

A guide for taking care of the dermestids (updated 8.5.09).

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Dermestid beetles (Family Dermestidae) come in variety of colors, shapes, and sizes. The one we have here is black and has an elliptical thorax, with white ventral side. They are known to eat animal flesh, fur, skin, feathers, among other things, but don't worry, they are uninterested in gnawing on living animals. Most of the flesh-eating, however, is done by the larvae, not by fully-grown beetles. The larvae are the brown caterpillar-esque entities wiggling around in the tank. As with regular pets, the dermestids require care and maintenance on a regular basis for them to flourish. It is also important to keep them inside the tank since escapees will likely destroy other specimens in the room and in the lab. This guide will serve as a reference for maintaining a colony of healthy dermestids, while preventing them from escaping. The following is a list of check-ups that need to be done on a regular basis (daily or every couple of days):

Temperature

You can quickly check the temperature inside the tank by reading off of the thermometer pasted on the right side of the tank. The optimal temperature for the dermestids is 70—80°F. Below 70°F, the dermestids become sluggish. If this is the case, the two heating pads placed underneath the tank should be plugged into an outlet. If they are already plugged in, moisten the paper towels in the tank by using the water spray, since moisture will help trap more heat in the tank. Above 80°F, the beetles become too active and may begin to fly. If this is the case, do not open the tank. We do not want any beetles to fly off from the tank. To cool the tank, unplug the heat pads if they are on, or have the fan turned on above the wire mesh for couple hours.

Opening and closing the lid

To open the lid on the tank, use the orange suction, which is usually located on top of the tank. Before you open the tank, make sure there are no beetles on or near the lid. Also, DO NOT open the lid if the beetles are flying. Refrain from having the lid open for any extended period of time, i.e., no more than about 45 seconds. When closing the lid, make sure it is sealed tightly. To achieve this, use the lead brick to hold the lid down on the left side of the lid, and smear the clay over the gap between the lid and the tank to hold down the right side of the lid.

Humidity

The tank should be kept moderately humid. The air inside the tank should feel moist, but not to the point where condensation occurs. If the humidity is too high, white mites, *Lardoglyphus zacheri*, may begin to appear, so it is important to keep the humidity at a reasonable level. To lower the humidity, place several dry paper towels in the tank. Since the dermestids like to be under moist paper towels, place moist towels over where you want the dermestids to eat or congregate.

Food

Ideally, food (i.e., animal flesh) should always be present in the tank. However, dermestids can live without food for several days, but no more than one or two weeks. To prepare a tasty meal for the dermestids, one must follow these procedures (*look at the separate "specimen preparation" sheet for more details on preparing specimens for collections*):

1. *Obtain animal flesh.* Usually, Dr. Sereno has specimens that he wants prepared for his vertebrate collection. So, ask him if there are any specimens that need preparing. If there is, make sure that the specimen has been identified, sexed, and measured before you start preparing them—they should be written on the bag or have a label inside the bag (if not, contact Dr. Sereno or Jim O'Reilly, who studies herpetology). If he doesn't have any specimens for the dermestids to munch on, you can buy meat from a local grocery store. From experience, I can say that the dermestids prefer pork over chicken. I suggest "pork steak" from Treasure Island, which costs around \$2.00 per pack. Any money you spend for the dermestids can be reimbursed—hand in the receipts to the OBA office.
2. *Gut specimens and remove fat.* Specimens must first be gutted before placing them into the tank. If the specimen is a mammal with fur, you must also skin the specimen. There are dissection tools on the table and in the cabinet. Also, fat must be removed to the best of your ability because fat turns rancid quickly and too much of it may saturate the eggs, preventing them from hatching. While skinning and gutting, be careful not to damage the bone of the specimens.
3. *Dry the animal flesh.* This is done by placing the flesh directly under the hood, which should always be turned on. You want to shoot for a perfect jerky texture—not too moist, but not too dry either—since dermestids will

not eat fresh flesh and will have difficulty consuming flesh that are too dry and hard. The time it takes for a piece of flesh to dry depends on its size, but should take no more than couple days. You should flip the flesh after a day or two to allow both sides to dry to a consistent texture.

4. *Place the flesh into a box or container.* Be careful not to place specimens into boxes with bones from other specimens. The last thing you want is to have bones from different specimens in a single box. Now place the box inside the tank. Cover up the flesh with moist paper towels for maximum efficiency. Keep a close eye on the flesh, especially if it is a specimen, because the bones will begin to disarticulate if it stays in the tank too long. Once the dermestids have completely eaten the flesh or specimen, you may take it out of the tank, removing as many innocent dermestids as possible from the bones, before putting it in a re-sealable bag and in a freezer (more on this under “removal of objects from the tank”).

Ventilation and odor

Every couple of days, turn on the black fan, which is usually located on top of the tank, and place it on top of the wire mesh for couple of hours. This accomplishes a few things: (1) provides the dermestids with fresh air; (2) reduces the smell of decaying matter; (3) decreases the level of humidity. DO NOT leave the fan on over night since it will dry out the air inside the tank (unless water is condensing on the surface like crazy).

Bedding and Housing

The beetles require bedding material to hide and pupate. Cardboard and foam blocks are excellent sources for bedding material. Make sure to keep the bedding dry by maintaining the humidity inside the tank at a reasonable level.

Removal of objects from the tank

If any object, e.g., flesh, bones, and cardboard, needs be removed from the tank, it should immediately be placed into a re-sealable plastic bag, and into the freezer. To ensure that all the beetles, larvae, and eggs are killed, the contents should be kept in the freezer for at least 3 days. After taking the plastic bag and its contents out of the freezer, you should dump the contents into a regular plastic bag used in wastebaskets, while saving the re-sealable bag for future use. Tie the waste bag and dump them into a dumpster located outside the lab.

Pests

There are two pests that you need to look out for: *Lardoglyphus zacheri* and *Necrobia rufipes*. Both pests are harmful to the colony, so quickly remove them with a tweezer and kill them if you see them. *L. zacheri* are small white mites that begin to appear when the humidity level in the tank becomes too high. To prevent this, keep the tank relatively dry and well ventilated. *N. rufipes* are small beetles with green-blue iridescence that come from dead specimens. They are especially harmful since they eat both the dead specimens and the dermestid larvae. To decrease the chance of them appearing, make sure specimens entering the tank have been kept in the freezer beforehand, although some are able to survive through extreme cold for a long time. If you see a growing population of pests in the tank, it may be necessary to start the dermestid colony over again (read below).

Cleaning and re-colonization

Between every 6 months to a year, the tank should be cleaned to prevent further accumulation of old cardboard, paper towels, skin molts, frass, and dead beetles. This may be done bit by bit every week or in one sitting. To clean the tank gradually, bait the beetles to one side of the tank with food and leave for a day, allowing them enough time to migrate. Once the area you want to clean is relatively free of dermestids, remove objects as desired. To clean the tank in one sitting, you must also restart the colony. Before you begin, you should ask Dr. Sereno for permission or help. Re-colonization requires that you transfer 100—150 healthy beetles to a separate container. Then, bomb the room with insecticide to ensure that all the beetles and pests in the tank and the room are dead. Then put the dead beetles and objects into a plastic bag, and throw it away. Then take the tank outside and rinse the tank with sponge and soap. Let it dry and then, transfer the surviving 100-150 dermestids back into the tank.

Light

Make sure to turn off the light before leaving the room. The dermestids prefer dark areas.

LASTLY, KEEP THE ROOM CLEAN AND ORGANIZED!