

PAPER • OPEN ACCESS

Nursery method of Jatimbulan Tilapia (*Oreochromis niloticus*) in Pasuruan, East Java

To cite this article: I Anggraeni and P D W Sari 2020 *IOP Conf. Ser.: Earth Environ. Sci.* **441** 012133

View the [article online](#) for updates and enhancements.

You may also like

- [Identification of ectoparasites in Fry Tilapia \(*Oreochromis Niloticus*\) in Aquaculture Pond](#)

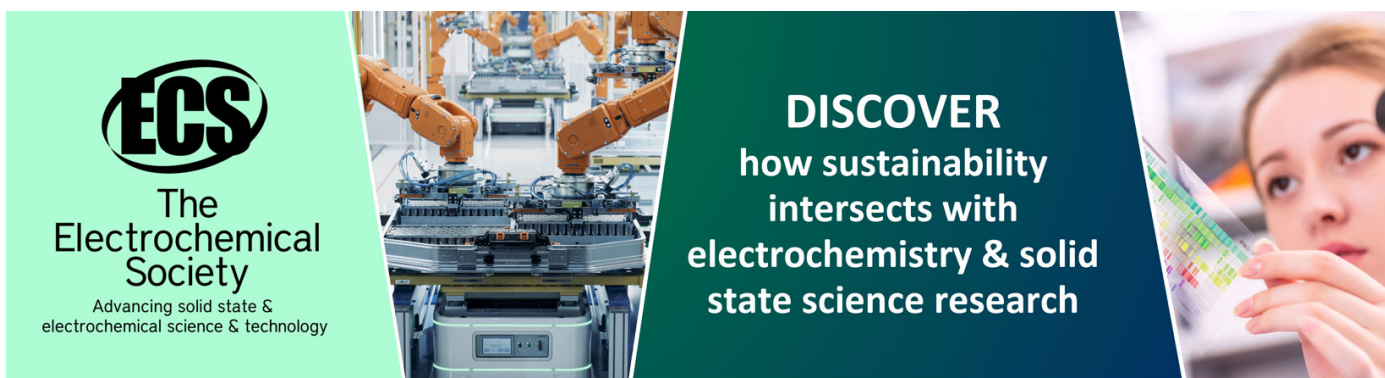
E Yusni and N Rambe

- [Improving genetic quality of cultivated aquatic species under a breeding program: Case study of first generation \(G1\) population of red tilapia \(*Oreochromis spp*\)](#)

B Gunadi, A Robisalmi and Lamanto

- [The effect of different dose on biological performance and its correlation with growth of nile tilapia \(*Oreochromis niloticus*\)](#)

Y R Widyastuti, E Setiadi, A Saputra et al.



ECS
The
Electrochemical
Society
Advancing solid state &
electrochemical science & technology

DISCOVER
how sustainability
intersects with
electrochemistry & solid
state science research

Nursery method of Jatimbulan Tilapia (*Oreochromis niloticus*) in Pasuruan, East Java

I Anggraeni¹ and P D W Sari^{1,2}

¹Department of Fish Health Management and Aquaculture, Faculty of Fisheries and Marine, Universitas Airlangga 60115 Surabaya, West Java, Indonesia

²Corresponding author: putri.dw@fpk.unair.ac.id

Abstract. Jatimbulan Tilapia (*Oreochromis niloticus*) is the third generation of the crossover six parental strain of tilapia. The nursery method for Jatimbulan Tilapia (*Oreochromis niloticus*) fry is carried out in soil and concrete-walled pond, as well as seeds having an average length of 2.3 cm and an average weight of 0.181 grams. The treatment used is feeding pellets by feeding frequency two times a day with a 30% feeding rate of the biomass. Treatment significantly generating good growth and survival; SGR (1.12%) and SR (97%). Water quality in the maintenance media contained in a reasonable range for raising Jatimbulan Tilapia.

1. Introduction

Tilapia (*Oreochromis niloticus*) is one of Indonesia's leading commodities which has the potential to be developed in supporting national food security and improvement of public welfare [1]. One commodity in East Java tilapia fish is Jatimbulan Tilapia. Jatimbulan Tilapia are selected from individuals using six of the parent strain among others G3 Black Tilapia, G6 Black Tilapia, Puntan Black Tilapia, Citralada Red Tilapia, Kedung Ombo Red Tilapia, White Tilapia Sleman. Propagation of parent candidates is carried out on the results of the Individual Selection III (F3), namely F1 Black Tilapia, East Java that is suitable for use in the broodstock type [2].

According [3], the demand for fish as a source of animal protein is likely to increase, the fulfillment of the supply shortage was not possible filled by fish capture itself, but must be supplied from the cultivation, one is tilapia fish farming. The cultivation is divided into several parts, namely hatchery, nursery, and enlargement. Separating tilapia is a stage of advanced maintenance of fish seed. Tilapia nursery was purposed to obtain a uniform size of tilapia, both long or weight. Nursery of tilapia is often done in freshwater ponds. However, some set it up in pockets of floating nets, rice fields and ponds [4].

2. Materials and methods

2.1. Materials and research tools

The fish used in this nursery activity are the seeds of the jatimbulan tilapia fish (*Oreochromis niloticus*) obtained from the UPT Laboratory of Fish and Environmental Health in Pasuruan, with a



size of less than 1 cm. Feed given is in the form of pellets produced by PT. Central Pangan Pertiwi, Karawang with the trademark HI-PRO-VITE-781-3.

This nursery activity uses a ground-based pond media and concrete wall with 400 m² and 40 cm water depth. Measurement of water quality for temperature using a thermometer, dissolved oxygen using a DO meter, and pH using a pH meter. Measurement of fry growth using a long-term ruler for long, and analytical scales for weight.

2.2. The variables measured

The variables measured in this study include the length and weight, specific growth rate, and survival rate. While supporting data such as water quality include temperature, dissolved oxygen (DO), and pH.

3. Results and discussion

3.1. Stocking larvae

The larvae aged 2-3 days after coming out of the mouth a length less than 1 cm stocked into the pond. Before stocked, were counted in a tub for sampling and ensure the number of larvae were stocked in the pond. The calculation process is carried out quickly so that the fish do not die. The process of entering larvae into the pond is done quickly so as not to cause stress on the fry. The larvae that will be placed in the nursery pond are acclimatized first, by stabilizing the temperature of the water in the tub with the temperature of the water in the pond. [5] states that acclimatization gives fish a chance to adapt to the new environment by avoiding stress on fish that will be stocked in nursery ponds. Larvae density in nursery I is 100 fish/m² [6]. The total larvae stocked in the nursery pond are 136,000 larvae.

3.2. Feeding

Feed given to larvae of tilapia that are kept $\pm$ 12-14 days until it becomes a fry, just like the feed given to brooders that is in the form of floating pellets it's just smaller size that is 2.0 to 2.3 mm with dose 30% of total biomass, or as much as 1.1 kg / day. The dosage is appropriate according to [6] the dose of feed given ranges from 20-30% of the weight of biomass in the form of feed in the form of flour or granules. The feed is given twice a day at 08.00 a.m and 2.30 p.m.

Feeding is carried out evenly distributed throughout the surface of the pond. This is to reach the larvae that are spread throughout the pond so that the distribution is even. The dosage of feeding on the first stocking until the harvest becomes the fry ready for sale are not added or fixed.

The feed used in nursery jatimbulan tilapia i.e floating pellets is a trademark of HI-PRO-VITE-781-3. HI-PRO-VITE-781-3 is a pellet diameter of 3.2 to 4 mm, but at the time of feeding, pellets are mashed first. HI-PRO-VITE-781-3 has a content of protein 31 - 33%; 5% fat; 5% fiber; content of ash 13%; and 12% moisture content. This feed is used because it has the nutrients needed for the nutrition of Jatimbulan Tilapia. The nutritional needs of larvae and tilapia broodstock do not have much difference, only the protein needed by tilapia larvae is 35% while for fry to consumption size is 25-30% [2].

3.3. Length and weight gain

Data on the average of length and weight increase of Jatimbulan Tilapia seed for 21 days are presented in the graph below.

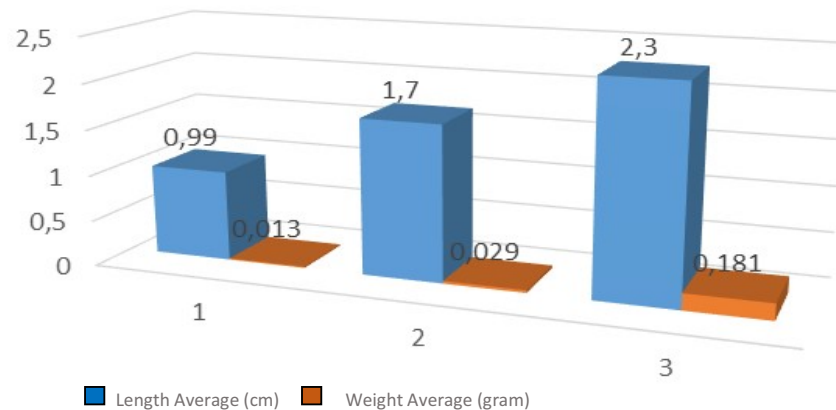


Figure 1. Average growth and length of Jatimbulan Tilapia Seed

Based on Table 1, it can be seen that in the first week or larvae measurements the average length of tilapia seeds is 0.99 cm and the average weight is 0.013 grams. In the second week, the average length increased to 1.7 cm and average weight of 0.029 grams. The average final weight of Jatimbulan Tilapia seeds is 0.181 grams and the average final length is 2.3 cm in the third week of maintenance. The increase of weight and length of tilapia seeds occurs could be cause the feed given is in accordance with the needs of the fish.

3.4. Specific Growth Rate

The results of the measurement of Jatimbulan Tilapia larvae showed a growth rate that always increased with a percentage growth rate of 1.12% / day. Growth is influenced by several factors of movement or stocking density in a pond. This is supported by the statement of [7], which said that fish growth occurs because of the availability of feed-in sufficient quantitative also utilizing space in the water column resulting in fish growth. Then, according to [8], the increase in growth rate is related to the increasing weight of average tilapia seeds and water quality. The higher the average weight of tilapia seeds, the higher the rate of growth.

According to the research done by [9], the specific growth rate of untreated tilapia seed is 1.88% / day, which means it is greater than the results of the study. This is because fish density that is too high can reduce water quality, fish growth becomes slow, the level of diversity of fish size is high. High stocking density will disrupt the growth rate even though food needs are fulfilled. This is due to competition in fighting for space and competition in getting food.

By the opinion of [10], said that the higher the density of Tilapia seeds, the more low value of specific growth rate because the fish have competitiveness in utilizing food and water column so that it will affect the growth rate of the fish.

3.5. Survival rate

As much as 136,000 larvae stocked in nursery ponds, 132,000 tilapia seeds then are harvested. The survival rate of Jatimbulan Tilapia seeds at the end of the study which was maintained for 21 days is 97%. Based on the results obtained, the survival rate is quite good because it is above 80% [6].

The high survival of Jatimbulan Tilapia seeds could be caused by the ability of the durability of Jatimbulan Tilapia and adaptation so that they can adjust to the pond environment. The good management of pond activities such as good water quality, supplementary food per day between 3-5% of body weight, feed, control and prevention of pests and diseases will avoid the mortality a lot. Also, tilapia has several advantages such as relatively more resistant to pests and diseases be able to adapt (tolerant) to changes in environmental conditions [11].

Even though the SGR value is low, the results of the survival rate of Jatimbulan Tilapia seeds are high, because a good survival rate can be obtained by maintaining a suitable environment such as the availability of feed and water quality at the time of maintenance. This is supported by the statement of [12] stating that good water quality will affect the survival of fish and fish growth.

3.6. Water quality

The quality of the water in the maintenance media is in accordance with what is needed for the maintenance of Tilapia fish as general. The water quality parameters seen during the study consist of 25 - 34 °C in temperature, 4,2 - 9.6 mg/l in dissolved oxygen, and 7.5 - 8 in pH.

4. Conclusions

Based on the study that has been carried out, it can be concluded that what needs to be considered in the method of Jatimbulan Tilapia nursery distribution is larvae stocking, feeding, growth and weight gain, specific growth rate, survival, and water quality.

5. References

- [1] Marie R, M A Syukron, S S P Rahardjo 2018 *JSAL*. **5**
- [2] Freshwater Cultivation Development Unit 2008 *Cultivation of Tilapia in East Java* Pasuruan p 54.
- [3] Serdiati N 2008 *TORANI* **18**, 301 - 305
- [4] Khairuman and K Amri 2003 *Tilapia Cultivation* (Jakarta : Agromedia Reader) p 2 - 96
- [5] Arianto R M, A D P Fitri, B B Jayanto 2018 *JoFRUMT* **7**, 43-51
- [6] National Standardization Agency 2009 *Produksi Induk Ikan Tilapia Hitam (Oreochromis niloticus Bleeker) Kelas Induk Pokok* (Jakarta : Indonesian National Standard) pp 1-16
- [7] Juardi Z, M Fitriani, A D Sasanti 2016 *JALI* **4**
- [8] Herawati and G Suantika 2007 *Seed DisSain Tek.* **1**, 1-14
- [9] Muhammad M, Rahimi S A E and Dewiyanti I 2017 *JIM FKP Unsyiah* **2**, 183-193
- [10] Aji N, E Arini, T Elfitasari 2013 *JAMTech* **2**, 94-100
- [11] Djarijah, S A 1995 *Red Tilapia* (Yogyakarta Kanisius) p 87
- [12] Pratiwi R, Basuki F and Yuniarti T 2016 *Journal of Aquaculture Management and Technology* **5**, 137 - 145