The Intensive Program of Hatchery Aquaculture Performance of Gourami (Osphronemus gouramy) in IPB Pandaan

V B Pribawastuti1, S H Samara2,3

1 Study Program of Aquaculture, Faculty of Fisheries and Marine, Universitas Airlangga, Surabaya 60115 Indonesia
2 Department of Aquaculture, Faculty of Fisheries and Marine, Universitas Airlangga, Surabaya 60115 Indonesia
3 Corresponding author: syifania.hanifah@fpk.unair.ac.id

Abstract. Gourami is an important economic fish in Indonesia. The increasing demand for gouramy must be balanced with increased seed production by aquaculture activity. One of the important activities in the gouramy aquaculture is hatchery. This study aims to determine the performance of gouramy hatchery at IPB Pandaan. The working method used in this study was the descriptive method by utilizing primary and secondary data. The hatchery gouramy in IPB showed good performance with fertilization rate with value of 72.36% and hatching rate of 85.55%. The water quality parameters were also suitable for hatchery gouramy activity. The temperature ranged from 28-29°C, pH levels ranged from 7.1-7.9, DO level ranged from 4.32-5.79 mg/L.

1. Introduction

Indonesia is an equatorial country that has a tropical climate so it has high biodiversity. Gourami (Osphronemus gouramy) is a fish native to Indonesia, gouramy is widespread in several countries such as Malaysia, the Philippines, and Thailand. Gouramy is one of the animals that has a relatively slow growth, lives in calm, clear waters (not containing mud) and deep [1]. Gouramy is one of the commodities that is considered capable of increasing production, farmers' income and also as a means of increasing nutritional value in the community. Gouramy fish is known for having a savoury taste and dense meat texture [2]. Gouramy is one of the fish that has a high production average of 68.15%. Gouramy production from 169 thousand tons to 356.53 thousand tons during 2017-2018 [3]. The increasing demand for gouramy must be balanced with increased seed production. To produce the seeds, the process of hatching eggs, rearing larvae and rearing larvae is carried out. The characteristics of fertilized eggs are clear yellow and unfertilized eggs are whitish yellow or pale yellow [4]. Larval rearing is carried out intensively to meet high market demand because it has a high number of stocking densities [5]. Nursery is the stage of rearing fish seeds that aim to get a certain size of seed. Nurseries were carried out only twice. Nursery I is rearing fish fry from 0.75-1.00 cm in size to 1.0-2.0 cm in size [4]. Nursery II is the stage of seed maintenance from 1.0-2.0 cm in size to 2.0-4.0 cm in size [4]. One of the businesses that produce gouramy seeds is the Pandaan Aquaculture Installation (IPB) Pasuruan Regency, East Java. At the Pandaan Fisheries Cultivation Installation (IPB), there are several activities in the field of aquaculture including the hatchery of giant prawns, gourami, tilapia, tombro fish, and snakehead fish. This research was conducted to determine the performance of gouramy hatchery at IPB Pandaan.
2. Material and methods

2.1. Research design

The working method used in this study was a descriptive method by utilizing primary and secondary data [6]. The fish used were 22 female and 11 male gourami with a weight of 2.5-3 kg/fish and 2 years of age. Breeding was conducted with a male to female ratio of 1:2 [4]. Breeding was carried out in 11 ponds and the parameters were calculated.

2.2. Research parameter calculation

Parameter penelitian ini adalah FR (Fertilization Rate) and Hatching Rate (HR). FR was calculated by using the formula [7]:

$$\text{FR} = \frac{\text{Fertilized Eggs}}{\text{Total Eggs}} \times 100\%$$

HR was calculated by using the formula [8]:

$$\text{HR} = \frac{\text{Total Hatched Eggs}}{\text{Total Fertilized Eggs}} \times 100\%$$

The water parameter quality measured in this study were pH, temperature and DO (Dissolved Oxygen). pH was measured by pH meter, temperature used thermometer, and DO used DO meter.

3. Result and discussion

The results of the gouramy breeding performance parameters in IPB Pandaan showed in Table 1. The value of FR was 72.36%. This FR value was better than the previous study in Jombang, Indonesia which was only 53.54% [4]. This was because the broodstocks of gouramy were given taro leaves, papaya leaves and kale leaves. Taro (Colocasia esculenta) leaves are widely used by carp farmers for hatchery activities [9]. Taro leaves have a protein of 27.8%, cheap and have been proven to improve the hatchery performance of gouramy [10]. Papaya leaves and kale leaves are often used in fish hatchery activities such as catfish and milkfish because they antibacterial and antifungal to prevent disease in broodstocks or eggs [11], [12]. HR data on gouramy hatchery activity at IPB Pandaan showed a value of 85.55%. The HR value in this study was greater than the previous study with a value of 84.33% [13]. This was because previous studies only used betel leaves in hatchery gouramy activities, not using taro leaves, papaya leaves and kale leaves. However, this HR value was less than the previous study which reached 96.65% [14]. This was because in the hatchery process at IPB Pandaan using palm fibers, while in previous research used breeding nest [14].
5. hatchery gouramy activity. It could be concluded the

4. Table 2

| No. | Initial Egg (Eggs) | Fertilized Egg (Eggs) | Total Unfertilized Egg (Eggs) | Hatched Egg (Eggs) | Unhatched Egg (Eggs) | FR (%) | HR (%) |
|-----|-------------------|-----------------------|-------------------------------|-------------------|----------------------|--------|--------|
| 1   | 2150              | 1500                  | 650                           | 600               | 900                  | 70%    | 40%    |
| 2   | 6506              | 5872                  | 634                           | 5418              | 454                  | 91%    | 92%    |
| 3   | 9159              | 6355                  | 2804                          | 6077              | 278                  | 69%    | 96%    |
| 4   | 2398              | 1667                  | 731                           | 1378              | 289                  | 70%    | 83%    |
| 5   | 2887              | 2072                  | 815                           | 1955              | 117                  | 72%    | 94%    |
| 6   | 4988              | 3349                  | 1639                          | 2953              | 396                  | 67%    | 88%    |
| 7   | 3634              | 2371                  | 1263                          | 2100              | 271                  | 65%    | 89%    |
| 8   | 12907             | 7744                  | 5163                          | 7168              | 576                  | 60%    | 93%    |
| 9   | 261               | 169                   | 92                            | 131               | 38                   | 64%    | 78%    |
| 10  | 2860              | 2002                  | 858                           | 1846              | 156                  | 70%    | 92%    |
| 11  | 3818              | 3753                  | 65                            | 3597              | 156                  | 98%    | 96%    |
| Average | 4688 | 3350.364 | 1337.636 | 3020.273 | 330.0909 | 72.36% | 85.55% |

Water quality checks were carried out twice, morning and evening. Water quality data could be seen in Table 2. Based on the measurement of water quality parameters, the temperature ranged from 28-29°C, pH levels ranged from 7.1-7.9, DO level ranged from 4.32-5.79 mg/L. The water quality parameters were suitable for gouramy hatchery and egg hatching activities, with a standard temperature value of 29-30°C, pH 6.5-9.5 and DO 4-6 mg/l [2]. This was because the hatchery activity at IPB Pandaan was carried out liming which functions to maintain water quality and eradicate pests [15].

Table 2. Water quality parameter in IPB Pandaan

| No | Temperature (°C) | pH | DO (mg/L) |
|----|-----------------|----|-----------|
|    | Morning | Evening | Morning | Evening |
| 1  | 28      | 29     | 7.4     | 7.1     | 4.96   | 5.36  |
| 2  | 28      | 28.9   | 7.3     | 7.2     | 4.81   | 5.18  |
| 3  | 28.6    | 29     | 7.4     | 7.5     | 4.38   | 4.71  |
| 4  | 28      | 29.3   | 7.4     | 7.4     | 4.55   | 4.68  |
| 5  | 28.3    | 29.1   | 7.4     | 7.5     | 4.51   | 4.67  |
| 6  | 28      | 28.8   | 7.7     | 7.8     | 4.92   | 5.69  |
| 7  | 28.6    | 29.4   | 7.5     | 7.6     | 4.81   | 5.79  |
| 8  | 28      | 29.2   | 7.6     | 7.4     | 4.76   | 5.66  |
| 9  | 28      | 29     | 7.5     | 7.8     | 4.81   | 4.98  |
| 10 | 28      | 28     | 7.6     | 7.6     | 4.32   | 4.83  |
| 11 | 28.9    | 28.8   | 7.6     | 7.5     | 4.51   | 4.68  |

4. Conclusion
It could be concluded the hatchery gouramy in IPB showed good performance with fertilization rate with value of 72.36% and hatching rate of 85.55%. The water quality parameters were also suitable for hatchery gouramy activity.

5. References
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