

# **Family : Culicidae**

**Genus : Anopheline & Culicine**

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

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# Culicine : Introduction

**Common name** : Mosquitoes .

**Host** : Man ,all domesticated animals, reptiles and birds

**Species** : *Anopheles gambiae* .

*Culex pipens*.

*Aedes aegypti*

# Culicine : Morphology

- These are slender bodied flies.
- The legs are long and eyes are prominent.
- The thorax is wedge shaped.
- The mouth parts is adopted for blood sucking.
- The antennae is 15 segmented.



# Anopheles mosquitoes





# Anopheles mosquitoes



# Culex mosquitoes



# Culex mosquitoes

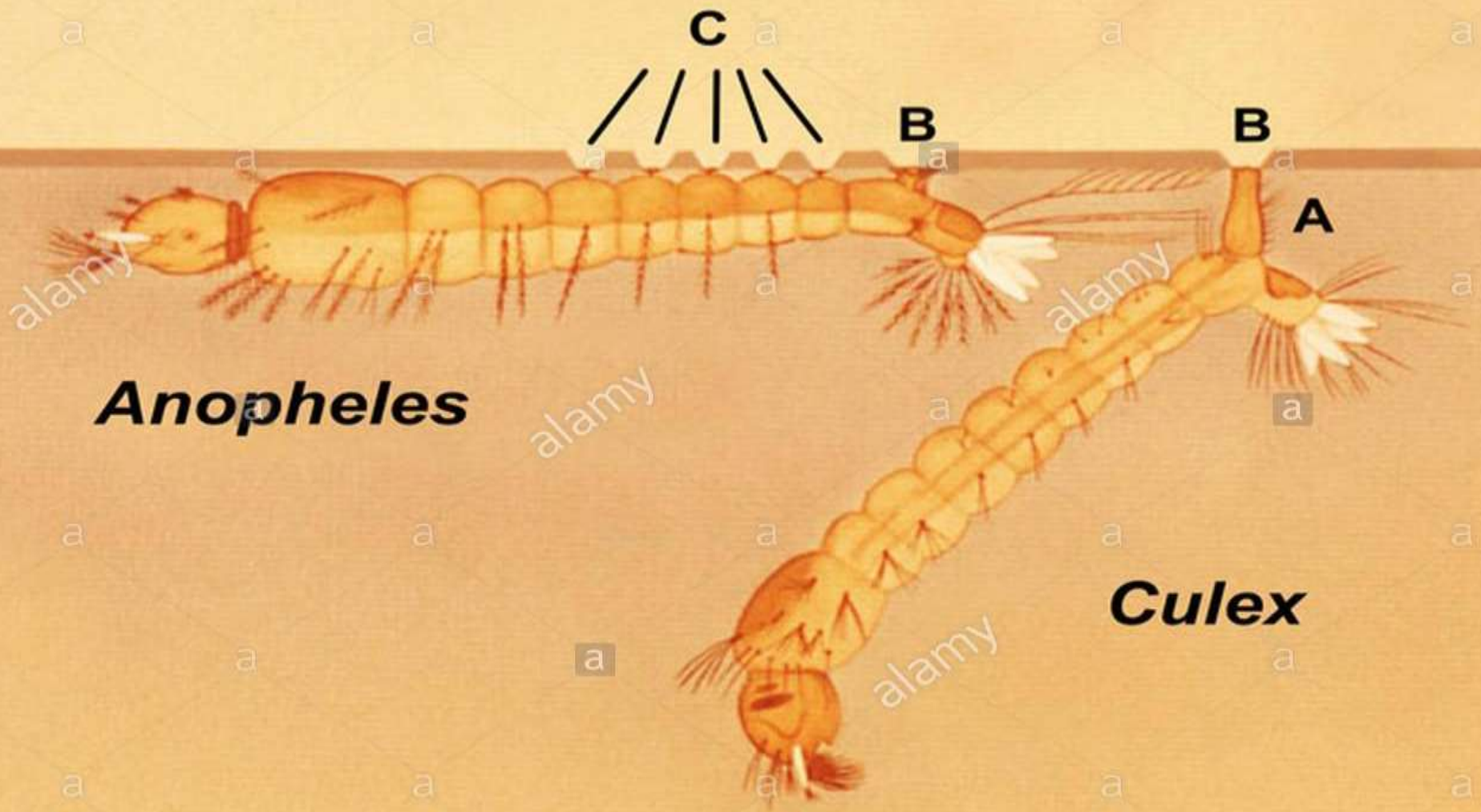


# **Aedes mosquitoes**





# **Aedes aegypti**



## Anophelies / Culex

# Mosquitoes : Life cycle

- All mosquito species go through four distinct stages during their life cycle:

Egg - Hatches when exposed to water.

Larva –Termed as "wiggler" lives in water; molts several times; most species surface to breathe air.

Pupa –Termed as "tumbler" does not feed; stage just before emerging as adult.

Adult -Flies short time after emerging and after its body parts have hardened.

- The first three stages occur in water, but the adult is an active flying insect.
- Only the female mosquito bites and feeds on the blood of humans or other animals.

# Mosquitoes : Life cycle....contd

- After obtaining a blood meal, the female mosquito lays the eggs directly on or near water, soil and at the base of some plants.
- The eggs hatch in water and a mosquito larva or "wiggler" emerges.
- The larva lives in the water, feeds and develops into the third stage of the life cycle called, a pupa or "tumbler." The pupa also lives in the water but no longer feeds.
- Finally, the mosquito emerges from the pupal case after two days to a week in the pupal stage.
- The life cycle typically takes up two weeks, but depending on conditions, it can range from 4 days to as long as a month.
- The adult mosquito emerges onto the water's surface and flies away, ready to begin its lifecycle.



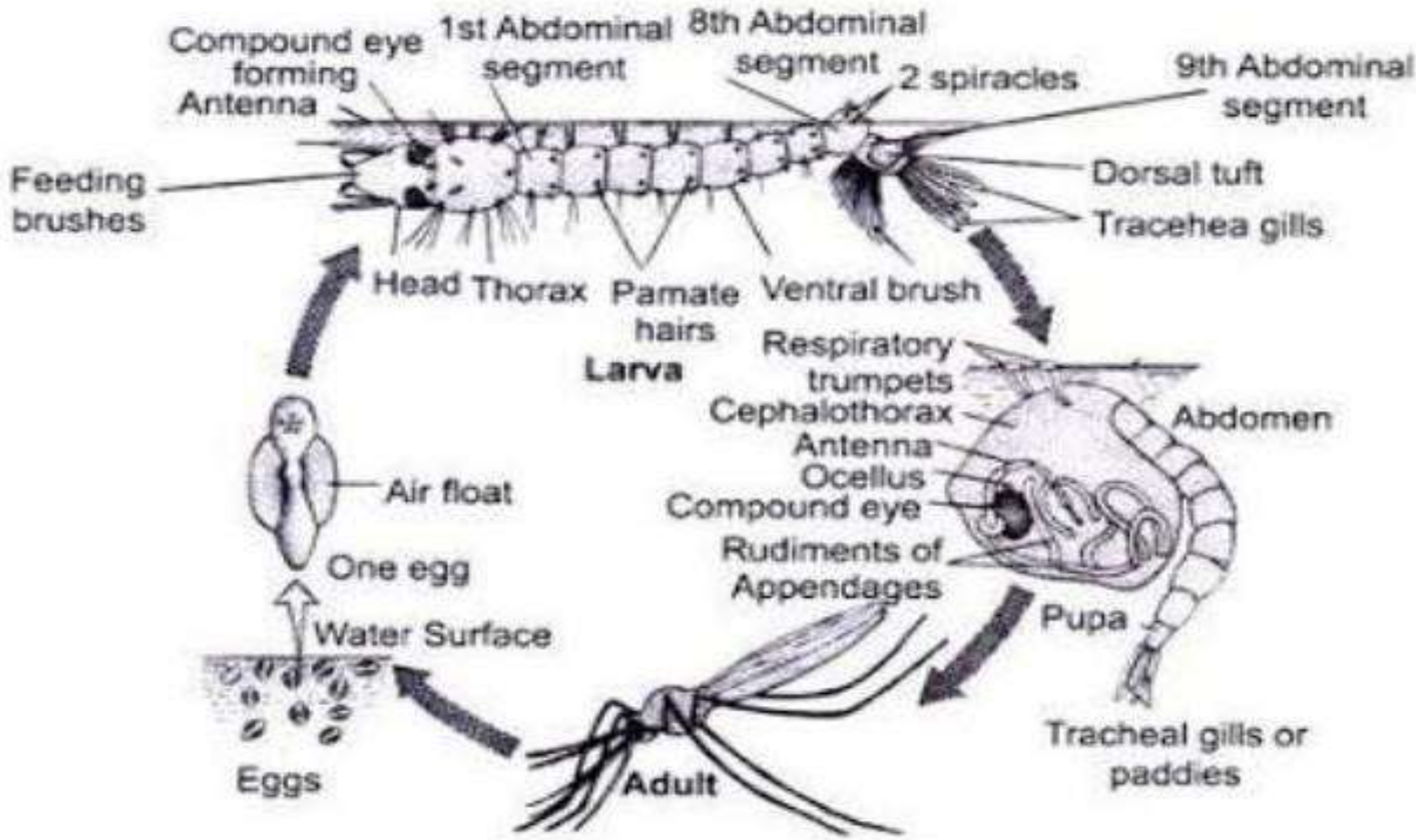
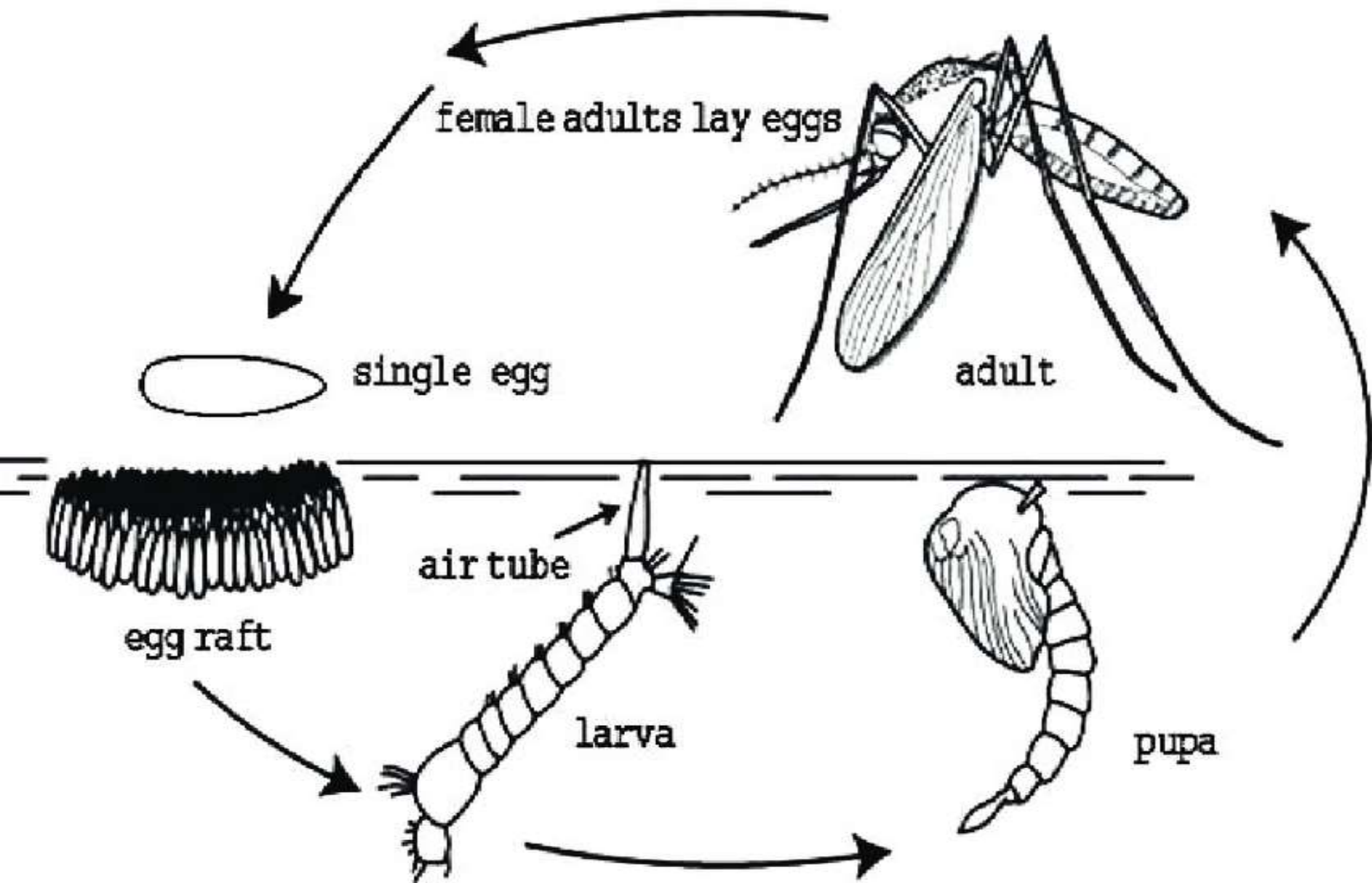
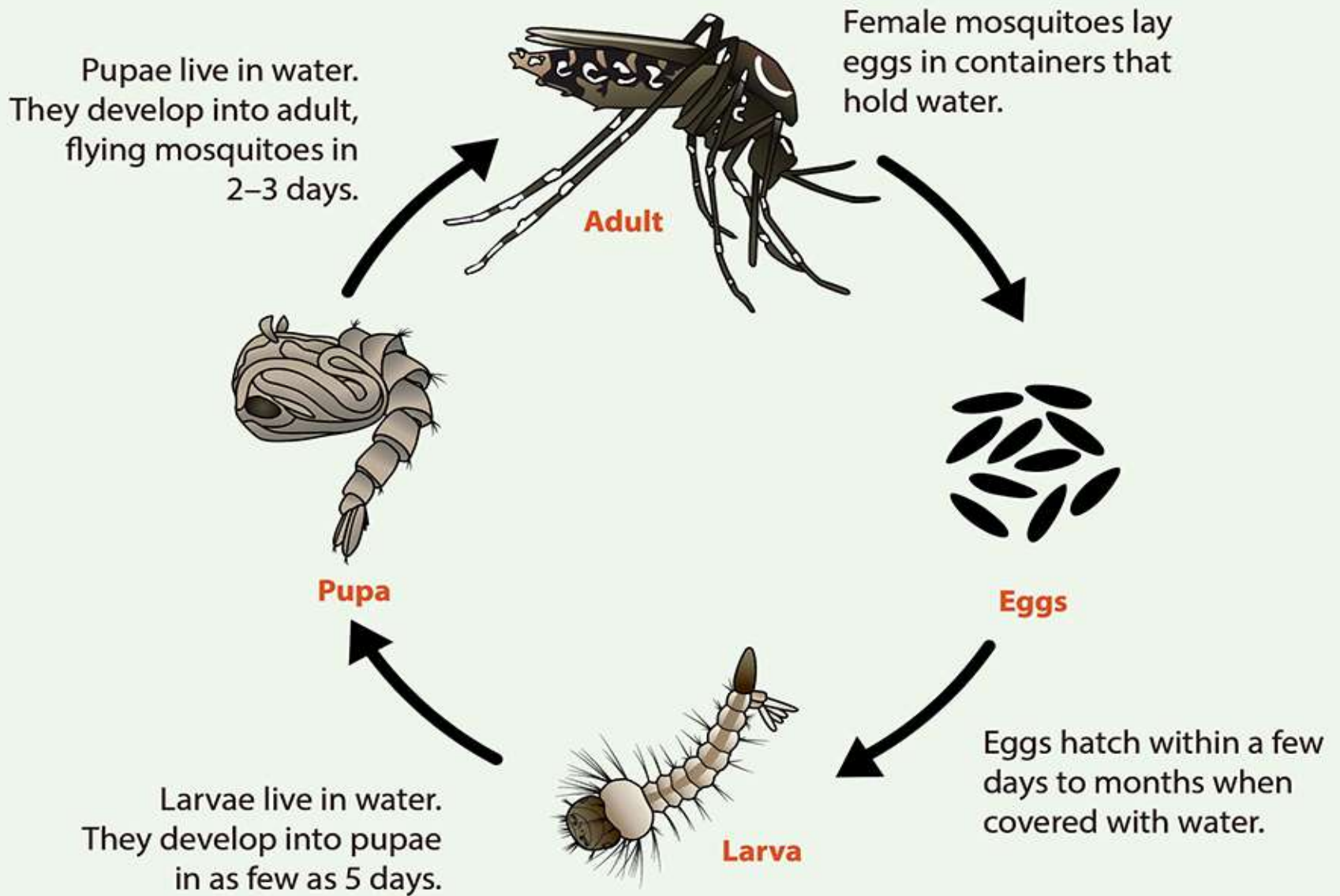


Fig. 8.7. Life cycle of *Anopheles*

# Life cycle of *Anopheles*



## Life cycle of Culex



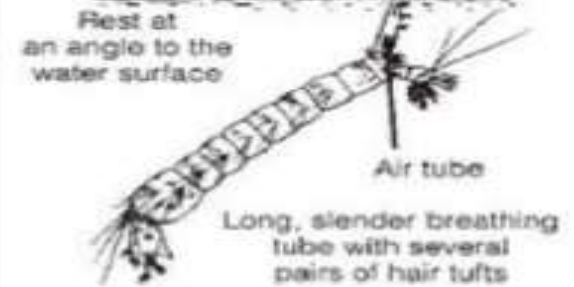
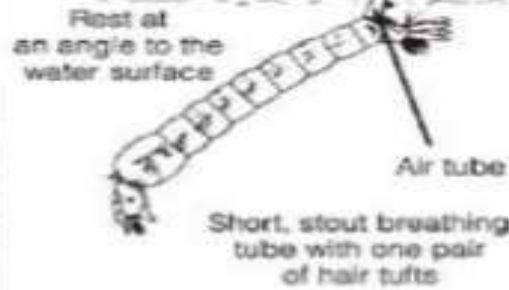
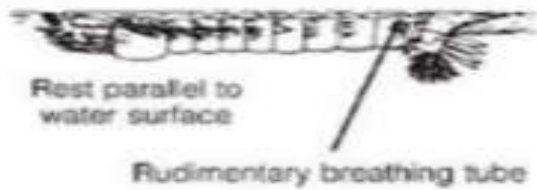
# Life cycle of Aedes

**ANOPHELES**

**CULEX**

**AEDES**

Larvae



Pupae (differ only slightly)



Adult

Proboscis and body in same straight line



Proboscis and body at an angle to one another

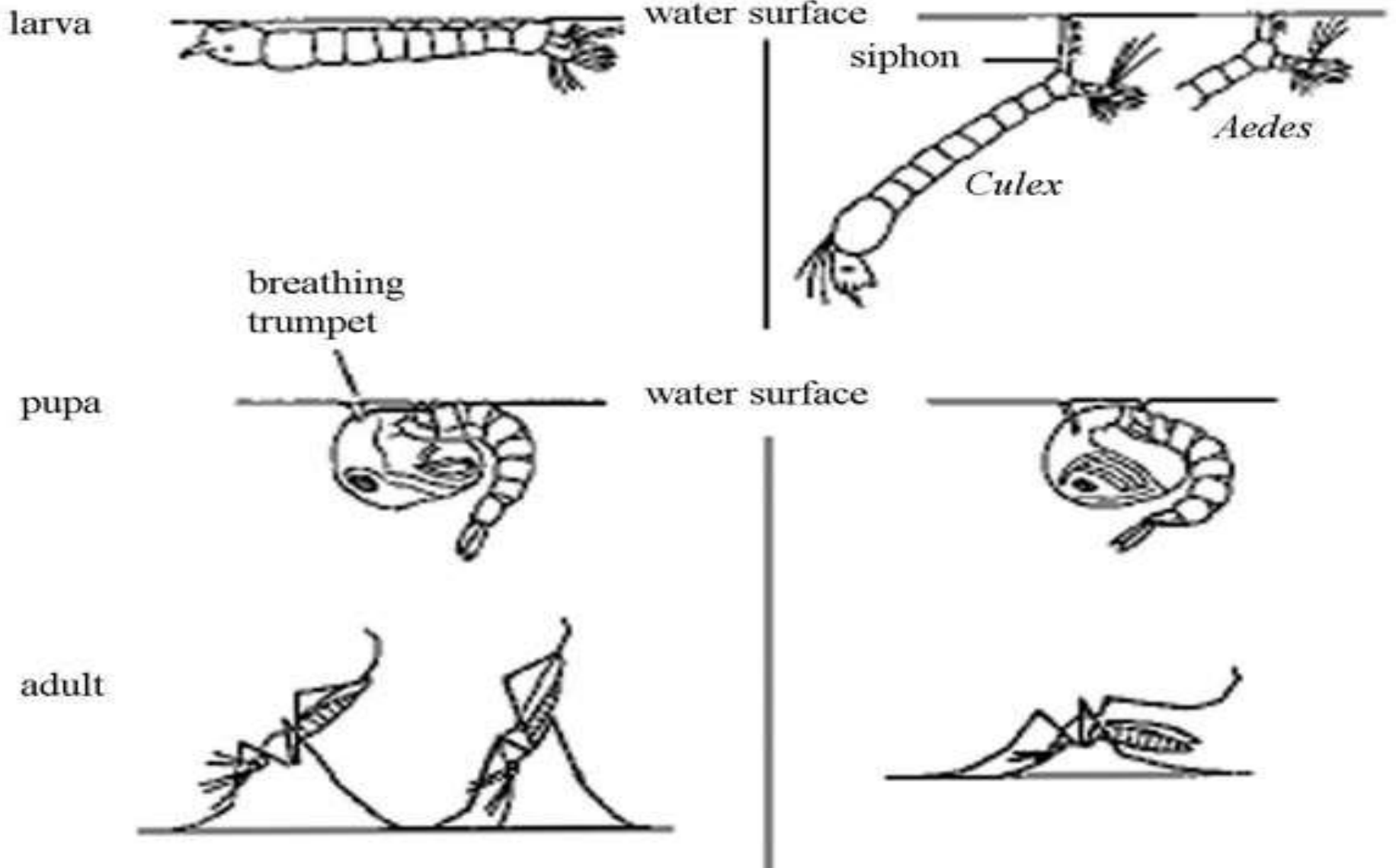


Proboscis and body at an angle to one another



# Comparative study of Anopheles / Culex

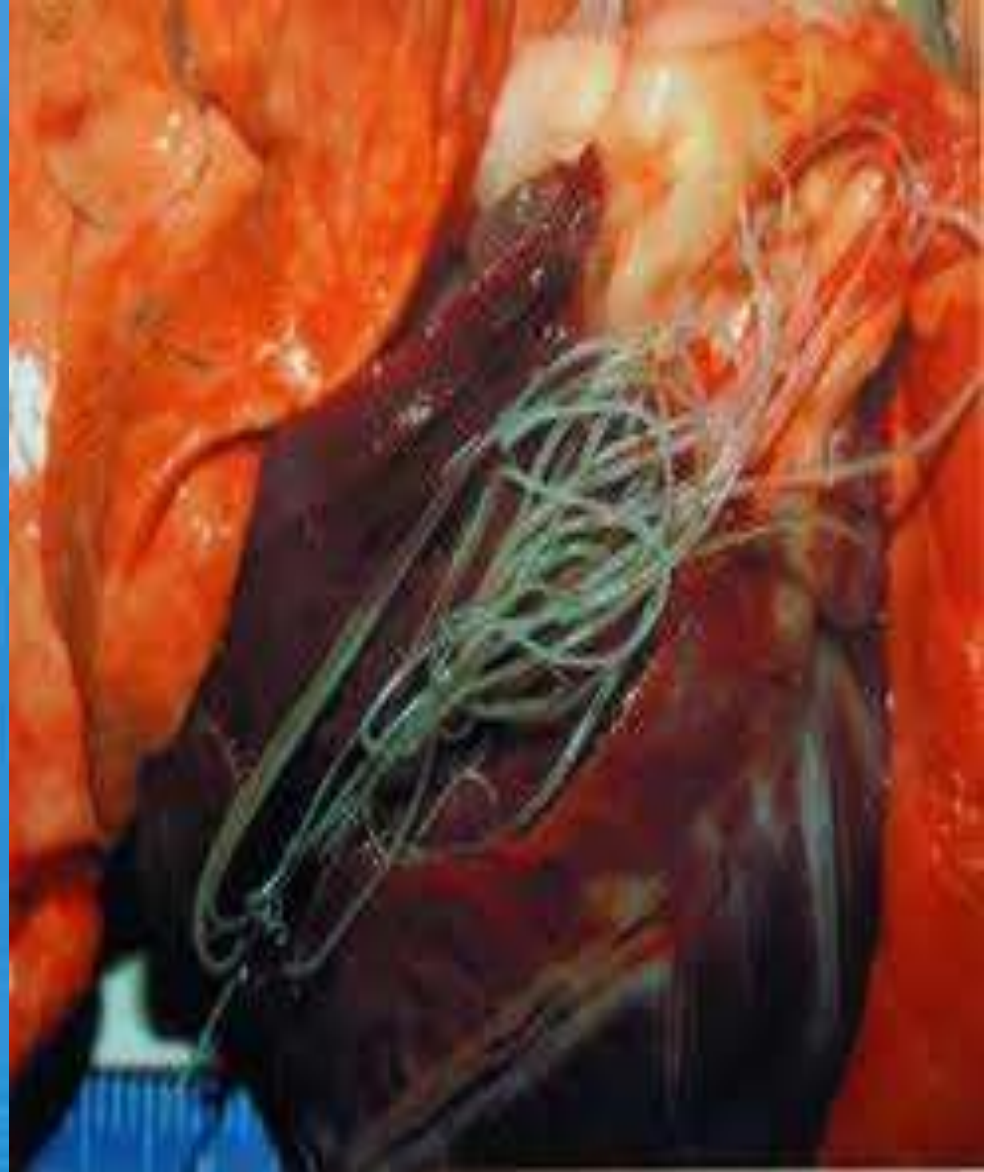




# Comparative study of Anopheles / Culex

# Culicine : Pathogenesis

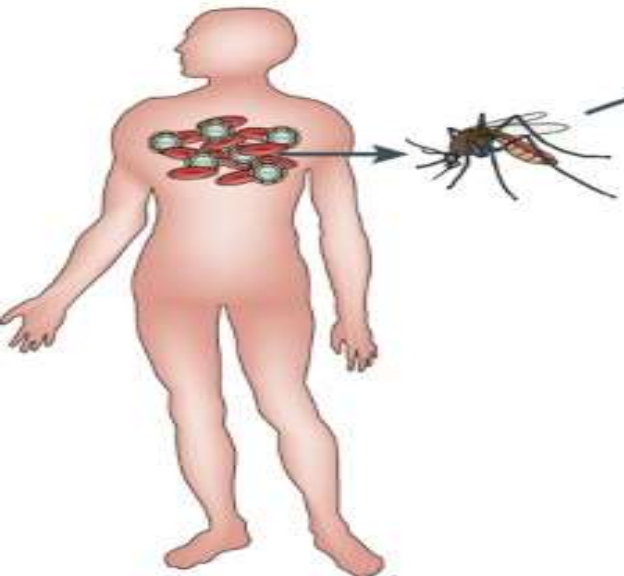
- They are transmitting agent of many vector-borne diseases, caused by either parasites, bacteria or viruses.
- Malaria is a parasitic infection transmitted by Anopheles.
- Dengue is the most prevalent viral infection transmitted by Aedes.
- Other viral diseases transmitted by vectors include chikungunya fever, Zika virus fever, yellow fever, Japanese encephalitis, tick-borne encephalitis .
- They also transmits *Dirofilaria immitis*.
- *Plasmodium gallinacean* the causative agent of bird malaria also transmitted by these fly.



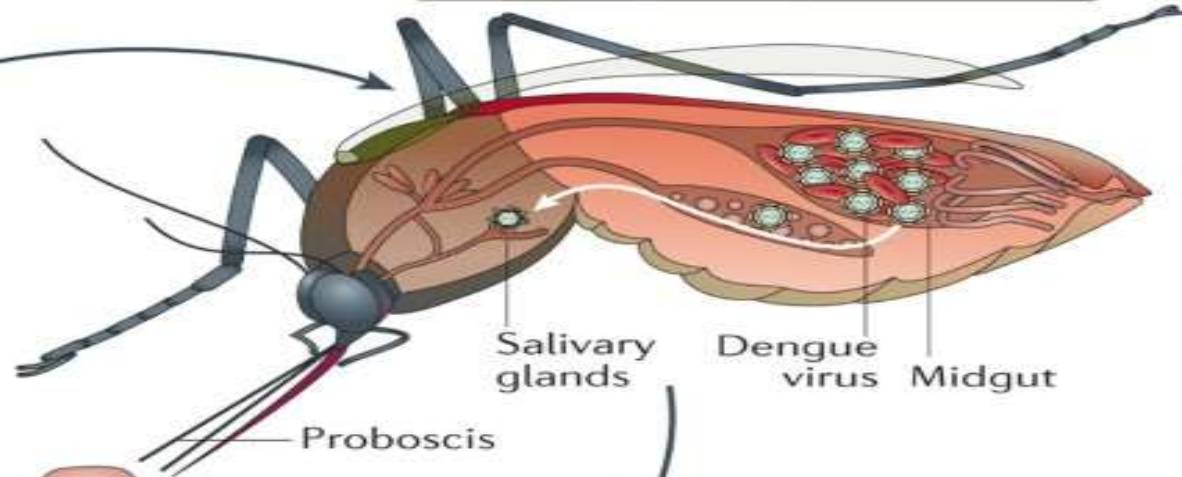
## Dog affected with **‘Heart worm’**



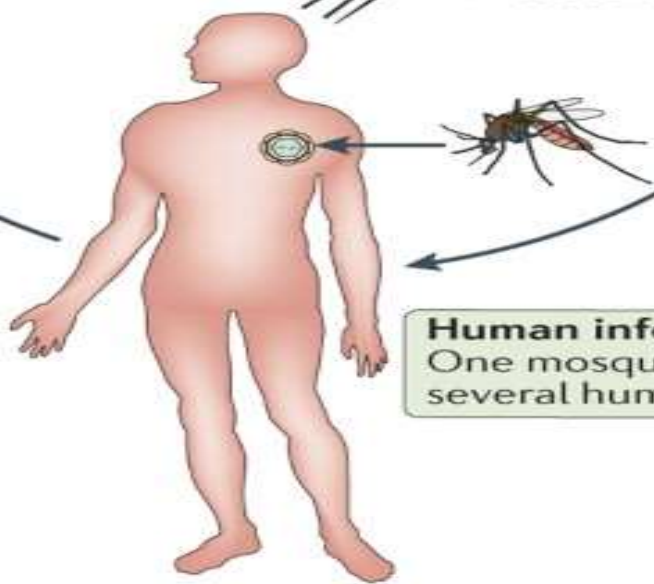
**Mosquito infection**  
Mosquito takes a blood meal from a person with acute dengue



**Extrinsic incubation**  
Virus infects the midgut and eventually travels to the salivary glands (usually 8–10 days)



**Intrinsic incubation**  
The onset of symptoms usually takes 4–7 days



**Human infection**  
One mosquito can infect several humans

# Aedes causing 'DENGU FEVER'





# Transmission of avian malaria



# Transmission of avian malaria



# Culicine : Control

- Reduction of the mosquito breeding sites.
- Killing of mosquito larvae where the insects breed.
- Removal of algae from ponds.
- Use of mosquito repellent in living space.
- Biologically control by rearing of Gambusia fish.
- Increase the number of mosquito predators in your yard.