

BIOLOGY

Mosquito Egg Raft



Mosquitoes lay their eggs on the surface of fresh or stagnant water. The water may be in tin cans, barrels, horse troughs, ornamental ponds, swimming pools, puddles, creeks, ditches, catch basins or marshy areas. Mosquitoes prefer water sheltered from the wind by grass and weeds.

Culex mosquitoes usually lay their eggs at night over a period of time sticking them together to form a raft of from 100 to 300 eggs. A raft of eggs looks like a speck of soot floating on the water and is about 1/4 inch long and 1/8 inch wide. A female mosquito may lay a raft of eggs every third night during its life span.

Anopheles and many other mosquitoes lay their eggs singly on the water surface. *Anopheles Spp.* breeds in stagnant collections of clean water such as ponds, lakes, overhead reservoirs, underground tanks, etc. in urban and rural areas.

Culex Spp. breeds prolifically in stagnant collections of polluted water such as drains, cess pools, gutters, septic tanks, etc. in urban surroundings.

Aedes Spp. breeds in man-made collections of stagnant water such as water coolers, pots, old tyres, cans, empty bottles, flower vases etc in urban areas.

Armigeres Spp. : large mosquitoes that breed profusely in septic tanks, entering through the vent pipes and laying eggs inside.

Tiny mosquito larvae (1st instar) emerge from the eggs within 24 - 48 hours almost in unison.

Mosquito Larva



Mosquito larvae, commonly called "wigglers," live in water from 4 to 14 days depending on water temperature.

Larvae must come to the surface at frequent intervals to obtain oxygen through a breathing tube called a siphon. They are constantly feeding since maturation requires a huge amount of energy and food. They hang with their heads down and the brushes by their mouths filtering anything small enough to be eaten toward their mouths to nourish the growing larvae. They feed on algae, plankton, fungi and bacteria and other microorganisms. They breathe at the water surface with the breathing tube up breaking the water surface tension. One mosquito species

larva feeds on larvae of other mosquitoes: *Toxorhynchites*, the largest mosquito known, are predators of other mosquito larvae sharing their habitat. Their larvae are much larger than other mosquito larvae.

During growth, the larva molts (sheds its skin) four times. The stages between molts are called instars. At the 4th instar, the usual larva reaches a length of almost 1/2 inch and toward the end of this instar ceases feeding. When the 4th instar larva molts, it becomes a pupa.

Mosquito Pupa



Mosquito pupae, commonly called "tumblers," live in water from 1 to 4 days, depending upon species and temperature.

The pupa is lighter than water and therefore floats at the surface. It takes oxygen through two breathing tubes called "trumpets." The pupa does not eat, but it is not an inactive stage. When disturbed, it dives in a jerking, tumbling motion toward protection and then floats back to the surface.

The metamorphosis of the mosquito into an adult is completed within the pupal case. The adult mosquito splits the pupal case and emerges to the surface of the water where it rests until its body dries and hardens.

Mosquito Adult



Only female mosquitoes require a blood meal and bite animals - warm or cold blooded - and birds. Stimuli that influence biting (blood feeding) include a combination of carbon dioxide, temperature, moisture, smell, color and movement. Male mosquitoes do not bite, but feed on the nectar of flowers or other suitable sugar source. Acquiring a blood meal (protein) is essential for egg production, but mostly both male and female mosquitoes are nectar feeders. Female *Toxorhynchites* actually can't obtain a bloodmeal and are restricted to a nectar diet. Of those

female mosquitoes capable of blood feeding, human blood meals are seldom first or second choices. Horses, cattle, smaller mammals and/or birds are preferred.

Anopheles mosquitoes are active after dusk and aptly called the 'midnight-biter'. These mosquitoes transmit malaria to man.

Aedes mosquitoes are painful and persistent biters. They search for a blood meal early in the morning, at dusk (crepuscular feeders) and into the evening. Some are diurnal (daytime biters) especially on cloudy days and in shaded areas. They usually do not enter dwellings, and they prefer to bite mammals like humans. *Aedes* mosquitoes are strong fliers and are known to fly many miles from their breeding sources. *Aedes* mosquitoes are responsible for the spread of Dengue and Dengue Haemorrhagic Fever (DHF) and Chikungunya virus.

Culex mosquitoes are painful and persistent biters also, but prefer to attack at dusk and after dark. They readily enter dwellings for blood meals. It is the common house mosquito and a major nuisance, causing sleepless nights. *Culex* mosquitoes are generally weak fliers and do not move far from home, although they have been known to fly up to two miles. *Culex* and *Mansonioides* mosquitoes transmit Filaria.

Armigeres mosquitoes are vicious crepuscular (dusk) biters. They are not a major transmitter of any human disease, but the bite is very irritating and scratching the bitten area can lead to secondary infections. A day biter, with peak period of dawn and dusk when they attack a person in large numbers and even follow him if he moves away.