

Introduction

Zebrafish (*Danio rerio*) are a key experimental vertebrate model that shares the same internal organs and many of the same genes that humans have. They are currently being utilized in research areas that include the study of human disease genetics (e.g. development, metabolic diseases, etc.), behavioral studies (e.g. neurological development) and toxicology. Recently there has been great emphasis on improving the psychological wellbeing of zebrafish. We at the Cleveland Clinic have developed an in-tank enrichment item for them that we have named squidlies. Environmental enrichment is important because it provides the animal with sensory stimuli. Additionally, animals housed with enrichment have shown to have positive effects when dealing with unpredictable chronic stress.

Squidlies: What are they?

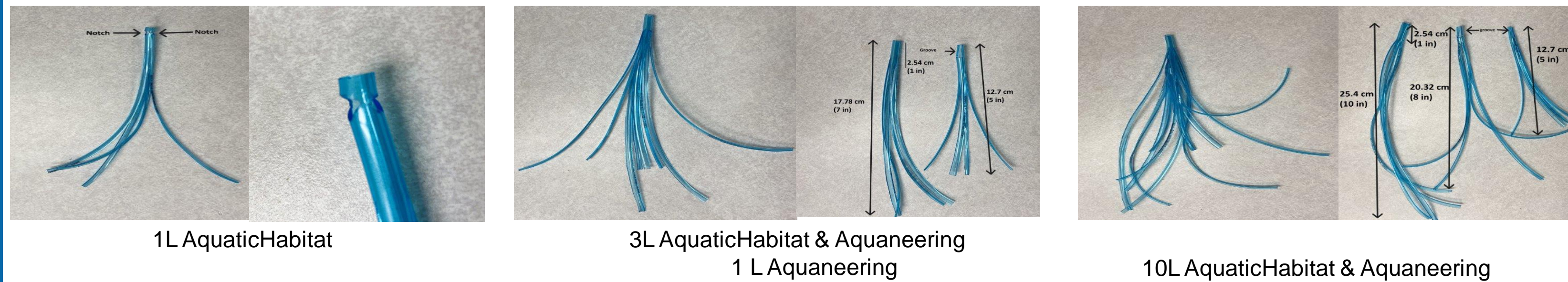
Squidlies are an inner tank form of enrichment that allows the fish to swim around them. They mimic tree/plant roots in the water. In addition, they help reduce aggressive acts.

Material

- Repurposed polyurethane waterline(s)
 - 1 for 1L
 - 2 for 3L
 - 3 for 10L
- Ruler
- Utility knife
- ¼" square rod
- Sodium bicarbonate
- Castration bands



Design



- Cut the desired length of the waterline(s).
- Leaving 2.54cm at one end untouched, split waterline into fourths with utility knife.
 - Insert ¼" square rod into waterline and use as a cutting surface.
- Repeat with another piece of waterline that is 5.08 cm smaller.
- With the untouched end of the smaller tube cut a groove.
- Place grooved end inside the longer tubing.
- Use Sodium bicarbonate as a lubricant .
- Split and notch one more piece if it's for a 10L.
- Attach to lid with castration band.

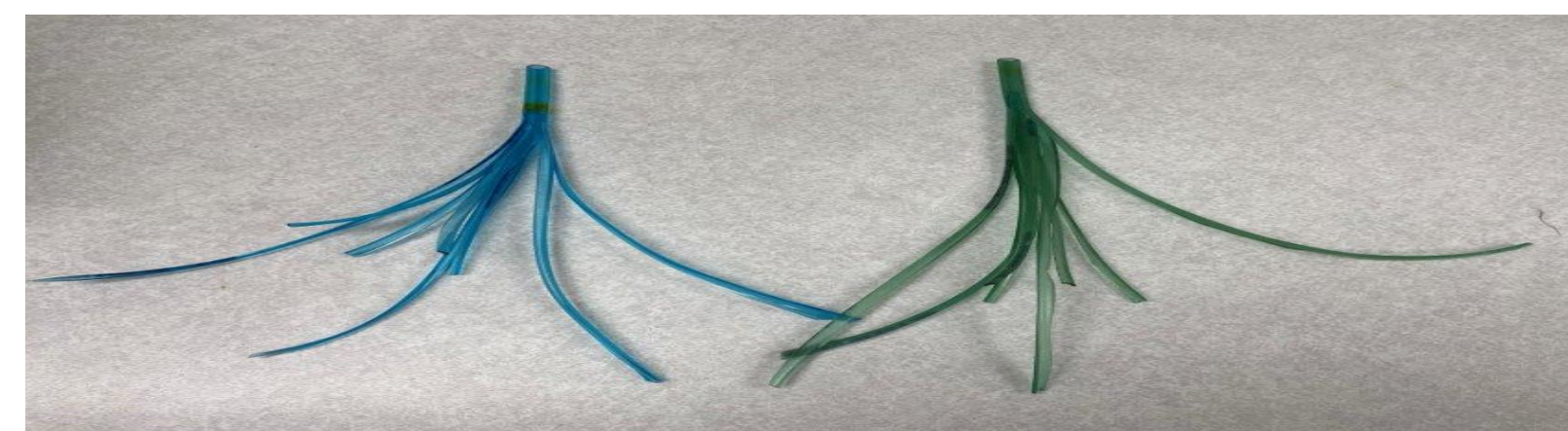
Deviation in Design

For AquaticHabitat 1Ls the squidlies are made by cutting one piece of waterline into fourths leaving 2.54cm at the end. That section is notched and is placed between the pegs of the baffle.



How to clean?

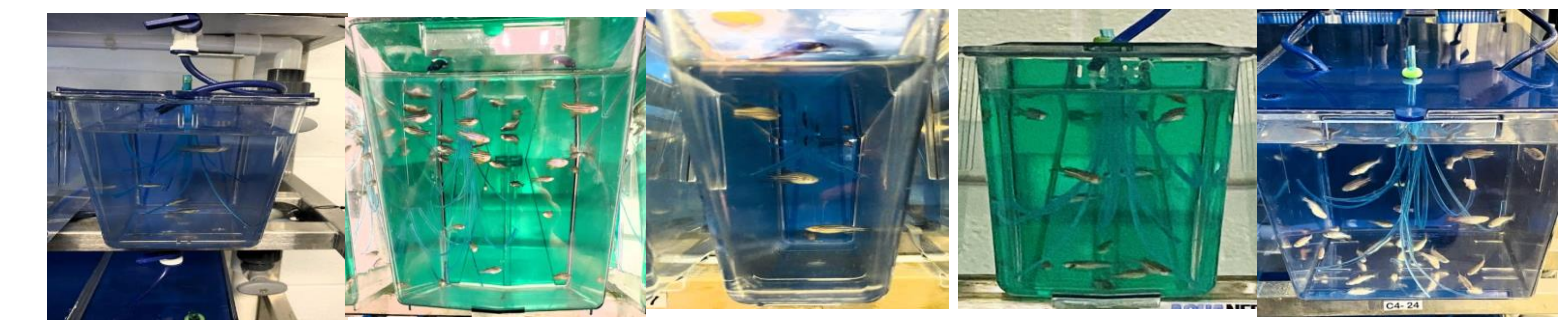
Soak in Virkon Aquatics® for 10 minutes in a 1% solution, then thoroughly rinse.
 1% solution Mixture: 1 scoop (provided) to 1 gallon of water.



On the right, a squidlie that was soaked 13 times in bleach. Not only did it become discolored the material became tacky. Left is a squidlie cleaned 12 times in Virkon Aquatics®. ATP testing confirmed cleanliness of the enrichment.

Results

There is currently only anecdotal evidence, but the fish appear to enjoy the squidlies. There is currently confounding variables, but we have noticed a decrease in the number of health reports and mortalities. When observing the fish they seem to prefer to shoal where the squidlie is located.

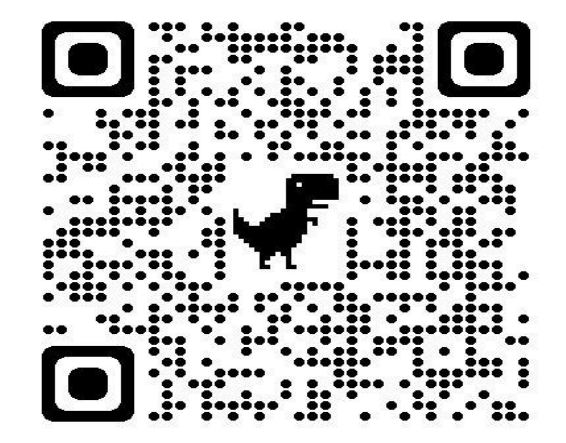


Future Plans

In the future, we would like to quantitatively identify if the zebrafish do shoal more towards the squidlies than open parts of their microenvironment. Additionally, we would like to test to see if the color of the material makes any difference to their preference.



Poster



LASPro Article
Pg. 40-42

Contact Information

Address: 9500 Euclid Avenue ND4-43
 Cleveland, OH 44195
 E-mail: woodh2@ccf.org