



# FLEAS



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पटना-800014 (बिहार)

# FLEAS

## CLASSIFICATION:

Phylum: Arthropoda

### Classes

Insecta

Arachnida

Pentastomida

Subclasses: Apterygota  
(Generally wingless insects)  
and Pterygota

Order: Acarina  
(Ticks & Mites)

Family: Linguatulidae  
(Tongue worms)

Subclass: Pterygota

### Divisions

Exoterygota

Endopterygota

Order: (1) Mallophaga (biting lice)  
(2) Siphunculata/Anoplura (sucking lice)  
(3) Hemiptera (bugs)  
(4) Odonata (dragon flies)  
(5) Orthoptera (cockroaches,  
grasshoppers)

Order: (1) Diptera (true flies)  
(2) **Siphonaptera (fleas)**  
(3) Coleoptera (beetles)  
(4) Hymenoptera (bees, wasps,  
ants)

# FLEAS

**Order: Siphonaptera**

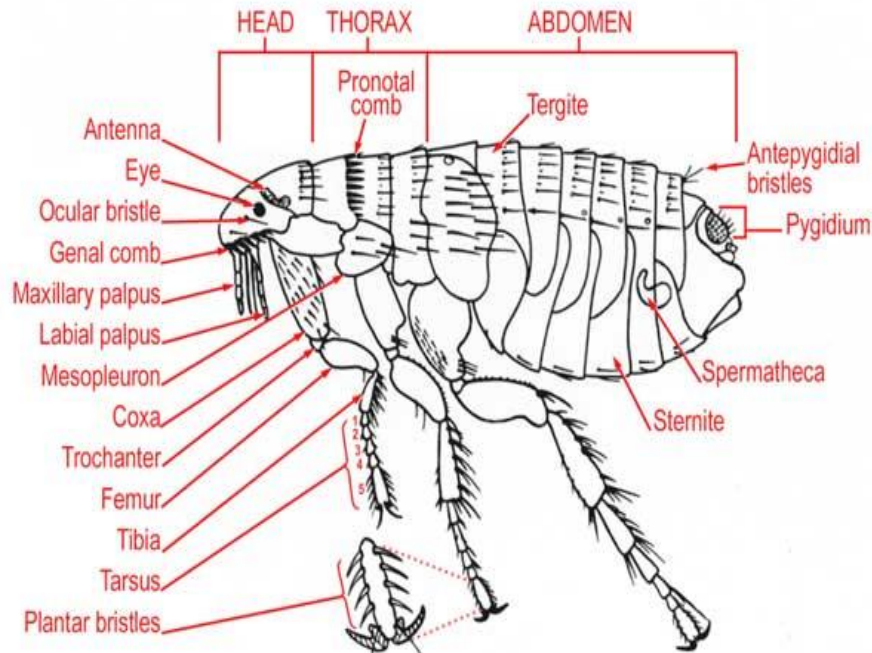
The name siphonaptera is derived from the Greek words siphon+ apteron which means the sucking wingless insects i.e. fleas



# FLEAS

## Morphological characters:

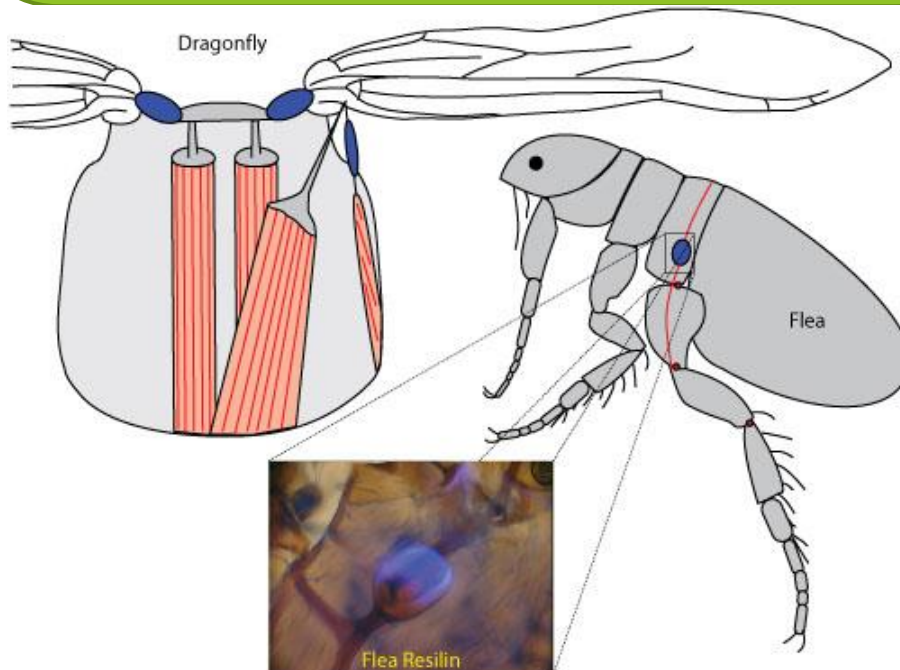
- ⌚ Temporary parasites.
- ⌚ Wingless insects (their ancestors had wings which modern forms have lost) with laterally compressed bodies .
- ⌚ Eyes present or absent and three-segmented antennae.
- ⌚ Compound eye absent.
- ⌚ 3- pairs legs.
- ⌚ Third pair of legs much larger than the others and are adapted for leaping on and off their hosts.



# FLEAS

## Morphological characters:

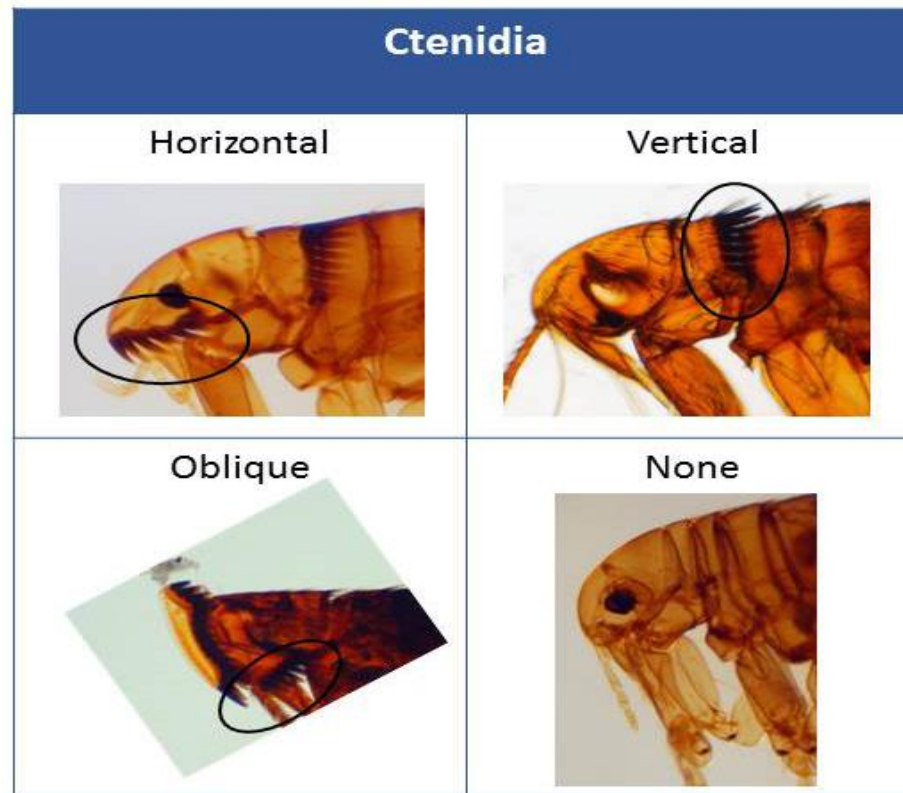
- 🕒 Rubber-like elastic protein, **resilin**, which gives fleas their remarkable jumping ability.
- 🕒 A flea can jump vertically up to 18 cm (7 in) and horizontally up to 33 cm (13 in).



# FLEAS

## Morphological characters:

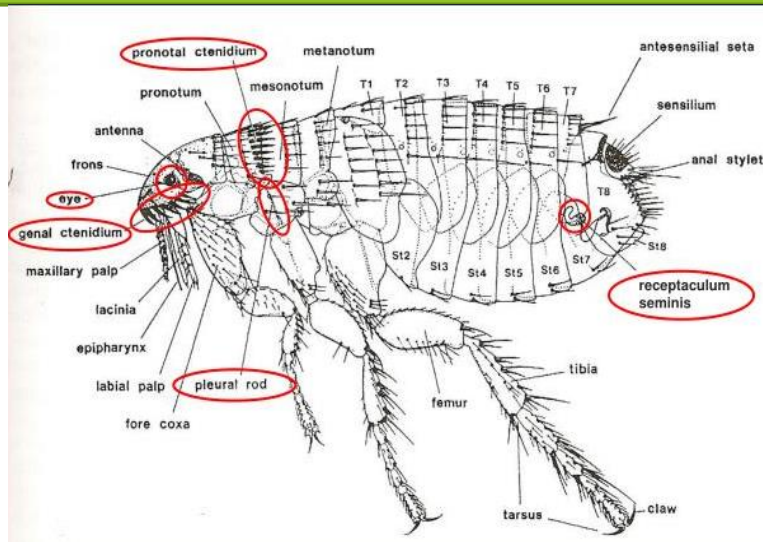
- ⌚ Head and thorax bears a numbers of prominent spines called combs.
- ⌚ Genal combs present on the head whereas pronotal combs are present on the posterior border of first thoracic segment.



# FLEAS

## Morphological characters:

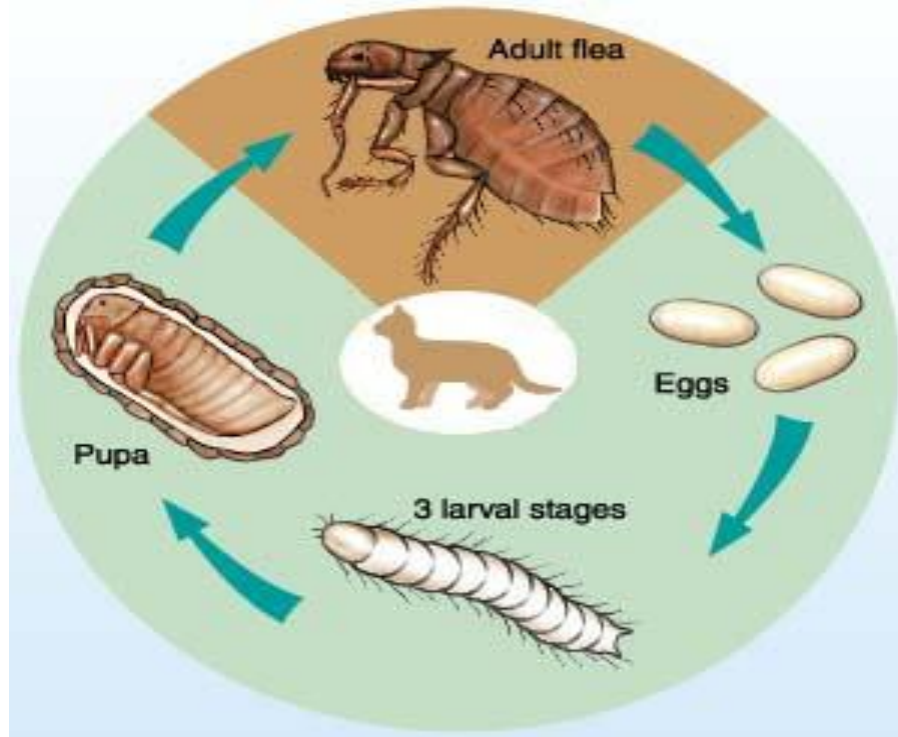
- ⌚ Abdomen has ten segments. The 9<sup>th</sup> abdominal segment of both male and female flea bears a dorsal plate called sensillum or pygidium.
- ⌚ Male flea has chitinous and coiled penis (aedeagus).
- ⌚ Last segment of ten segmented abdomen has two hooked processes called the anal struts which are used for holding on to substrata or for locomotion.
- ⌚ Both sexes are blood sucker but only the adult fleas are parasitic.



# FLEAS

## Life-cycle:

- 🕒 Holometabolus (complete metamorphosis).
- 🕒 Life-cycle comprises as egg, larva, pupa and adult.





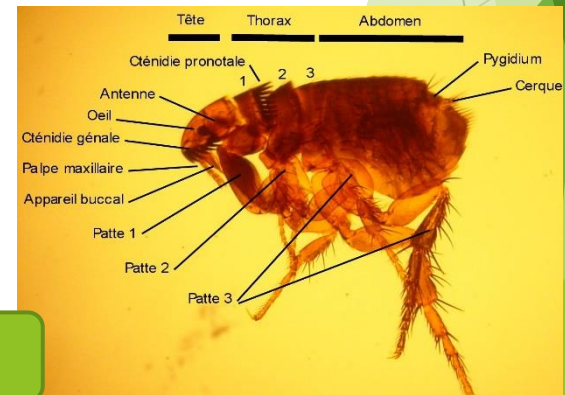
# FLEAS

## List of important fleas , their host and salient morphological characters:

Flea	Host	Salient morphological characters
<i>Ctenocephalides canis</i> (common dog flea)	Dog	Both genal and pronotal ctenidium present in which genal ctenidium is horizontal. Head length less than twice height and spine 1 of genal ctenidium is shorter than spine 2.
<i>Ctenocephalides felis</i> (common cat flea)	Cat	Both genal and pronotal ctenidium present in which genal ctenidium horizontal. Head length twice height and spine 1 of genal ctenidium is equal to spine 2.



*Ctenocephalides canis*

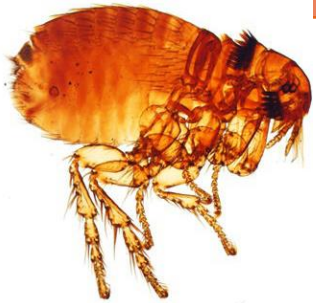


*Ctenocephalides felis*

# FLEAS

List of important fleas , their host and salient morphological characters:

Flea	Host	Salient morphological characters
<i>Spilopsyllus cuniculi</i>	Rabbit	Both genal and pronotal ctenidium present in which genal ctenidium is oblique.
<i>Ceratophyllus gallinae</i> (common flea of chicken)	Poultry	Only pronotal ctenidium is present.
<i>Echidnophaga gallinacea</i> (Stick-tight flea)	.Poultry	Ctenidium absent and forehead angled anteriorly



*Spilopsyllus cuniculi*



*Ceratophyllus gallinae*



*Echidnophaga gallinacea*

# FLEAS

List of important fleas , their host and salient morphological characters:

Flea	Host	Salient morphological characters
<i>Pulex irritans</i> (common human flea)	Man, also in pig, dog & cat	Ctenidium absent and Frons rounded anteriorly. It may also occur on the pig, dog, cat & rat.
<i>Tunga penetrans</i> ( Chigger or chigoe flea or sand flea)	Man & Pig	Only pronotal ctenidium is present.
<i>Xenopsylla cheopis</i> (Black rat flea or oriental flea)	Rat	-



*Pulex irritans*



*Tunga penetrans*



*Xenopsylla cheopis*

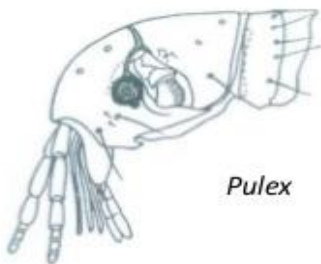
# FLEAS

## Laboratory Confirmation/ Species Identification

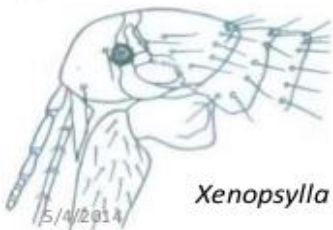
No comb/ctenidia



*Echidnophaga*

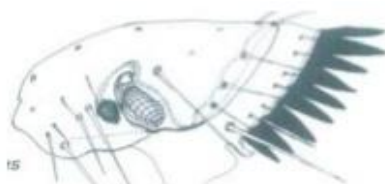


*Pulex*



*Xenopsylla*

With Pronotal comb only



*Ceratophyllus*

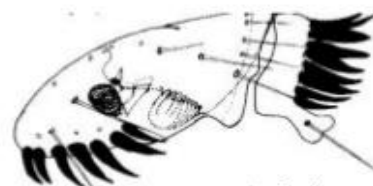


*Nosopsyllus fasciatus*

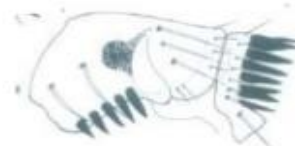
with Genal and Pronotal comb



*Ct. canis*



*Ct. felis*



*Spinopsyllus*

Lecture on flea by Alim

15



*Ctenocephalides canis*



*Ctenocephalides felis*

# FLEAS

## Pathological significance & Disease transmission:

- Cause annoyance and irritation to the hosts during biting for sucking of blood.
- Infested host become restless, loose body condition etc.
- Animals exposed to 1<sup>st</sup> times flea bites results formation of erythema followed by pin point elevation.
- Acute itching leads to formation of papules and pustules and causing a condition called “flea bite dermatitis”.



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## Pathological significance & Disease transmission:

- 🕒 Flea-bite allergy is a hypersensitivity reaction to the flea saliva released into the skin during feeding.
- 🕒 Flea's saliva contains a hapten (an incomplete antigen) which combines with the host's skin collagen to form a complete allergen. The resulting allergy is most commonly a combination of immediate and delayed type by hypersensitivity.

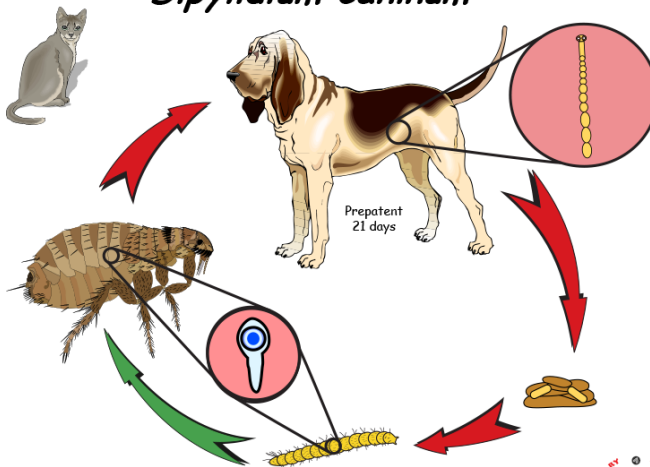


# FLEAS

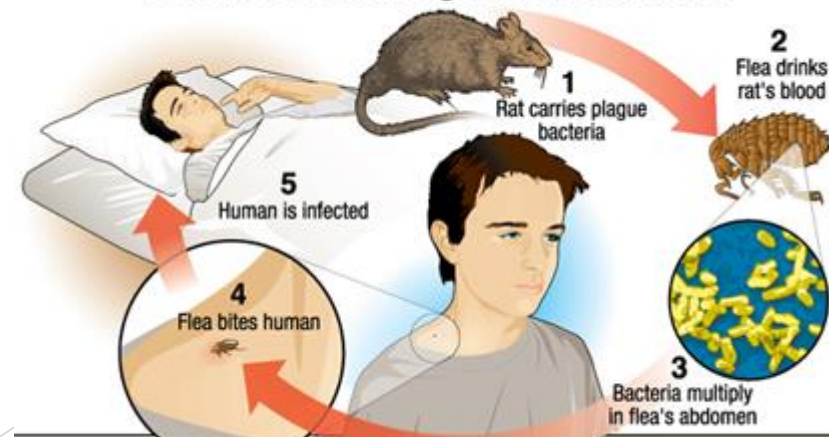
## Intermediate host/ Vector/ Disease transmission:

Fleas	Intermediate host/ vector/ Disease transmission
<i>Ctenocephalides canis</i> , <i>Ctenocephalides felis</i> & <i>Pulex irritans</i>	Act as intermediate host for <i>Dipylidium caninum</i> ( Dog tapeworm), <i>Dipetalonema reconditum</i> ( dog filarial worm)
<i>Xenopsylla cheopis</i>	Acts as vector of <i>Yersinia pestis</i> (The causative agent of bubonic plague in man)
<i>Spilopsyllus cuniculi</i>	found on the ears of rabbits and vector of myxomatosis

### *Dipylidium caninum*



### How the Bubonic Plague Was Transmitted



# FLEAS

Tips to Prevent Flea Infestation

## Treatment & Control:

- ❖ Treatment of the infested animals with suitable insecticides like deltamethrin, malathion,, lindane etc. by spraying on the body as well as in and around shed of animals.
- ❖ Ivermectin @ 1ml/50 kg b.wt S/C .
- ❖ Flumethrin pour-on apply on dorsal midline from the head to the base of the tail.
- ❖ Fleas collars impregnated with insecticide like Methoprene are usually used in controlling of fleas of dog & cats.





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## Control:

- ❖ Insect development inhibitor like Lufenuron etc. can be used orally to inhibit chitin synthesis and eggs & larvae development.
- ❖ Bedding materials of animals like carpets, rugs , gunny bags etc. should be cleaned thoroughly or sun-dried or sprayed with insecticide



**THANK  
YOU**