BUG BIZ
Pest Management and Insect Identification Series
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Simulium meridionale, Turkey Gnat (Diptera: Simuliidae)

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Description

The turkey gnat is a member of the family Simuliidae (black flies, buffalo gnats). Adults of most species are similar, with small dark gray or black bodies that are one-fifteenth to one-twelfth of an inch (1.5-2.0 mm) in length. The thorax is prominent and rounded from the side view, with the head tucked in a slightly downward orientation. This gives them a humpbacked appearance, which has led to the common name of the family, "buffalo gnats." On close inspection, a pattern of silvery gray hairs (setae) is often visible on the body. Males and females differ dramatically in eye size, with females possessing larger heads and the eyes situated along the sides. Males possess smaller heads with enormous eyes that are broadly connected across the top of the head. The antennae are short and multisegmented, and the wings are clear, with heavier veins present along the leading edge. Species identification of black flies usually requires careful examination using a microscope or dissection and should be performed by a qualified insect diagnostician.

Larvae are aquatic and are always attached to a solid substrate, such as aquatic vegetation or organic or man-made debris. The bodies are tubular, up to one-tenth of an inch (2.5 mm) in length. The most prominent features are a pair of fanlike extensions on either side of the head that extend into the water column.

Life Cycle

Life cycles of black flies differ mainly in adult feeding preferences, larval habitats and seasonal development. Many species occur in various parts of the world, and outbreaks are particularly common in cooler regions with abundant flowing water. In Louisiana, the adults begin emerging during mid-April, initially as males that congregate in small swarms to await the arrival of females. Females begin emerging a few days later. Adults are day active (diurnal) and are most active on clear, calm spring days when temperatures do not exceed 80 F for most of the day. Activity diminishes by dusk. After mating, female turkey gnats require a blood meal for egg development and exhibit a strong preference for birds. Domestic fowl are aggressively attacked, thus the name turkey gnat, but wild birds are also affected. Females lay several hundred eggs each near appropriate aquatic habitats, typically just above the water line. There, the eggs may remain dormant for several years. When water levels rise in winter or early spring, the larvae hatch, undergo numerous molts — six molts are typical — and pupate within a silken case under water. The adults emerge a few weeks later and the cycle begins again. Development is strongly influenced by temperature and seasonal fluctuations in water level and flow. Few adults are produced during years of low rainfall, and enormous populations can occur during flood years.

Adult black fly female, lateral view. Museum specimen, Louisiana State Arthropod Museum.

Adult turkey gnats, front views of heads: left, male; right, female. Museum specimens, Louisiana State Arthropod Museum.

Ecological Significance and Pest Status

The annual emergence of turkey gnats in south Louisiana is a relatively recent phenomenon previously restricted to more northern states. A severe outbreak occurred in numerous parishes of Louisiana during spring 2010, and emergences of varying degrees of severity have been observed annually since then. The adult females will bite humans, and the bites are often followed by inflammatory swelling and itching that may persist for a number of days but are not considered medically significant, except in rare cases. They are a significant health threat to birds, especially poultry and caged birds that are limited in mobility. Bird mortality is common and is the result of blood loss (exsanguination), restriction of airways and other symptoms resulting in respiratory distress and anemia. Veterinarians refer to this as simuliotoxicosis in reference to the family name of black flies, Simuliidae. In addition to simuliotoxicosis, black flies have been implicated in carrying and spreading pathogens such as *Leucocytozoon*. These pathogens include numerous species reported in many parts of the world, including Louisiana. They vary in their ability to cause disease in poultry; however, most cases of mortality in Louisiana are the direct effects of blood loss because of turkey gnat feeding.

In Louisiana, the two most common pest species of black fly are the turkey gnat and buffalo gnat (*Cnephia pecuarum*). Female buffalo gnats mainly feed on mammals and are a serious threat to livestock in certain parts of the state. At least eight additional species of *Simulium* and one additional species of *Cnephia* are also known from Louisiana. Other, unrecorded species are likely to occur in the state.

Control

The most effective means of preventing simulotoxicosis is to monitor severity of spring emergences of turkey gnats and protect birds from exposure until the emergence runs its course, which is typically several weeks to over a month in duration. Keeping domestic fowl and pet birds in screened enclosures of a smaller mesh size (i.e., less than one-fifteenth of an inch; 1.5 mm) than the adult turkey gnats will minimize impacts. Birds that are restricted in enclosed areas outdoors are particularly susceptible. Free range poultry are usually able to escape severe impacts from turkey gnats by moving around but should be monitored carefully and may exhibit increased activity and stress levels when turkey gnats are present.

People who are outdoors during the period may use appropriate repellents, such as strong DEET formulations, following label directions carefully. Anecdotal data suggests that vanilla extract and some cosmetic formulations can be effective for temporary relief during heavy outbreaks of black flies, but these are untested and should be used with caution and a good dose of skepticism.

Control of larval populations is not a viable option because of the widespread availability of suitable flowing water in larval habitats in Louisiana and most other areas where this species occurs. Contamination of these water sources and other aquatic habitats may occur if larval control is attempted.

References

Adler, P. H., D. C. Currie, and D. M. Wood. 2004. The Black Flies (Simuliidae) of North America. Cornell University Press. 941 pp.

Schnellbacher, R. W., A. K. Holder, T. Morgan, L. Foil, H. Beaufre`re, J. Nevarez, and T. N. Tully, Jr. 2012. Avian Simuliotoxicosis: Outbreak in Louisiana. Avian Diseases. 56: 616-620.

Contact Us

For advice about arthropod identification or diagnosis, contact the LSU AgCenter Department of Entomology. Reach the department through the Contact Us webpage:

https://bit.ly/36c4awm

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PUB 3742 online 5/20