



FLEAS



डा. अजीत कुमार

परजीवी विज्ञान विभाग

बिहार पशुचिकित्सा महाविद्यालय

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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)

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Order: Siphonaptera

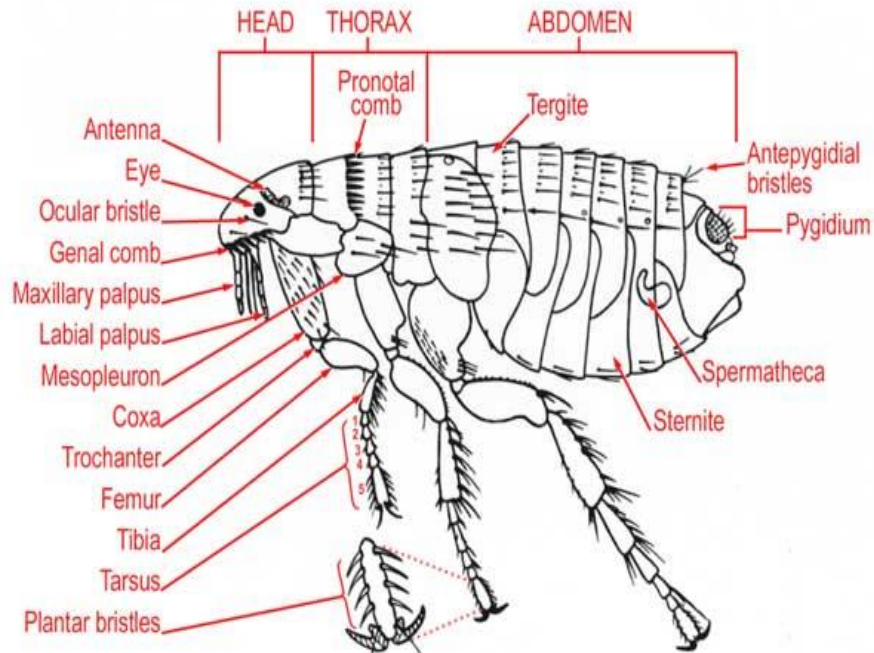
The name siphonaptera is derived from the Greek words siphon+ apteron which means the sucking wingless insects i.e. fleas



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Morphological characters:

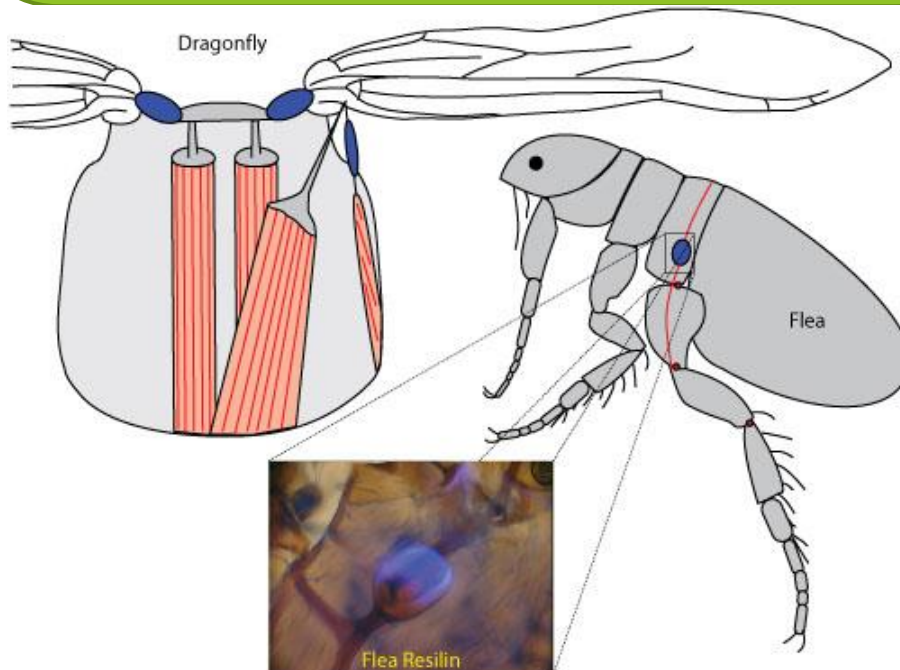
- ⌚ Temporary parasites.
- ⌚ Wingless insects (their ancestors had wings which modern forms have lost) with laterally compressed bodies .
- ⌚ Eyes present or absent and three-segmented antennae.
- ⌚ Compound eye absent.
- ⌚ 3- pairs legs.
- ⌚ Third pair of legs much larger than the others and are adapted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



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Morphological characters:

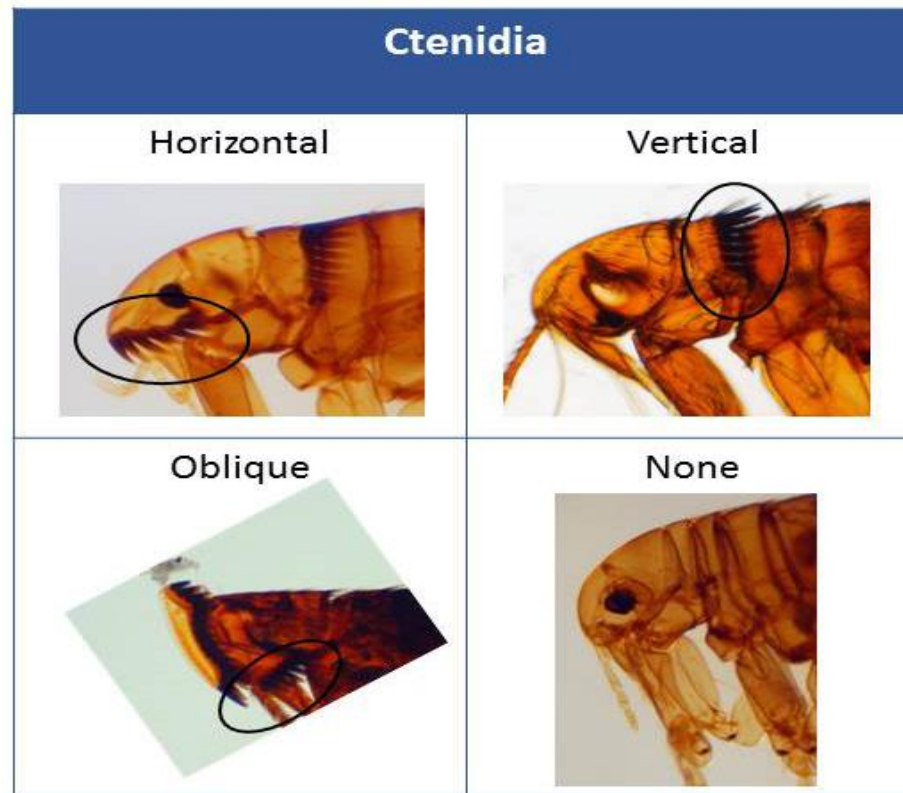
- 🕒 Rubber-like elastic protein, **resilin**, which gives fleas their remarkable jumping ability.
- 🕒 A flea can jump vertically up to 18 cm (7 in) and horizontally up to 33 cm (13 in).



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Morphological characters:

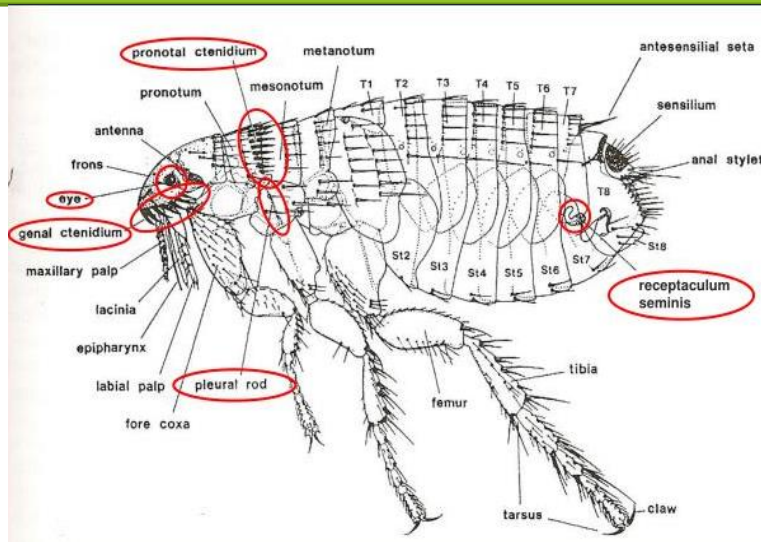
- ⌚ Head and thorax bears a numbers of prominent spines called combs.
- ⌚ Genal combs present on the head whereas pronotal combs are present on the posterior border of first thoracic segment.



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Morphological characters:

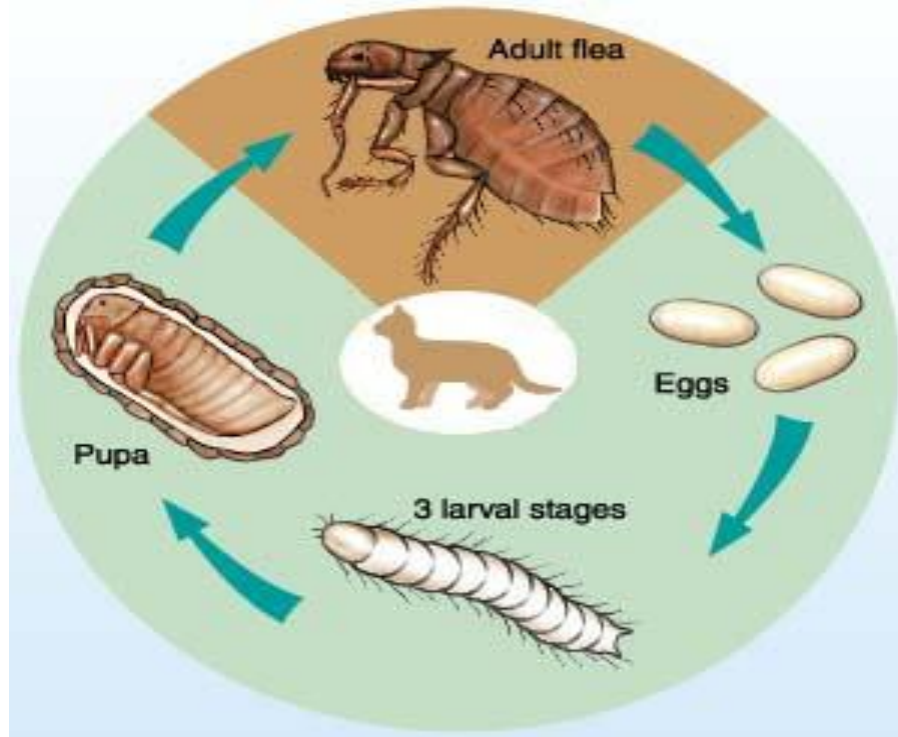
- ⌚ Abdomen has ten segments. The 9th abdominal segment of both male and female flea bears a dorsal plate called sensillum or pygidium.
- ⌚ Male flea has chitinous and coiled penis (aedeagus).
- ⌚ Last segment of ten segmented abdomen has two hooked processes called the anal struts which are used for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



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Life-cycle:

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



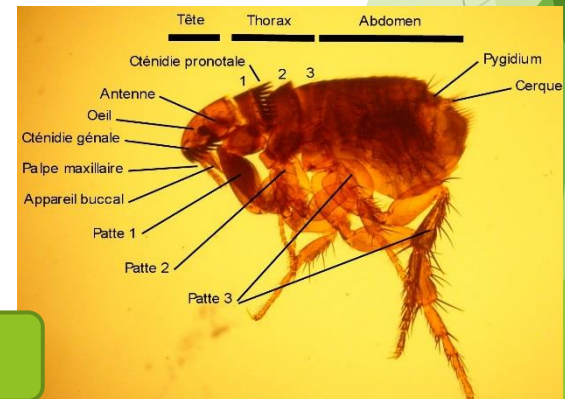
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List of important fleas , their host and salient morphological characters:

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

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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

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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

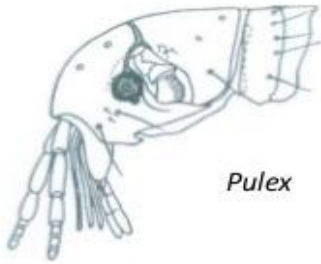
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Laboratory Confirmation/ Species Identification

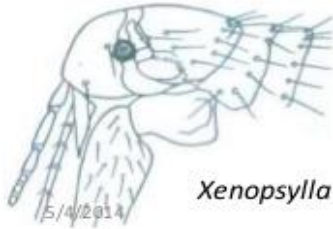
No comb/ctenidia



Echidnophaga



Pulex



Xenopsylla

With Pronotal comb only



Ceratophyllus

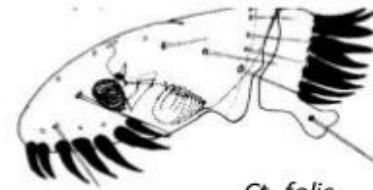


Nosopsyllus fasciatus

with Genal and Pronotal comb



Ct. canis



Ct. felis



Spinopsyllus

Lecture on flea by Alim

15



Ctenocephalides canis



Ctenocephalides felis

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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 1st 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.

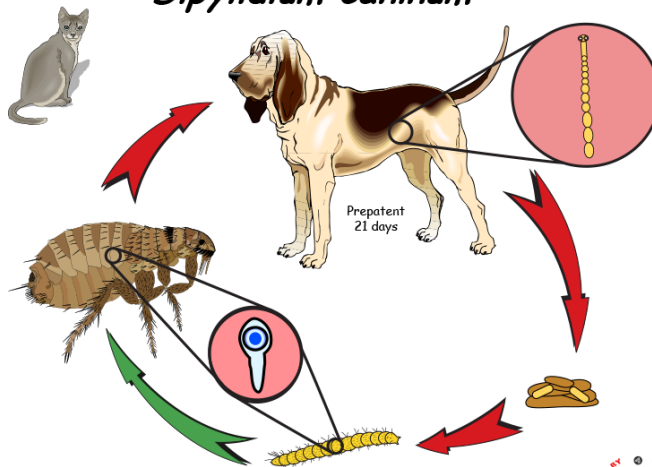


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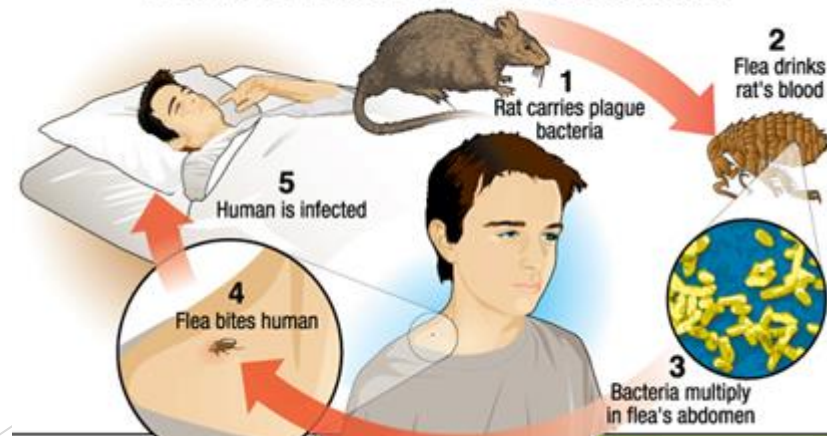
Intermediate host/ Vector/ Disease transmission:

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



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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**