

# *A Concise Guide to the Collection, Preparation, and Processing of Bryophyte Voucher Specimens*



## INTRODUCTION

Collecting bryophytes is for the most part a relatively easy, inexpensive, and productive endeavor, it is the identification that can at times be challenging. A few hours spent in the field can produce a significant number of collections, requiring an equally significant number of hours in the laboratory for accurate identification and efficient processing of specimens. Equipment needed for collecting is minimal; however laboratory equipment, references, and storage equipment are not always affordable. Depending on the ultimate goal for collecting such organisms; a quality specimen consisting of ample material and complete location and ecological data is essential for assembling a scientifically valuable specimen. Without this combination, neither of these two components may be useful from a scientific perspective. With proper attention paid to collecting, documentation, identification, and processing of specimens; the resulting vouchers should remain a valuable asset to science for many decades to come.

Since mosses, liverworts, and hornworts (collectively called bryophytes) are generally dependent on free water for sexual reproduction, the best place to look for them is in areas that have a fairly reliable source of surface water, soil moisture, or at least humidity. However, bear in mind that bryophytes do grow in arid environments. Searching for specimens in habitats such as forests, stream banks, road cuts, in or adjacent to water bodies, waterfalls, overhanging cliffs, etc., will usually reward one with ample collections. In any given habitat, bryophytes grow on a number of different substrates and in some instances certain taxa may be obligate to a given substrate (see “data” section below). Typical substrates for these organisms include: soil, rock, tree trunks, tree bases, and woody vines. Many manmade structures also provide a suitable habitat such as masonry buildings, cemetery headstones, roof surfaces, and other similar structures.

## EQUIPMENT

---

Equipment needed for collecting is minimal and relatively inexpensive. A few basic “tools” will facilitate the process and produce a scientifically valuable specimen. The following list is a good starting point for collecting; additional equipment may be added or modified to individual preferences.

- small pocket knife
- small paper bags (ca. 3” x 5”)
- 10X-14X hand lens or “loop”
- small plastic spray bottle
- plastic grocery bags
- pencil/pen
- field book
- GPS



## SAMPLING SPECIMENS

---

Selecting an adequate specimen is based on **quantity** and **quality**. Depending on the specific substrate, a few square inches (3-4) of “moss” should be an adequate quantity of material to aid in identification and produce a suitable set of vouchers. Generally, bryophytes growing on soil or tree trunks (bases) will easily yield this amount of material without significantly damaging the overall population of the organism. In some cases, bryophytes growing on hard surfaces such as rocks may yield a smaller amount of material and may be more difficult to extract. When collecting always bear in mind that removal of specimens SHOULD NOT be conducted to the point of complete removal of a species from a site or causing significant damage to the population. If there appears to be a small population at any given site, it is most prudent to collect a

smaller sample in the interest of preserving the species at the site. Also, very often a single collection will actually result in multiple taxa - due to the intricate way in which these organisms tend to grow.



A good **quality** specimen should ideally consist of both the gametophyte and the sporophyte generations (if present). Most often the gametophyte generation (the green “leafy” part) is present and easily identifiable in the field, but may not always include the sporophyte generation (the often yellow, red, or brownish “stalk” that is elevated above the rest of the plant). Most bryophytes come in various shades of green; but many others are yellow, reddish-brown, or with other similar coloration. With that in mind, be aware the sporophyte is ephemeral and is not always present, or visible. Although a large number of taxa can be identified without the sporophyte, it is ideal to have them if they are present. Collection of viable, actively growing, material will facilitate a more reliable identification and ultimately result in a better voucher. When collecting, it is

important to collect a “representative” sample. A representative sample is valuable for making observations of the general habit of the organism and to adequately sample any variation present within a population.

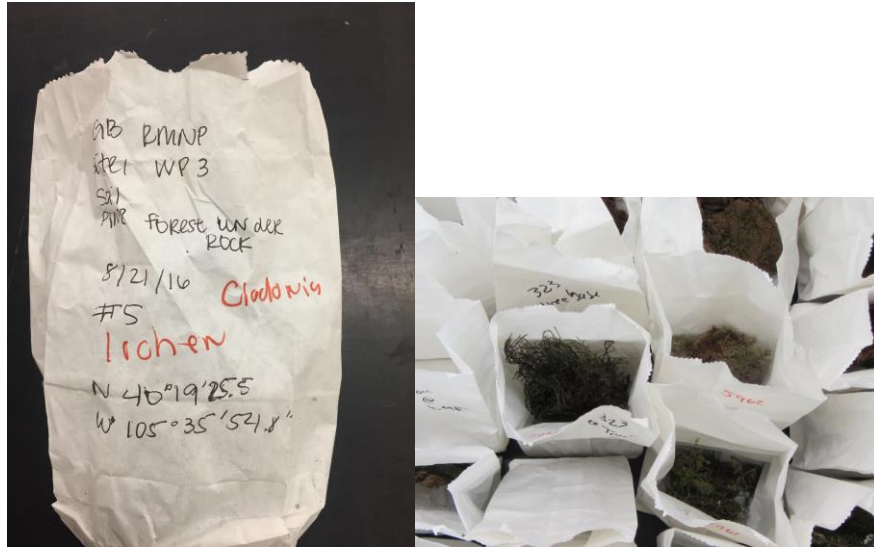


## PROCESSING AND HANDLING

---

Depending on the substrate involved, most bryophytes can be rather easily removed from the surface by hand or with a small pocket knife or similar instrument (water from a small spray bottle can be used to hydrate specimens for easier removal). The sample should then be placed in an individual bag for transport to the lab. Each sample should be given some type of unique identifier (number, letter, etc.) that will enable the collector (or someone else) to link the specific

sample to the specific location (and associated data) where it was collected. This is important in the event the location needs to be re-visited for some reason in the future. Using small paper bags for collections minimizes space and maintains individual collections separate from each other.



Plastic “baggies” should be avoided as these may lead to molding of specimens before identification can be completed. Also, plastic bags may allow the specimens to continue growing. This may lead to aberrant growth of specimens and make positive identification difficult or impractical.

Specimens should be air dried to ensure a quality specimen. Depending on the location, this can be accomplished by leaving the specimens on a table, or other surface, with the tops of the bags open to allow air flow. After a few hours (or days in some situations) the specimens should be sufficiently dry for storage or transport. A small fan on low speed will facilitate drying. However, direct or indirect heat should not be used for drying. Added heat will dry the specimens too rapidly and result in a brittle, poor quality specimen.





## DATA

Collection data associated with an individual specimen is a very important component of making a useful voucher. Making notes about various attributes of the sample and site is a tedious, but essential, task for many beginning collectors. However, with a little patience and experience this process will become easier and relatively painless. The sample label below illustrates typical data collected for each specimen. In most instances a single collection location/data set is used for multiple taxa with appropriate changes made for specific substrates, etc. A field notebook is essential for recording data that may be forgotten as the day progresses. As mentioned before, some taxa occur on specific, or limited, types of substrates. **For bryophytes it is important to note the substrate on which the specimen was found.**

This is an example of one of my labels. **The format is not critical, the data is!** Obviously, some of the data is determined at the herbarium, so if you provide the basic data, labels can be prepared much easier.

<p>S. M. TRACY HERBARIUM (TAES) TEXAS A&amp;M UNIVERSITY Plants of Texas – Hardin County BRYOPHYTE COLLECTION</p>	
<p>POLYTRICHACEAE <i>Polytrichum ohioense</i> Ren. &amp; Card.</p>	
<p>Big Thicket National Preserve - Jack Gore Baygall and Neches Bottom Unit; N side of Timber Slough Road ca. 3.0 miles E of its intersection with FM 2937; herbaceous layer in full shade of an inundated, heavily forested, depressional wetland; hydric, loamy sand soils; specimen substrate – sandy soil; associated with <i>Juncus repens</i>, <i>Rhynchospora corniculata</i>, <i>Panicum gymnocarpon</i>, <i>Cyperus</i>, <i>Taxodium</i>; GPS: N 30.49470, W 94.12393.</p>	
Leg: D.A. Kruse 1680	06 March 2007
Det: D.A. Kruse	

S. M. TRACY HERBARIUM (TAES)  
TEXAS A&M UNIVERSITY  
Plants of Texas - Hardin County

← Standard label stuff  
← Standard label stuff  
← State and County

POLYTRICHACEAE  
*Polytrichum ohioense* Ren. & Card.

← FAMILY - after id  
← Species and authorities - after id

Big Thicket National Preserve - Jack Gore Baygall and Neches Bottom Unit; N side of Timber Slough Road ca. 3.0 miles E of its intersection with FM 2937; herbaceous layer in full shade of an inundated, heavily forested, depressional wetland; hydric, loamy sand soils; specimen substrate – sandy soil; associated with *Juncus repens*, *Rhynchospora corniculata*, *Panicum gymnocarpon*, *Cyperus*, *Taxodium*; GPS: N 30.49470, W 94.12393.

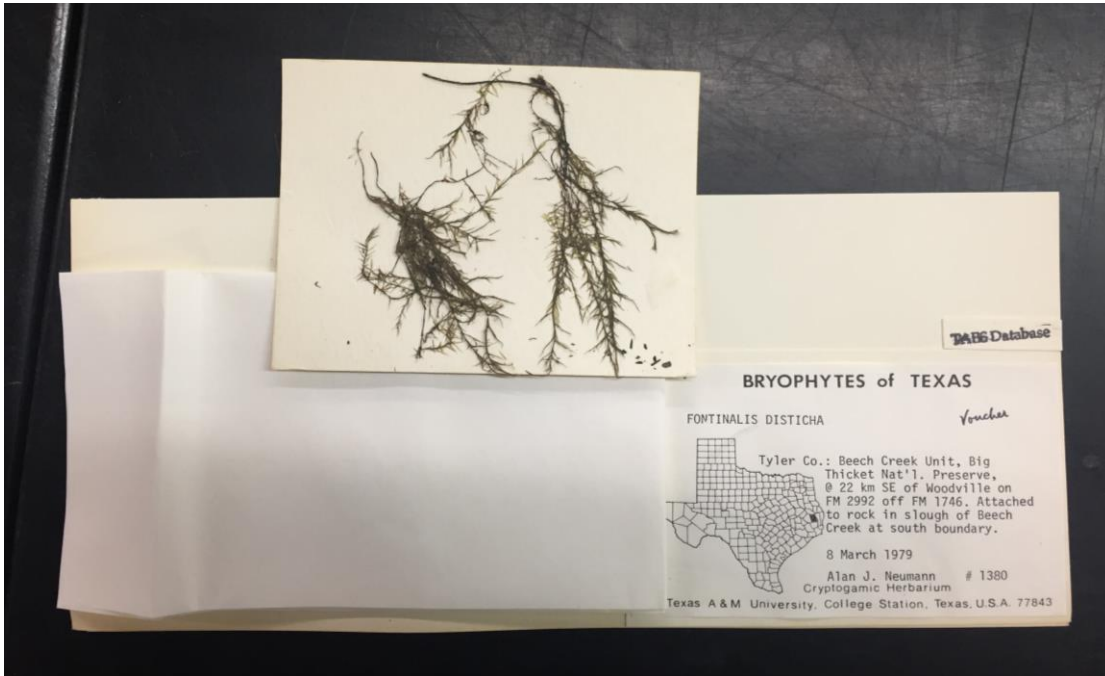
*Data to have is something about the habitat, soils (this is generally quite generic), soil moisture regime, associated species, etc. Much of this will/may be repetitive if you collect at the same or similar site(s). GPS if you can get it.*

D.A. Kruse 1680

← Collector and a “unique” collectors number

06 MARCH 2007

← Collection date



## FINAL NOTES

Once specimens are completely dry and properly packaged, they should be mailed to the address provided. Please note - it is extremely important that sufficient collection and site data be included with the specimens. This will aid in preparing an appropriate label for each specimen. If an Excel file has been provided, completing the applicable data fields will make label preparation relatively easy. All fields may not be completed by the collector, but certain basic information is essential. Also, be sure to include complete contact information if a report of identifications is requested.

As is customary in exchanges for identification, all specimens will become the property of the project and accessioned into a public herbarium following identification and final processing. Duplicates may be distributed to cooperating bryologists or herbaria in other states or countries.

**Please do not hesitate to contact me if you have questions or concerns, and as always, thanks for your time and effort on behalf of this project!**

Dale A. Kruse

[www.texasbryology.com](http://www.texasbryology.com)

[dakruse@texasbryology.com](mailto:dakruse@texasbryology.com)

979.229.6195