Health Management of Humpback Grouper Larvae (*Cromileptes altivelis*) in BBRBLPP Gondol

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Abstract

Larvae health management is a key factor in the hatchery of humpback grouper (Cromileptes altivelis) to prevent mass larval deaths and cause financial losses. Management of humpback grouper larvae health includes larval rearing, larval feed management and larval disease control. The primary data collection method was carried out in 3 ways, namely observation, active participation and interviews. Secondary data retrieval by studying literature from various related sources. The humpback grouper larvae were reared in the hatchery to control the temperature and condition of the larvae. Larval ponds are sterilized with 3-5 ppm chlorine in the morning and rinsed thoroughly so that no chlorine remains. Larvae were reared from the age of 1 day to 45 days. Feeding the larvae was started when the larvae were 2 days old with Nannochloropsis occulata. Rotifers were given when the larvae were 2-3 days old with a density of 5 individuals/ml. Artemia was given when the larvae were 20 days old until the age of 40 days. Pellets are given when the larvae are 8-10 days old with a pellet size of level 1. The pellet size continues to increase according to the larva's mouth opening. The disease that often attacks larvae is Viral Nervous Necrosis (VNN). The characteristics of larvae infected with VNN are reduced appetite, weak movement, larvae float on the surface and lie on the bottom of the pond. VNN attacks can only be overcome by prevention. The bacteria that often attack the larvae are Vibrio alginolyticus. Vibrio alginolyticus can be treated with antibiotics or non-antibiotics. The use of antibiotics is not recommended because they have negative side effects, so you can use other alternative medicines derived from herbal plants (phytopharmaceuticals).

Keywords: *Larvae health management, Humpback grouper, Cromileptes altivelis.*

Introduction

In general, grouper is a fish with high economic value. In Indonesia, grouper is an export commodity to various countries in Asia such as Vietnam, Singapore, Malaysia, Hong Kong, Taiwan and China (lu, 2017; Dadiono et al., 2020). In addition, grouper is one of the main commodities in the aquaculture sector in Indonesia (Wirawan et al., 2021).

The type of grouper that is the leading export commodity is the humpback grouper (*Cromileptes altivelis*), this fish has the potential to be cultivated because it is relatively tolerant of limited space and salinity (Arif and Regan, 2020). Humpback grouper is a popular fishery commodity in the international market as consumption fish and ornamental fish. Market demand for humpback grouper continues to increase, both in the domestic market and in foreign markets (Prayogo and Hidayat., 2014). To meet market demand, there is a great opportunity for hatchery and rearing of humpback grouper, this also reduces the overfishing of humpback grouper in nature.

One of the important problems that arise in humpback grouper hatchery activities is when the fish are in the larval phase, where during this larval phase the humpback grouper needs special attention related to its health management in the form of larval rearing, feed management and disease control. Larval health management is an important factor in hatchery efforts. If larval health management is not carried out

properly, it can result in larval death and reduced seed production, causing large financial losses (Ismi et al., 2014). This study aims to determine how the larval health management of humpback grouper (*Cromileptes altivelis*) applied at BBRBLPP Gondol Bali includes larval rearing, larval feed management and larval disease control.

Methods

This research was conducted in September – October 2013 at BBRBLPP Gondol Bali. This research is a descriptive study where the primary data collection method is carried out in 3 ways, namely observation, active participation and interviews with several sources (Dadiono & Insani, 2020). Meanwhile, secondary data retrieval with literature studies is used to collect information from various related literature sources to enrich the discussion, by comparing the results obtained with previous studies (Halim et al., 2021).

Result and Discussion

a) Larvae Maintenance

The larval pond used is a yellow rectangular concrete pond with a capacity of 10 m3. At the corner of the pond is made slightly circular to avoid the gathering of larvae in the corner of the pond. In the corner of the pond there is a drain hole equipped with a cover pipe which has been perforated on the sides and given a net with the aim of preventing larvae from being sucked into the drain hole. The larval pond is covered with a colorless or clear tarpaulin to prevent dirt from entering the pond.

Spreading is carried out starting from the egg stage, which is stocked into the larval rearing pond and at the same time becomes a place for hatching eggs. The eggs themselves hatch within 24-36 hours. This pool is made of concrete in the form of a square with a size of 3 m x 3 m x 1 m. Larval rearing is carried out in the hatchery so that the temperature and condition of the larvae can be controlled. The concrete pool was previously cleaned and sterilized using 3-5 ppm chlorine, then rinsed and drained so that there was no residual chlorine. After the pool is cleaned, fill it with new water and let it sit for one night first so that the water temperature is the same as the room temperature in the hatchery. Based on the statement of Muslim et al., (2019), Water used for grouper rearing should be sterilized using high doses of chlorine between 20 ppm to 30 ppm. After being allowed to stand for one day, the water contained in the holding pond is channeled into the larval pond, the pump in the holding pond should not be at the bottom, and the distance between the pump and the bottom of the pond is 70 cm so that sediment deposits are not pumped into the larval pond.

Aeration in the larval pond must be continuously turned on, which functions as an oxygen supply in the larval pond. Humpback grouper eggs begin to hatch about 24 hours - 36 hours after stocking. After the eggs hatch, they will enter the larval stage, at this stage the fish are called D1. Based on the statement of Ismi et al. (2018), D1 is a phase where fish larvae are transparent and floating larvae spread in the rearing pond. Larval rearing will be carried out until the D45 phase. In this D45 phase the grouper larvae are already in the juvenile form, so at this stage the grouper larvae must be separated to avoid cannibalism (Ismi et al., 2012).

b) Larvae Feed Management

The natural feed given to the early phase of the humpback grouper larvae was Nannochloropsis occulata which was given when the grouper larvae were 2 days old. It aims to provide feed for the rotifers which will later be used as feed for humpback grouper larvae, this is because the rotifers match the apertures of the humpback grouper larvae. Natural feed is first cultured on a laboratory scale to a mass scale. Nannochloropsis occulata is spread through pipes from mass culture ponds to Nannochloropsis holding ponds located in larval rearing sites. The filling of the Nannochloropsis reservoir is carried out between 15.00 – 15.30 WITA and will be channeled into the larval pool until the larvae are 30 days old.

Furthermore, the larvae were given feed in the form of rotifers (Branchionus plicatilis). The feeding of rotifers was started when the larvae were 2-3 days after hatching

(HSM) with a density of 5 individuals/ml. To determine the rate of predation, the density of the rotifers was calculated twice a day, in the morning and evening, if the result was less than 5 individuals/ml, the rotifers were added. The same thing with the statement of KKP (2013), where rotifers as grouper larvae feed can be given when the larvae are 2-3 days old with a density of 5-7 individuals/ml.

When the larvae were 5 days old up to 35 days old, the density of the rotifers was increased to 10-15 individuals/ml. The rotifer was first enriched by giving Nannochloropsis occulata for 6 hours. According to KKP (2013), enrichment of rotifers and Artemia was carried out 2 hours before this natural food was given to grouper larvae.

Furthermore, when the humpback grouper larvae were 20 days old, they were given feed in the form of Artemia. Artemia feed itself is given 2 times a day, in the morning and afternoon. Before being given to grouper larvae, Artemia is hatched in the hatchery first. Meanwhile, according to Muslim et al. (2019), the hybrid tiktak grouper (humpback grouper x giant grouper) was fed Artemia when the larvae were 7 days old.

Feeding pellets for humpback grouper larvae is started at the age of 8-10 days with a level 1 pellet size. This pellet size will continue to be adjusted to the size of the larva's mouth opening. Pelleted feed continues to be given until the larvae are 45 days old, at which time the harvesting process has been carried out for the first time, when the fish is 50 days old, the pellets are usually added with multivitamins.

c) Larval Disease Control

The disease that often attacks the larvae of humpback grouper is the same as that which usually attacks the larvae of other types of grouper, namely Viral Nervous Necrosis (VNN). The characteristics of grouper larvae infected with VNN are reduced appetite, very weak movement, and sometimes the larvae float on the surface of the water and lie on the bottom of the rearing pond. This disease often causes a high mortality rate. Currently there is no way to overcome this disease, which can be done only by means of prevention so that the water in the larval pond is not contaminated with VNN. Some of the prevention efforts that can be done are to sterilize the equipment used in larval production activities. Then if the seeds have been exposed to VNN, the thing to do is to remove all the seeds and water contained in the pool and clean it by scrubbing the sides and bottom of the pool. In addition to viral diseases, grouper larvae are still susceptible to bacteria, one of which is *Vibrio alginolyticus*. According to Sahari (2018), grouper infected with *V. alginolyticus* bacteria can die up to 70%, this makes this bacterium a very dangerous pathogenic agent.

Treatment for the attack of *V. alginolyticus* bacteria can be done using antibiotics or non-antibiotic drugs, but the use of antibiotics can have a bad effect on larvae and residues on the environment (Dadiono, 2014; Dadiono, 2017). Alternative medicine that can be used to treat *V. alginolyticus* can use a variety of drugs from natural ingredients (Fitofarmaka). Based on the research results of Oktaviani et al. (2019), the use of life-sustaining leaves at a dose of 700 ppm can increase grouper immunity against *V. alginolyticus*. Meanwhile, based on the research of Dadiono et al., (2017), the use of binahong leaf extract at a dose of 100 ppm can increase the survival of test fish infected with bacteria by 90%. Based on the research of Andayani et al. (2020), the use of aloe vera extract at a dose of 2 ppm has the potential to increase fish resistance to bacterial attack.

Conclusion

Management of the health of humpback grouper larvae at BBRBLPP Gondol starts from the larval rearing process, larval feed management and larval disease control. Larval rearing is carried out in a hatchery which functions to control the temperature and condition of the larvae. Larval rearing ponds should be cleaned and sterilized using 3-5 ppm chlorine in the morning and rinsed thoroughly. Aeration in the larval pond must be continuously turned on to supply oxygen for the larvae. Rat grouper larvae were reared from day 1 to day 45. Feeding of larvae was started when the larvae were 2 days old, the feed given was Nannochloropsis occulata. Rotifers were started when the larvae were 2-3 days old with a density of 5 individuals/ml. When the larvae were 20 days old, they were

fed Artemia every morning and evening. Pellet feed was started when the larvae were 8-10 days old with a pellet size of level 1. The pellet size continued to increase according to the larvae's mouth opening until harvest. The disease that often attacks grouper larvae is VNN (Viral Nervous Necrosis). With the characteristics of a reduced appetite for larvae, weak movement, the larvae float on the surface of the water and lie on the bottom of the pond. Handling VNN attacks can only be done by means of prevention. The bacteria that often attack grouper larvae is *Vibrio alginolyticus*. To treat larvae that are attacked by *V. alginolyticus*, you can use antibiotics or non-antibiotics, but the use of antibiotics is not recommended because they have bad side effects, so alternative treatments for *V. alginolyticus* can use natural medicines from plants (phytopharmaceuticals).

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