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Getting Bugged in Arizona!

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Because of Arizona's geographical location next to Mexico, its varied habitats, its many mountain ranges rich in biological diversity and its numerous unique plant species that serve as insect hosts, Arizona is a "hot spot" for insect collecting. This means that entomologists (people who study insects) from around the world plan dream vacations to Arizona to collect our local insects.

Despite the fact that explorers and scientists have devoted years investigating Arizona insects, there is a lot more to discover. There are over 1 million insects described worldwide and some scientists estimate there are as many as 10 million that have not yet been named (Turpin, 1992)! Most research has focused on naming and controlling those insects that become a "problem." Humans in general don't pay much attention to insects unless the insects are bothersome, or unless they are large and beautiful or showy. While some insects are thought to be undesirable, many are beneficial or benign.

INSECT OBSERVATION

Studying insects is an interesting and inexpensive hobby. Here are tips you can use to increase your chances of finding insects. The first tip is to go where the insects live. Insects spend a good deal of time searching for and consuming food. While some insect herbivory could be viewed as detrimental to your landscape, orchard or garden, low levels of plant herbivory is not harmful to plants. Look on trees, shrubs and other plants for grasshoppers, cicadas, lacewings and walking sticks; look in and on flowers for bees, wasps, bugs, butterflies and beetles; under tree bark for beetles, caterpillars; under rocks or logs for beetles, earwigs, crickets, roaches, (be aware that venomous snakes, scorpions, and centipedes also like to hide under rock ledges and logs); near water for dragonflies, damselflies, stoneflies and caddisflies.

LURING AND TRAPPING INSECTS

The second tip is to lure insects to a place where you want them to be. Learn the habits and favorite foods of insects and provide them. Plant a butterfly garden with plants that attract butterflies. Purposely provide hiding places for insects by placing some wood down and checking underneath it weekly to see if insects seek shelter there. Create pitfall traps by burying empty soup cans up to the rim. Cover each soup can with a small board elevated,¼" or less off the ground, with small pebbles. Insects crawl underneath the board and fall into the can. Carefully check pitfall traps daily, as spiders and scorpions may also fall into the traps. Night-flying insects will be lured to a porch light or a blacklight. To create a blacklight lure, suspend a white bed sheet from a clothesline or other suitable structure; replace the fluorescent white bulb in a fixture with a blacklight bulb, and place the blacklight so that as much of the white sheet glows as possible. Insects will start visiting the sheet at dusk and different species will continue to arrive until dawn.

INSECT PHOTOGRAPHY

Many people enjoy observing or photographing insect's habits and behavior. Observing how and what insects eat, and how insects change is fascinating. Insects can be detained in small jars to begin with, but if they are caterpillars, they will molt and get bigger, so an "upgrade" to a larger container may be necessary. If the captive insects normally crawl about on the ground hunting for food, a more spacious cage where a mini-habitat can be created is desirable. Usually some clean soil or sand, a small shallow jar lid for a water dish and a place to hide are basic requirements for an insect habitat. Identify the insect and research its food requirements. Realize that insects are not common household pets which will notify you when they are hungry. Most caterpillars in nature feed on only one or two species of plants. When the caterpillar has eaten all the tender leaves of that particular plant in its vicinity, it has to hunt for more of the same species of plant! If a person wants to keep a caterpillar and watch it grow and become an adult, fresh leaves must be collected, rinsed gently, tapped dry, and placed in the cage on a daily basis. By rinsing and tapping the leaves dry, parasites of caterpillars may be washed away and the small amount of moisture that remains will substitute for a source of drinking water for the caterpillar. Although some insects are capable of drinking from a "water dish," caterpillars may crawl up on the edge, fall in and drown. Take notes on your insect experiences. If you are rearing caterpillars make notes of what the caterpillars eat, the dates that caterpillars molt and their appearance.

One may not have room to keep live insects for lengthy observation, however, photographing insects is a satisfying pursuit and images can be stored in a very small space! Insect photography requires a camera that can focus on small objects, and a notepad for taking notes of when and where the insect was found. Once an insect is found and the camera in hand, the challenge becomes keeping the insect in the view finder while composing the photograph. This can be overcome by collecting the insect in a jar, and briefly refrigerating it, thus slowing the insect's activity level. The photographer then carefully removes the

insect from the jar and positions the insect on a previously arranged background for multiple photographs from different angles. If the insect warms and begins more rapid movement, it can be returned to the jar and to the refrigerator for additional chilling. Once the insect has been photographed, allow it to return to ambient temperature and release it in its natural habitat. Insects should not be released into habitats where they are not normally found.

COLLECTIONS

To make a scientific insect collection, other equipment and supplies are needed. An insect net, a killing jar, a spreading board and a storage or display box, can be homemade or inexpensively purchased at local discount stores. Special insect pins are available from scientific supply companies. When killing an insect for a scientific collection it is important that the insect be handled as gently as possible. Capture the insect in a net or a jar. Once captured in a net, the insect should be transferred to a jar and placed in the freezer until dead. An alternative to killing insects by freezing is to have a jar that contains a small amount of killing agent, the fumes of which will kill the insect. Handled with care, household ammonia can be used to kill insects. Ensure that the insect is really dead before removing it from the jar for mounting. The insect is mounted by pinning it through the body and arranging its legs, wings and antennae in a natural pose. Insect collectors have learned to leave insects in the killing jar or freezer for a sufficient time. An impatient collector may remove an unconscious, but not dead, insect from the jar or freezer, pin it and arrange its legs, wings and antenna only to return later to discover the revived insect struggling to get off the pin which is thrust through its body. The insect must be re-killed before rearranging the legs, wings and antennae. Allow a week, in dry weather conditions, for pinned insects to dry before labeling and storing. Insect labels should be small, yet large enough to allow the wording to be read. At minimum, the label contains the name of the state, county and the city or natural landmark where the insect was collected; the date when collected; and the name of the collector. This label is placed on the pin just below, and parallel to, the insect's body. Insect collections must be protected from hazards such as breakage, dampness and other insects. Tight fitting wooden insect collection boxes with closed-cell foam attached in the bottom are available for purchase, but other tight fitting boxes, such as cigar boxes with Styrofoam in the bottom will suffice. To deter other insects from eating a collection, wrap a few moth crystals (the kind used in closets), in cotton fabric and pin securely to the inside box bottom. Moth crystal chemicals are harmful to insects as well as humans. Read and follow cautionary statements on the container. If protected, insect collections last years. Some museums contain specimens collected and named in the 1700's by Carl Linnaeus, the father of biological nomenclature!

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RESOURCES

Whether observing, photographing, rearing or making a scientific collection, identification of insects is like a hunt for treasure. There are field guides available from bookstores or the internet which give general information about many different kinds of insects, and how to properly pin and mount them. Other guides are more focused on specific groups, such as beetles. If you are stumped and cannot determine the insect you have collected, take the specimen to the University of Arizona Cooperative Extension Office in your county. Each office will assist you in determining the insect's identity. Additionally, each Cooperative Extension office is that county's "home base" for the 4-H Youth Development program. If young people are interested in learning about insects there may be a 4-H Club in the county whose members participate in entomology projects. If no Entomology club exists, it is a wonderful opportunity for an adult mentor to recruit some youth, start a 4-H club and using the 4-H member manuals, teach the wonders of Entomology. The joys of hunting and exploring, developing tools, collecting and displaying, the insects of Arizona are a treasure for any 4-H member and leader. Despite all the insect collectors from out of the area, information about Arizona entomology is incomplete. You can contribute to the body of knowledge by sharing information you have learned and recorded through photographs, notes on rearing and insect specimens collected.

The following are internet sources for insect collecting equipment and books.

http://www.bioquip.com/default.asp

http://www.wardsci.com

https://www.forestry-suppliers.com/search.asp?stext=insect%20collecting

http://www.carolina.com/home.do?s_cid=ppc_gl_carolinabiologicalsupply&code=L4&gclid=CK_IhMfTwZgCFRFMagodJG9E0g

Turpin, T., (1992). *The Insect Appreciation Digest,* Purdue University, West Lafayette, Indiana. Copyright 1992 by The Entomological Foundation, Lanham, Maryland.