

Habitat Guide

(aka: The Collecting Cheat Sheet...)
(Updated to 7th Edition of Study of Insects)

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About this Guide

In order to build your insect collection you will need to learn where and how to collect insects. This handout provides concise information on the habitat preferences of North American insect families and the best technique(s) to use to collect them. This information should help you collect more effectively and efficiently. The handout is divided into four major sections as follows:

1. *How to Use this Handout.*—Contains suggestions on the different ways you might use this handout.
2. *Synopsis of Common Collecting Techniques.*—Contains brief descriptions of a variety of common collecting techniques.
3. *Habitats and Collecting Techniques.*—Contains information about generalized habitats and identifies collecting techniques appropriate for collecting in each.
4. *Family by Habitat Table.*—The heart of the handout. It concisely lists all of the families of insects known from America north of Mexico, together with generalized information on adult and larval habitats and best collecting methods to use for each family. The table also indicates which families are relatively “rare” (i.e., less likely to be collected), which families are known to occur in Texas, and (for many orders) which families are known to have been collected previously in Brazos County.

How to Use this Guide

- *Microhabitat Targeting.*—Review the habitat preferences of groups of families (e.g., orders). Use the Habitats and Collecting Techniques section to identify collecting techniques appropriate for collecting material from each major habitat type shown by that family group.
- *Family Targeting.*—Check the appropriate “In my collection” boxes as you collect families for your collection. Use this information to identify which families are NOT in your collection. Using the table, identify the microhabitats where these families are most likely to be encountered. Then, use one or more of the techniques recommended in the Habitats and Collecting Techniques section to target these families for collection.
- *Family Identification.*—The “Family” column indicates (to the best of my current knowledge!) which families are known to occur in Texas. Use this information in conjunction with your textbook’s keys to help you identify your Texas specimens – if you key a Texas specimen out to a family that the table indicates is not known from Texas, you may want to double check your identification. Cautionary Note: Our knowledge of the Texas insect fauna is still far from perfect. Some families marked as “NT” may yet be found in Texas, so the table CANNOT be used as an absolute guide as to what families you may find in Texas.

Synopsis of Common Collecting Techniques

For additional information on collecting techniques see the current edition of *An Introduction to the Study of Insects*.

Active Collecting Techniques

- **Netting.**—The classic class of capture techniques for insects. Comes in several varieties:
 - **Sweeping.**—Use of a stout net to sweep specimens from vegetation. Requires a sturdy net bag.
 - **Aerial netting.**—Used to capture individual specimens from the air or on plants. Uses a fragile net bag.
 - **Aquatic.**—Used to capture aquatic specimens. Uses a specially designed bag and net ring.
 - **Beating.**—Use of a net as the container for beating (see below).
- **Aspirating.**—Specimens are sucked into a collecting tube (but not your mouth!) with a hand-held device called an aspirator.
- **Light Collecting (L).**—Specimens are attracted to a light source (typically an incandescent, ultraviolet or Mercury vapor light bulb) and land on a vertical sheet near the light source, or are directed by means of vertical vanes into a funnel trap placed below the light source. Specimens are collected directly from the sheet (by hand or aspirator) or are sorted subsequently from the funnel trap.
- **Beating.**—A container (e.g., a pan, insect net or piece of stretched cloth) is held under a object (e.g., a shrub or tree branch) harboring insect specimens. The object is beaten or tapped with a stick. Dislodged specimens fall into and are collected from the underlying container by hand or with an aspirator.
- **Ground-Object Flipping.**—Objects lying in contact with the ground (e.g., rocks, logs, boards, etc.) are turned over to expose specimens beneath. Collecting is mostly by hand, and thus usually not too efficient.
- **Berlese Funneling (B).**—Not strictly a collecting method, but rather an extraction technique for moist, field collected, samples. A vertical funnel incorporating a horizontal screen and a top light bulb is used to separate small specimens from litter samples. Sample materials are placed on the screen. Heat from the light bulb dries the sample and forces specimens toward its bottom, where they eventually fall through the screen and into a container of preservative placed at the bottom of the funnel.
- **Log Collecting.**—A stout metal object (e.g., knife, crowbar) is used to break apart bark and wood associated with logs or large branches. Collecting is mostly by hand or aspirator after specimens have been exposed. Highly fragmented or decomposed woody debris can also be Berlesed.
- **Kick Screen.**—A screen or mesh (generally small and handheld) stretched across the current of a stream or river. Disturbing sediments on the upstream side of the screen by “kicking” causes specimens to be carried by the water current into the screen, from which they can be collected.

Passive Techniques

Many passive trapping techniques have been developed for collecting insects. A few of the most common are noted below.

- **Malaise Trap (MT).**—A tent-like structure composed of vertical fabric-mesh panels and a sloping fabric-mesh roof. Flying insects that ascend when they encounter a barrier (in this case the vertical trap panels) are caught in a funnel trap placed at the apex of the trap’s roof. Effective primarily for flying insects. Traps placed in natural insect flyways tend to be most productive.
- **Pitfall Trap (PT).**—Small, slick-sided, cups or containers are buried in the ground with the lip of the container even with the surface of the ground. Specimens fall into and are caught in a preservative filling the bottom of the container. Effective for many ground-dwelling species. Placing a bait (e.g., stale beer, meat, peanut butter, dung, molasses, etc.) in the trap will preferentially attract certain types of insects and increase the trap’s efficiency. In the rainy season, a rain cover is needed.
- **Pan Trap (PnT).**—A shallow pan or bowl filled with a preservative and placed where it will not be disturbed (generally on the ground). Such pans may be used alone, or at the bottom of the vertical panes of other trap types such as flight intercept (see below), window pane or Malaise traps. The color of the pan can have important effects on the types of insects trapped (yellow and blue are generally best). Effective for a variety of flying insects. In the rainy season, a rain cover is needed.
- **Flight Intercept Trap (FIT).**—A vertical pane erected to intercept flying insects, coupled with a pan trap at its base to capture and preserve specimens. Several varieties are commonly used. The window pane trap relies on a smooth vertical surface which insects cannot grasp, but has the disadvantage of often producing visible glare. Flying insects hit the pane and drop into the pan trap. The flight intercept trap is often a fabric mesh, but operates in the same manner. A sprayed strip or two of a contact insecticide can significantly improve the catch of the fabric mesh type trap. The visibility of the trap (e.g., color, mesh density) and the color of the pan traps will affect number and type specimens captured.

Habitats and Collecting Techniques

In order to maximize the diversity of specimens in your collection you will need to use a variety of different collecting techniques and collect in a variety of different habitats. In the Family by Habitat table that follows, the habitat preferences North American insect families are divided into a generalized set of habitats and habitat groupings. The scopes of these are outlined below, together with lists of common collecting techniques that are particularly appropriate for capturing specimens in each.

Aquatic

Surface

- *Scope:* Includes freshwater and saltwater surface film microhabitats (Note: There are relatively few insect species found in brackish or saltwater microhabitats).
- *Collecting Techniques:* Aquatic net, hand-held strainer, hand-collecting (for slower taxa), light collecting (for winged taxa).

Subsurface

- *Scope:* Includes subsurface freshwater and saltwater microhabitats.
- *Collecting Techniques:* Aquatic net, kick screen, light collecting (for winged taxa).

Riparian

Flying

- *Scope:* Includes near-water aerial microhabitats (for species seen and collected primarily in flight).
- *Collecting Techniques:* Sweep netting, aerial netting.

Plants

- *Scope:* Includes microhabitats associated with near-water plants. Plants may be used for any of a variety of purposes (e.g., perching, feeding, cover, hunting prey).
- *Collecting Techniques:* Aspirating, sweep netting, aerial netting, beating, light collecting, hand collecting, Malaise trapping, pan trapping, flight intercept trapping.

Moist Ground

- *Scope:* Includes all microhabitats associated with near-water moist ground, such as litter, wrack, soils, sand flats.
- *Collecting Techniques:* Aspirating, Berlese funneling, pitfall trapping, ground-object flipping, hand collecting.

Terrestrial

Moist Ground

- *Scope:* Includes all microhabitats associated with moist ground away from obvious bodies of water, such as forest leaf litters and soils.

- *Collecting Techniques:* Aspirating, Berlese funneling, pitfall trapping, ground-object flipping, hand collecting.

Dry Ground

- *Scope:* Includes all microhabitats associated with relatively dry ground, such as dry leaf litters.
- *Collecting Techniques:* Aspirating, Berlese funneling, pitfall trapping, ground-object flipping, hand collecting.

Plants

- *Scope:* Includes non-woody microhabitats associated with terrestrial plants, particularly leaves, flowers, and fruits.
- *Collecting Techniques:* Aspirating, sweep netting, aerial netting, light collecting, beating, Malaise trapping, pan trapping, flight intercept trapping, hand collecting.

Parasites

Vertebrates

- *Scope:* Includes microhabitats associated with vertebrate animals (all external).
- *Collecting Techniques:* Fur/feather combing/bushing, filtered fur/feather wash, hand collecting from live or dead animals.

Invertebrates

- *Scope:* Includes microhabitats associated with invertebrate animals (external and internal).
- *Collecting Techniques:* Hand collecting from live or dead animals.

Miscellaneous

Wood / Logs

- *Scope:* Includes woody microhabitats of plants, including standing or fallen logs, under bark chips, in the cambial region between bark and wood, in burrows in wood, in rotting wood, in woody branches and twigs.
- *Collecting Techniques:* Aspirating, log collecting, Berlese funneling, pitfall trapping.

Ants/Termites

- *Scope:* Includes microhabitats associated with ant and termite nests.
- *Collecting Techniques:* Aspirating, ground-object flipping, digging and hand collecting, digging and Berlese funneling.