UNIVERSITY OF CENTRAL OKLAHOMA

NATURAL HISTORY MUSEUM

(UCONHM)

HERPETOLOGICAL SPECIMEN PRESERVATION & PREPARATION POLICIES & GUIDELINES

Revised July 2010

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Contents

Introduction

I would like to start off saying I am no expert in the field of taxidermy of museum preparations. The following instructions are merely the knowledge I have acquired while working first hand on preparing herpetological and mammalian specimens at the University of Central Oklahoma for the past three years. If you, the new preparer, learn any new or easier ways to prepare specimens please make notes or add pages to this manuscript. I will stress that cleanliness and caution must be exercised when preparing specimens. Disease and bacteria can be spread if the right amount of caution is not taken. Always clean up after yourself.

I hope my knowledge is appreciated and can be easily passed on to you. The number one thing about this preparation is to have fun. You are making history. Long after you are gone the specimens you prepared will live on educating generations of students. So take pride in your work.

Roxie

Pre-prep Storage

Depending on the type of specimen you are attempting to prepare (alcoholic vs. skeletal), the pre-prep storage varies.

Alcoholic Specimens

Cells are easily denatured by temperature. If the temperature is too cold or hot the cells will rupture. It is important to try and keep the specimen in the exact state at which it was found. There are macro and microscopic details that can be useful to scientists for research purposes.

Place the specimen in a refrigerator until you are ready to inject.

- The refrigerator is cool enough to keep the specimen from rotting at a substantial pace, yet warm enough that it will not rupture the cells like a freezer would.
- Make sure you inject the specimen within a couple of days or rotting will begin to occur.
- Make sure the data for the specimen is inside the container.

Skeletal Specimens

With skeletal specimens we are not concerned about preserving the soft tissue. You will still want to take into account how you store the specimen so it is easier to flense later on.

Double bag the specimen and tightly wrap the bags around the body with tape or tying materials.

- You are trying to prevent freezer burn so the more layers, the better.
- Make sure the data (written in PENCIL) for the specimen is inside the bags it is wrapped in.

From the Freezer

This part of the preparation takes some planning. You will need to have a relative idea on how big the specimen is so you know when to lay it out for thawing. Thawing can take anywhere from hours to days, so plan ahead.

Box turtle, water turtle…….. 5-6 hrs.

Large snapping turtle…….. 10-12 hrs.

Snakes, Lizards……. 2-4 hrs.

Frogs…… 1-2 hrs.

Normally I will just put something from the freezer into the refrigerator a day or two before I plan to flense it. This way the specimen has begun to thaw, but is not completely thawed, and will take less time when I set it out on the counter to thaw completely. Usually reduces thawing time by a few hours.

When you lay the specimen out to thaw you want it to sit out at room temperature for the time specified. Make sure that you anticipate the blood leaking if it is a road kill specimen, and place the specimen in the sink or in a container.

If you are in hurry you can always place the specimen in a bag and run hot water over it. Do not directly run hot water on the specimen. This could flush tissue and/or small bones and create a mess.

Flensing

This is the messy, stinky and kind of fun part. Below is a list of the tools you will need. It is recommended that you use gloves for two reasons; first, the smell you will be dealing with will linger on your hands if you don't wear gloves; second, safety, who knows what that critter is carrying so better safe than sorry.

List of Tools

-Razors

-Scissors

-Scalpel

-Gloves

-Tray or plastic bag (to put meat and guts in)

What you are trying to accomplish with this step is to get rid of as much of the meat and skin as possible. The less meat you have on the animal the faster the bugs will clean the bones (less meat, less time). It is especially important that you take off all the skin. The bugs do not like to eat through the tough skin and you will be forced later to clean the bones by hand because of this. It is also important that you take out the intestines. Intestines do not dry well and will mold in the bug tank so make sure you take them out.

If you think that you may run out of specimens to clean, in later months, you should try and save some of the big chunks of muscle meat, dry them and store them in the freezer so you have something to feed the bugs when there are no specimens needing to be cleaned.

Make sure you dispose of the meat properly. You should but the excess meat and guts into a plastic bag, double bag it and depending on what the curatorial manager says, either put it in your trash or walk it to the campus dump.

Drying

Okay now that you have your specimen cleaned out you will want to dry it. The bugs do not like to eat extremely moist meat; they also will not eat freezer burned meat.

You will need to place your specimen under the hood or some ventilated device. Do not place it in a heated dryer, this will make the meat too jerky like and will take longer for the bugs to devour. You want to make sure the specimen is placed in a ventilated system for several reasons; first, they stink and you are doing everyone a favor by not allowing the smell to spread throughout the department. Second, this prevents mold from growing on the specimen.

Drying times vary; you will want to make sure that you turn the specimen over, throughout the drying process, so that both sides dry evenly. Below is a list of relative times it takes to dry the specimens.

Box turtle, water turtle…… 3-4 days

Large snapping turtle…… 5-6 days

Snakes, Lizards……. 1-2 days

Frogs…… 2 days

To The Bugs

After the specimen is dry, depending on the specimen, you may want to wrap it in cheese cloth. If you are dealing with an animal that is small or has a lot of small bones you will want to wrap the specimen in cheese cloth to prevent bones from being lost.

Animals that should be wrapped in cheese cloth include; snakes, lizards, small juvenile turtles and frogs. You will wrap the animal in one layer of loose cheese cloth. Larger animals need no further preparation after drying to be submitted to the bugs.

You will want to create a tag that you can tie onto the specimen that allows you to identify it. Typical bug tag includes scientific name, date and collector. Make sure you anticipate the bug urine and water leaks by using waterproof ink or pencil on the tag. When you place the specimens into the bug tanks, make sure you space them out. The bugs love to move bones and whole specimens around so keeping body parts grouped is a good idea.

○ ○	Sex (Rep.) Coll. Number Collector State: County: Town: Specific location Total-Tail-Hind Foot-Ear=Weight (g) Date

EXAMPLE:

○ ○	Female (2L+3R) 27 J. Smith OK: Oklahoma Co.: Edmond: inters. of Bryant and 2nd St. 240mm-101-30-14=90g 27 June 2010

Each specimen will take a different amount of time to be completely cleaned. Time varies, usually depending on animal size. Small animals should only take a couple of days, but large animals may take weeks. It also depends on your colonies' taste; some colonies prefer one type of meat over another. The colonies' appetite will also be influenced by the season. In winter months your colony will slow down and not eat as rapidly, compared to summer and spring time when the bugs will become very active.

Once the bugs have done their job you will want to remove the specimen and immediately place it in a freezer. Leave the specimen in the freezer for a minimum of three days. This will kill the bugs that are still on/in the bones.

Cleaning

Now that the bugs in the bone have been frozen to death, you may begin cleaning. You will need some supplies for this step.

<u>List of supplies</u>

Hydrogen peroxide (3%)

Acetone

Gloves

Net (small fish tank net)

Soft toothbrush

Forceps

* Keep the tag attached to the specimen at all times.

First, you will want to soak the skeleton in acetone for about five minutes. This will kill any remaining bugs that happen to have made it through the freezer.

Second, pour off the acetone back into the acetone container (NOT DOWN THE DRAIN). Then wash the skeleton off in some soapy water. If the skeleton looks dirty you may want to take a soft toothbrush and scrub the skeleton.

Third, place the skeleton in some type of container and cover the skeleton with hydrogen peroxide. This will whiten the skeleton and make a beautiful specimen. Leave the specimen in the solution for a few hours.
***You can skip this step when you are dealing with turtle shells.

Lastly, remove the skeleton from the hydrogen peroxide, rinse, and then lay it out on paper towel. You may dispose of the hydrogen peroxide down the drain while running water. Then use the forceps and pick out any remaining bugs that may be logged into tight spots on the skeleton.

Place the specimen under the hood or in the dryer. It will take the specimen overnight to dry and you may want to leave it a few extra days to make sure it is completely dry before boxing it. Otherwise mold may start to grow if the bones are still wet.

Museum Storage

At this point you have a clean, white, dry specimen that is ready to be processed. From here on out it is up to the curator on how they would like their specimens stored. Most of the specimens will be stored in acid-free boxes that will prevent colorizing of the bones. You should make sure that the original data tag is with the specimen along with the newly created tag that is attached to the specimen.

Alternate Preparation Methods

There is another way to prepare specimens: boiling. This is probably the smelliest thing I have ever done. It is not pleasant. Yet, the first time you have to boil a specimen it will certainly motivate you to keep the bug colony healthy and thriving so you never have to endure the torture again.

Here is how it is done.

1. Get a pot that is big enough to submerge your specimen.
2. Add about a cup of Borax to the pot.
3. Fill the pot so that your specimen is covered with water.
4. Place the pot on a Hot Plate under a hood/ventilated area.
5. Crank up the heat.
6. Allow to boil for at least an hour. Poke at the specimen and determine if the tissue is soft enough to be pulled off with ease, if the tissue is still not easily removed allow it to continue to boil checking it every 15 min.
7. Turn off the Hot Plate, have a strainer ready at the sink and pour the hideous broth into the strainer.
8. Clean the pot and place it back under the hood (NOT on the Hot Plate). ** HIGHLY recommend that you double glove your hands for the rest.
9. Take the specimen and sift through the goo and pull out any lose bones.
10. Pick all the meat off the specimen. Use the tool of your choice.
11. Then proceed to cleaning page. You do NOT need to do the acetone soak.

Alcoholic Preparation

Alcoholic preparation is the preservation of the specimen's internal and external morphology. You will be using some hazardous solutions so below I have provided a toxicity table for your understanding.

SOLUTION	MOLECULAR FORMULA	TOXIN EFFECT
Formaldehyde	CH_2O	Known human carcinogen
Ethanol	C_2H_6O	Eye and skin irritant

***Must wear gloves.

The overall goal of this procedure is to inject all areas of the specimen with formalin so the internal anatomy is preserved. You may have to begin by diluting your solutions. To dilute your ethanol to a 70% solution, mix 1400ml of alcohol with 600ml of deionized water. To dilute your formaldehyde to a 10% solution, mix 10ml of formaldehyde with 90ml of deionized water.

First, you will begin with selecting the appropriate needle size for your specimen, the more delicate the specimen the smaller the needle should be.

Next, you will fill the syringe with a 10% solution of formaldehyde. You will want to inject all soft tissue of the body. You will be injecting on the ventral side of the animal. The only time you will have to inject on the dorsal side will be to get into the skull cavity through the foramen magnum.

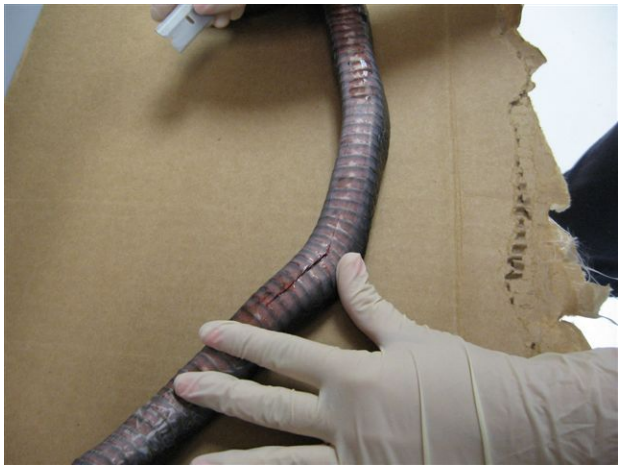
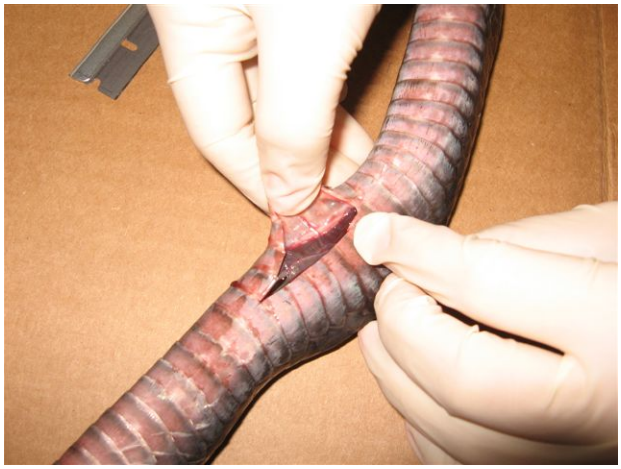
Snake- stick the needle under each scale on the belly of the snake, then into the skull.

Turtles, Lizards, Amphibians – Inject multiple times in each area of the body, also inject each finger if possible.

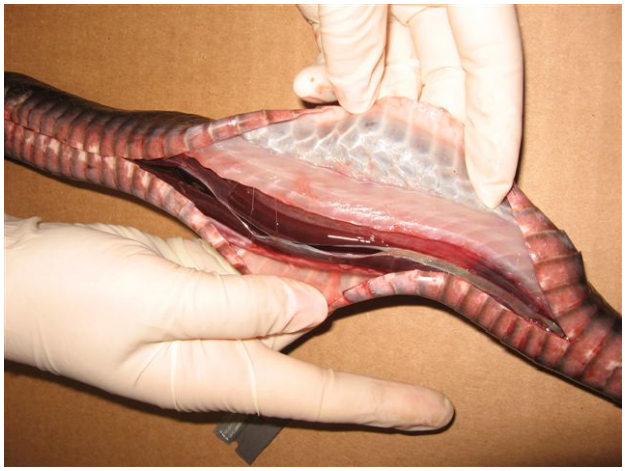
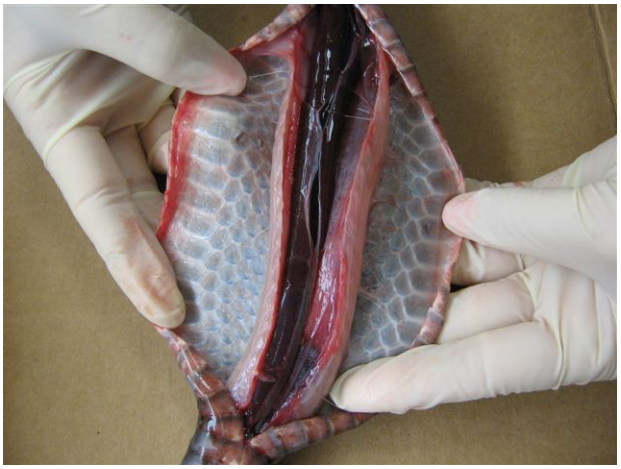
Skin Preparation

Saving reptilian skins is relatively new to our collection. This process will allow for future studies on things such as; pattern differences, aging and molecular studies. The only skins at this time that I have prepared are snake skins. Their skins are relatively easy to remove, dry and store.

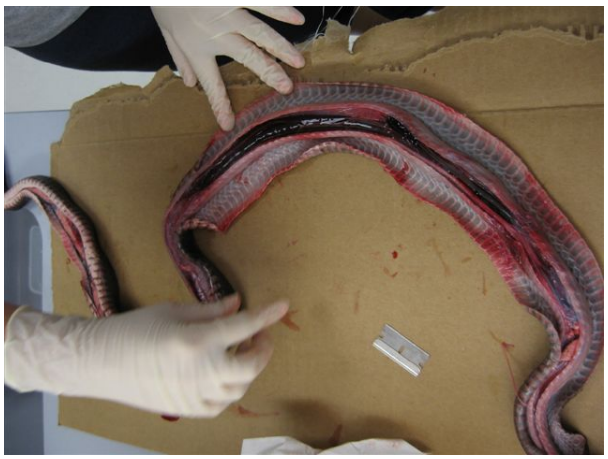
First, lay the snake on its back and make an incision from the cloacal opening through the lower jaw. This incision should now be exposing the intestines.

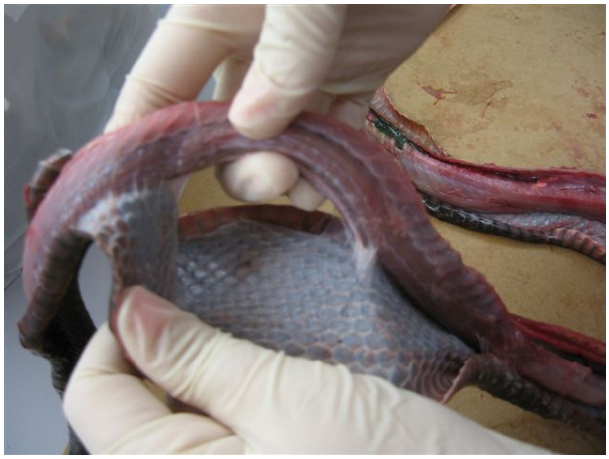



Next, find an area in the middle of the body and try to remove the skin from the ribs. Once you are able to detach a little bit of skin from the ribs, run your finger between the ribs and skin to detach the skin.

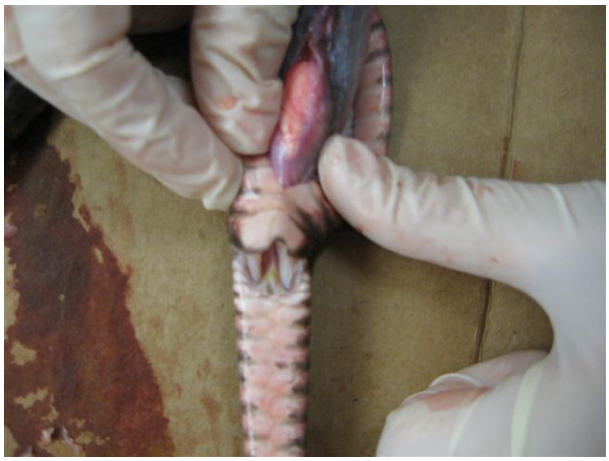
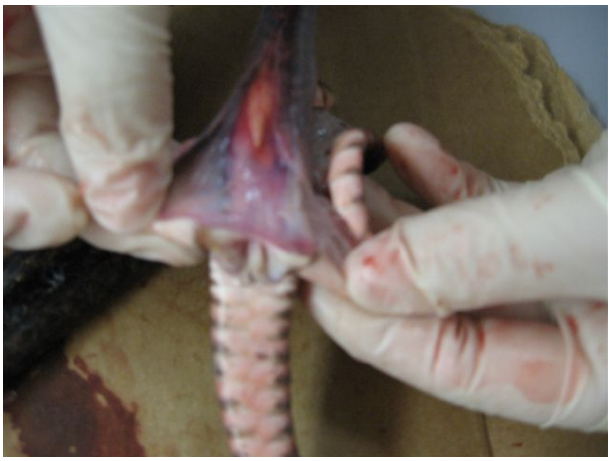



Continue the skin detachment along each side of the body from cloacal opening to jaws. Once the skin is detached from the ribs, work your finger (between the skin and muscle) to peel off the skin from an area on the spine and then remove the rest of the skin from the torso of the snake.

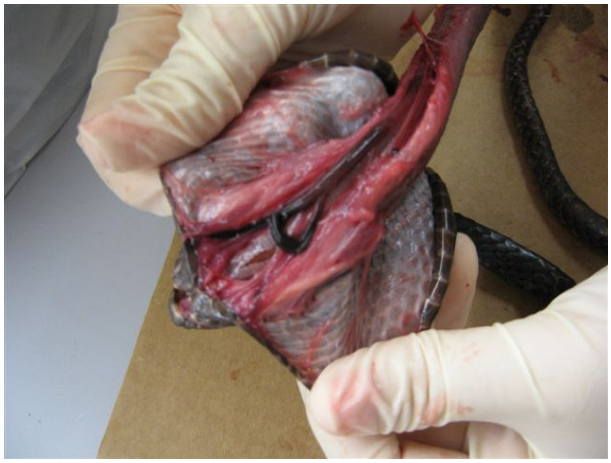


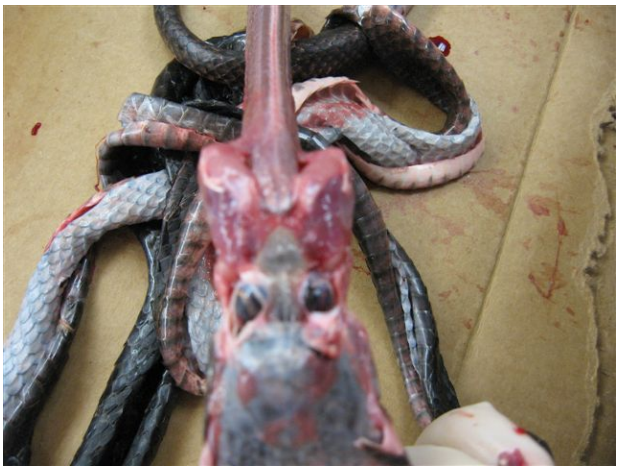


From the cloaca down you will have to make another incision to peel back the skin off the tail, this a little more tricky because the skin actually extends up into the cloaca. Make a cut through the cloacal opening and down the tail. Peel back each side of the cloaca. You will replicate this move at the other end of the snake with the jaws.

At the cranium, you will want to keep intact as much of the head skin as possible. It is a little more difficult to remove because it is firmly attached. The bottom jaw skin will be split into two halves because of the initial incisions. The top of the head should not be split.



You should then rinse off all the excess blood from the skin and pat it dry with paper towels. Then get a long piece of cardboard, the length of the skin, and lay one piece of paper towel on it length wise (this will help prevent the skin from sticking to the cardboard which makes it difficult to remove when the time comes). Lay the snake skin flesh side up along the cardboard. Then pin along the edges of the skin, about every one inch, to keep the skin flat to the board (this will keep the edges from curling in on itself).

Lastly, place the skin in the dryer or under the hood to dry out. It will take only a few days to dry, but leave the skin where it is for a week to make sure it is completely dry. Once the skin is dry, remove the pins and peel as much of the paper towel off of the skin as possible without tearing it.

*** This drying technique only works on average size snakes, e.g. native North American species. For larger species, e.g. captive bred Pythons and Boas, traditional tannery methods should be used.

XX: COPIES OF FORMS

A. Reptile Loan Form

University of Central Oklahoma Natural History Museum Page ___ of ___
Biology Department, Howell Hall
100 N. University Drive
Edmond, Oklahoma 73034
(405) 974-5911 **Outgoing Loan Contract**

Borrowing Institution:
_____ OUTGOING LOAN # _____
_____ Duration of loan
_____ From _____
_____ To _____
Contact _____ Purpose of loan _____
Telephone _____ Approved by _____
Email _____ Date_____
Shipping _____
Total # of objects/specimens Total insurance value $ _____

Description of loan Check for Attachment ____

Catalog Accession Number	Object/specimen Description	Insurance Value

Borrower, please read outgoing loan conditions on the reverse of this contract and sign to agree to the conditions. Return the signed Registrar copy in the envelop provided and keep the Borrower copy for your records.

Borrower signature: _____ Title _____ Date _____
Title: _____ Date:_____

Objects/specimens returned to the mammal section of the UCONHM
Signature_____ Title:_____ .Date _____

B. Reptile TK Form

UCONHM – Reptile Section TK Sheet

Species _____ **TK #** _____

Country _____ **State** _____ **County** _____

Specific Locality _____

Lat and Long. _____

Elevation _____

Collector _____ Collection Date _____

Preparator _____ No. ____ Preparation Date _____

VOUCHER _____ Skin _____ Skull _____ Post-cranial skeleton _____ Fluid

Other _____

UCONHM Mammal Section Catalog Accession Number _____

MEASUREMENTS _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

TL Tail Hind Ft. Ear Wt FA Tragus _____ _____ _____

_____ Male_____ Female Reproductive Condition _____

TISSUE:

____ Heart/Kidney ____ Lung ____ Reproductive Organ

____ Heart ____ Spleen ____ Entire Specimen

____ Kidney ____ Brain ____ Lysis buffer _____

____ Liver ____ Blood ____ Alcohol _____

____ Muscle ____ Embryo ____ Other _____

OTHER PREPARATIONS:

____ Mitotic ____ Meiotic ____ Tissue Culture

____ Sperm ____ Karyotype ____ Other _____

MISCELLANEOUS:

Age: ____Juvenile ____ Subadult ____ Adult

____ Molting _____

Comments: _____

_____

_____

_____

_____