Lichen Photography with a Smartphone

The latest iPhone and Android smartphones have excellent, easy to use cameras that are well-suited to photographing lichens in the field as well as indoors through a microscope. I am most familiar with iPhones (my current model is an iPhone 11 Pro), but the tips and techniques in this article are equally applicable to high-end Android smartphones, such as the Samsung Galaxy and Google Pixel models.

Before your lichen foray, make sure your smartphone battery is fully charged, and check that you have enough memory available for new images. Use a microfiber cloth to remove dust or fingerprints from the camera lens cover. In my vehicle I carry an iFrogz Golite 7800 portable charger, capable of recharging my iPhone several times if I run out of battery power.

I recommend that you set the flash on your smartphone to “Off”, and always use natural lighting for your lichen photography. Many lichens have a body (called a thallus) that is very light in color and reflective, and a flash will overexpose the image highlights and wipe out much of the fine detail in the surface of the thallus, which can be an important aid to lichen identification. If your smartphone has an HDR (high dynamic range) setting, turn this feature to “On”. This will cause the iPhone’s camera to take multiple photos of the lichen at different exposure settings, and blend the exposures together to retain more detail in the highlight areas of the lichen thallus.

Shield lichens on hemlocks, Marquette, Michigan
iPhone XS, 52mm (2X) lens, ISO 64, 1/120th sec, f/2.4, handheld

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When you have found a lichen specimen that you wish to photograph, begin by taking one or two photographs of the substrate (tree bark, rock, soil) that the lichen is growing on, using the wide-angle lens on your smartphone. Make a note of the type of tree or rock, which can help in lichen identification. The latest iPhones have a superb panoramic photography feature, and you may want to shoot a panorama of the lichen habitat using the PANO setting on your iPhone.

Optimal lighting for lichen photography is diffuse light from a cloudy or partly cloudy sky. The *worst* lighting is bright sunlight, which creates inky black shadows and overexposed, washed-out highlights in the image. I also avoid searching for lichens in wooded areas on bright sunny days because it's much harder to locate and photograph lichens in this type of high contrast lighting. If you need to photograph a sunlit lichen, shade the lichen with your body to create softer lighting.

Smartphones have a built-in autofocus and auto exposure facility, but I prefer to set the focus and exposure manually by tapping and holding the subject (e.g. the lichen) on the screen that is most important in the photograph. This will bring up "AE/AF" in yellow on the screen, plus a yellow box surrounding the subject. You can then adjust the exposure (i.e. lighten or darken the image) by using your finger to scroll the yellow line with a sun icon next to the yellow box. My iPhone 11 Pro has a tendency to overexpose some lichen photos by default, and I usually take one or two extra darker exposures to compensate.

Common greenshield, hammered shield lichens, Lake County, Ohio
iPhone 7+, 63mm (2X) lens, ISO 20, 1/680th sec, f/1.8, handheld

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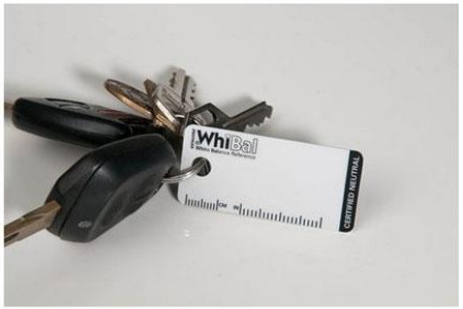
Today's smartphones will focus to within 3-4 inches of a subject, so you can take a close-up photo of a lichen thallus with plenty of detail for most identification purposes. Some smartphone cameras, including the iPhone 11 Pro, have a dual or triple lens that features a 2X telephoto which serves as a 2X macro lens for close-ups. Position the smartphone so that the lens is at a 90-degree angle to the main surface of the lichen thallus, to maximize depth-of-field. Hold the smartphone firmly with both hands, and if possible lean against a tree or rock to minimize any movement of the phone during the exposure.

Most smartphones produce very accurate color in photos taken in natural light. If you want your lichen photos to have 100% accurate color, carry a Whibal G7 calibrated gray card (get the small keychain model or the 2x3-inch model). Take a photograph with the gray card placed next to the lichen, then another without the gray card.



Elegant sunburst lichen, Bruce Peninsula, Ontario
iPhone 7+, 63mm (2X) lens, ISO 20, 1/530th sec, f/1.8, handheld

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Back at home on your PC/Mac, use Adobe Lightroom or Photoshop to correct the color of the photo with the gray card, and apply the same adjustment to the image without the gray card. Voilà – perfect color!

In addition to photographing lichens in the field, you can use your smartphone to take close-up photos of lichens through the eyepiece of a dissecting or compound microscope. You will need an adapter to attach the smartphone to the microscope eyepiece. After researching various phone adapters via the Internet, I purchased a Novagrade Microscope Adapter (about $140 online), which can be used with smartphones or mini-tablets up to 4-3/8 inches in width. I adjusted the adapter to center the iPhone's camera lens in the eyepiece of my Motic dissecting microscope, then applied a small amount of digital zoom to fine-tune the diameter of the circular microscope image to fit the rectangular image of the iPhone 7 Plus. To minimize any vibration of the smartphone, I use the volume control on my iPhone's earbuds to trigger the exposure instead of tapping the shutter release button on the iPhone's screen.

The next time you want to photograph a lichen, remember that the best camera is the one that is always with you – your smartphone! **- Ian Adams**

Apothecia of star rosette lichen, Motic microscope, Novagrade iPhone 7+, 28mm (1X) lens, ISO 40, 1/17th sec, f/1.8, handheld