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Sugar Preparation and Feeding

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Protocol status: Working

We use this protocol and it's working

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Abstract

Aedes mosquitoes, especially males, are dependent on flower nectar. Raising them in artificial conditions demands offering a sugar meal to maintain their life cycle. The potassium sorbate sucrose solution is used for maintaining adults in breeding cages, as well as for males destined for field releases. The sterile male release batches are fed with sugar-soaked cotton strips that are replenished daily until final field release.

Potassium sorbate inhibits fungal and bacterial growth in sugar solutions offered to adult mosquitoes. Please review the SDS for potassium sorbate before working with the compound. It is generally recognized as safe and less toxic than table salt; however, gloves and eye goggles are recommended while working with the compound and resulting sugar solution.

We will always need the sugar solution since it is used to maintain both the colony cages as well as the release males. Always make more and always keep a stock on hand.

Attachments



Sucrose protocol (24...

1.5MB

Guidelines

If running low on sugar, bags of sugar may be readily procured from the stockroom. If we are running low on potassium sorbate, please inform the AST supervisor so that more may be ordered.

For sugar feeding cages, please note that the eye straps must be installed prior to using the sugar feeders. Eye strap installation and other cage retrofitting procedures are not covered here.

It is vitally important that the sterile males have constant access to the sugar. This provides them with humidity, hydration and an energy source to utilize while they await their release. They will quickly die if the sugar solution is withheld or if it dries up.

Materials

Sugar Preparation:

- 1 gal Nalgene bottle
- 1000 mL graduated cylinder
- Reverse Osmo Water (RO-water)
- Granulated sugar (sucrose)
- Potassium sorbate
- Scoopula
- Plastic Weigh boats
- Balance

Sugar Feeding (adult cages):

- Sugar and potassium sorbate solution
- 50 ml skirted centrifuge tubes (2 per cage)
- Rubber bands
- Lens cleaning cloths
- Metal ceiling hooks
- Nalgene squirt bottle
- Cordless drill and bit
- Nitrile gloves
- Lab safety goggles

Release feeding:

- Sugar and potassium sorbate solution
- Plastic tray
- 12", 1 lb Cotton roll (Padco)
- Guillotine paper trimmer
- Nitrile gloves
- Lab safety goggles

Safety warnings

- ! Use personal protective equipment, such as gloves and eye goggles. When cutting cotton into strips, the blade is extremely sharp and so you must exercise extreme caution as you feed the cotton sheet through the trimmer. There is a guard on the trimmer that can reduce, but not eliminate, the risk of laceration or amputation. When cutting the strips, focus on the task and stop immediately if distracted.

Before start

Weight all necessary components beforehand

Preparing sugar solution

- 1 In a 1 gal Nalgene bottle, add 3000 ml of reverse osmose water using a 1000 ml graduated cylinder.
- 2 Add 330 g of granulated sugar to the bottle.
- 3 Close the bottle and shake until the sugar has completely dissolved.
- 4 In the balance, set one small weigh boat on the metal plate and tare the balance.
- 5 Measure out 3.3 g of potassium sorbate on the weigh boat.
- 6 Add the potassium sorbate to the 10% sugar solution.
- 7 Gentle agitation to incorporate the potassium sorbate into the sucrose solution.
- 8 Label the bottle with the preparation date and store the solution in the refrigerator.
- 9 Whenever a bottle of sugar solution has been depleted, immediately wash and rinse it. Begin to prepare more sugar solution.
- 10 If running low on sugar, bags of sugar may be readily procured from the stockroom. If we are running low on potassium sorbate, please inform the AST supervisor so that more may be ordered.

Cage feeding

- 11 Remove the cap from a 50 ml skirted centrifuge tube and drill a 1/8" hole in the side of the skirt on the tube (Figure 1).



sugar feeders.jpg 229.7KB

- 12 Obtain a large piece of lens cleaning cloth and cut into 2" x 2" squares. Set aside.
- 13 Hold a drilled tube upright and add sorbate sucrose solution to the brim of the tube using a squirt bottle.
- 14 Place a lens cloth over the top of the tube and roll it down over the sides of the tube, making the surface of the lens cloth taut over the top of the tube.
- 15 While holding it tight, wrap a rubber band around the tube to secure the cloth to the tube.
- 16 Invert and check to ensure that the cloth is wet but not leaking. If leaking, ensure that the cloth is taut over the opening.
- 17 To place a feeder in a cage, insert the narrow bent end of a ceiling hook into the hole on the skirt.
- 18 Pinch the wire loop with two fingers to open the triangular end of the hook and latch the hook onto the eye strap in the cage.
- 19 Place two feeders into each cage and check weekly. Replenish as needed (Figure 2).
 Sugar in cage.jpg 185.8KB
- 20 Once a cage has been scheduled for termination, remove and disassemble the sugar feeders.
- 21 Dump the sorbate sucrose solution down the sink and rinse the tubes and rubber bands.
- 22 After blood feedings and oviposition, the cloths will have blood stains and occasional eggs. Place the dirty lens cloths in a bleach solution and let sit until they are relatively free of blood stains.
- 23 Rinse with water thoroughly until clean and free of bleach. Hang to dry.

Release Feeding

- 24 Obtain a cotton roll from the supply area. Using the paper trimmer, cut the unfurled cotton roll into strips approximately 1-1.25" wide.
- 25 Once a sufficient number of strips have been cut, gather them and remove the paper backing.
- 26 Fold them in half and place them in a plastic tray. They may be stored this way for future use. Maintain an adequate store of strips for use throughout the week.
- 27 When ready to use, place the folded strips into a separate plastic tray.
- 28 Inundate the tray with the potassium sorbate sugar solution. The cotton will absorb a large quantity of solution.
- 29 Once the strips have been inundated and are sufficiently soaked, remove one strip at a time and, using gloved hands, gently squeeze out excess solution so that when you hold the strip in your hand it is wet but not dripping.
- 30 Rewet strips if you can see individual cotton fibers or dry spots.
- 31 Gently fold strip into a V-shape and place it on top of the male release container with the open end of the V corresponding to the side of the bucket with the number label (Figures 3 and 4).  Release buckets.jpg 313.4KB  Bucket top.jpg 123.1KB
- 32 Once the sugar strips have been placed on the containers, move the containers to the larval room.
- 33 Check sugar strips daily. If dry, remove them from the top of the buckets, place them into a plastic tray, and inundate with sugar solution as described above.