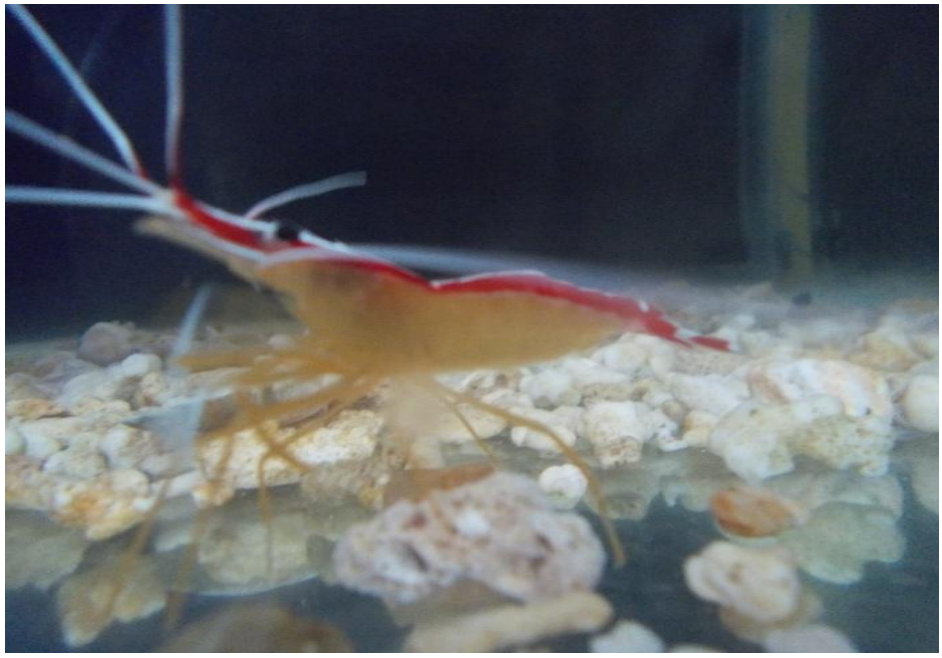
PRO 2161

SHRIMP BREEDING AND LARVAL REARING

(Cleaner shrimp)



By

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2016/2/29

CONTENT

1. Introduction

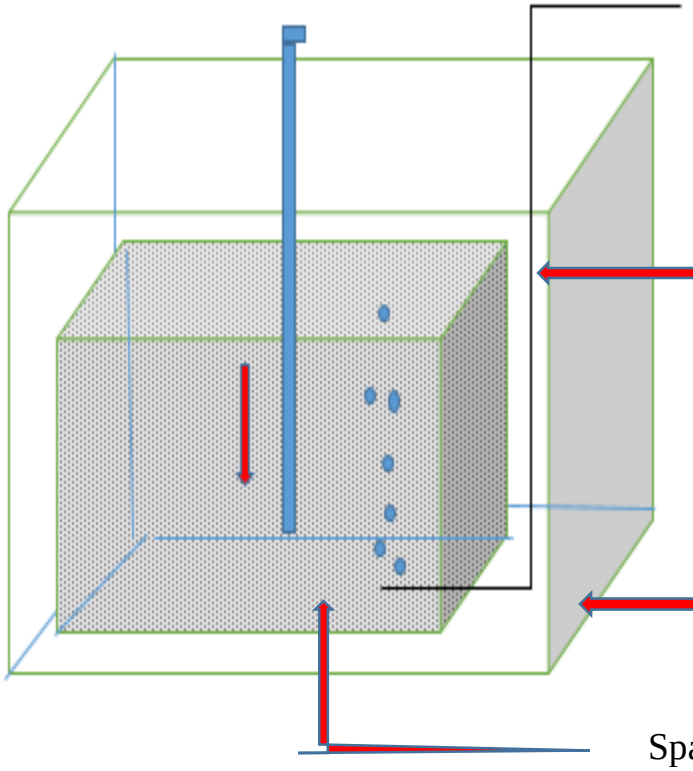
This is the second trial of shrimp breeding. Materials and methods used this trial may overcome errors in the first trial. Modifications are as follows:

1. Modified the spawning system
2. Modified the spawning chamber

Trial one failure	**Results**	**Modification done in the trial 2**
Accumulation of feed on the bottom	Increase ammonia level which is harmful to aquatic organisms	Aeration and water inlet extended to the tank bottom
Lack of aeration	Oxygen deficiency	Added an aeration system
Poor water recirculation	Oxygen deficiency	Added two power heads and modify the pipe lines
Poor water quality	High ammonia, low oxygen.	Added a bio filter

By **providing incoming water at the bottom of the tank**

- shrimps can obtain oxygenated water.
- turbulence prevent accumulation of waste on the bottom.
- Turbulence suspend larvae in the water column. Hence they can easily contact with food particles.

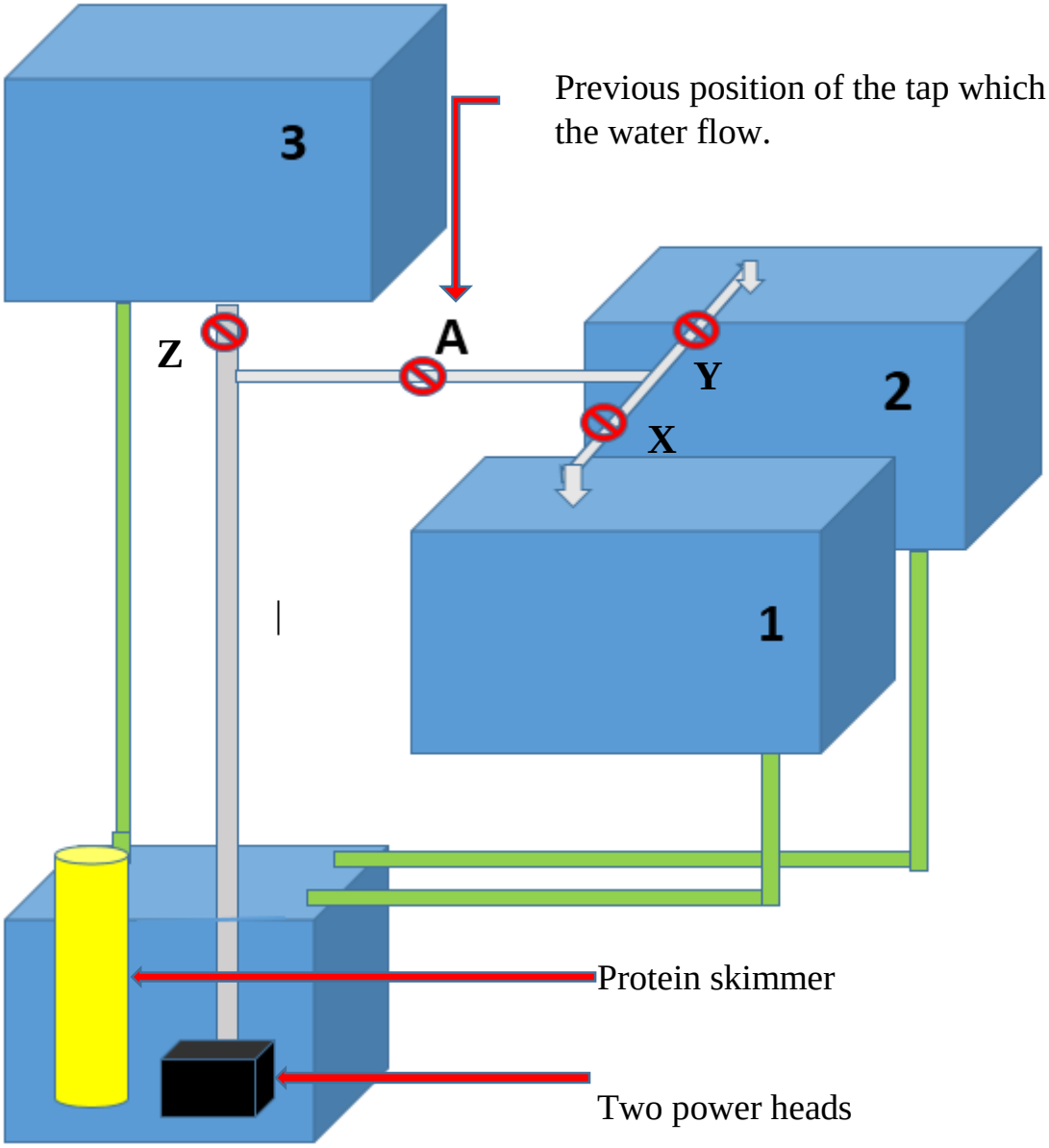


Aeration system on the bottom

- Shrimps can obtain more Oxygen.
- Waste do not accumulate on the bottom.
- Prevent aneaerobic conditions on the bottom.

40 L Tank

Spawning chamber



- X, Y, Z are new positions of taps. By them water flow of all three tanks can be easily fixed.
- Water flow of the tanks are now about 4L/min.

Also in this trial spawning chamber was modified. Previous spawning chamber was made with a mosquito net. But larvae, who are smaller than mesh of the mosquito net escape from the spawning chamber. This create several issues,

1. Larvae escaped through tank outlet pipe.
2. Cloth traps set at the outlets block the water circulation.

Therefore spawning chambers are replaced with a smaller mesh cloth (Organdi net) which can retain larvae inside it.

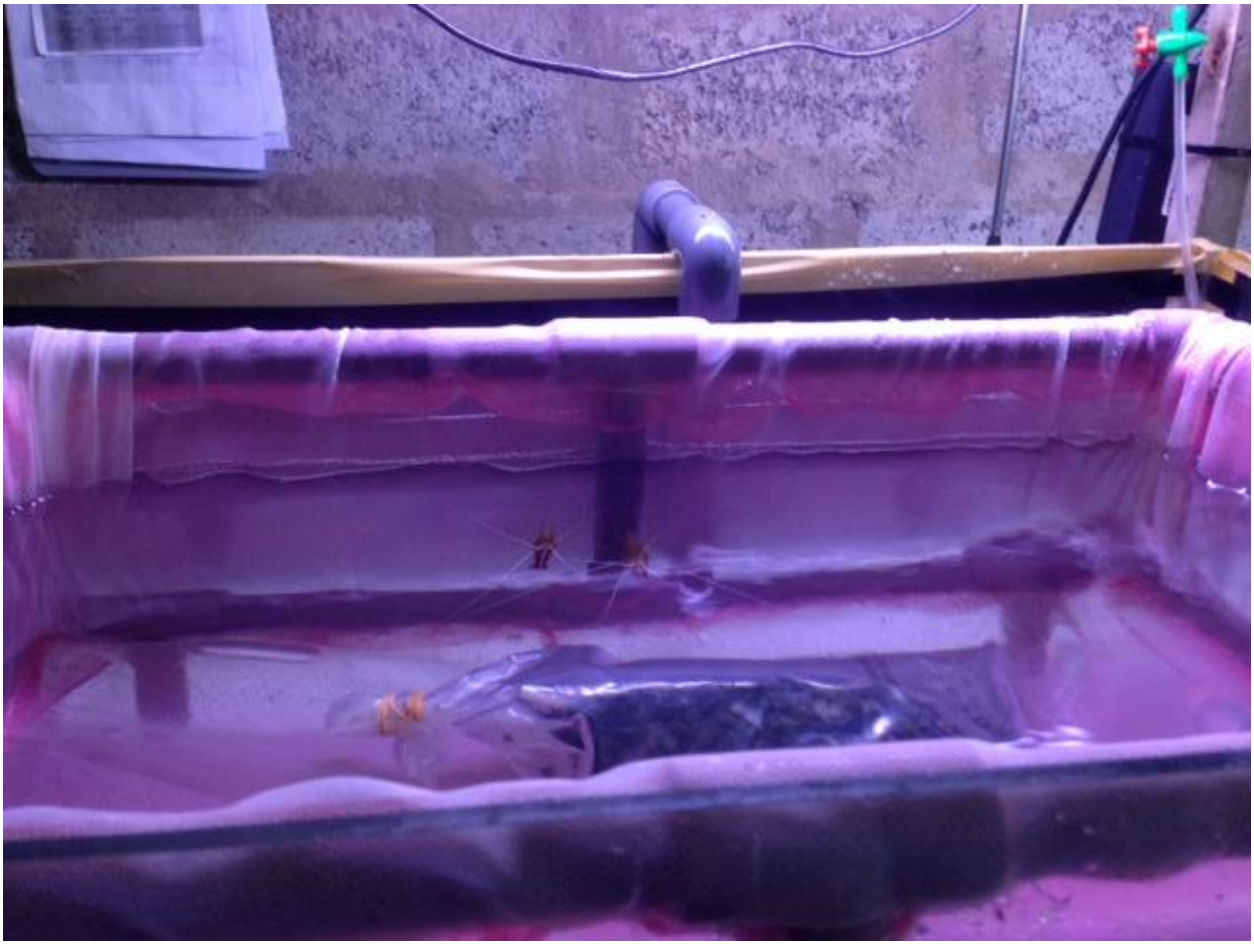


Figure 1: New spawning chamber

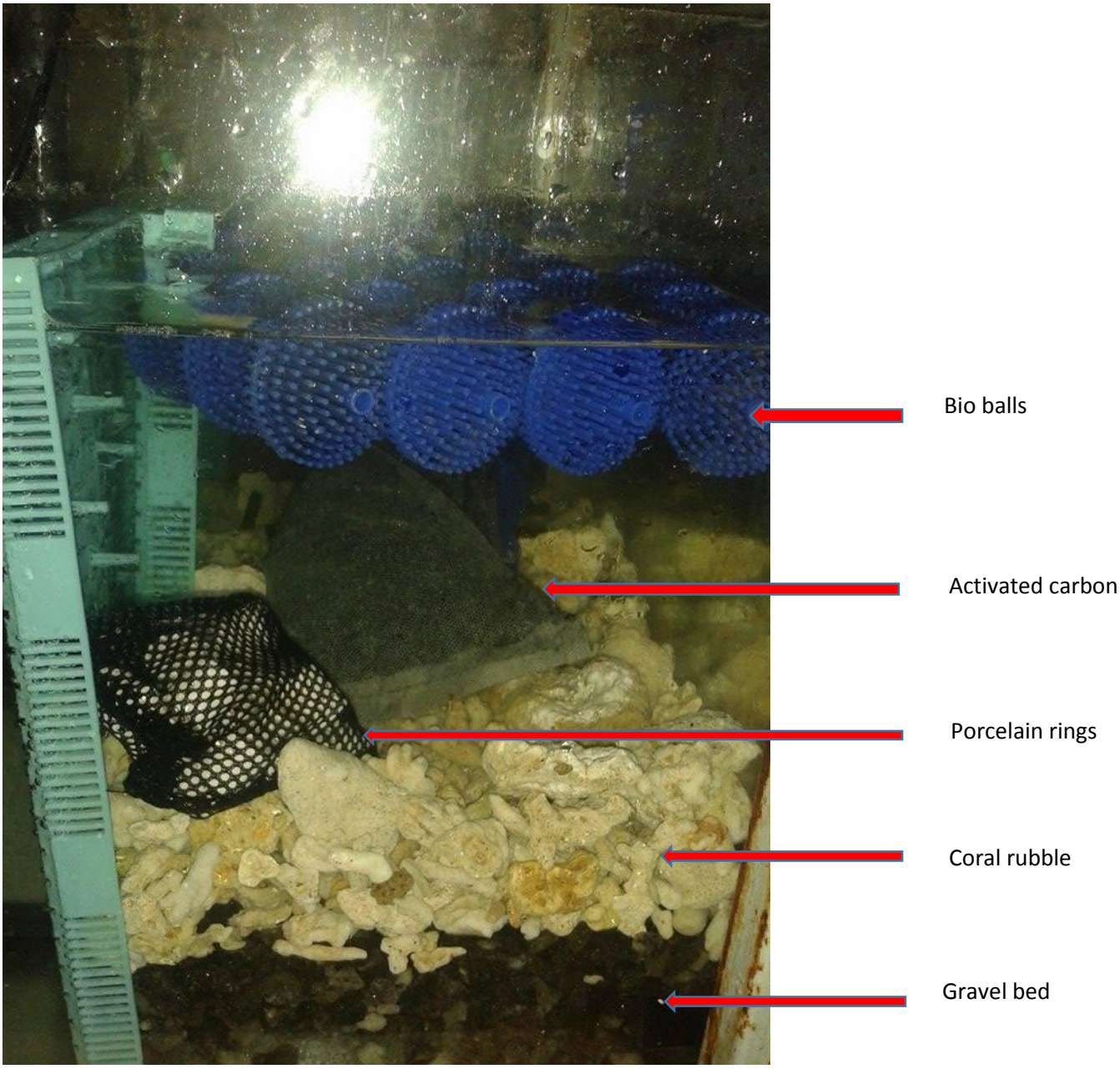


Figure 2: Bio filter in the shrimp system

2. **Brood stock and larval feeding**

Food items used in the previous trial one, using for the trial 2 also.

	Feed	**Time**
brooders	Egg custard	8.45 AM
	Egg custard	12.45 PM
	Pellet feed	4.45 PM
Larvae- DAY 5	Micro algae	8.00 AM
	Rotifers	11.00AM
	Micro algae	1.00PM
	Rotifers	3.00 PM
		5.00PM
Larvae- DAY 6 to 11	Enriched brine shrimp	8.00 AM
		12.00PM
		4.00PM
Larvae – DAY 12 to 5 months	Brine shrimp	8.00 AM
	Powder feed	12.00PM
	Brine shrimp	4.00PM

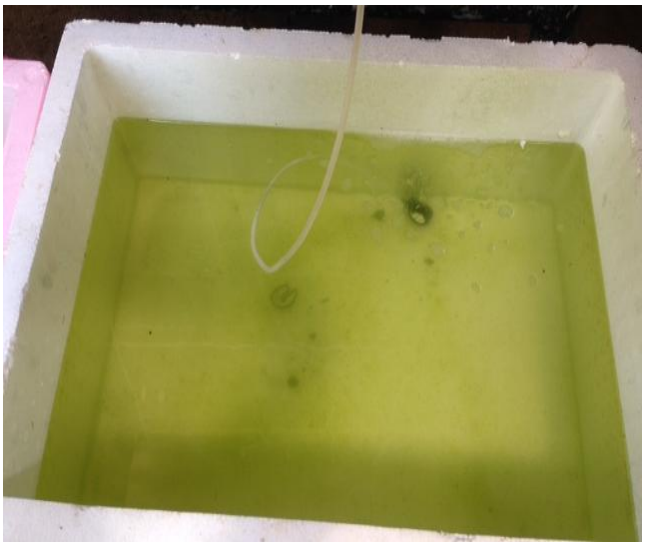


Figure 3: Marine chlorella culture in a styrafoam box

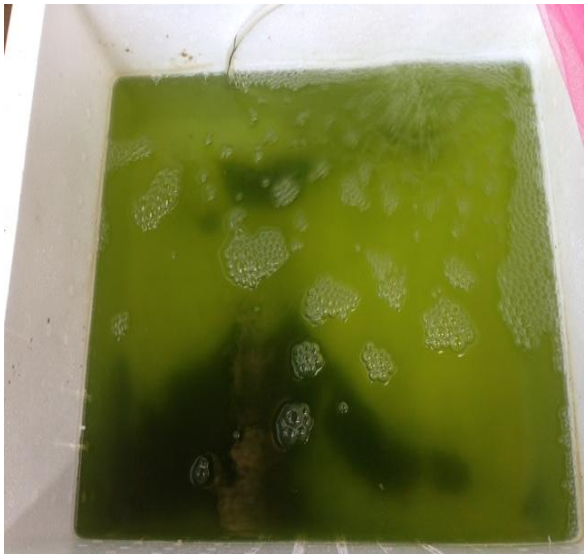


Figure 4: Rotifer culture in a styrafoam box

3. Procedure

a. Water quality was monitored prior to introducing brooders.

Parameter	value
NH_3 (ammonia)	0
NO^-_2 (nitrite)	0.20mg/L
NO^-_3 (Nitrate)	5.0mg/L
pH	8.0-8.5
Temperature	28°C
Salinity	35

b. Broodstock selection

A pair of Hipolis shrimps with length greater than 5 cm was selected from the back up tank. One shrimp should be larger than the other. Gave a 5 minute fresh water bath prior to introducing to the spawning chamber. Brooders were introduced to the system on 2016/2/16.

c. Brooders rearing

- Fed them according to the time table.
- Siphoned 20% water daily from the system.
- Give photoperiod of 24 hours.

d. Spawning and hatching

Eggs were clearly visible in females belly on 2016/2/24. One batch of eggs were hatched on 2016/2/29. Male was removed from the chamber. Eggs could be hatched during late night or early morning.

e. Larval rearing

Cleaner shrimps spend their larval stage from 58 to 140 days.

Fed larvae with chlorella according to the time table. 80mL of micro algae containing water was added to a tank per time.

Figure 5: 80 mL feeding spoon