

Acquiring and Caring for Captive-Bred Madagascar Hissing Cockroaches:

A Guide for the High School Biology Classroom

By Dr. Ron Wagler

Acquiring Captive-Bred Madagascar Hissing Cockroaches

Captive-bred Madagascar hissing cockroaches (*Gromphadorhina portentosa*) can be purchased online or at pet stores and cost between \$2 and \$10 each. An inexpensive way to have large numbers of Madagascar hissing cockroaches (MHC) for your classroom activities is to set up a breeding colony. Purchase no less than ten MHC young (i.e., nymphs) to begin your breeding colony but if you can purchase twenty do so. If you are able to purchase adult MHCs request four adult females for every one adult male and again purchase between ten to twenty individuals. Both of these scenarios will increase the chances that your breeding colony will provide large numbers of roaches for many years to come. Male and female MHCs are easy to identify when adults. Adult male roaches have two large protruding bumps (tubercles) on their dorsal plate (prothorax) behind the head (See Figure 1). Adult females also have tubercles in the same location but they are reduced and smooth (Mulder and Shufran 2016). For further information on identifying adult male and female MHCs, search Google Images for *male female hissing cockroach*. If you are unable to buy the MHCs because of their cost, a local zoo, nature center or university may let you borrow or have them. Before beginning the MHC activity, consult with your school nurse and with students' parents to make sure none of your students are allergic to MHCs or to any allergen that will result from the MHCs being in the classroom. Also check to see that your school does not have any policies against keeping live animals in the classroom. Remember to always treat your MHCs in an ethical manner and never engage in activities that will harm them. For further guidelines on the responsible use of living animals in the science classroom, see the National Science Teachers Association position statement at www.nsta.org/about/positions/animals.aspx

Figure 1: An Adult Male Captive-Bred Madagascar Hissing Cockroach (*Gromphadorhina portentosa*)



Photo by Author.

Caring for Captive-Bred Madagascar Hissing Cockroaches

One of the best enclosures for your MHC breeding colony is a plastic 18-gallon storage tote (See Figure 2). These containers can be purchased at most major department or home improvement stores. MHCs have the ability to climb many surfaces so it is important to have a well-sealed lid on your enclosure. If you do have a lid on your enclosure and MHC nymphs are still escaping place an 8 cm wide layer of petroleum jelly around the top inside wall of the enclosure where the container wall meets the lid. Make holes in the enclosure lid that are no larger than 3 mm in diameter. Add a 2.5 cm deep layer of coconut fiber (i.e., coir) to the bottom of the enclosure. Coconut fiber can be purchased at pet stores. Place egg flats vertically in the enclosure (See Figure 2). This will provide ample space for your MHCs to live.

Figure 2: Madagascar Hissing Cockroach Enclosure



Photo by Author. Note: A 2.5 cm deep coconut fiber substrate has been added to the bottom of the enclosure. The egg flats should be positioned in the enclosure as shown in the picture. The food dish is in the upper right corner of the enclosure and the blue water cooler is in the lower right. An adult MHC is drinking from the water cooler wick.

As with all living organisms, food and water are essential. Water can be poured directly on one corner of the exposed substrate, you can make an MHC water cooler (See Wagler 2010 in References) or you can provide water to your MHCs using apples. If you combine a large-volume water cooler with a large amount of dry dog food, your enclosure will require less maintenance and you will be able to check on your MHCs less frequently. The dry dog food can be placed on the enclosure floor or in a food dish. You will also want to supplement the dry food with varying types of fresh fruits and vegetables, such as celery, carrots, tomatoes, squash, grapes, red leaf lettuce, romaine lettuce, bananas, banana peels, orange slices, apple slices, pea pods, potato slices and sweet potato peelings (Mulder and Shufran 2016). If any of the food becomes moldy remove it from the enclosure.

Proper temperature is also important for the well-being of your MHCs. Because MHCs are from a tropical to subtropical climate, they do well at a room temperature of 72°F to 76°F. Do not expose roaches to prolonged temperatures lower than 65°F. Because roaches are ectotherms, they tend to act lethargic and will not mate when they are exposed to temperatures lower than 70°F. When MHCs are exposed to higher temperatures (approximately 80°F or higher) for prolonged periods, they increase their activity levels and may mate. Place a heat cable (i.e., Zoo Med brand) on one end of the enclosure to raise the temperature of your enclosure into the mid 80°F so that your roaches will breed. Follow all safety precautions when using the heat cable. Heat cables can be purchased at pet stores. Do not expose MHCs to prolonged temperatures over 90°F. The gestation of MHCs is between 60 and 70 days, and a female will give birth to 20 to 40 nymphs over a one to two day period. After the nymph (which is white upon birth) is born, it will undergo six molts (shed its exoskeleton) before reaching full development in five to ten months. The length of a full-grown adult MHC varies from five to ten cm (Darmo and Ludwig 1995). The weight of MHCs varies from approximately less than half a gram at birth to approximately 24 grams as adults. Dead MHCs can be placed in the trash. Note that it is not possible to cover all aspects of the care and captive breeding of this species in this one article but the essential aspects have been presented. I have found these care and captive breeding techniques to be successful but you will find other techniques online. If you have further clarification questions about these care and captive breeding techniques please contact the author by email at rrwagler2@utep.edu.

References

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