



Smithsonian
National Museum of Natural History

Memo

Department of Botany
U.S. National Herbarium

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To Seeds of Success Program Participants
From Andrew P. Clark, Collections Management
Subject Basic Voucher Specimen Preparation Techniques

Below is a short description of some of the issues plant collectors should be aware of when collecting specimens for the Seeds of Success program. The collector should place emphasis on consistency while keeping in mind the details. The plant collector is a vital part of this project and they must view their responsibility to history and science as important. Here at the Smithsonian we have specimens entering their 200th year of existence and they still provide valuable information to researchers because their collector endeavored to create a scientific artifact that was clear, concise, and detailed.

Collection: The standard U.S. herbarium sheet is 11 $\frac{3}{4}$ inches wide by 16 $\frac{1}{2}$ inches long. If your specimen is larger please consider dividing or folding the specimen so it will fit comfortably on a sheet. A specimen that requires more than one sheet is acceptable as long as the label data indicates there are multiple pieces to be mounted on separate sheets. Please be aware though that these separated pieces still belong to a singular collection.

Pressing: For the majority of vascular plants species no special consideration is made when pressing specimens in the field except to attempt to display the specimen in such a way that all taxonomic features of the specimen can be examined easily. There are a few exceptions to be aware of and they include: ferns, large bulky fruits, grasses, seeds, and large leaves.

Ferns: If only a few leaves are collected it is important that one or a few of the leaves are reflexed so that when mounted upon a sheet a researcher will be able to examine both the top and bottom surface of the leaf. This is most important because key taxonomic characteristics (spore producing structures) are typically located on the lower surface and if the leaf is not reflexed before pressing than an attempt should be made to collect multiple leaves so upon mounting all surfaces can be observed.

Large Bulky Fruits (i.e. pine cones): Inevitably these parts of a specimen and the point of attachment are some of the most fragile parts of a herbarium specimen and almost always break away from the specimen either during preparation or during examination. It is encouraged to indicate on the label, presence of bulky fruits and to

contain them in a paper or plastic envelope labeled accordingly, while shipping to 'US'. This is a great way to assure that they do not become separated and lost during processing. This consideration would also apply to cactus specimens which typically become very brittle during the drying process. In this case the entire specimen could be placed in a plastic bag during shipping to both contain any separated pieces and also to protect the processing technician that could unknowingly become injured from the spines of these specimens.

Grasses: Because of the tuft like growing nature of grasses it is sometimes necessary to harvest a large specimen for pressing. In this case it is important to remember the dimensions of a herbarium sheet and prepare accordingly. Once dried it is virtually impossible to arrange the specimen to fit on a sheet and the specimen may have to be cut into pieces to fit on a sheet which can compromise the scientific and physical integrity of the specimen.

Seeds: The primary objective of the Seeds of Success program is to maintain a seed bank for the conservation and development of native plant materials for restoration and rehabilitation of U. S. lands. As such, it is preferable that some seeds stay with the voucher collection. After pressing and drying, a collection may begin to shed seed. If this occurs the seed may become separated from the specimen during shipment and processing. Once separated, unless witnessed directly by the processing technician, this seed will not be placed back with the specimen because it cannot be assumed that this is the specimen to whom the seed belongs. To prevent this, place the loose seed in a paper or plastic envelope labeled with the collection information so that it can be included with the mounted collection.

Large Leaves: Some of the same concerns regarding grass collections apply here. Remember that a U.S. Herbarium sheet has a finite size and plan accordingly when collecting such plants.

Labeling: Labels play a huge role in the significance of a specimen. Without a label or with poor/inaccurate label information a specimen is useless as a scientific or historical artifact. A future researcher should be able to use a specimen label to connect the specimen to the place and time of its collection along with the collector and possible determiner of the plant species.

A typical label is approximately a 4 x 4 inch square (the ideal, but not set in stone) and is printed on acid free paper. The label should, at minimum, contain the determination (family, genus, and species), collection location (as specific as possible), the date of collection, the name of the collector(s), and the collection number. Currently Seeds of Success participants have been including their data sheets with their collections without labels. Although the data sheets are a valuable resource, a traditional specimen label is the convention and would greatly speed up processing of specimens. **You may find specific labeling instructions on the SOS website.**

Shipping: Please keep in mind that it is a long way to NMNH and the U.S. Postal service is not known for delicate handling of parcels. Specimens should be interleaved between newsprint (cheap and widely available) and sandwiched between two pieces of cardboard tied at each end with string and the whole bundle wrapped like a present in newsprint or craft paper (this prevents loose pieces from ending up in the bottom of the box). Also

here at 'US' we are great supporters of recycling but, when reusing boxes try to find ones that will hold the bundle(s) as snugly as possible (less movement = less damage). We have found that this is a cheap, easy, and effective method for shipping specimens over great distances.

Finally, remember to put a notice of transmittal in the packaging that indicates who (institution) is sending the specimens, and the number of specimens in the shipment. The document should also clearly state the intention of the sending institution. If from a Bureau of Land Management office or affiliate the transaction is considered a 'transfer' of material. If the collecting institution is a private entity (botanic garden or university) the transaction is considered a 'gift' to the Smithsonian. We also welcome scanned and emailed communication indicating the same; this is cheaper, faster, and better for the environment. Please remember though that we require a signature from the depositing agent on any documentation received. **You may find a notice of transmittal template on the SOS website.**

You can find a perfect example of herbarium specimen at: <http://botany.si.edu/types/>

Select: Detailed Search

Genus: *Achnatherum*

Species: *wallowaensis*

Click on the image in the right corner to enlarge.

Please feel free to browse the digital images of our type collection so that you may become more familiar with the various techniques used for mounting botanical specimens. If you have any questions about specimen preparation or if you would like to know the statues of your vouchers please do not hesitate to contact me. I would be more than happy to help.

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