

## GUIDELINES FOR COLLECTING AND PRESERVING PLANT SPECIMENS

(adapted by C. Morse 2000 from BIOL 603 text by M. Lane 1994)

**Introduction.** A herbarium specimen is an actual record that a particular species of plant grows in a certain locality under the habitat conditions stated on the label attached to the specimen. Herbarium specimens are extremely useful to botanists and other scientists studying the vegetation of a region or the biology of a plant species. The specimen represents a record of the distribution and the life history of the species. If the collection data are complete and accurate, a biologist can not only compile a floristic list from the herbarium specimens of a region, he or she can also glean information about the habitat conditions under which a species is found, how common it is, whether there is variability in the morphology of a species in different sites, when it comes into flower and/or fruit, and a variety of other data about the species. Because a herbarium specimen thus represents a piece of data, it is important that the specimen be well displayed and the label be as complete, accurate, and informative as possible.

**Field procedures.** When you collect a specimen, look for a plant that is representative of those in the population. If you are collecting an herb or a grass or other non-woody vascular plant, you should attempt to collect both the above-ground plant parts and the roots. Often the underground structures are very important in identifying the species. When possible, choose a specimen that has both flowers and fruits on it. If this is not possible, but the species is both in flower and in fruit in the population, you should make two collections. Gently dig up the specimen and shake off the excess soil. Collect enough individuals of the species to generously fill a herbarium sheet (11.5 x 16.5 inches). Specimens made from woody plants should be clipped from the shrub, tree, or liana. Try to collect branches that show both flowering and fruiting material.

You may carry the plants in the field by placing them in a plastic bag, preferably not of black plastic (because it may get very warm), into which you have placed a wet paper towel or wet piece of newspaper. Place the plants into the bag, with the roots down, so that specimens will not become too muddy or mixed together. Avoid leaving the collecting bag in the sun, because the specimens may become baked or steamed, and thus ruined. If you are making a series of collections in slightly different habitats, you can group specimens from a single collecting site together by wrapping them in several sheets of newspaper, forming a "trumpet" around the specimens. If you pour a little water into the trumpet and turn it slowly as it soaks through the newspaper, you will create a humid environment which will help keep your specimens in good condition. They can be coded as to collection site, and then placed in the plastic bag.

As emphasized above, the data describing the collection are of paramount importance. If the collection data are scanty or incorrect, the specimen becomes worthless for any scientific purposes. Make careful and complete notes to describe the plant populations you collect and the habitats in which they are found. The minimal data for a collection are: the *date* of the collection, the *collecting locality* (county, city, road numbers, legal description, or other directions which are detailed enough so that another person could stand a good chance of relocating your collecting site), a *description of the habitat* (woods, meadow, tallgrass prairie border, barren eroded slope, etc.), the name of the *collector* (you and anyone else who is collecting with you) and a *collection number*. Each specimen you collect will thus have its own unique designation, and will be coded in your collecting book, so that others can correct any errors which might creep into the label as it is being prepared.

In addition to the above data, it is very helpful to make notes on other aspects of the biology of the species. For example: How big was the population from which this collection was made? How abundant was the species? What color are the flowers? (Dried flowers tend to lose their color when they are pressed.) Were the flowers fragrant? Were the vegetative portions of the plant fragrant? Was the plant being visited by pollinators? Did you notice any obvious variability in the species at this site, such as in flower color? Some other kinds of data, such as plant habit, are of particular importance in identifying species of certain families. As you become familiar with different families, you will learn what characters deserve special attention, but it is always best to note any characters you think may be of use to other biologists that will not be preserved with the specimen. You might choose to make only the minimum of notes while you are in the field; however, be sure to annotate your collection book as soon as you return, so you do not forget or misremember descriptions.

**Drying the specimens.** Plants are dried by arranging them inside pieces of newspaper in a standard plant press. The plant press consists of an outer wooden frame, within which are pieces of corrugated cardboard that permit air to circulate through the center of the press. Specimens are usually dried by placing them over a low heat source for a number of hours until the moisture is gone. An external heat source is not always necessary, however, especially when one is drying only a few collections at a time, and the climate is not too humid. When drying specimens in this way, leave the press in an open place where air can circulate. It helps to shift the specimens within their paper each day (or remove them entirely) until the specimens are *completely* dry.

Press the individuals which represent a single collection on one-half of a single sheet of newspaper. When folded in half, such a single newspaper sheet is the approximate size of a herbarium sheet. In arranging a specimen, remember that the way it is bent in drying is the way it will remain permanently. Large plants may be bent into a "V" or "N" shape to fit them into the folder. Press open the flowers (or some of them) to show the inside parts. Arrange the leaves, when possible, so they do not overlap. Some leaves should be turned over to show the back sides. If the root or bulb is very thick, it may be pared in half; include both pieces in the specimen. Similarly, twigs or leaves that make the specimen too bushy can be carefully removed and pressed separately. If the plant has a woody stem, trim the end in an oblique angle to show the color of the pith. All parts of the specimen should be included within the newspaper. Flower parts extending beyond the dimensions of the press will become brittle and broken, and the specimen will not fit on a standard herbarium sheet.

When the specimen has been arranged hold it in that arrangement with one hand and close the paper. The newspaper folders will be sandwiched in the press such that there is a corrugate on either side of them, separating adjacent specimens. You should build your stack of specimens on top of one of the wooden frames, layering first a corrugate, then the newspaper folder, another corrugate, newspaper, etc... Each plant should be coded *on its newspaper folder* with its collection number and the date of the collection, so you can cross-reference it to your collection book as you prepare the permanent label. When you have finished with all your specimens, end with a corrugate, place the second wooden frame on top, and draw the straps tightly around the press. As the plants dry, the straps can be tightened to apply continuous pressure to the specimens.

**Labeling, mounting and filing.** When the specimen is dried and ready to be stored, a permanent label is placed with it. A sample label is shown below. You may vary this format for your own collections as you see fit.

## PLANTS OF KANSAS, USA

### CYPERACEAE

#### ***Carex brevior* (Dewey) Mack. ex Lunell**

Kansas, Johnson Co: 2 mi W Clearview City. S side junction of KS Hwy 10 and Evening Star Road (near entrance ramp to KS Hwy 10 East). T13S R21E Section 01 SW¼ of SW¼.  
38°56'35"N 95°02'17"W (determined from topographical map).  
Elevation 300 m.

Broad, weedy drainage ditch along S side of road. *Bromus inermis*, *Phleum pratense*, *Carex*, *Eleocharis* and *Scirpus* common.

Abundant. Plants caespitose.

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19 May 2000

**The Ronald L. McGregor Herbarium (KANU)  
University of Kansas, Lawrence KS USA**

Specimens are mounted (glued, taped, pinned, or sewn, depending on the herbarium) to a heavy sheet of rag paper, and the label is attached to the lower right hand corner. After being mounted, the specimens are filed in herbarium cases in folders, usually sorted by plant family, genus, and broad collecting area (such as North America, or Kansas). When mounted and filed in this fashion, the specimens are accessible to other scientists who may wish to study them for systematic, floristic, ecological or other purposes.