Nursery technique of gouramy fish (*Osphronemus goramy*) at instalasi perikanan budidaya, pasuruan, east java

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Abstract. Gouramy is one of the freshwater consumption fish which has high economic value. Gouramy including consumption fish which is superior in cultivation activities, but the availability of carp seeds cannot meet the very high market demand. So the proper and sustainable cultivation of gouramy is needed to meet market demand. The purpose of this study was to determine the techniques and constraints of gouramy nursery. The method used is descriptive method with data collection including primary data and secondary data. This research was carried out in 23 December 2019 - 22 January 2020 at the Instalasi Perikanan Budidaya (IPB), Pasuruan, East Java. The stages of gouramy nursery techniques include pond preparation, seed distribution, feeding, water quality management and handling of pests and diseases.
1. Introduction
Aquaculture production has shown the most rapid expansion among all Indonesian agronomic production sectors, with annual growth of around 7% [1], after the government established aquaculture development as a national priority in 2009 [2]. Gouramy fish is one of the economically important local species. Its annual production was over 119,000 tons in 2014 and has grown exponentially over the previous 15 years [1].

Cultivation of gouramy much in demand by cultivators, but there are many problems faced. One of the problem is gouramy has slow growth [3]. The growth of gouramy tends to be slow, this is because the gourami undergoes changes in eating habits at each phase of its growth, namely in the one month phase after hatching it is carnivorous, omnivorous in the juvenile phase and herbivorous in the adult phase [4]. In addition, the availability of gouramy seeds is not continuous and is still very limited. Seed is one of the important factors in the implementation of cultivation activities. The availability of seeds that are not continuous and is still very limited occurs because the carp seeds that are widely used are still the result of natural spawning. Based on these problems, it is necessary to do research on gouramy fish enlargement techniques in Instalasi Perikanan Budidaya (IPB), Pasuruan, East Java.

2. Material and Method
The research was carried out at Instalasi Perikanan Budidaya in Pasuruan, East Java. The working method used is the active participation method with data collection including primary data in the form of observation, interviews and active participation and secondary data in the form of literature study to complete the data collected. The data analyzed this research used is the descriptive method.

3. Result and Discussion
3.1 Pool preparation
The pond used for the maintenance of nursery of gouramy seeds is a pond whose bottom is still soil while the pool wall is made of concrete and has an area of 96 m². Preparation of ponds for gouramy seed maintenance activities for nursery, namely drying, liming and water preparation. Drying is the initial stage in preparing ponds for aquaculture activities and aims to evaporate the remaining ammonia. The amount of mud at the bottom of the pond is reduced to reduce residual ammonia and speed up the pond drying process. Drying was carried out for 2 days.

Liming is done the day after the pond drains. The part of the pool that is chalked is the pool wall and the bottom of the pool. The liming technique on the pool wall is carried out by the painting method. Lime is put into a small tub and then mixed with water at a ratio of 0.5 kg/L. While the liming technique at the bottom of the pond is done by spreading lime evenly. The type of lime used is Tohor (CaO) with a dose of 50gr/m². The main uses of lime are It increases the pH of pond bottom and water, This enhances the availability of nutrients like phosphorous; increased nutrient availability; benthic production becomes greater; The alkalinity of water is increased thereby increasing the availability of carbon iv oxide for photosynthesis; The increased alkalinity values after liming provide a buffering capacity to pond water against drastic pH fluctuations resulting from eutrophication and Humic stains of vegetative origin, which restrict light penetration into the pond water are cleared by lime treatment [5]. Water preparation or water filling is carried out on the third day after drying the pond with a height of 60 cm. The source of water used comes from river water that has been filtered in a water reservoir.

3.2 Spreading seeds
Spreading of seeds is done by shifting the seeds in the hatchery and greeding according to size. Seeds were stocked in the pond as many as 2558 individuals from 10 aquariums. Seeds that are ready to be sown are acclimatized first. Acclimatization is the process of adjusting to different environmental conditions [6].
3.3 Feeding

The feed given to nursery was in the form of a combination of silk worms and pellets. On four days after sowing, the feed given was silk worms, the next three days a combination of silk worms and pellets was given. After the 7th day, the feed was given in the form of pellets. The pellet used is in the form of 781-1 which is ground first so that it becomes a powder. The frequency of feeding is twice a day, namely in the morning and afternoon. Feeding in nursery is using the adlibitum method. The combination of feed in nursery aims to adjust the eating habits of carnivores from carnivores to omnivores. Food supply during the larval stage is an important factor for achieve maximum growth and survival rates [7].

3.4 Seed growth

Sampling was carried out once a week from the beginning of seed stocking with a total of 10 individuals per sampling. Length and weight are parameters measured in seed growth. Measurement of body length using a ruler and body weight using an analytical scale with an accuracy of 0.01 grams.

![Figure 1. Gouramy seed length growth chart](image1)

![Figure 2. Gouramy Specific Grow Rate chart](image2)

Based on the results of sampling from the beginning of the stocking until the third week has increased. The increase in length from the beginning of stocking to the third week was 0.9 cm. The body weight of gouramy seeds from the beginning of stocking until the third week increased by 0.57 grams.
Factors that affect the growth of fish consist of internal and external factors. One of the main internal factors is the condition of the fish's body. Fish with normal body conditions can digest feed well so that it supports their growth [8]. External factors such as environmental factors and feed are very influential on fish growth. Another factor that affects the growth of gouramy seeds is the stocking density, the lower the stocking density, the faster the seed growth [9].

3.5 Water Quality

Table 1. Water Quality

| Parameter     | Value     |
|---------------|-----------|
| Temperature (°C) | 26.7-29.4 |
| pH            | 6.9-7.3   |
| DO (mg/L)     | 5.19      |

Based on the measurement results, water quality is considered optimal for the survival and growth of gouramy seeds. The optimal temperature for the maintenance of carp fry is around 25-30°C and pH 6.5-8.5 [10]

3.6 Pests and diseases

Pests in gouramy fish nursery activities are gatul fish (Oryzias javanicus), rice snails, river shrimp, and moss. Moss can grow on walls and pond surfaces. This can interfere with the movement of gouramy seeds and block the intensity of sunlight entering the pond. Pest control can be through preventing the entry of pests into the pond and taking pests directly.

The fungus that usually attacks gouramy larvae is Aphanomyces sp. This fungus causes the body of the gouramy larvae to be black or darker in color and there is a white cotton-like appearance on the body and tail of the fish, while the behavior is that the fish float under the surface of the water and occasionally the fish swim hyperactively. Gouramy fish is one of the host species that is susceptible to disease Aphanomyces sp. Fungi can infect host organisms when they exposed to stress or when the deep water environment bad condition [11].

4. Conclusion

The nursery technique of gouramy at the Intalasi Perikanan Budidaya (IPB) Pasuruan, Jawa Timur, starts from pond preparation, seed distribution, seed maintenance and water quality management.
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6. Unknowledgement
The authors extend their gratefully acknowledge to Instalasi Perikanan Budidaya (IPB), Pasuruan, East Java and also Faculty of Fisheries and Marine Universitas Airlangga Surabaya.