Herbarium Worker's Guide & Manual

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BAILEY HERBARIUM
College of Saint Benedict and Saint John's University

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Accessioning Specimens in the Permanent Collection

All specimens that are entered in the permanent collection are given an unique Accession Number. The numbers proceed in sequence. We currently have approximately 32,000 specimens accessioned into our permanent collections.

To accession a specimen:

- Obtain the number stamp, herbarium stamp, accession record book and stamp pad
- The accession number is placed inside the official herbarium stamp on the upper right-hand corner of the specimen.
- If the specimen comes from another herbarium and already has their stamp/accession number, put ours on the specimen, too. If the upper right-hand corner has plant material or is otherwise occupied, put the accession stamp as close as possible to the upper right hand corner that still looks attractive.
- Practice with all stamps before using them on a specimen
- Check the accession record book for the last number stamped. This should match the number on the stamp. If the number on the stamp and the number in the book don't match see below.
- Change the number on the stamp to the next number in sequence. Stamp it in the space on the accession stamp (practice first).
- When finished for the day, stamp the last number used in the accession record book and record the date.

When the Stamp and Accession Record Records Don't Match

Use your best judgement to determine which number is correct. Did you forget to stamp the book last time? Did someone tamper with the stamp and change the number? Do you remember what the last specimen filed was and can you check it?

Once you have made a decision as to the number, make a note in the Accession Record Book justifying your decision.

Color Code to Genus Folders

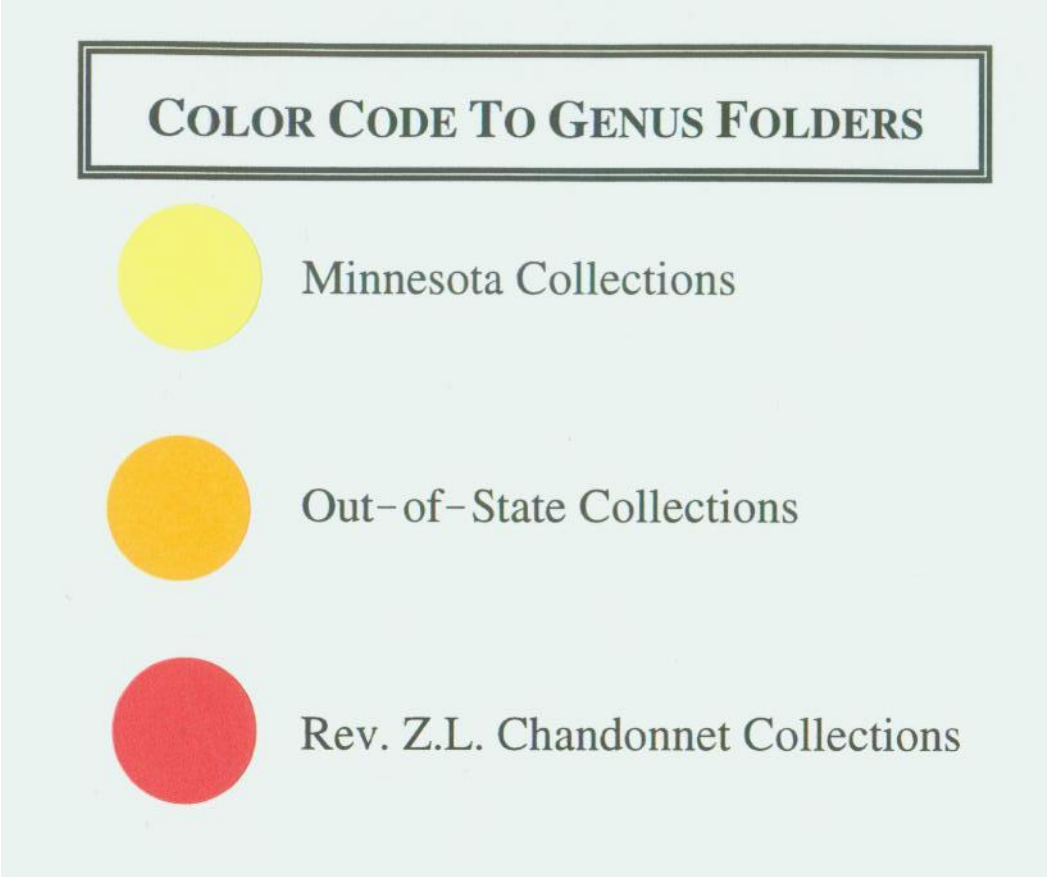
- Each genus folder is numbered with the family number inside a colored dot.
- The color-code represents the source of the specimen:

  YELLOW – specimens from Minnesota

  ORANGE – specimens from out-of-state

  RED – specimens in the Z.L. Chandonnet Collection

- Within a genus, specimens should be filed in the following order: Minnesota specimens (yellow dot), Out-of-State specimens (orange dot); finally Z.L. Chandonnet specimens (red dot).
- A color code sheet, like the one below, is available inside each cabinet as a reminder



Daily tasks

- Water plants (if any), approximately weekly or when soil looks dry.
- Check soap dispenser and fill as necessary
- Check paper towel dispenser. If empty, tape a note on the dispenser alerting the Custodian to refill
- Priority of tasks:

    1. check for new jobs;
    2. unstack mounted plants and put in cubby "to be filed;"
    3. file any books that have been removed from the library;
    4. file laminated specimens;
    5. Then any of the following in no particular order - file specimens in the permanent collection; file specimens in the teaching collection; mount plants; enter plants in the database.

- Clean/tidy the Herbarium when you are finished working for the day. Make sure to leave enough time for cleaning. This includes: dusting tables/benches, cleaning around sink, throwing away obvious garbage, putting items back in their proper place, cleaning up scraps by the paper cutter, organizing journals and books; etc.
- Record your hours in the Log Book

Filing Specimens: Permanent Collection

1. Accession the specimen (see #3)

2. Determine the family to which the specimen belongs. This information is often provided on the label or can be found up in Mabberley's *Plant Book,* Ownbey's & Morley's *Atlas of Plants of Minnesota,* or online *International Plant Names Index* (IPNI – www.ipni.org).

3. Once the family is known, consult the "Alphabetical Listing of Vascular Plant Families" that is posted throughout the herbarium (usually inside each case) to find the family number.

4. Locate the family in the appropriate case. If the specimen is the first in its family, a family divider (and genus folder) needs to be created. Blank dividers and labels are available and the new divider should be created using existing ones as a model. Be sure to include the family number (see listing) on the label.

5. Place the specimen in the appropriate folder in the family.

    - Within a family, plants are sorted alphabetically by genus.

    - Within a genus, specimens are sorted by origin. Plants from Minnesota are filed first in a genus folder with a yellow dot followed by Non-Minnesota Plants (orange dot), and finally specimens in the Z.L. Chandonnet Collection (red dot).

    - Within a genus folder, species are sorted alphabetically (if numerous individuals of a particular species exist, a separate species folder may be created).

    - It may be necessary to create additional genus (or species) folders. Use existing folders as a model.

Filing Specimens: Teaching Collection

- Specimens in the teaching collection are filed alphabetically by family.
- Within a family, specimens are placed in separate folders in the following order: unidentified mounted specimens (Mounted Indets); unidentified unmounted specimens (Unmounted Indets), identified specimens in separate genus (or species) folders (alphabetic).
- Specimens should be placed in a folder whether or not they are identified. They should not be placed in the cubby simply wrapped in newsprint.
- If the identify of the specimen is known, place it in the appropriate genus or species (if known) folder. Mounted specimens should be filed in a separate genus folder from unmounted specimens.
- If the specimen is not identified, place it in one of the "Indet" folders.

Filing Specimens: Laminated Collection

- Laminated specimens get filed in the open-front wooden file cases
- File by family - family names are written on the back of the specimen or on the label. If there is no family divider, create a new one. Use the existing family dividers as a model.
- File in the following order: (1) small specimens; put them all in a folder; (2) machine-laminated specimens; (3) contact paper-covered specimens
- Filing laminated specimens is a top priority

Library

Filing

- Books removed from the library should be refiled as soon as possible.
- Books are filed by the Library of Congress system (i.e., Q/QK/S/SB are the most common call letters)

Add a Book to the Library

- Determine the correct call letters (online search, or contact the campus librarians)
- Create a label for the spine (use supplies from the library)
- Glue/attach/clear tape the label to the spine (use supplies from library)
- Write “Herbarium” on the ends of the pages
- Enter into our database. (need directions)
- File book in proper place

Magazines on Display Shelf

- Keep the shelves organized. Make sure magazines are neat and in their proper place.
- When a new issue comes out, remove the old issue and place it on the shelf beneath the article or magazine that is being displayed.

Label Preparation

In Microsoft Word:

1. Go to Tools; then Envelopes and labels
2. Make sure “Labels” is in the forefront, then click “options”
3. In the scroll barred menu in the bottom left-hand corner of the options window, select the number that corresponds with the labels you are going to print out (i.e. Avery 5161, Avery 5160, etc.)
4. Click “OK”
5. Click “New Document”
6. Ta-Da! Type your text in the sectioned areas; copy and paste text as many times as needed.

Mounting Specimens

Mounting Paper: Specimens are mounted on standard-sized (11.5 x 16.5 inches) archival (acid-free, 100% rag) paper.

Glue: Various types of glue can be used; we use archival quality white glue. Elmer's is a reasonable and inexpensive substitute if we temporarily run out of white glue.

Materials Required: mounting paper, cookie tray, paint brushes (one large, one small), squirt bottle with glue, probes, weights, blocks, cardboard ventilators, squirt bottle with water.

Technique: To mount a specimen, gather the mounting materials. Pour some glue directly on the cookie sheet and then add a little water to thin. Mix the glue and water with a paint brush and spread it around the cookie sheet.

Place a sheet of mounting paper on top of cardboard ventilator. Place the label in the lower right-hand corner. *Before gluing, lay out the specimen on the mounting paper*. Considerations when arranging the specimen:

- Leave a border at the margin of the paper
- Leave room for the label in the lower right-hand corner
- Leave room for a packet above the label
- Avoid placing plant material near the left-hand edge of the specimen because the the specimen can be damaged from the greater pressure here from gripping the genus folder
- Choose the best side of the specimen to display
- Expose hidden flowers/fruits
- Carefully remove excess soil from roots
- Trim the specimen as necessary. Save trimmings in a packet
- Any loose items should be saved and placed in a packet
- Separate plants in clumps
- Keep the specimens aligned in the same direction
- Smaller specimens should be placed at the top of the sheet, larger ones near the bottom
- If the plants are small, mount a few and place the rest in a packet
- Place large specimens diagonally to better fit
- Large specimens may need to be folded into a "V" or "W" to fit on the sheet. Mount with the apex pointing up or the root pointing down.
- Be sure that both sides of the leaves are visible. If necessary, detach a leaf and glue it upside down or place it in a packet
- If there is only a single leaf, cut a small segment and turn it over or place in a packet
- Leave room for the herbarium label in the lower right-hand corner
- the specimen should look as attractive as possible

Gluing the Specimen: Before gluing, arrange the specimen, label and packet on the paper to insure everything will fit and look good. Once the specimen arrangement has been decided, then you can glue the specimen and label. First, glue the specimen, then the packet and finally the label. Notes:

- **Tray Method**: Larger, stiff, less-brittle specimens can be gently placed in the glue in the cookie tray. Push the specimen completely into the glue using the probe. Carefully remove the specimen (the probes can help) and then place it in its pre-determined position on the mounting paper.

- **Direct Glue Application** – smaller, more brittle specimens will likely break when you try to remove them from the glue tray. In these cases, use the squirt bottle to apply glue directly to the underside of the specimen. If the specimen is extremely delicate, it may be necessary to place the specimen on the herbarium paper, then carefully lift up a leaf/stem and put the glue on the sheet with the squirt bottle or paintbrush and then push the specimen into the glue.

- **Check your work** – it is nearly always necessary to spot glue leaves and other parts that didn't get enough glue on them initially. Using the probe, lift leaves, etc. and place glue underneath/on the paper using the brush or squirt bottle. When the specimen is turned upside (which normally should never be done, there won't be loose parts).

- **Weights** – it is almost almost necessary to hold glued parts down using some of the weights. Be careful to not glue the weight to the specimen!

- **Stacking** – glued specimens are stacked apartment-style using the small wooden blocks.

- **Labels** – use full-strength glue, diluted glue will cause the label to wrinkle. Avoid smearing glue on the labels. One trick is to place the label upside down on the old sheet of newsprint. Then apply some glue with the squirt bottle to the label. Spead the glue especially near the margins with a paintbrush. Then carefully pick up the label and place it in the lower right-hand corner, approximately 1/8th inch from each margin. Then fold up the newsprint, place it on top of the label, and rub the label to firmly affix it to the specimen.

- **Loose Parts** – should be placed in a fragment packet. These are glued above the label. Note, that a line of glue is placed in the middle of the packet so it remains attached but can still be removed from the specimen.

Packet Preparation

Commercially-Prepared Packets: follow the appropriate directions

Herbarium Staff-Prepared Packets: if commercially prepared packets are not available, make them according to the following directions:

1. Determine which size packet is required (small, medium or large) and obtain the appropriate template.

2. Obtain an appropriate-sized sheet of paper. Large packets are prepared from a full sheet of paper (8.5 x 11); Medium packets use an 8.5 x 11 sheet of paper cut in half (final size - 5.5 x 8.5); Small packets use an 8.5 x 11 sheet cut in quarters (final size - 4.25 x 5.5).

3. Place the template over the paper. The top (narrowest part) of the template should line up with the top edge (narrow end) of the paper.

4. Fold upward the paper extending below the template.

5. Remove the template and now fold the top section downward over the previous folded section

6. Place the paper over the template and fold the sides backward using the sides of template as a guide.

Pest Control

Always be on the lookout for evidence of insect pests. If you observe evidence such as: (1) specimens that appear to have been eaten; (2) living or dead insects; (3) insect parts; or (4) plant material that appears powdered; tell the Curator immediately.

If pests are discovered, the cabinet must be treated immediately. All specimens will be removed, wrapped in plastic bags, and repeatedly frozen and thawed to kill pests. The cabinet will be disinfected before returning the specimens.

Any specimens brought into the herbarium will be freeze-treated to kill potential pests.

Specimen Preparation: Dried Specimens

1. Prune plant as necessary to obtain an attractive, yet scientifically accurate, specimen;

2. Place between sheet of newspaper in a plant press. Some leaves up and others down, arrange in an attractive way. Large stems bent in a "V" or "W". A card with a slit can help hold plants in a bent shape. Plants shouldn't extend beyond edge of newspaper. Put your collection number on the newspaper. Some specimens are very difficult to fit into the press or cause special problems -- see text (succulents, thick woody structures; large; very small; spiny).

3. Then, place in a plant press. You essentially make a "dagwood sandwich" in the following sequence: frame - cardboard (also called a ventilator; the corrugations should all run in the same direction, perpendicular to the long axis of the press) - blotter (dryer) - specimen in newsprint - blotter - cardboard - blotter - specimen - repeat, *ad infinitum*. Tighten press with strap - stand on it if necessary;

4. Place the press over a source of heat if possible/necessary (light bulbs work well and minimize the fire hazard) with adequate ventilation. Use the drying cabinet in the Botany Lab;

5. After 8-12 hours open the press and rearrange the specimens as necessary. Press again. It may be necessary to change newspaper and/or blotters. It is critical to dry specimens quickly to prevent decomposition, prevent mold growth, and maintain color.

Specimen Preparation: Quick-freeze

To prepare frozen specimens: Place the flowers in a Chinese food take-away container. Fill the container but do not compact or overfill. Write the family and scientific names on the container with a marker and then place in the freezer at low humidity.

Advantages - Works great to preserve color and shape, especially flowers

Disadvantages - Bulky, costly storage, specimens may "melt" (don't last long outside of freezer).

Specimen Preparation: Laminated Specimens

To prepare a laminated (Contac Paper) specimen:

Obtain an appropriate-sized sheet of herbarium paper. Normally, an entire sheet of herbarium mounting paper is used; if not certain, ask. Cut a piece of cardboard slightly larger than the mounting paper. For a full-sized sheet of mounting paper a standard herbarium ventilator (*i.e.,* cardboard) works well. Cut a piece of contact paper approximately six inches wider than the specimen.

Lay the herbarium paper on the cardboard. There should be no more than about 3 cm of cardboard showing around all edges. Be sure the cardboard will fit in the cabinet. Arrange the specimen artfully on the herbarium paper. Remove the backing from the contact paper and carefully place the contact paper over the specimen. Avoid wrinkles and bubbles in the contact paper and moving the specimen. Smooth down the contact paper and fold the overlapping edges beneath the specimen.

To prepare a Machine-Laminated specimen:

These specimens are laminated by machine in the CSB Media Center in HAB. Simply bring the specimen and mounting paper to the Media Center (Sister Denise used to do it) and ask for it to be laminated. They will place the sheet on heavy tag board and then laminate it. This is the preferred method of laminating. It costs approximately $1.00 per sheet.

Studying Herbarium Specimens

Do not remove any material from an herbarium specimen without the permission of the Curator. To study a dry specimen, the sample must be rehydrated and softened. To do this, apply 10% glycerin in water, or boil with a few drops of detergent, or simply add a few drops of warm soapy water.

A long-arm dissecting microscope is available for use.

Visitors to the Herbarium

If there are visitors to the herbarium, please make them welcome. Invite them to examine the displays, relax, study, listen to music or use the computer (if it's not in use). Give them our herbarium literature (*i.e.*, Fact Sheet, Brief History, Guide to the Collections). Request that they sign the *Guest Book*.

If the visitor plans to consult and study the collections, provide an orientation to the herbarium that should include:

- signing the *Guest Book*
- showing the arrangement of the collection, location of family/numerical listings
- unlocking cabinets (if necessary)
- showing the location of reference materials
- providing tools for specimen study (razor blades, probes, microscope slides, petri dishes, dissecting microscope, lens paper and cleaner, hot plate, detergent or glycerin, beaker)
- showing the safety equipment available in the herbarium (first aid kit, fire extinguisher, exits)