

Herbarium Sample Collection Protocol

Materials:

- List of desired taxa
- Shovel-end forceps
- Fine tip forceps
- Log sheet
- Herbarium specific rules
- Cleaning cloth
- Camera
- Large storage bag
- Collection envelopes or bags
- Labels with collector information
- Permanent marker
- Magnifying glass

Note 1: Each herbarium will have its own set of specific rules and guidelines. Be sure to request a copy of these instructions prior to collecting.

Note 2: It is good practice to do research about the herbarium prior to the scheduled visit. Be sure to know the names of any contacts at the herbarium before arriving.

Note 3: Practice good collecting etiquette for the duration of the visit. Use proper manners, dress, and collection protocol. It is also important to wear comfortable, supportive footwear.

Note 4: Out of respect for the herbarium and staff members, headphones should be worn at all times when listening to audio devices.

Note 5: Carefully handle all folders and sheets at the herbarium. This is vital. Be sure to maintain the correct order for folder and sheet stacking. Always keep the folders and sheets horizontal (with plant material facing up), even when searching through a specific family. This horizontal position must be maintained at all times, especially when transporting the material to and from the workspace.

Note 6: Never remove any plant material from a sheet with a single flower.

Note 7: As of 2014, small leaves, stems, bark, and other plant material should also be collected, in case of future phytolith processing.

Note 8: If any plant material comes loose from the herbarium sheets during collection, it should be placed in the fragment packet on that specific sheet. If there is no fragment packet on the herbarium sheet, request one from the herbarium staff.

Note 9: Only collect plant material from a single herbarium sheet. Examine several sheets within a folder before deciding which specimen is most likely to yield abundant pollen.

General Herbarium Rules:

1. Restrict sampling to non-type specimens only. If you are unsure about the location or designation of the type specimens at a certain location, be sure to ask the herbarium director for further clarification regarding their type specimens.
2. Sample only from one or two species per taxon, unless species-specific collection is required.
3. Check the fragment packet for loose plant material, prior to collecting directly from the sheet.
4. Remove flowers only from herbarium sheets with ample flower material. As previously stated: Never remove the flower from a sheet with a single flower.
5. Place a label with the collection information on the herbarium sheet after removing the plant material. This label should include by whom the material was collected, purpose, date, & location (see Figure 1).

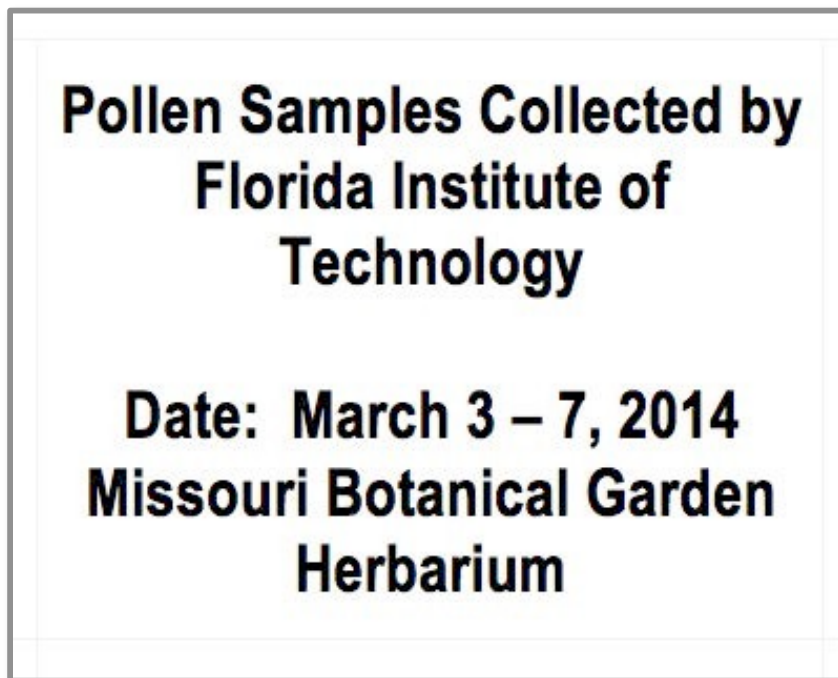


Figure 1: Herbarium sheet label

Collecting Samples:

1. Reference the taxa list or priority list to determine which genera need to be collected.
2. Search the herbarium collection for the specific genus to be collected. The cabinets are typically categorized by family, then alphabetically by genus and species.
3. Remove the necessary folder(s) gently from the cabinet. Be sure to notate the exact location from which the file was removed, so it can be returned to the proper place after collection.
4. Remove the folder and carry it in a horizontal position to the workspace. Place the folder on a flat surface for collection. The folders and sheets should never be “flipped over” from their original orientation. They should be returned to the exact same stacking order after collection.

5. Search the sheets in the folders for one with sufficient flower material for collection, preferably from the fragment packet. After examining a sheet, place it off to the side of the folder. Maintain the proper stacking order so that the sheets can be returned to their folder in the appropriate order. Once again, do not flip over the sheets. **THIS IS VERY IMPORTANT.**
6. Check the fragment packet for material prior to sampling directly from any sheet. Try to find an ideal specimen with material in the packet. Only collect from the sheet directly if there is no material in the fragment packet on any of the sheets within that specific genus.
7. If there is material within the fragment packet, use the fine tip forceps to remove any whole flowers and place them into the collection envelope. If there is loose or broken flower material, use the shovel-end forceps to scoop the material and place into the envelope. If there is plenty of material available, multiple flowers can be collected. If there is no material in the fragment packets, use the fine tip forceps to remove one or two flowers from the sheet. **DO THIS VERY GENTLY.** Do not destroy or damage any of the other plant material on the sheet. If necessary, use the shovel-end forceps to gather any loose material. If the flowers are large, strictly anthers should be removed and placed in the collection envelope. Use the best judgment possible when determining whether or not the entire flower or just the anthers should be taken.
8. After collecting from an ideal specimen, label a collection envelope with the family, genus, and species.
9. Photograph the herbarium sheet description label for future reference (see Figure 2).

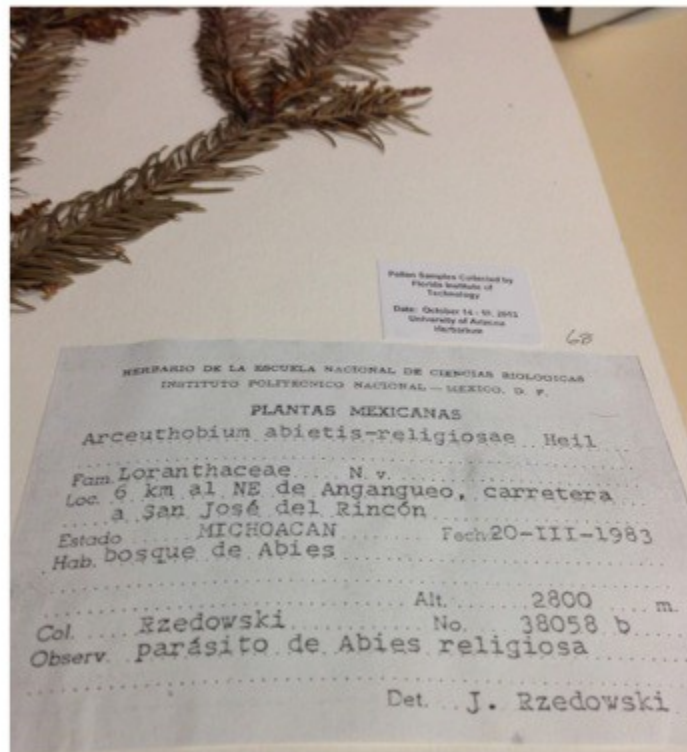


Figure 2: Herbarium sheet photograph for future reference

10. Seal the envelope.
11. Record the necessary information on the herbarium log sheet (see Figure 3).

Missouri Botanical Garden Herbarium				
Family	Genus	Species	Notes	Collector/Herbarium Page #

Figure 3: Herbarium log sheet

- 12. Place the collection label on the herbarium sheet. It may be placed immediately above or to the left of the original identification label. If there is not enough room, it can be placed at a different location along the perimeter of the sheet.
- 13. Mark the genus as ‘collected’ on the priority list.
- 14. Replace the sheet in the proper location within the folder. The sheets should be gently re-stacked in the appropriate order, replacing the stacked sheets in the order which they were previously set aside.
- 15. While carrying the folders in the horizontal position, replace the folders in the proper slot in the herbarium cabinet (see Figure 4).



Figure 4: Herbarium cabinet system – typically organized alphabetically per column

- 16. Use the cloth to clean the collection tools.
- 17. Repeat steps 1 through 16. Gather as many samples as possible during the collection visit.
- 18. Organize the collected samples alphabetically by family, genus, and then species for storage or future processing.