Dr.Omaima

Simuliidae

Black flies

Black flies, known also as "buffalo gnats" and "turkey gnats," are very small, robust flies that are annoying biting pests of wildlife, livestock, poultry, and humans. Their blood-sucking habits also raise concerns about possible transmission of disease agents. You are encouraged to learn more about the biology of black flies so that you can be better informed about avoiding being bitten and about their public health risk.

Description

Black flies range in size from 5 to 15 mm, and they are relatively robust, with an arched thoracic region . They have large compound eyes, short antennae, and a pair of large, fan-shaped wings. Most species have a black body, but yellow and even orange species exist.

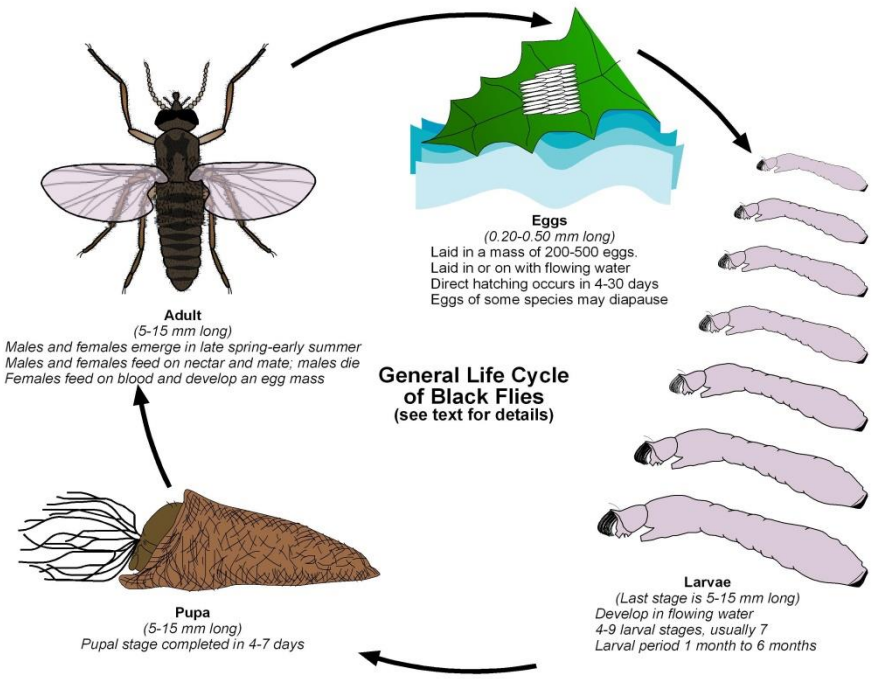
Life cycle

Black flies undergo a type of development known as "complete metamorphosis". This means the last larval stage molts into a non-feeding pupal stage that eventually transforms into a winged adult. After taking a blood meal, females develop a single batch of 200-500 eggs. Most species lay their eggs in or on flowing water, but some attach them to wet surfaces such as blades of aquatic grasses.

Eggs of most species hatch in 4-30 days, but those of certain species may not hatch for a period of several months or longer. The duration of larval

development ranges from 1-6 months, depending in part on water temperature and food supply. The life cycle stage that passes though winter is the last stage larva attached underwater to rocks, driftwood, and concrete surfaces such as dams and sides of man-made channels.

The pupal stage is formed the following spring or summer, typically in the same site as the last stage larva, but may occur downstream following larval "drift" with the current. Adults emerge from the pupal stage in 4-7 days and can live for a few weeks.



Medical important

The bites of black flies cause different reactions in humans, ranging from a small puncture wound where the original blood meal was taken to a swelling that can be the size of a golf ball. Reactions to black fly bites

that collectively are known as "black fly fever" include headache, nausea, fever, and swollen lymph nodes in the neck.

Animals attacked:

Cattle, poultry, swine, horses, sheep, goats, dogs, deer

Veterinary Impact:

Black flies are transmitters of pathogens (nematodes, protozoans and viruses) that can cause disease. Black fly females have very painful bites and can exhibit nuisance swarms. Large numbers of black flies can cause bird and livestock death as well as cause a stamped, trampling of young, structure crashing and tumbling. Suffocation has been reported and blamed for animal deaths by blocking respiratory passages. Excess blood loss can be detrimental to the host's health. Most deaths are caused by toxemia and shock to the actual bites. Persistent attacks cause unruly host behavior, weight loss, reduced egg and milk production, malnutrition of young animals, dermatitis and epidermal necrosis, impotence, delayed pregnancy and stress-related diseases.

Disease Transmission:

Bovine Onchocerciasis caused by the transmission of *Onchocerca lienalis*, a filarial parasite, by *Simulium jennigsi*. Infected cattle sometimes show dermatitis and inflammation of the skin and connective ligament.

Leucocytozoonosis is caused by the protozoans Leucocytozoon and is transmitted to birds causing this malaria-like disease. *Leucocytozzon simondi* is specific to ducks and geese; *L. smithi* is specific to turkeys and transmitted by *S. meridionale* and *S. slossonae*. Leucocytozoonosis can

be fatal in poultry; birds with chronic infections develop weakened immune systems and reduce reproduction. Infections can produce emaciation, dehydration and convulsions that lead to death. This disease has devastating effects on the North American poultry industry.

Black flies are carriers of the protozoan *Trypanosoma confusum* to North American birds through infected fecal droplets.

At times, black fly attacks are so massive and virulent that it causes simuliotoxicosis in livestock. These deaths are dues to acute toxemia and anaphylactic shock caused by toxins introduced within black fly saliva. Calves are highly vulnerable as well as horses, mules, sheep, goats and pigs.

Control:

To get the best control of a black fly population, it is best to aim for the larvae stage. The larvae are easier to target due to their sometimes specific habitats and their concentrated developing habits. Treating for the adults (with repellents and pour-on) will get small results but is very costly and not used as often as treating the water source for larvae. Typically *Bacillus thuringiensis israelensis* is used to treat waterways worldwide for the larvae. The most effect repellents are those containing DEET.

When large populations threaten livestock a few tactics can be used to limit their discomfort and the number of attacks, such as; smoldering fires with dense smoke, repellents with permethrin or ivermectin ear tags, pour-on and spray formulations, white petroleum jelly inside the ears of horse will reduce bites, as well as providing shelters.

1- The bites of black flies cause different reactions in humans, mention them?

2- enumerate the disease transmitted by black fly?

3- In general mention the control methods on insects?