

بسم الله الرحمن الرحيم

حشرات اقتصادية

343 وقن



https://www.youtube.com/watch?v=_EWIDu3ubW0





مسار هجرة صفر مثبت عليه شريحه مرتبطة بالاقمار الصناعية ..
قطع عشرة آلاف كيلومتر في ٤٦ يوم .. من شمال أوربا جنوب أفريقيا ..
لاحظ كيف تجنب عبور البحر المتوسط .
أيضا تجنب عبور جنوب مصر وشمال السودان بسبب دقة وقلة الغذاء .
وحسب ما ذكر المصدر تعتبر أول هجرة له .
سبحان الله .



INSECTS ORDER

WINGS الأجنحة

METAMORPHOSIS التطور

MOUTHPART أجزاء الفم

رتبة ذات التطور غير الكامل

- ◉ ORDER HOMOPTERA
- ◉ ORDER HEMIPTERA
- ◉ ORDER ODONATA
- ◉ THYSANURA
- ◉ ORDER ISOPTERA
- ◉ ORDER ORTHOPTERA
- ◉ ORDER ANOPLURA
- ◉ ORDER DERMAPTERA
- ◉ ORDER THYSANOPTERA

ORDER HOMOPTERA

متجانسة الأجنحة

Wings (Whiteflies, aphids, mealy bugs, scale insect)

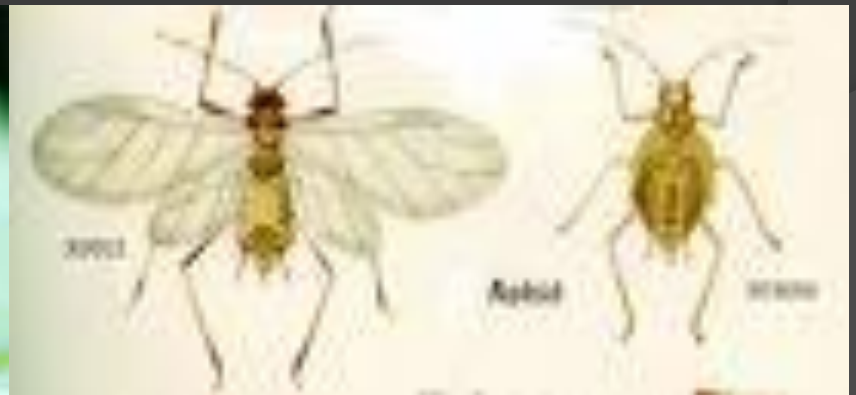
- Winged

In winged adult, the front wings are either membranous or slightly. Hind wings are membranous.

in scale insect and aphid , the male have only one pair of wings.

- Wingless

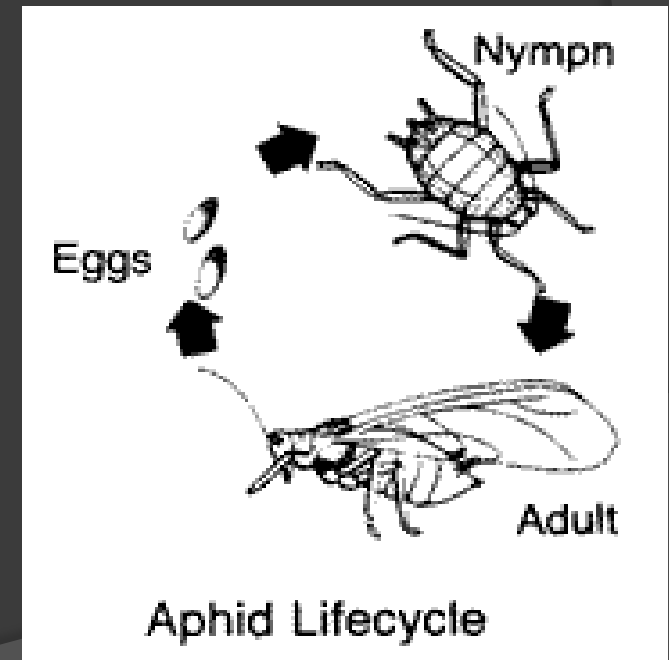
In the female



Metamorphosis

Gradual metamorphosis

- ⦿ Produced by the female without males this is called parthenogenesis.
- ⦿ Eggs (hatch in spring)
- ⦿ Nymphs (nymphs are wingless)
- ⦿ Adult



Aphids (Homoptera)

Mouthpart

Piercing-sucking mouthpart

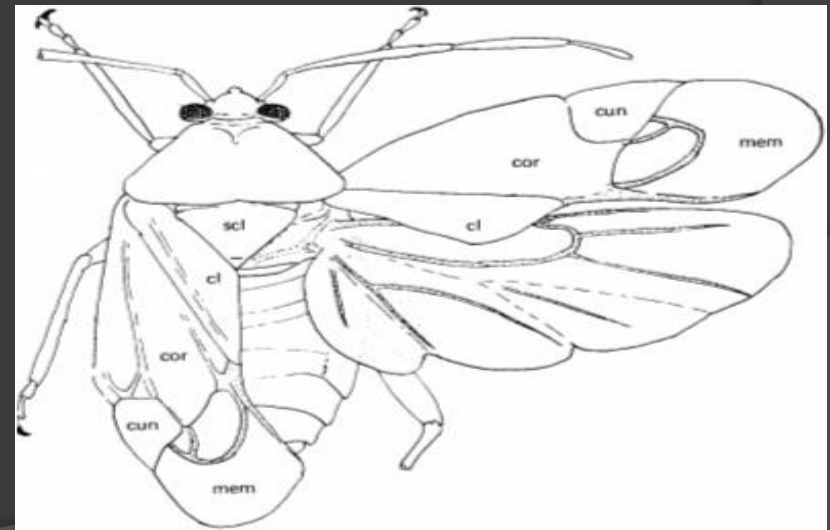


Homoptera - Kenneth piercing sucking
402 x 270 - 62k - gif
idlab.entom.vt.edu

ORDER HEMIPTERA

Wings

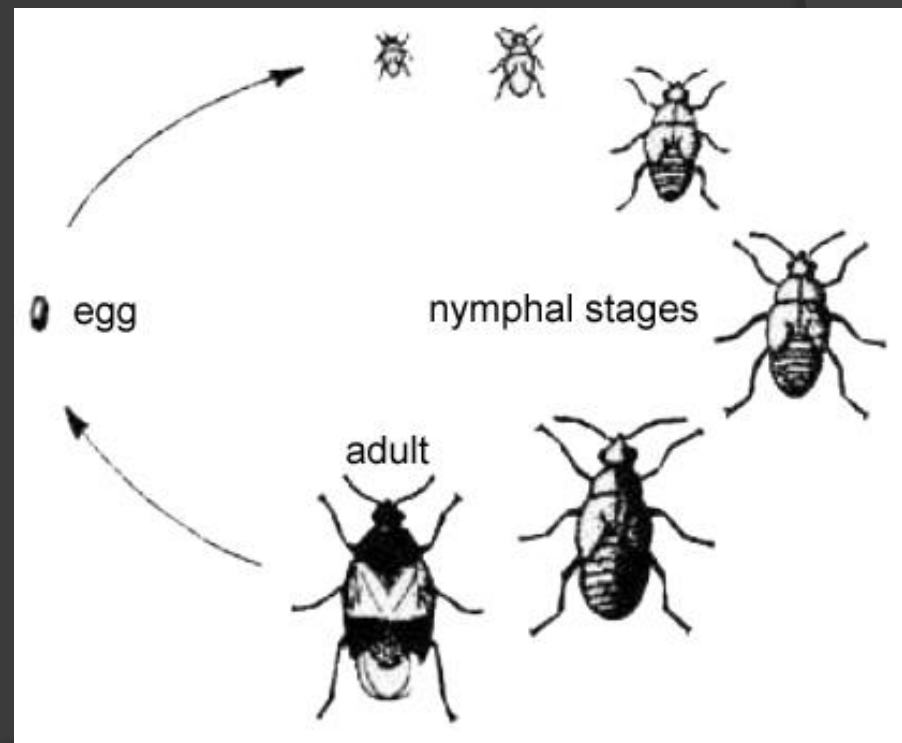
- ⦿ True bug wings are properly called hemelytra.
- ⦿ Two pairs of wings usually present, the anterior pair is harder than the posterior pair.



Metamorphosis

Gradual metamorphosis

- ⦿ Eggs
- ⦿ Nymphs
- ⦿ Adult

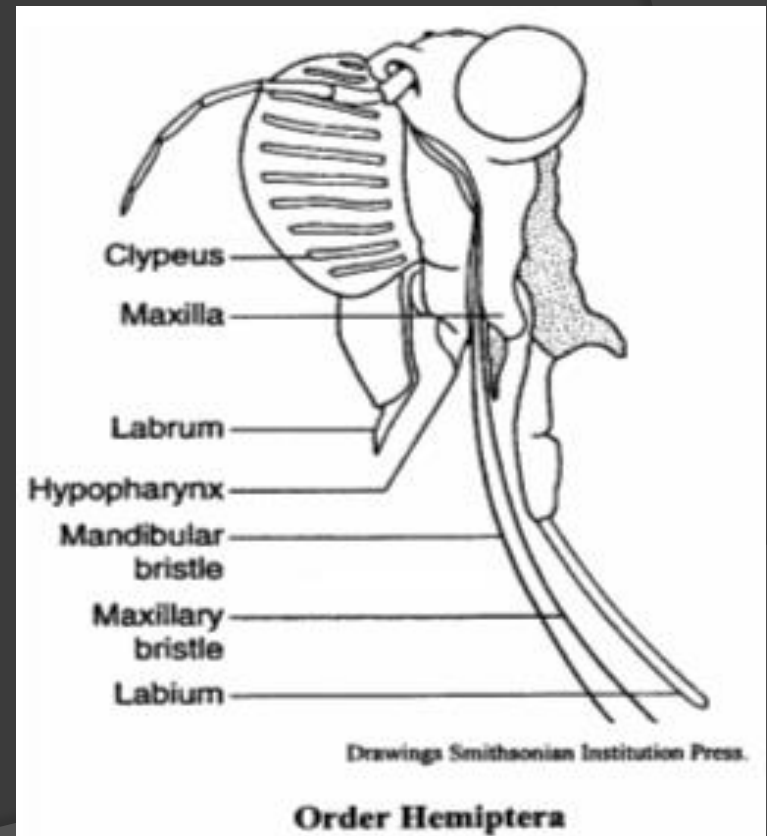


Order Hemiptera: flower bug, incomplete metamorphosis

Mouthpart

Piercing sucking mouthpart

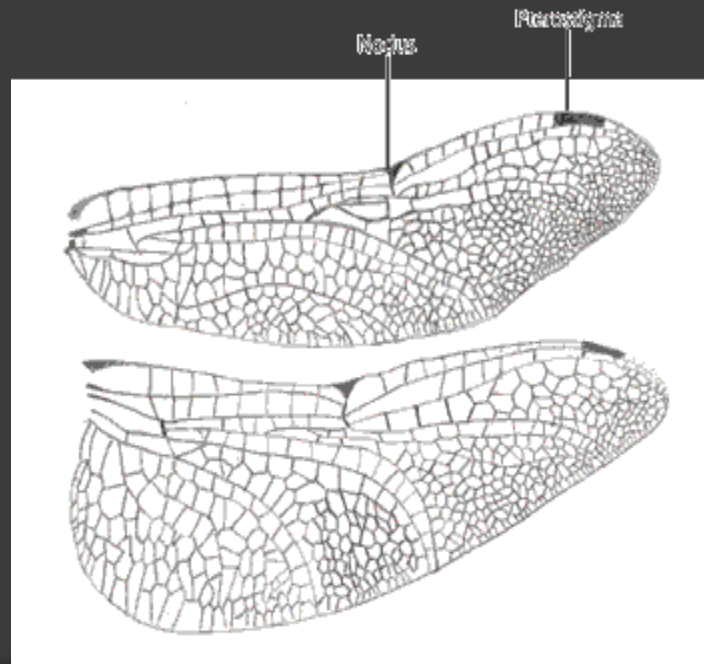
- ⦿ Labium in the form of a dorsally grooved sheath.
- ⦿ There is bristle-like stylet modified mandibles and maxilla



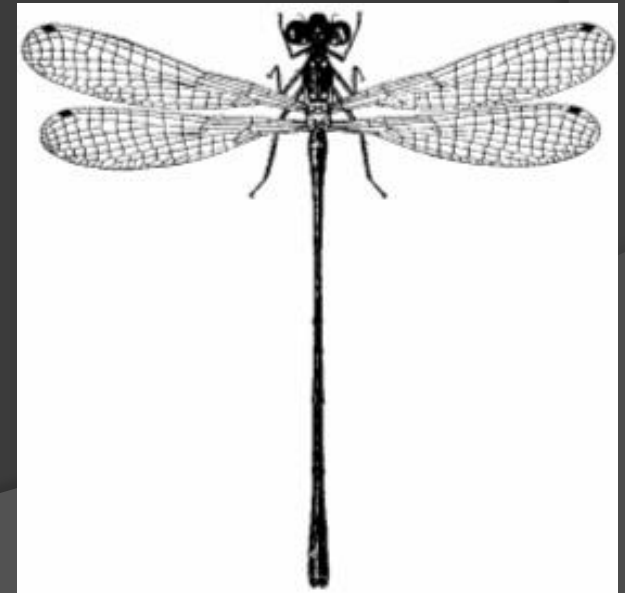
ORDER ODONATA

Wings

- ◉ Two equal or subequal pair of elongated.
- ◉ Membranous wings, each wings with a complex reticulation of small cross veins.



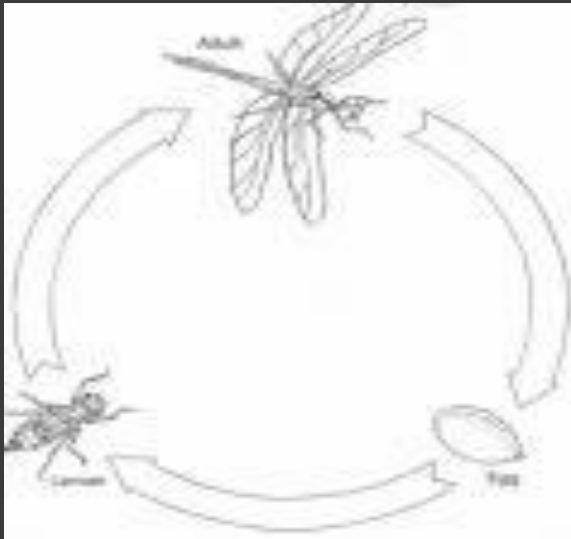
Dragonfly (Anisoptera) Wings



Metamorphosis

Incomplete metamorphosis

- ⦿ Eggs
- ⦿ Nymph
- ⦿ Adult



Odonata 591 x 688 - 16k - gif
palaeo.gly.bris.ac.uk



Mouthpart

Chewing-mouthpart

- ◎ The mandible well-developed.



www.bmpt1.com/.../photographinginsects01.html



entomology.umn.edu

ORDER ISOPTERA

Wings

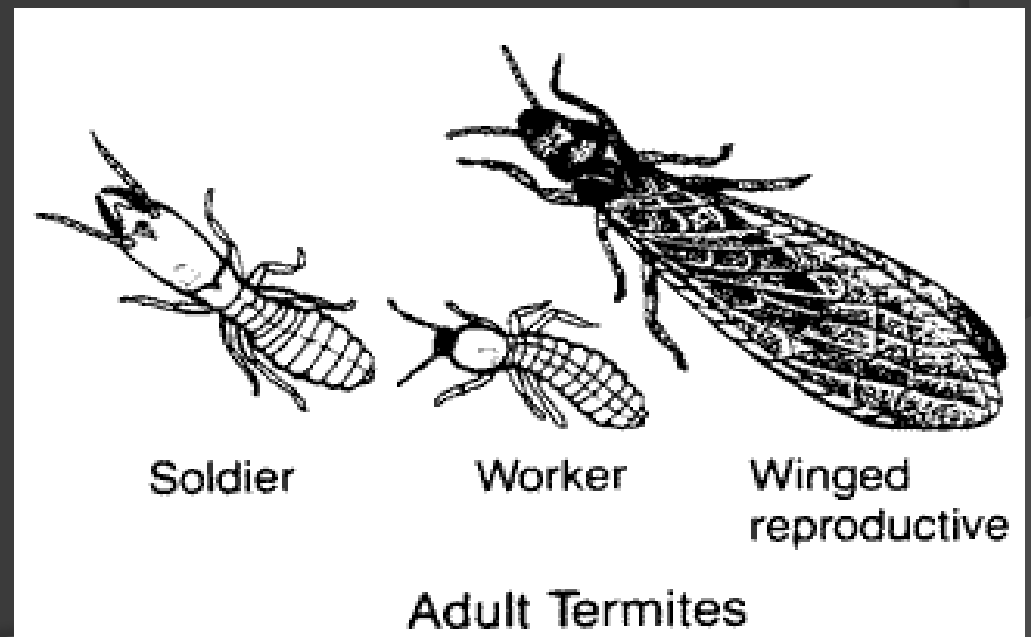
- ⦿ The wing is very similar, elongated and membranous.
- ⦿ The wing superposed flat over the back when at rest.
- ⦿ Anterior veins strongly sclerotized.



Metamorphosis

Incomplete metamorphosis

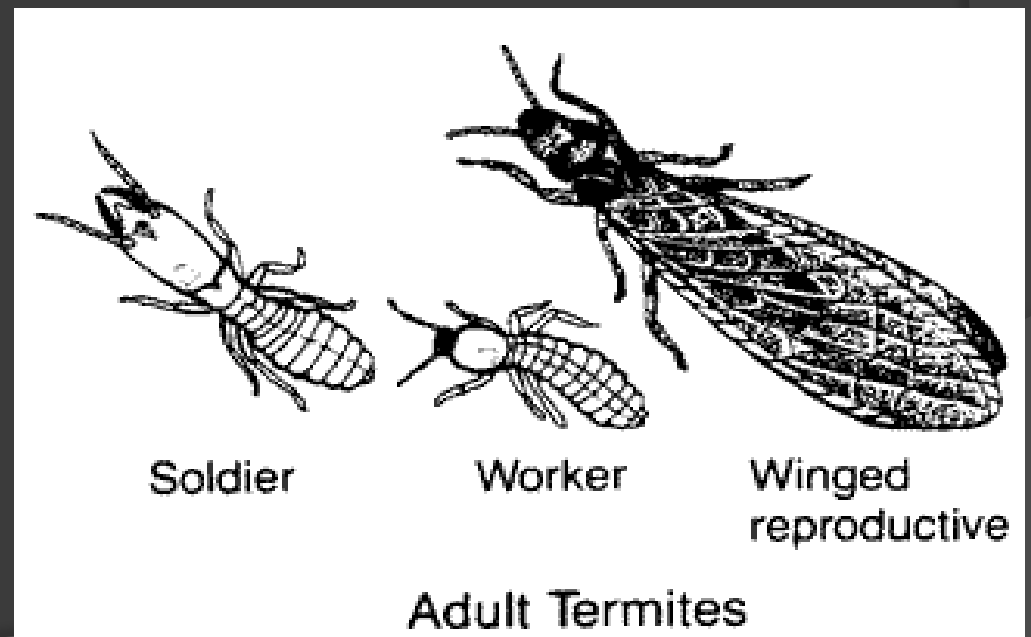
- ⦿ Eggs
- ⦿ Nymphs
- ⦿ Adult



Mouthpart

Chewing mouthpart

- Soldier
- Worker
- Queen



ORDER ORTHOPTERA

Wings

- ⦿ Fore wing are leathery, called tegmina
- ⦿ Fam. Grillidae can produce the song when front wing are rubbed together.

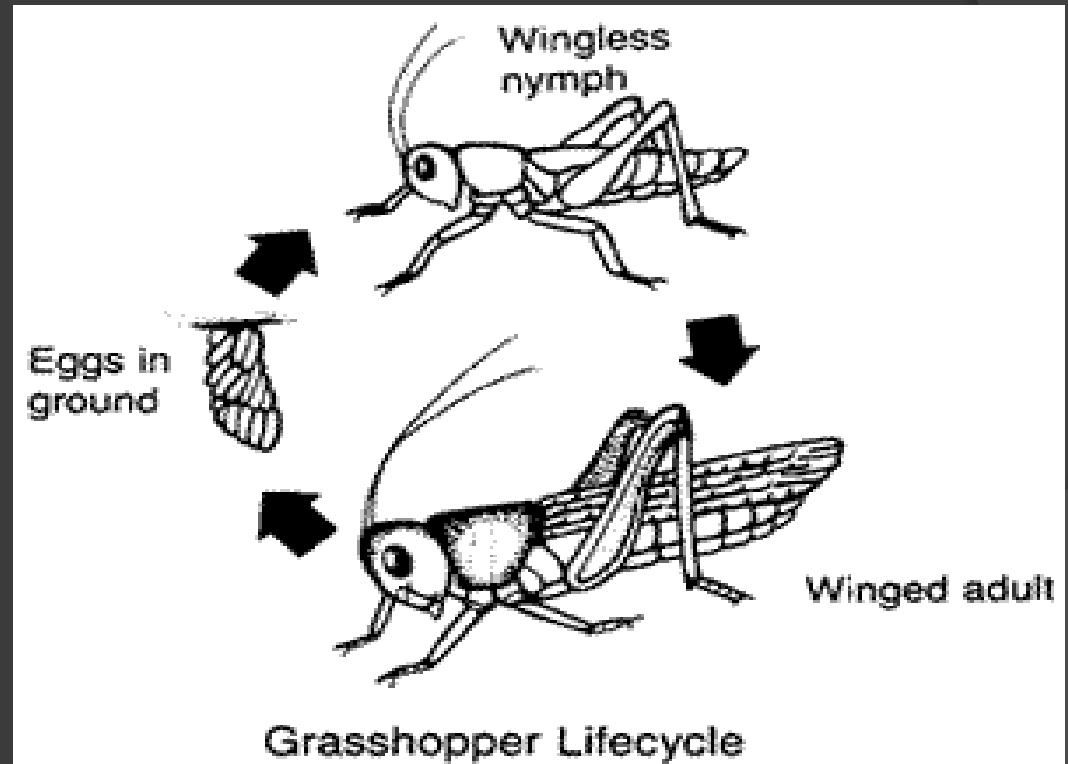


Order Orthoptera: Grasshopper, *Dissosteira carolina*,
[The Insects of Cedar Creek Photo Album](#)
The hind wings fold like a fan under the tegmina.

Metamorphosis

Gradual metamorphosis

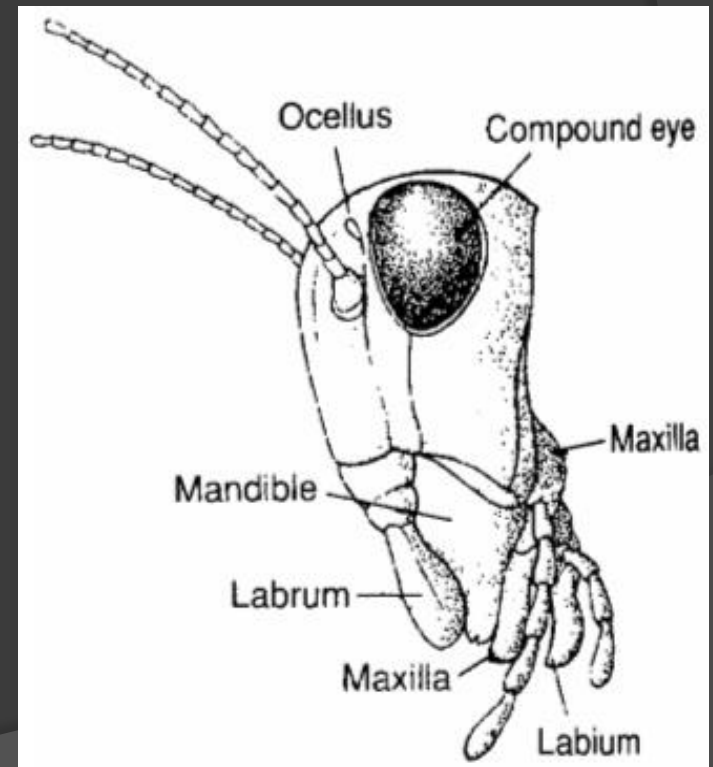
- ⦿ Eggs
- ⦿ Nymphs
- ⦿ Adult



Mouthpart

Chewing mouthpart

- ⦿ Mandible are well-developed.
- ⦿ The mouthpart consist of the mandible, maxilla, labrum, and labium.



ORDER DERMAPTERA

Wings

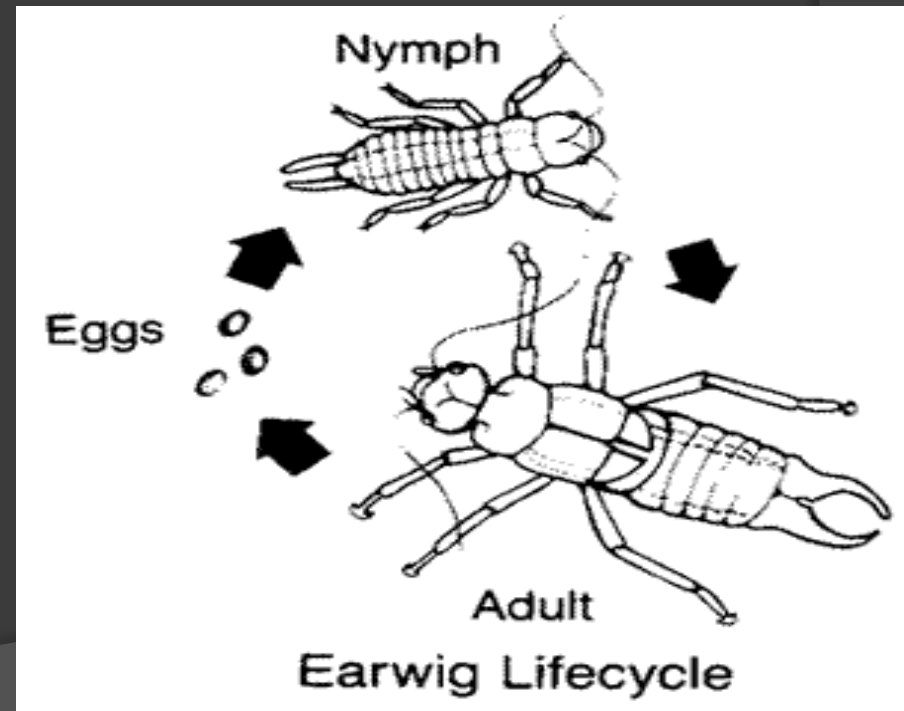
- ⦿ Fore wing modified into very short leathery tegmina devoid of veins.
- ⦿ Hind wing semicircular, membranous, with the veins highly modified and disposed radial



Metamorphosis

Gradual metamorphosis

- ⦿ Eggs
- ⦿ Nymphs
- ⦿ Adult



Mouthpart

Chewing mouthpart



ORDER THYSANOPTERA

Wings (Thrips)

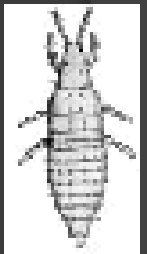
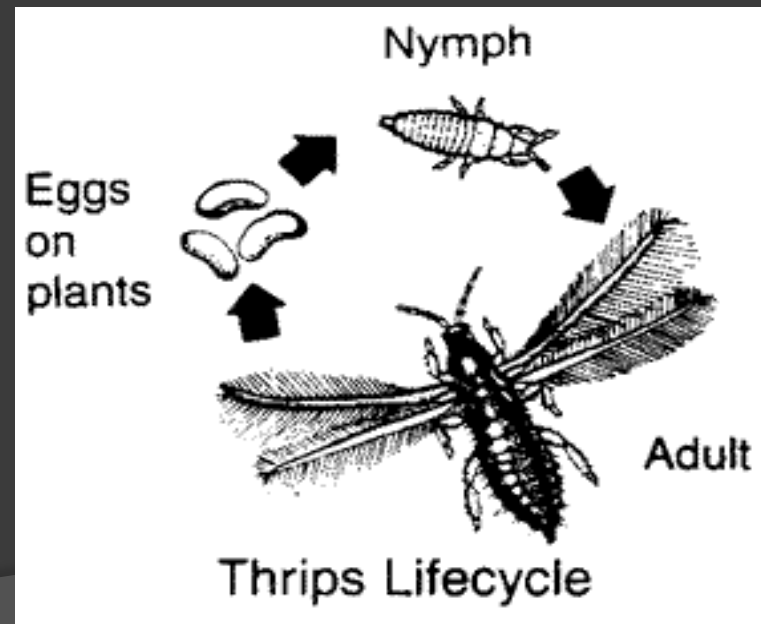
- Four membranous wings are fringed with long hairs called fringed wings.



Metamorphosis

Intermediate gradual and complete metamorphosis

- ⦿ The development of wings is internal in early instars but external in later instars.
- ⦿ There are inactive instars, very similar to pre pupa and a pupa, before transforming into adult



Mouthpart

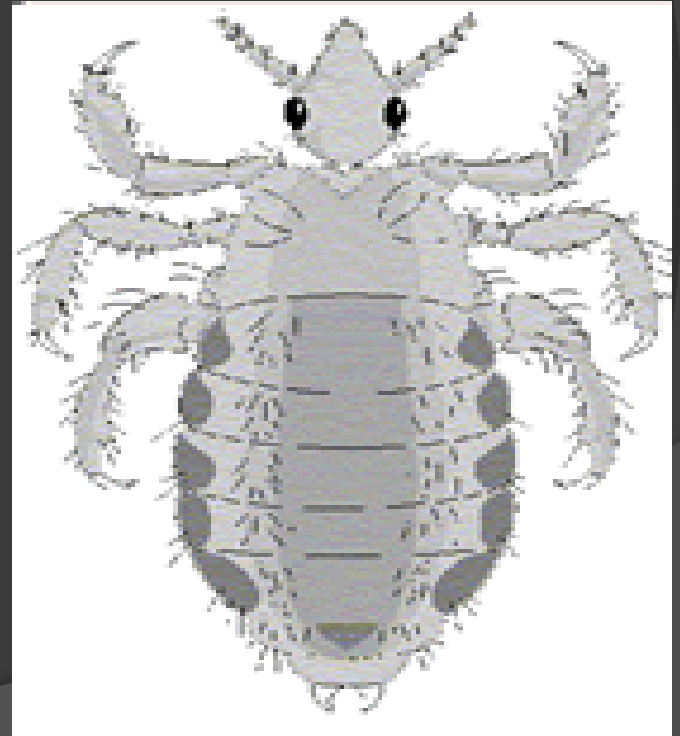
Rasping-sucking mouthpart

- ⦿ The broadly conical proboscis is asymmetrical.

ORDER ANOPLURA

Wings (Sucking lice)

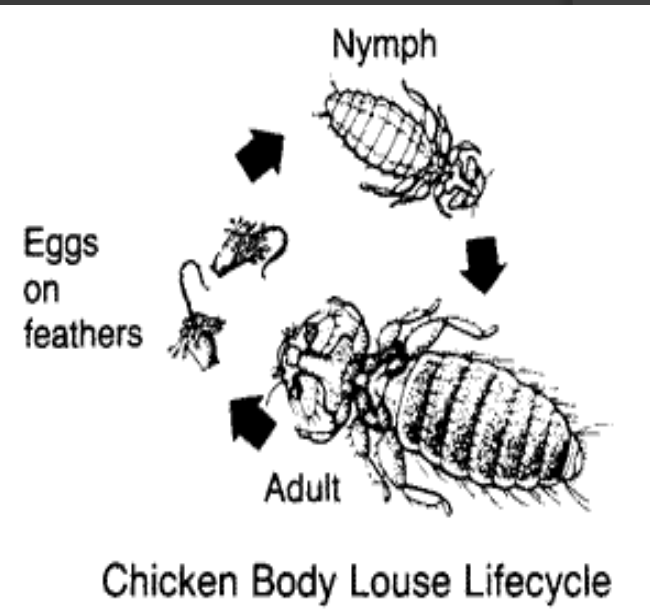
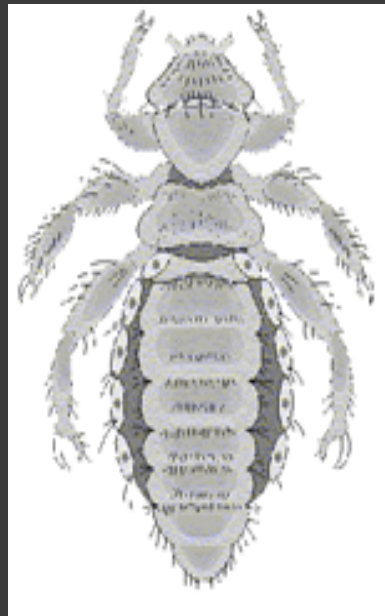
The wingless insects



Metamorphosis

Incomplete metamorphosis

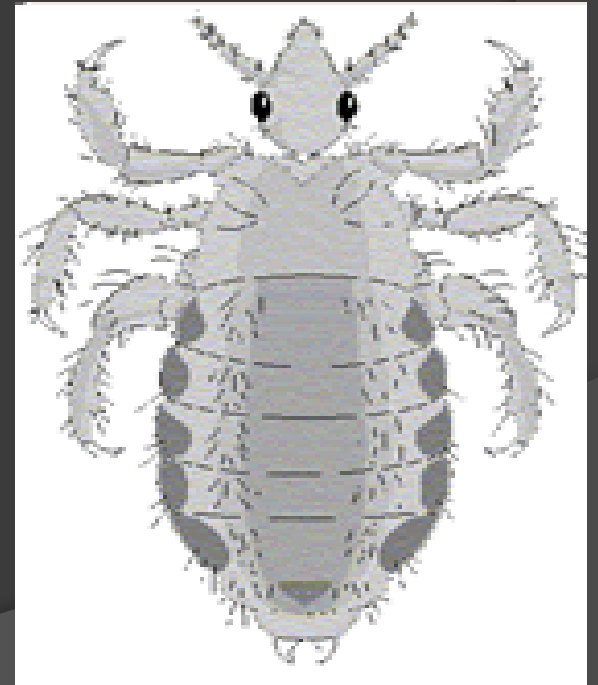
- ⦿ Eggs
- ⦿ Nymphs
- ⦿ Adult



Mouthpart

Piercing-sucking mouthpart

◎ Hemathophagous



رتب ذات التطور الكامل

- ◎ ORDER SIPHONAPTERA
- ◎ ORDER DIPTERA
- ◎ ORDER LEPIDOPTERA
- ◎ ORDER COLEOPTERA
- ◎ ORDER HYMENOPTERA

ORDER SIPHONAPTERA

Wings

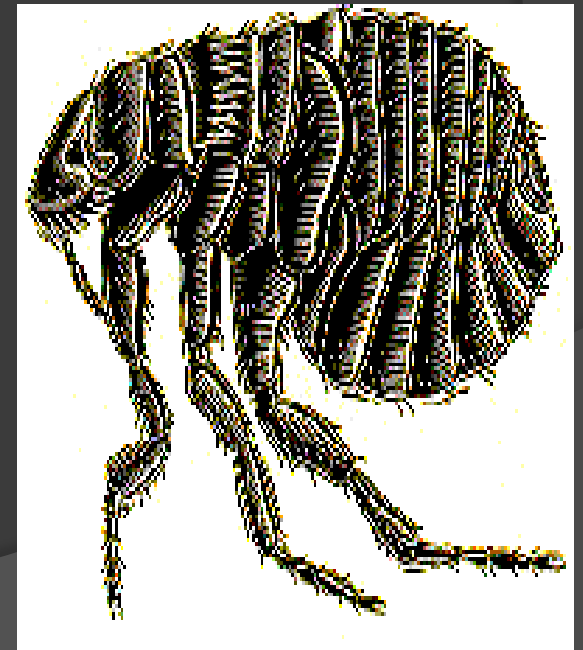
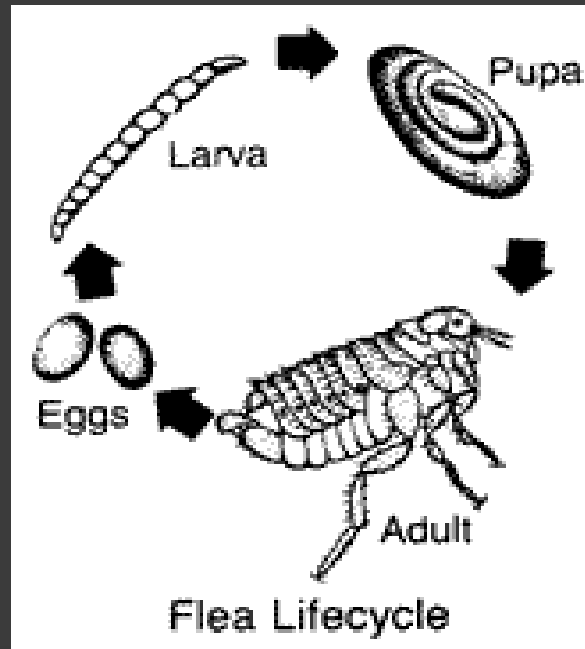
- ⦿ They don't have wings called apterous



Metamorphosis

Complete metamorphosis

- ⦿ Eggs
- ⦿ Larvae
- ⦿ Pupae
- ⦿ Adult

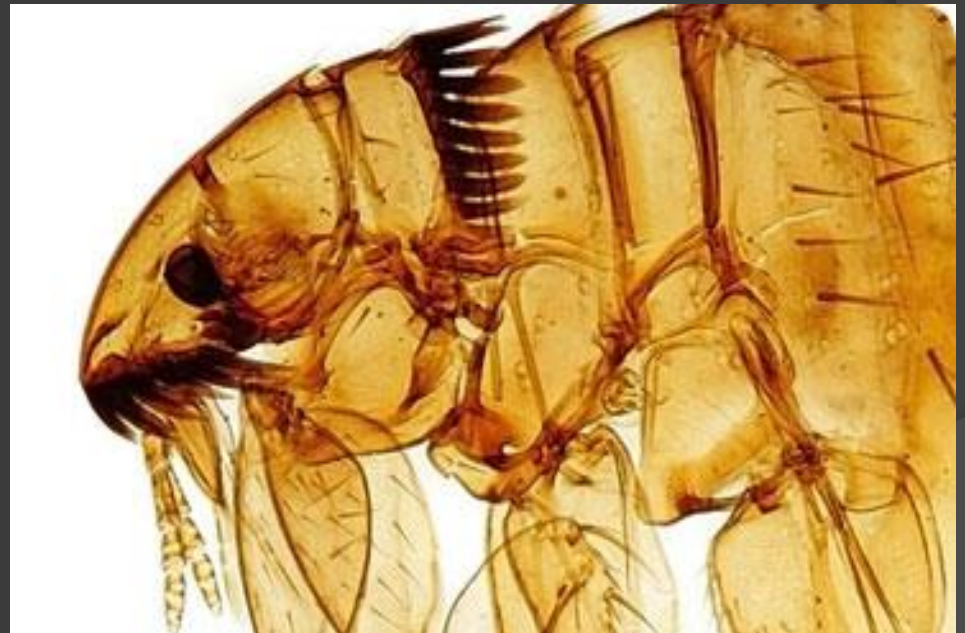


Fleas (Siphonaptera)

Mouthpart

Piercing sucking mouthpart

⦿ Maxillary and labial palp present



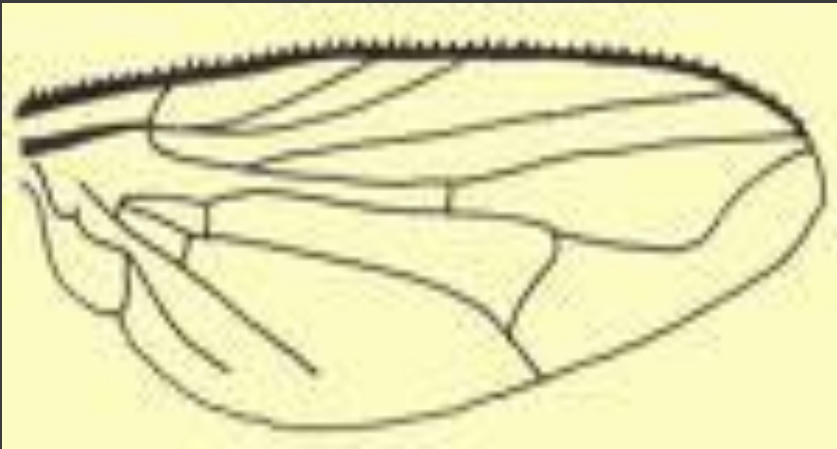
Head of a female *Ctenocephalides felis felis*, the cat flea.

370 x 225 - 31k - jpg nhm.ac.uk

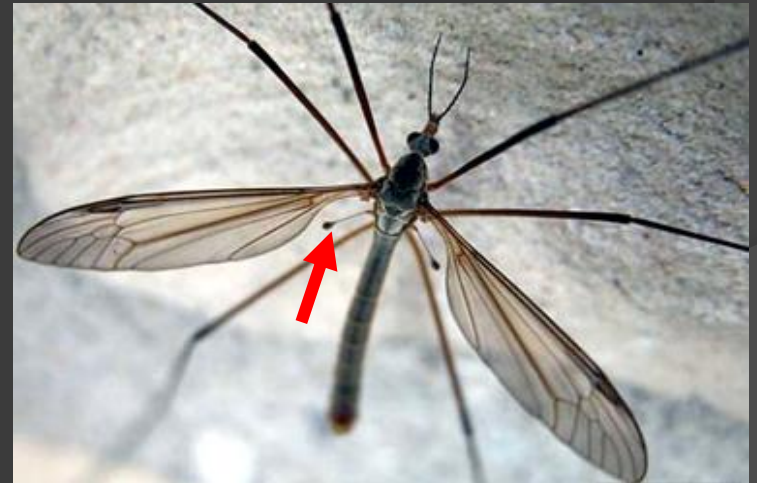
ORDER DIPTERA

Wings

- ◉ Flies and mosquitoes.
- ◉ The front wings are membranous.
- ◉ The second pair of wing are small, called halteres/balancers.
- ◉ There is veins and cells clearly.



Wings, veins, and body
691 x 500 - 64k - jpg
entomology.umn.edu



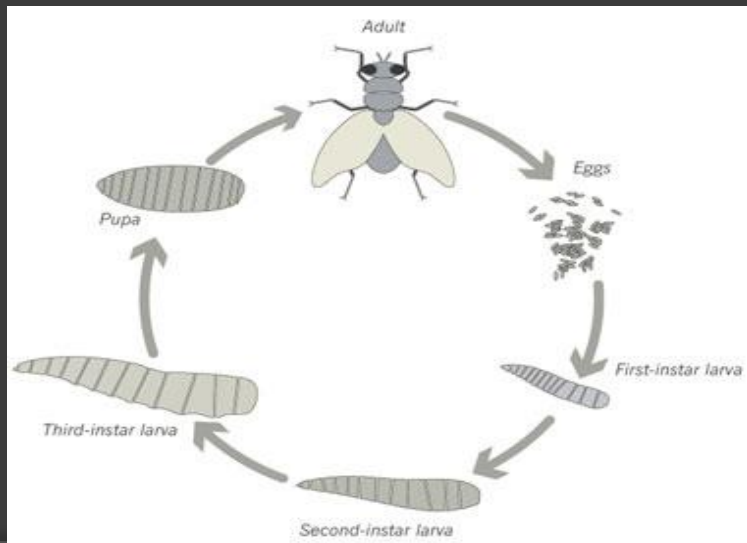
Order Diptera: Crane fly, *Tipula oleracea*, Janco
Tanis, jancology.com, www.insectimages.org

Metamorphosis

Holometabola (Complete metamorphosis).

There is four stages of complete metamorphosis.

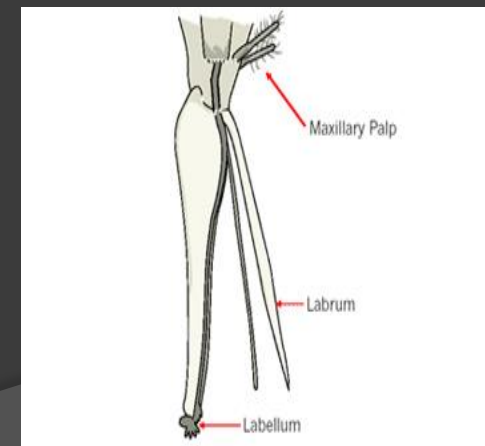
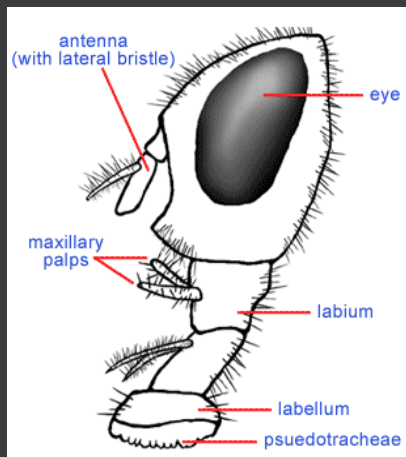
- ⦿ Eggs
- ⦿ Larvae (Maggot) 3m0r 4 larval instars.
- ⦿ Pupae
- ⦿ Adult



Mouthpart

Type of the mouthpart most species have haustellat mouthparts and collect food in liquid form

- ◉ Lapping / sponging (Housefly)
- ◉ Piercing sucking (Mosquitoes)
- ◉ Cutting sucking (predator of robber flies)
- ◉ Intermediate type (rasping and sucking) for hemathopagous flies
- ◉ Cutting-lapping

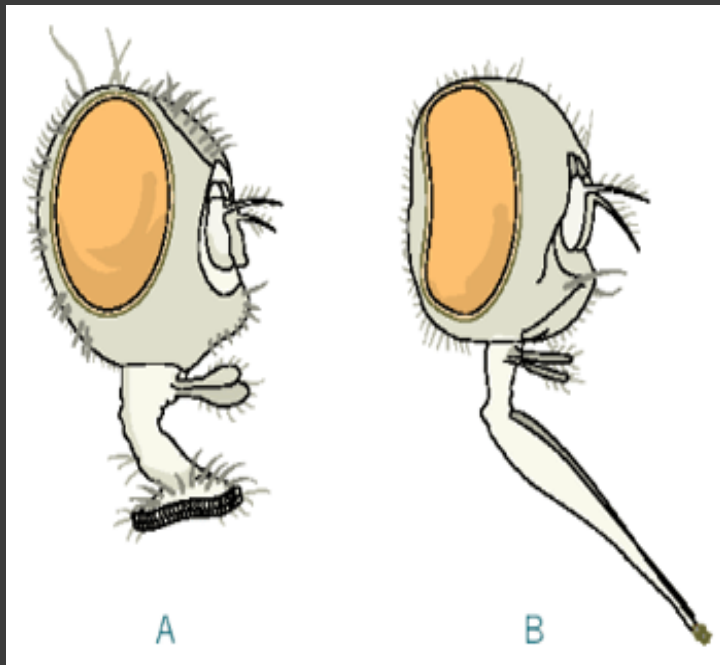


Sponging mouthparts are used to sponge and suck liquids.
Examples: House flies and blow flies (order Diptera).

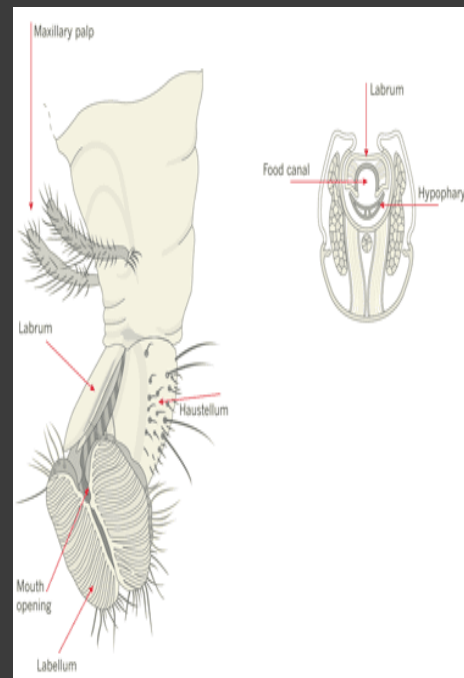
Mosquito

Tsetse fly (piercing sucking)

Mouthpart



Heads of adult house fly (A) and stable fly (B) showing the differences in the mouthparts (proboscis).



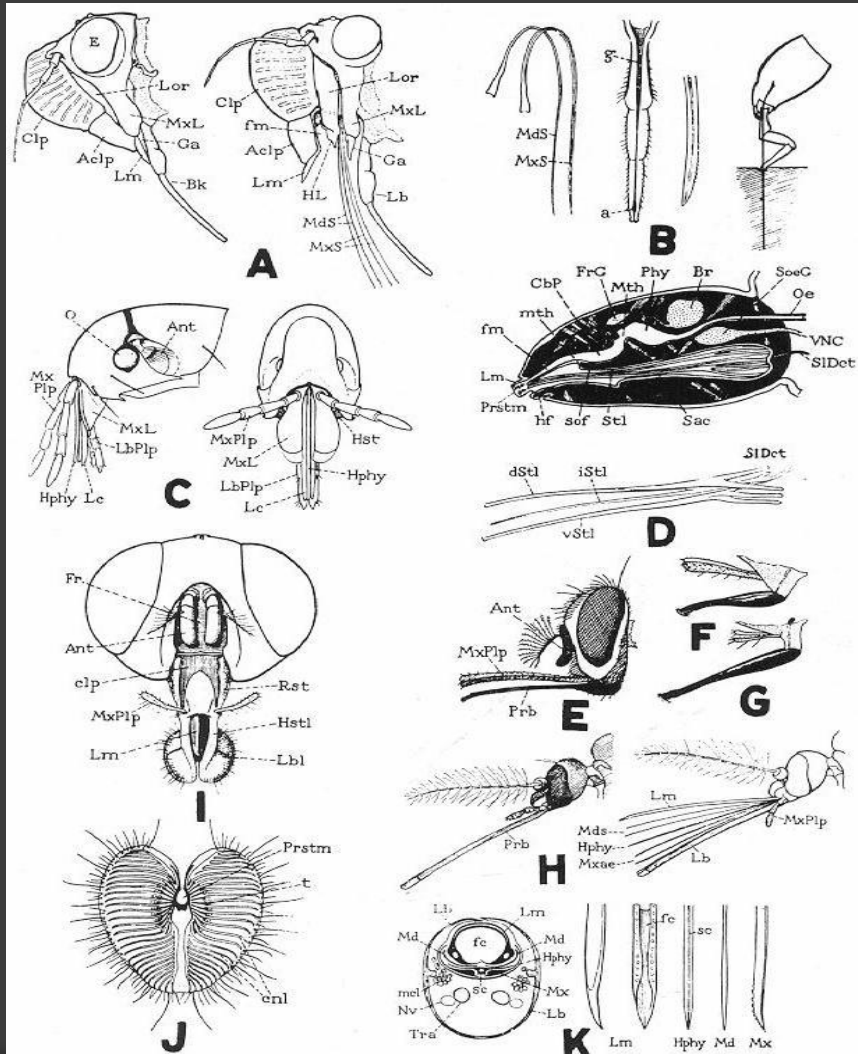
Lapping type



Piercing proboscis and short palp

www.uoguelph.ca/nadsfly/FFP/filtable.htm

Mouthpart



Tsetse fly

www.astrographics.com/.../GP2156.html

ORDER LEPIDOPTERA

Wings

- Two pair membranous wings, the body, wing clothed with broad scale
- Cross veins few number
- The body, wings of butterfly and moths clothed with broad scale
(Richards & Davies, 1964)



Order Lepidoptera: Io moth, *Automeris io*, Ronald F. Billings, Texas Forest Service, www.insectimages.org

NOCTURNAL



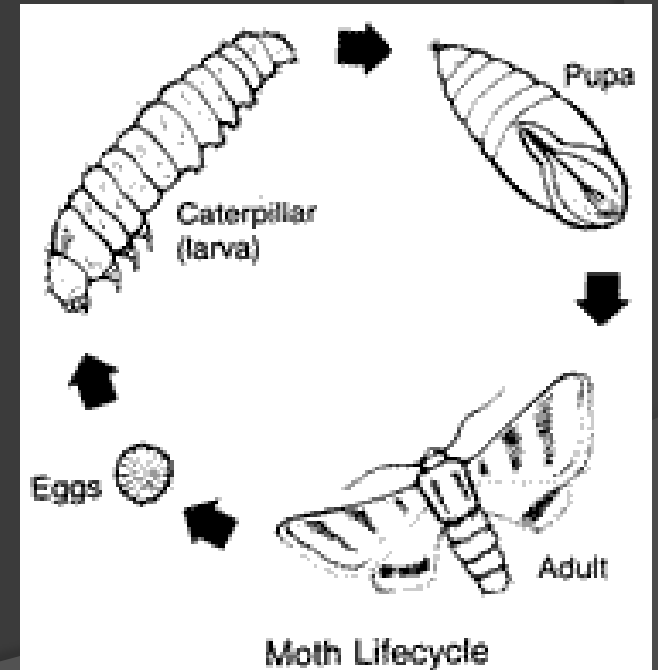
Order Lepidoptera: Tiger swallowtail, *Papilio turnus*, Edward L. Manigault, Clemson University Donated Collection, www.insectimages.org

DIURNAL

Metamorphosis

Holometabola (complete metamorphosis)

- ⦿ Eggs
- ⦿ Larvae
- ⦿ Pupae
- ⦿ Adult



Lepidoptera and Moth (Lepidoptera)

Mouthpart

Siphoning mouthpart in adult stages

- Suctorial proboscis formed by the maxillae

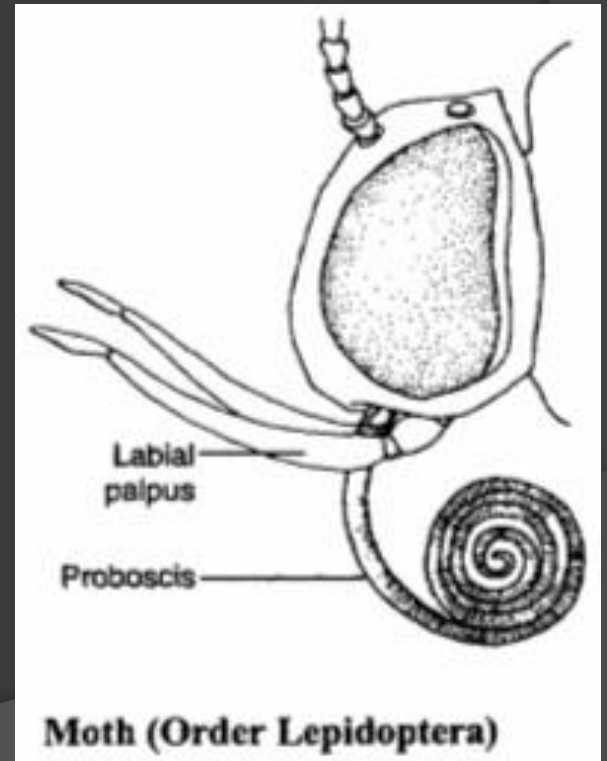
Chewing mouthpart in larvae stages

- Great importance in the larval stage



insects.tamu.edu/extension/youth/bug/bug092.html

Siphoning mouthparts lack stylets and are used to suck liquids. Examples: Butterflies, moths

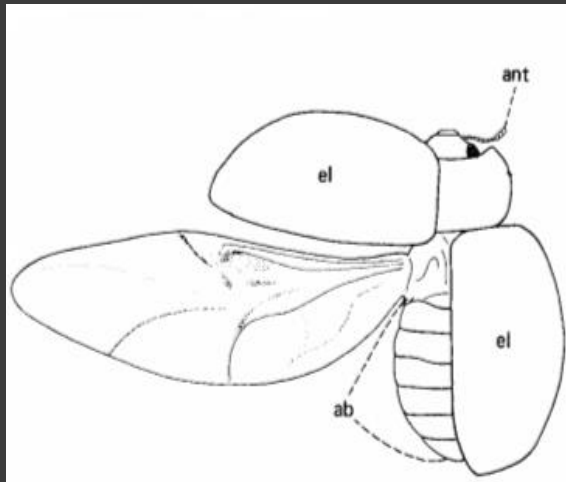


Moth (Order Lepidoptera)

ORDER COLEOPTERA

Wings

- ⦿ Fore wings are modified into horny leathery-elytra
- ⦿ Hind wings membranous, folded beneath the elytra
- ⦿ Veins less

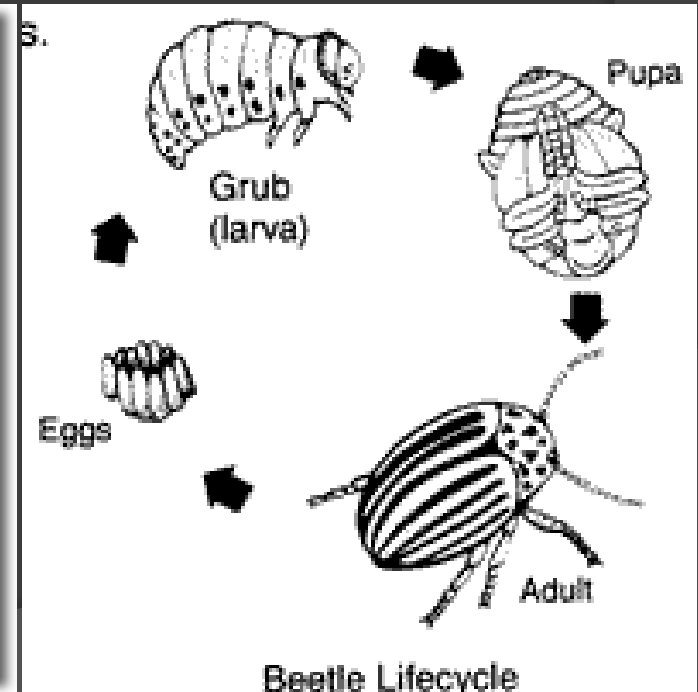


Order Coleoptera: Dung beetle, *Heliocopris andersoni*, in flying position, A Davis, Dept. of Zoology and Entomology, University of Pretoria, [Transvaal Museum](#)

Metamorphosis

Holometabola (Complete metamorphosis).

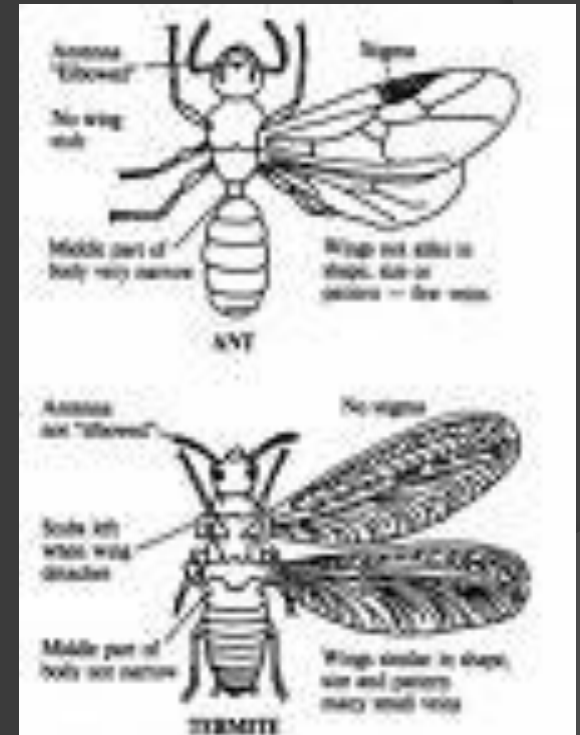
- ⦿ Eggs
- ⦿ Larvae
- ⦿ Pupae
- ⦿ Adult



ORDER HYMENOPTERA

Wings (Ant, bees, wasps)

- Two pair of membranous wings.
- The venation greatly reduced
- Hind wing smaller than forewings

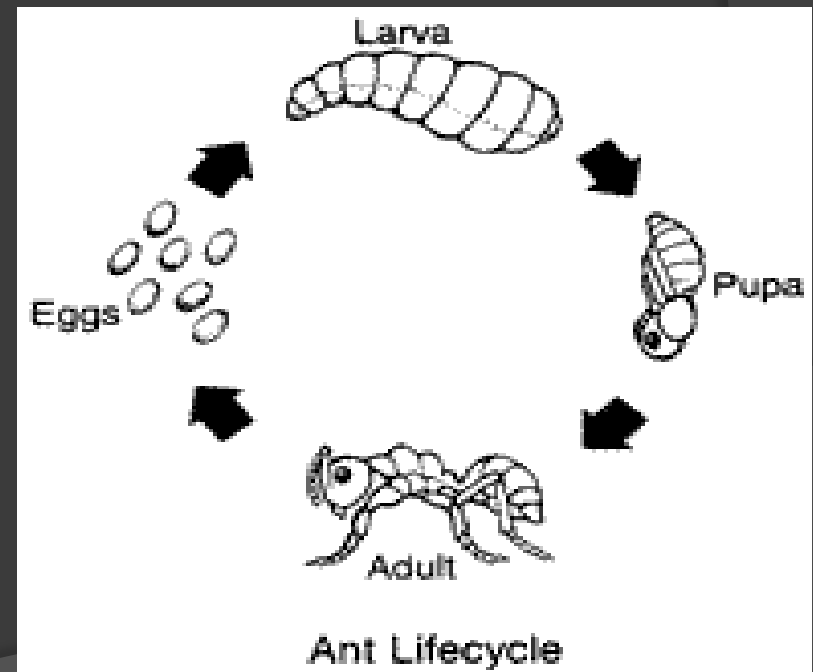


Hymenoptera wings (upper side)
www.entomology.umn.edu/museum/links/coursefil...

Metamorphosis

Complete metamorphosis

- ⦿ The larvae generally podous with a more or selected head
- ⦿ Eggs
- ⦿ Larvae
- ⦿ Pupae adult



Mouthpart

- ⦿ Chewing-lapping mouthpart of a bees
- ⦿ Chewing mouthpart of Ant



Order Hymenoptera: Blueberry bee,
Habropoda laboriosa, Jerry A. Payne, USDA
APS www.insectimages.org



400 x 268 - 44k - jpg
insectzoo.msstate.edu

References

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