# Botany 101: Collecting and Preserving Plants

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Collecting: The following is a guide to the various items of equipment and techniques required to make and preserve plant collections.

## Collecting equipment:

- Durable pocket-sized field notebook (field log). Use a pencil or indelible pen.
- Small trowel, shovel, or sharp knife for digging roots.
- Bottle of water or access to water source.
- Clippers or pruning shears for cutting branches.
- Plastic bags to hold the plants until they are ready to press (wet newspaper helps keep plants "fresh").
- Plant Press.
- Camera for recording appearance of the live plant and habitat (optional).
- Global positioning system (GPS) (optional).

## Field log:

A specimen is only useful if notes that include a unique identifying number accompany it. The best system of collection numbers to use is consecutive numbers. We all have to start at "1." Each number should refer to one collection, and should never be repeated. Therefore, the collector's name + their collection number designate a unique specimen. All duplicates (parts of the same plant) should bear the same number.

**The collection number is recorded in the field notebook** at the time of collection together with information about that collection. As much as possible of the following data should be included for each collection:

- Precise locality – country, state, county, town, miles and direction from a town or street intersection, and latitude and longitude (GPS)
- Altitude
- Habitat – type of soil, topography, slope, exposure
- Associated species and vegetation type
- The plant proper – record features which will not be evident from the pressed specimen (e.g., whether it is a tree/shrub/herb, height, notes on root system, etc.), as well as those features which may be lost on drying (e.g., flower color and odor)
- Date of collection
- If photographs are taken, note in one's log the image numbers for a specimen.

**When pressing each specimen, record your name and collection number on the margin of the newspaper.**

**Building your own plant press:**

Plants properly pressed, dried, labeled, and mounted can be stored indefinitely as a record of the flora. The equipment is simple and can be improvised. You will need a plant press and newspaper to hold the specimens. Plant presses can be purchased* or improvised.

You will need:

- 2 pieces of board of equal size at least as large as a folded newspaper: 12" x 16" (boards with holes (peg board) for ventilation or lattice frames are ideal)
- Pieces of corrugated cardboard as ventilators (the same size)
- Absorbent paper (folded newspaper, paper towels, or blotter paper)
- Newspaper
- Rope, belts, or webbing straps to hold press together OR a couple of heavy books to weigh down the stack of pressed specimens.
- Foam ~12 x 16 (Optional)
- * Information on purchasing presses on separate sheet.

When pressing, alternate layers thusly: cardboard, absorbent paper, folded newspaper with the plant pressed inside, absorbent paper, cardboard…etc. Place the stack between the two boards. Tie the press tightly and evenly with ropes or straps. Place in a warm, dry location or in the sun for several days. Specimens that are not particularly fleshy usually dry within 5-7 days. You may need to replace the absorbent paper every few days for fleshier plants. Once all the water is removed, the plant will last indefinitely.

**What to collect:**

**First, be sure you are in an area where you can legally collect plants.**

Be conservative and collect only what you need. Do not collect rare plants; i.e. do not collect if you have only seen one or two examples of that plant in the area. Select vigorous, typical specimens. Avoid insect-damaged plants. **Make sure the plant has flowers and/or fruits.** It may be a good idea to collect extra flowers and fruit for identification purposes. Sterile plants are very difficult to identify.

Roots, bulbs, and other underground parts of herbaceous (non-woody) plants should be carefully dug up, and the soil removed with care. It may help to soak the ground around a plant with water to help loosen up very dry soil in order to collect roots systems. When collecting shrubs and trees, clip one or two small branches. Collect sufficient material to fill an herbarium sheet (11" x 15") and still leave enough room for the label. Plants too large for a single sheet may be divided and pressed as a series of sheets.

Note: If you are not able to press specimens during collection, place specimen in labeled (See field log below for information on collection number) plastic bag and add a sprinkle of water OR place wet newspaper in your plastic bag prior to collecting.

**Pressing:**

When pressing the plant, consider what you want the dried specimens to look like. All the "valuable information" has to be visible from a single side, since the other side will be glued to paper. Make sure both sides of the leaves are visible, and turn flowers/fruits in various directions so the fronts, sides, and backs of them are visible.

Long, slender plants can be folded in a zigzag fashion to fit inside the newspaper sheet. Bulky parts and fleshy fruits can often be halved or sliced before pressing. Odd fragments (bark or large hard fruits) should be kept in numbered or labeled envelopes or packets with the main specimen. Very long specimens can be cut in multiple sections for a multi-page plant specimen.

Very bulky specimens can be "spaced" from the next specimen up with foam or rolled/ folded newspaper. This extra support can prevent uneven pressing of plants in the press.

**Identification of plant material**:

Attempts to identify unknown plant material should be made. Identification can be accomplished though the use of floras (i.e. dichotomous keys), published plant descriptions or monographs, illustrations and photographs; and comparison with correctly identified herbarium specimens. A microscope &/or magnification loupe can be extremely helpful in determining diagnostic features when using floras to complete identification.

**Label:**

Plant labels are created with the information from the field log. They should be printed on acid-free paper. Below is a typical format for a specimen label from BRIT.

BOTANICAL RESEARCH INSTITUTE OF TEXAS
Plants of Texas

Name of plant: *Genus species* Authority
Family:
Country:
State:
Locality:

(other information from field log goes here)

Collector: Number: Date:

**Mounting:**

Mounting supplies*:
Acid free rag based paper (11-1/2 x 16-1/2 inches is standard size).
Glue (neutral pH)
Gummed tape (linen tape) or needle and thread
Fragment packets (purchased or made)
Paper towel squares
Wax paper (11-1/2 x 16-1/2 inches is standard size).
Foam (1/4 to ½ inch craft style) (optional)
Cardboards (11-1/2 x 16-1/2 inches is standard size).
Specimens—pressed and thoroughly dried.

* Information on purchasing supplies on separate sheet.

Use acid-free paper of good quality (100% cotton rag is used in the herbarium). Elmer's glue is not of professional quality, but works well nonetheless. The label is always glued down first, in the lower right-hand corner. Determine which side of the dried plant demonstrates the best characteristics, and position it on the paper before applying glue. Then, turn it over and outline the edges of all parts with a thin stream of glue. Turn the plant back over and carefully place it on the paper (this method works for most plants), blotting up excess glue as you gently press it to the paper. Any pieces of plant that become detached should be placed in a paper envelope (fragment packet) that is glued to the sheet. If extra security is desired for certain areas of the plant specimen, linen tape or needle and thread can be used to secure those parts to the page. After attaching the label and plant, place a sheet of wax paper over the entire specimen, (followed by foam, if used, and cardboard). Weights or heavy books should be placed on top of the specimen(s) until the glue dries.

**Storage:**

Herbarium specimens will last for hundreds of years if properly cared for. The best conditions for storage include low temperature (from 50-65 ºF), low humidity, low light, and infrequent handling. Use two hands when picking up and holding specimens to reduce damage. Roaches and certain beetles will destroy plant specimens. You can kill insects in dried plant specimens by freezing them for three or four days, and keep them pest-free in a tightly-sealed plastic bag.

**References:**

Forman, L. & D. Bridson. 1989. The Herbarium Handbook. Royal Bot. Gard., Kew.


*Supplies:

Herbarium Supply Company: (field equipment, pressing and mounting supplies)
www.herbariumsupply.com

Ben Meadows Company: (notebooks, pens, press, other field equipment)
www.benmeadows.com

Forestry Supply: (notebooks, pens, press, other field equipment)
www.forestry-suppliers.com/index1.asp

Acorn naturalists: (press)
www.acornnaturalists.com/store/category.asp?SID=2&Category_ID=329

Notes