

Ribbens, Eric, Franck, Alan. 2011. The Wired Herbarium #11: Incorporating digital images. In The Vasculum (newsletter of the Society for Herbarium Curators) 6(2), July 2011.

“A picture is worth 1000 denials.” Ronald Reagan

While much of the digital herbarium world is currently concerned with imaging herbarium specimens, in a recent column I raised a different question: the role of, and how to, attach digital images of plants that are being collected for herbarium specimens.

A little background: I study several species of *Opuntia* in the midwest, especially *Opuntia fragilis*. I have visited, collected, and attempted to document 94 midwest populations of this species, as well as locations in other regions and other *Opuntia* species. By far the best herbarium specimen is an entire plant, with a blooming flower. However, this is frequently impossible or impractical, for several reasons. Many of the populations I study have never been observed to flower. Some of the locations I study are small populations where collecting an entire plant, in my opinion, is not justifiable. On top of these issues, *Opuntia* species are not easy to press, especially an entire plant. Furthermore, in many cases these fascinating plants are polymorphic enough that it is difficult or nearly impossible to determine species identification without studying the entire population. For example, last year I visited several sites in Utah where *O. fragilis* hybridizes with other *Opuntia* species. The hybrids become obvious as hybrids especially when seen in the context of the two parent species.

For all of these reasons, images are important. Photographs can be invaluable for bulky plants, rare or unknown taxa, hybrid populations, or plants that become transmogrified upon processing for the herbarium. They are helpful to see characters that cannot be (or often are not) put on a voucher specimen or for characters that are best understood in a photo (though they may be described on the label).

After my earlier Wired column, Alan Franck contacted me with several comments regarding the use of photos and herbarium specimens. He has found photos to be very useful whilst studying succulents such as *Agave* and the cactus genus *Harrisia*. For example, in the genus *Agave*, photos are helpful in characterizing leaf curvature and shape, number of leaves per plant, plant height and habit, and the shape and height of the inflorescence. Although many of these qualities can be described on the label, a photo accomplishes this task with much more ease and eloquence. Howard S. Gentry often included black-and-white prints with his herbarium specimens of *Agave*. Although color can be an important character for plants, generally black-and-white photographic prints are considered to have better longevity and be much more archival.

Of course, an image will never replace an actual museum specimen, but certainly images can substantially augment and clarify the nature of an herbarium specimen. How should those images be attached to a specimen? How should they be stored? And in particular, how should they be included in digital records? Confession time: I take lots of pictures. I'm working on a description of a recent visit to a site in Minnesota, and I just checked my files. I have 52 photographs from my last visit there, plus another dozen or so photographs from a few years ago. Clearly, it does not make sense to burden an herbarium specimen with 52 images.

I do not have definitive answers or protocols. Certainly, I need to know more about how other curators and digitizers handle this issue. However, it seems to me that:

First of all, databases should record when there is an image or images associated with a specimen. I have a field in my database that indicates if the specimen includes a map of the site, since two of my collectors included maps with each specimen. If there are images, maps, or other graphical information associated with a specimen, I think that should be indicated in the database and on the specimen label, and perhaps images should be linked to the database record.

Second, collectors especially of difficult taxa should if possible include photographs. For taxa for which photos are quite useful, Alan (and many other collectors) attaches to the herbarium specimen a large packet containing black-and-white prints of the plant. This way the photo and the specimen are tied together. In some cases, herbarium specimens have been made solely from a photo but this is not ideal given the limitations of studying a photo. Rarely is the instance where no plant tissue at all can be included with the photo.

Third, in these days of digital images, I believe images derived from digital files should also be digitally stored. Herbarium curation is complicated enough without the need to properly store photographic papers. Digital storage is not really any different than storing pickled flowers or fruits, wood sections, or any other material that cannot be kept with the herbarium specimen. Make sure documentation operates in both directions (i.e. from picture to herbarium specimen as well as herbarium specimen to picture). Digital material should probably be placed in a separate folder for each herbarium specimen. The images should be saved in a format that can be accessed by a variety of programs, and each image should be documented with the location, date, photographer, photograph notes, etc. I usually create a .txt file with the information for the images, and save the .txt file in the same folder as the images.

If in your curation you manage digital images, especially if you follow another protocol, I'd like to hear from you!