Mayflies

Huge swarms of adult mayflies, in recent years (1995-97), have become a nuisance by their presence in some communities along the western basin of Lake Erie. Most swarming occurs in late June and early July. Mayflies accumulate around lights, making roads, streets, sidewalks, etc. slippery and dangerous. These annoying insects may fly into one's face, ears, hair, land on clothing, crawl behind eyeglasses and splatter car windshields. Along lake shores, piles of decaying bodies drift onto beaches and, if not removed, an offensive fish-like odor occurs discouraging tourists during the July 4th holidays. Also, some people are hypersensitive, displaying symptoms of hay fever and asthma (allergies) from inhaling airborne pieces of their dead fragmented bodies.

Mayflies do not bite or sting nor feed on homes, furnishings, food, etc. (Their presence is an indicator of clean water and a healthy environment.) The chief importance lies in their value as food for fish, dragonfly nymphs and birds. Anglers imitate the adults in dry flies, referred to as "spinners" or "duns," and pattern wet flies after the nymphs (Naiads). Lake Erie is now known as the "Walleye Capital of the World" since more than three million fish are caught each year.

Identification
The adult Mayfly, *Hexagenia,* is fragile, soft-bodied, elongate and has two or three long, many-jointed, threadlike tails. Antennae are short inconspicuous bristles. The head is large with round prominent eyes. Forelegs are quite long and stout. Mouthparts are non-feeding. Front wings are large, triangular, membranous with numerous longitudinal veins and cross veins. Wings are held upright and together over the body when at rest. Different mayfly species range from about 1/4 to 1-inch long.

Adults are pale yellow with brownish stripes and a reddish brown thorax (middle segment). The first adult, a bit darker, is called a subimago or subadult (hot sexually mature) with wings and capable of flight. Both male and female subimagoes shed their skin (molt), even the wing covering a final time, leaving behind an exoskeleton to become (sexually mature) imago adults.
In the 1950s, scientists documented as many as 300 to 1,000 immature mayf1ies (nymphs or naiads) 111 a single square meter of lake bottom. After mayflies began to recolonize the Western Basin since 1991, their annual average densities in the sediment have increased dramatically. In 1995, there were 34 nymphs per square meter and in 1996, 102 per square meter which corresponds with an increase in the sizes of adult swarms along the lakeshore of Lake Erie.

Nymphs (naiads) are aquatic, sturdy immatures living at the bottom of quiet bodies of water or rapidly flowing streams for about two years or more. Hexagenia nymphs molt 20 to 30 times. They are narrow and elongate-oval, with shovel-

like front legs and seven pairs of tracheal gills laterally on the abdomen (rear body segment) used to obtain oxygen from air dissolved in the water. There are three slender plumose tails on the body end. Eggs are oval, less than 1/16 inch long and deposited directly on or in the water, sinking to the bottom.

Life Cycle and Habits

Mayflies are classified in the Insect Order Ephemeroptera, meaning in Greek "lasting but a day." As winged adults, they survive only a few hours or at most a few days, nothing is eaten, nor do they crawl or walk. They only fly and mate within dancing swarms, usually in late afternoon or evening. Swarms, consisting of hundreds or thousands, emerge from the water after synchronously appearing along and inland of the shoreline. Mating normally occurs the same day adulthood is achieved. Females release as many as 8,000 fertile, oval eggs over the water, often scattering them or, in some species, in mass in a suitable place. After eggs are laid, females fall to the water and float, often drifting onto beaches in nuisance piles or windrows. Others are strongly attracted to and congregate under night lights.

Top View – Nymph or Naiad

Side View - Adult

Top View - Adult

Dead mayflies pile up, decompose and give off an offensive dead fish-like odor (stench). This material serves as a breeding ground for flies and other scavenger insects. Also, swarms can cause traffic hazards by their bodies getting crushed, resulting in dangerously slick roads and sidewalks. It is necessary for residents to shovel away mayflies near their homes, and street sweepers to clean the mess off the road. Heavy populations of swarming mayflies have been blamed for brown-outs at power plants, and even putting out campfires. Off water breezes often blow the swarms some distance inland to share the burden of windrows of mayfly bodies. Unfortunately, a reasonably large number of people, who dwell where mayflies dance and shower their debris toward earth, come down with a seasonal hay fever and sometimes serious asthma (causes sneezes and wheezes). It is believed that the protein content of insect chitin (disintegrated bodies and covering) do damage to the allergic individual's respiratory system. The presence of these nuisance insects may discourage tourism during the July 4th holiday along Lake Erie. Fortunately, the swarming season is temporarily, annoying from the last week of June through the first two weeks of July each year.

Eggs laid on the water surface gradually sink to the bottom and, after a few days or several months, hatch into tiny aquatic nymphs well adapted for living at the bottom of quiet bodies of water or rapidly flowing streams. Some species burrow into the lake sediment to feed on algae, diatoms, aquatic vegetation, other aquatic insects, etc. When mature, nymphs swim to the surface or climb up plant stems or rocks where they break the nymphal skin, wait briefly for the wings to dry, and fly off. (This subimago period lasts a few minutes to 48 hours, depending on the species.) Subimagoes are dull in appearance while true adults are shiny with longer tails and legs.

Control Measures

There are no effective widespread controls for nuisance mayflies. Insecticides cannot be used at the source to kill nymphs since other valuable fish food organisms would be killed and the water possibly made unsafe for fish and people. Fogging to kill the adults would require frequent heavy insecticide use and would not be practical. Many feel that the inconveniences caused by nuisance mayfly swarms each summer are more than offset by benefits to the sport and commercial fisheries of Lake Erie. Knowledge of the mayfly swarming season (late June and early July) is a "window" that one can wait out.

Light Management

Since adult mayflies are 'highly attracted to bright lights, it is recommended that good night light discipline be practiced, especially during the swarming season. Some communities and private residences currently shut off or reduce lighting at public places such as ball fields, parks, streets, etc. City crews post road signs warning drivers to be

careful of slick roads. .

Source: *Mayflies and Lake Erie - A Sign of Times,* (FS-069) 1997 Ohio Sea Grant College Program
Information obtained through the Ohio State Extension Fact Sheet HYG-2166-97