MD 532 109 Skin and related connective tissues

Lab demonstation:
Parasitic infection of the skin and connective tissue

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PIC: N Engl J Med 2016; 374:e16

Objective

- **After finishing the lab demonstration and self-study, a 2nd-year medical student should be able to identify the morphology (to create differential diagnosis) of the following organisms based on their morphological characteristics:**
  - **Protozoa and helminths that cause skin diseases**
  - **Medically important arthropods**
    - **Ectoparasite**
    - **Venomous arthropods**

Why do we need to identify the causative parasite and medically important arthropods?

- **Accurate Diagnosis**: Many parasitic and arthropod-borne diseases present with overlapping clinical symptoms.
- **Treatment Selection**: Misidentification can lead to incorrect treatment, drug resistance, or disease progression.
- **Epidemiological Surveillance**: Tracking the spread of disease vectors or parasitic species, allowing for targeted public health
- **Understanding Life Cycles**: Crucial for understanding transmission dynamics and for interrupting the cycle at appropriate points.
- **Public Health Planning and Education**: Proper identification supports the development of health education materials, risk communication, and community-based control programs tailored to the specific parasite or vector in question.

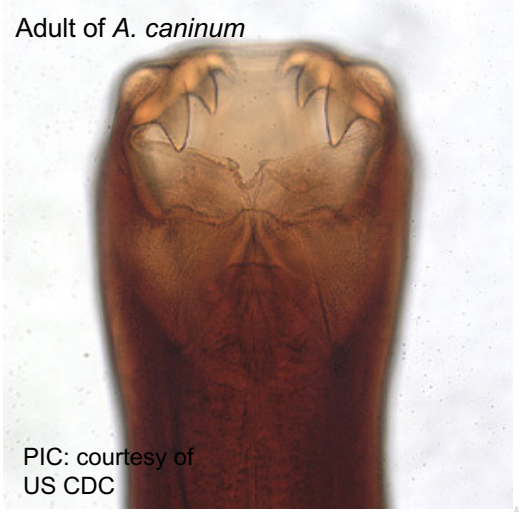
Lab demonstation

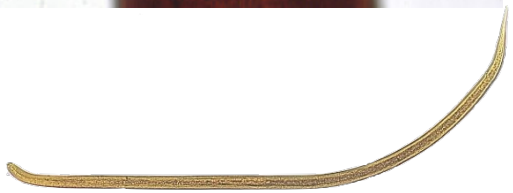
Protozoa and helminth

PIC: N Engl J Med 2016; 374:e16

Cutaneous larva migrans

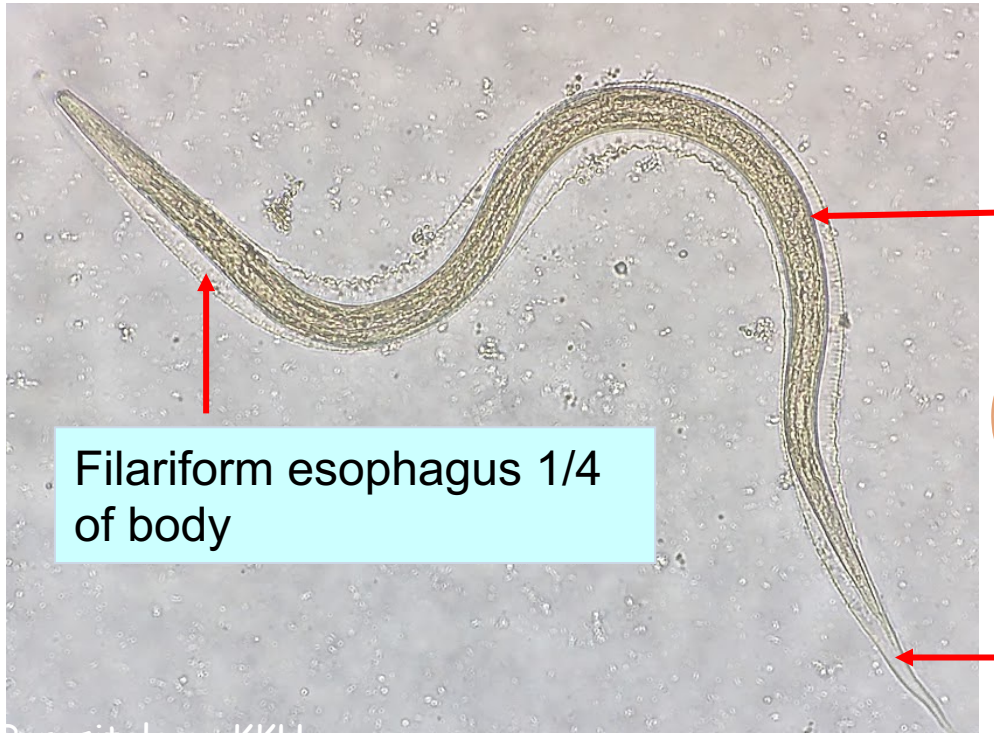
- **Hookworm-related cutaneous larva migrans (CLM, Hr-CLM)**
  - **Animal (dog, cat, and wild) hookworms**
  - Human hookworms also causing the symptom but less common
- **Larva currens**
  - *Strongyloides stercoralis*
- **Larva migrans profundus (Gnathostomiasis)**
  - *Gnathostoma* spp.
    - Mainly *G. spinigerum*





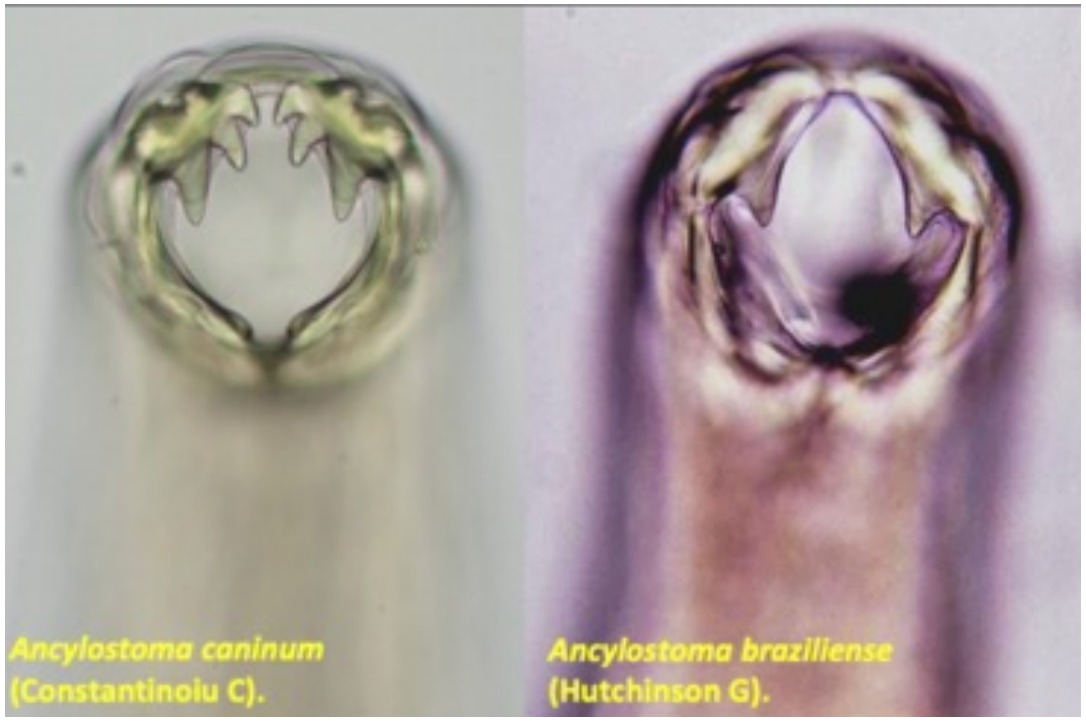
Cutaneous larva migrans

- **Causative agent:** animal hookworm
- **Stage:** L3 (filariform) larva
- Size: 600– 700 μm long



Cutaneous larva migrans

- Animal hookworm (Adult)

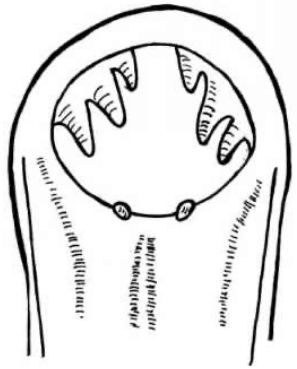


PIC: Parasite bank of University of Melbourne

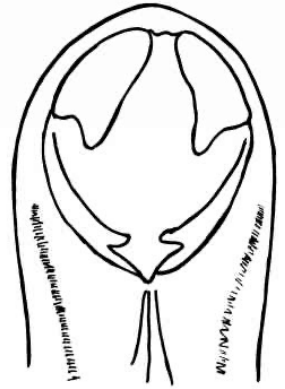
*Ancylostoma duodenale**

Ancylostoma ceylanicum

*Necator americanus**



Ancylostoma caninum



Ancylostoma brazillense

**Human hookworm*

Modified from:
Darvin Scott Smith, Medscape, 2025.

Intermittent migratory swelling

- Causative agent: *Gnathostoma* sp. (mainly *G. spinigerum*)

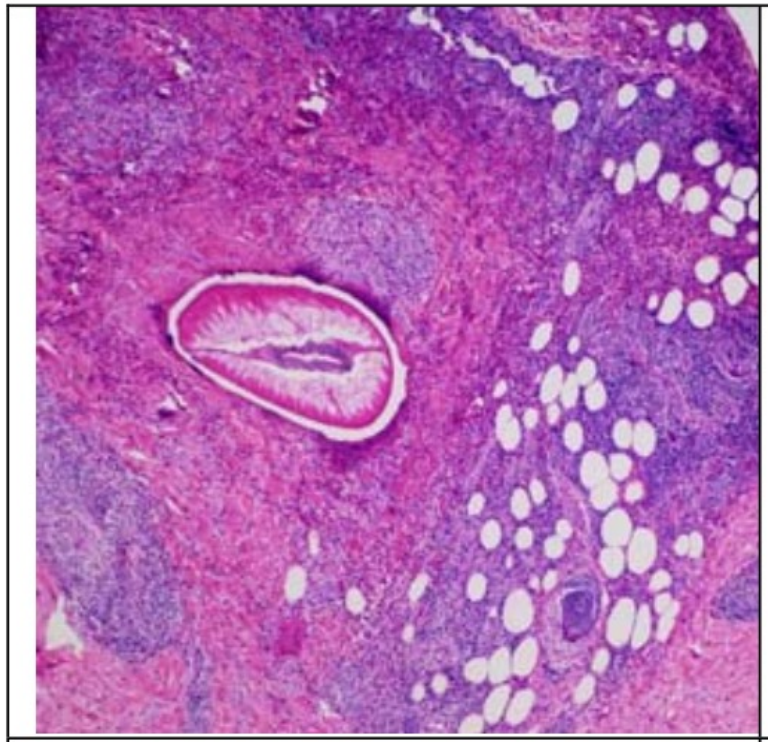


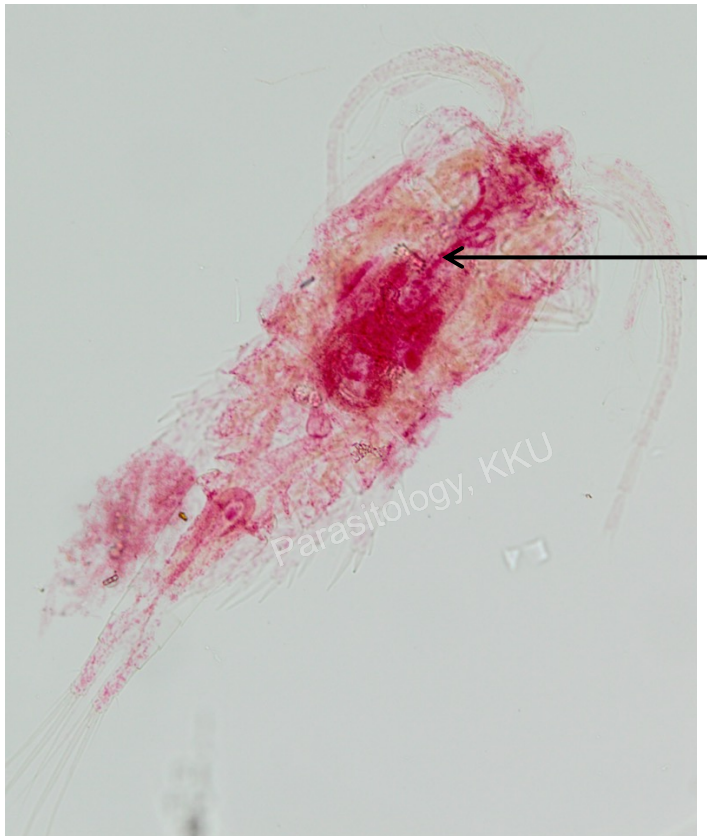
Figure 13.2, H&E 40x

Figure 13.3, H&E 200x

https://www.rama.mahidol.ac.th/ramalaser/sites/default/files/public/pdf/interhospital/2010/ih2010-13.pdf

Intermittent migratory swelling

- Causative agent: *Gnathostoma spinigerum*
- Stage: early L3, advance L3



Cephalic bulb with 4 rows of spines

Larva currens

- Causative agent: *Strongyloides stercoralis* (L3)

Am. J. Trop. Med. Hyg., 108(2), 2023, pp. 340–345

Larva currens

- **Causative agent:** Strongyloides stercoralis (L3, filariform larva)

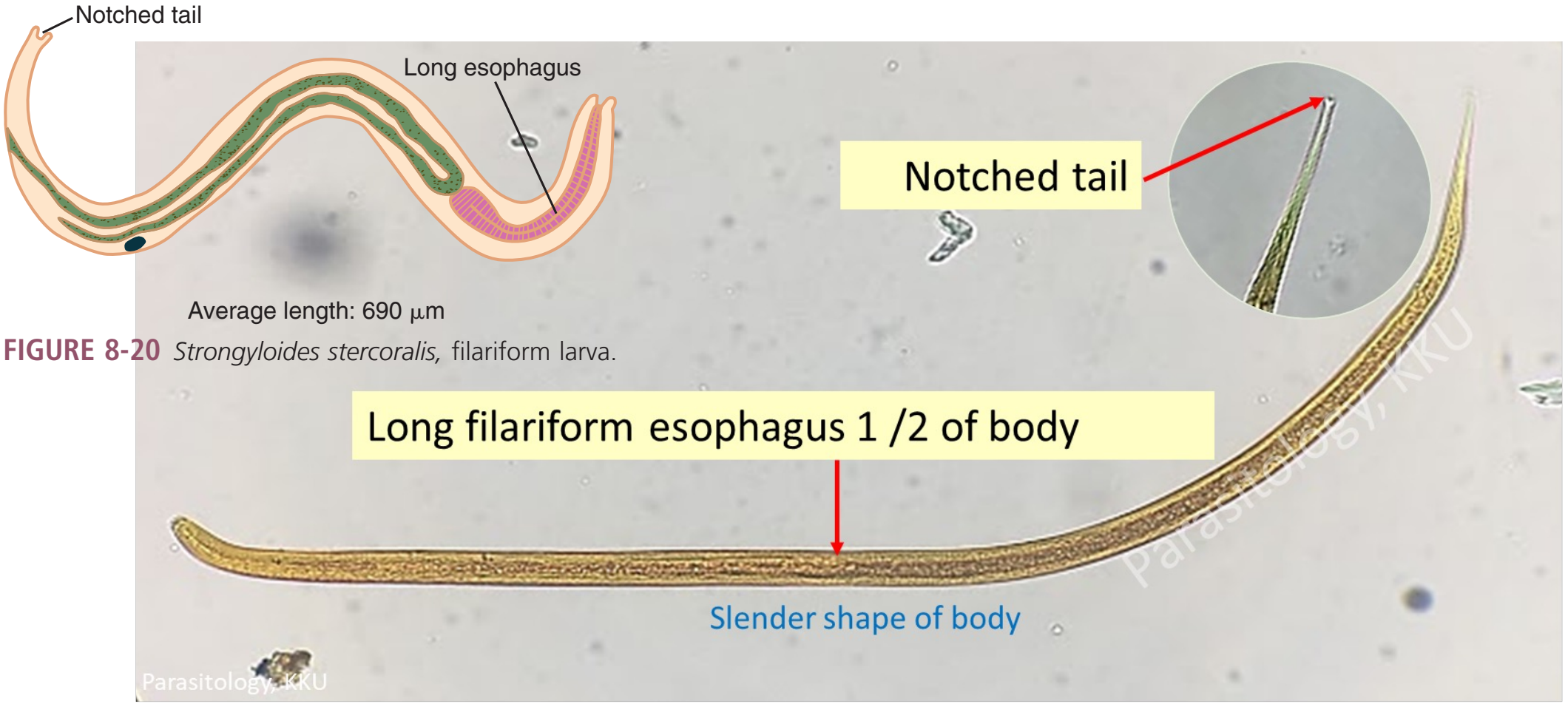
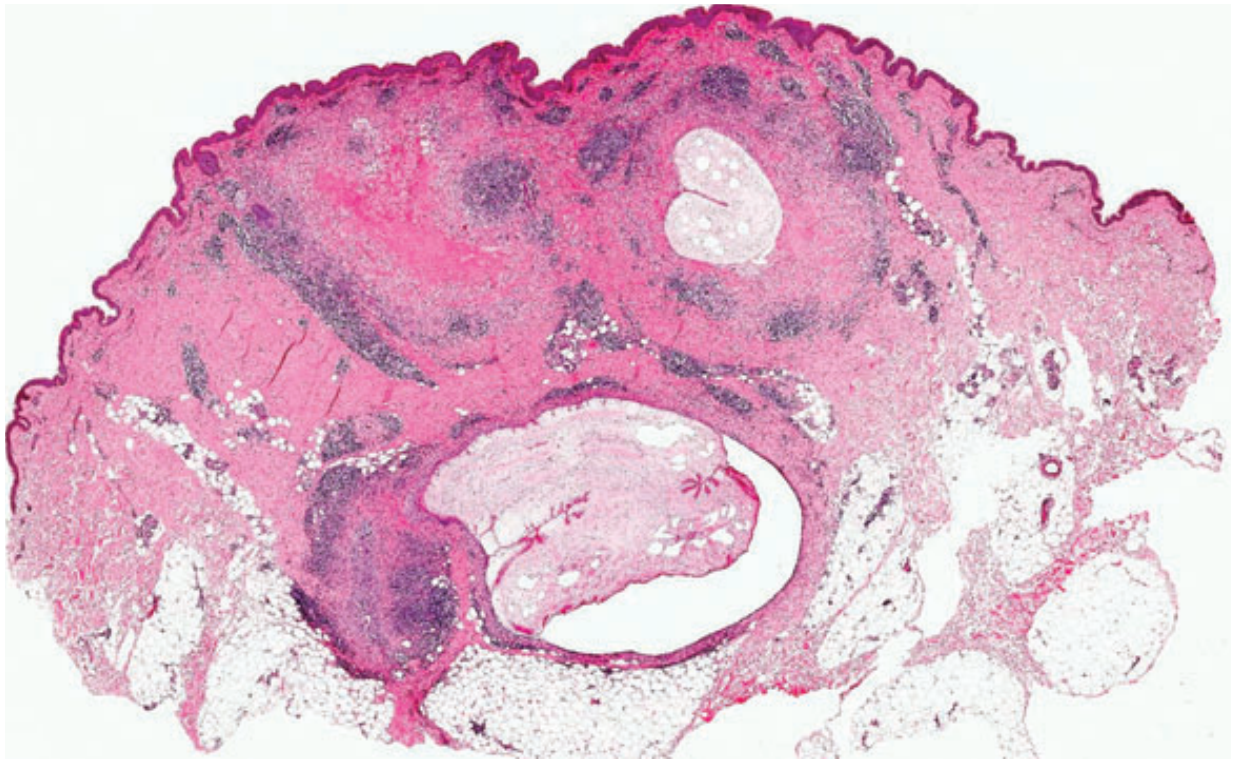


FIGURE 8-20 *Strongyloides stercoralis,* filariform larva.

Sparganosis

A 2.0 cm irregular dermal nodule



A superficial and deep dermal infiltrate surrounding two sections of the worm tract and body.

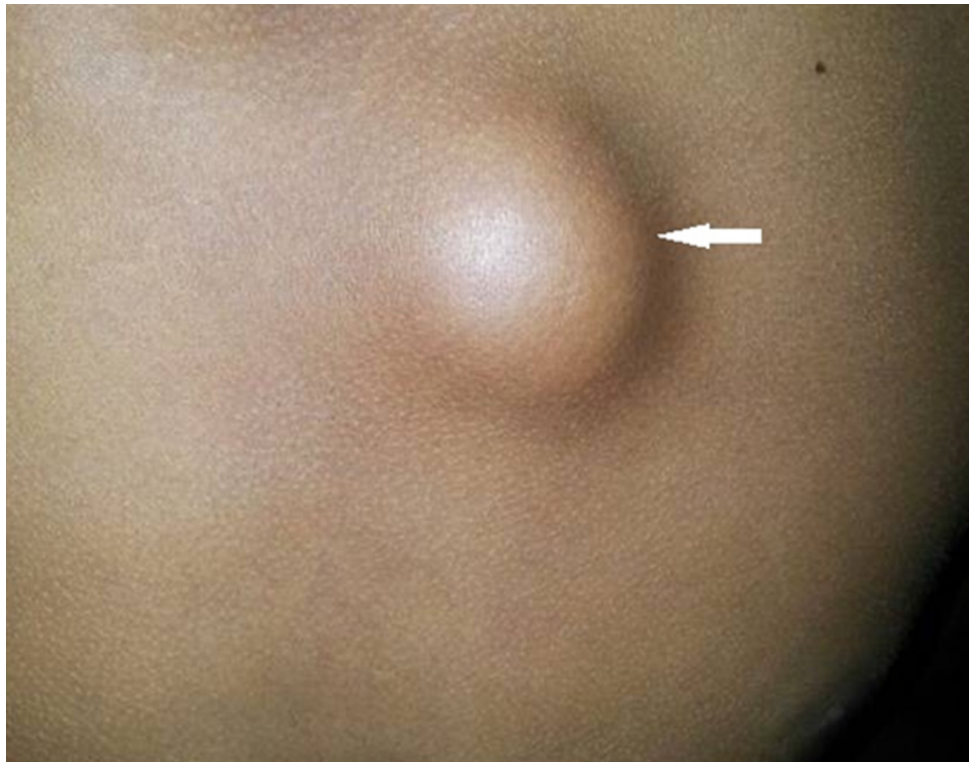
J Cutan Pathol *2015: 42: 1–5*

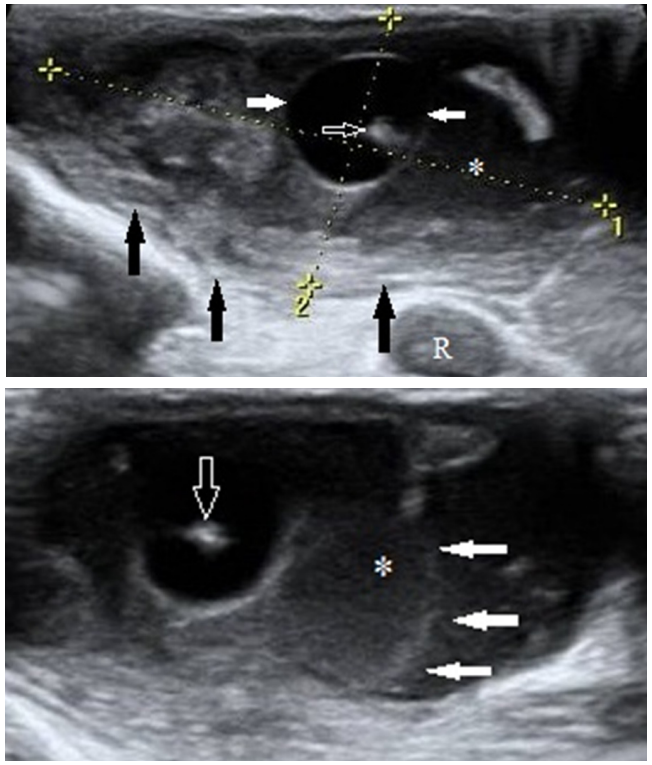
Sparganosis

- Causative agent: Pleurocercoid larva (Sparganum) of *Spirometra* sp.
- **Creamy-white and ribbon-liked**

Cutaneous cysticercosis

- **AKA Cysticercosis cutis**
- *Cysticercus cellulosae* of *Taenia solium*





Pol J Radiol, 2016; 81: 478-482

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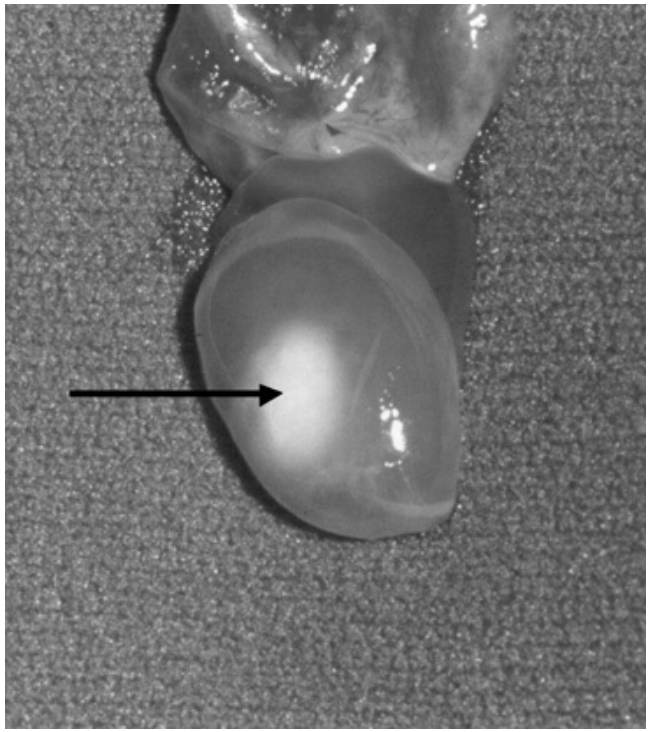
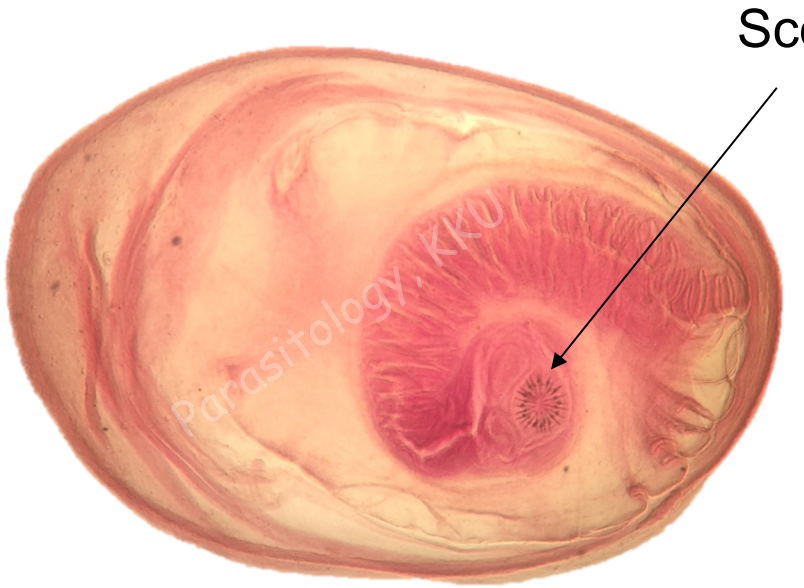


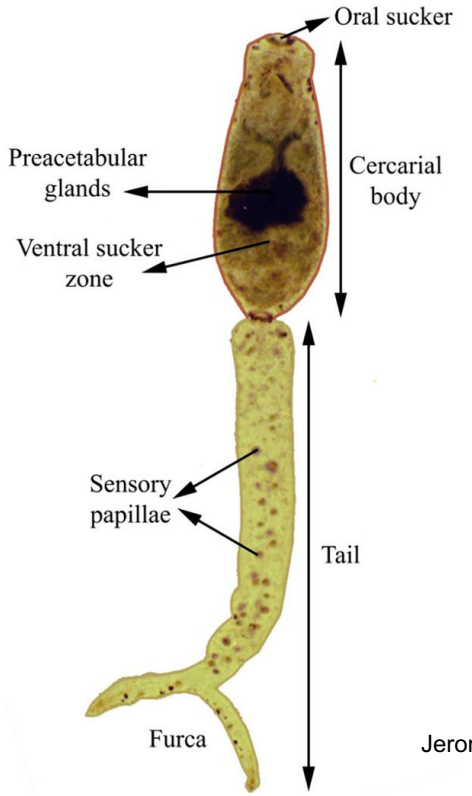
Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2007;103:528-33



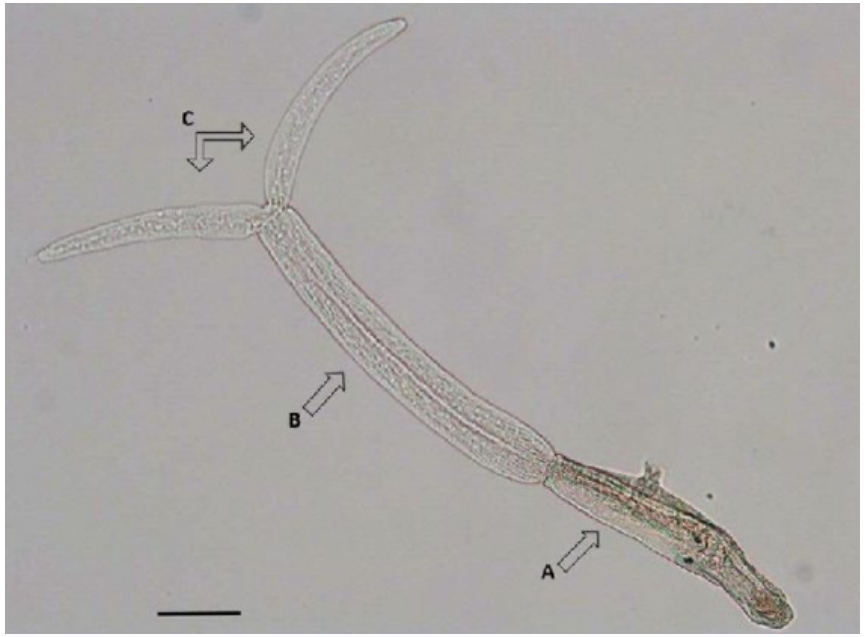
Oval shape,
the bladder is the paler area

Cercarial dermatitis

- Causative agent: animal schistosome
- Stage: cercaria



Morphology of
S. mansoni (Human blood fluke)

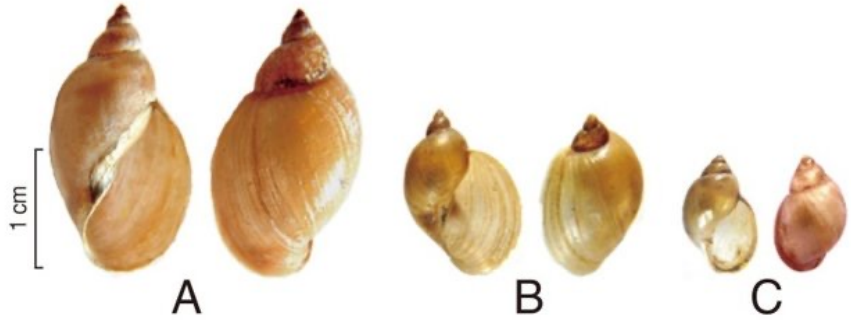


Jerome Boissier, et al. 2019.

Cercarial dermatitis

- Intermediate host:

Indoplanorbis snail



Lymnaea (*Radix*) snail.

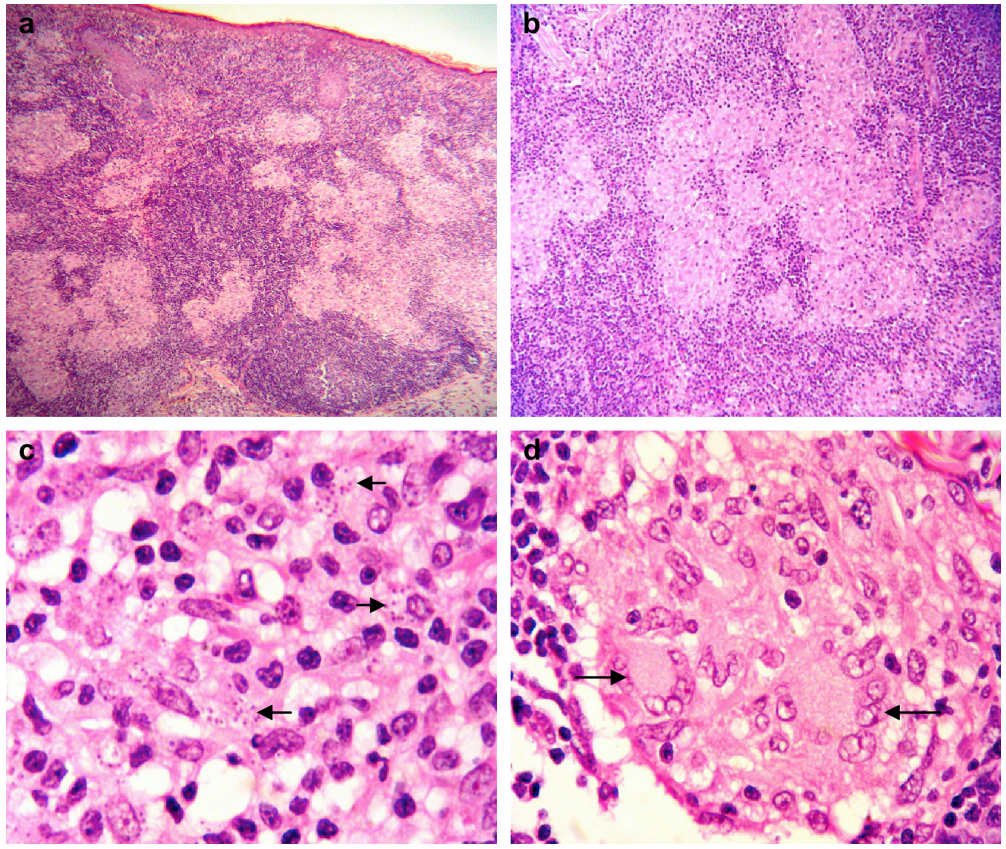
Korean J Parasitol Vol. 51, No. 6: 657-662, December 2013
Evolutionary Systematics. 6 2022, 151–173

Cutaneous leishmaniasis

- Skin biopsy from lesion

Cutaneous leishmaniasis

- Skin biopsy from lesion



Histology of cutaneous leishmaniasis

a. Diffuse chronic inflammatory cell infiltrate in dermis with multiple non-caseating granulomata (×40)
b. Tuberculoid-type granulomata with central histiocytes and peripheral inflammatory cells (×100)
c. Leishman-Donovan bodies (arrows) within cytoplasm of epithelioid histiocytes (×600)
d. Langhans type giant cells (arrows) within a granuloma (×600).

Travel Med Infect Dis. 2011 January ; 9(1-4): 37–46.

Cutaneous leishmaniasis

- Skin biopsy from lesion
- Amastigote in macrophage (monocytes / histiocytes)

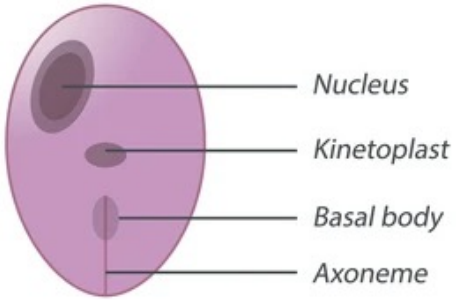
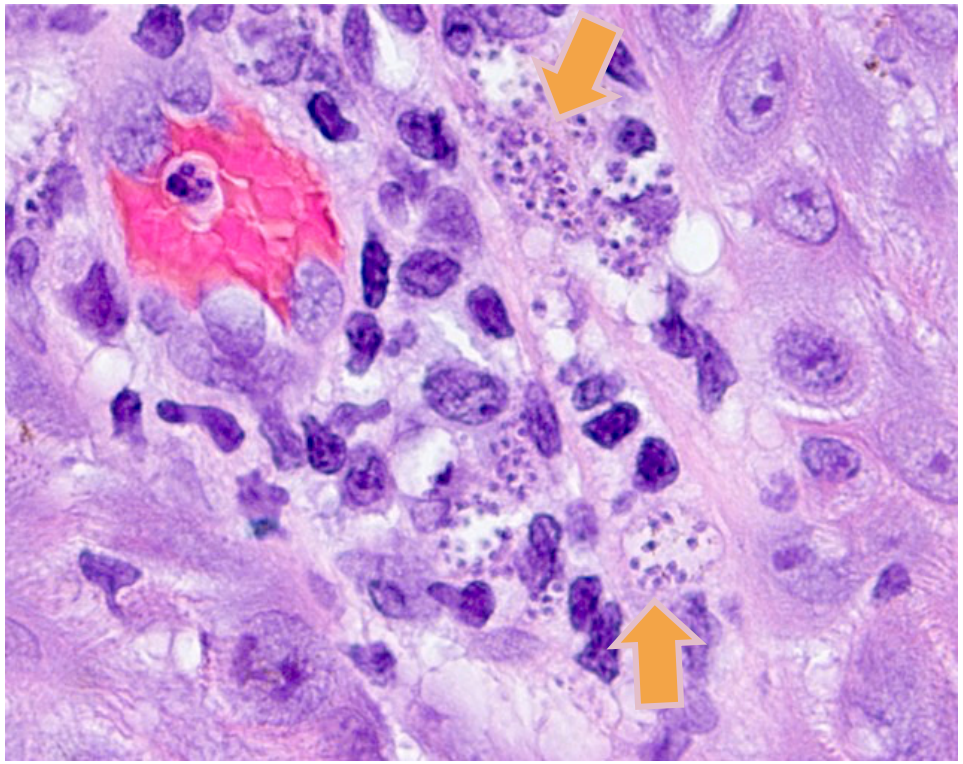
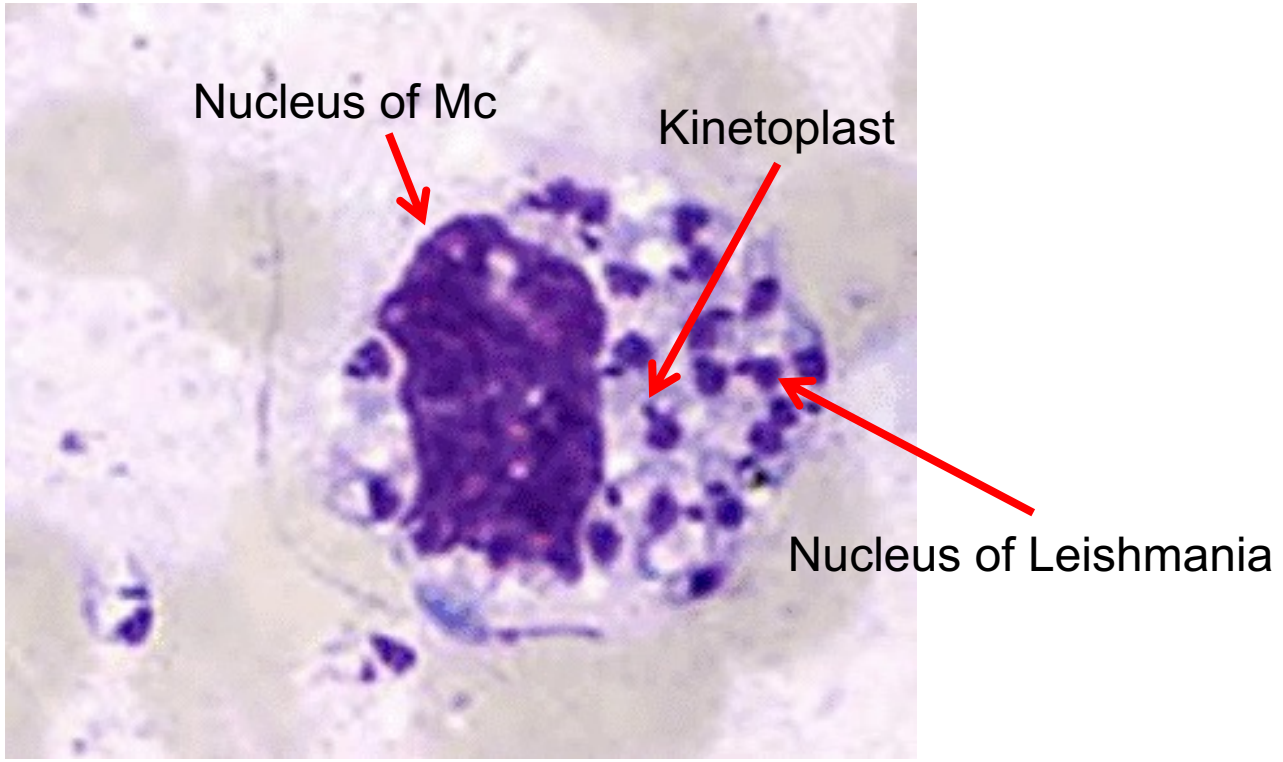


Fig: Amastigote of L.donovai



Skin biopsy



Peripheral blood smear

Cutaneous leishmaniasis

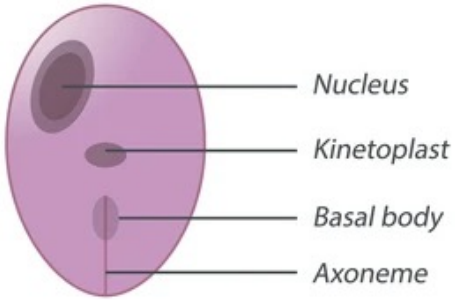
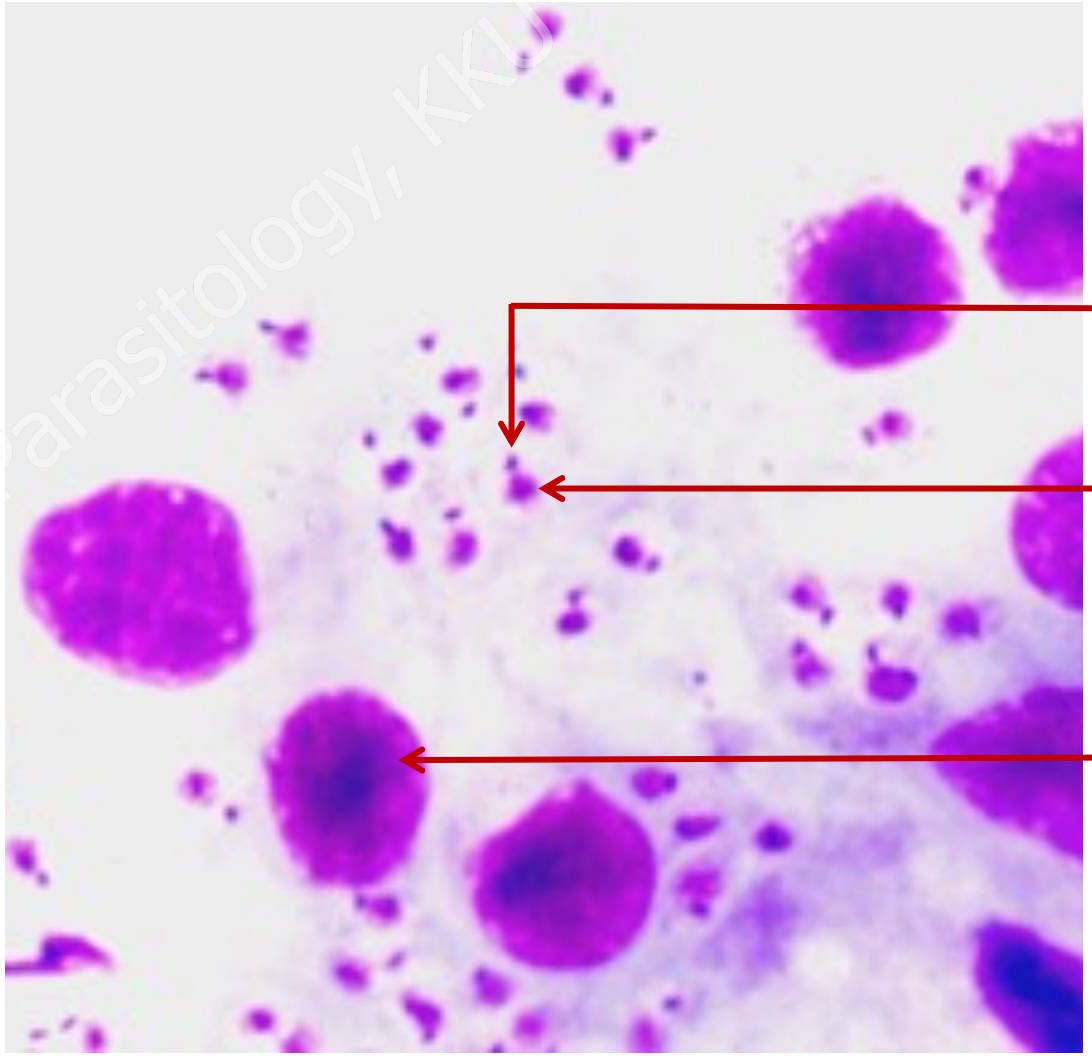


Fig: Amastigote of L.donovai

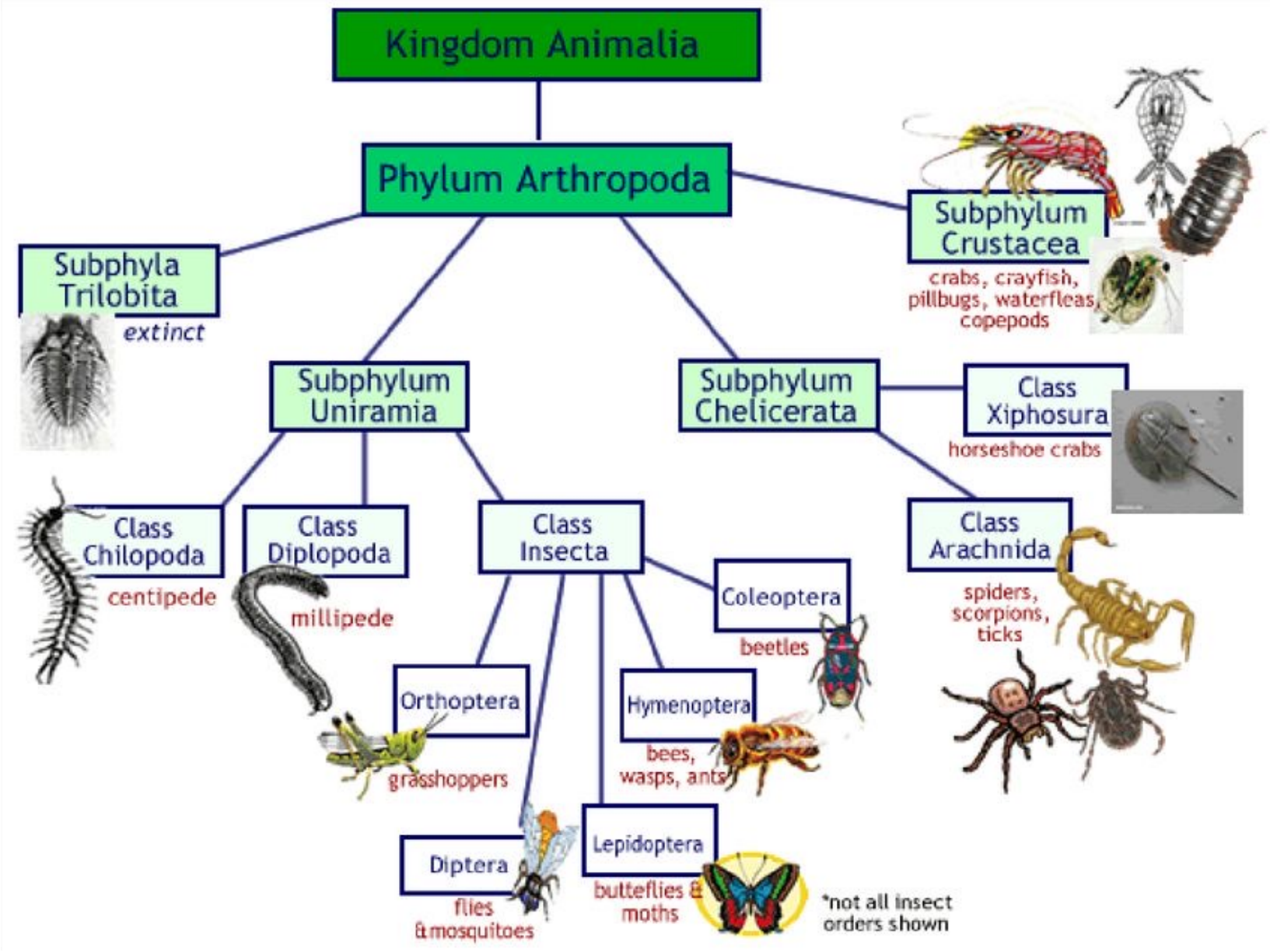


Lab demonstation

Medically important arthropods

PIC: https://bscholarly.com/most-dangerous-spiders-in-the-world/
https://www.ndsu.edu/sites/default/files/fileadmin/nursing/pictures/ane-npr/ANE-NPR_3.3.pdf

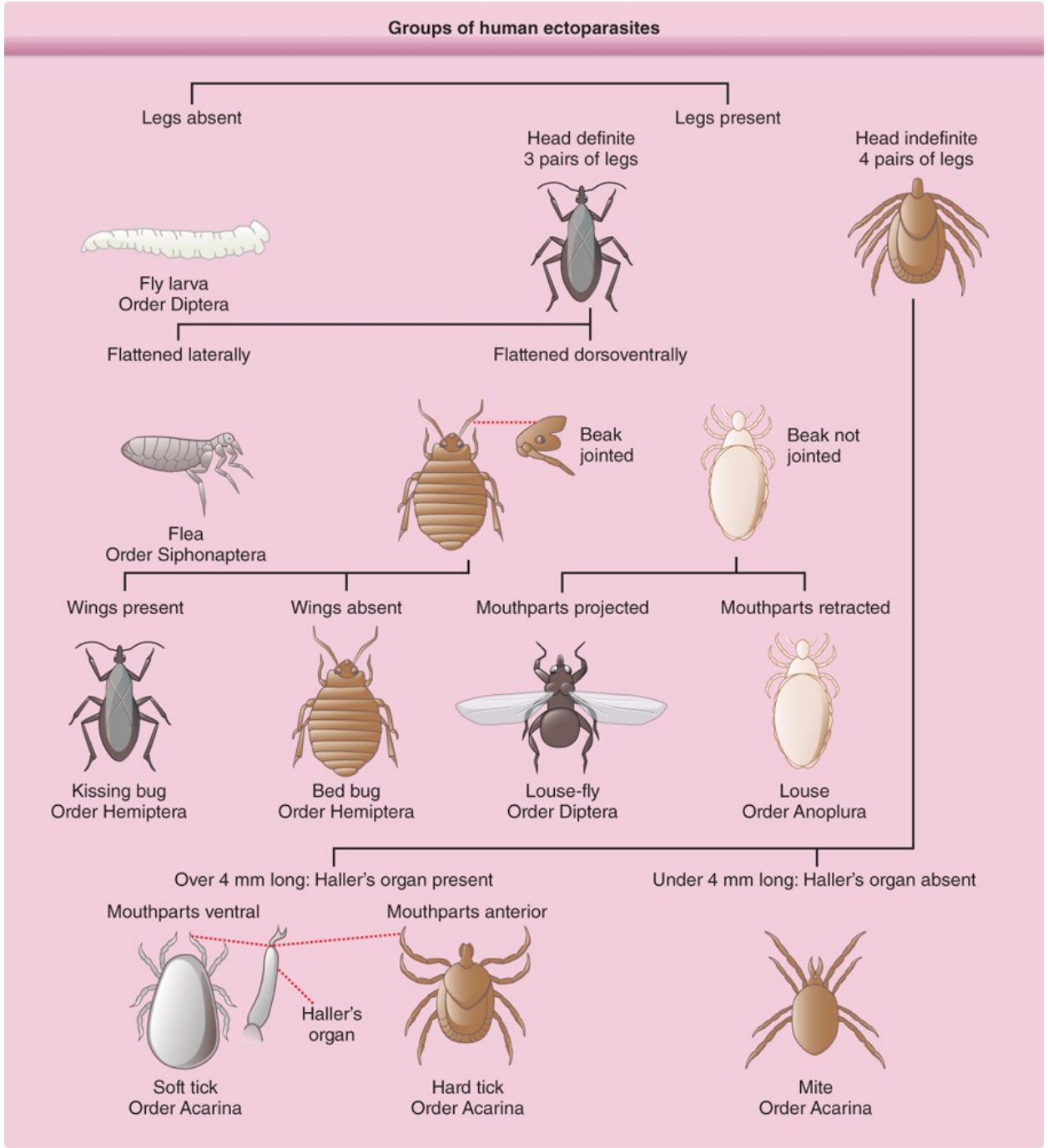
Medically important arthorpods



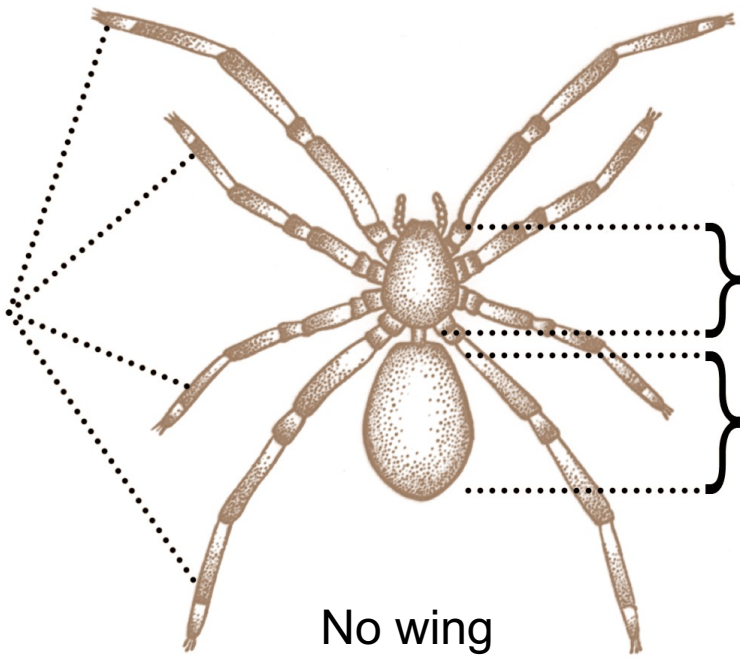
Today demonstration: medical arthropods

- Class arachnida
  - Spider
    - Brown recluse spider
    - Widow spider
    - Talantula
  - Scorpion
  - Acari
    - **Ticks (เห็บ)**
      1. Ixodid or Hard tick
      2. Argasid or Soft tick
    - **Mites (ไร)**
      1. Trombicula mite (Chiggers ไรอ่อน)
      2. House Dust mite ไรฝุ่นบ้าน
      3. Scabies mite หิด
      4. Follicle mite ไรรูขุมขน
- Class chilopoda
  - Centipede
- Class insecta
  - **Lice (เหาและโลน)**
    1. Head louse (*Pediculus humanus* var. *capitis*)
    2. Body louse (*Pediculus humanus* var. *corporis*)
    3. Pubic/Crab louse (*Phthirus pubis*)
  - **Bugs**
    1. Bed bug (เรือด) (Cimex spp.)
    2. Triatomine bug (มวน)
  - **Fleas (หมัด)**
    1. Dog/Cat flea (*Ctenocephalides* spp.)
    2. Human flea (*Pulex irritant*)
    3. Rat flea (*Xenopsylla cheopis*)
  - **Flies (แมลงวัน)**
    1. Blood sucking flies: stable flies (แมลงวันคอกม้า)
    2. Non-blood sucking: house/flesh/blow flies
  - **Mosquitoes (ยุง)**
    - ***Anopheles, Culex, Aedes, Mansonia* spp.**

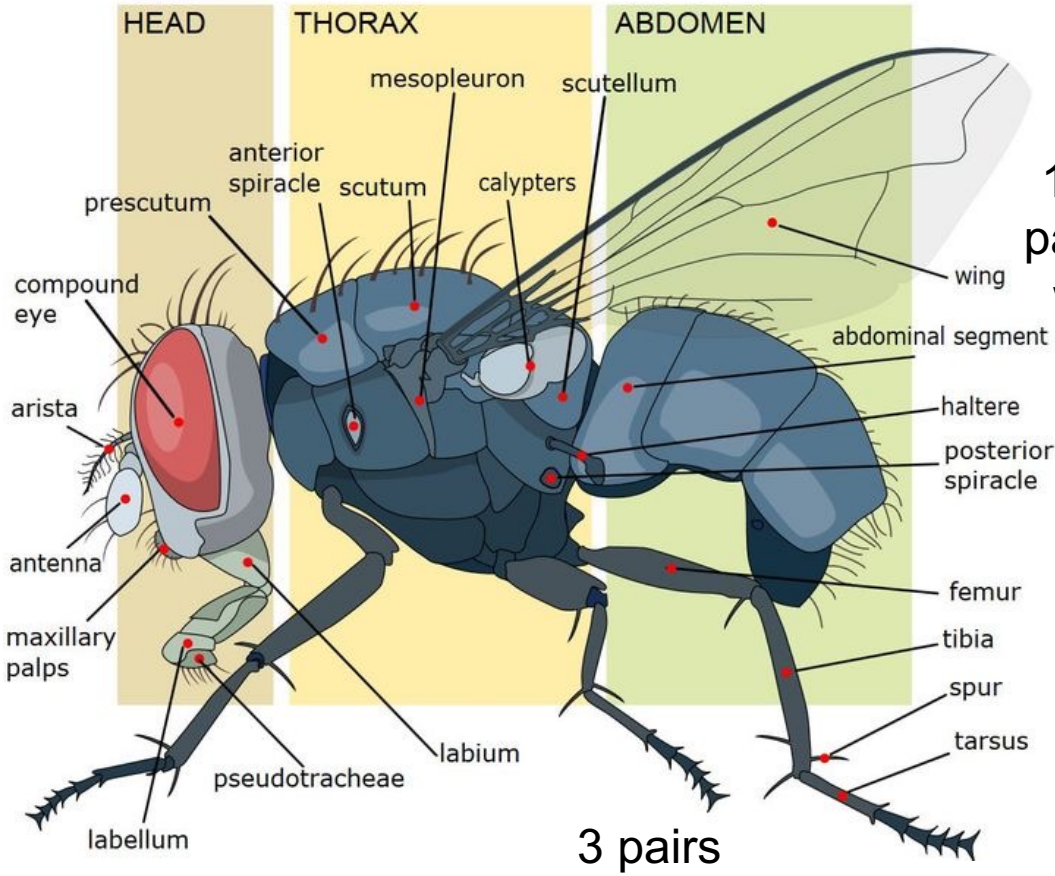
Ectoparasite



Arachnid VS Insect



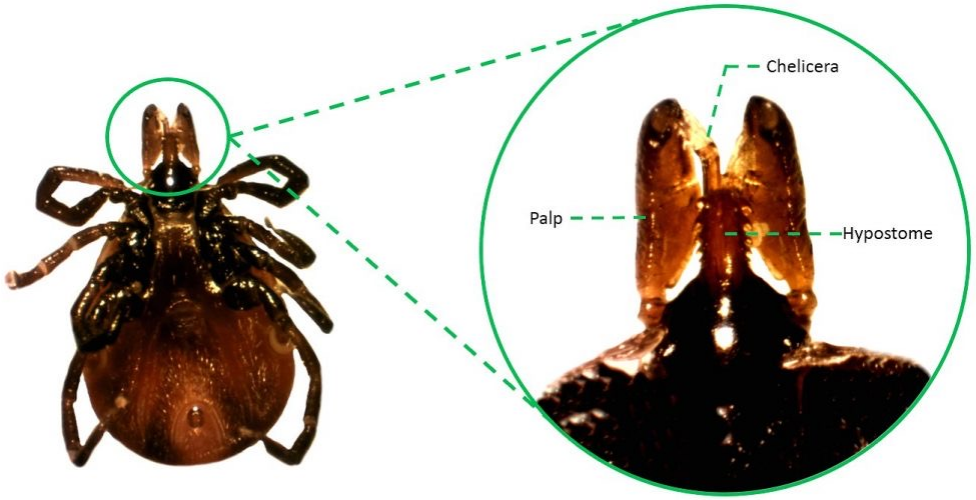
PIC: CDC Public Health Image Library



PIC: Department of Entomology, University of Nebraska–Lincoln

Arachnid: Acari (Tick and mite)

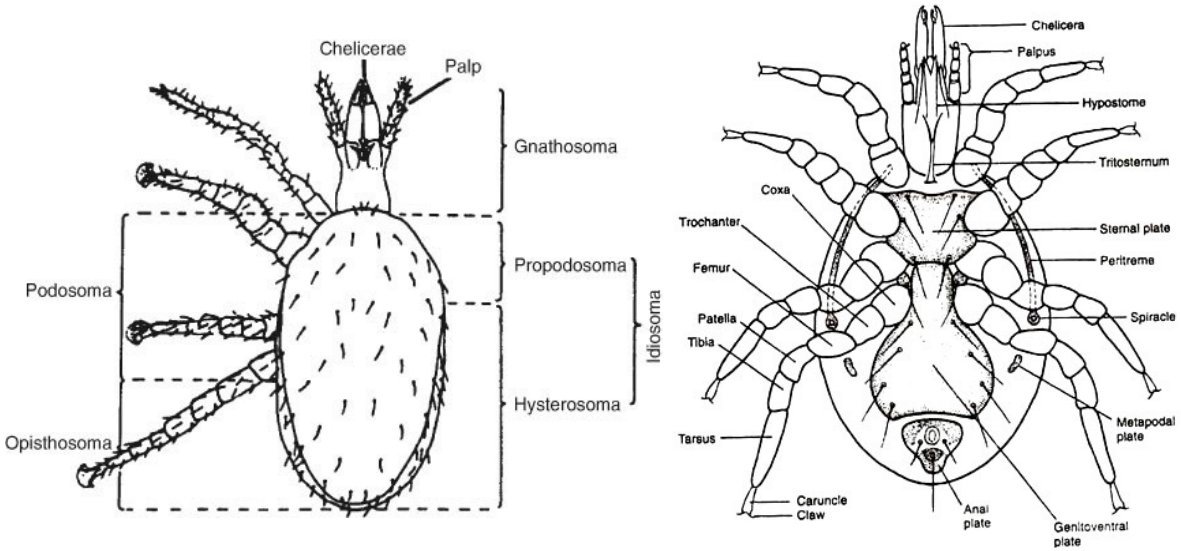
	Ticks	Mites
Size	> 3 mm	< 3 mm
Hair	Short or no hair	Long hair
Hypostome	With teeth	Hidden, no teeth
Haller's organ	Present	Absent



Griffin Dill

https://extension.umaine.edu/ticks/tick-biology/

Tick



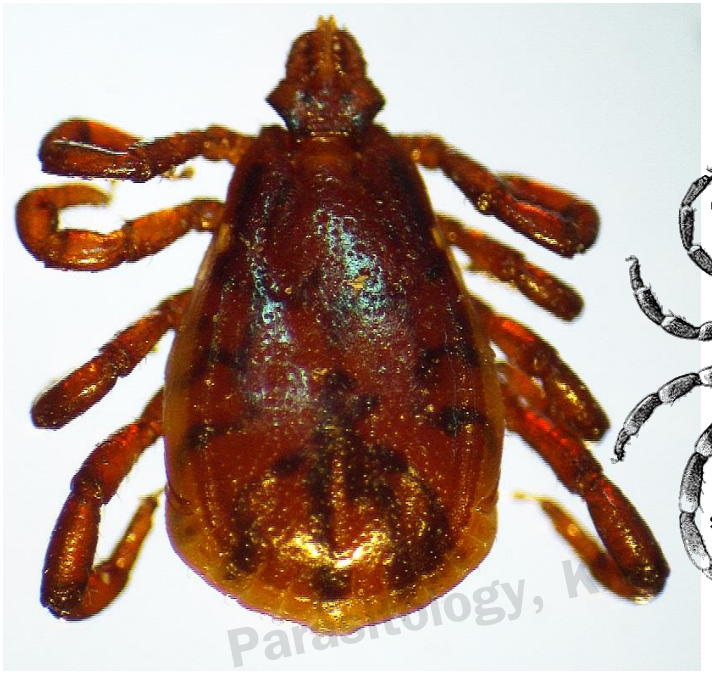
John L. Capinera. Encyclopedia of Entomology, 2008

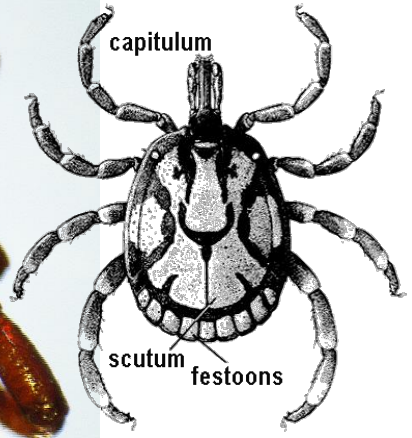
Fig. 6.18 : Generalised mesostigmatid mite (ventral view)

Mite

Ixodid or Hard tick (*Ixodes* spp.)

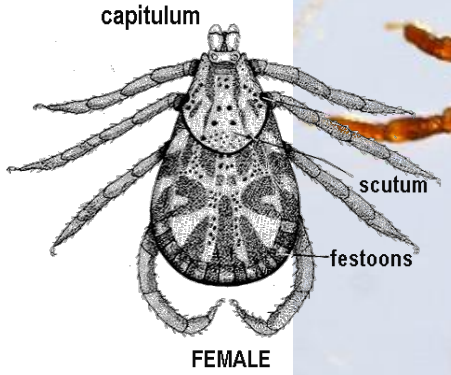
- **Adult (size ~1 - 9 mm)**





MALE

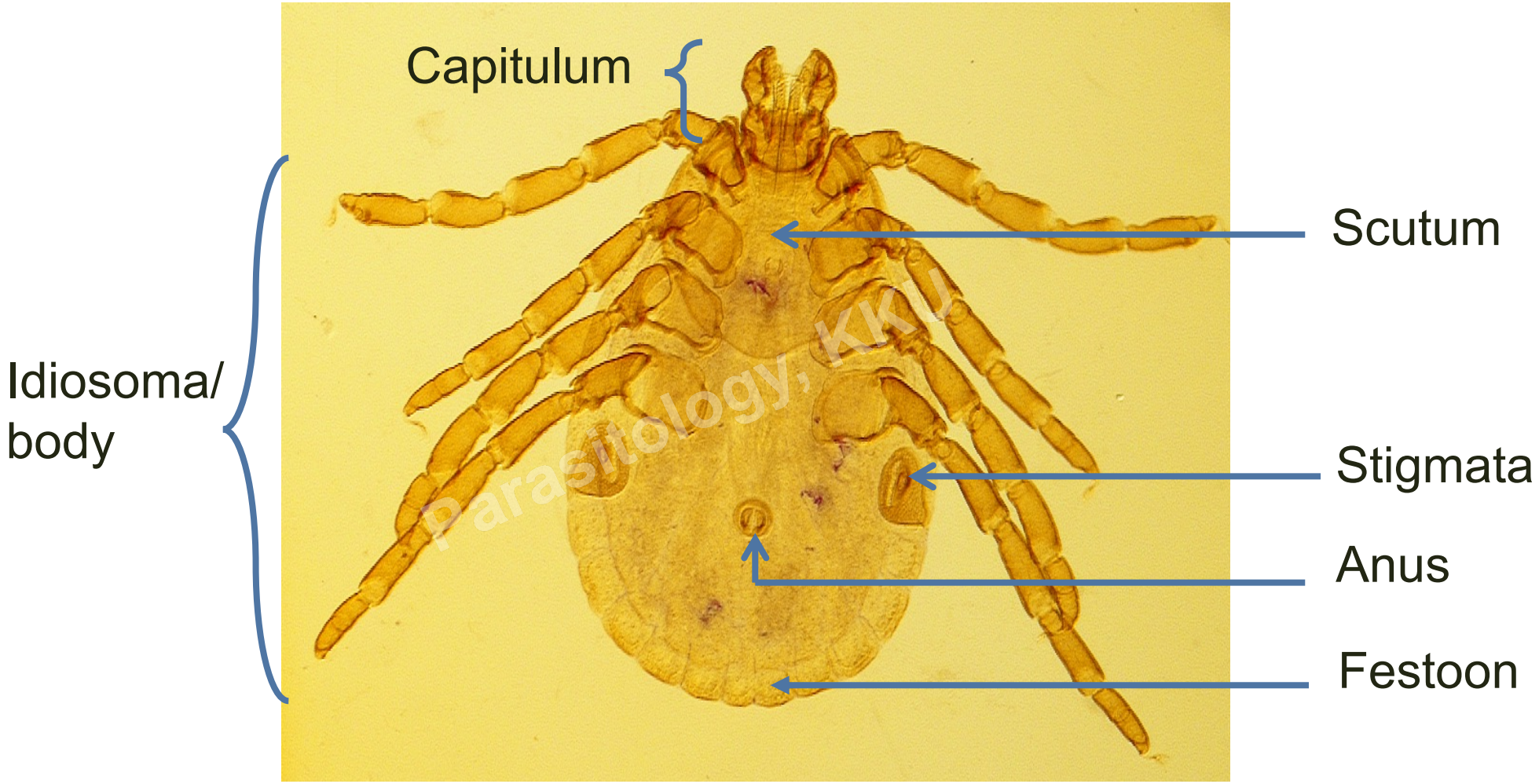
(Service, 2004 : 223)



FEMALE

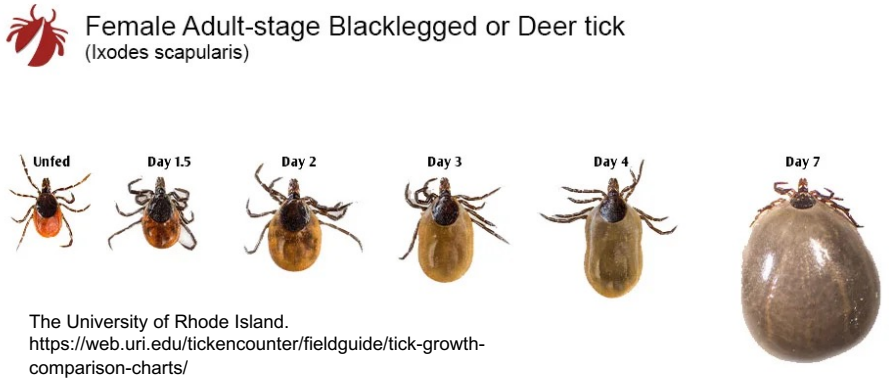
Ixodid or Hard tick (*Ixodes* spp.)

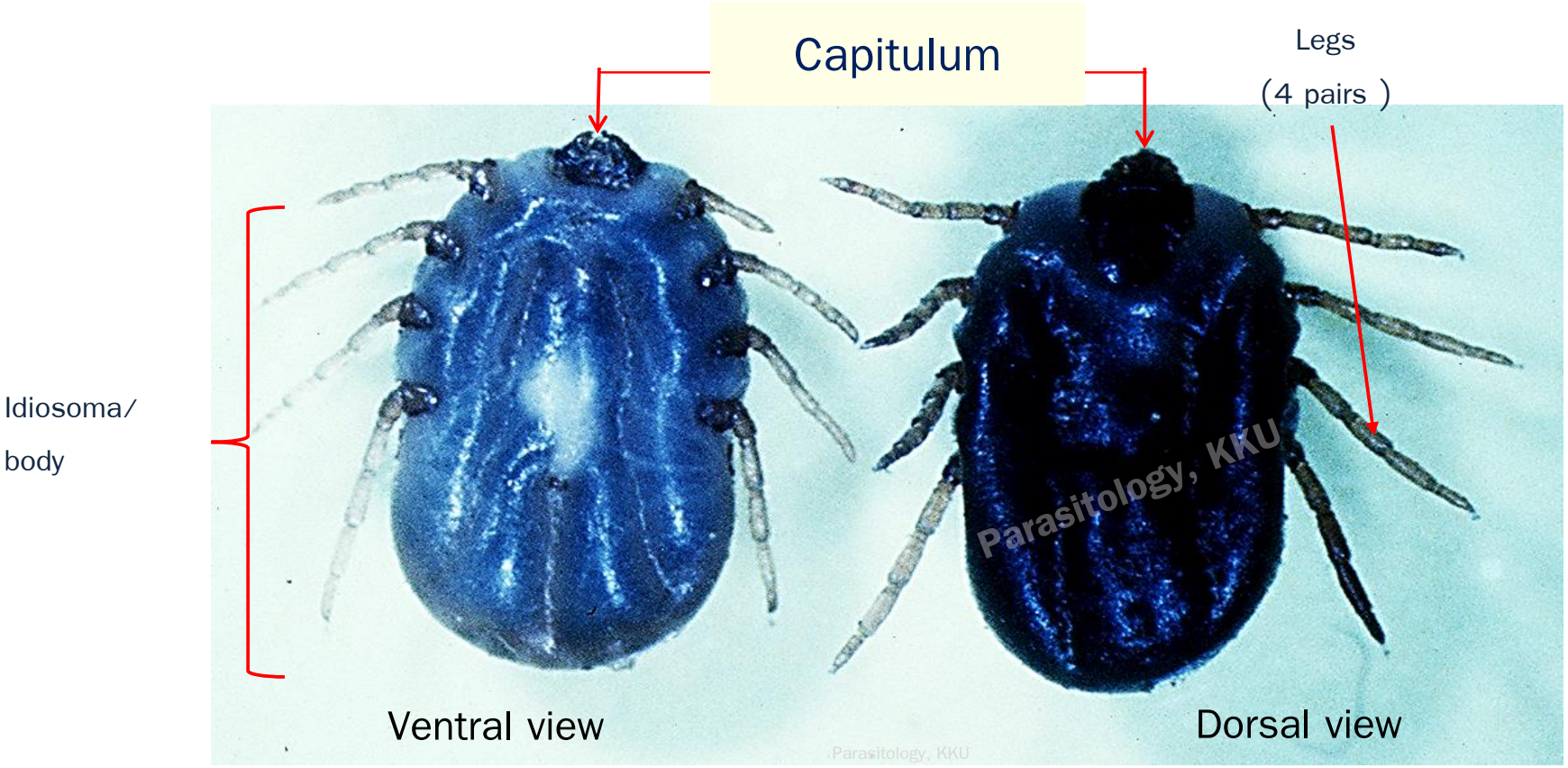
- **Adult (size ~1 - 9 mm)**



Hard tick (*Ixodes* spp.)

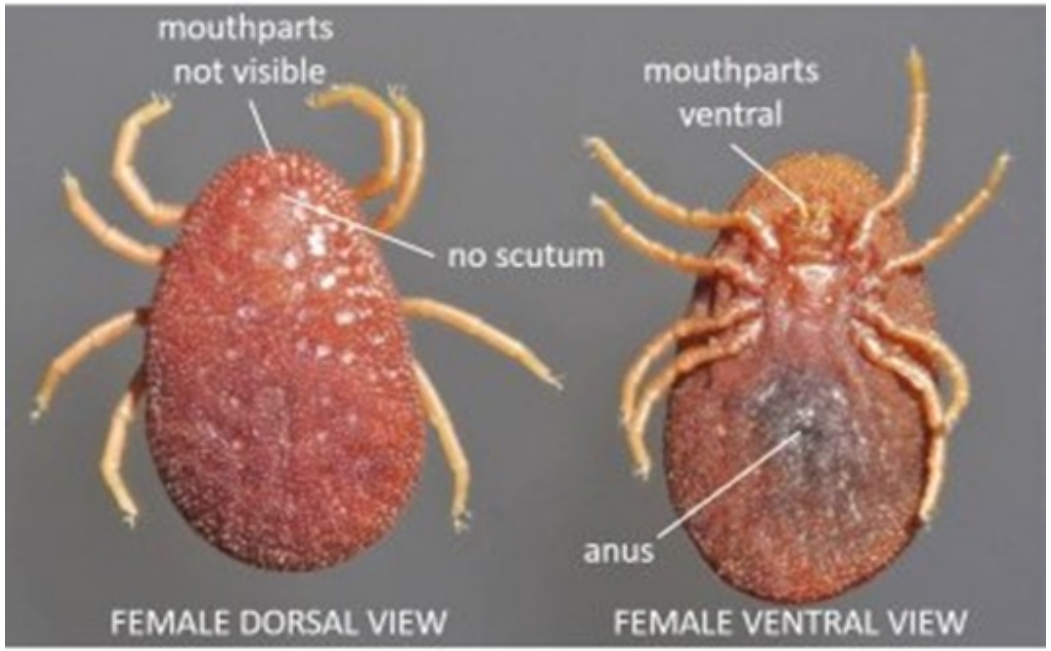
- **Engorged adult (size ~1 - 9 mm)**





Argasid or Soft tick (*Argus* spp.)

- **Adult (size ~1 - 9 mm)**



Photograph courtesy of Daktaridudu [CC BY-SA] Wikimedia Commons.

Capitulum is not seen
when look on **dorsal view**

Argasid or Soft tick (*Argus* spp.)

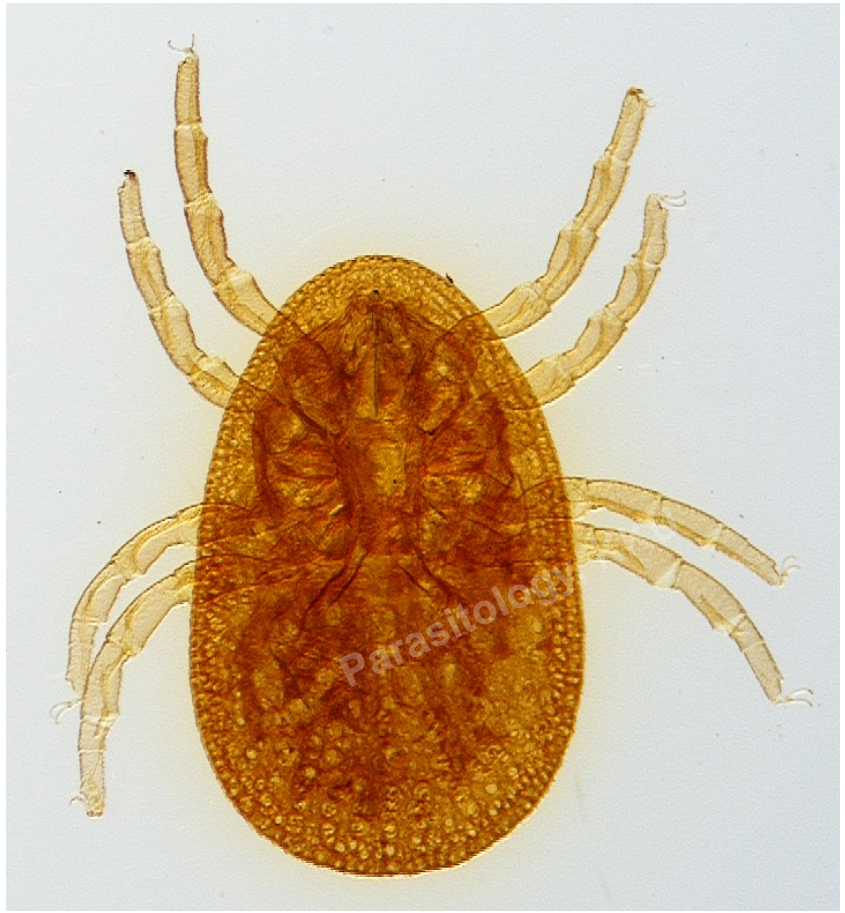
- **Adult (size ~1 - 9 mm)**

PIC: CDC

Capitulum is not seen
when look on **dorsal view**

Argasid or Soft tick (*Argus* spp.)

- **Adult (size ~1 - 9 mm)**

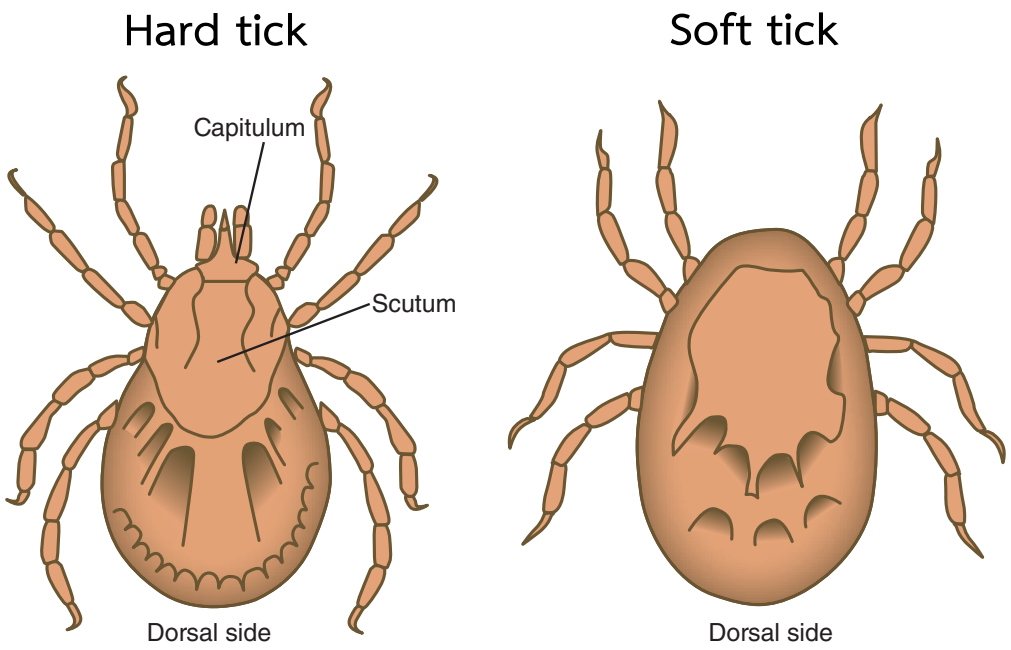


Dorsal view

Ventral view

Hard tick vs soft tick

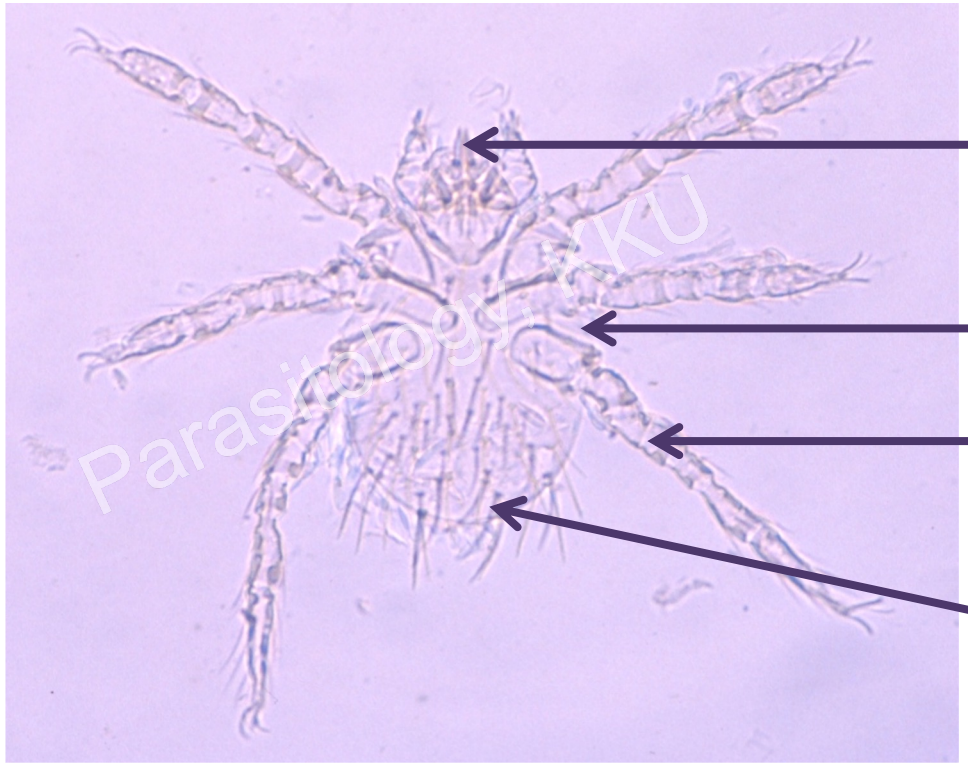
	Ixodid or Hard ticks	Argasid or Soft ticks
Capitulum	Visible dorsally	Not Visible dorsally
Scutum	✓	x
Festoon	✓	x



Gockel-Blessing EA. Clinical Parasitology 2013.

Trombicula mite - (*Trombicula* sp.)

- Larva or **chigger** (size 0.1 – 0.3 mm)

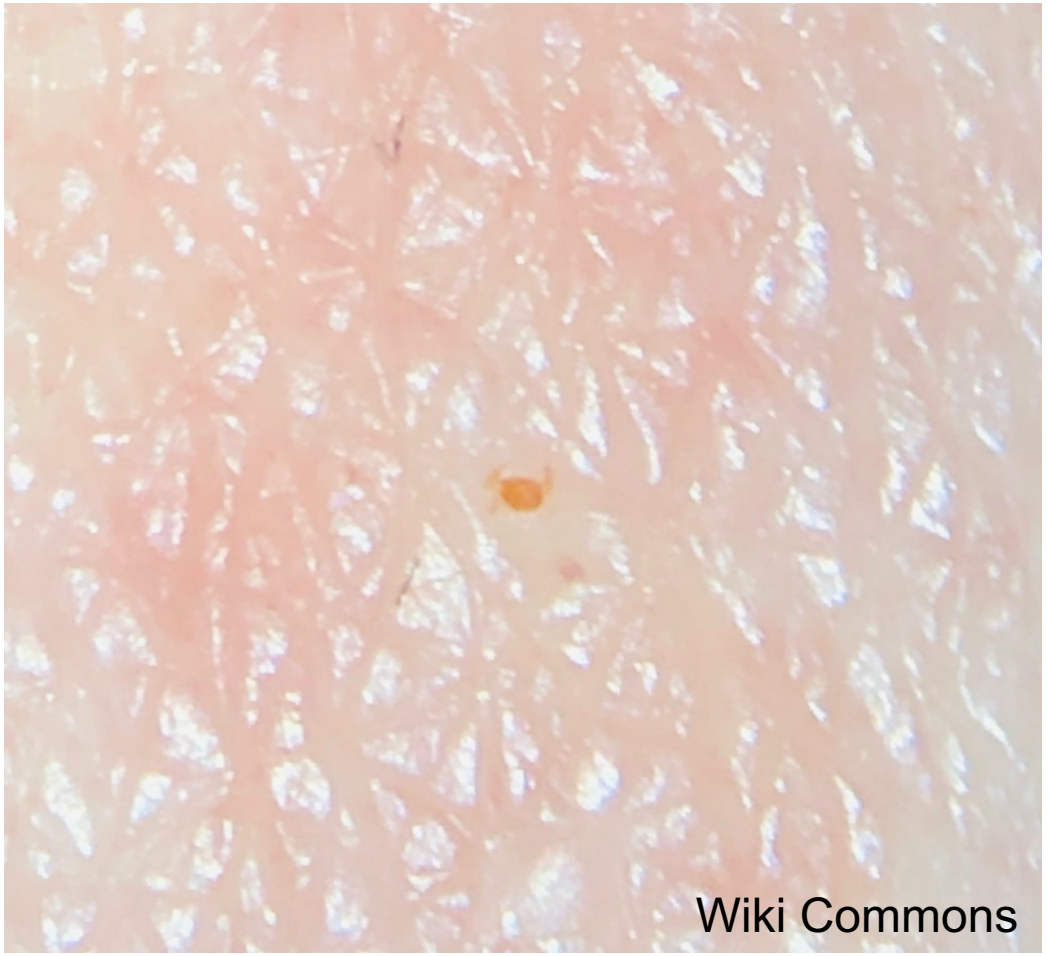



https://www.wikilectures.eu/w/Trombidiasis

Harvest mite
Adult size 1-2 mm.

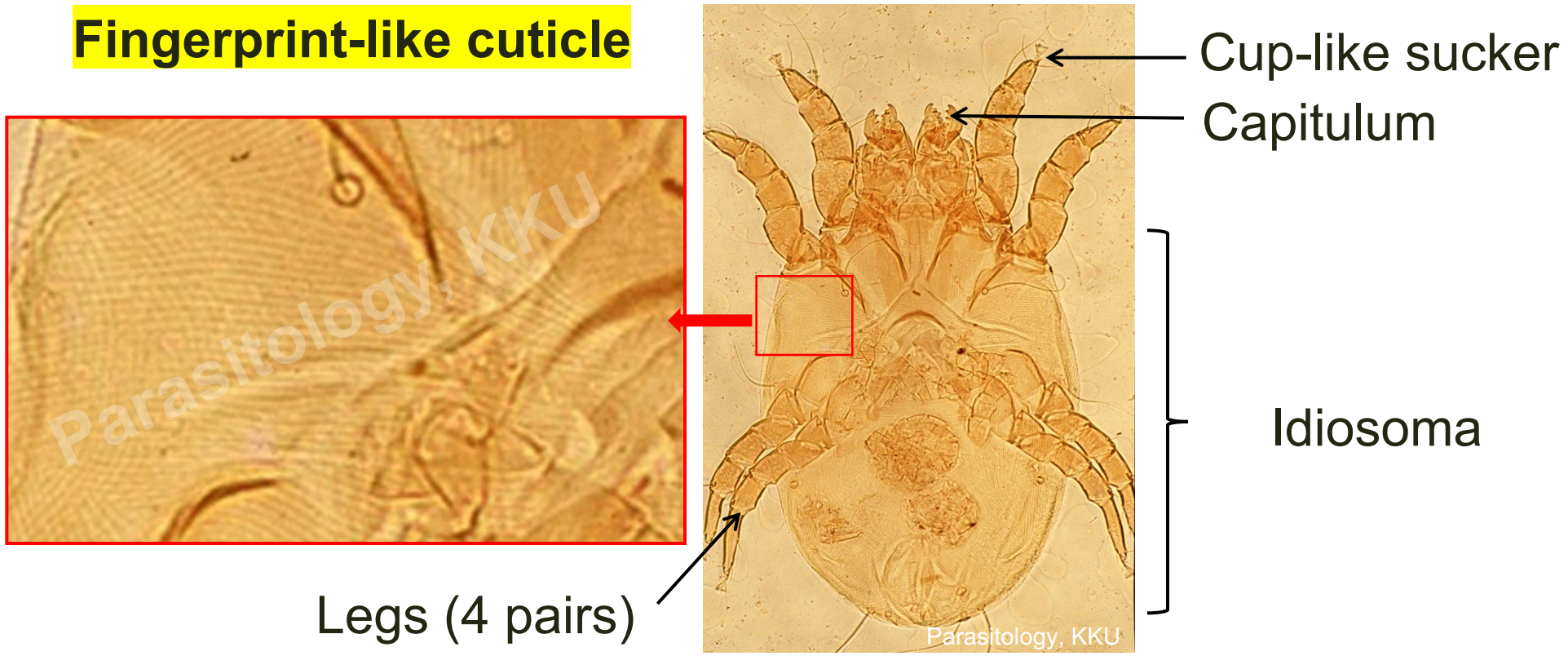
Trombicula mite - (*Trombicula* sp.)

- A trombiculid mite larva attached to human skin



House dust mite (*Dermatophagoides* spp.)

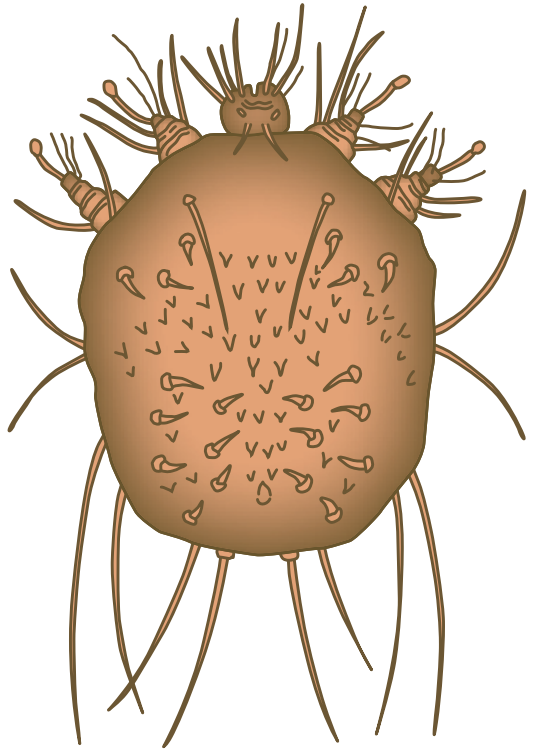
- Adult (size: ~ 0.1- 0.3 mm)



Scabies mite – *Sarcoptes scabiei* (หิด)

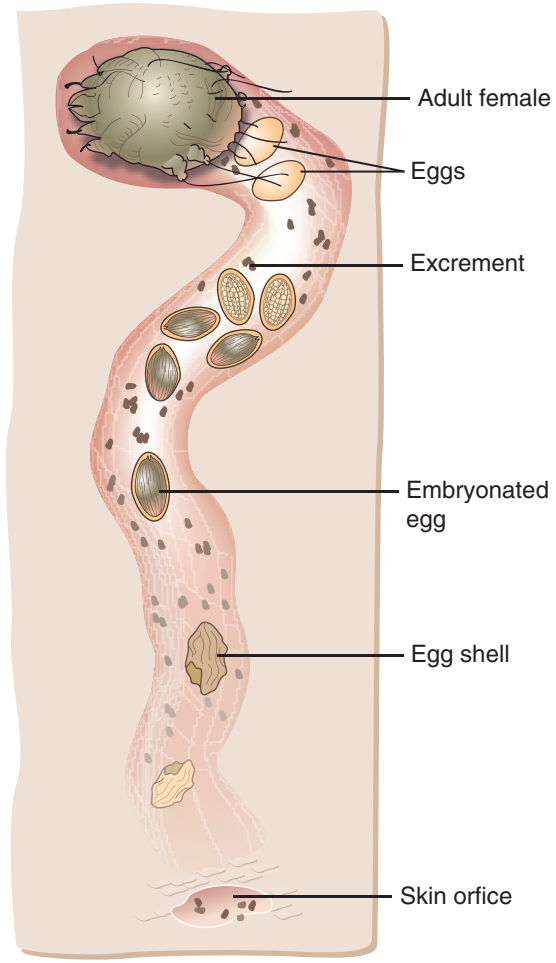
- Stage: adult (size ~ 0.2 - 0.45 mm)

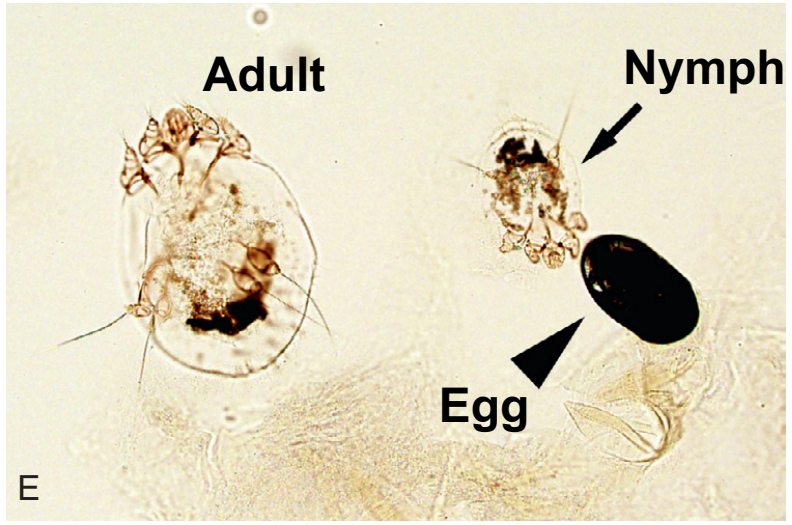
Gockel-Blessing EA. Clinical Parasitology 2013.

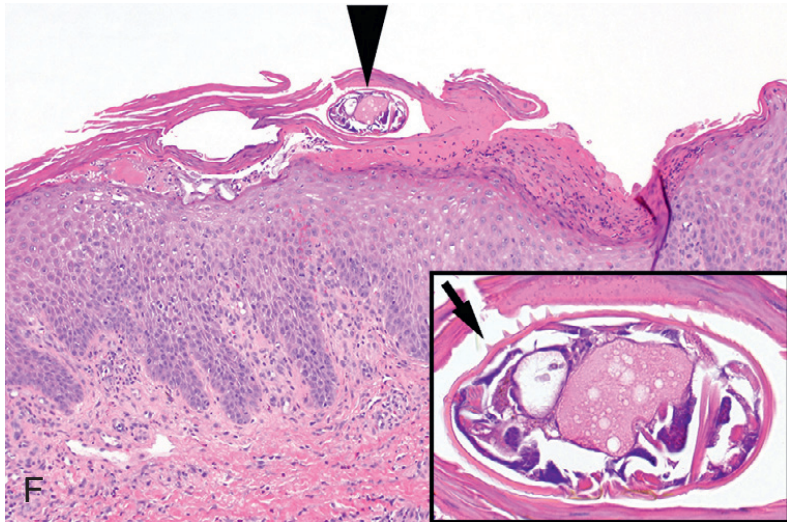


- **Ovoid**
- **Tortoise-like body**

Scabies mite



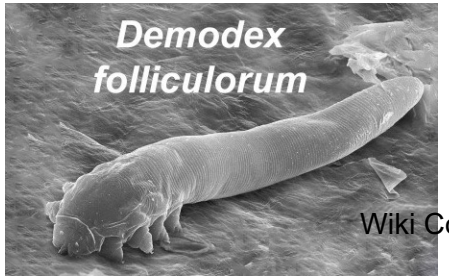




- Skin scaping for scabies protocol: https://www.wadsworth.org/sites/default/files/WebDoc/696367798/scabies%20instructions%20v%203.pdf

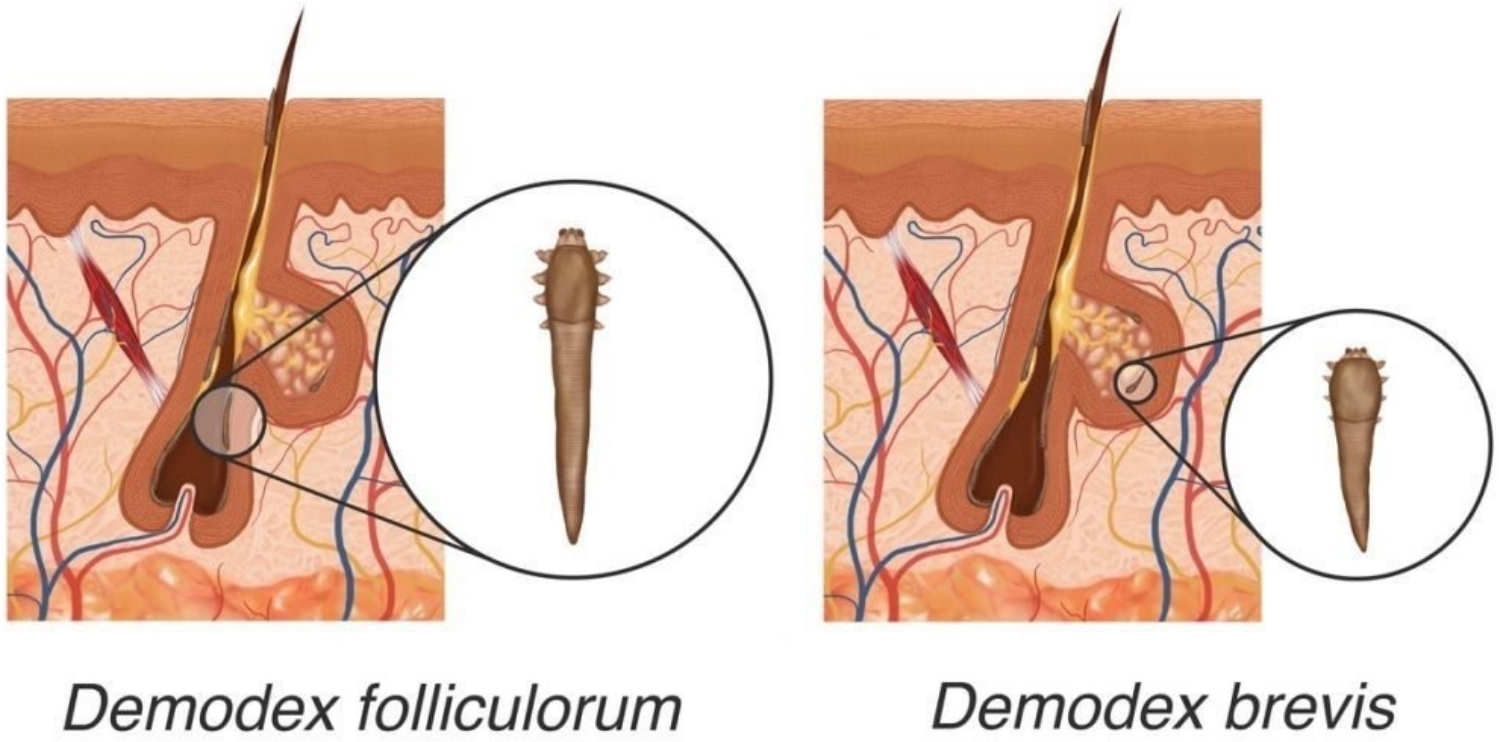
PIC:
Blaine A. Mathison and Bobbi S. Pritt. Parasitology. In: Rifai N, editor. Tietz Textbook of Laboratory Medicine. St. Louis, Missouri: Elsevier; 2023.
McPherson RA, Pincus MR, eds. Henry's clinical diagnosis and management by laboratory methods. 24th ed. Philadelphia: Elsevier; 2022.

Follicle mite (*Demodex* spp.)



Wiki Commons

- Stage: adult (permanent slide)
- Size: *D. folliculorum* 0.3-0.4 mm in length, *D. brevis* 0.15-0.2 mm length



https://www.ungexau.com/en/more-about-mites/

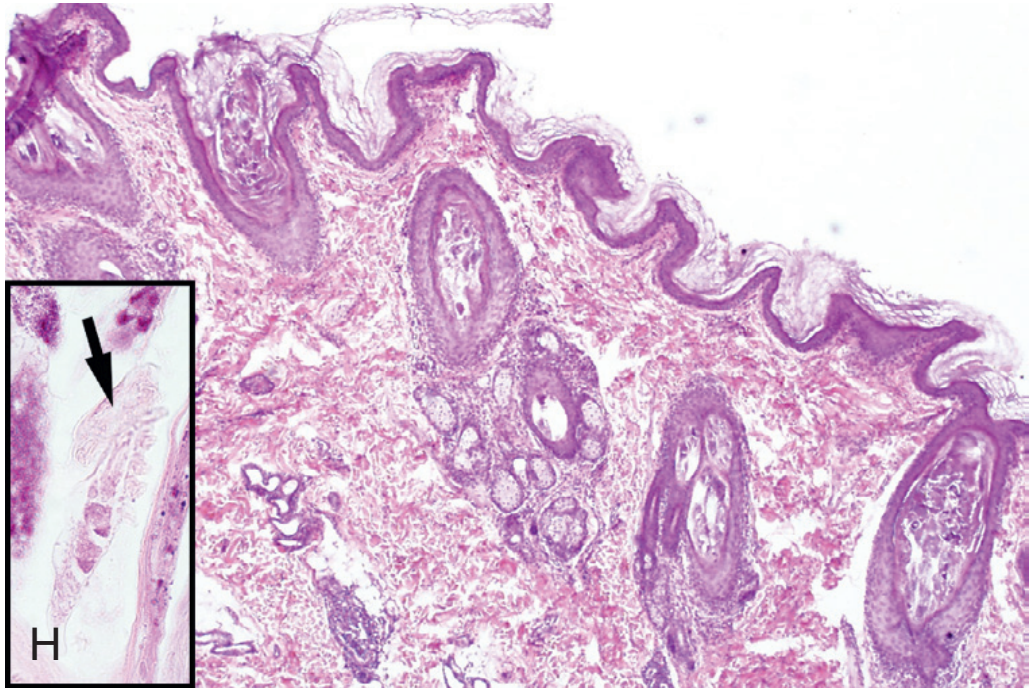
D. folliculorum

Carly A. Elston, Dirk M. Elston. Clinics in Dermatology, 2014.

D. brevis

Follicle mite (*Demodex* spp.)

- *D. folliculorum* adult mite and *D. folliculorum* mites within hair follicles in histologic section



PIC: Blaine A. Mathison and Bobbi S. Pritt. Parasitology. In: Rifai N, editor. Tietz Textbook of Laboratory Medicine. St. Louis, Missouri: Elsevier; 2023.

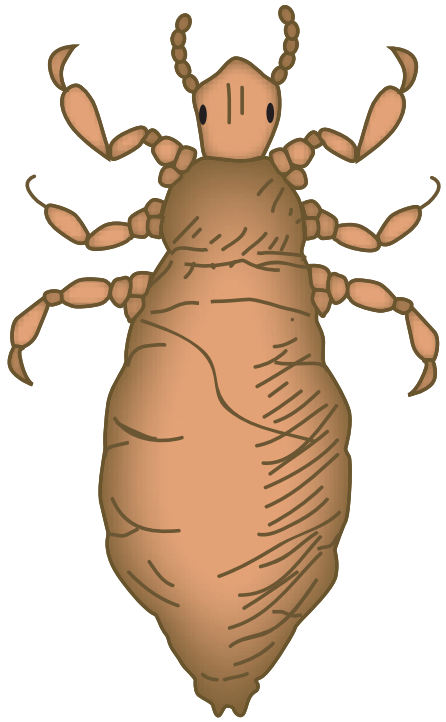
Human lice (plur.) or louse (sing.) (เหาและโลน)

	Head lice	Body lice	Pubic lice
	Pediculus humanus capitis	*Pediculus humanus humanus*	*Pediculus pubis*
	Pediculosis capitis	Pediculosis corporis	Phthiriasis or Pediculosis pubis
			

Human lice

	Head lice	Body lice	Pubic lice
	Pediculus humanus capitis	***Pediculus humanus humanus***	***Pediculus pubis***
	Pediculosis capitis	**Pediculosis corporis**	**Phthiriasis or Pediculosis pubis**
Size	Female: 2.4 -3.3 mm	Female: 2.4 -3.6 mm	Female: 1 – 2 mm
Habitat	Hair and scalp	Body and clothing	Genital area
	Morphological similar		Distinct morphology
	Non-disease-carrying	Vector for epidemic typhus, trench fever, and relapsing fever	Non-disease-carrying

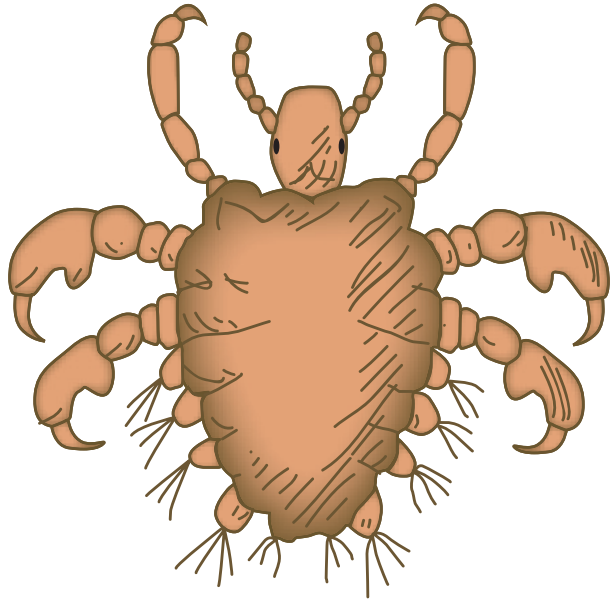
Human lice



- Narrow thorax
- 6 segments of abdomen
- 1 Spiracle each abdomen
- Size of all legs are similar
- Without lateral process
- Abdomen elongate
- Size 2-4 mm.

Gockel-Blessing EA. Clinical Parasitology 2013.

Pediculus humanus
Head lice and body lice



- Wide thorax
- 4 segments of abdomen
- 3 Spiracles at 1st abdomen
- Forelegs; smaller
- Other legs; bigger
- With lateral process
- abdomen very short and broad
- Size 1.5-2 mm.

Gockel-Blessing EA. Clinical Parasitology 2013.

Pediculus pubis
Pubic lice or crab lice

Pediculus humanus capitis (Head louse)

- Adult (2-3 mm.)

Male

Female

Antenna

Legs (3 pairs) with claw

Spiracle (1 per abd. Segment)

Character

- Dorsoventrally flattened
- Wingless
- Small eyes
- Head is smaller than thorax
- Male: pointed end of the abdomen
- Female: W-shaped at the end of abdomen

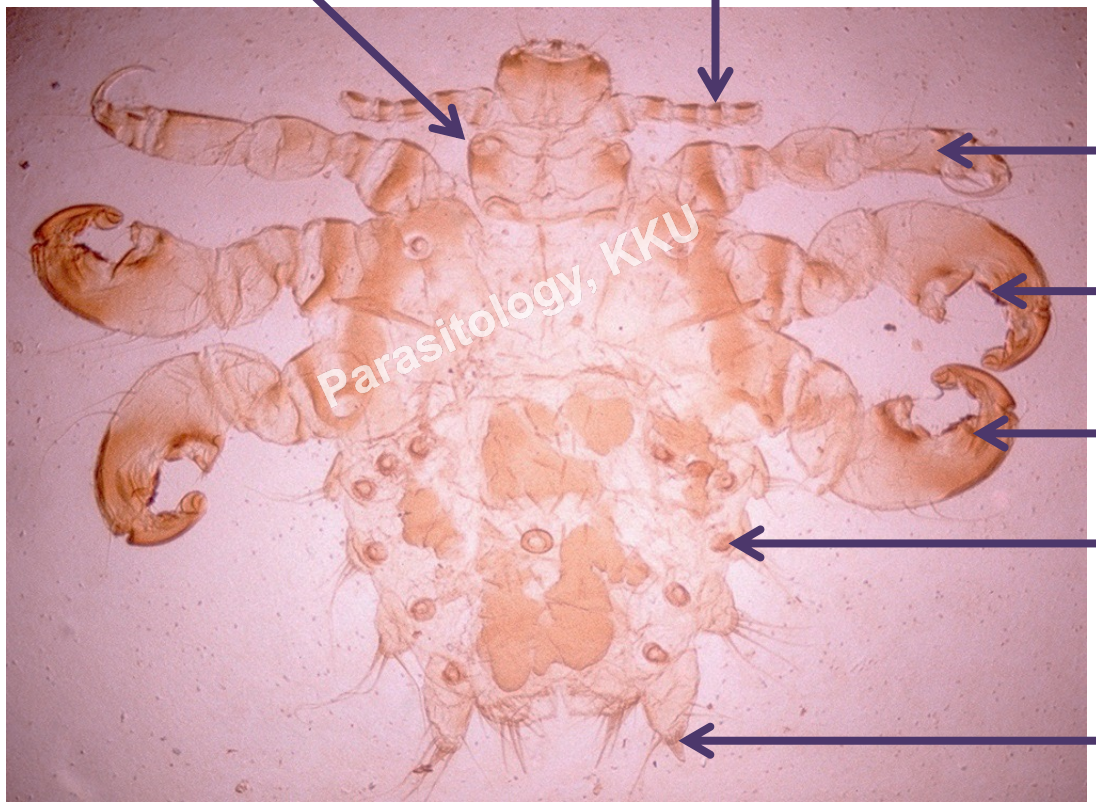
Pediculus humanus capitis

- Egg (size: 0.3 – 0.5 mm)

Source: P Chin-Hong, E.A.Joyce, M. Karandikar, M. Matloubian, L.A. Rubio, B.S. Schwartz, W. Levinson Levinson's Review of Medical Microbiology & Immunology, A Guide to Clinical Infectious Diseases, 18th Edition: Copyright © McGraw Hill. All rights reserved.

Pediculus pubis or *Phthirus pubis*

Thoracic segment is very wide



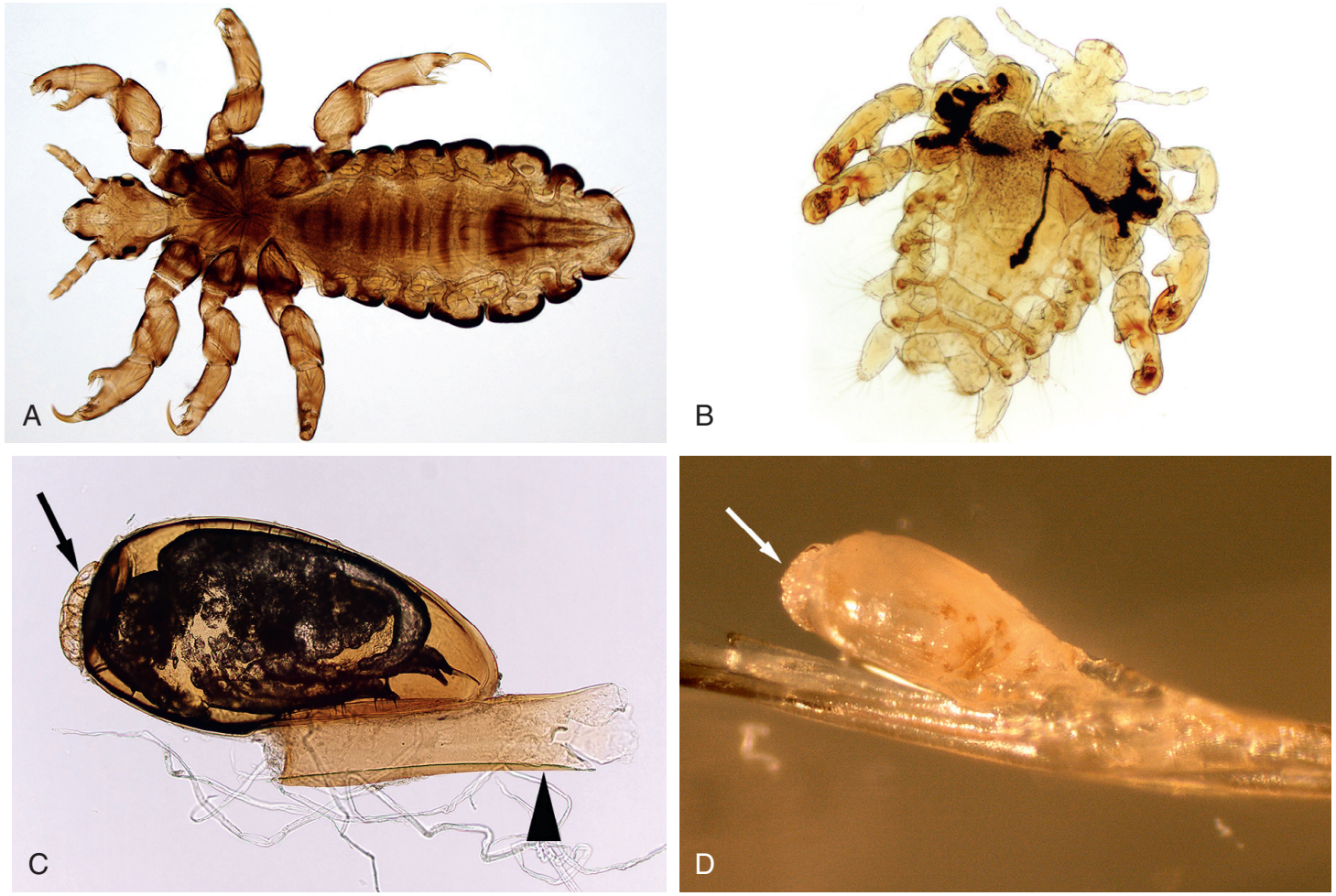
First pair of legs thinner than second and third pairs

Claw

Spiracle (3 spiracles at 1st abdominal segment)

Lateral process

Head louse vs Pubic/Crab louse

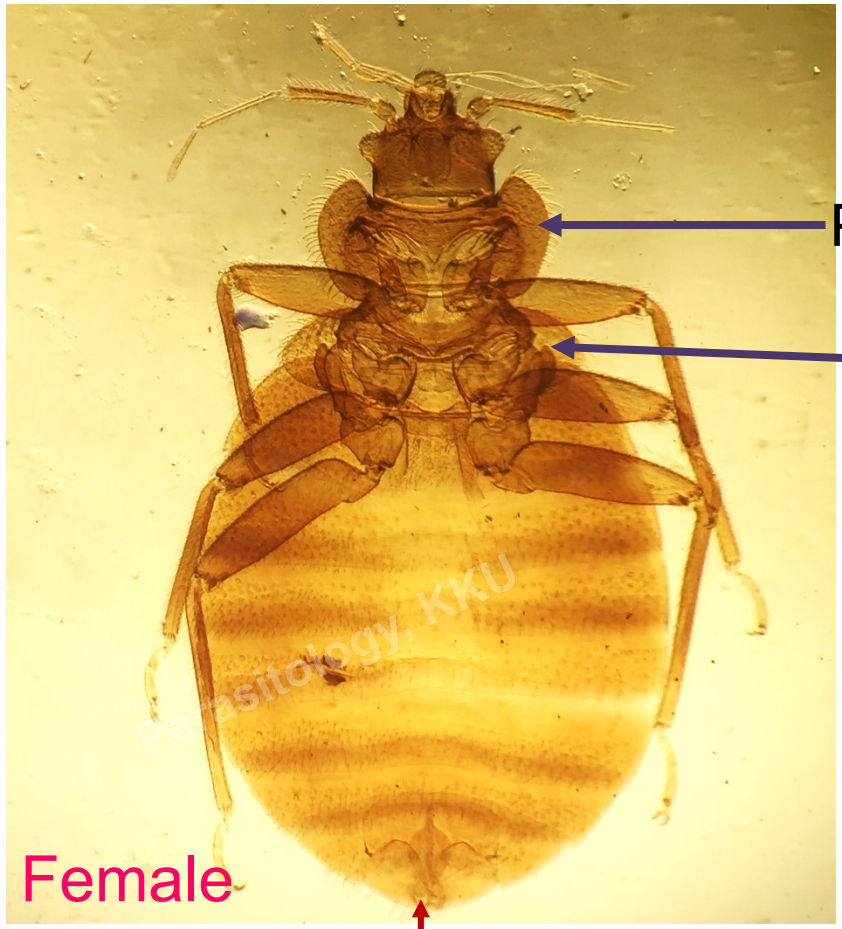


PIC: Blaine A. Mathison and Bobbi S. Pritt. Parasitology. In: Rifai N, editor. Tietz Textbook of Laboratory Medicine. St. Louis, Missouri: Elsevier; 2023.

Bed bug (*Cimex* spp.)

- Adult (~4-6 mm)
  - Brownish color
  - Hemelytra wings (but rudimentary wings)
  - Dorsoventrally flattened

Cimex hemipterus
(Tropical bed bug)



Bed bug (*Cimex* spp.)

- Adult (~4-6 mm)
  - Brownish color
  - Hemelytra wings (but rudimentary wings)
  - Dorsoventrally flattened

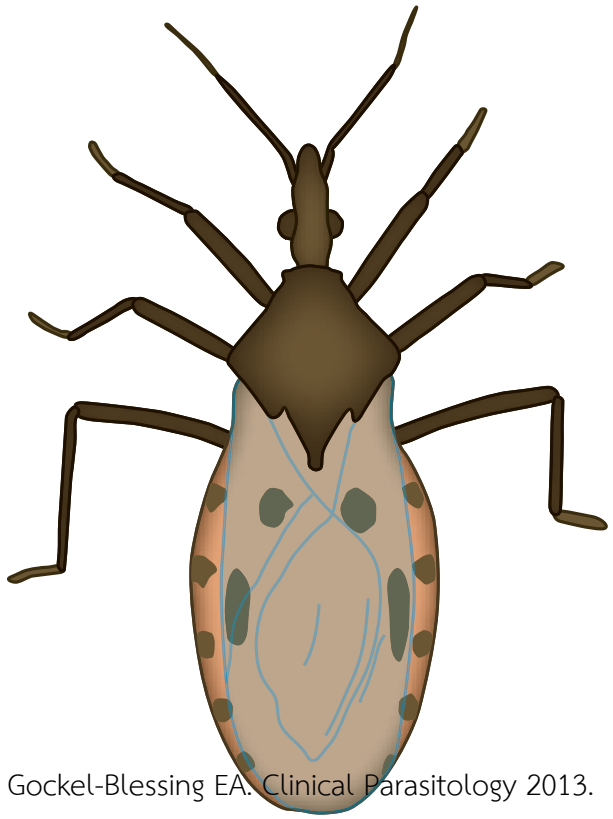
Cimex hemipterus
(Tropical bed bug)

Curved tip of abdomen

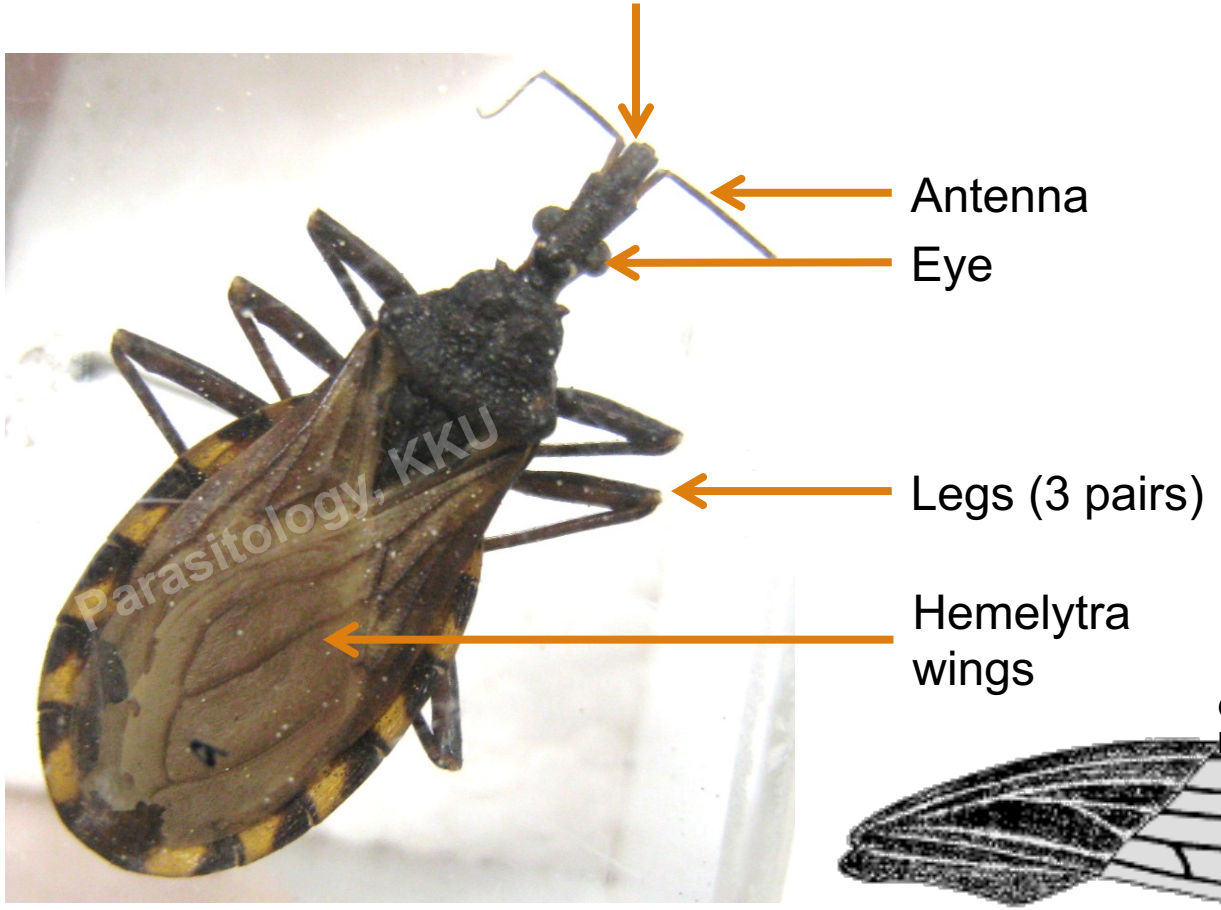
Triatomine bugs, Cone nose bug, Kissing bug (มวน)

- Adult (1-2 cm)

The region in front of the eyes is cylindrical to conical shape.



Gockel-Blessing EA. Clinical Parasitology 2013.

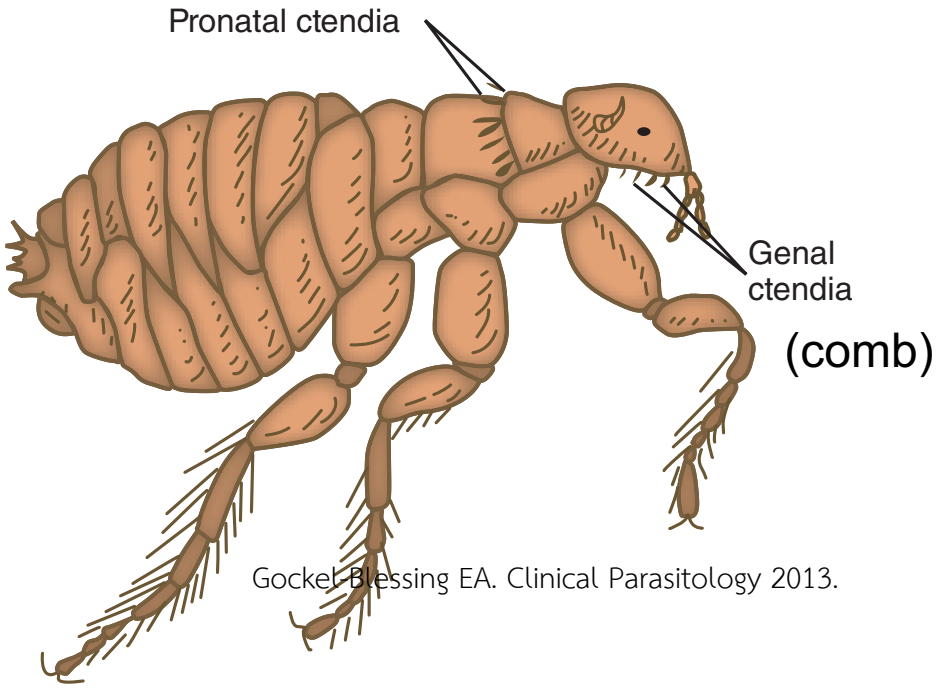


General Entomology
NC State University

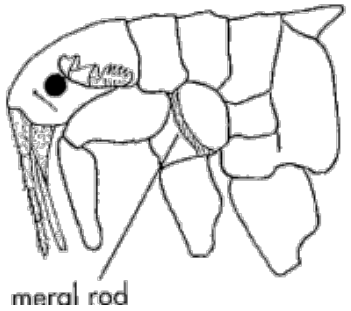
Hemelytra

Fleas

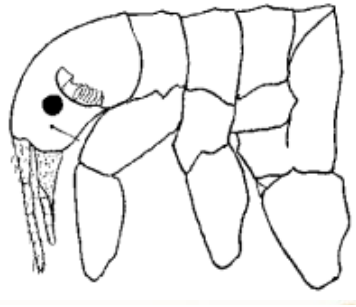
- Small insect, wingless
- Piercing–sucking mouthparts
- Size ~1-9 mm. long
- Laterally flatten
- The pair of hind limbs well adapted for jumping.



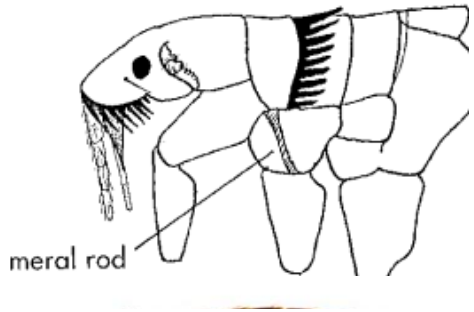
- Species:
  - Oriental Rat flea: *Xenopsylla cheopis*
  - Human flea: *Pulex irritant*
  - Dog flea: *Ctenocephalides canis*
  - Cat flea: *Ctenocephalides felis*



Xynopsylla



Pulex

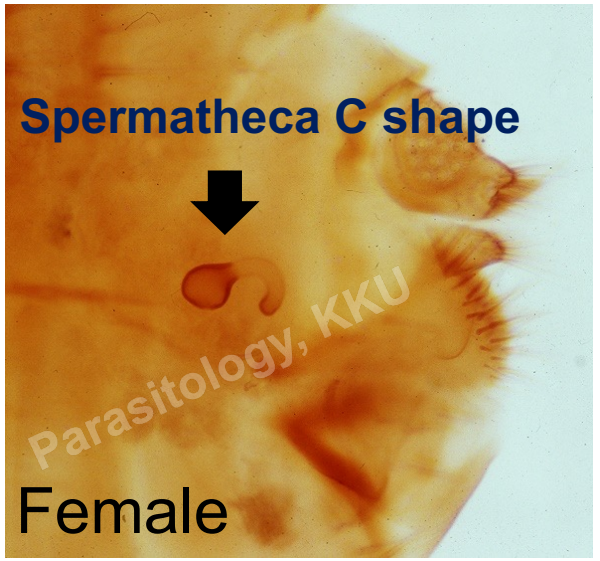


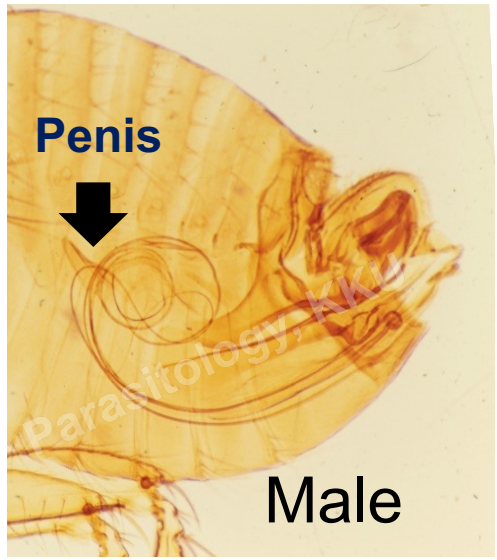
Ctenocephalides

Dog flea (*Ctenocephalides canis*)

- Adult (1-8 mm)

C. canis* and *C. felis* are very similar in morphology and difficult to distinguish





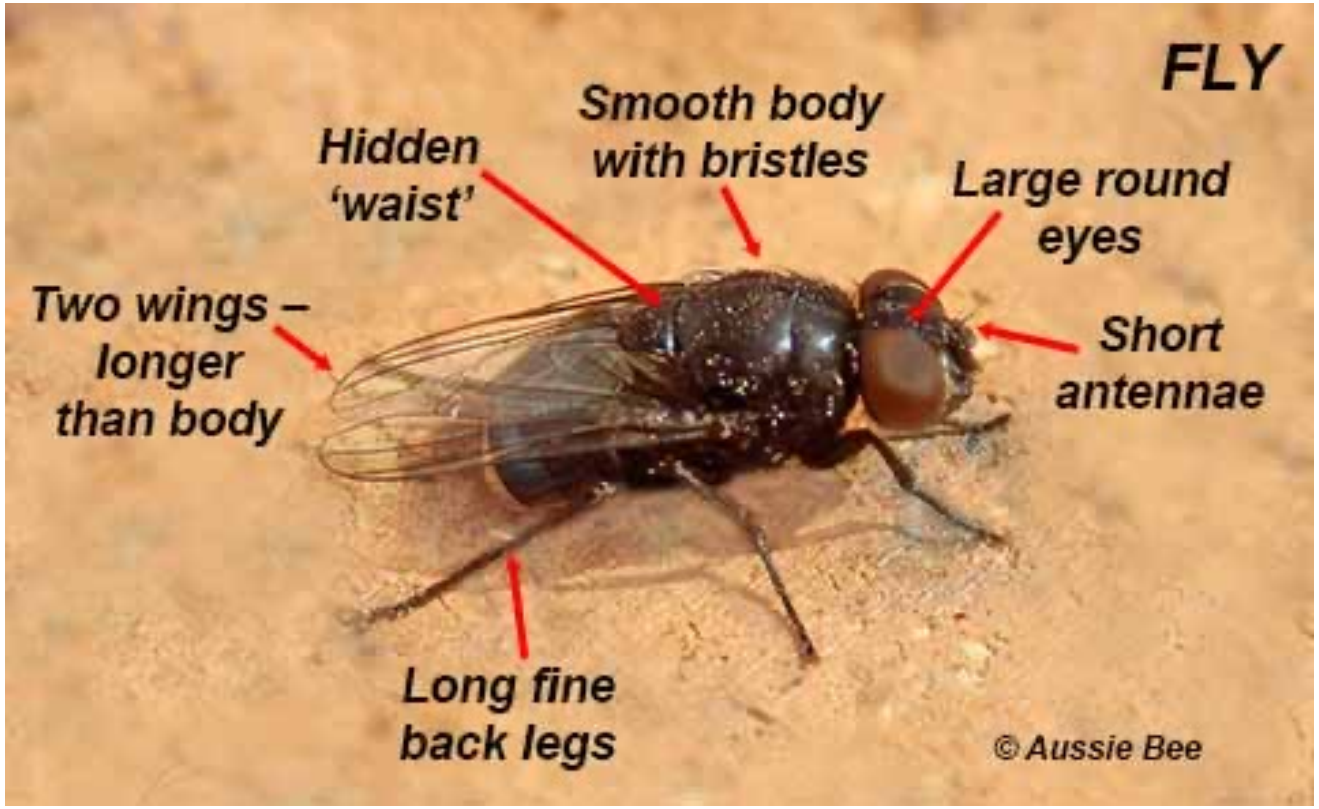
Oriental rat flea (*Xenopsylla cheopis*)

- Adult (1-8 mm)

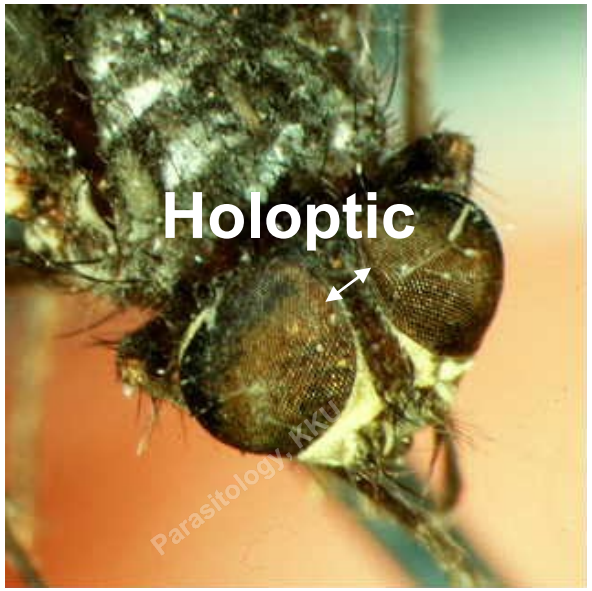
No pronotal comb
and genal comb

Flies

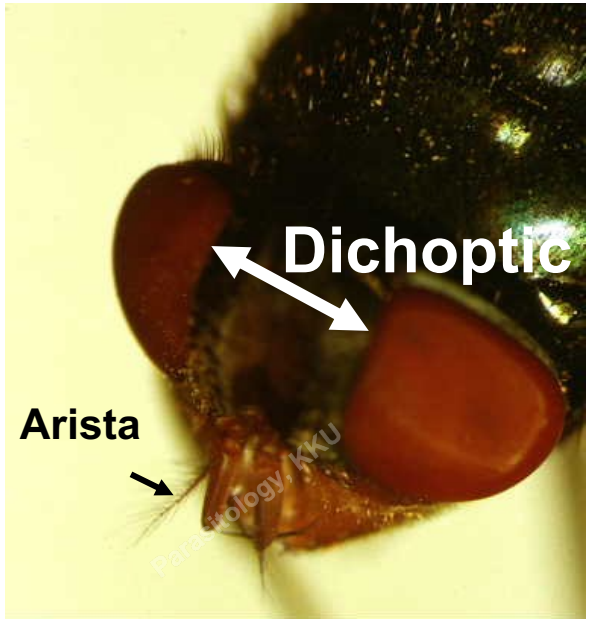
- Adult



Ref: Australian Native Bee Research Centre



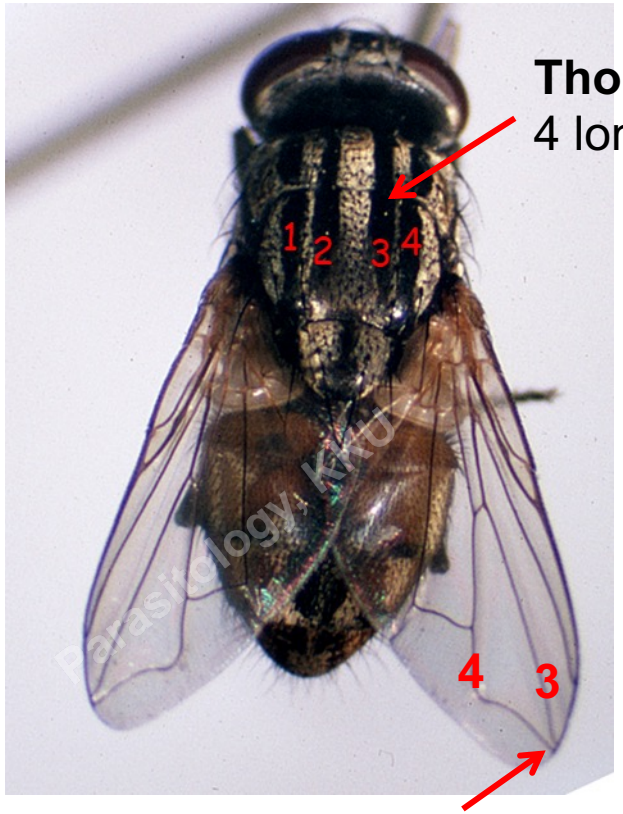
Male



Female

Common house fly

- ***Musca domestica***

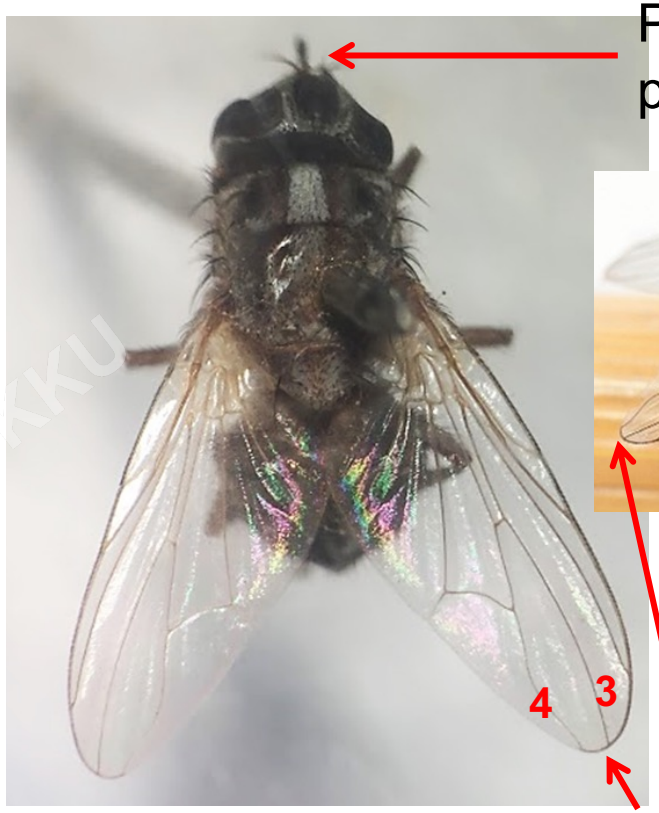


Thorax:
4 longitudinal stripes

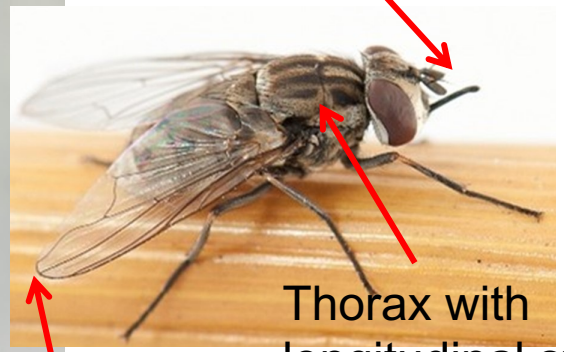
The 4th wing vein
close to the 3rd vein

Stable fly

- ***Stomoxys calcitrans***



Piercing-sucking
proboscis



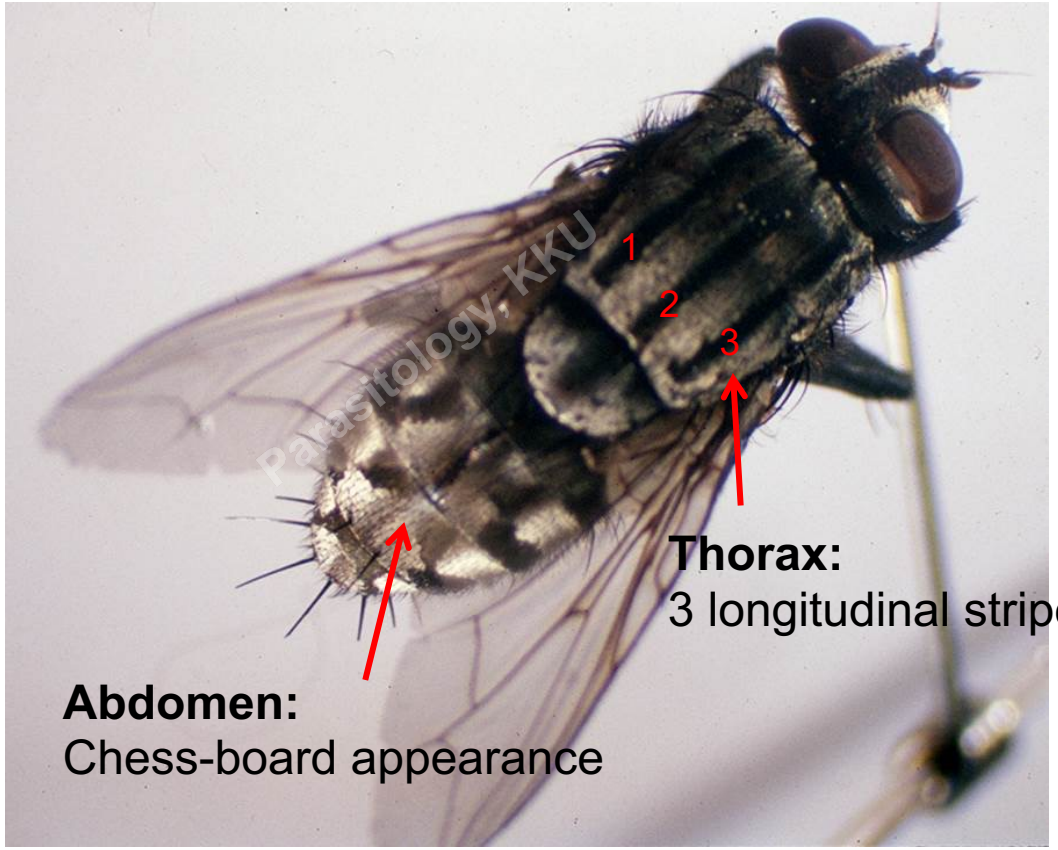
Thorax with
longitudinal stripes

PIC:
https://www.capel.wa.gov.au/services/health-environment/stable-fly.aspx

The 4th wing vein
not close to the 3rd vein

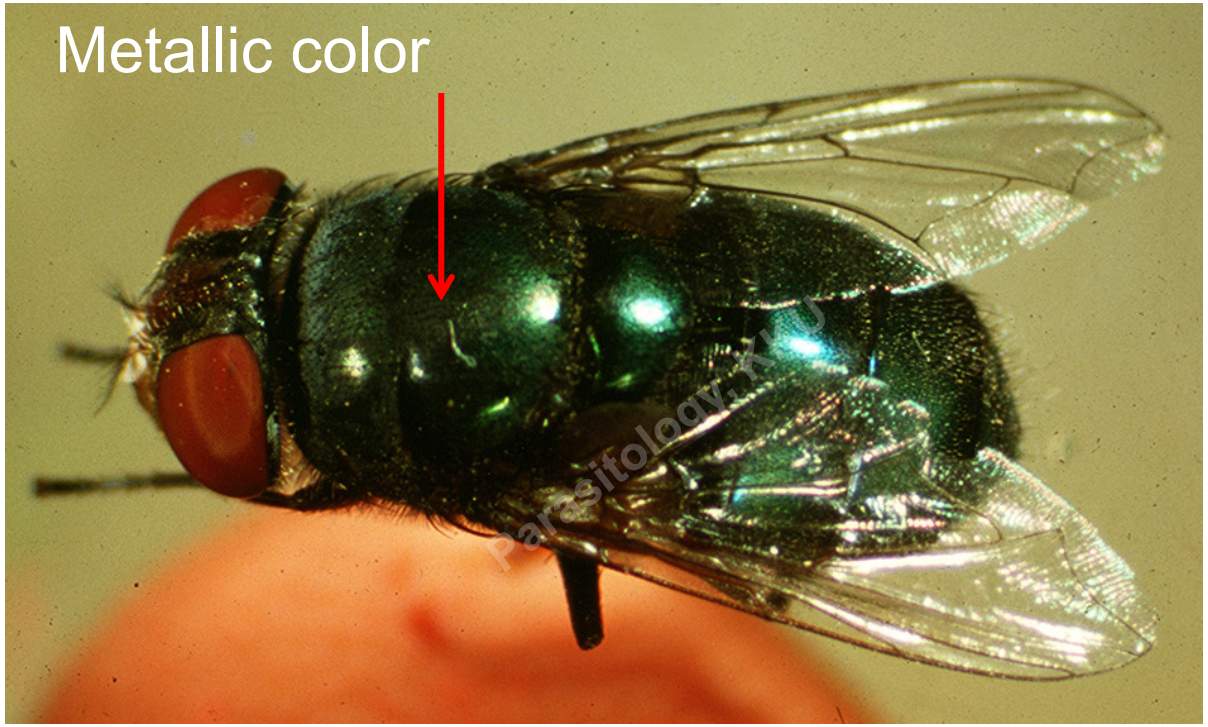
Fresh fly

- ***Sarcophaga* sp.**



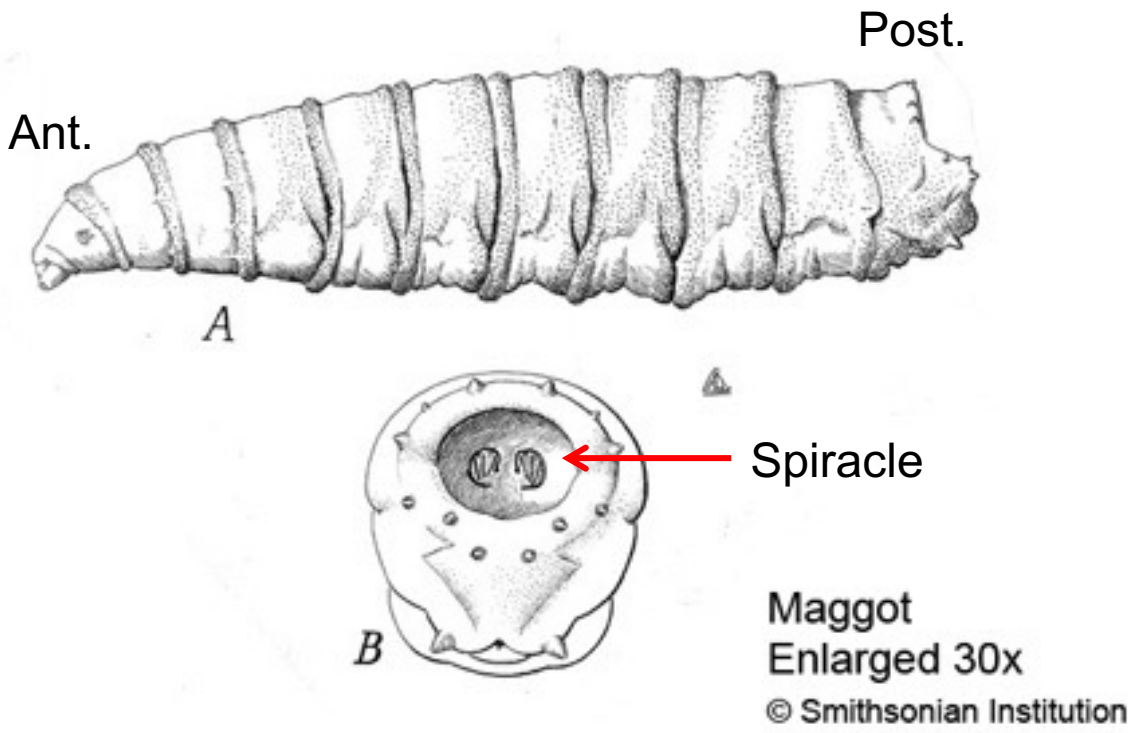
Blow fly

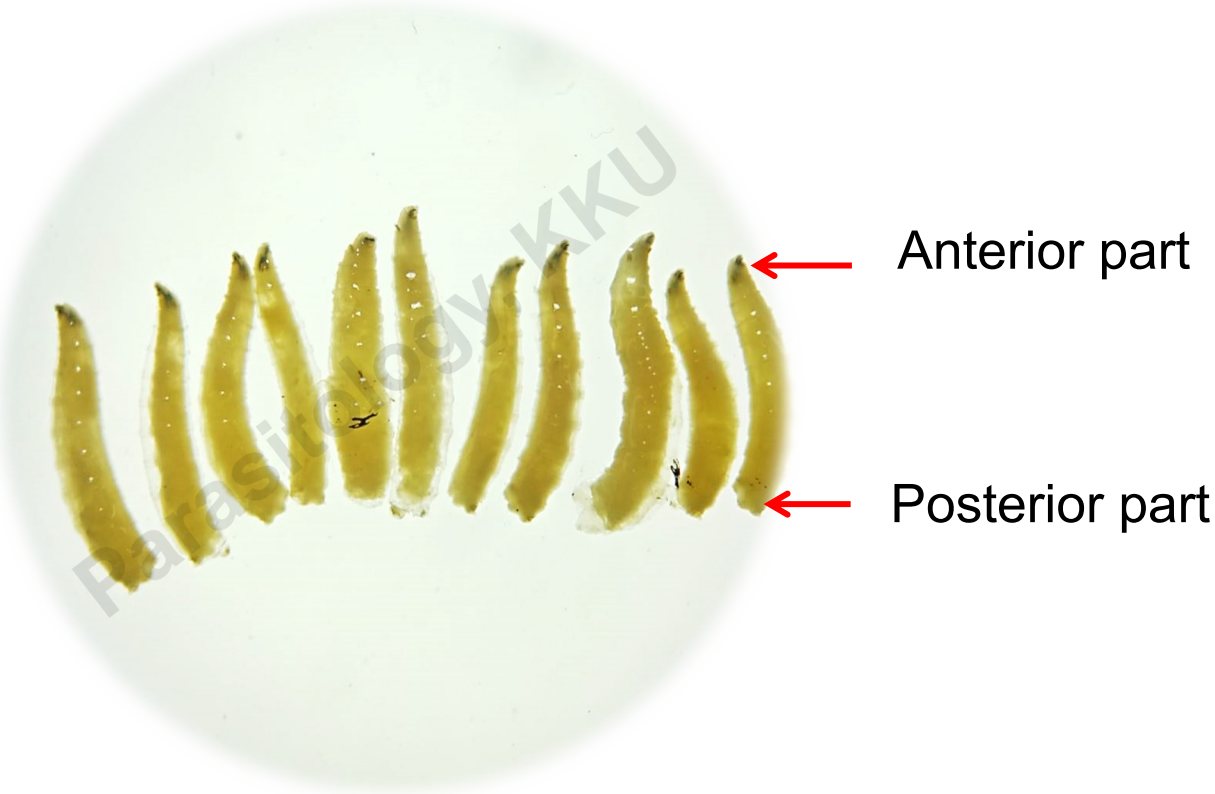
- ***Chrysomyia* sp.**



Flies

- Maggot

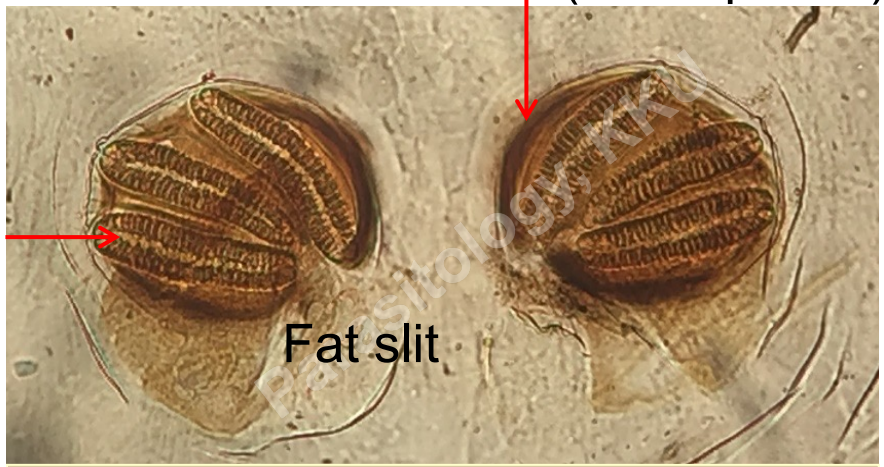




Posterior spiracle of meggot

Common house fly

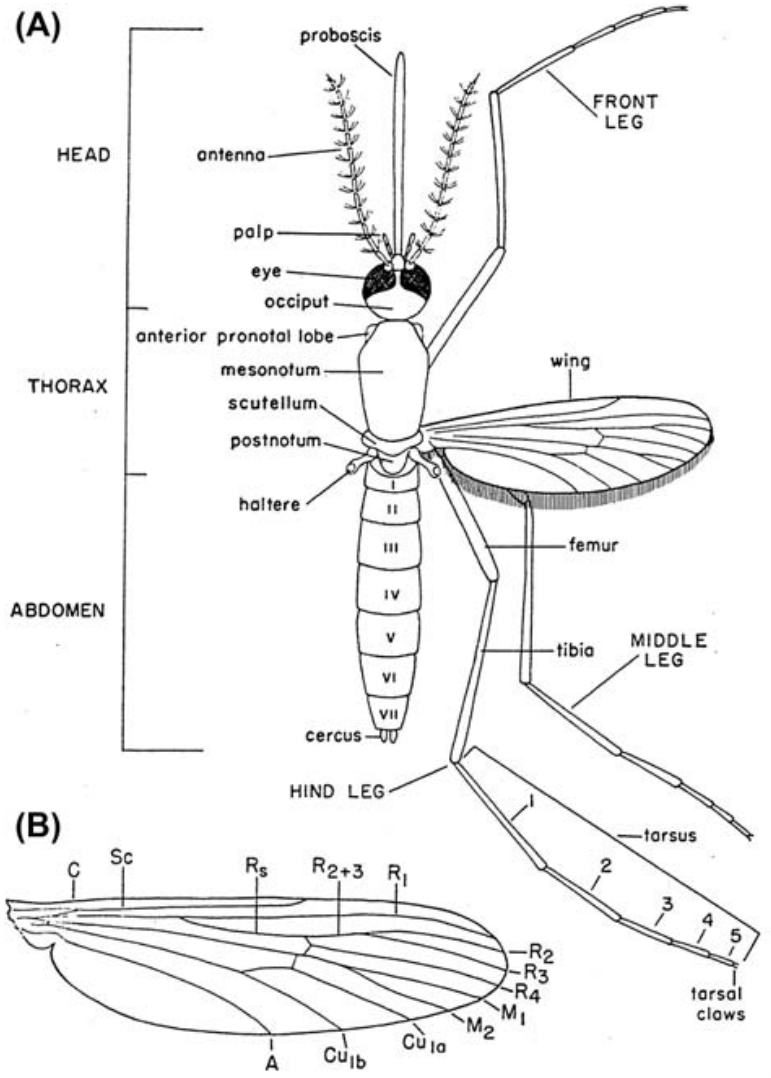
Flesh fly



Blow fly

Mosquitoes (Family: *Culicidae*)

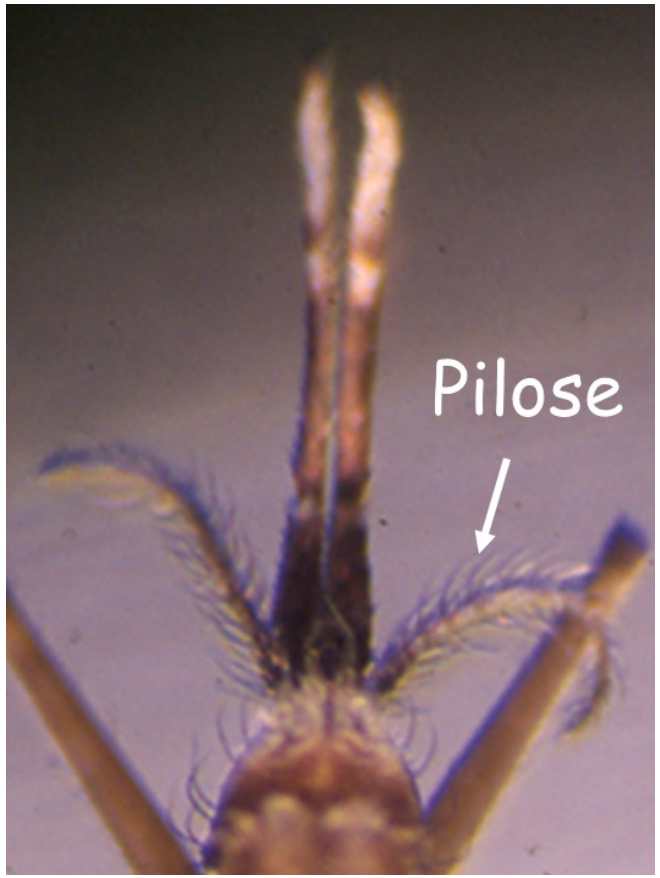
- 2 subfamilies
- Subfamily: *Anophelinae*
  - Genus: *Anopheles* (ยุงก้นปล่อง)
- Subfamily: Culicinae
  - Genus: Culex (ยุงรำคาญ), Aedes (ยุงลาย), Mansonia (ยุงเสือ/ยุงแมนโซเนีย)

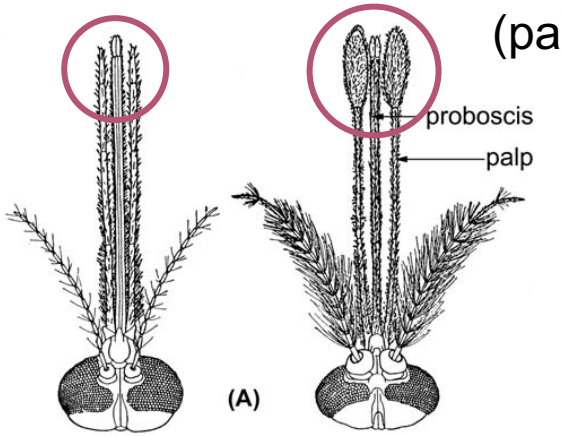


Gary R. Mullen, Lance A. Durde, eds. Medical and Veterinary Entomology, 2018.

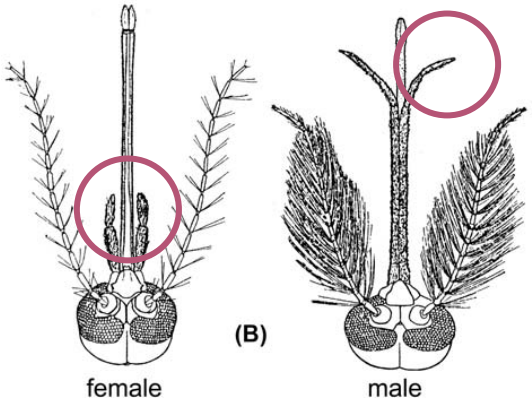
Mosquitoes (Family: *Culicidae*)

(palpus; pulpi)

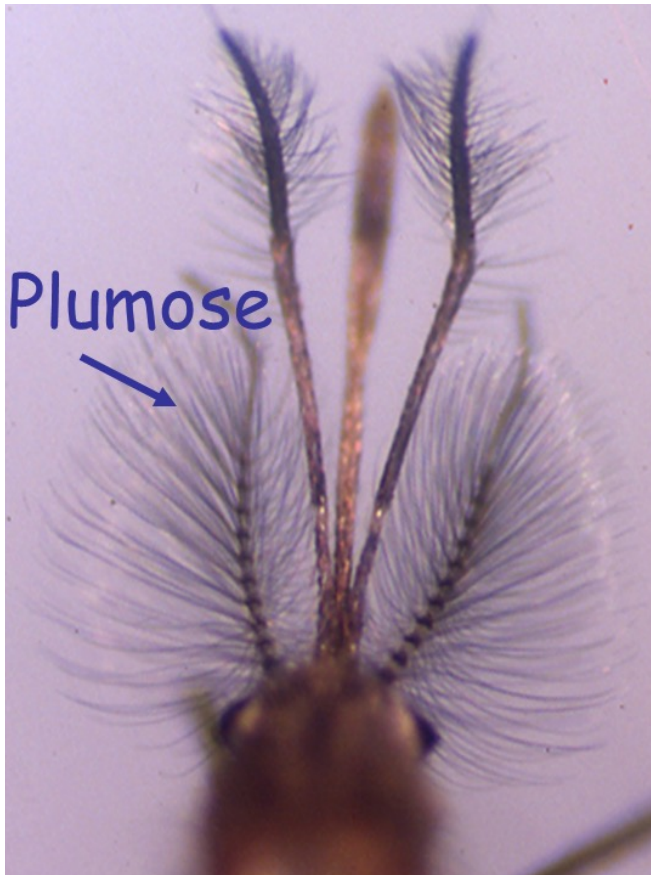




Anophelines

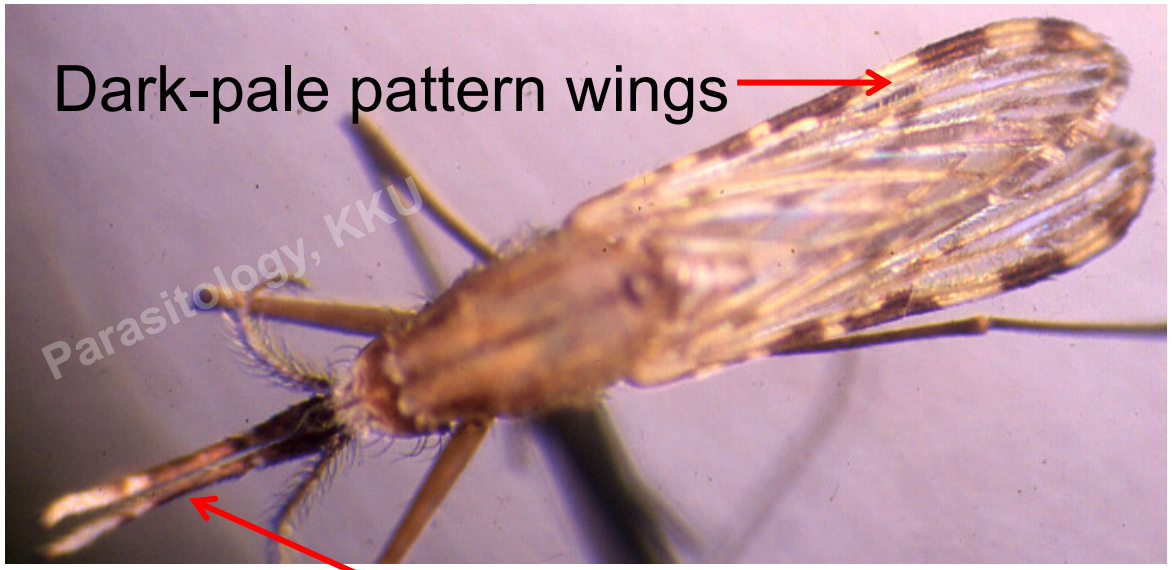


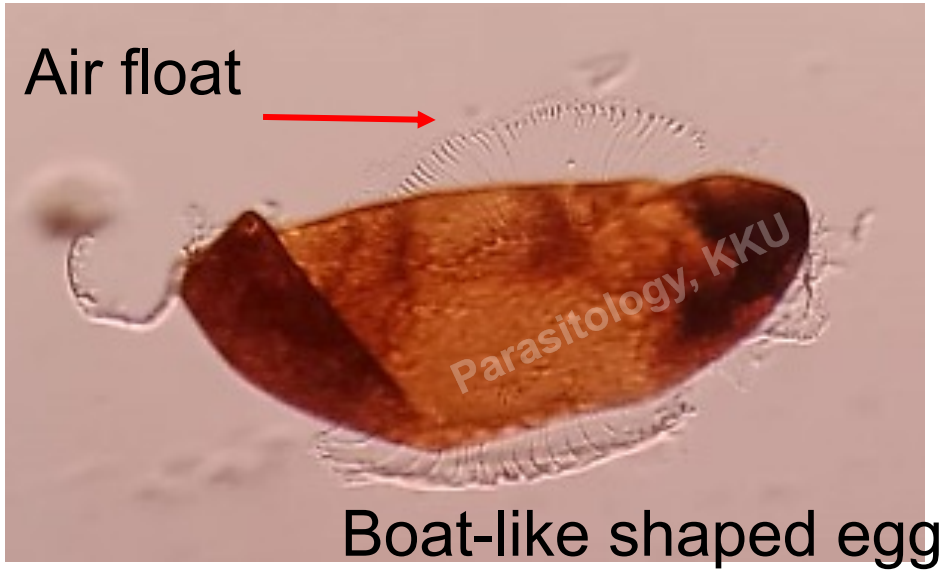
Culicines



Gary R. Mullen, Lance A. Durde, eds. Medical and Veterinary Entomology, 2018.

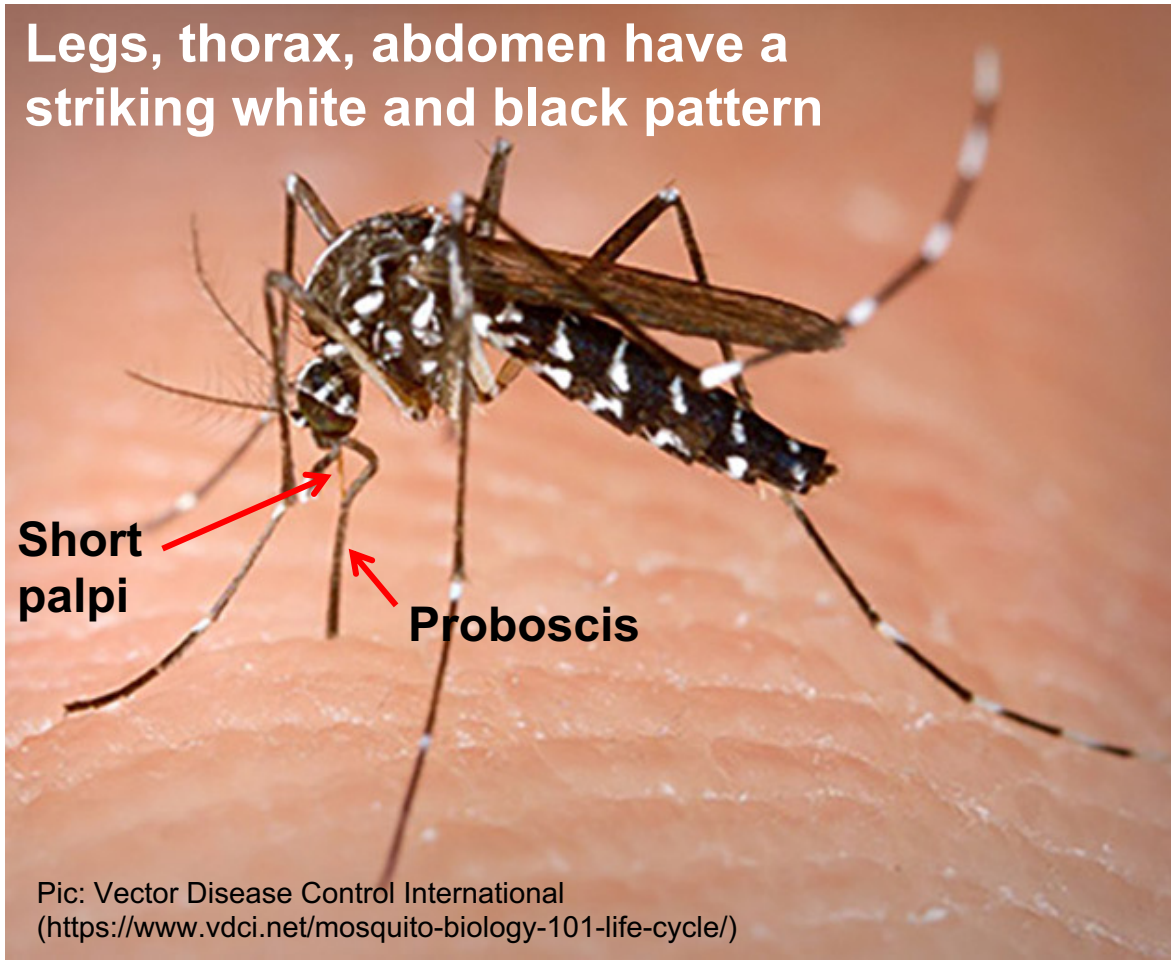
Anopheles sp.



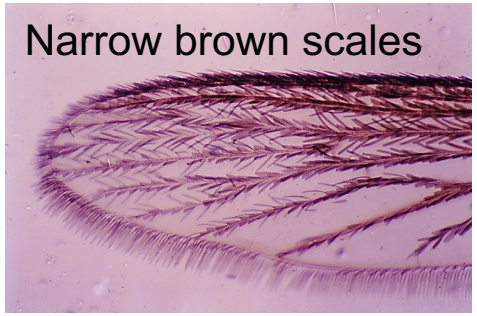


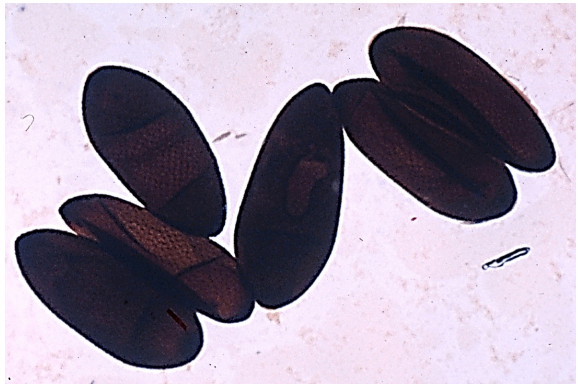
Walter Reed Medical Center

Aedes sp.



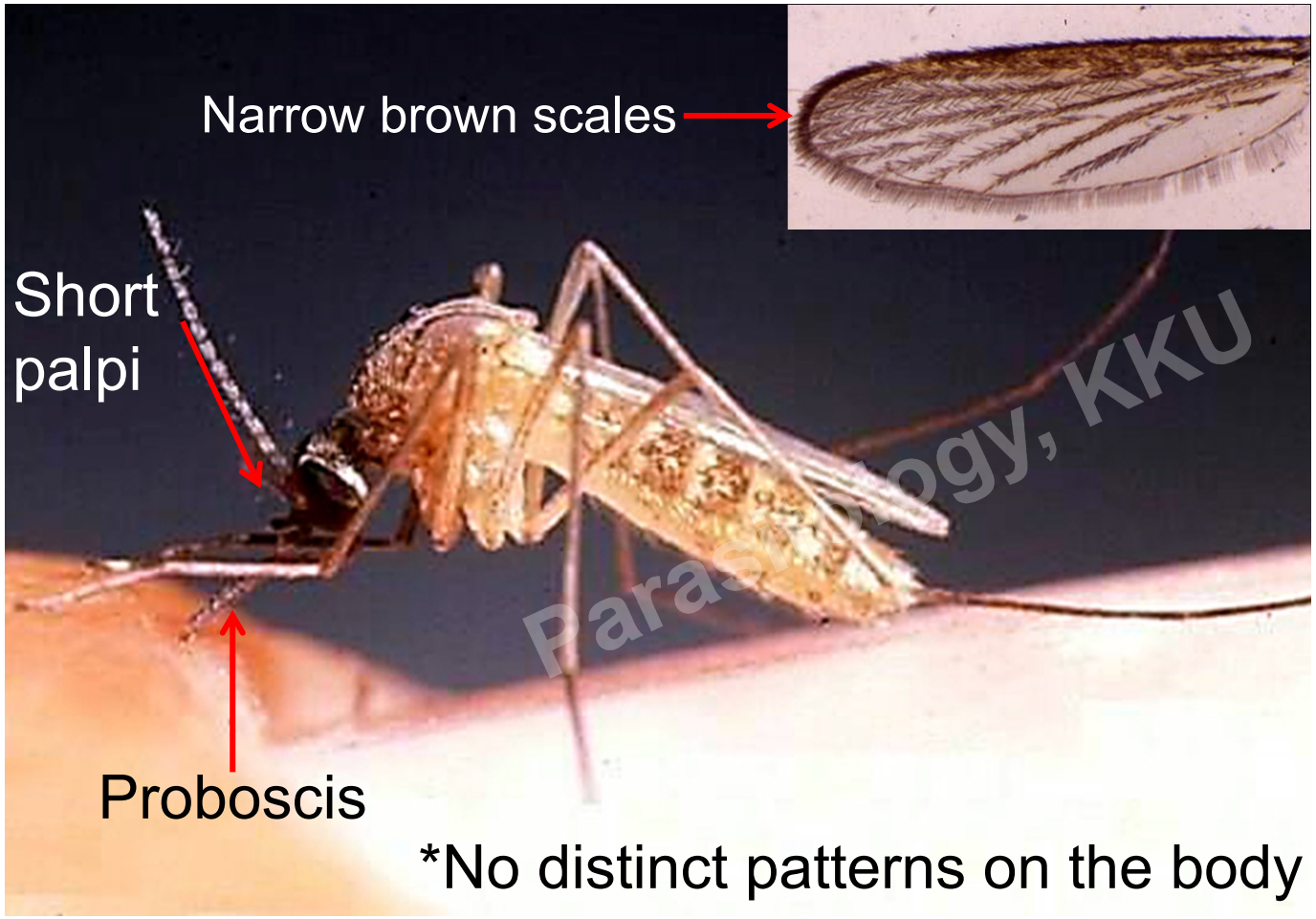
Pic: Vector Disease Control International (https://www.vdci.net/mosquito-biology-101-life-cycle/)





Egg:
Ovoid shape,
rugby-like,
black in color

Culex sp.



*No distinct patterns on the body

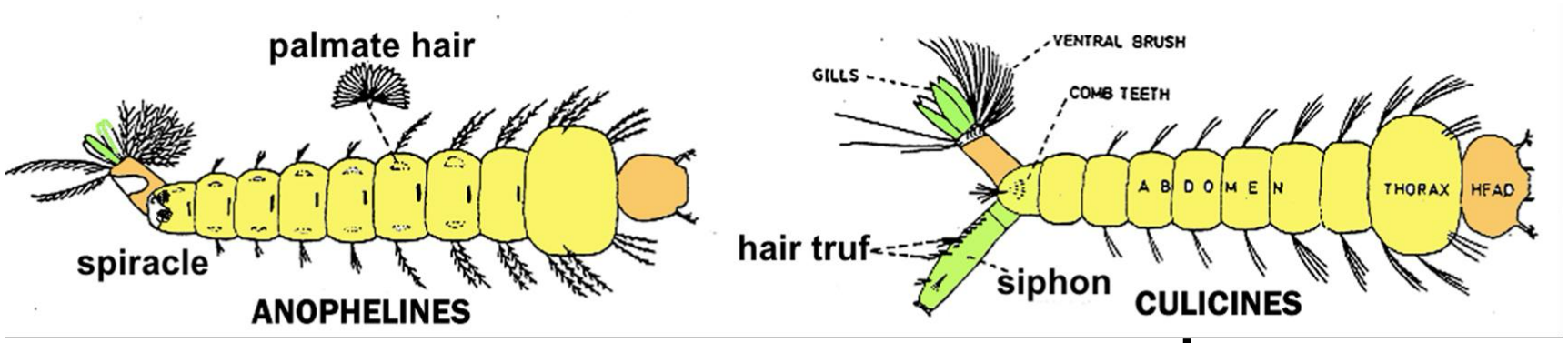
A raft of eggs appears as a speck of soot floating on the water.

Mansonia sp.

Florida Medical Entomology Laboratory, 2025 (https://fmel.ifas.ufl.edu/mosquito-guide/mosquito-genera-and-species/genus-mansonia/mansonia-titillans/)

Saw-like siphon (adhere to water vegetation)

Mosquitoes larva



No siphon

siphon

hair tuft

a short barrel-shaped

AEDES

hair tuft

CULEX

Long and narrow,

>1 pair of hair tuft

siphons adapted

for piercing aquatic plants

to obtain air

MANSONIA

Diagram is courtesy of
Dr.Chatanun Eamudomkarn

Mosquitoes larva

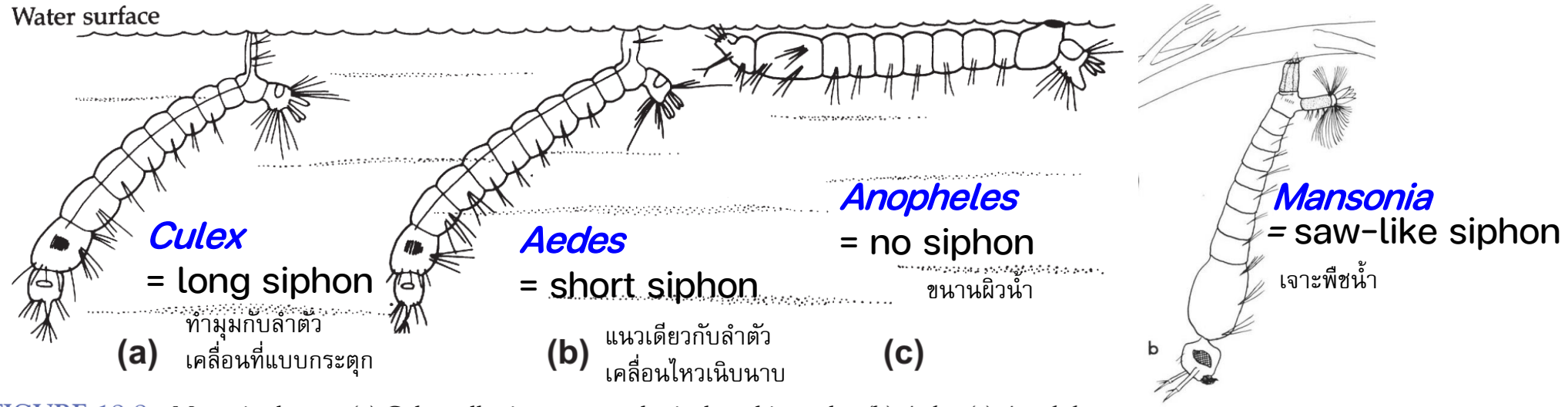


FIGURE 18-8 Mosquito larvae. (a) Culex adhering to water by its breathing tube. (b) *Aedes*. (c) *Anopheles*.

N.R.H. Burgess, A color atlas of medical entomology, 1993

Pic is courtesy of CDC

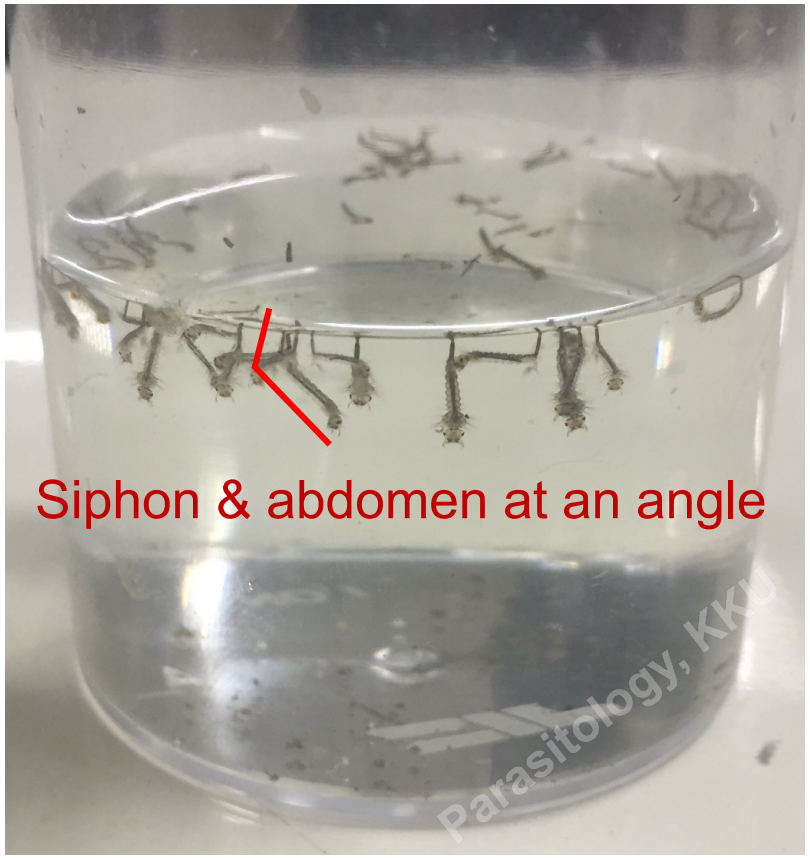
CDC

UK wildlife

Florida Medical Entomology Laboratory

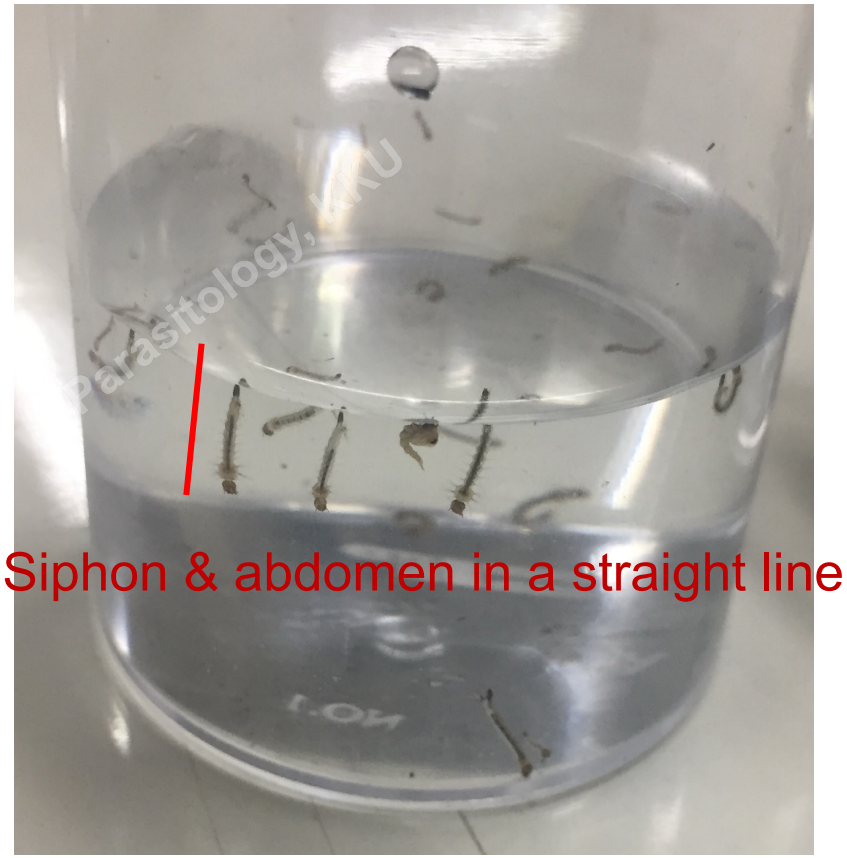
Mosquitoes larva

Culex larvae



Jerky movement

Aedes larvae

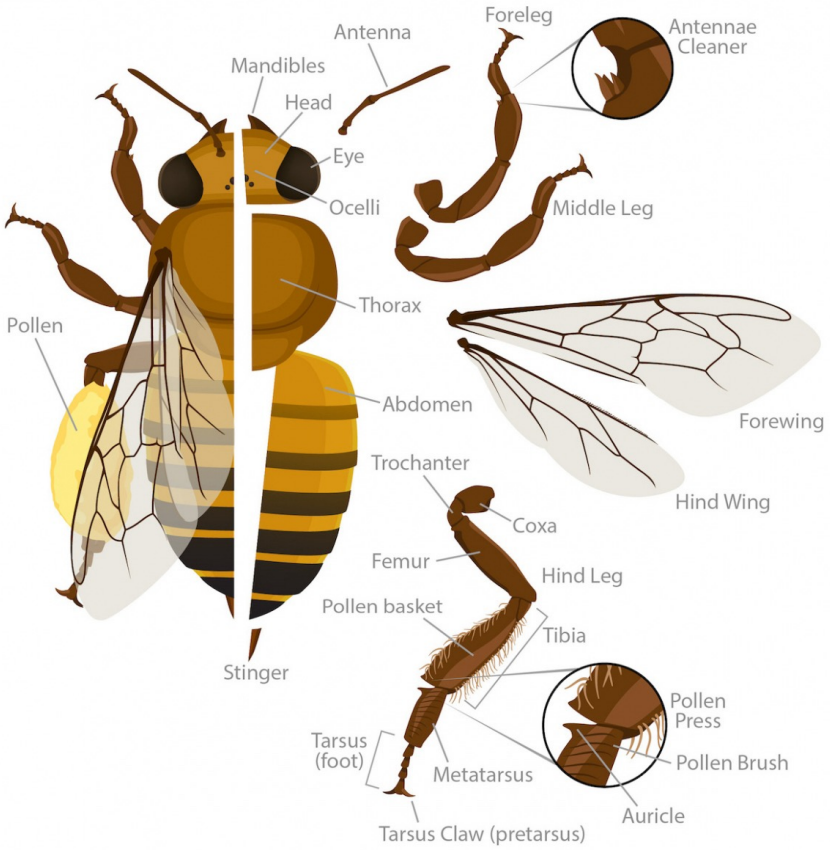


S-shape movement

Venomous/poisonous arthropods in Thailand

- Hymenoptera
  - Wasps and bees
  - Ants
- Spiders
- Scopions
- Centipedes
- Blister beetles
- Caterpillars
- Ticks and mites

Anatomy of hymenoptera



- Three main body part:
  - Head,
  - Mesosoma (Thorax and the first segment of abdomen), and
  - Metasoma.
- Three pairs of legs and two pairs of membranous wings
- A large compound eye with several small simple eyes
- Forewings are larger

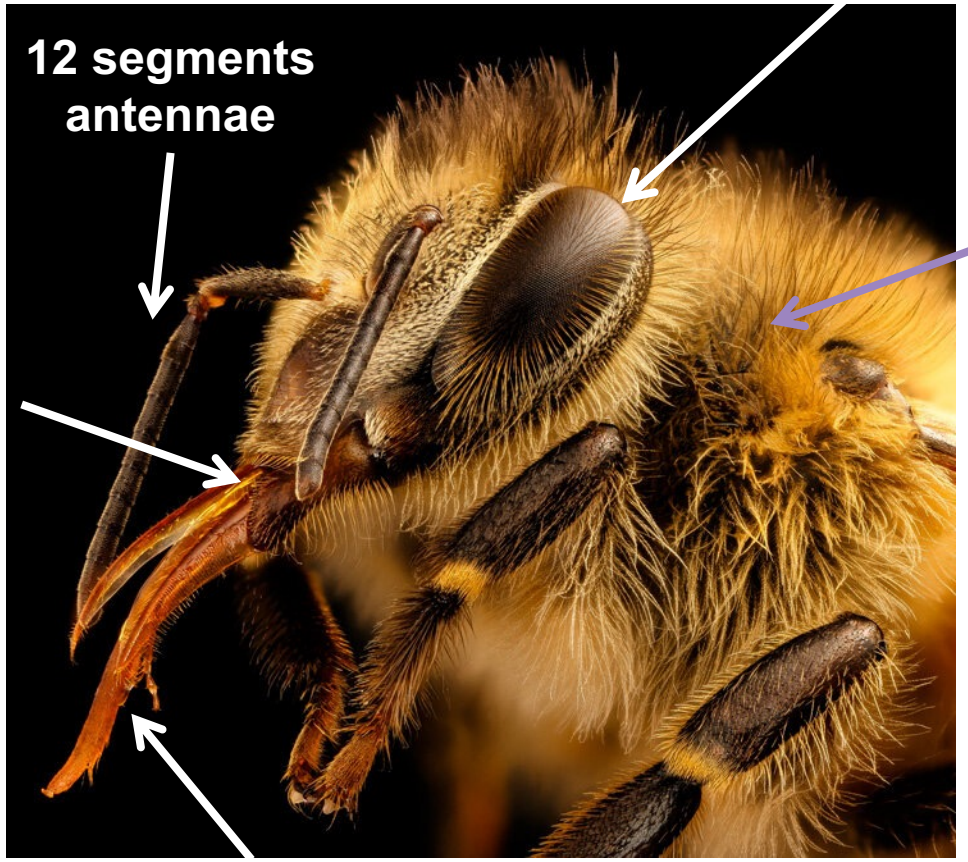
https://beehoneymakers.com/category/bee-biology/

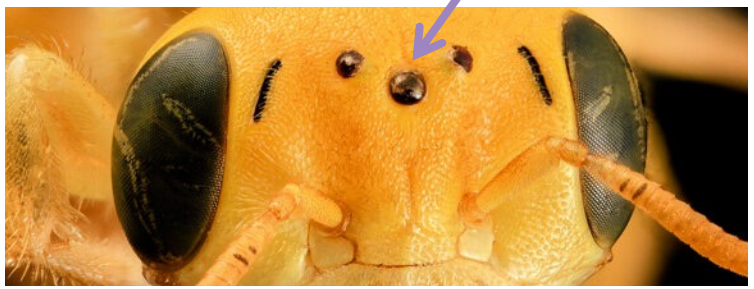
Honey bee (Type: worker bee)

PIC: Paleontological Research Institution

- Color: black and yellow stripes
- Branched or plume-like setae(hairs) cover its body
- A pair of large compound eyes and three small simple eyes (ocelli) at their head.
- 12 segments antennae
- The mouthparts: a pair of mandibles and a long proboscis for sucking up nectar.
- The thorax has three segments, each with a pair of robust legs, and a pair of membranous wings on the hind two segments.
- The abdomen has nine segments, the hindermost three being modified into the sting.
- Barbed stinger

Honey bee

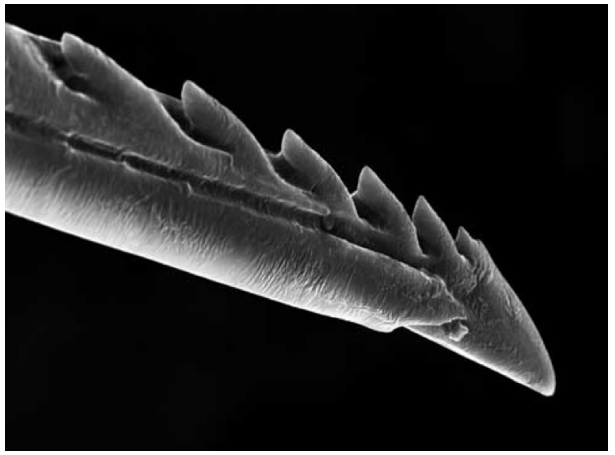




PIC: Paleontological Research Institution

Honey bee - Barbed stinger

Damrong Wiwatwongwana et al, ARCH OPHTHALMOL/VOL 130 (NO. 3), MAR 2012



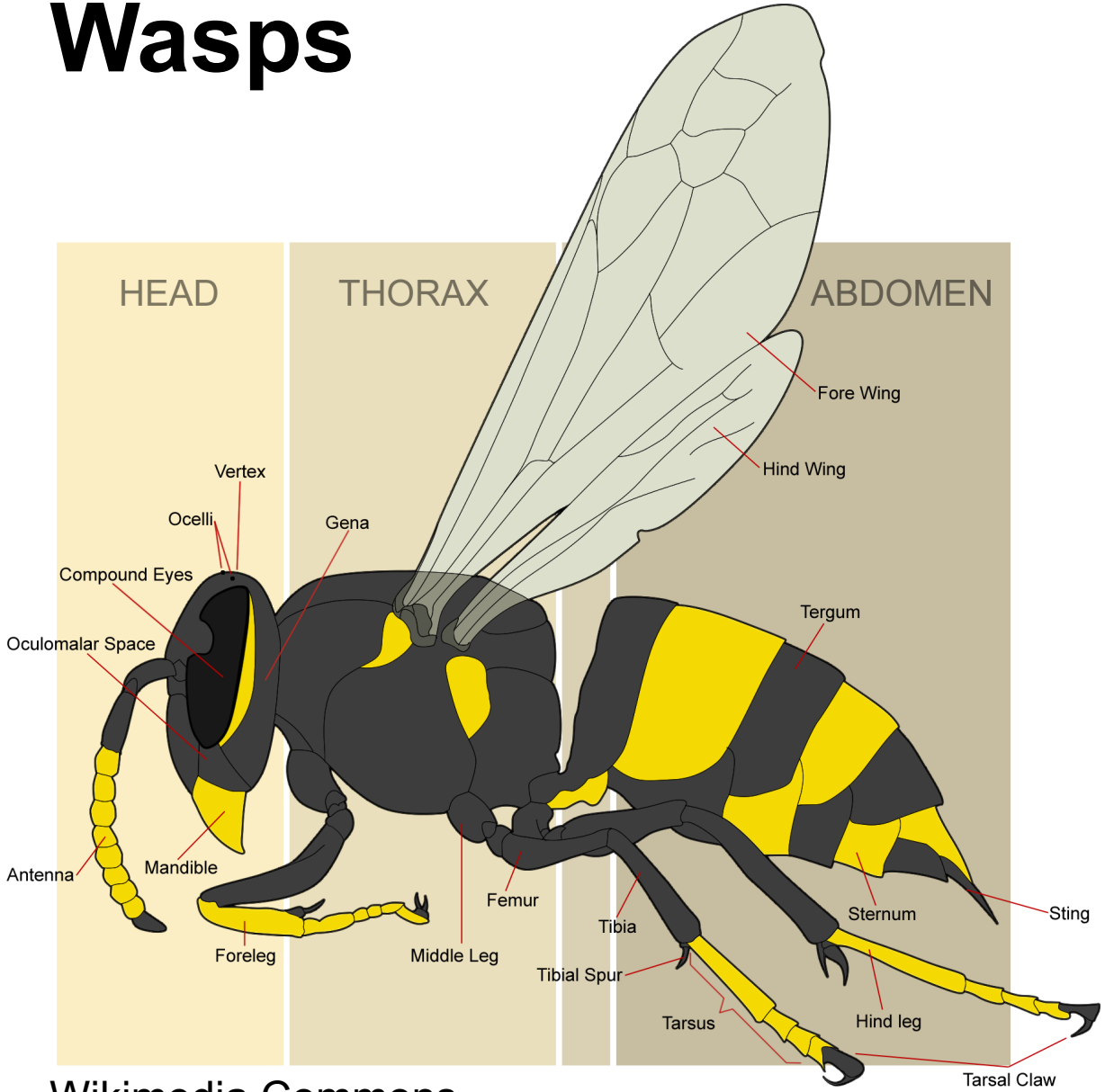
PIC: Rakesh Das et al. *Scientific Reports*, 2018.

Wasps

iStock photo

- Color: shinny black and yellow stripes or all black
- Few or no satae (hairs) on body
- Skinnier but larger than the bee
- A narrow waist, the petiole, joining the first and second segments of the abdomen
- Stinger (modified ovipositor) is straight without barb; in some species can freely retract or extend
- Mouthparts is similar to bee but mandible might be larger

Wasps

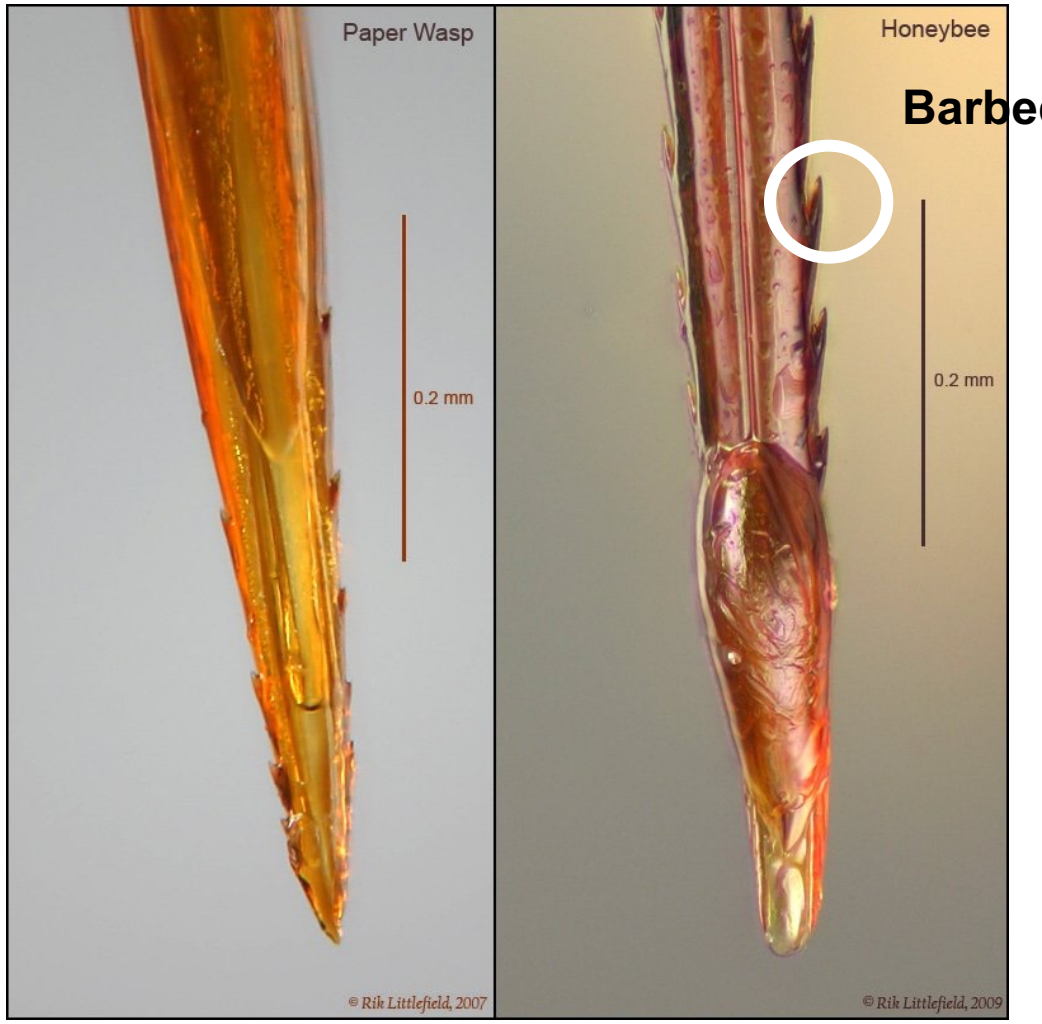


Wikimedia Commons

(Almost) Smooth stinger

biology.stackexchange.com

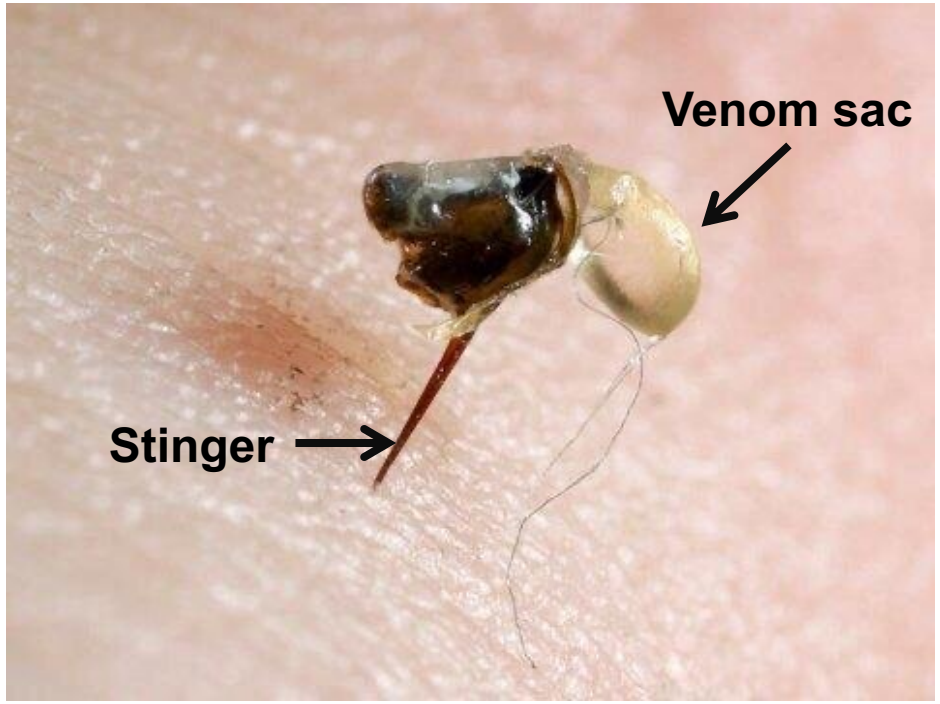
Stinger – Bee vs wasps



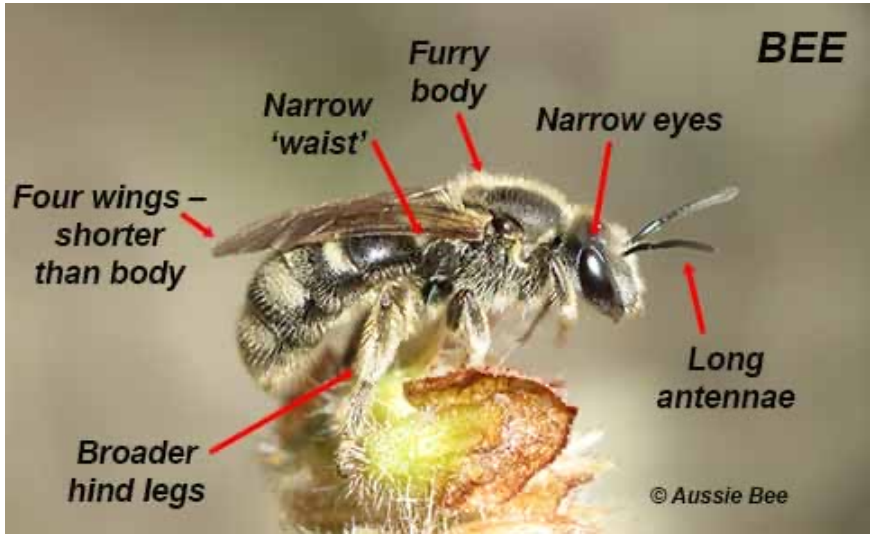
Barbed – much bigger

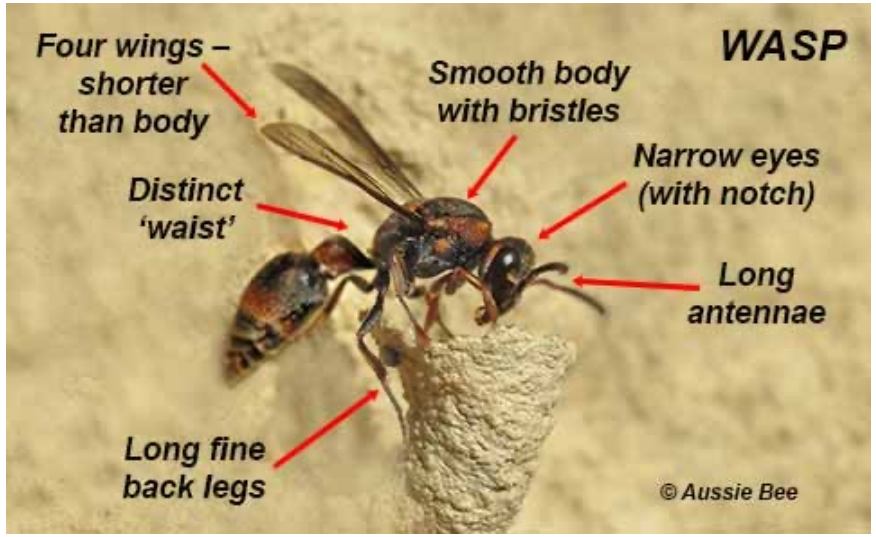
https://wellcomecollection.org

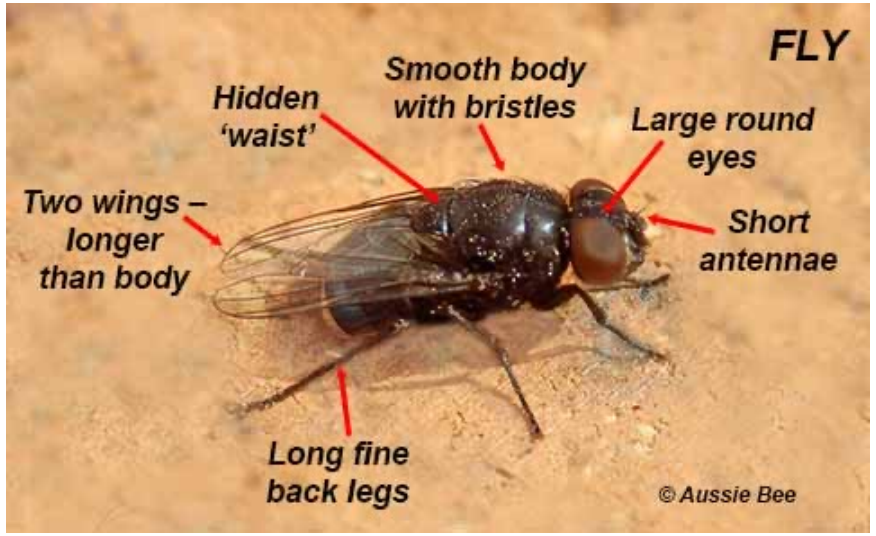
Stinger – Bee



Fly vs Bee vs Wasp







Ref: Australian Native Bee Research Centre

Fly vs Bee vs Wasp

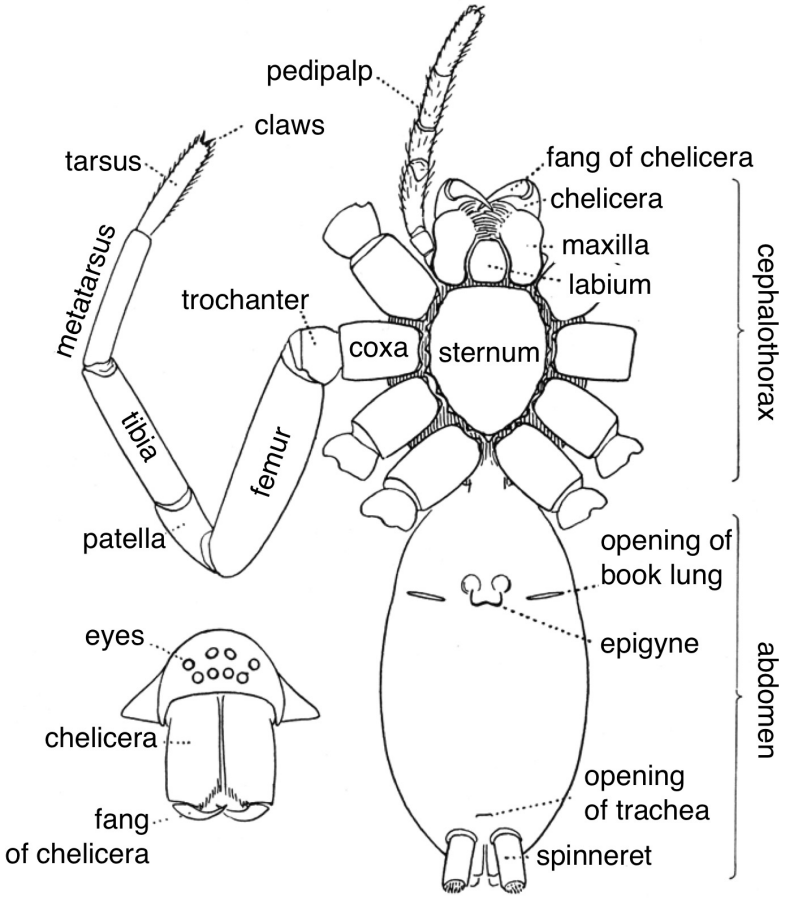
	Bee	Wasp	Fly
Body shape	Often hourglass shape with short 'waist'	Often slender with distinct 'waist'	Often broad with hidden 'waist'
Number of wings	4		2
Antennae	Long		Short
Eyes	Narrow, on side of head.		Wide and round, toward front of head
Collect pollen?	Yes	No	
Furry bodies?	Often furry	Usually shiny, with some bristles	
Hind legs	Often with broad segments	Long and fine	

Bi-coloured Arboreal ant

Tetraponera rufonigra (มดตะนอย)

Adobe stock
License via KKU

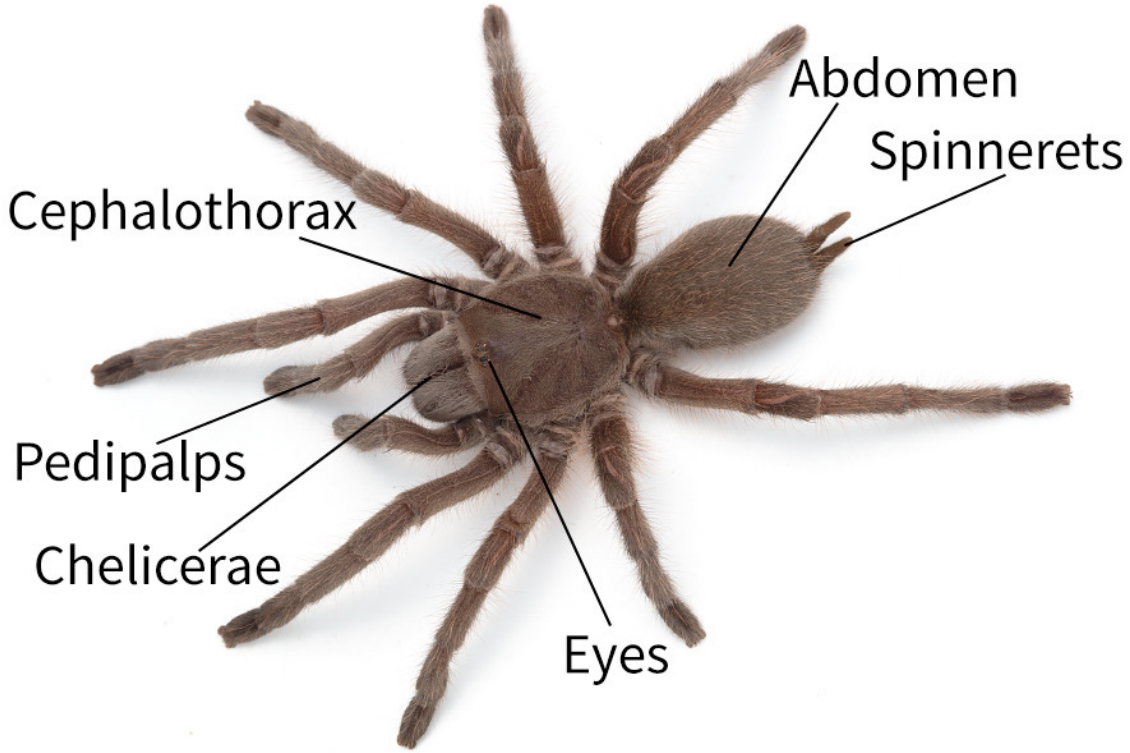
Anatomy of spider

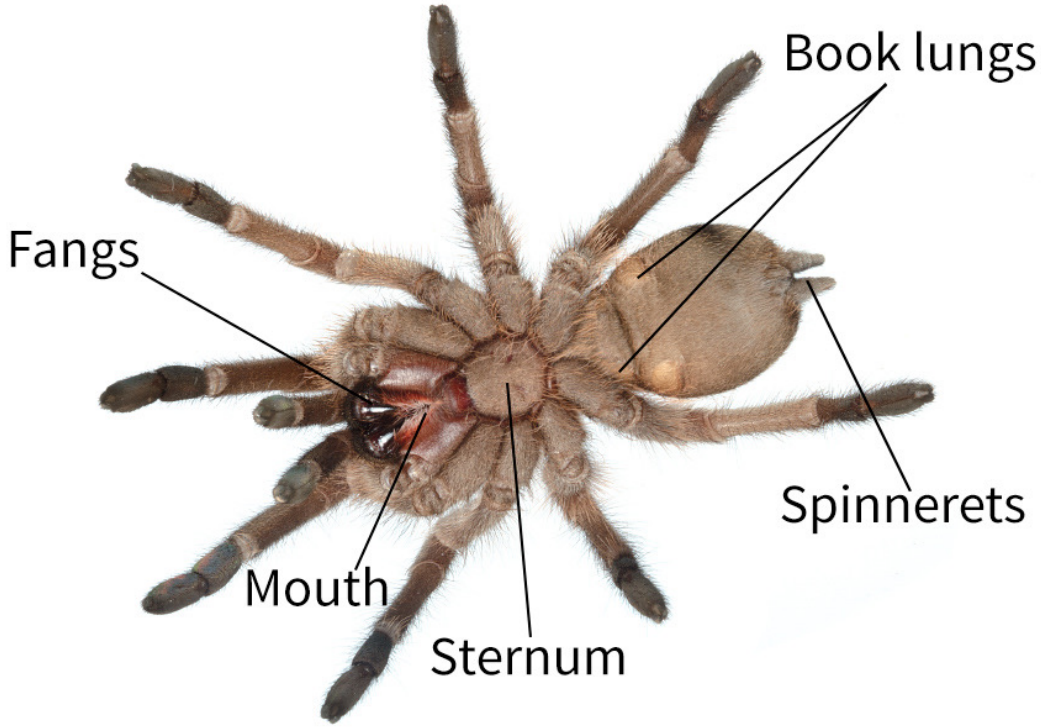


Wikimedia commons
(https://commons.wikimedia.org/wiki/File:Spider_external_anatomy.png)

- Shared many characteristics with other arachnids.
- Bodies divides into two tagmata
- Eight joint legs
- No wings
- The presence of chelicerae and pedipalps
- Most spiders possess venom through the fangs of the chelicerae.
- A mouth part shaped like a straw that they use to suck up the liquefied insides of their prey

Anatomy of spider





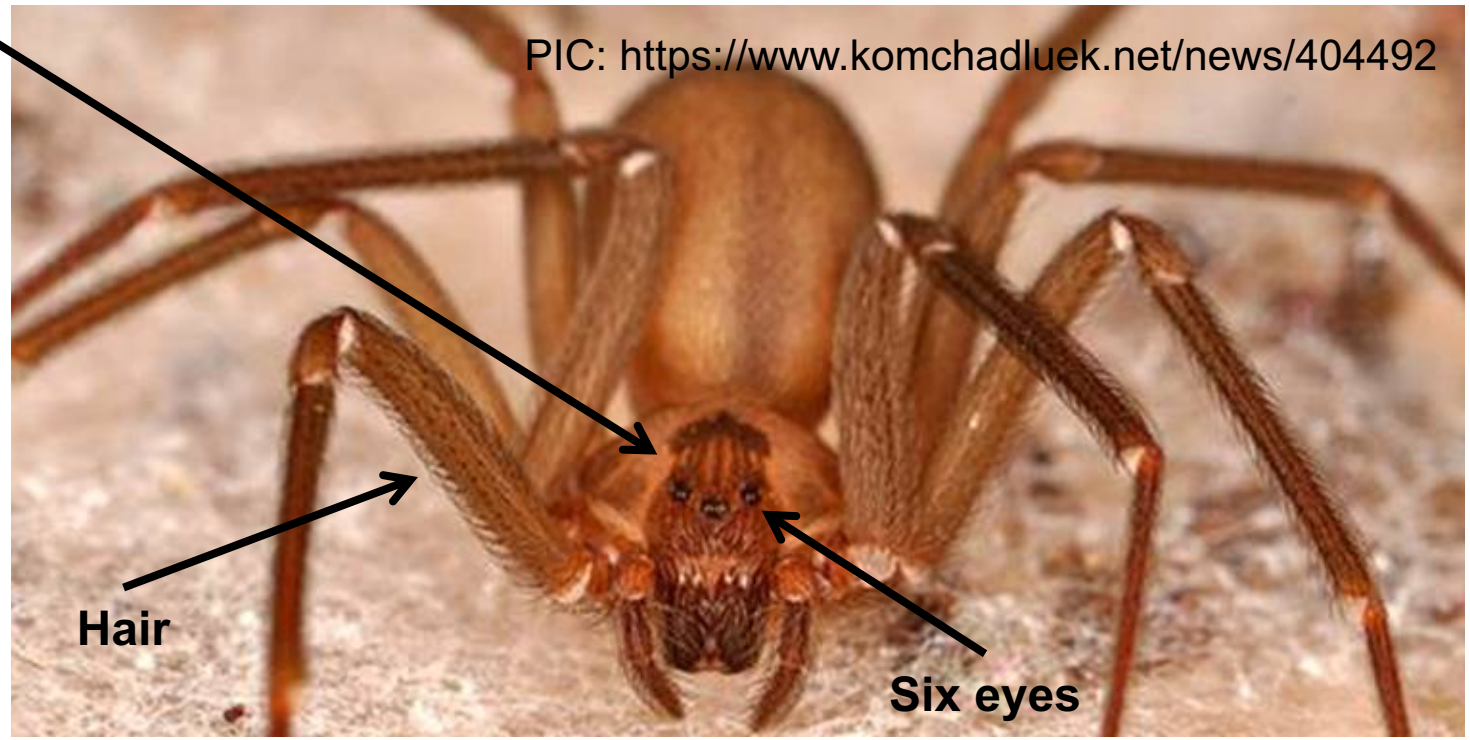
PIC: https://identify-spiders.com/spider-anatomy/

Medical important

PIC: https://www.pestmanagementonline.com/spider.html

Brown recluse spider (*Loxosceles reclusa*)

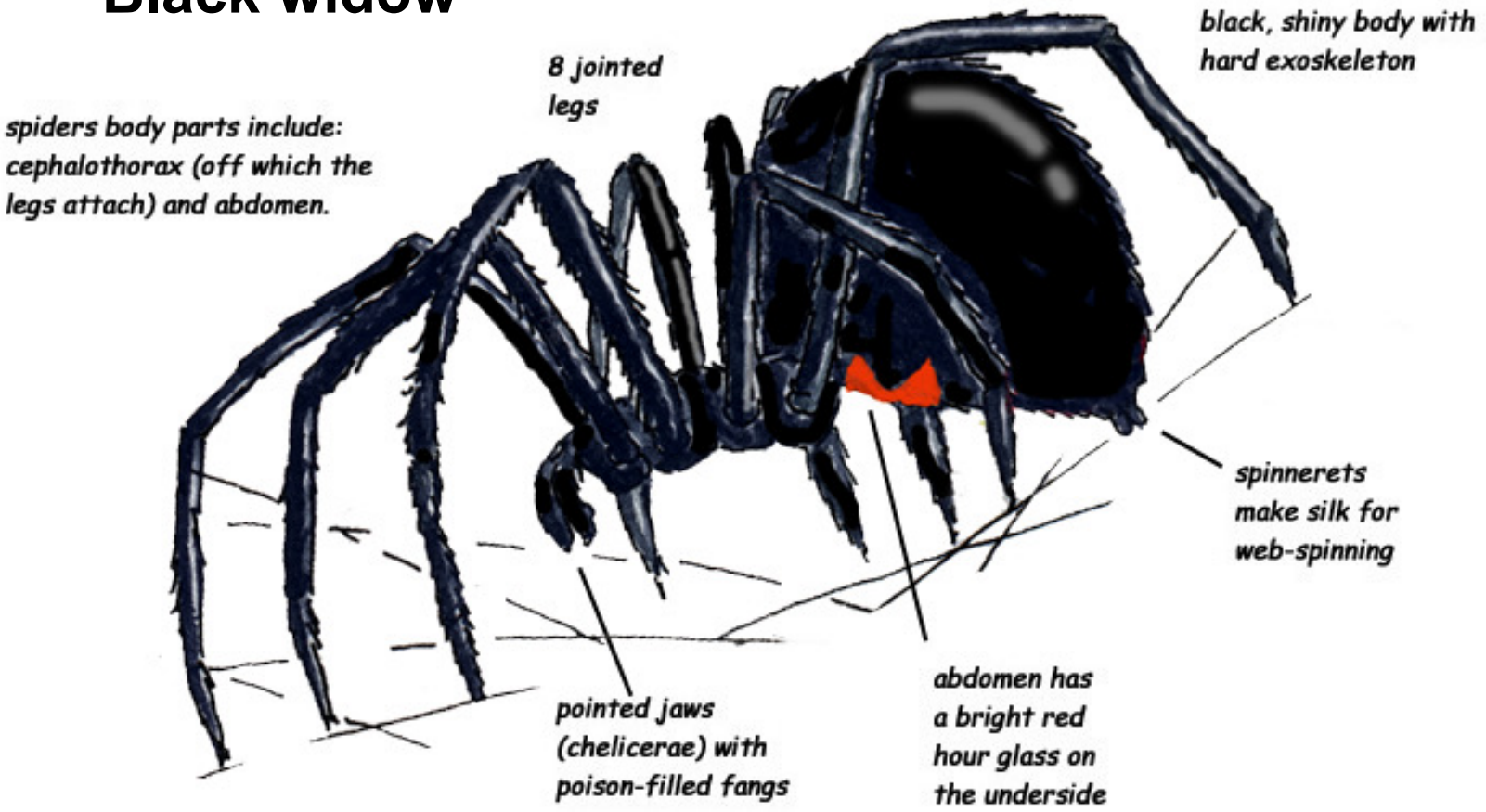
- Color: brown
- Hair covering over the body
- Six eyes, each with a single lens
- A violin pattern on its anterior cephalothorax



Widow spider

Size ~8 – 10 mm

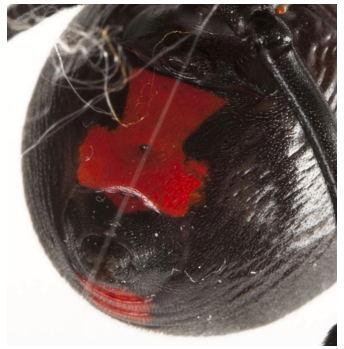
Black widow



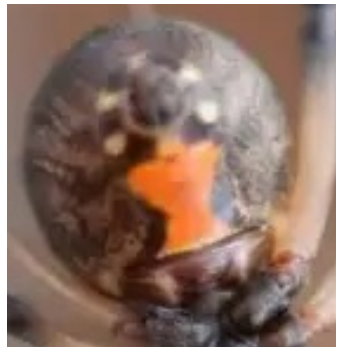
https://capitolpest.net/wp-content/uploads/2015/08/black_widow_diagram.jpg

www.exploringnature.org

©Sheri Amsel



Black widow



Brown widow

Red widow

PIC: iNaturalist

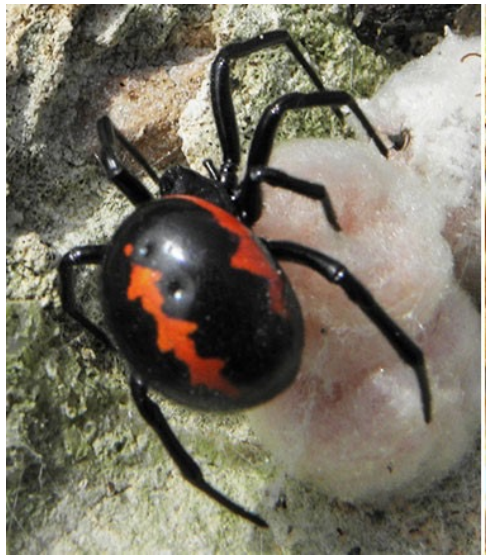
Widow spider

Black widow

Brown widow

https://en.wikipedia.org/wiki/Latrodectus_geometricus

False widow spider



All PIC are open license via Wikimedia commons

- A similar dark-colored, globular shiny abdomen
- A more complex pattern of markings, which can include cream-colored bands or spots.
- Lack the distinct hourglass shape marking

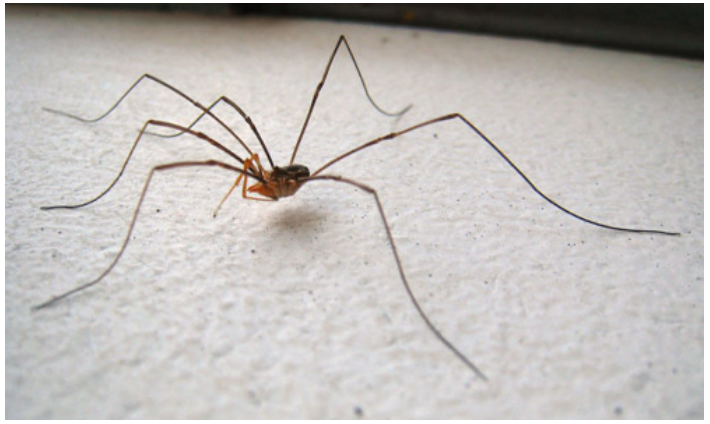
- Bites can cause discomfort and mild symptoms

Other common spider in Thailand

Golden Orb-weaver Spider

Huntsman Spider

Common Housefly Catcher



Harvestman Spider

- Yellow sac spider
- Bite can cause sharp pain, as well as cause necrotic lesions

All PIC from: https://treasuresofthailand.com/most-common-spiders-in-thailand/

Tarantula

Pic: National Geographic

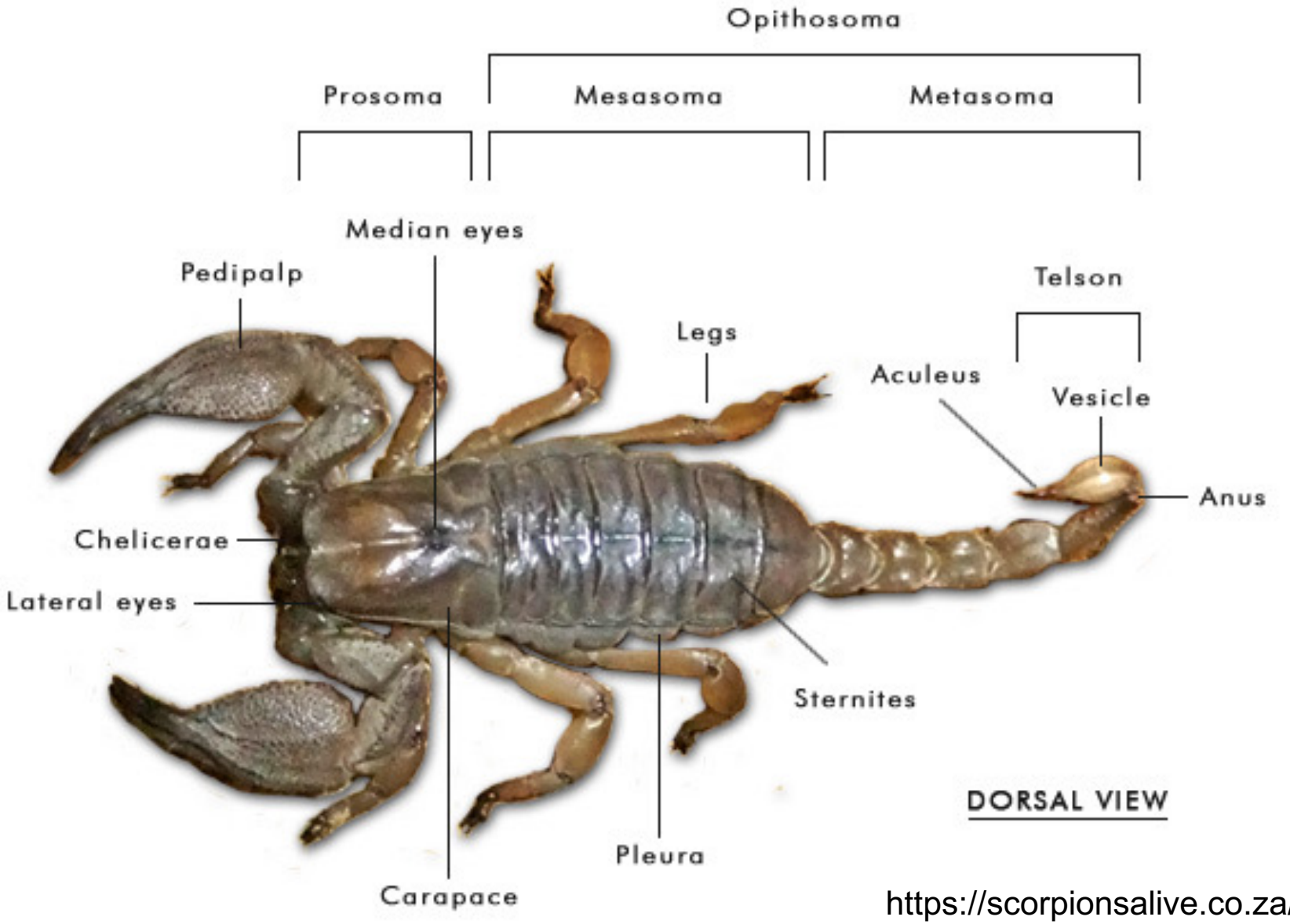
- Large spider
- Tarantulas are always hairy-bodied.
- **Urticating hairs (setae):**
  - Throw these barbed bristles as the first line of defense
  - **Can not penetrate skin but can cause dermatitis**

Tarantula vs other spiders

- Tarantulas are always hairy-bodied.
- **Tarantulas have two or four spinnerets while spiders have six.**
- Spiders exude silk to make webs to capture prey, whereas tarantulas do that for carpeting of floor of the nest.

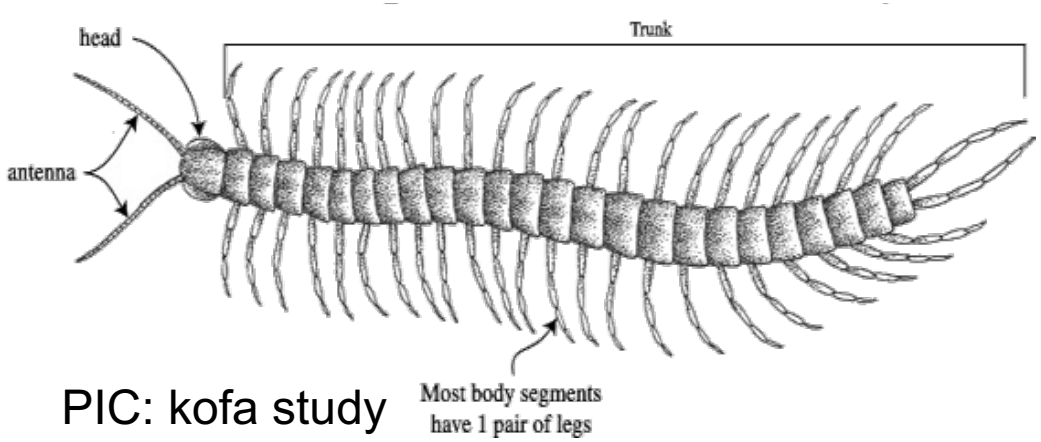
https://en.wikipedia.org/wiki/Spinneret

Scorpion

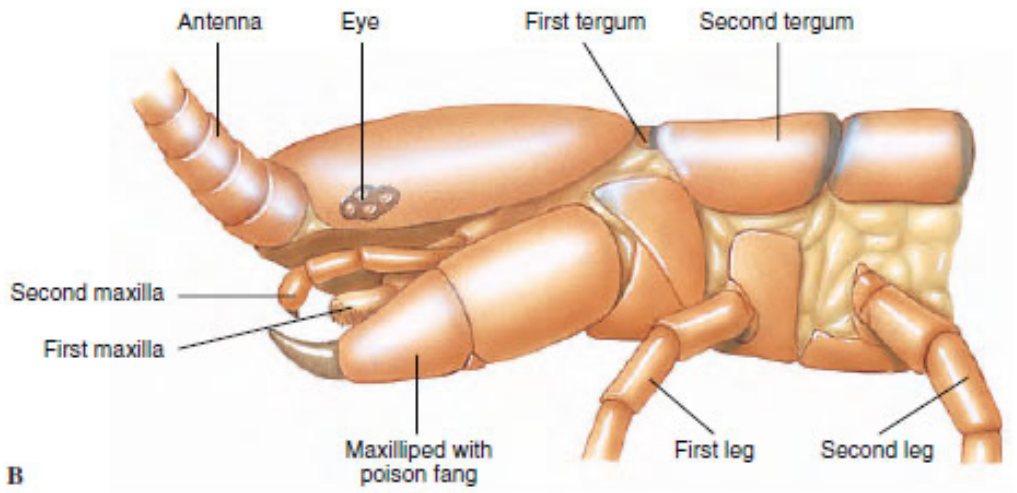


https://scorpionsalive.co.za/anatomy.htm

Anatomy of Chilopoda (e.g.,centipede)



PIC: kofa study



- A rounded or flattened head
- The first pair of limbs, called maxillipeds, stretch forward from the body to cover the remainder of the mouth.
  - These limbs end in sharp claws
  - **Connect to venom gland** and help the animal to kill or paralyze its prey.
  - **For centipedes also known as <u>Forcipulps</u>**
- Body consists of 15 or more segments

Edgecombe and Giribet, 2007

Activity

- Lab talk
- Lab demonstation

- Formative quiz: check-out QR code

Reference and feature reading

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เด็กหญิง ป.4 ถูกผู้ปกครองพามาตรวจ เพราะเพื่อนล้อว่า “เป็นเหา” ตรวจพบไข่เหาเป็นจำนวนมาก หากนักศึกษาเป็นแพทย์ท่านนั้นจะปฏิบัติตนกับเด็กขณะตรวจ และ สื่อสารกับผู้ปกครองอย่างไร?

4) หลักความเป็นธรรม/ยุติธรรมกับคนไข้ (Justice)

- *การจัดหาบริการสุขภาพอย่างเท่าเทียมกันตามความจำเป็นโดยไม่คำนึงถึงฐานะทาง เศรษฐกิจ ชนชั้นทางสังคม ความเชื่อทางศาสนา หรือสีผิว*

7. หลักรักษาศักดิ์ศรีคนไข้ (Dignity):

- *จะทำอะไร ต้องไม่ให้คนไข้เสียศักดิ์ศรีของความเป็นคน*
- *ทั้งผู้ป่วยและแพทย์มีสิทธิที่จะมีศักดิ์ศรีของความเป็นมนุษย์*

“แพทย์ที่ดีไม่ควรใส่ใจกับสถานะความมั่งคั่งหรืออายุ ไม่ควรคิดว่าบุคคลนั้นเป็นที่น่าสนใจหรือไม่สวย ไม่ว่าเขาจะเป็นศัตรูหรือเพื่อน เป็นคนจีนหรือชาวต่างชาติ ไม่ว่าจะไม่มีการศึกษาหรือมีการศึกษา ควรจะพบทุกๆ คนในพื้นที่เท่ากัน และควรปฏิบัติกับทุกๆคนราวกับว่าเขาเป็นญาติที่ใกล้ชิดของเรา”

Simiao นักคิดทางการแพทย์ นักปรัชญา แพทย์รักษาชีวิตที่มีชื่อเสียงทางแพทย์แผนจีน และได้รับขนานนามว่า “China's King of Medicine”

Q & A

เอกสารสรุปคำสอนบรรยาย

แบบประเมินการสอน

Thank you

Contact

E-mail: apisch@kku.ac.th

Facebook page: Department of Parasitology, KKU

YouTube Channel: Parasitology, KKU