

Booklet #20: The Northern Virginia Alliance of Camera Clubs

PHOTOGRAPHING INSECTS

by

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PREFACE

The Northern Virginia Alliance of Camera Clubs (NVACC) is an informal organization started in 1997 by Joseph Miller with the assistance of Dave Carter and Ed Funk. Our purpose is to promote communication and cooperation among camera clubs. We accomplish this by (a) publishing a monthly calendar of the member clubs' activities; (b) conducting training seminars for photographic judges; (c) maintaining a registry of trained judges who serve the clubs' monthly competitions and critiques; and (d) maintaining a directory of speakers who have been recommended by the various clubs. You can learn more about NVACC by going to our web site at www.NVACC.org.

This booklet is one of a series that was developed by NVACC during the period 1998-2008 to capture the considerable expertise of the many accomplished photographers in Northern Virginia and share it with others. Over recent years, we have seen significant change in the photographic art form and very rapid technical advance in both the media of photography (film and digital) and the tools (cameras, lenses, computers, and software). For that reason, the detail of some of these booklets may seem "dated", although the ideas and techniques presented transcend "progress" and the digital-film divide. Watch the NVACC web for new booklets as well as revisions that incorporate new technology and ideas into the existing ones.

Originally, our booklets were made available through member clubs for a small fee that covered the cost of reproduction. Now, however, the booklets are available on www.NVACC.com where individuals may download one machine-readable copy and one print copy per page for personal, noncommercial use only. Written permission from NVACC is required for any other use.

If you would like to know more about NVACC or have questions or suggestions concerning our booklets or services, please feel free to contact us at JoeMiller@NVACC.org.



Photographing Insects

Creepy crawly bugs! Yeech! Get out the spray. This is a common response to insects. But, think beautiful butterflies, dazzling dragonflies, or delicate damsel flies. Open your eyes and a truly fascinating world awaits you.

At first glance, photographing insects may appear to be a rather narrow photographic specialty. Once you begin, however, you will face a wide variety of challenges and opportunities to use all your photographic skills. Plunge in and you will observe amazing behavior and survival strategies. You will develop a deeper appreciation for the incredible natural world in which we live.

This booklet is meant to be an introduction to insect photography. Readers interested in a more in-depth discussion of macro (close-up) photography in general and insect photography in particular should consult John Shaw's "*Closeups in Nature*," and especially Larry West's "*How to Photograph Insects & Spiders*." Another booklet in this series, Booklet No. 8, "Photographing Wildflowers and Other Small Subjects, An Introduction to Macro Photography" by Dave Carter, contains a detailed discussion of macro photography.

Equipment

Camera body. Many major brand camera bodies are suitable for insect photography. If you intend to photograph a lot of insects, one essential feature is a depth-of-field preview button. As you attempt to get larger size images of small subjects, the depth of field (front to back sharpness) at any given f/stop becomes shallower. Attempting to get a life-size image (1 to 1) of a subject at f/32 provides you with only about 1/8 of an inch depth of field. Going to two or three times life size yields almost no depth of field and no margin for error. At these magnifications, I have found that the depth-of-field preview button pushed down part way actually helps me focus on the subject. However, as you squeeze the button be very careful not to move the camera. Recheck the focus after you release the button.

The depth-of-field preview button is useful in another way as well. Looking through your viewfinder as you set up your photo, the aperture is generally wide open. In macro photography you generally shoot stopped down to at least f/16 and often to f/32, or as much as your lens will permit. The depth-of-field preview button will show how much of your subject is sharp. It will also will show what the background will look like in the final image. A background that appears fairly soft through an aperture of say f/4 may become very busy and unappealing at f/32. In low light situations you may not be able to see anything through the viewfinder at f/32. In this case slowly press the depth-of-field preview button so you can see the effect of smaller f/stops on the background. Very often the best insect photos show a sharp subject against a soft background. If this is your intent, use your depth-of-field preview button to be sure you are achieving that

effect.

Autofocus may be a handy feature if you are chasing butterflies (or, as many of us are finding, if your eyes are not what they used to be). However, recall that the depth of field runs from 1/3 in front of the point of focus to 2/3 behind it. In many situations you may wish to place the point of focus a bit behind the part of the subject closest to you to get more of the creature sharp. Manual focus is generally a better method for doing this.

Another useful feature, though not mandatory, is a spot meter capability in your camera's metering system. You often will find yourself in a situation where your subject has very different brightness values from the background (e.g., a bright yellow tiger swallowtail butterfly against dark green foliage). Use the spot meter to determine the correct exposure for the butterfly.

Lenses. Your choice of lenses will depend on how serious you intend to be. If you enjoy macro work, but do not intend to specialize, you may not want to invest in a fixed focal length macro lens. However, you can obtain excellent results with zoom lenses. Some zoom lenses have a macro setting. These are not true macro lenses. Nevertheless, you can obtain excellent results with these lenses. For many years I used a Tamron 70-210 macro zoom with good success. There are some advantages to zoom lenses. Using a zoom lens permits you to set up at a fixed distance from your subject and obtain images of varying sizes by zooming the lens. This can be a great advantage in the field where it is often difficult to set up your tripod without getting it tangled in brush. If you have to move the tripod, the composition may be effected. It's nice to be able to set up only once. With a fixed focal length macro lens you may find yourself moving the tripod legs back and forth to get the exact image size you desire (though you may be able to use a focusing rail to overcome this problem). On the other hand, zoom lenses have some disadvantages. They may zoom on their own if you aim them straight down, and they may not work well with macro accessories such as diopter lenses and extension tubes.

If you intend to do a lot of macro work and only want to purchase a single lens, I recommend a top-of-the-line 200mm macro lens if it is within your budget, and if one is manufactured for your camera body. Some longer macro lenses have a lens collar that enables you to attach the lens directly to the tripod. These collars allow you to turn the camera easily from horizontal to vertical.

There are other benefits of fixed focal length macro lenses. One is the ability to obtain a bigger image size without the use of accessories. Many macro lenses can provide life size images whereas zoom lenses generally are limited to about 40 percent of life size. Fixed focal length macro lenses usually have better edge to edge sharpness and give less distortion. Fixed focal length macro lenses frequently have smaller f/stops enabling you to get greater depth of field than from a zoom lens.

Two-element diopter lenses. Diopters are lenses that screw onto the front of your prime lens like a filter. They enable you to move closer to your subject and increase the

image size. Nikon makes diopters in 52mm and 62mm sizes, each size in two strengths. Canon makes them in 52mm and 58mm sizes, each with two strengths, and in 72mm and 77mm in one strength each. Leica makes them with two strengths in 55mm. My 200mm fixed focal length macro lens can produce a life size image. Stacking Nikon's two diopters (one of each strength) on the lens gives an image about 2.7 times life size. I could not stack diopters with the Tamron zoom and achieve acceptable sharpness. The great advantage of diopter lenses is that there is no loss of light. They also are relatively inexpensive. Consequently, they are my first choice among the accessory options used to increase magnification. Make sure that the optical quality of your diopter lenses is as good as your lens.

Extension tubes. These offer another approach to increasing the magnification of your prime lens. They are simply hollow tubes that are placed between the camera body and the lens. They enable you to focus closer. While tubes are useful under the right circumstances, they have two disadvantages. They cause loss of light. They also cause instability. You are more likely to have camera shake if you use tubes. I often combine a single 27.5mm tube with my 200mm macro lens and two diopter lenses to obtain an image three times life size of insect eggs or extreme closeups of butterfly wings. However, I am able to do this only indoors in controlled conditions. My success rate is not high due to the extreme difficulty of focusing.

Tele-converters (multipliers). Tele-converters offer another option for increasing the magnification of your prime lens. A 1.4-times tele-converter placed between the camera body and the lens will convert a 200mm lens to a 280mm lens, increasing image size by 40%. A two-times tele-converter doubles the focal length making it a 400mm lens. If the focusing distance is not changed, this doubles the image size. A major drawback of tele-converters is loss of light. A 1.4-times tele-converter costs one stop of light. A two-times tele-converter costs two stops. Like the extension tubes, tele-converters decrease stability to some extent. Make sure the optical quality of your tele-converter is as good as your lens.

Flash. I prefer to photograph nature subjects in natural light. However, in insect photography there are situations where it is necessary to use flash to open up a shadow area. Flash also can be useful to provide a highlight in the eye. Sometimes flash is the sole light source for the subject. Any TTL (through-the-lens) flash unit that permits you to adjust flash output should be acceptable.

If you are unable to use a tripod you may consider using a flash. Hand holding your equipment while attempting to obtain a large, sharp image of any insect, even in bright sunlight, is very difficult. Using ISO 100 film on a sunny 16 day, you can shoot at 1/250 of a second at f/11, if you have steady hands or can lean against some sort of support. Less light and you must sacrifice shutter speed or depth of field, and you are likely to be unsuccessful. Hand-holding a camera also can lead to imprecise composition.

Tripods. Tripods are essential for most types of insect photography. Among my favorite subjects are insects covered with dew. These little jewels are found early in the morning (just after sunrise) and you must photograph them before the temperature warms up and the sun dries the insect. If the insect is warm enough to flutter its wings and knock the dew off, your shot will be lost. Low light conditions combined with the need for small f/stops to obtain the required depth of field result in shutter speeds generally a quarter second or slower, often as much as four to eight seconds. Hand-holding your camera is out of the question. A good solid tripod along with a tripod head that can be locked down tightly is necessary to obtain razor sharp images.

I also use a tripod for indoor butterfly life-cycle photography, that is, eggs, caterpillars, conversion to a chrysalis, and the final emergence of the butterfly. The need to be sure the subject is sharp necessitates using a tripod.

Cable release. If you are using a tripod, be sure to use a cable release to avoid camera shake. If there is no wind and you have forgotten or lost your cable release, use the self-timer on your camera.

Reflectors. Excellent insect photos can be made with front, side or back lighting. However, when you take a back-lit or side-lit shot, there will be shadows. These shadows may be soft or harsh. Your eye can see a much broader range of light than film can record. It is important that you study your subject to determine whether added light is necessary. You can use reflectors (or flash) to provide additional light. You can make a simple, inexpensive reflector by crumpling aluminum foil and attaching it to a piece of cardboard. Lightweight silver and gold (warming) reflectors are sold at photo stores. They often fold so they don't take much space.

Scissors. On many occasions you may find a good subject with grass or a stem which you would prefer not to be in the composition. If the vegetation cannot be tied back, I use scissors to cut away those parts of the vegetation that interfere with the subject. I always cut as little as possible to minimize my impact on the environment. I never cut flowers. When cutting grass or stems, I hold the top of the vegetation in one hand while cutting with the other. This reduces the chance that the vegetation will fall onto your subject!

Other useful items. Always wear a hat, boots, long pants, and a long sleeve shirt. Use a good insect spray such as Cutters or Deep Woods Off. If you are serious about insect photography, you will end up traipsing about in thick grasses and shrubbery. This is prime insect habitat. While photographing insects is rewarding, being bitten is not, particularly with the risk of Rocky Mountain fever and Lyme disease carried by ticks. You should take reasonable precautions to protect yourself and check carefully when you return home. While you will quickly feel a mosquito bite, ticks have an ability to crawl all over you without your knowing it. I have found ticks in my hair and on my back as much as three days after a photo excursion. In wet conditions, I place my photo pack on a

large plastic bag and use another to kneel on if I must shoot from a low position.

Locations

Public parks. Any local park with a meadow or flower garden should provide a good source of subjects. In addition, some parks are now developing butterfly gardens designed to attract a variety of species to feed and reproduce. My longtime favorite local park for insect photography is Huntley Meadows Park located in southern Fairfax County. Other places I have had success include Greenspring Gardens Park off Duke Street near 1-395, Great Falls Park in Virginia, and Hughes Hollow along the C&O Canal in Maryland.

Your backyard. You may want to plant flowers, bushes and trees which attract butterflies and other insects. The Audubon Field Guides list insects and their host plants. You can create a backyard habitat that should provide you with plenty of photographic opportunities. I have had success in both a small patio and a normal suburban yard. It is important to check your plants frequently. It's easy to spot a tiger swallowtail butterfly feeding on your flowers by simply glancing out of your window. However, to find smaller butterflies, beetles, or insect eggs, you must take a close look. If you spot insects mating on a particular plant, check that plant, particularly the underside of the leaves, the next day to see if there are any eggs.

Techniques

Dew-covered insects. The major challenge in photographing dew-covered insects is to find them. Potential opportunities occur from May through mid-October in the Washington area. You need to search meadows, preferably those protected from wind and near a marsh or pond. In pond areas the humidity may be a bit higher than other places. In the Washington area I have found that if the temperature drops below 60 degrees, preferably below 55 degrees, and if there is sufficient humidity, there will be a good dew. Most insects will not be able to move under these conditions. The quality of dew varies from barely noticeable to spectacular. A good rule of thumb is that if the dew on the grass in your neighborhood is good or if there is a lot of dew on car windshields left in the open over night, then the dew in a meadow is likely to be terrific.

An essential requirement for photographing dew-covered insects is no air movement. With exposures of at least $\frac{1}{4}$ of a second and often up to four seconds, and insects attached to leaves, grasses or stems, the slightest breeze will spoil your photographic opportunity.

Depending on conditions you may have as little as half an hour and as much as a couple of hours in the early morning (just after sunrise) to find and photograph these little gems. Given that their survival depends on not being spotted by a predator, it can

be tough to find them. With some practice you are likely to improve your success rate. I have come up empty on many occasions and on others found 15 to 20 sparkling dragonflies. Once you find the first one, it seems easier to find more. One helpful approach is to bend or kneel down and look through grasses. It is harder to see them when you are in a standing position. You should search walking in one direction for 30 to 40 feet, then turn around and search back to your starting point. Insects totally camouflaged from one perspective may stand out from another viewpoint.

Before You Take the Picture

- Determine whether the insect is in a position that will produce a good photo. Often, insects are found in the midst of thick vegetation. Under these circumstances, too much cutting of surrounding plants may be required. If so, find another subject.
- Check the quality of the specimen. Make sure the wings are not torn and that the insect looks fresh. Butterflies freshly emerged from the chrysalis are superior to those that have been flying about for a week.
- View the insect from all perspectives, front, back and side. You will often find that one view is superior. Start with this view.
- Check your composition through your lens prior to setting up your tripod. This will help you determine how far away from the insect you want to be and how high off the ground the camera must be placed.
- Carefully place your tripod so that the legs do not accidentally hit the stem or grass on which your subject rests. You will be surprised how difficult this can be. It sometimes seems that every blade of grass is connected to all other blades of grass. When you hit one with your tripod, other blades of grass are likely to move.
- The great advantage of photographing insects early in the morning is you can get close. If the temperature is cool enough, they can't move. But remember, the closer you move your tripod to the insect, the more likely you are to knock the insect off its perch or hit the stem and knock off some dew. The longer macro lenses have an advantage here by providing more working distance.
- Make the final composition and focusing adjustments by looking through the viewfinder and using your depth-of-field preview button. This helps to assure that all parts of the subject are in focus. It can be extremely difficult to produce a large image of a dragonfly with the entire insect in focus, particularly if the wings are not perfectly parallel to the body. You can help yourself immensely by carefully positioning your tripod so that the front of the lens is parallel to the subject. When I am having difficulty, I sometimes find it useful to step back and view the setup

from the side.

- Study the whole viewfinder, including the edges, to be sure there are no distracting elements. Be on the lookout for highlights in the background. Try different angles and compositions. Try tilting your camera a bit to add a dynamic line, but be sure the result looks natural.
- If the insect and the background are of different tones, take a spot meter reading from the insect. If your camera does not have a spot meter, take a meter reading from an area having the same tone as the insect. Some insects are very dark and others are very light. Adjust your exposure accordingly. Use a reflector if necessary to open up the shadows. Be sure there is no breeze, then shoot.
- Take a minimum of two or three shots and recheck your focus, particularly if there is any wind movement. There is no guarantee that a stem will return to the same position after it sways in the breeze.

Special Problems

As the insect warms up there are different challenges. Getting close enough to get a good image without scaring them away may be difficult. Not only may they fly away, but they may simply move to the other side of a stem or leaf. Even if you get close, some insects are always on the move. Some butterflies feed while fluttering their wings, or they may move quickly from blossom to blossom. This makes it very difficult to set up a tripod. Other insects, such as the praying mantis, may remain motionless for long periods.

Photographing dew-covered insects is essentially portraiture. As it warms up, you can look for feeding, mating and other typical behavior. These may make interesting photographs. Your photographic technique will depend on the insect and what it is doing. For insects that remain in one place, or for insects such as dragonflies that may return to the same spot after flying off, you may have time to set up a tripod. Whenever possible, try to use a tripod.

If you try to handhold your camera with natural light remember the tradeoff. The faster your shutter speed the larger your aperture and the less your depth of field. I only attempt hand holding in natural light when I can accept a small image of the insect, i.e., 1/4 to 1/3 life size. I always try to lean against something or brace the camera in some fashion when shooting without a tripod.

When hand holding the camera you may wish to try flash. If you are very close to the subject, your lens could block the light from an on-camera flash. Use a flash bracket to move the flash off the camera (brackets designed for macro photography are available from Kirk Enterprises and Really Right Stuff). Be sure to aim the flash carefully. I have found that the best approach is to determine the desired magnification, preset the lens

and flash for that distance, and move in slowly until the insect is in focus.

When using flash you often get a black background. This happens because the light from the flash falls off quickly as distance increases. Very little light may reach the background. The resulting photo can give the impression of being taken at night. This would not be appropriate for a butterfly feeding at a flower. Many insects have black areas on their bodies, most commonly their antennae, their legs, and often the edges of their wings. These features will be lost against a black background. If you compose carefully, you may be able to find a perspective in which the insect is set off completely against leaves. Larry West offers two other solutions. You can have a friend hold a slave flash unit behind the insect and aimed at the subject. This will provide rim lighting to set off the body of the insect. As an alternative, you can set up a green or other natural colored card behind the insect and aim a slave flash unit at it to provide a background. Be sure the card is out of focus.

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Equipment Sources

Kirk Enterprises, Inc. 107 Lange Lane, Angola, IN 46703. Phone: 1-800-626-5074.

Really Right Stuff, P.O. Box 6531, Los Osos, CA 93412. Phone:805-528-6321.