Fish Hatchery Technique of Wader Pari (*Cyprinus carpio*) in Cultivation Fisheries Instalation Kepanjen Malang Jawa Timur

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Abstract

Wader fish is one of the endemic fish that has the potential to be developed, for this reason it is necessary to cultivate wader fish so that the availability of wader fish is continuous and can meet market needs. One way to produce seeds is by spawning. The main parameters observed in this study were fertilization rate, hatching rate and survival rate. The value of the fertilization rate in spawning is 70%. The hatching rate in spawning was 68% and survival rate for spawning was 47%. The water quality value obtained at the time of the study were pH 6.7-7.4, temperature 26.5-29.5°C and DO 5.23-7.33 mg/l.

Keyword : Wader pari, spawning, fertilization rate, hatching rate and survival rate

Introduction

Indonesian waters have abundant biodiversity, in which there are endemic fish that can only be found in Indonesian waters. It is recorded that there are 4,782 species of fish native to Indonesia that spread throughout the water area including snakehead fish (Chana striata), barley (Leptobarbus hoevenli), fish sepat fish (Trichogaster pectoralis), belida fish (Notopterus chitala), uceng fish (Nemachilus fasciatus), tilapia (Oreochromis niloticus), wader fish (Rasbora argyotaenia), billiard fish (Mystacoleucus padangensis), and so on (Lenny, 2017).

Wader fish is an endemic fish of Indonesia that needs to be protected from population decline due to human activities such as land clearing and meeting human needs itself (the need for animal protein that is affordable) and wader fish is one of the edemic fish that is widely liked by the Indonesian people besides its low price, the taste is also in accordance with the tongue of the Indonesian people (Jusmaldi and Nova, 2018). However, along with the increase in development that can lead to a decrease in clean river or lake water, the existence of wader fish is threatened by its existence, so there is a need for efforts for cultivation, one of which is the natural spawning of wader fish.

Muslim (2017), natural spawning is spawning that is not without the use of hormones as spawning stimulants. The use of natural spawning methods in this study was carried out to determine the production value of wader stingrays considering the great potential of wader commodities in Indonesia. Fecundity, degree of fertilization and hatchability of eggs are parameters that are often used to determine the success of the spawning method. The spawning process is to determine the fecundity value, degree of fertilization of eggs (FR) and hatchability of eggs (HR)

Materials and Methods

The research was carried out in 2022 at the IPB Kepanjen, Malang, East Java. Before hatchery maintenance spawning fish, and preparation are carried out (brood rearing, preparation of the brood maintenance and selection medium), spawning, hatching eggs, larval rearing, larval nursery, water quality management, harvesting and post-harvest. Fish hatchery wader pari uses the intensive and intensive. semiIntensive pools as a spawn and hatching eggs, while the pool spring intensively as a place pendederan. larvaeA container that is necessary in conducting wader pari fish hatchery that is pond concrete with the size of $3 \ge 2 \ge 0.5 \text{ m}^2$

Results and Discussion

Brood maintenance

The collection of wader stingray mothers owned at the Kepanjen Aquaculture Installation to date amounts to 1630 heads. 1,115 male broods and 515 female broods. The mother wader fish that will be used in production activities comes from a mother who is not one offspring and has a good qualitative and quantitative based on morphology,

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fecundity, hatchability of eggs, growth and survival. Wader fish production requirements 6-8 months, the average weight is 7.6-8 gr. Broods are kept separately in wall ponds with running water. The feed given is in the form of pf 800 pellets with a protein content of 39% with a total feed of 2-3% of biomass with a frequency of administration 3 times per day. This is consistent with statements Habibi (2013), that the provision of proper feed absolutely necessary to preserve the carrier to stay healthy, fish and please know that the limited or poor nutrition can affect the growth and ripeness the gonads.

Spawning pond before use first drying the pond aims to remove moss and dirt that sticks to the floor wall of the pond after cleaning the pond is drained for 1 day to kill and sterilize from other organisms that can hinder the spawning process is carried out after the drying process is completed in the water content with a height of 30 40cm. Preparation of the medium in the form of kakaban and paving stones as ballast for the place where the eggs are attached when the mother wader spawns. According to Mustajib (2018), the drying of the pond is carried out for three days with the aim of removing toxic compounds decomposition of organic matter. Drying of the bottom of the pond is carried out to kill pathogenic bacteria, toxic compounds, as well as accelerate the process of mineralization of organic matter. The purpose of lime feeding is to raise the pH of the soil and kill the remaining pests of the disease from the previous cycle. These steps are carried out simultaneously for \pm 1-2 weeks. Meanwhile, fertilization aims to meet the nutrient needs needed by phytoplankton as zooplankton and fish food (Cahya, 2020). Furthermore, fertilization is carried out with the aim of growing phytoplankton and zooplankton as natural feed for larvae. The fertilizer used is chicken manure. Fertilizers are evenly distributed in the pond. The dose used was 200 grams/m² of pool area.

Selection of Parent Candidates

The male stingray wader brood that has matured gonads has relatively slender body characteristics, bright body color, the urogenital orifice is pale and when stripped it releases sperm. As for the mother female stingray wader that has matured gonads, it can be seen from the ventral part which is slightly bulging, the body color is dark, the urogenital hole is pink and when stripping the egg will come out. The male stingray wader brood is 225 while the female is 110 who have gone through the selection stage. The mother female stingray wader that matures gonads and is ready to spawn has an average weight of 7.97 g with an average length of about 8.5 cm. Meanwhile, the male wader mother has an average weight of 4.55 g with an average length of 7.65 cm. Male and female wader broods that have matured gonads can be seen in figure 1.



Figure 1. (a) Male parent(b) Female parent

Spawning

Spawning of stingrays can be done in an aquarium, trough, or pond. The parent pair of stingray waders is put into the spawning pond. The ratio of males and females used is 2: 1. The mother stingray wader will chase each other which indicates that interest is starting to occur. Then the male stingray wader mother will swipe the urogenital part to the urogenital part of the female wader fish mother.the mother wader stingray will remove the eggs and be directly fertilized by the male stingray wader mother. Then the fertilized egg will stick to the kakaban.

Hatching eggs The process of hatching eggs occurs for approximately 24 hours. The next handling that must be done is to move all the mother stingray wader fish to the mother pond. If the mother is not immediately transferred, it will cause many stingray wader fish fry to be preyed upon by the wader mother itself The difference between the eggs of the unfertilized and fertilized wader stingrays.can be seen in figure 2.



Figure 2. (a)unfertilized (b) fertilized eggs

The eggs of the fertilized stingray wader fish and the unfertilized have very clear differences and can be seen directly. The eggs of the fertilized stingray wader have a clear white color. Meanwhile, the eggs of unfertilized stingray wader fish have a milky white color. This is in accordance with the opinion (Iswahyudi et al., 2014), that the characteristics of the eggs of the stingray wader that have been fertilized are clear in color while the eggs of the unfertilized stingray wader are white.

All eggs on the spawning substrate are calculated to determine fecundity. Fecundity is observed by counting the entire number of eggs produced and comparing with the weight of the brood. Wader stingray eggs are adeshive, that is, the eggs are sticky so they will easily stick to the substrate. During the egg hatching process, fecundity data, fertilization rate or FR (Fertilization rate) and hatching degree or HR (Hatching rate) are obtained.

Based on the data obtained wader brood with a weight range of 7.8-8.2 g has an average fecundity of 1500. Zubaidah (2011), states that in one spawning, wader fish have a fecundity value of 985-2000 eggs per brood. In the spawning process, the percentage of eggs that are fertilized with eggs removed is 70%. In addition, from hatching eggs obtained a value of 68%. According to Fariedah (2018), the degree of hatching or hatchability is the percentage of the number of fertilized eggs. The success of high hatchability of eggs can be influenced by several factors which include egg quality, water quality and handling at the time of hatching.

Larva Rearing

The stocking of larvae is carried out carefully with the use of dippers with the aim that the larvae are not stressed. The larvae are stocked with a density of 6,380 heads. The temperature of the larval rearing pond should be maintained in the range of 26.5-29 °C. At temperatures below 25 °C, white spots will usually form on the larvae causing mass death. The most important thing in the maintenance of larvae is to keep the pond clean. The newly hatched larva still carries a supply of food in itself (yolk), so it does not need to be fed for 3-4 days (Supryady et al., 2021). After the food supply is exhausted, the larvae should be immediately fed. Feed in the form of Daphnia sp. This type of water bug has a protein content of 39.4 %. This type of water flea is given up to 7 days old. Furthermore, it is introduced with 00 fengli pellet feed and mixed with 500 ml of water, it is expected that when it

reaches the fry, the wader fish has recognized the food given.

Larval nursery

The nursery pond for the wader hatchery of the stingray wader is a semi-intensive pond. Measure a nursery pond with an area of 6 x 40 m with a depth of 1 meter. In preparing the nursery pond, the inlet and outlet of the sluice uses a fine net so that the fry cannot pass through the waterways and prevent pests from outside from being carried into the pond. The first thing to do is to carry out drying with the aim of removing disease seedlings that may have remained from previous activities. Filling of pool water is carried out gradually with a depth of 20-30 cm. This is because the fry are still very small, larvae that are already 7 days old have been transferred to the pond from the moment they hatch in the spawning ground. The stocking density of wader stingray fry ranges from 300-600 heads per m². Larvae that are 7 days old are nursed I. The larger the size of the wader fish fry, the lower the stocking density of fish fry. After 2 weeks of age, the fry of wader stingrays are densely stocked with 10 heads / liter. Furthermore, the next 2 weeks will be nursery to II until the target production size (2-3 cm. Wader stingray seeds measuring 1-2 cm use pellets that have a protein content of 40% because at that age wader fish fry need a lot of protein for development. The type of feed given is in the form of Fengli 0 type pellets. This feeding is added with water a little and then clenched – the goal is to prevent accumulation at the bottom of the pond. The accumulation of feed residue will form ammonia which is harmful to fish fry (Hasibuan et al., 2021). In principle, the size of the feed should be adjusted to the mouth opening in the seeds of the stingray wader. Feed given with a frequency of 3 times a day. Feeding time can be done in the morning, afternoon and evening.

Water Quality Management

In the hatchery business, it is necessary to carry out water quality control activities. Water quality measured in stingray hatcheries includes pH, temperature and DO. Because such water quality parameters have the most influence on natural conditions. Data on the results of water quality measurements at the Kepanjen Aquaculture Installation (IPB) can be seen in table 1 below:

Table 1. Water Quality	Value Range
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Parameter	Unit	Result	References
рН	-	6,7-7,4	6,5-8

			Rahmawati (2006)
Temperature	₽C	26,5- 29,5 ºC	25-29 ºC Munjayana., <i>et al.,</i> (2015)
DO	Mg/l	5,23- 7,33 mg/l	6,36-8,15 Iswahyudi (2013)

Temperature

Based on the results of water quality measurements for the temperature parameter, results were obtained with an average of 26.5-29.5 °C. From the results of these data it is appropriate according to BSN (2014), which is a standard value that is owned nationally in the Indonesian region. Temperature influences directly or indirectly on factors such as enzyme activity, metabolic rate and oxygen levels. The rate of absorption of poison can be higher with an increase in temperature.

Ph

Based on the results of water quality measurements, the pH parameter is in the range of 6.7-7.4 . According to BSN (2014), the optimal pH ranges from 6.5-8. This also agrees with (Junardi et al., 2019), stating that to support the life of an aquatic organism naturally a pH value between 5 and 8.7 is required.

Disolved Oxygen (DO)

Based on the results of water quality measurements for the DO parameter, the results obtained were 5.23-7.33 mg/l. According to BSN (2014), the optimal DO range is at least 3 mg/l so that the results of the water quality data are in accordance with the standard values that are owned nationally in the Indonesian region.

Harvest

Harvesting is carried out when the larvae have reached a size of 2-3 cm. Harvesting seeds to be harvested is not fed for \pm 24 hours. Seed harvesting is done without draining the pond. The tool used is a 2 mm mesh spread along the width of the pond. The SR value obtained is 47%. From this it can be known that the survival rate of fry is very low. This is in accordance with the research of Robisalmi et al. (2017), allegedly because the difference in the ratio of males and broods does not trigger stress in the larvae of wader stingrays. Stress will generally occur if triggered by high stocking density that increases competition for space and food needs, the influence of metabolic waste, thereby lowering the survival rate of wader fish.

Post Harvest

Packaging of larvae and seeds is carried out manually, both from the preparation of the tool to transportation to the transport car. In one seed plastic there are a maximum of 2,000 seeds and 5,000 heads/larval bag. Plastic packing is given water with oxygen which is 1: 3 and fill the seeds in one plastic bag depending on the distance where the seeds will be sent. The plastic containing the seeds must be laid out as well as possible so that they do not leak or break during the trip. A pick-up car is capable of transporting up to 75 plastic seeds using a two-tier support frame, while if the number of shipments is more than 75 plastics, the number of larvae or seeds per plastic (bag) is approximately 2000 heads/bag.

Pest and Disease Control

Pest and disease control is absolutely necessary to keep farmed fish in healthy conditions. Pests that often disturb the larvae of wader rays are wild fish, monitor lizards, snakes, conchs, and frogs. Meanwhile, diseases that usually attack wader stingrays are fungi and Aeromonas hydrophilia. After knowing the pests and diseases that attack the stingray wader fish, prevention and treatment can be carried out. Prevention of pests that attack stingray waders can be done by regularly cleaning the pond using a brush and chlorine or chlorine that has been dissolved with water so that the crust and moss that stick to it can be removed. Chlorine or chlorine is administered at a dose of 10 ppm and allowed to stand for \pm 7 days. This is done so that the pool to be used is clean and free from pests and diseases from previous use of the pond.

Conclusions

Fecundity of wader Pari fish 1,500 with a fertilization rate of 70% and a hatching rate of 68%. Harvesting is done at seed size 2-3 cm with SR 47%. Temperature water quality parameter values are 26.5-29.5 0C, Ph 6.7-7.4 and DO 5.23-7.33.

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