

# Selected Families of Diptera



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# Characteristics of Diptera

- **One pair of wings (and one pair of halteres).**
- **Larvae are maggots.**
- **Large compound eyes.**
- **Occur in a wide variety of habitats and have a wide variety of lifestyles: some feed on plants, some are predacious, some are scavengers.**
- **Many are beneficial, others are pests.**

# Crane Flies

Family Tipulidae

**Hosts:** Decaying material, other animals.

**Life History:** Occur in damp vegetation, grasslands, or deserts. Adults emerge in spring and don't feed. Most larvae feed on decaying vegetation, but some are predaceous. They are bioindicators.

**Overwintering:** Larvae under leaves or in damp areas.



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# March Flies

Family Bibionidae

**Hosts:** Decaying organic matter.

**Life History:** Adults emerge in spring and fall and swarm. They live for a week and lay eggs in ditches and swamps. Larvae pupate in soil.

The lovebug  
*Plecia nearctica*  
on goldenrod



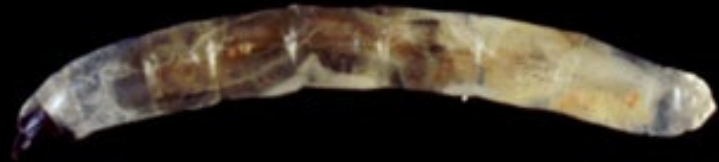
# Darkwinged Fungus Gnats

## Family Sciariidae

**Hosts:** Decaying vegetation and fungi.

**Life History:** Occur in moist, shady places where larvae live in fungi, plant roots, or decaying vegetation.

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# Gall Midges

Order Diptera  
Family Cecidomyiidae

**Hosts:** Larvae feed on aphids, mites, scales, whiteflies, and thrips.

**Life History:** Tiny adults feed on honeydew and nectar, larvae are predaceous.



Whitney Cranshaw

**Top and bottom: *Aphidoletes aphidimyza* feeding on aphids**

# Gall Midges



**Hessian fly, *Mayetiola destructor*,  
adult laying eggs**



**Sorghum midge,  
*Contarinia sorghicola***

# Moth and Sand Flies

Family Psychodidae

**Hosts:** Decaying vegetation and other organic matter.

**Life History:** Occur in moist places such as drains and sewers, decaying matter, mud, moss, and water. Some adults suck blood, but most are harmless.





# Mosquitoes

Family Culicidae

**Hosts:** Larvae feed on organic matter, adult males on nectar and plant juices, adult females on blood.



**Life History:** Adults lay eggs on water or in areas that will be flooded. Larvae are aquatic. Adult females may vector diseases. Many generations a year.

**Overwintering:** Some as mated females.

# Mosquitoes

**Cultural Control:** Eliminate larval habitats such as drainage areas and stagnant water. Use screens, protective clothing, and repellent.

**Chemical Control:** Spray or aerosol insecticides.



# Black Flies

Family Simuliidae

**Hosts:** Larvae filter feed, adults feed on nectar, females suck blood.

**Life History:** Eggs are laid in or near water, where larvae develop. Adults may be pests of livestock or humans.

**Overwintering:** Eggs or larvae.



# Biting Midges, Punkies, No-See-Ums

Family Ceratopogonidae

**Hosts:** Other insects, blood of other animals.

**Life History:** Larvae are scavengers in mud, sand, tree holes, water, and decaying vegetation. Adults are biters.



# Midges

Family Chironomidae

**Hosts:** Organic material.

**Life History:** Adults lay eggs in water, where larvae are scavengers. Some live in mud tubes. Larvae are called bloodworms and are sold as fish food.



# Horse and Deer Flies

## Family Tabanidae

**Hosts:** Larvae are predaceous, adult males feed on nectar and females on blood.

**Life History:** Females lay eggs in masses over water. Most larvae are aquatic. One generation per year.

**Overwintering:** Larvae.



**Top: deer fly; bottom: horse fly**

# Soldier Flies

Family Stratiomyidae

**Hosts:** Larvae feed on decaying vegetation, mold, algae, dung, and small aquatic animals.

**Life History:** Larvae occur in water, under bark, and in their food sources. These flies may enter bathrooms and kitchens.



Drees

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# Robber Flies

Order Diptera  
Family Asilidae

**Hosts:** Butterflies,  
wasps, bees,  
dragonflies,  
grasshoppers,

beetles, and other flies. Larvae feed on soft-bodied insects such as grasshopper eggs, white grubs, and other insect larvae.

**Life History:** Larvae live in soil and decaying wood; adults are fast fliers.





# Robber Flies



**Adult female**



**Adult male**

# Small-Headed Flies

Family Acroceridae

**Hosts:** Larvae are parasitoids of spiders; adults feed on flowers.

**Life History:** Eggs are laid on vegetation. Larvae attach to and enter spiders. Larvae pupate outside of hosts.



# Bee Flies

Family Bombyliidae

**Hosts:** Adults feed on flowers, larvae on other insects.

**Life History:** Larvae are parasites of insects or predators

of grasshopper eggs. Adults are found flying quickly around flowers in sunny, grassy areas. They buzz like bees.



# Long-Legged Flies

Family Dolichopodidae

**Hosts:** Other small insects.

**Life History:** Larvae are aquatic or semi-aquatic and found in streams, swamps, mud, or under bark. Some mine grass and other plants.



# Syrphid or Hover Flies

Order Diptera  
Family Syrphidae

**Hosts:** Larvae feed on aphids, scales, and other insects.

**Life History:** Adults feed on nectar and pollen. Larvae are predaceous. One generation every 2 to 4 weeks.



David Laughlin



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# Syrphid or Hover Flies

**Clockwise from right:  
Syrphid egg, larva, and  
larva on branch**



# Stilt-Legged Flies

Family Micropezidae

**Hosts:** Excrement.

**Life History:** Occur in wet places. Larvae feed on excrement.



# Stalk-Eyed Flies

Family Diopsidae

**Hosts:** Wet organic matter.

**Life History:** Often found in skunk cabbage.  
Live in wet habitats.





# Picture-Winged Flies

Families Otitidae and Platystomatidae

**Hosts:** Plants and decaying materials.

**Life History:** Found in wet places.



**Platystomatid fly**

# Fruit Flies

Family Tephritidae

**Hosts:** Fruit.

**Life History:** Some are pests, some form goldenrod galls, others are leaf miners. Some species mimic spiders or wasps.

**Overwintering:** Larvae.



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# Leafminer Flies

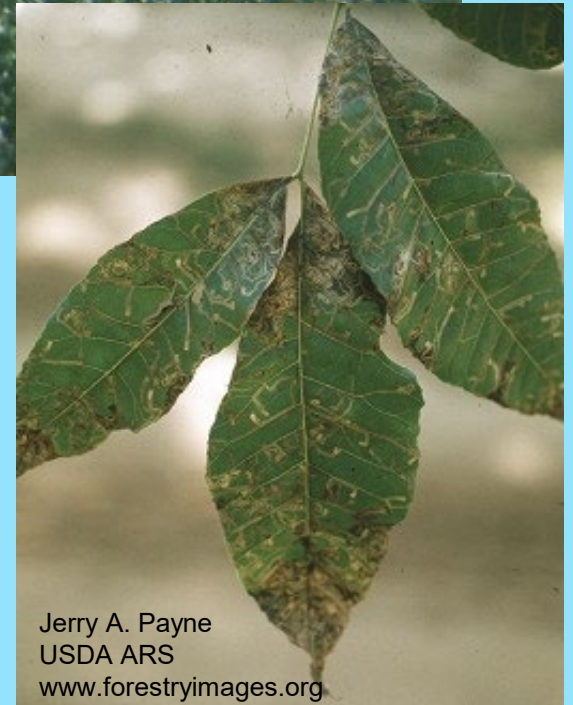
Family Agromyzidae

**Hosts:** Various plant species.

**Life History:** Adults lay eggs on leaves and larvae mine.

Larvae pupate in pupariums on the ground. Several generations per year occur in greenhouses.

**Monitoring:** Yellow sticky cards.



# Small Fruit Flies

Family Drosophilidae

**Hosts:** Decaying fruit and fungi, other insects.

**Life History:** Some larvae are external parasites of caterpillars or predators of bugs. Because of their short life cycles, they are often used in genetics.



# House, Face, and Stable Flies

**Family Muscidae**

**Hosts:** Dung and decaying matter.

**Life History:**

Occur in houses or barns. Some species bite and many carry diseases.

Larvae pupate in pupariums. Many generations per year.

**Overwintering:** Adults.



# Blow Flies

**Family Calliphoridae**

**Hosts:** Carrion, excrement, tissue.

**Life History:** Scavengers or pests of livestock (screw-worm) or humans (tumbu fly). Larvae are used in medicine to remove dead flesh from patients, and used in forensic entomology to estimate time of death at crime scenes.

**Cultural Control:** Sterile male release (screwworm), maintain sanitary conditions.



# Flesh Flies

## Family Sarcophagidae

**Hosts:** Larvae feed on animal matter, adults on nectar and other plant juices.

**Life History:** Some are parasites of vertebrates or other insects. Some lay eggs in bee or wasp nests. The forest tent caterpillar parasitoid *Sarcophaga aldrichi* belongs to this family.



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# Bot Flies

Family Oestridae

**Hosts:** Mammals such as livestock.

**Life History:** Eggs are laid on animals and larvae penetrate the skin or enter through mouth, nose, etc.

Adults annoy livestock but don't bite.

**Top:** Rabbit bot fly adult

**Bottom:** Horse bot fly larvae, *Gasterophilus intestinalis*





# Tachinid Flies

Order Diptera  
Family Tachinidae

**Hosts:** Caterpillars, adult and larval beetles, sawfly larvae, true bugs, grasshoppers, and others.

**Life History:** Adults lay eggs on plants or hosts. Larvae develop inside hosts and pupate in 4 to 14 days. One or more generations per year.



# Louse Flies

**Family Hippoboscidae**

**Hosts:** Birds, sheep.

**Life History:** External parasites.

