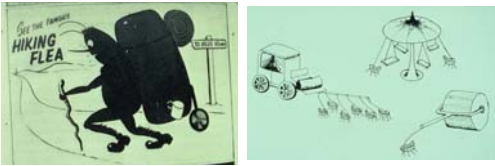


Entomology 156: Biology Of Parasites
The Arthropod Parasites Lecture 5. RB
Kimsey
The Insecta: Fleas, Introduction to Flies



I Order Siphonaptera: the Fleas

A. Introduction

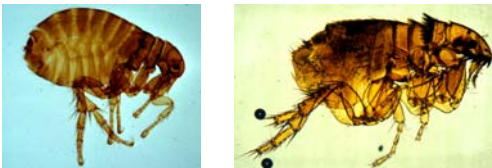
1. Classification- order Siphonaptera
 - a. Roughly 2000 species
 - b. About 14 Families



I Order Siphonaptera: the Fleas

A. Introduction

2. Found on all continents
3. Common periodomestic species
 - a. *Pulex irritans*, "the human flea"
 - b. *Ctenocephalides felis* "the cat flea"



I Order Siphonaptera: the Fleas

B. Morphology- ectoparasitic life

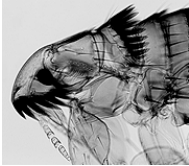
- 1. Laterally compressed
- 2. Antennae in grooves



I Order Siphonaptera: the Fleas

B. Morphology- ectoparasitic life

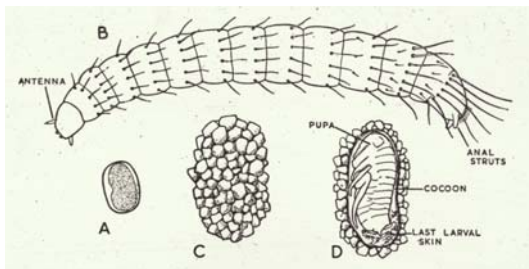
- 3. Many backwardly directed spines and combs
- 4. Powerful jumpers- especially large animal fleas



I Order Siphonaptera: the Fleas

C. Biology and Life history

- 1. Life cycle- Holometabolous or complete



I Order Siphonaptera: the Fleas

C. Biology and Life history

- 2. Eggs laid by adult females
 - a. Free, not attached to host hair or debris
 - b. Laid in nesting sites, areas frequented by host
 - c. Hatch into first instar larva



C. Biology and Life history

- 3. Larvae free living caterpillars
 - a. Long hairs, chewing mouth parts
 - b. Live in nests
 - c. Ingest host debris- hair, skin fragments, dried blood, and fecal material
 - d. Invertebrate hosts of parasites- Diphylidium etc
 - e. 5 larval molts



C. Biology and Life history

- 4. Pupate
 - a. Silken cocoon
 - b. Adults may remain "Pharate"



C. Biology and Life history

- 5. Adult- habits of two kinds
 - a. Free living, on hosts, in nests etc



C. Biology and Life history

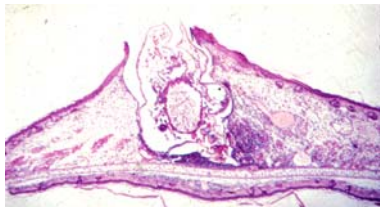
- 5. Adult- habits of two kinds
 - b. Permanently attached to hosts

- 1) Cutaneous- Echidnophaga the stick tight flea



C. Biology and Life history

- 5. Adult- habits of two kinds
 - b. Permanently attached to hosts
 - 2) Subcutaneous- Tunga the chigoe flea



C. Biology and Life history

- 6. Host association
 - a. Highly host specific
 - b. Permanently attached to hosts
 - 1) Most species
 - 2) Highly specialized
 - 3) Some hosts share of taxa due to ecological overlap

6. Host association

- b. Rarely facultatively host specific
 - 1) Peridomestic species Ctenocephalides dog and cat fleas
 - 2) Stressed rodent fleas- Xenopsylla cheopis
- c. Example- English rabbit fleas

D. Human nests and flea biology

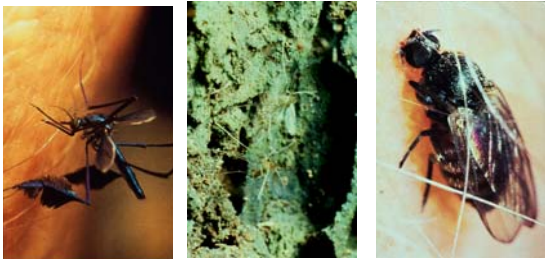
- 1. The fleas
 - a. Pulex irritans, "the human flea"
 - b. Ctenocephalides felis "the cat flea"
- 2. Peridomestic life history

D. Human nests and flea biology

II. The flies, Introduction to order Diptera



a. Nematocera- mosquitoes, et al.



b. Brachycera- horse flies, house flies et al.

II. The flies, Introduction to order Diptera

II. The flies, Introduction to order Diptera

II. The flies, Introduction to order Diptera