

Family : Simuliidae

Genus : Simulium

**Morphology, bionomics, life cycle,
pathogenesis & control.**

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Simulium : Introduction

Common name :

Black flies ,Turkey gnats , Buffalo gnats.

Species : *Simulium indicum* ,
Simulium ornatum .

Simulium : Morphology

- They are stout bodied black coloured small sized flies .
- The piercing proboscis is short thorax is humped over the head
- The male and female are morphologically .
- The pupa is boot shaped or slipper shaped .
- The antennae is 11 segmented.



Simulium fly



Simulium fly

Simulium : life cycle

- The females deposit eggs on vegetation just below the water surface.
- Larvae emerge from eggs and attach themselves to aquatic or emergent vegetation as well as rocks.
- Most of the black fly larvae are filter feeders, with the larvae feeding on nutrients in the water.
- Larvae pass through six stages before reaching the pupal stage.
- Pupae are encased in a silken cocoon attached to vegetation or other objects in the stream.
- Adults emerge from the pupal case through a slit and float to the surface on a bubble of air.
- Emerging adults live from two to three weeks.

Simulium sexes compared

Male

Female

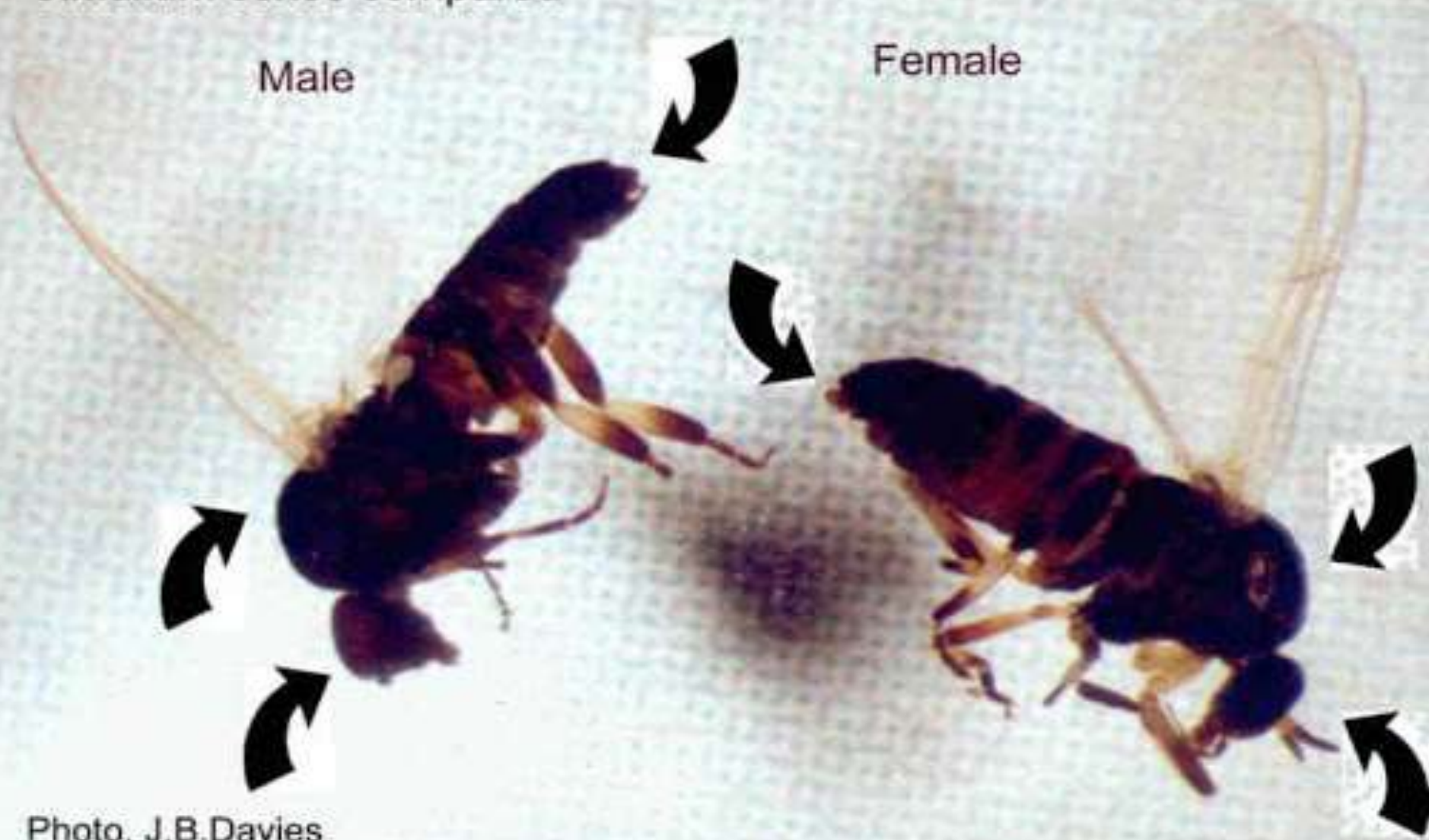
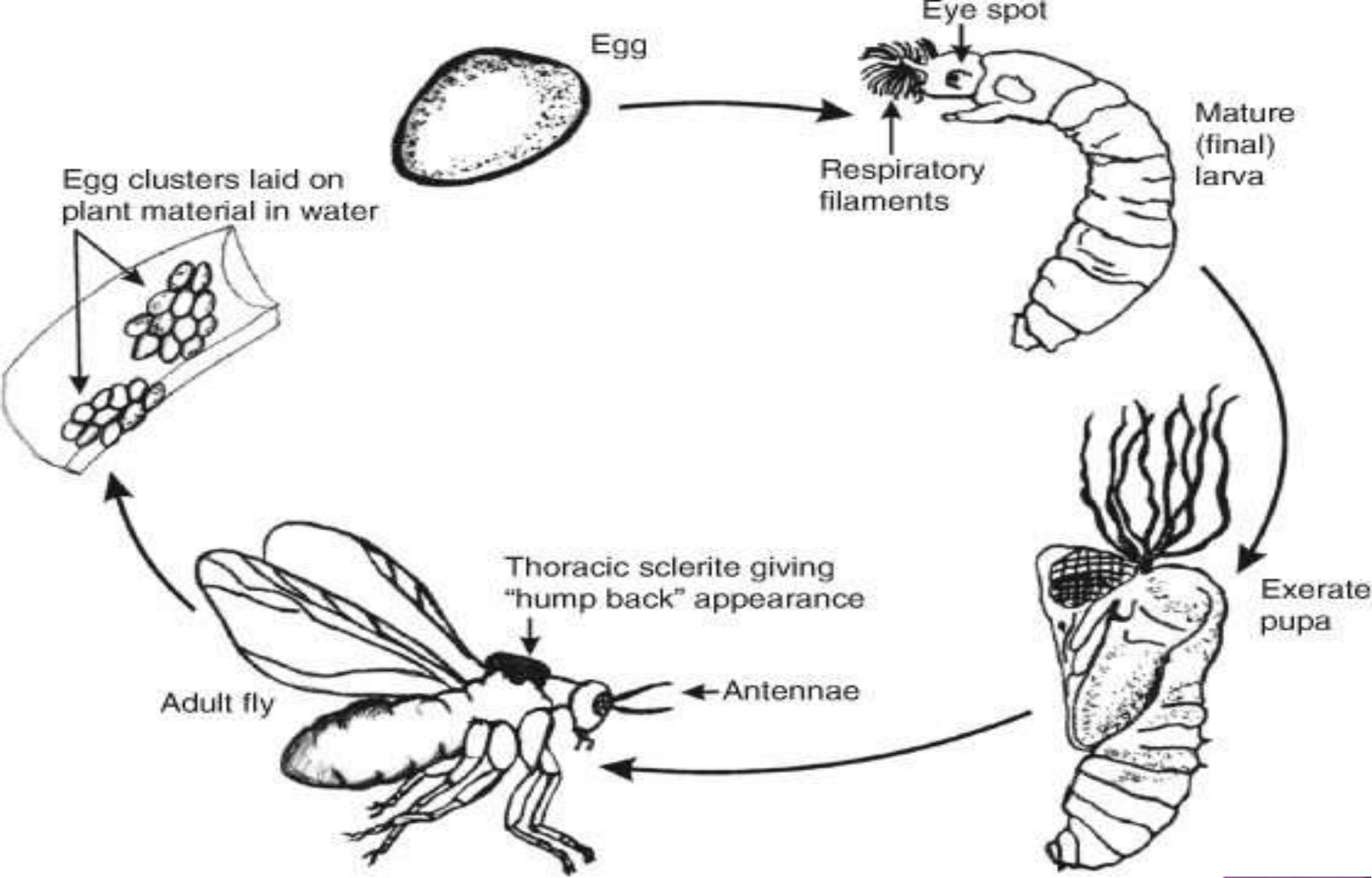
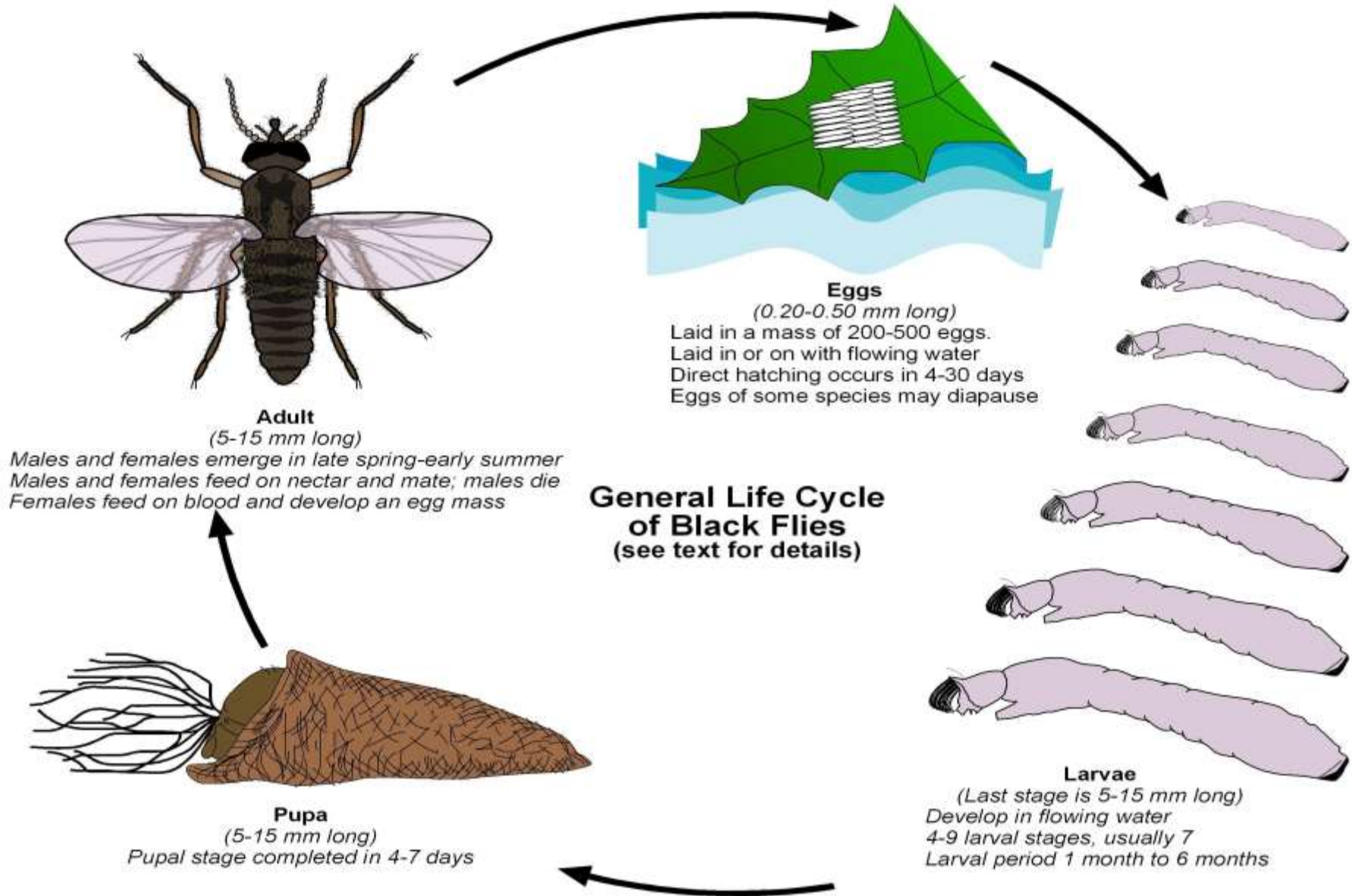


Photo. J.B.Davies

Male & Female Simulium



Life cycle of Simulium



Life cycle of Simulium



Early Larva

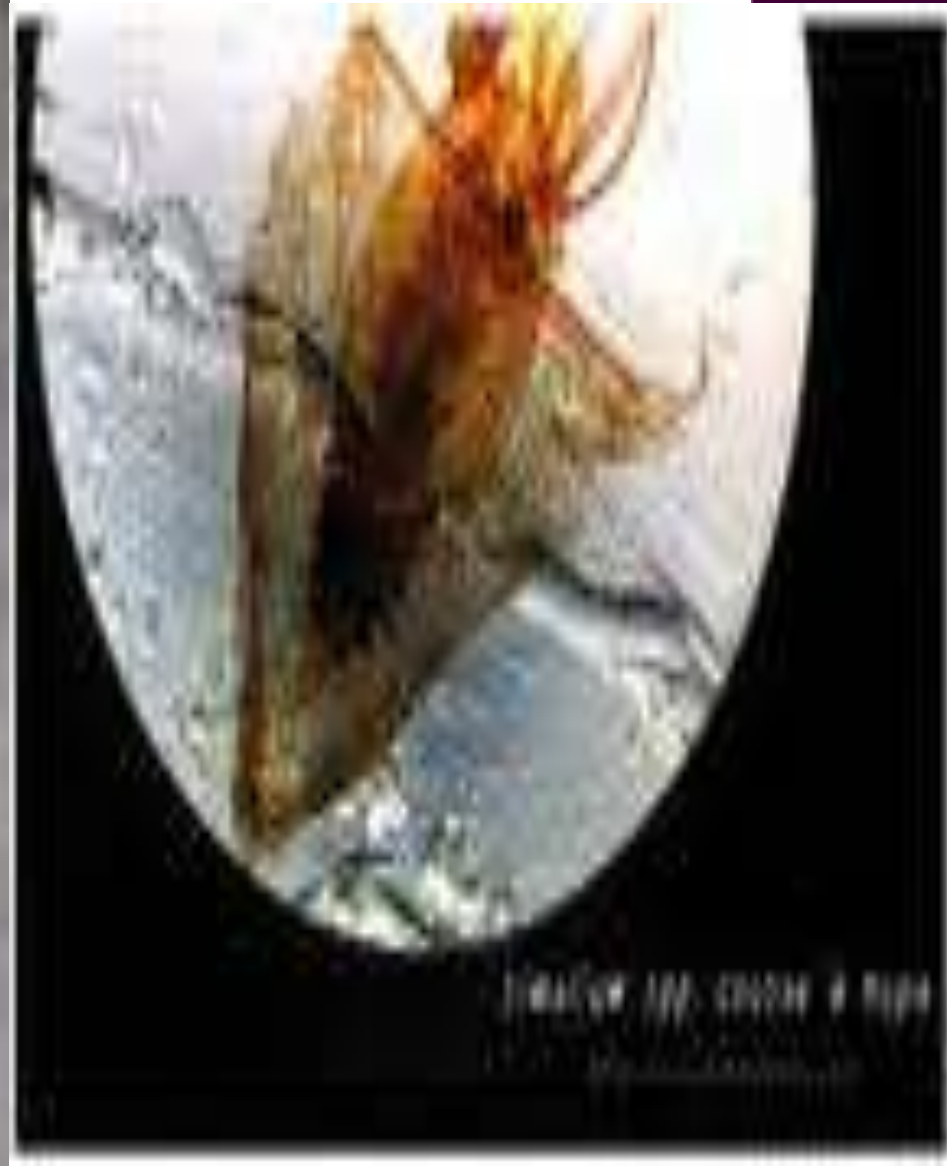
Mid Larva

Late Larva

Pupa

Adult

Simulium : Stages of life cycle



Proleg of Simulium



Silicon cocoon like structure

Simulium : Pathogenesis

- Female black flies are blood feeders whose bites can itch and persist for several days.
- The flies bite by cutting into the skin and feeding on the pool of blood that forms in the hole they make. Anticoagulants injected into the feeding site by black flies can cause mild to severe allergic reactions in sensitive individuals.
- Strong reactions include fever, nausea and allergic dermatitis.
- Large black fly populations and strong bite reactions can be life threatening and sometimes kill domestic animals.
- Black fly bites are very painful causes ‘Vesicular stomatitis’ and ‘Eastern equine encephalitis’.



Vesicular stomatitis



Vesicular stomatitis



Eastern Equine Encephalitis

Simulium : Control

- Control of black flies is difficult because of the number of potential breeding sites.
- Treatment of breeding sites (streams, rivers, etc.) would involve techniques similar to those used by mosquito control in aquatic habitats.
- Fogging for black flies would have to be done during the day when these insects are more active .
- Black flies are small enough to pass through window screen, so long pants and fine screen netting over head help prevent feeding.
- Repellents such as “DEET“ are not very effective.
- Because black flies feed only during the day time so, the repellent can be applied preferably during day .