

BLOWFLIES: AN AGENT FOR CHEMICAL POLLUTANTS

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INTRODUCTION: WHAT ARE BLOWFLIES?



Fig. 1: Blow Fly

The Calliphoridae family of insects, which is part of the Diptera order, includes blow flies (insects that have two wings). They belong to the genera *Calliphora*, *Lucilia*, and *Chysomya*. Despite being generally bigger than house flies, they have many of the same behaviours. They are coloured green, blue, copper, and purple. Blow flies may also go by the names blue bottle, green bottle, or screw-worms. Warm, muggy weather is ideal for blowflies to flourish.

When it is windy, extremely dry, and hot, or when it is chilly outside, they struggle. These circumstances are crucial to the blow fly's life cycle.

LIFE CYCLE OF A BLOWFLY!

The female blow fly deposits eggs to start the life cycle. A single female is capable of depositing between 250 and 300 eggs, mainly throughout the winter. Two to three weeks are needed to complete the life cycle. The male blowfly is sexually mature when it is born, however, the female blowfly must ingest some protein before she may mate. The holes of a corpse or wounds are where the eggs are often placed. The rotting material is subsequently consumed by the larvae. The eggs subsequently hatch after 24 to 48 hours.

FORENSIC SIGNIFICANCE IN REGARD TO BLOWFLIES

Blow flies are indeed the organisms that first get attracted to the corpse. That is why they are considered to be of very great forensic significance. These flies are influenced by a wide range of factors that make them both, attract and repel. The legs, cerci, and antennae of blow flies have receptors that have the potential to respond to the attractants around them. They usually tend to prefer filthy areas and attract the odour of animal excretions and secretions, ammonia, and fatty acids. The fumes released by the burning of eucalyptus oil in a simmering pot will repel these flies away. They have a tendency to fly almost up to 10 to 12 miles away from their origin by carrying traces of decay and searching for an appropriate dead corpse to lay their eggs whose life cycle is very significant in determining the time since the death of the body. Not just on dead bodies, rather they also lay eggs on meat, garbage, poorly managed compost files, and other unhygienic areas. They are not capable of harming you through a bite or a sting. But, yet they are way too dangerous as they act as vectors and may cause health-related diseases

like cholera, food poisoning, and dysentery. Geographically, blow flies are found almost everywhere and are richly found in temperate or tropical areas where they can thrive. During the fall, there are chances of these flies entering our houses so as to find a warm place. This is to support their lives in the winter. And in the spring, they come into play thereby appearing in the houses.

HOW ARE THEY USEFUL IN DETECTING CHEMICALS AND OTHER POLLUTANTS IN THE ENVIRONMENT?

Throughout the generations, different wars have taken place between various countries and regions. The use of weapons, especially chemical weapons, was rampant during war times. These chemical pollutants remain in the environment and affect human health. In a study conducted at Indiana University, blowflies can be used to detect various chemical pollutants present in the environment. This study has been published in a journal titled ‘Environmental Science and Technology’.

According to Christina Picard, Associate professor of biology at Indiana University, “There are always blowflies about, and they are excellent at sampling our surroundings. They will taste the environment as they fly through it, and their stomachs will preserve the knowledge. To ascertain which substances were present in the blowflies’ stomachs, researchers employed a mass spectrometer. Simulants of chemical warfare agents as well as some of the by-products that chemical agents break down into when exposed to the environment were both detectable. We would discover it on the fly if it came across a water source with a chemical agent hydrolyzed in the water.”

The researchers discovered that while chemical warfare weapons do not last for very long in the environment, they are sufficiently conserved in the fly’s intestines for chemical analysis. Additionally, they were able to detect the chemical warfare agent imitators

up to 14 days after a fly had first been exposed to them, showing that there are safer ways to collect samples without endangering people's lives.

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