

Protocol for maintaining *Gryllus bimaculatus* culture (17th Jun 08)

Equipment

1. **Boxes:**

Cages can be ordered from <http://www.petco.com/>

Cricket culture at Cambridge:

12 small cages: 40 x 25 x 25 cm (length x width x height)

7 big cages: 62 x 42 x 30 cm

total length of lower shelf in the insect hut: 430cm x 48cm

2. **Shavings:** used to cover the ground of boxes (makes cleaning much easier!)

3. **Egg boxes:** as a shelter for the crickets

4. **Light timer**

5. **Petris dishes with cotton:** as water supply and place for egg deposition

6. **Water gel:** as water supply

7. **Cricket food 1:** commercial orange “cubicles”

8. **Cricket mix 2:**

1. Put following ingredients into the mixer bowl

1000g Porridge oats

1000g Wheatgerm

500g Maize meal

50g Soya powder

50g Yeast

50g Granulated sugar

5g Salt mix

2. Mix together thoroughly

3. Then add 250 ml pure corn oil

4. Mix again until all oil is absorbed

5. Decant into stock bin

lasts for a few (3-4) months for the cricket population

Setting up a container for keeping crickets

1. Fill up the container with ~1/2 inch of shavings.
2. Then place egg boards at one half of the container in order to create a shelter for the crickets (important also for territorial behaviour of crickets)
3. Add
 - a. 1 small (3inch) Petri dish with moist cotton as a water supply (cotton just prevents that the crickets don't drown in the water)
 - b. 1 small (3inch) Petri dish: water gel
 - c. 1 small (3inch) Petri dish: orange cricket food (cubicles)
 - d. 1 large petri dish (5inch) with cricket diet

Maintenance

1. **Feeding:** Crickets are easy to keep, as long as they are provided with enough food and water **every day**. Usually a Petri dish with the insect diet lasts for days, and doesn't go bad, as long as it doesn't get mouldy. Once the cricket food is running low, discard the leftovers and fill up the Petri dish with new food mix. It's really critical that the crickets are provided with enough water all the time. Usually water should be added to the Petri dish with the cotton every day. The water gel dries out after 1-2 days, just add a bit of water, so that the gel fills up with water again. In cages with young crickets (sexually not mature yet) add as much water as the cotton can take. Since the same Petri-dish serves as a water supply and a place for eggs laying. Only add enough water that the cotton is a little bit moist, otherwise the crickets won't lay eggs. If the cotton can not replace the next day, fill up the Petri-dish with water as well.

Optional Crickets can also be provided with lettuce and carrots (not necessary though), but use only organic vegetables (risk of insecticides-contamination)

2. **(Optional:) Collecting eggs from the cotton:** Eggs are washed out of the cotton in a 2 liter beaker with tap water. Let eggs sink down and the cotton will float in the water. Use large forceps to swirl the cotton around in the water, so that more eggs will sink to the bottom. Remove cotton from the water and keep it in a Petri-dish for a subsequent wash. Drain water carefully in a tea sieve so that the eggs will stay at the bottom. Take the cotton fibres out from the tea sieve (might contain some eggs) and add it to the large cotton pile. Then add water to the almost empty beaker and drain the water again in order to remove the remaining cotton fibres in the water. The beaker should now contain clean eggs freed from the cotton. Add water, swirl the eggs in the beaker and drain the water quickly into a sieve with a mesh, so that the eggs are washed out of the beaker into the mesh. The eggs can then be collected easily from the mesh. Embryos also develop in the cotton without washing them out first. It's easier (faster) to incubate the eggs still in the cotton but there is a risk that the cotton dries out (and the eggs..). Therefore one should check the cotton if it's still moist to prevent desiccation.

3. **Incubating eggs:** use a 6cm Petri-dish, add cotton on the bottom, and moisten it with PBS. Then place one piece of filter paper on top of it. The filter paper should become moist as well. Don't use too much PBS, otherwise the eggs will drown and not develop. Ideally, it should be only enough PBS so that the Petri-dish remains moist for the whole development (~12days). Then place the eggs on the filter paper, cover the eggs with another piece of filter paper and close the Petri-dish. Label the Petri-dish with the date and time of collection.
4. **Keeping crickets:** The generation time of crickets is roughly 2 months at 30°C, but everything between 25-30°C should be fine (they live in South Europe, Asia, South Africa..). The generation time will go up at lower temperatures.
5. **Changing the cages:** crickets from one egg collection (eggs from one week) can be kept in the same cage until they reach the final moult. Adult crickets are easily recognised by their fully developed wings, and females carry a ~1 inch ovipositor. If running low of large cricket cages, combine two cages of the oldest crickets.

Schedule

Maintenance (every day!):

- Replace small petri-dishes with eggs from the container with adult crickets with fresh petri-dishes with cotton. Make sure that the cotton is a bit moist (not too much, otherwise the eggs won't develop).
- Put lid on the petri-dishes with eggs, label them (date of collection) and place them up-side down (lid on bottom) in the 28C incubator.
- Add water to the Petri dishes with cotton every day. In those containers with nymphs, add enough water, so that the cotton is completely moist. Replace the cotton after a few days (when it becomes gross..)
- Add water gel, or add just water to the petri dish with the gel in it. Always make sure that the petri dish is filled up with water gel.
- Fill up petri-dish with food mix (cereals); throw away old cricket food when necessary
- transfer eggs from the 28C incubator into the cage in the 28C room **every day** so that one cage contains crickets hatched within one week.
- Check petri-dishes in 28C incubator if the cotton becomes too dry. Add a tiny bit of H₂O or PBS with the spray bottle to the cotton when necessary.
- remove old dry cotton from the container (cotton where crickets hatched) and transfer to an empty container. Freeze this container (to make sure that the cotton doesn't contain any surviving baby crickets).
- Clean up container at -20C from the day before: throw away the cotton and keep the petri-dishes

Maintenance (every week):

- Set up a new cage every week and (generation time is around 2 months, this means that 8 cages are required)
- Merge cages with adult crickets, when the crickets don't lay eggs any more. Freeze the empty cage (with shavings) before throwing the shavings and egg cartons to the trash. Make a note on the label of the container.
- Split cages, when a cage with nymphs becomes too crowded (>100 crickets/cage). Otherwise the crickets will start to cannibalise each other. Make a note on the label of the container

Cleaning the tanks:

- Put shavings and Petri-dishes into one large container, put it at -20C over night and clean the container the next day
- Rinse tanks with warm water, then spray with multi-surface cleaner
- rinse again and allow to dry

General cricket information

Cricket sizes sold from Livefood direct:

- Micro: 2-4mm
- Small: 5-8mm
- Small/medium: 9-12mm
- Medium: 13-18mm
- Large: 19-25mm
- Adult: 25-30mm