

Langerhans Lab Protocols

NC STATE UNIVERSITY

5-20 gallon Tank Maintenance

- The 5-20 gallon tanks should be maintained by: 1) changing 50-80% of the water (siphoning out all debris at the bottom) every 2-3 weeks; 2) cleaning the filter; 3) replacing the filter media every 4-8 weeks; and 4) monitoring water quality using the nitrite, nitrate, and ammonia freshwater test solutions (see instruction manual). Water changes and filter maintenance frequency will vary among tanks depending on the number of inhabitants, duration of filter media use, water quality test results (see water chemistry target range protocol), and general debris/algae load.
- Periodic water quality testing is required by our IACUC protocol. The quote below was copied from an e-mail by Gabriel McKeon (DVM, DACLAM, University Attending Veterinarian, NCSU, LAR) to Brian Langerhans (PI), Erik Archer (current Lab Manager), Kay Coole, Judith Lassiter Schledorn, and Paula DeLong on 1-31-14:
“Please ensure that water quality results are recorded and available for review. The frequency will largely depend upon performance of the fish, but a standard frequency should be established in your SOP. I think by and large, a weekly test is sufficient for most colonies of fish in a stable environment a[n]d subsequent water changes as needed.”
Use the test solution instruction manual (near solution bottles), water chemistry target range protocol (in binder), and testing device maintenance/instructions (in binder) for proper test procedures and frequency. Test result values are recorded on a water chemistry record log sheet in the binder for each room.
- Use water from the Aquatic Eco-Systems rack in BRF 223 to refill cleaned tanks using the clear tube coiled up at the upper right of the rack as you walk in the door. This tube runs at ~0.72 gallons/minute. **Always set a timer with an alarm for the appropriate amount of time it will take to fill buckets, etc., to prevent wasted waiting time and overfilling** (e.g. If you are filling a 5 gallon bucket, set a timer for 6.5 minutes).
- Keep track of which tanks were cleaned and/or treated (e.g. stress zyme or fungus clear) by logging your work on the ‘daily notes’ log sheet in the binder.
- Keep track of filter media changes for each tank by placing a tape label on the tank or filter indicating the date of media change.
- Make sure the fish have had enough time to eat (at least 10 min) before siphoning water out for cleaning.
- **Keep a close watch for any mature males in fry tanks! Move any males you find into separate tanks (by brood) as soon as possible!**

Cleaning steps:

1. Unplug the filter from the power strip.
2. **Carefully** remove the tank lid.
3. Remove the filter, being careful not to allow water in the filter reservoir to enter the tank, and set aside.
4. **Carefully** remove the plants and structures without disturbing the fish as much as possible.
5. **Carefully** use the large, blue siphon to remove all debris (not including the gravel) from the bottom of the tank.
 - a. Position a waste water bucket below hose outflow (small end of siphon tube).
 - b. Use the squeeze valve to start water flowing.
 - i. May require several pumps with the squeeze valve.
 - ii. **Be very careful to not draw up any fish!**
 - c. Periodically monitor the outflow.
 - d. Place the wide end of the siphon tube on the bottom of the tank at a slight angle to obtain the desired amount of suction.

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- e. Slowly move the tube through the gravel keeping the end of the tube in contact with the tank bottom to draw up debris.
 - f. Lift the tube off of the bottom periodically to allow the cleaned gravel to fall out of the tube and prevent the gravel from restricting flow.
 - g. When done siphoning ~50-80% of the tank water, run tap water through the siphon hose for a few seconds to rinse.
6. Disassemble the filter (draw tube and filter media).
 - a. Rinse/scrub the plastic components with tap water and the cleaning brushes and let drain.
 7. If the filter media is within the ~1-2 month use window and has not been restricting water flow when the filter is on, rinse the filter media with **tank water** and set aside.
 - a. Reusing filter media that has been rinsed with tap water will kill any beneficial bacteria.
 - b. Refer to the label on each tank for the date the filter media was changed last.
 8. If the filter media is not within the ~1-2 month use window and has been restricting water flow when the filter is on, replace it.
 - a. Discard and replace the filter media using the appropriate BioBag filter size and included carbon packet if necessary.
 - i. Thoroughly rinse new filter media and carbon with tank water to remove carbon dust before installing the filter.
 - ii. Make note of the renewed media by indicating the date on a label for each tank.
 9. Reassemble the filter and set it aside.
 10. Use a clean sponge (not filled with tap water) to **carefully** scrub all sides of the inside of the tank to remove algae.
 - a. Attempt to disturb the fish as little as possible.
 11. Replace the filter.
 12. Refill the tank with BRF 223 rack water to just above the draw tube fitting on the filter.
 13. Add ~1Tbsp of Stress zyme (beneficial bacteria solution) to the filter reservoir, behind the filter media.
 14. Fill the filter reservoir with BRF 223 rack water and allow some to pass through the filter and into the tank.
 15. Plug the filter in to activate the motor.
 - a. If necessary, slowly pour BRF 223 rack water into the filter reservoir until the filter starts to pump water at a normal rate.
 16. Adjust the flow of water using the knob at the top of the filter uptake shaft (if applicable).
 - a. Because *Gambusia* do not like strong current, allow the pump to run at full strength only for a few minutes after finishing the cleaning so any remaining suspended material will be quickly drawn into the filter and removed from the water; turn the flow down afterward.
 17. Replace the tank lid and top off the tank to the bottom of the black frame at the top of the tank.
 18. Check to make sure the fish seem to be doing okay before moving on to the next tank.
 19. Keep track of which tanks were cleaned and/or treated (e.g. stress zyme or fungus clear) by logging your work on the 'daily notes' log sheet in the binder.