INVESTIGATING WHICH SALINITY LEVEL IS BEST FOR COPEPOD SURVIVAL AND PRODUCTION

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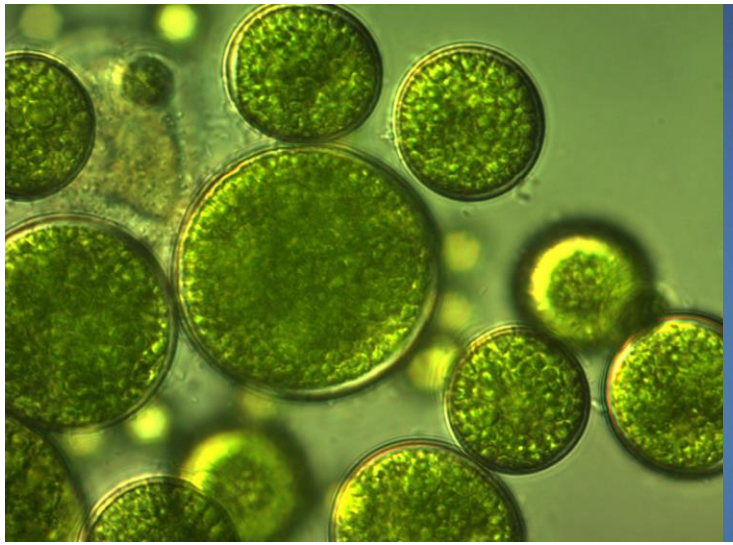
BACKGROUND INFORMATION

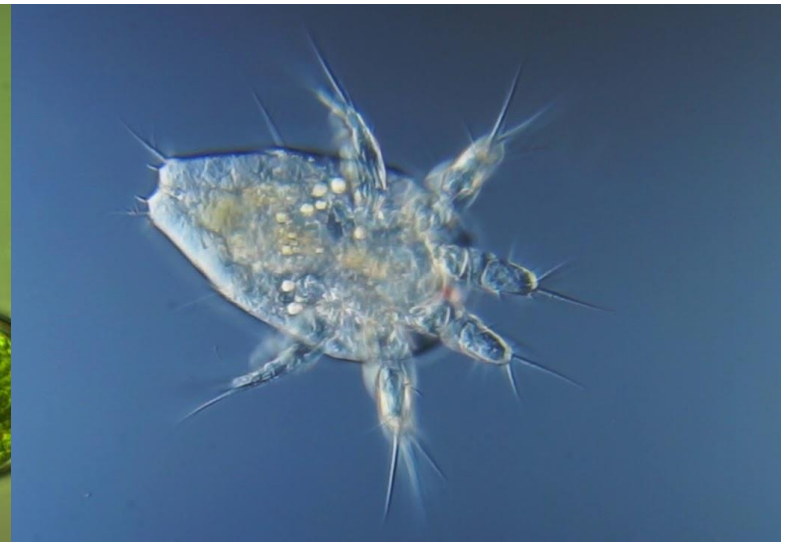
Genus: Apocyclops

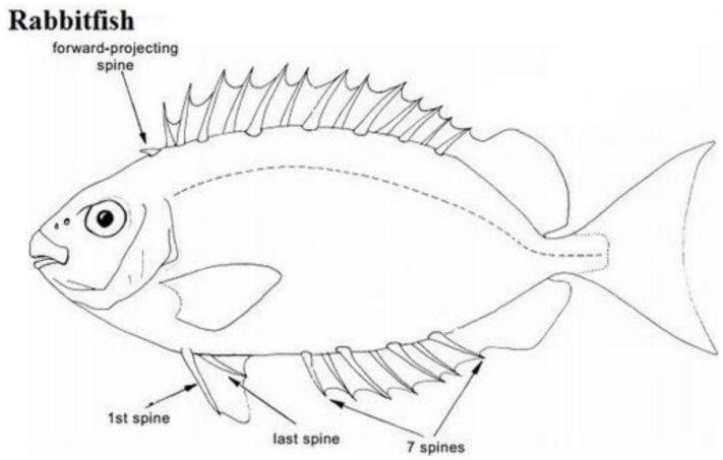
Species: Panamensis

Size: 0.1 - 0.4 mm

Apocyclops panamensis copepod are crustaceans found in both bodies of saltwater and freshwater. They're primary source of food is microalgae and copepods are the base of the marine food chain. Copepods are consumed by many small fish larvae (rabbit fish) after their yolk, as their first source of food making them a very important component in the food chain. In aquaculture copepods are critical to the process of larval rearing. Aquaculture facilities use copepods as feed to freshly hatched larvae until they are mature enough to eat other sources of food.







Background Information

RESEARCH QUESTIONS

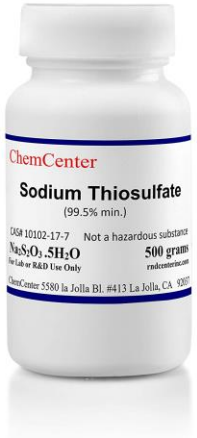
- Which water salinity level is best for copepod growth and reproduction?
- How do copepods nauplii react to differing salinity levels?

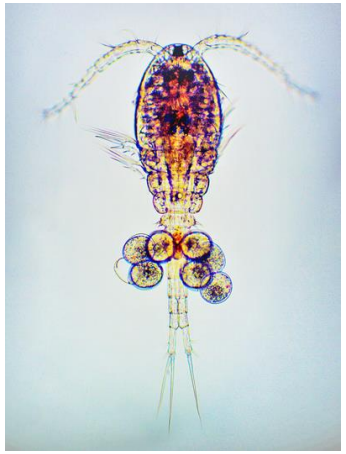
HYPOTHESIS

Based on prior research I hypothesize that copepod survival will be best at 20 salinity.

MATERIALS

- 2-liter water bottles
- Fresh Water
- Salt water
- Bleach
- Thiosulfate
- Apocyclops Copepods
- Rigid Air Tube
- Scale





MATERIALS

- Microscope
- Sedgwick rafter
- Frozen Microalgae Rotigrow
- Air Pump
- Air Tubes
- RefractoMeter
- Aqua Check Strips

METHODS

-Set up the air pumps and connect them to the rigid air tube

-Drill a hole in the bottle caps of the water bottles

-Disinfect water bottles in a Clorox bath

-Mix 3 different ratios of saltwater and freshwater (15, 20, 25)

-Add four milliliters of bleach to each bottle

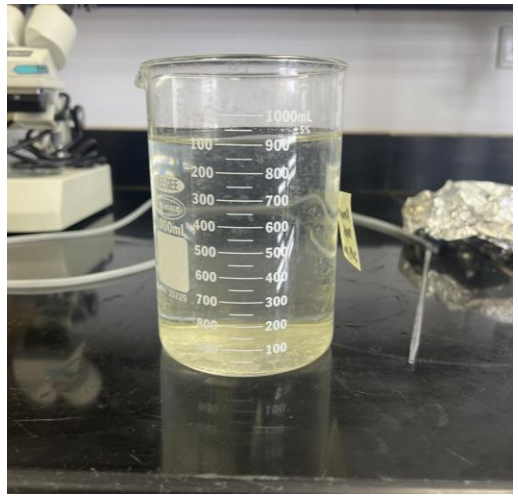
METHODS

-After thirty mins neutralize the chlorine by adding thiosulfate

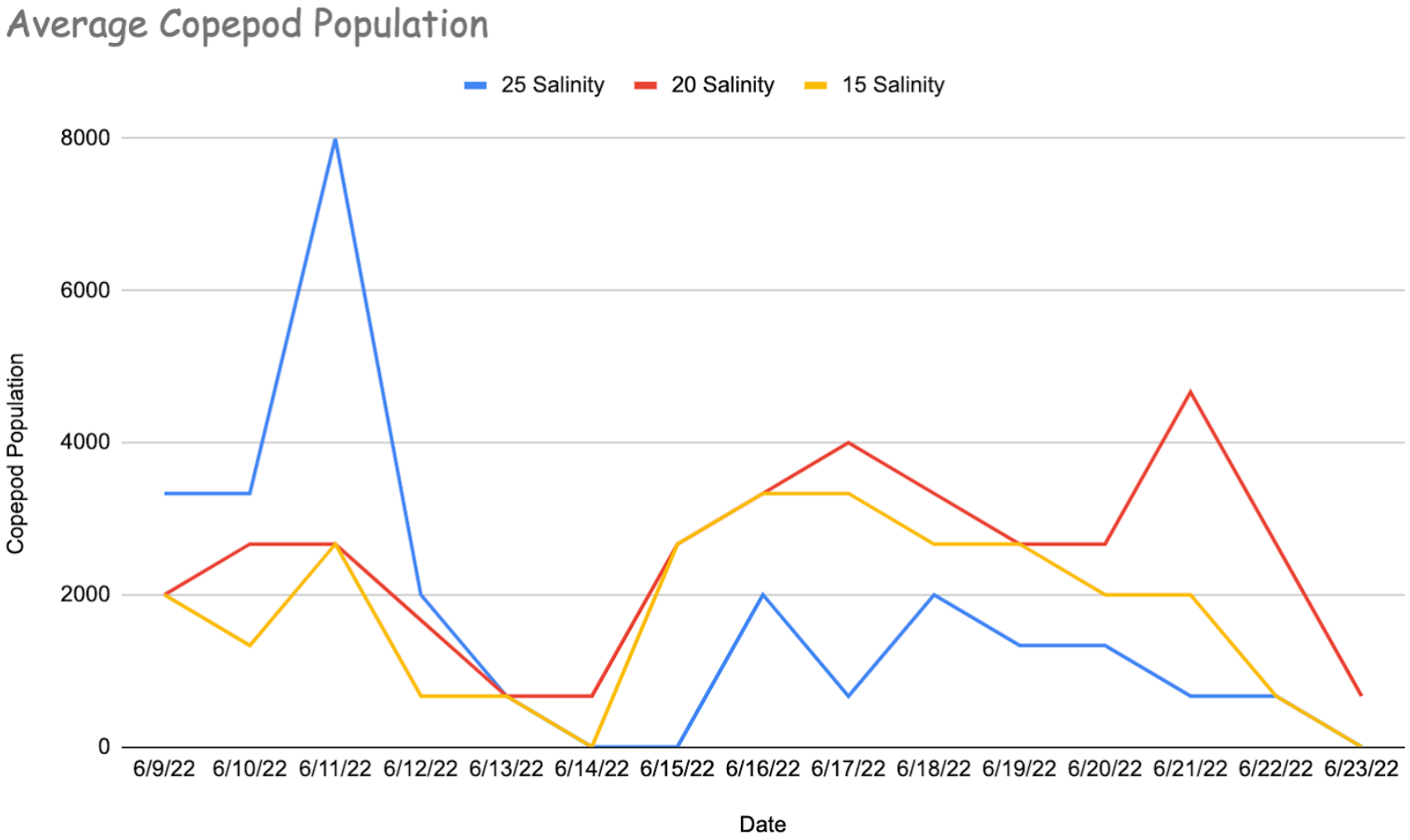
-Add 2-3 copepods per ml (4000-6000 copepods) into each bottle

-Connect the rigid air tube to the caps

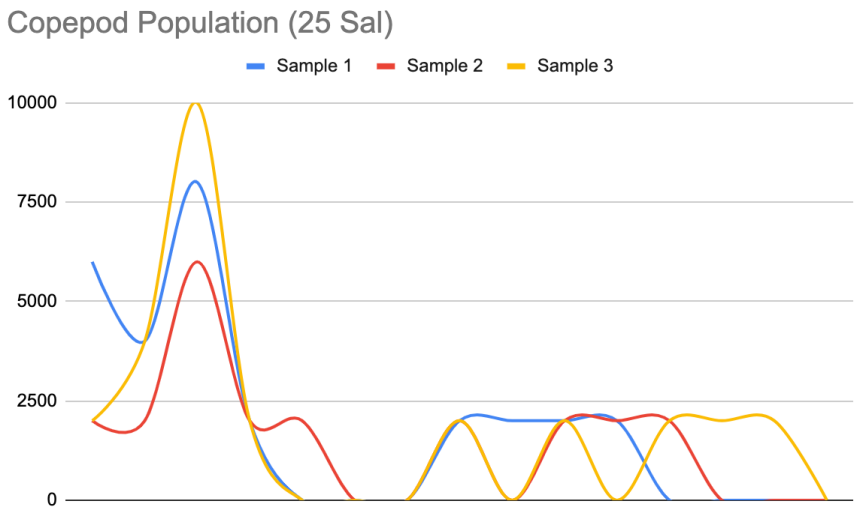
-Draw 1 milliliter samples from each bottle and count daily

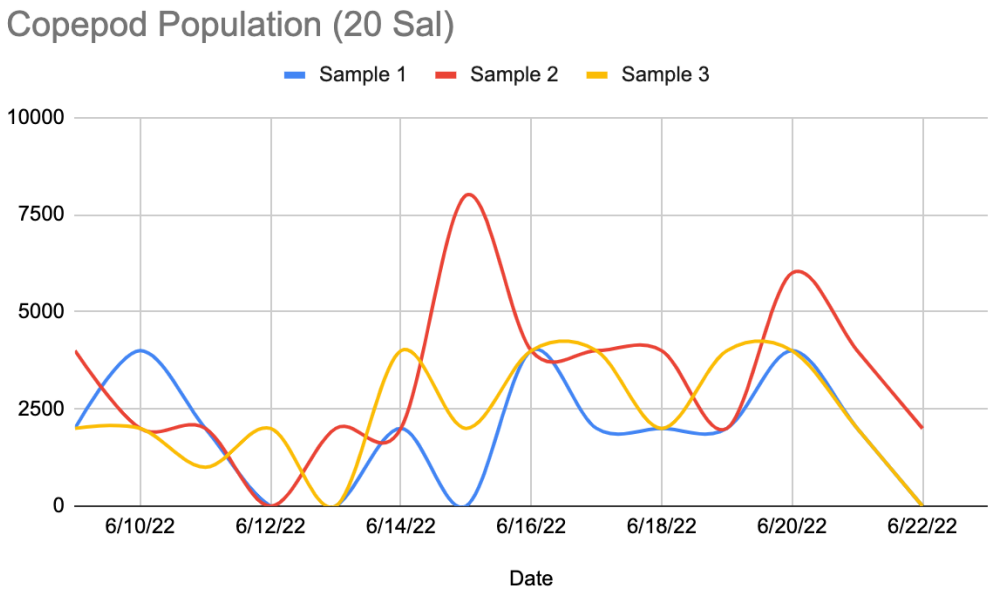


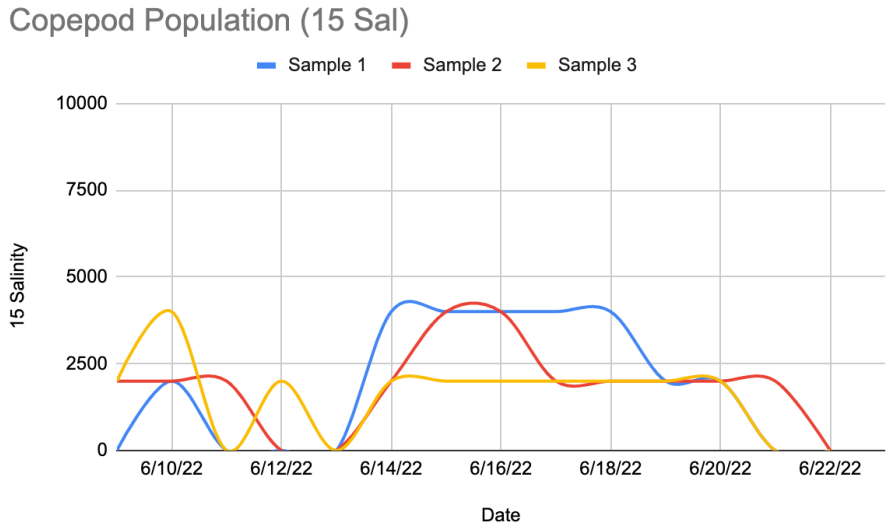
RESULTS


Average Copepod Population
25 Salinity
20 Salinity
15 Salinity
8000
6000
4000
2000
0
Copepod Population
6/9/22
6/10/22
6/11/22
6/12/22
6/13/22
6/14/22
6/15/22
6/16/22
6/17/22
6/18/22
6/19/22
6/20/22
6/21/22
6/22/22
6/23/22
Date

RESULTS


Copepod Population (25 Sal)
Sample 1
Sample 2
Sample 3
10000
7500
5000
2500
0


Copepod Population (20 Sal)
Sample 1
Sample 2
Sample 3
10000
7500
5000
2500
0
6/10/22
6/12/22
6/14/22
6/16/22
6/18/22
6/20/22
6/22/22
Date


Copepod Population (15 Sal)
Sample 1
Sample 2
Sample 3
10000
7500
5000
2500
0
15 Salinity
6/10/22
6/12/22
6/14/22
6/16/22
6/18/22
6/20/22
6/22/22
Date

OBSERVATIONS

By the fourth day, copepod populations dropped in all three salinity levels but rose two days after initial drop.

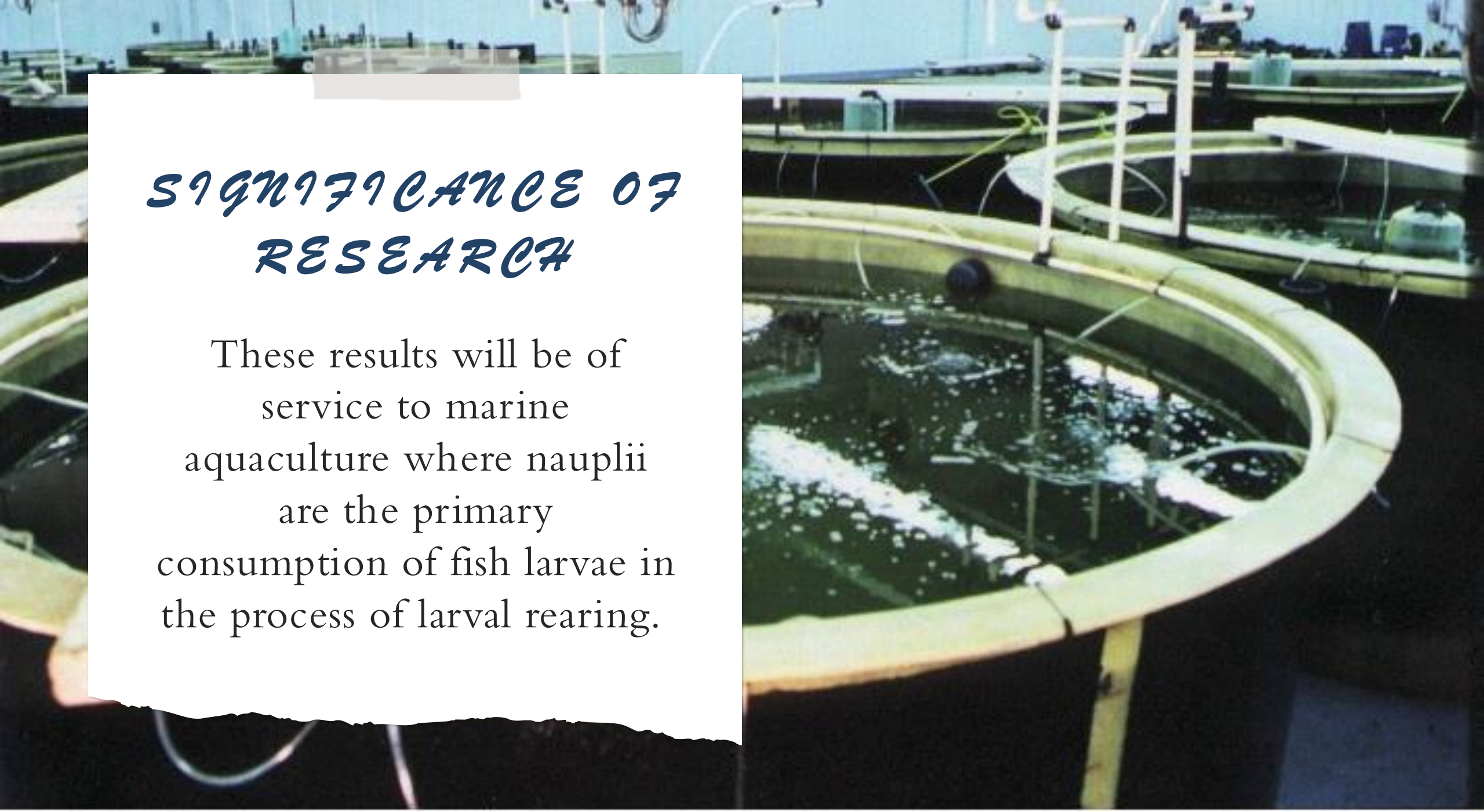
By the 6th day, most nauplii matured into copepodites.

By the end of the experiment almost all copepods died.

No copepods in this experiment reproduced.

Conclusion

Based on the results of the experiment, water salinity at 20% is best for copepod survival, followed by 15% and lastly 25%.



SIGNIFICANCE OF RESEARCH

These results will be of service to marine aquaculture where nauplii are the primary consumption of fish larvae in the process of larval rearing.

ADDITIONAL RESEARCH

Duplicate research in a warmer environment to investigate difference in copepod activity using the same salinity levels.

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