Application for Handling Hybrid Grouper Eggs (*Epinephelus lanceolatus x Epinephelus fuscoguttatus*)

Muh. Sulaiman Dadiono[1],* and Maheno Sri Widodo[2]

[1]*Department of Aquaculture, Faculty of Fisheries and Marine Science, Universitas Jenderal Soedirman, Jl. dr. Soeparno, Komplek GOR Soesilo Soedarman, Purwokerto, Indonesia*
[2]*Department of Aquaculture, Faculty of Fisheries and Marine Science, Universitas Brawijaya, Malang, Indonesia*
*Email: sdadiono@unsoed.ac.id

Abstract

Applications for handling hybrid grouper eggs (Epinephelus lanceolatus x Epinephelus fuscoguttatus) include the initial egg handling process, egg selection, egg counting and egg observation. The initial handling of hybrid grouper eggs (Epinephelus lanceolatus x Epinephelus fuscoguttatus) begins with stripping the female tiger grouper and male giant grouper to get eggs and sperm. Mixing eggs and sperm is done using chicken feathers. Egg selection is done to separate good and bad quality eggs. Good quality eggs will float on the surface, are round, transparent in color and have a core. Poor quality eggs will sink to the bottom and become milky white. The egg calculation technique uses the manual method with the help of a petri dish and a 20 ml beaker glass. Observation of eggs using a microscope magnification 40x. The fertilized egg has a transverse line between the nucleus of the egg which is a developing embryo. The unfertilized egg does not have a transverse line which indicates the egg does not have an embryo.

Keywords: *Eggs handling, Grouper eggs, Hybrid grouper, Epinephelus lanceolatus x Epinephelus fuscoguttatus*

Introduction

Grouper is an export commodity to various countries in Asia. In addition, grouper is one of the main commodities in the aquaculture sector (Dadiono & Suryawinata, 2021). The type of grouper that is the leading export commodity is the hybrid grouper (Dadiono et al., 2020).

Currently, hatchery activities for hybrid grouper (*Epinephelus lanceolatus x Epinephelus fuscoguttatus*) have been widely carried out in various parts of Indonesia. One of the areas in Indonesia where hybrid grouper hatchery is practiced is along the northern coast of the island of Bali (Ismi et al., 2012; Wirawan et al., 2021). The high demand for hybrid grouper seeds is due to the hybrid grouper growing faster than other types of grouper (Sutarmat & Yudha, 2013). The growth of the hybridized grouper larvae is faster than other groupers with a length of up to 12 cm for 2 months of rearing (Ismi, 2017).

Although many hybrid grouper hatcheries have been carried out, there are still some obstacles in the series of hatchery processes until they reach the hands of consumers. There are several processes that need to be considered in the hatchery of hybrid grouper, including the broodstock selection process, feed management, fish health management, water quality management and no less important is the process of handling hybrid grouper eggs so that they can hatch.

The process of handling hybrid grouper eggs if not handled properly can cause the eggs to fail to hatch even though they have been fertilized. If there is a failure in the hatching process it can cause financial losses. In addition, the handling of hybrid grouper eggs is different from the handling of other types of grouper. This is because the hybrid grouper is a hybrid grouper from 2 different types of grouper so that the egg handling process is much more complicated.

The purpose of this research was to determine the application of good hybrid grouper egg handling and it is hoped that this research can provide additional knowledge in the field of aquaculture. This research includes 3 main treatments, namely initial handling of eggs, egg selection, egg counting and egg observation.

Materials and Methods

This research was conducted at the hybrid grouper hatchery (*Epinephelus lanceolatus x Epinephelus fuscoguttatus*) located around northern Bali. The method of data collection was carried out by direct observation, active participation and seeking information from sources through interviews (Halim et al., 2021). The data collected will be analyzed descriptively (Dadiono & Aminin, 2021; Halim & Dadiono, 2021). The data discussed include initial handling, egg selection, egg counting and egg observation. Meanwhile, the tools and materials used during active participation are as follows:

Tools

The tools used in handling hybrid grouper eggs are:

- Basin
- Aerators
- Aerator hose
- Petri dish
- Fiber tub 30 Liter
- Beaker glass 20 ml
- Microscope

Materials

The materials used in handling hybrid grouper eggs are:

- Tiger grouper eggs (*Epinephelus fuscoguttatus*)
- Sea water
- Chicken feathers
- Sperm giant grouper (*Epinephelus lanceolatus*)

Results and Discussions

Initial Handling

Handling hybrid grouper eggs is very different from handling grouper eggs that are spawned naturally, in general grouper eggs from natural spawning will be released by grouper brooders in the broodstock pond, then will be accommodated in the egg collector which is attached to the reservoir (Dadiono & Suryawinata, 2022). which are found on the sides of the broodstock pond as it approaches the dark moon. The egg collector has a size of 100x60x100 cm made of nylon minophylline with a mesh size of 400 µm.

Hybrid grouper eggs are eggs resulting from artificial spawning between female tiger grouper (*Epinephelus fuscoguttatus*) and male giant grouper (*Epinephelus lanceolatus*). To get tiger grouper eggs and giant grouper sperm obtained by stripping. After all the eggs come out, the eggs are immediately accommodated in a basin and that's when the sperm of the grouper is ready to be mixed using chicken feathers. This is similar to the statement by KKP (2013), grouper hybridization is carried out by artificial fertilization by mixing female tiger grouper eggs with giant grouper sperm. Tiger grouper eggs are removed by striping and stored in a plastic basin. The prepared giant grouper sperm is then mixed with tiger grouper eggs using a soft brush.

Egg Selection

The fertilized eggs are then put into a fiber tub size 30 liter filled with seawater and has been aerated. Then the aeration is stopped first and the eggs are carefully stirred. Stirring is done by twirling hands, this aims to separate between fertilized and unfertilized eggs.

Egg selection aims to separate good and bad quality eggs, by settling grouper eggs without aeration for several minutes. The characteristics of good quality eggs will float on the surface, are round, transparent in color and have a core. Meanwhile, eggs of poor quality will sink to the bottom of a body of water and become milky white. The fertilized egg will float on the surface of the water. According to Ching et al. (2018), to observe fertilized grouper eggs, eggs were collected from the incubation tank using a fine scoop net with a mesh size of 60 lm and transferred into a 500 ml beaker glass containing filtered seawater. The eggs are then put in a clean place and observed with a compound microscope to observe the development of the embryo.

Eggs that float will be taken later, while eggs that sink to the bottom of a body of water will be discarded, for eggs that float in the middle are fertilized but low-quality eggs, in this egg cultivation activity will also be taken. As for research, floating eggs will not be taken. Furthermore, the unfertilized eggs will be removed by siphoning, after the siphoning process is complete the aeration is turned on again.

Egg Counting

The technique of calculating hybrid grouper eggs uses the manual method. This manual method is carried out with the help of tools such as petri dishes and a 20 ml beaker glass. The egg calculation stage is carried out in several stages. The first step is to take a sample of eggs in the egg container as much as 10 ml. The sampling technique must be careful, where once taking the sample it must fit 10 ml. If it is less or more than 10 ml then it must be repeated until it gets the exact 10 ml result. If you have got the desired sample then diluted the sample using sea water. This dilution is done to make it easier when counting eggs. Then the sample is poured little by little into a petri dish and counted. Calculation of the number of eggs using the formula: *Number of eggs : number of samples / volume of samples x volume of fiber***.**

The results of egg calculations that have been carried out are obtained in one spawning cycle of hybrid grouper producing approximately 150,000 eggs for one grouper brood. This result is relatively small when compared to the average female grouper brood in producing eggs. According to Ismi (2017), the hybrid grouper spawning process in one striping process for two tiger grouper broodstocks produces 1-2 million eggs which will be mixed with 1-2 ml of giant grouper sperm for 1 million eggs. Meanwhile, according to KKP (2013), every 1 million tiger grouper eggs can be mixed with 10 ml of giant grouper sperm. The number of eggs produced is not optimal this can be caused by several factors such as the age of grouper brooders, unhealthy broodstock conditions or other factors (Dadiono et al., 2022).

Egg Observation

The eggs are then observed to see if the eggs are perfectly fertilized or not, and to find out how far the embryo has developed using a microscope. The eggs were then observed using a microscope with a magnification of 40x. After observing it, the results can be seen in the form of differences between fertilized eggs and unfertilized eggs. The fertilized egg will look like there is a transverse line between the egg nucleus. The transverse line is actually a developing hybrid grouper embryo. Whereas in unfertilized eggs there is no visible transverse line which indicates the egg does not have an embryo. According to Sugama et al. (2012), fertilized grouper eggs will show a well-developed embryo with a position circling the yolk. Grouper eggs that are not fertilized will not see a developing embryo. But if there are a small number of eggs that are irregularly shaped, dark in color and the embryonic development is not normal, then the eggs can still hatch but with poor quality larvae. Meanwhile, according to Ismi (2017), fertilized grouper eggs will show the development of an embryo that looks clear and floats, eggs that are not fertilized by an embryo do not develop and are white in color. Then the grouper eggs were stocked in the hatchery and acclimatized for 10-20 minutes before being stocked. Grouper eggs will hatch after being incubated for 20 to 24 hours (Dadiono & Insani, 2020).

Conclusion

Application of hybrid grouper egg handling in hatcheries along the north coast of Bali begins with the initial egg handling process, egg selection, egg counting and egg observation until the eggs hatch into larvae. Handling hybrid grouper eggs is different from handling grouper eggs that are not hybridized. The initial handling of hybrid grouper eggs begins with stripping the female and male brooders to obtain eggs and sperm. Mixing eggs and sperm is done using chicken feathers or a soft brush. Selection of hybrid grouper eggs is done to separate good and bad quality eggs. The characteristics of good quality eggs will float on the surface, are round, transparent in color and have a core. Meanwhile, eggs of poor quality will sink to the bottom and become milky white. The technique of calculating hybrid grouper eggs uses the manual method with the help of tools such as a petri dish and a 20 ml glass beaker. The egg count results obtained in one hybrid

grouper spawning cycle produces about 150,000 eggs for one grouper brood. After being observed using a 40x magnification microscope, the fertilized grouper eggs looked like there was a transverse line between the egg nuclei. The transverse line is a developing hybrid grouper embryo. Whereas in unfertilized eggs there is no visible transverse line which indicates the egg does not have a developing embryo.

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