

PROTOCOL FOR LABELING DISSECTION SLIDES AND VIALS IN THE MCGUIRE CENTER

J. Hayden, D. Matthews, K. Willmott — 31.v.2024

As stated in the Collections Policy of the Florida Museum of Natural History (Anonymous 2022), under Curation, "[a]ll collections in the Museum shall be curated according to the highest professional standards." This includes following generally accepted procedures for anatomical dissection. The procedures for dissecting and labeling slides of Lepidoptera have been published numerous times. Winter (2000) provides a good contemporary overview.

1. **Before dissecting** specimens belonging MGCL or FSCA, the specimen or series of specimens should be shown to a curator or collection manager and permission granted for dissection. Dissections must be completed in the Morphology Lab, rm. 219 or an on-site location approved by a curator or collection manager. Specimens and associated parts are not to be removed from the building for off-site study without a loan being issued. All persons working in the Morphology Lab should be up to date with required ES&H training and appear on a current lab roster in GatorTracs.
2. As in other institutions, we ask to see examples of your dissections before granting permission to dissect MGCL/FSCA specimens. Images of prior dissections will suffice. If you do not have experience with dissections, we require that you work with practice material first from your personal collections or will provide practice material for you to work with.
3. There are three dissection labels: a label for the pinned specimen, a temporary label that accompanies the dissected parts, and one or two permanent labels for the slide or vial.
 - a. The pin labels ought to be printed in series beforehand, such as "J.E. Hayden Genitalia Preparation no. 0001," "...0002," "...0003" etc. —————→ **S. BENNETT
GENITALIA
PREP. #4684**
 - b. The temporary label may be hand-written.
 - c. The slide label(s) may be neatly hand-written, printed, or a combination thereof.



4. Photograph the specimen if required by the Curator of the collection and assign it a unique catalog number. This is recommended for later illustration in publications and to document scale color patterns prior to soaking in KOH.
5. At the same time as you break off the abdomen, put the permanent label on the pin. **Do not rely on photographs alone or memory to associate specimens with dissections.**
6. Keep the temporary label associated with the abdomen. If dissecting more than one specimen, put it in the KOH solution with the abdomen or pinned to the cork on the tube. At all costs, avoid mixing up abdomens.
7. Enter the data into your dissection notebook or spreadsheet: identification, locality, date of collection; sex or stage; personal preparation number; collection; collection slide number (if available); specimen unique identifier number (MGCL # or number assigned by loaning institution); date of preparation.
8. Write the slide labels.
 - a. If writing by hand, do so now.
 - b. If in a formatted spreadsheet, enter the data and print labels as soon as possible.
 - c. Write on the labels the same data as the pin labels: the personal preparation number and name of dissector, institutional slide number, collection data, collection, catalog number, taxonomic identification, and type material if applicable. In addition, state the mounting medium and the anatomical parts (e.g. male genitalia, wings).
9. Keep the temporary label with the abdomen in the dissection dish of water and then the alcohol for dehydration.

For Slides:

10. Using a glass-etching pen, etch your gen. prep. # on the back of the slide before mounting the parts. If you already have an institutional slide number (MGCL #, NMNH #, etc.), write that also on the slide.
11. Write the same numbers on the front of the slide on the side with wax pencil or alcohol-resistant marker.
12. Discard the temporary label only after writing the gen. prep. number on the slide or inserting a vial label into the glycerin vial.
13. Mount the dissected parts in mounting medium. Put on the cover slip. Indicate mounting medium on slide label.
14. Store the slide horizontally on a slide tray until set (hardened).
15. The slide may be heated for one week at low heat so the medium hardens faster. After the medium has set, store the slide in the box oriented so slides are still horizontal.
16. If you do not already have a block of institutional (FLMNH-MGCL) slide numbers, ask for them now. Assign them to the specimens, writing the FLMNH-MGCL slide number on the slide labels.
17. Affix the labels as soon as possible.
 - a. Stick on handwritten labels immediately or, for thick dissections with not much room, when the mounting medium has settled in a couple hours.
 - b. Stick on printed labels as soon as you print a batch. Estimate how long it will take to make a batch of slides; do not leave it open-ended. Two months is a maximum. Move the process along.

For Glycerin vials: proceed from Step 5.

6. At minimum, stand-alone glycerin vials with genitalia must have a label inserted into the vial. The label states the personal preparation number, such as "J.E. Hayden genitalia prep. # 1234." Other unique numbers are also desirable. The label must be written in pencil or laser-printed on cotton-rag paper suitable for alcohol.

7. Microvials that are on a separate pin next to the pinned specimen must also be assigned the same prep. no. label. Pelts (abdominal cuticles) may be kept in a separate microvial but both must be on the same pin with the pelt below.

Additional notes:

Students' collections and other undonated collections must be kept separate from the main collection. This avoids disputes about ownership. If students practice dissection on their own specimens, the specimens should be kept separate from those in the main collection. Keeping personal collections separate is also the policy of the FSCA. Be aware that FLMNH has a collections policy that applies to all faculty, staff, and students, available at <https://www.floridamuseum.ufl.edu/collections/policy/>.

The protocol is to prevent messes and destruction of specimens. A dissection that is not unambiguously linked to the rest of the specimen is as good as lost. You are making dissections out of a public collection, so respect that the specimen is public property and that you are entrusted to handle it professionally. Others will use it for research after you. The Destructive Sampling policy of the FLMNH is worded for external researchers, but its principles apply to internal researchers too. See <https://www.floridamuseum.ufl.edu/collections/policy/#Destructive-Analysis>. Using a unique number helps other people to associate the parts of a specimen if you are unexpectedly unable to continue your work. Make it easy for them. For the same reason, keep your lab notebook or specimen index available for the Collections Manager or your supervisor.

Slides and other dissections MUST be labeled with a unique Genitalia Preparation number of the dissector that is on both the pinned specimen and on the slide or in the glycerin vial. Almost all publications and in-house policies in the past century emphasize that the first step of dissection is to assign one unique preparation number that links the pinned specimen to the slide or vial (Bennett 1929; Clarke 1941; Busck 1942; Hardwick 1950; Kroon 1973; Heppner 1991; Winter 2000; Lee and Brown 2006; Rawlins 2006; Brown et al. 2010; DaCosta 2017). The necessity of indexing slides to specimens goes back at least to Bennett (1929). Some quotations emphasize its importance:

"The MOST IMPORTANT requirement is to adopt a system of labelling the preparations and specimens so that no confusion is possible, and also to preserve both. Specimens and slides thus labelled are of scientific value whereas if one is lost the other's value is considerably decreased." Kroon (1973, emphasis in original).

"It is astonishingly easy to disassociate genitalia and bodies when working with taxa you are unfamiliar with, or with two or more specimens that are difficult to distinguish from each other using external morphology." DaCosta (2017, emphasis in original).

Do not speed. Robinson (1976) recommends making six dissections per day at the most.

Do not devise a process that is so complicated that you cannot finish it. Professionalization is good, but the more complicated the process, the more likely that the lack of a material or an available technician will impede it. For example, if some information is lacking from the slide labels (e.g. species identification or type material designation), do not delay printing the labels—just write in the information by hand later.

Keep a **lab notebook** with columns for Family (or family-level taxon), Genus, Species, Locality (country and state, optionally county); sex; dissector's personal slide number; Collection; Collection slide number; date dissected; MGCL catalog number. An Excel spreadsheet may serve in lieu of a journal but should be printed periodically or otherwise backed up. The journal must be kept in a **place accessible to the Collections Manager and supervising Curator**. The N share drive or a shared Google document are good for spreadsheets.

- Family-level taxon is useful for telling which slide box the slide will be put into.
- Locality is to two administrative levels to copy into the Material Examined section of a publication.
- Collection refers to the institution that owns the specimen. It will be MGCL or FSCA if dissecting specimens housed in the MGCL. Specimens borrowed from other collections are referred to by other acronyms.
- The MGCL/FSCA has one unitary slide number sequence. Many other collections also have their own sequences, such as the NMNH and the NHMUK. This institutional sequence incorporates slides made by many people. Although an institutional number may be added to a slide, both numbers are retained on labels and should be recorded as other identifiers when cataloging specimens or reporting label data in material examined sections of manuscripts.
- Under Sex, one may note other things like "larval cuticle," "wings [sex]," or "whole body." A separate column may be warranted.
- With a spreadsheet, an Index column is useful for sorting the data, then resorting it back to original order. Columns for type material and other data are also useful.

Journals and spreadsheets have pros and cons. A journal can be written in on the lab bench without turning on and plugging in a laptop – but then you have to digitize it later, because Excel sheets have many advantages. In any case, *record dissection data immediately when making the dissection*. **Do not procrastinate and think that you will enter the data later.** "Later" means "never."

As previously noted, students and new researchers must demonstrate proficiency and skill with dissection before being allowed to dissect accessioned MGCL/FSCA specimens. Until then, they may practice with specimens in their personal collections or unlabeled specimens designated by staff for practice.

Every dissector must have his or her own preparation number series. It links the pinned specimen to the slide or glycerin vial.

Label paper must be archival cotton-rag bond paper. The adhesive must adhere for decades. Suitable labels include foil-backed labels and Scotch 3M 568 positionable mounting adhesive (discontinued in 2024). The Scotch 568 is a "double-tack" adhesive that binds paper to glass. Double-tack paper has two backings so that it can be cut to size. As recommended by some NMNH (USNM) researchers, amazonbasics clear school glue may be used, however we do not know the lifespan of this product. This is why first etching slides with the prep number using a glass scribe is recommended.

Slides must be labeled with the Gen. Prep. No. of the dissector. They may also be labeled with the MGCL slide number or other institutional slide number. Likewise, a label with the number must be placed into a glycerin vial.

Label paper for slides must be archival. Cotton-rag bond paper is acceptable. To write on slides, wax pencil is necessary in any exposed environment and is better for storage over long term (e.g. if adhesive paper is not immediately available). Print "extra heavy" with a LaserJet printer.

Information on slide labels must be legible. The order of information on the labels may vary depending on space, but please follow the precedent of current slides. Leave some space on labels for additional information to be written in.

Not acceptable:

Slides labeled only with a species name, a country, an ambiguous code, or nothing at all.

Writing on glass with an easily erasable marker. It may be okay for slides that are awaiting labeling promptly *if in an environment protected from liquids*.

Slide label paper that comes off easily. Labels that are not designed to adhere to glass are not allowed.

Slides with mounting medium that is not approved. Recommended are: Canada balsam or Euparal made by a reputable company. Not acceptable are: Permount, Euparal made by Hampstead Halide, nail polish.

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