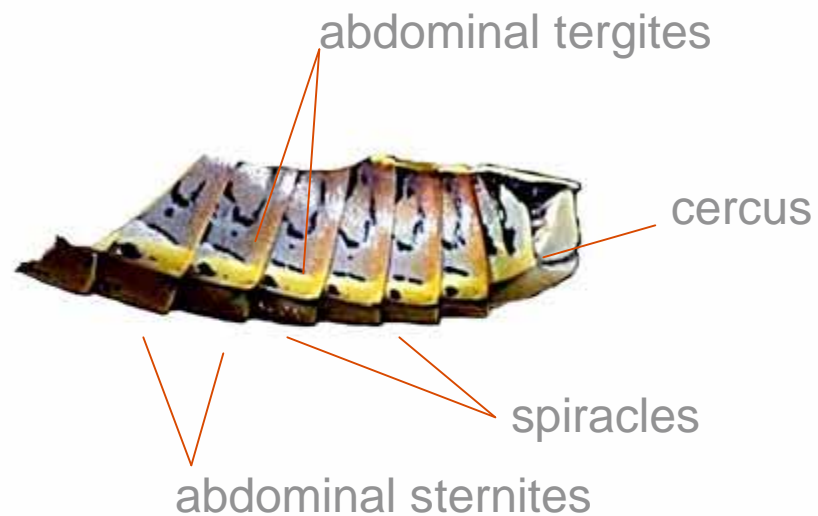
Prolegs on abdomen

Jointed True legs on thorax



# Abdominal Tutorial

<http://www.cals.ncsu.edu/course/ent425/tutorial/abdomen.html>



# Lubber Grasshopper

