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Short explanation of hybrid cantang grouper (*Epinephelus lanceolatus x Epinephelus fuscoguttatus*)

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Abstract

Hybrid cantang grouper is the result of cross-breeding engineering between the Epinephelus lanceolatus and Epinephelus fuscoguttatus grouper species. This hybrid grouper was first developed by BPAP Situbondo under the auspices of the Ministry of Marine Affairs and Fisheries of the Republic of Indonesia. This article briefly explains the hybrid cantang grouper starting from morphology, habitat, reproductive cycle and cross-breeding methods.

Keywords : Cross-breeding, Grouper, Hybrid Cantang, Epinephelus lanceolatus, Epinephelus fuscoguttatus.

The hybrid cantang grouper is a cross between the kertang grouper (*Epinephelus lanceolatus*) and the tiger grouper (*Epinephelus fuscoguttatus*). The results of this crossbreeding produce fish with high economic value which are the prima donna of exports (Ismi, 2017; Dadiono & Widodo, 2022; Dadiono et al., 2022). The morphology of the cantang grouper is a combination of both parents (Dadiono et al., 2020).

This hybrid grouper has a faster growth rate compared to the kertang grouper and the tiger grouper. In a maintenance period of 6 months, the cantang grouper can reach a weight of 8-9 ounces per fish. Other advantages of the cantang grouper include rapid growth, resistance to disease, high selling price, and high demand, especially from the middle to upper classes. The cantang grouper has great potential to increase the diversification of cultivated species and fisheries production in the future. This hybrid grouper cultivation technology continues to be developed, considering that the Kertang grouper broodstock as a genetic resource has faster growth than other types of grouper (BBAP Situbondo, 2011).

According to BBAP Situbondo (2012), hybrid cantang grouper has a distinctive morphology that can be recognized from the following characteristics:

1. Body Shape

- The body is *compressed* and relatively rounded.
- The width of the head is slightly smaller or almost the same as the width of the body.

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2. Body Color and Pattern

- The skin is blackish brown with five black lines across the body.
- All fins (pectoral, anal, ventral, dorsal, and caudal) have a pattern similar to kertang grouper with a yellow base and decorated with black spots.
- Black spots are spread on the head and near the pectoral fins with varying numbers between individuals.

3. Fins and Structure

- The dorsal fin widens towards the back and is fused, consisting of 11 hard rays and 15 soft rays.
- The pectoral fin consists of 17 soft rays.
- The ventral fin has 1 hard ray and 5 soft rays.
- The anal fin consists of 2 hard rays and 8 soft rays.
- The caudal fin has 13 soft rays and is *rounded*.

4. Head and Mouth Features

- The mouth shape is wide with a *superior* type (the lower lip is longer than the upper lip).
- The teeth are pointed (*canine*).

5. Scales

- The scales are *stenoid* type (serrated).

6. Body Size

- Body length reaches 48 cm.
- Intestine length is around 63 cm.

This morphology makes the hybrid cantang grouper easy to recognize and distinguishes it from other types of grouper.

According to Fitri & Purbayanto (2017), grouper fish are a type of fish that live in the euphotic zone with a complex habitat, so they have a higher diversity index than fish that live on muddy or sandy waters. Grouper fish are *nocturnal*, meaning they are more active at night and tend to hide in coral crevices during the day. The distribution of grouper fish, especially tiger grouper as the female parent of cantang grouper, is very wide in the Indo-Pacific region, including the Red Sea, tropical islands in the Indian Ocean, and the western to central parts of the Pacific Ocean, such as the eastern region of Samoa and the Phoenix Islands. This species is also found along the east coast of Africa to Mozambique, Madagascar, India, Thailand, Indonesia, the tropical coast of Australia, Japan, the Philippines, New Guinea, and New Caledonia (Heemstra & Randall, 1993). This wide distribution shows the adaptability of grouper fish to various tropical and subtropical environmental conditions.

According to Mariskha & Abdulgani (2012), grouper fish are generally solitary, but when entering the spawning period, these fish form groups. Grouper eggs and larvae are pelagic, while adult fish are demersal. Tiger grouper fish are included in the category of protogynous hermaphrodite fish, which is a condition in which the gonad differentiation process begins from the functional female phase, then changes into a

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functional male. At the growth stage until reaching gonad maturity, grouper fish are initially female and then change into males after growing larger or getting older. This sex change phenomenon is closely related to spawning activity, age, sex index, and body size of the fish (Nursida, 2011). This process shows the biological adaptation of grouper fish to ensure successful reproduction in their environment.

The stages of Cantang grouper (Epinephelus sp) seeding based on BBAP Situbondo (2013) are explained as follows:

a. Preparation of Female Tiger Grouper Broodstock

- Readiness to Spawn: The female broodstock is considered ready to spawn if checking using cannulation shows eggs that have separated and dry quickly when placed on the back of the hand.
- Hormone Injection: The female broodstock is injected with HCG hormone. The first injection is done on the right back with a dose of 250 IU/kg, and the second injection is done 10-12 hours later on the left back with a dose of 500 IU/kg.
- Placement in the Tank: After the injection, the broodstock is put into a 10 m^3 fiber tank equipped with aeration and an egg collector tank.

b. Preparation of Male Grouper Broodstock

- Broodstock Selection: The selected male broodstock must be at least 40 kg in size.
- Anaesthesia: The male broodstock is given anesthesia to avoid stress or resistance during sperm collection.
- Sperm Collection: Sperm is collected by stripping the male broodstock's stomach. The sperm fluid is collected in a sterile container and must not be mixed with seawater or fish urine. The sperm is then stored in a refrigerator.

c. Crossbreeding (Hybridization)

- Egg Check: The female broodstock is checked at 22.00 by cannulation on the genitals to ensure the condition of the eggs. Eggs that are ready have the characteristics of a large diameter, clear color, and float or hover in seawater.
- Artificial Mating Process:
- The female broodstock's stomach is gently massaged to remove the eggs, which are then collected in a basin.
- Kertang grouper sperm is sprayed onto the eggs at a dose of 1 ml of sperm per 1 million eggs.
- The eggs and sperm are stirred evenly using chicken feathers for 10-15 minutes.
- The eggs are left for 10-15 minutes so that the fertilization process takes place perfectly.
- Fertilization Check: Egg samples are checked under a microscope to ensure successful fertilization.

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- Egg Incubation: Eggs that are successfully fertilized are placed in an incubation tank equipped with a flowing water system and aeration. The gonad maturity time usually occurs at 00.00.

This stage ensures successful fertilization and the continuity of the life cycle of the Cantang hybrid grouper seeds.

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