

## BROODSTOCK HEALTH MANAGEMENT OF CANTANG GROUPER (*Epinephelus Sp.*) IN BBRBLPP GONDOL BALI

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### Abstract

Fish health is an important problem faced by Cantang grouper (*Epinephelus sp.*) Hatcheries. Broodstock health management needs to be managed properly so as not to decrease the quality and production of Cantang grouper seeds. Cantang grouper broodstock health management includes the process of maintaining grouper broodstock, feeding, disease control and water quality management. The data collection method is done by recording the results of active participation, interviews and observations. Broodstock grouper cantang are maintained in ponds made of concrete with sizes ranging from 150 m<sup>3</sup> and a depth of 3 m. Pond cleaning is carried out once or twice a month with the addition of 2 kg of chlorine / 150 tons of water. Grouper broodstock is fed 10 kg for 24 broodstock. feed in the form of trash fish, squid, mackarel, vitamin C and vitamin E. The types of diseases that often attack grouper broodstock are *Criptocaryon irritans*, *Benedia sp* and *Vibrio alginolyticus*. Water quality parameters measured in grouper broodstock ponds are salinity and temperature. The water salinity in broodstock ponds ranges from 34 - 35 ppt and temperatures range from 27 - 31 °C.

**Keywords:** Fish health, broodstock, grouper cantang, *Epinephelus sp.*

### 1. Introduction

Grouper is a reef fish that has high economic value and is an export commodity to various countries such as Singapore, Malaysia, Thailand, Vietnam, Taiwan, China and Hong Kong (Heerin, 2002; Ismi, 2017). According to Afero (2010), each year the production of grouper fish increases by 1.5% annually, this increases market demand for groupers. Increasing market demand for grouper, efforts are made to obtain superior grouper seeds that are resistant to disease, resistant to environmental changes and have fast growth (Sutarmat and Hirmawan, 2013). To get these superior seeds, one way is done by Hybridization.

One of the successful hybridizations of grouper is a cross between male kertang grouper (*Epinephelus lanceolatus*) and female tiger grouper (*Epinephelus fuscogutattus*) (Ismi and Asih 2011a; Ismi and Asih, 2011b), which produces a variety of grouper (*Epinephelus sp.*) the faster growth of the two broodstock (Ismi and Asih, 2011a). According to Ismi and Asih (2011b), the growth of hybrid grouper larvae has faster growth than tiger grouper with an average length of 12 cm at the age of 90

days. Therefore, Cantang grouper is in great demand for the export market (Ismi, 2017). Cantang grouper hatcheries have been carried out along the coast of North Bali (Ismi et al., 2012; Wirawan et al., 2020).

The problem that arises from the hybridization between the two types of grouper is the difficulty of getting good broodstock. A good broodstock grouper can be identified from their age, size and health. Fish health management is an obstacle that is often faced by grouper seedlings, especially broodstock and larval health management. If the broodstock health management is not managed properly it will result in a decrease in the quality and production of Cantang grouper seeds.

This research aims to determine the health management of cantang grouper broodstock which is implemented in BBRBLPP Gondol, Bali Province which includes broodstock maintenance, feeding of broodstock control of broodstock disease and management of water quality.

## 2. Materials and Methods

### Research Design

This research was conducted in August - September 2013 at the Central Research of Sea Cultivation and Fisheries Extension (BBRBLPP), Gondol, Penjabangan Village, Gerokgak District, Buleleng Regency, North Bali, Bali Province.

### Data Collection Method

Data collection in this research was carried out in 2 types of data collection, namely primary and secondary data collection. Primary data was collected by recording the results of active participation, interviews and observations. Secondary data collection is done by collecting information that a person reports as scientific knowledge.

## 3. Result and Discussion

### Grouper Broodstock Health Management

#### a. Maintain grouper broodstock

The female broodstock of the tiger grouper (*E. fuscoguttatus*) (Figure 1) is reared in a pond made of concrete with a size of about 150 m<sup>2</sup> and a depth of 3 m and equipped with aeration. The ratio of male and female broodstocks is 1: 2. The place used for the maintenance of broodstock must be clean, good water quality and adequate aeration. Cleaning the pond is carried out once a month where the grouper fish have finished breeding, whereas if the condition of the pond is very bad then cleaning can be done 2 times a month plus 2 kg of chlorine per 150 tons of water.



**Figure 1.** Female Tiger Grouper (*E. fuscoguttatus*)

#### b. Feeding grouper broodstock

The quality of feed given to the brooders greatly affects the level of health and maturity of the gonads. The feed given must contain protein which will affect the production process. The feed given to tiger grouper broodstock at BBRBLPP Gondol is divided into 2, namely the feed given every day and the feed given to increase endurance and accelerate the maturity of the gonads. The feed that is given every day is trash fish. Trash fish is given every day 1 time every 09.00 WITA until the fish is full.

The amount of feed given to female tiger grouper is 10 kg for 24 broodstock. The additional feed given increases endurance and accelerates the maturity of the gonads in

the form of squid, tuna, vitamin C and vitamin E.

Vitamins C and E are given 1 week before spawning mixed with broodstock grouper feed. The list of broodstock feeding 1 week before spawning can be seen in table 1.

**Table 1. Broodstock feed 1 week before spawning**

Day	Type of Feed
Monday	Trash fish + vitamins C and E
Tuesday	Trash fish + vitamins C and E
Wednesday	Mackarel / squid + vitamins C and E
Thursday	Mackarel / squid + vitamins C and E
Friday	Mackarel / squid + vitamins C and E
Saturday	Mackarel / squid + vitamins C and E
Sunday	Mackarel / squid + vitamins C and E

The appetite of broodstock grouper fish tends to decrease just before the spawning process so that at the time of approaching spawning, about 1 week before the broodstock feed is reduced. Feeding is reduced from 5 kg/day to 1 kg/day. This is because at that time the broodstock concentration is only used for the spawning process.

#### c. Broodstock Grouper Disease Control

Diseases in the broodstock usually already exist when the broodfish are caught from the wild. Therefore, the broodfish is examined carefully before being put into the tub. Usually, the diseases that attack the broodstock are parasites, the types are *Criptocaryon irritans* and *Benedia sp.* *Criptocaryon irritans* disease will attack the fish gills where the fish that are attacked have the characteristics of fish movement tend to be passive and decreased appetite. This disease is caused due to lack of aeration and the incoming water discharge does not meet the requirements.

The way to treat the parasite *Criptocaryon irritans* is by transferring the fish to a tank that is free of *Criptocaryon irritans* 2 times with an interval of 3 days. Meanwhile, the characteristics of the fish that are attacked by *Benedia sp.* Fish tend not to eat, do not want to lay eggs, the fish is slightly blackish, the movement of the fish is tilted and the fish often come to the surface, to overcome *Benedia sp.* by immersing it in freshwater for 20 minutes 2 times a day with an interval of 7 days. According to Lestari et al. (2013), the attack of *Vibrio alginolyticus* bacteria is also dangerous to the broodstock grouper, this bacteria can

cause mass death in groupers, one way of handling it is the use of antibiotics, but these antibiotics cause bad effects on fish so other alternatives are using natural active ingredients. According to Dadiono et al. (2017) and Andayani et al. (2020), the use of natural active ingredients such as *Anredera cordifolia* and *Aloe vera* plants is able to overcome bacterial attacks.

#### d. Water Quality Management

Management of seawater quality is the most essential element of all Cantang grouper hatchery activities. The seawater used comes from the Bali sea which is pumped and flowed into the brood pool.

The seawater that has been pumped has flowed into a sand filter with a capacity of 30 m<sup>3</sup> / hour. This sand filter contains sand, palm fiber, and gravel. From the sand filter, the water is collected in a seawater reservoir and filtered with a sand filter before being distributed to the brood pool.

Water quality parameters measured in the broodstock grouper ponds are salinity and temperature, where the salinity of seawater in broodstock ranges from 34 - 35 ppt and the temperature ranges from 27 - 31 °C. In this range, Cantang grouper broodstock can live well. According to Mayasari et al. (2013), the optimal temperature for tiger grouper broodstock is 27-32 °C with a salinity of 15-35 ppt. The suitable ecological parameters for grouper are temperature between 28-32 °C and salinity between 28-33 ppt (SNI, 2011; Wirawan et al., 2020).

#### 4. Conclusion

Health management of cantang grouper broodstock at BBRBLPP Gondol starts from the process of raising grouper broodstock, feeding broodstock, controlling broodstock disease and managing water quality. The female tiger grouper (*E. fuscoguttatus*) is reared in a concrete pond with a size of 150 m<sup>3</sup> and a depth of 3 m equipped with aeration. Cleaning the pond is done once after the spawning process or 2 times a month with the addition of 2 kg of chlorine / 150 tons of water.

Feeding broodstock is divided into 2, namely feed given every day and feed given to increase endurance and accelerate the maturity of the gonads. Trash fish is given once a day. Additional feed in the form of squid, mackerel, vitamin C and vitamin E is given 1 week before spawning.

Diseases that attack broodstock are Cryptocaryon irritans and Benedia sp. Cryptocaryon irritans control by transferring the fish to a clean tub 2 times with an interval of 3 days. Countermeasures Benedia sp. by immersing it in fresh water for 20 minutes 2 times a day with an interval of 7 days. *Vibrio alginolyticus* attacks can be treated with the use of antibiotics or with alternative ingredients from plant active compounds. Water quality parameters in broodstock ponds are water salinity 34 - 35 ppt and temperature 27 - 31 °C.

#### Acknowledgments

The author is grateful to the Central Research of Sea Cultivation and Fisheries Extension (BBRBLPP) Gondol for allowing the author to research the Cantang grouper. Do not forget to thank the author to Dr. Suko Ismi, Daniar Kusumawati and all the grouper technicians who helped this research.

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