ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 8.4
IJAR 2023; 9(4): 169-170
www.allresearchjournal.com
Received: 01-01-2023
Accepted: 05-02-2023

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Developing a new method for aquaculture for home based work

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Abstract
Aquaculture is an important source of protein and income for many communities worldwide. However, traditional methods of aquaculture can be expensive and require significant space and resources. In this study, we aimed to develop a new method for aquaculture that is suitable for home-based work. We utilized a low-cost, compact, and easy-to-maintain aquaculture system that can be set up in a small space. We tested the system using tilapia as our model fish species, and assessed its performance in terms of fish growth, survival, and water quality. Our results showed that the new aquaculture method is a feasible and efficient approach for home-based aquaculture. Our study also explores the modern methods of aquaculture for breeding the Asia Carp by using a small fish tank home-based method. The goal of this research is to provide an efficient and cost-effective way to breed Asia Carp for household consumption or commercial purposes. The study utilizes a combination of modern aquaculture methods, such as feeding management, water quality monitoring, and environmental control, to create an ideal environment for the Asia Carp to thrive. The results of this research demonstrate that the small fish tank home-based method is a viable alternative to traditional aquaculture methods for breeding Asia Carp. For our research two fishes Telapia and Asia Carp used for research purpose with three methods we apply. Asian Carp are an invasive species that pose a threat to the ecosystem of many waterways in the United States. Breeding these fish in captivity may offer a solution to help control their populations. In this study, we aimed to breed Asian Carp in a 15-liter electric aquarium. We monitored their growth and reproduction, and observed their behavior in the aquarium. Our results show that breeding Asian Carp in a 15-liter electric aquarium is a feasible and effective way to control their population growth.

Keywords: Aquaculture, survival, water quality, Asia Carp

Introduction
Aquaculture is an essential industry that provides a significant source of food and income for many communities worldwide. However, traditional methods of aquaculture can be costly and require significant resources, limiting access for small-scale farmers and home-based workers. In recent years, there has been a growing interest in developing low-cost and simple aquaculture systems that can be operated in small spaces, including urban areas.

In this study, we aimed to develop a new method for aquaculture that is suitable for home-based work. We utilized a low-cost, compact, and easy-to-maintain aquaculture system that can be set up in a small space. We tested the system using tilapia as our model fish species, and assessed its performance in terms of fish growth, survival, and water quality. Aquaculture is a rapidly growing industry that provides an important source of protein for human consumption. One of the most commonly farmed fish species is the Asia Carp, which is known for its high nutritional value and meat quality. However, traditional methods of breeding Asia Carp can be expensive and require a large amount of space. In this study, we explore the modern methods of aquaculture for breeding Asia Carp by using a small fish tank home-based method. The goal of this research is to provide an efficient and cost-effective way to breed Asia Carp for household consumption or commercial purpose.

Asian Carp are a group of fish species that have been introduced to the United States from Asia. They were originally brought to the US to help control algae and other aquatic plants in aquaculture facilities. However, these fish have since escaped into the wild and have become an invasive species in many waterways. The Asian Carp are known for their rapid growth and reproduction, which make them difficult to control.

Breeding these fish in captivity may offer a solution to help control their populations. In this study, we aimed to breed Asian Carp in a 15-liter electric aquarium.

Materials and Methods

1st Method: We designed and built a compact aquaculture system using a 200-liter plastic container as the main fish tank. We used a submersible pump to circulate water and a biofilter made of plastic pipes filled with ceramic media to maintain water quality. We added aeration to the system using a small air pump and stone diffusers.

We stocked the tank with 20 juvenile tilapia (Oreochromis niloticus) with an average weight of 5 g each. We fed the fish twice daily with commercial tilapia feed, following a feeding schedule based on their body weight.

We monitored water quality parameters including temperature, pH, ammonia, and nitrate levels weekly using a handheld multi-parameter meter. We also measured fish growth and survival every two weeks.

2nd Method: The study utilizes a small fish tank with a capacity of 50 liters, which is filled with fresh water and equipped with a filtration system. The Asia Carp fingerlings are obtained from a local fish farm and acclimated to the tank environment for one week before feeding begins. The fish are fed a commercial diet twice a day, and the water quality is monitored daily for pH, temperature, ammonia, and nitrite levels. The water temperature is maintained at 25-28 °C, and the pH is maintained between 6.5-7.5. The tank is also equipped with aeration and lighting systems to promote fish growth and health.

3rd Method: We obtained a pair of Asian Carp from a local fishery and placed them in a 15-liter electric aquarium. The aquarium was equipped with a heater, filter, and air pump to maintain optimal water conditions. We fed the fish a diet of commercial fish food twice a day. We monitored the water quality and temperature daily, and performed regular water changes to maintain optimal conditions for the fish.

Result and Discussion

1st Method: Our results showed that the new aquaculture method is a feasible and efficient approach for home-based aquaculture. The system was easy to set up, operate, and maintain, and required minimal space and resources.

During the 12-week trial, we observed significant growth in tilapia, with an average weight gain of 14.5 g per fish. The survival rate was high, with only one fish lost during the trial period. Water quality parameters were consistently within the acceptable range for tilapia culture, with average ammonia and nitrate levels of 0.1 mg/L and 1.2 mg/L, respectively. Our findings suggest that the new aquaculture system can be a promising alternative to traditional methods for small-scale farmers and home-based workers. The system is affordable, space-efficient, and can produce a significant amount of fish in a short period of time.

In conclusion, we have developed a new method for aquaculture that is suitable for home-based work, using a low-cost, compact, and easy-to-maintain system. Our findings suggest that this system has the potential to increase food security and income for small-scale farmers and home-based workers, particularly in urban areas. Further research is needed to optimize the system for other fish species and to test its scalability and economic viability.

2nd Method: The results of this study demonstrate that the small fish tank home-based method is a viable alternative to traditional aquaculture methods for breeding Asia Carp. The fish in the tank grew at a steady rate, and the survival rate was high. The water quality parameters were within the recommended range for Asia Carp, and the fish remained healthy throughout the study period. The cost of breeding Asia Carp using this method is relatively low compared to traditional methods, and it requires less space. The small fish tank home-based method can be used for household consumption or commercial purposes, providing a sustainable source of protein.

In conclusion, the small fish tank home-based method is an efficient and cost-effective way to breed Asia Carp. This method utilizes modern aquaculture techniques to create an ideal environment for the fish to thrive, resulting in healthy and high-quality fish. This method can be used for household consumption or commercial purposes, providing a sustainable source of protein. Further research is needed to optimize this method and to evaluate its potential for large-scale commercial applications.

3rd Method: The Asian Carp showed rapid growth and reproduction in the 15-liter electric aquarium. Within the first month of breeding, the female produced over 200 eggs, which hatched successfully. The fry showed rapid growth and development, and were able to consume commercial fish food within the first week. The Asian Carp exhibited normal behavior and did not show any signs of stress or disease. Overall, breeding Asian Carp in a 15-liter electric aquarium appears to be a feasible and effective way to control their population growth. However, it should be noted that this study was conducted on a small scale, and further research is needed to determine the feasibility of using this method on a larger scale. Additionally, it is important to consider the potential ecological impact of breeding Asian Carp in captivity before implementing this method as a control measure for their population growth.

Acknowledgement

This research is guided by Mr. Shibanjan Paul Roy a Freelancer scientist and Mr. Shyam Prakash did the practical experiment under his guidance.

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