

## 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

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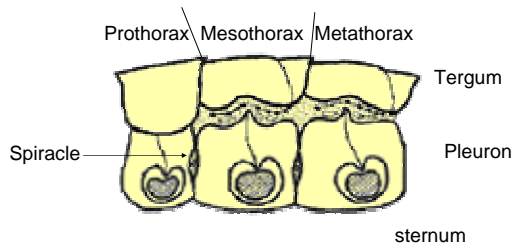
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## Insect Thorax



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

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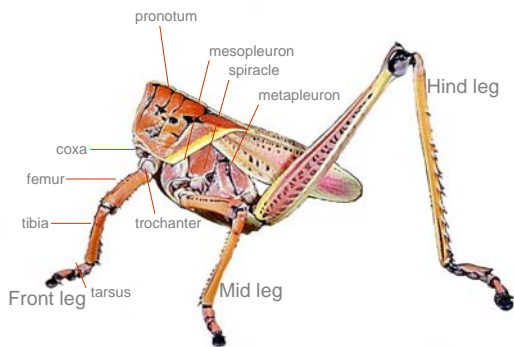
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## Intact Thorax



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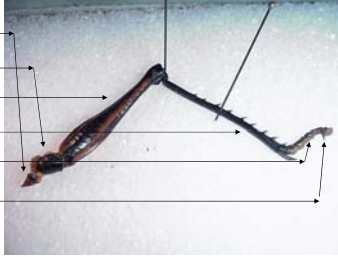
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## Leg parts to know

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



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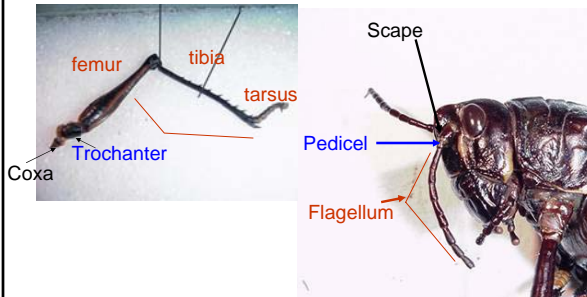
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Do legs resemble antennae?



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## 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)

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### Insect Leg Tutorial



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

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### Jumping (saltatorial)



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### Digging Adaptation (fossorial)



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Swimming  
(natatorial)



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Fore and Hind Wings



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Elytra  
Leathery forewings of beetles



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## 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)

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## Wing Adaptations to know

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

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

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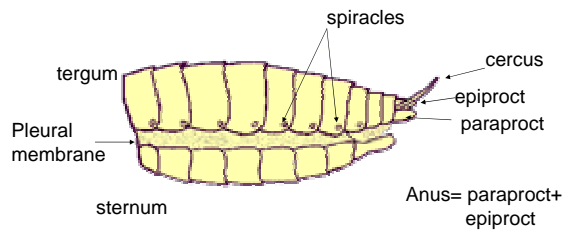
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## Insect Abdomen



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## 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

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## Posterior Male Anatomy



Aedeagus (penis) is internal and retractable

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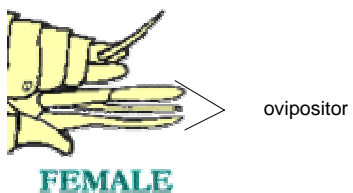
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## Posterior Female Anatomy



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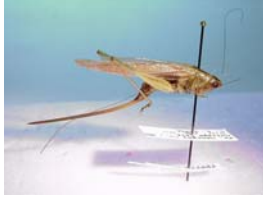
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## Ovipositors



Katydid



Sawfly

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## Stinger on abdomen of female cicada killer wasp



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## Other Abdominal Facts

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

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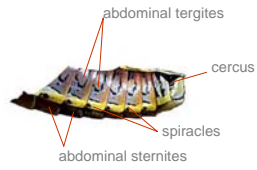
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# Abdominal Tutorial

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



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Lubber Grasshopper



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