Photographer's FOCUS

Serious Photo Equipment For Serious Mushroom Photographers

Part 2

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In Part One of this article, we took an in-depth look at cameras, lenses, and close-up accessories. In Part Two, we will look at camera support, lighting, and controlling the camera functions remotely.

Tripod

A tripod is, perhaps, the only "low tech" accessory that will be a part of this discussion. In order to have a useful discussion about tripods, it is essential to step back and identify the goal of any serious nature photographer: *to create high quality images.* In order for an image to be "high quality," it must (1) be correctly exposed; (2) be properly composed; and (3) have detail and sharpness. As will be shown in this part of the article, the use of a tripod will facilitate the attainment of objectives (1) and (2), and absolutely insure the attainment of objective (3).

Here's how that happens. Once you've maneuvered the camera and lens to the place where you see the desired composition in the viewfinder, the tripod locks in that composition so that you can now devote your attention to the other two tasks: addressing lighting and exposure issues, and bringing sharpness and detail to your composition. Your hands are free to take exposure readings, make exposure settings, set up artificial lighting, focus the lens and fine tune the composition. Because the camera is now firmly supported, you are no longer limited to using shutter speeds that must be fast enough to be hand-held. With the camera rigidly locked in place, you can now shoot in ambient low light with very small apertures (to maximize depth-of-field) and then use extremely slow shutter speeds to maintain proper exposure as well as insure that there will be no camera movement during exposures.

Another significant reason to use a tripod is to utilize the technique of "Focus Stacking" to maximize depth-of-field in the image. Depth-of-field is the plane within an image where details are sharp and in-focus. The laws of physics limit the amount of depth-of-field that one can obtain with any given lens. When shooting relatively small objects up close, depth-of-field becomes quite shallow. As magnification increases, depth-of-field decreases. For example, when shooting a close-up of a mushroom that's only 1 1/2 inches tall, you may find the depth-of-field to be less than 1/4 inch, even with a very small aperture setting. That amount of depth-of-field may not be sufficient to get both the front edge of the cap and the stalk in focus. The technique of Focus Stacking allows one to side-step the laws of physics and obtain an amount of sharpness and depth-of-field in an image that could range from a few inches in front of the subject to several inches behind it. Using this technique, one takes multiple images of the same subject at different focus points and then combines those images in the "Focus Stacking" software. In order to use this technique, however, it is essential that the camera's position remain constant during these multiple exposures. That cannot be accomplished without a tripod. Figures 1 and 2 show the difference in sharpness and

Figure 1.

Figure 2.


Figure 3.


Figure 4.


Figure 5.

detail using a tripod, with and without Focus Stacking. The difference is remarkable. Figure 1 is a single exposure, shot at f/22; Fig. 2 is composed of 13 exposures, each shot at f/22. In the single exposure, the depth-of-field is so narrow that it was not possible to get the entire cap in sharp focus. In the image that utilized Focus Stacking, the cap and stalk, as well as some foreground and background objects are detailed and in sharp focus.

The tripod is made up of two components: the legs and the head.

The legs of the tripod that one uses for mushroom photography must be able to get the camera and lens very close to the ground. That means that the tripod legs must have the capacity to swing out 90 degrees so that they are sitting flat on the ground (Fig. 3).

The tripod head is the most important component of the tripod. One can chose between two basic types of heads: a three-way pan head (Fig. 4) or a ball head (Fig. 5). The three-way pan head has three separate adjustments. One permits the camera to rotate in a side-to-side motion; another permits the head to tilt fore and aft, (pointing up or down), and a third allows the camera body to be set in either a horizontal or vertical position. Each adjustment on this type of head has a separate mechanism to lock in that adjustment. The "ball head," on the other hand, has a ball-in-socket configuration that permits the camera to be rotated and pointed in any direction and then locked in place with a single knob. There is also a knob that locks in the rotation function of the ball head. Ball heads are much faster and easier to use, and of course, a quality ball head is not inexpensive. As will be shown below,


Figure 6.


Figure 7.

the creative use of a ball head, along with a lens that has a rotating lens collar, will permit one to position the camera very close to the ground.

When shooting terrestrial subjects from a tripod, getting the camera close to the ground is essential. Here's why: as the camera moves closer to the subject while tripod mounted, one will need to point the camera downward to keep the subject in the viewfinder. Depending upon how high the camera sits on the tripod and the closeness of the subject to the camera, one could ultimately find himself pointing down onto the top of the mushroom in order to fill the viewfinder frame with the subject. It is axiomatic, therefore, that the closer one gets to a terrestrial subject, the lower one must be to the ground. On every ball head, there are one or more notches in the ball head socket that will permit the ball head flop over 90 degrees so it is perpendicular to the ball head socket. When that is done, the camera attached to that ball head will then be in the vertical position (shooting in portrait mode). But not only that, the camera will now be much lower to the ground. With my ball head and tripod, that works out to about a six inch reduction in height and puts the bottom of the camera between two and three inches off the ground. If a vertical (portrait) format is going to work for the intended image, you're in good shape. If, however, one wants to shoot this image with the camera in a horizontal (landscape) format, there's a problem unless one has a rotating lens collar on that lens. If that feature is present, one need only loosen the lock knob and rotate the camera and lens to the landscape position. It is this maneuver that makes the rotating lens collar so invaluable for shooting subjects close to the ground (Figs. 6 and 7).

Artificial Lighting

Natural or ambient light can result in some excellent mushroom images, but often, that's not the case. There is a reason for that, and it has to do with the quality, direction and color of the light reaching the subject, as well as the physical characteristics of the particular subject one is photographing.

Let's first take a look at the issues involving the light, itself. As mentioned previously, most often mushrooms are found growing in a forest environment. That means that the light hitting the subject is not direct sunlight, which is a good thing. Subjects lit by direct sun have far too much contrast due to the harshness of that light and will not yield pleasing results. Overcast light, on the other hand, is optimum lighting for mushrooms, but when you're photographing in the forest, the light is shaded by the trees. Shaded light has a bluish tint, which results in a somewhat cyanotic look for the subject. That light needs to be modified in order to bring out the true colors of the subject. This can be done with "warming filters" or by using artificial light.

However, there are a couple of other problems with forest light when it comes to photographing mushrooms. One of those problems is the direction of that light. It's coming from overhead. If you were shooting a subject in an open field on an overcast day, that soft, bright, overcast

Figure 8.

Figure 9.

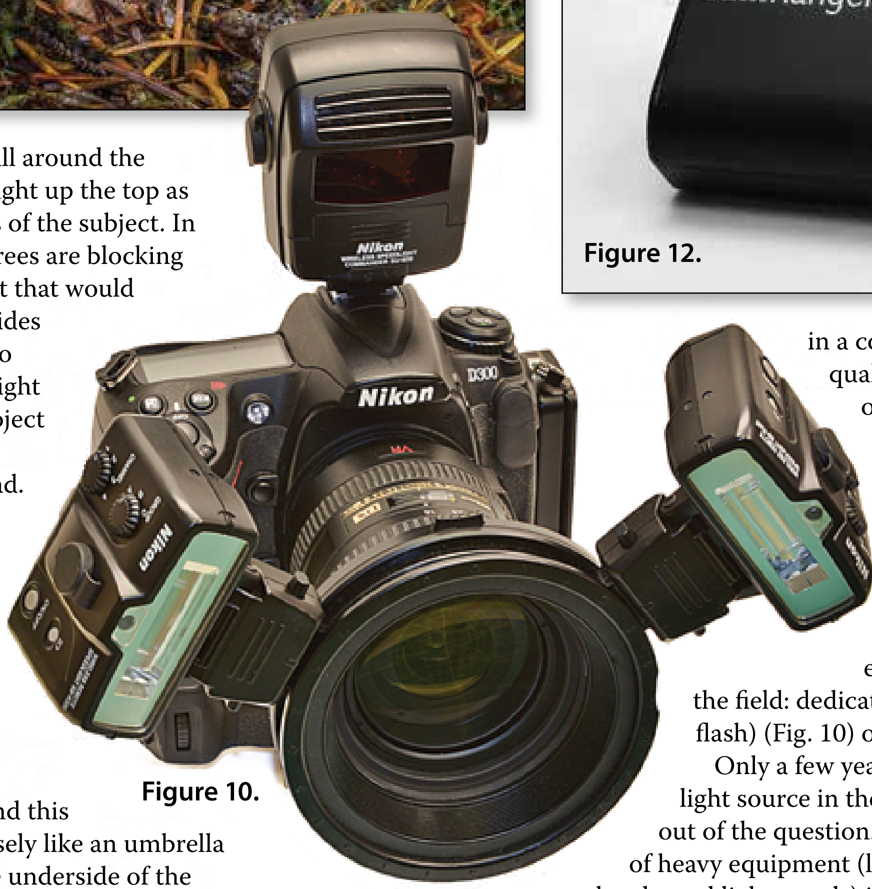

Figure 10.

Figure 11.

Figure 12.

light would be all around the subject. It will light up the top as well as the sides of the subject. In the forest, the trees are blocking most of the light that would illuminate the sides of the subject, so most all of the light that hits the subject is coming from directly overhead. This is where the physical qualities of the mushroom come into play. The most common "mushroom form" is that of an umbrella. And this form acts precisely like an umbrella by shielding the underside of the mushroom and the stalk from the light. If one's exposure setting is based upon the light striking the top of the mushroom, the stalk and the gills will be shrouded in darkness, resulting in a technically unacceptable exposure. Artificial light solves these problems in a couple of ways. It enhances the quality and color of the light to bring out the natural colors of the subject and it fills that shadowed area under the cap with sufficient illumination to bring out all the otherwise underexposed details (Figs. 8 and 9).

As far as artificial lights go, there are a couple of options to explore for shooting subjects in the field: dedicated macro speedlights (electronic flash) (Fig. 10) or constant light sources (Fig. 11).

Only a few years ago, the idea of using a constant light source in the field to shoot mushrooms was out of the question. One would need to carry a *ton* of heavy equipment (large heavy batteries, flash heads, chords, and light stands) into the field, making this venture totally impractical. However, with the development of LED lighting and the evolution of small, compact photo lighting equipment, that has all changed. Small portable LED photo lighting equipment has not only become available for the field

Figure 13.

photographer, but is less expensive than a similarly sized full-featured macro flash set up.

An advantage of using electronic flash is that one can obtain fairly small units that give consistently accurate lighting. Also, with a dedicated macro lighting unit, all the components attach to the camera or the lens, which facilitates the set-up and transportation of equipment in the field. The downside to using electronic flash is that one cannot see the effect of this lighting source until after the exposure is made. Also, one will need a Flash Meter in order to properly balance the artificial light with the ambient light.

With a constant light source, one can view the effect that the artificial light will have on the subject on the camera's viewfinder screen and arrange and adjust the lights as needed to achieve the desired effect before making the exposure. For a dedicated macro flash system, one can expect to pay between $230 and $1,000, depending upon whether the system is from a third party manufacturer or produced by one of the main camera manufacturers for their specific cameras. Depending upon the size, light output and other features, one can purchase a mini LED photo light for as little as $35. But for a full-featured unit with adjustable power setting, adjustable color settings and sufficient light output, expect to pay about twice that price. The units I purchased cost $79 apiece, but each unit came with its own detachable, collapsible mini light stand that permits the placement of the lights very close to the ground.

In a future article, I will go into detail on using both

Figure 14.


Figure 16.

lighting systems in the field, highlighting the pros and cons for each system.

Remote Camera Control

If there is one accessory that I would categorize as a "game changer" for photographing mushrooms, it's the CamRanger. This product came out in 2012 and became a mainstay in the world of photography. While it has applications for many types of photography, it has been a godsend for shooting mushrooms.

Basically, the CamRanger consists of a WiFi unit that attaches to your camera (Fig. 12). It also comes with an extremely versatile software program that allows one to use a smartphone, tablet, or computer to, not only act as a large remote viewfinder for your DSLR or Mirrorless Camera, but also permits one to remotely control all of the camera functions. One can set the aperture, shutter speed, white balance, ISO, release the shutter, and focus the lens without ever touching the camera (Fig. 13). One can also focus the lens by tapping the screen of the smart phone or tablet in the area where you want the camera to focus. If you want to refine the focusing of your subject, just double tap the screen and CamRanger zooms in on the image. I use an iPad with my CamRanger, which allows me to view my subjects on a bright, 9-inch screen, as opposed to the 3-inch LCD screen on the back of my camera. With CamRanger, I simply set my iPad on the ground and adjust the camera position by watching the image on the iPad (Fig. 14). I can then set all the camera functions while standing or kneeling next to the camera.

Figure 15 is an example of a shot that could never have been set up without the CamRanger. The lens used was a 14 mm ultra wide-angle lens. The camera was resting on the ground in a vertical position, approximately 3 inches from the subject (Fig. 16). Without CamRanger, it would have been impossible to set up this composition because the viewfinder was completely inaccessible.

CamRanger software also has a feature that permits automated "Focus Stacking." Part 1 of this article contained a dramatic example of the extreme depth-of-field that can be attained with Focus Stacking software. For anyone who engages in any form of macro photography, Focus Stacking software is an absolute necessity. While CamRanger does not provide Focus Stacking software with its product, it allows one to conveniently take the multiple images that are required for processing with that software. To utilize the Focus Stacking feature, one merely enters the lens focal length and aperture setting, along with the closest and farthest focusing points, and then hit the start button. CamRanger does the rest. It fires the shutter, adjusts the focus between exposures and calculates the number of exposures needed to obtain the desired effect.

CamRanger hardware can be purchased directly from CamRanger or from most online photo stores. The retail price is $349. With respect to Focus Stacking software, there are a number products on the market. The two most popular are Helicon Focus and Zerene Stacker. Helicon Focus sells for between $30 to $65 for a one year license or between $115 and $240 for a lifetime license. Price depends upon which version of the product you purchase. Zerene Stacker sells lifetime licenses ranging from $39 to $289, depending upon which edition of the product is purchased.

Figure 15.