Biodiversity Research and Teaching Collections Department of Wildlife and Fisheries Sciences Texas A&M University College Station

BRTC Post-dermestid Specimen Cleaning Protocol

Soak small skeletons overnight in 10-15% diluted ammonia solution. In the bug colony room, place skeletons in individual glass jars after carefully removing as many dermestids as possible.

Specimens in glass jars are then moved to main building and filled with ammonia solution. Ammonia solution is located near the wet lab; the side door may be opened when working with the solution to provide air flow. Soaking specimens should be placed on a cart in the prep room.

The morning after soak, pour solution/skeleton over a mesh sieve (can re-collect ammonia solution to re-use), rinse with water and let dry on a cart. For larger specimens, longer ammonia soaking followed by soaking in water can be used to help loosen tissue to be removed by hand (forceps).

After specimen is dry, place specimens in a specimen box or vial and place in the walkin freezer case for fumigation. Follow Fumigation Protocol.

Guidance from Bill Stanley (Field Museum), Steve Cardiff (LSU), and Verity Mathis (FLMNH)

Bill Stanley/Field Museum

We routinely soak our skeletons in a very light ammonia solution (1 part ammonia/9 parts water) for 24 hours. This softens up any tissue that may need to be picked off, and helps to get oils out of the bones. Longer than 24 hours will lead to deterioration of the skulls.

Steve Cardiff/LSU

I generally agree with Bill. Soak in "dilute" ammonia "overnight," then rinse with tapwater and let air dry. The ammonia does a little bleaching and degreasing, depending on % strength. If you soak in fluid for longer than 12-24 hr, then the teeth start to loosen and fall out and the skull sutures separate.

I prefer to use a stronger ammonia solution because I usually process multiple batches of specimens over several days and I re-use the same ammonia. Back when I could get 55 gal drums of full strength Ammonium Hydroxide, I would dilute to about 25-33%, which was still pretty potent. That has gradually become too difficult to deal with, so we buy 2.5L glass jugs of reagent grade ammonia that is 28-30% strength. I dilute each jug by about 1/2 - 2/3, so I'm still using a 10-15% solution.

If carcasses were properly treated pre-dermestid, then the dermestids should get 100% of the tissue. If carcasses are not properly eviscerated or are spoiled, wrapped too tight,

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dried over a smokey fire, or stored in ethanol, then some tissue/skin removal may be necessary. You can also soak dried carcasses in hot beef bouillon to make them more appetizing. I've heard that smearing them with bacon grease can also help, but I've never done that and I'm afraid of the greasiness....

I do all my ammonia work outside, so it's not a problem. Inside is definitely a problem.

I forgot to say that I am wary of peroxide. When I first came to LSU the skel-processing folks were using peroxide. Peroxide is much better for bleaching, but was nastier to work with and, in my opinion, it weakens the bones and leaves white powdery deposits. I've also used dilute clorox on things like ungulate skulls that were not 100% cleaned by the beetles.

Verity Mathis/FLMNH

So right now, post-dermestids, we soak the skeletons in 1:6 dilution of ammonia for generally 24 hours, and then soak in water to remove the ammonia and lingering fat, tissues, etc. Depending on the skeletons, sometimes they soak in water for weeks (replacing the water every few days or so until it is clear). This seems like a very slow process to me, but perhaps thats just the name of the game. And then occasionally the bones get soaked overnight in a weak peroxide/water solution as a final step to brighten them up and remove any lingering greasiness, if needed.

I am really hating the ammonia dilution we use, mostly because we don't have a good, protected way to pour it off (no fume hood, etc) so it just feels very unsafe and dangerous (basically take a deep breath, pour off, step away to breath, etc). I've been talking to one of the bird collection managers and he is trying to get away from ammonia all together and just use a commercial degreaser, like Krud Kutter, which he has been happy with, diluting that down to maybe a 10-20% dilution. Not sure of others thoughts on those kind of commercial products? So I'm considering that but it also sounds like maybe using an even weaker ammonia solution would work?