

Mosquito

Mosquitoes are the deadliest creatures on Earth. They are skilled chemists with highly advanced sensory organs, and their ability to locate blood vessels surpasses even the most experienced and skilled surgeons.

While we often rejoice at the arrival of spring, the return of mosquitoes can dampen that joy. To mark the beginning of the biting season, here are some lesser-known facts about these annoying creatures:

They're Females

Male mosquitoes, like butterflies, feed on flower nectar and are harmless. It's the female mosquitoes that feed on blood, extracting it to obtain proteins needed to produce more eggs.

Mosquitoes have fine gas sensors

Female mosquitoes possess a remarkable sense that helps them locate their victims: they can detect carbon dioxide (CO₂) exhaled by animals. Like a sniffer dog tracking a scent, the mosquito searches for areas with high CO₂ concentration, where potential hosts are likely to be found.

As it gets closer, the mosquito engages other senses: it detects body heat (in the form of infrared radiation) and picks up on body odors released through breathing and sweating.

In the following video, you can see how electrodes were connected to the sensory neurons in the mosquito's antenna. This allows us to observe—and hear—the activity of these nerves as the mosquito detects carbon dioxide or other substances emitted by the human body.

The mosquito's life cycle consists of four main stages: egg, larva, pupa, and adult. It begins when the mosquito lays eggs on the surface of water. Once the eggs hatch, larvae emerge. The larvae then grow and develop into pupae.

After a short period, the pupae mature and the adult mosquito emerges.

A 2004 study revealed that mosquitoes are twice as attracted to pregnant women compared to others. This appears to be due to the increased amount of carbon dioxide exhaled by pregnant women and their slightly elevated body temperature.

Mosquitoes have selective taste

Mosquitoes prefer the scent of lactic acid found in some people's sweat over that of butyric acid. In the same 2004 study, dozens of volunteers with different blood types were placed in a mosquito-filled chamber. The mosquitoes showed a clear preference for individuals with type O blood.

Mosquitoes can sense substances present in saliva or on the skin that vary depending on a person's blood type. Other factors that influence mosquito attraction include byproducts of cholesterol breakdown, alcohol consumption, genetic variations, and types of skin bacteria.

Mosquitoes inject substances into the body

When feeding, mosquitoes use their proboscis not only to draw blood but also to inject compounds into the skin. These substances prevent blood clotting, giving the mosquito more time to feed. In response, the body releases histamine near the bite site. Histamine causes blood vessels to expand and leak fluid, resulting in swelling. It also affects nerve endings, leading to the itching sensation associated with mosquito bites.

The mosquito's proboscis is a navigation expert

Scientists at the Pasteur Institute in France recorded footage of a mosquito probing under the skin of anesthetized mice. The video showed that the mosquito's feeding tube is incredibly flexible—capable of bending at 90 degrees. It uses sensors on its surface to locate the nearest blood vessel, then begins feeding and injecting as soon as it makes contact. These fascinating images can be seen in the following video (viewer discretion advised: the footage may be graphic).

A mosquito doesn't drink blood—it eats it.

When a mosquito feeds, it filters out the water content from the blood it draws and expels it as droplets from the rear of its body. As previously mentioned, the mosquito uses the proteins in the blood to produce eggs and reproduce. The water in the blood does not nourish the mosquito; in fact, it becomes a burden, so the insect quickly filters and eliminates it.

This process can be observed in the following video. At timestamp 2:08, a droplet of water is expelled (mosquitoes release multiple droplets), and the release is remarkably fast. You can also see the mosquito's proboscis actively searching for a blood vessel, as shown in the previous video.

An astonishing ability to carry weight

A mosquito can ingest about 6 milligrams of blood—an amount that might seem small to us, but it equals or even exceeds the mosquito's own body weight. Remarkably, the mosquito is still able to fly after feeding, thanks to flight muscles specially adapted for this scenario. However, it flies more slowly when full, which makes it easier to catch once it's satisfied.

The mosquito survives between bites

A mosquito typically rests for two to three days after biting, during which it digests the blood it has consumed and develops mature eggs. It then seeks out a source of stagnant water—using sensory receptors specifically evolved for this purpose—to lay its eggs. Throughout its lifespan, which lasts about a month, the mosquito continues this cycle, searching for new victims and managing to bite up to ten times.

A deadly killer

Mosquitoes are highly efficient at spreading disease because the females bite multiple people throughout their lives. Female mosquitoes are the deadliest creatures on Earth—responsible for the deaths of approximately 750,000 people every year due to the diseases they transmit, such as malaria, yellow fever, dengue fever, West Nile virus (which is present locally), and the Zika

virus.

Without Water, There Are No Mosquitoes

Mosquito larvae hatch from eggs laid in stagnant water and feed on organic materials like decaying leaves. The pupal stage also takes place in water, from which adult mosquitoes emerge. Mosquitoes cannot reproduce without stagnant water, making it an essential part of their life cycle.

Combating Mosquitoes: Draining and Alternative Measures

Female mosquitoes lay eggs only in still water—not in rivers or streams with strong currents. The most effective way to control mosquito populations is by eliminating stagnant water sources. Where draining isn't possible, a layer of oil can be applied to the water's surface. Mosquito larvae breathe through a snorkel-like tube that reaches above the surface; the oil blocks this tube, causing the larvae to suffocate and preventing them from maturing.

Mosquitoes Don't Venture Far

Although mosquitoes are capable of flying up to a kilometer, they rarely travel far from where they hatched—usually just a few dozen meters. If you're seeing mosquitoes around your home, there's likely a nearby source of stagnant water. It doesn't take a swamp—just a small water-filled dish beneath a flowerpot could be enough. Removing such sources is key to avoiding mosquito bites.

U.S. Military Funding in the Fight Against Mosquitoes

The compound DEET (N,N-Diethyl-meta-toluamide) remains one of the most effective mosquito repellents. It was developed by the U.S. Army in 1944 after American soldiers in the Pacific islands suffered from mosquito-borne diseases during World War II. Today, DEET is still widely used worldwide. In more recent efforts, researchers are developing mosquito-targeting laser weapons that detect and eliminate mosquitoes with precise, high-intensity beams.

Egg-laying process:

1. Female mosquitoes depend on blood:

To produce eggs, female mosquitoes need proteins found in blood, so they bite humans or animals to get the necessary blood meal.

2. They lay eggs on water:

After feeding on blood, female mosquitoes lay eggs on the water surface, on moist surfaces touching water, or on damp soil.

3. Types of egg-laying:

Clustered eggs: Some mosquito species lay eggs in connected chains that float on the water surface.

Single eggs: Other species lay eggs individually, one by one.

4. Number of eggs:

A female mosquito can lay about 200 eggs at a time, but this number varies depending on the species.

Notes:

Eggs hatch within a day or two, releasing small larvae.

Mosquito larvae are important food sources for many aquatic animals.

There are four larval stages, separated by three molts that transition them from one stage to the next.

Larval stages:

After the eggs hatch:

The eggs hatch in water, releasing larvae that live in the water and feed on organic matter and microorganisms.

Feeding:

The larvae feed on algae and organic materials in the water.

Breathing:

Mosquito larvae breathe air from the atmosphere through a specialized part of their body called the "siphon," which they use to reach the water surface.

Growth:

The larvae molt several times during this stage to grow larger.

Transformation into pupae:

After about four molts, the larva transforms into a pupa enclosed in a cocoon.

The pupal stage is a phase in the mosquito life cycle that occurs between the larval stage and the adult stage. During this stage, the mosquito's body undergoes significant transformation and develops into its adult form.

More details on the pupal stage:

Egg:

The mosquito life cycle begins with the egg, which hatches in water.

Larva:

A larva hatches from the egg, lives in the water, and feeds on algae and microorganisms.

Pupa:

After several molts, the larva transforms into the pupal stage. At this point, the mosquito stops feeding and its body is reorganized.

Adult:

After a certain period, the adult mosquito emerges from the pupa.

Comparison with beetles:

Mosquito life cycle:

It consists of four stages: egg, larva, pupa, and adult.

Beetle life cycle:

It also consists of four stages: egg, larva, pupa, and adult.

Common stage:

The pupal stage is when both mosquitoes and beetles transform their bodies into their adult forms.

The adult stage is the final phase in the mosquito life cycle, where the mosquito becomes a fully developed insect capable of flying and reproducing. The mosquito life cycle consists of four stages: egg, larva, pupa, and adult.

The four stages in the mosquito life cycle:

1. Egg:

The female mosquito lays eggs on the water surface or on moist surfaces. The eggs hatch into larvae.

2. Larva:

The larva lives in water and feeds on algae and microorganisms. It grows and molts several times.

3. Pupa:

After a period of growth in water, the larva transforms into a pupa.

4. Adult:

The adult mosquito emerges from the pupa and becomes capable of flying and reproducing.

Characteristics of the adult mosquito:

- * The body is divided into the head, thorax, and abdomen.
- * It has one pair of wings.
- * Females can be distinguished from males by the shape of their mouthparts

(proboscis) at the end of the abdomen.

* The adult insect dries off from water and becomes ready to fly.

Mosquito life cycle requires water:

The first three stages (egg, larva, pupa) depend on water. Therefore, mosquito control involves eliminating stagnant water sources.

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