



COBIA(*Rachycentron canadum*) **CULTURE**

HISTORICAL BACKGROUND

- Aquaculture research with cobia was first reported in 1975 with the collection of wild caught cobia eggs off the coast of North Carolina.
- In the USA, the first reported captive spawning of cobia occurred in 1996 in Mississippi.
- Research on cobia was also conducted in early 1990s in Taiwan Province of China and the technology to raise large quantities of cobia, fry was developed in 1997.

RECENT ADVANCES IN INDIA

- Realising the immense aquaculture potential of Cobia in India , the Central Marine Fisheries Research Institute (CMFRI) has been pursuing the broodstock development & seed production of Cobia. At Mandapam regional Centre of CMFRI, success broodstock development of Cobia had achieved on Wednesday, June 16, 2010.

Why Cobia?

- cobia is a highly valued sea- food species
- Faster growth rate
- adaptability for captive breeding
- lowest cost of production
- good meat quality and high market demand especially for sashimi industry

- It can be grilled, sautéed or served as sashimi
 - China has been the leading producer of farmed cobia, many other countries are developing technology to aquaculture cobia, hence global production of cobia is on the rise and it is appearing on menus more and more.

Habit and habitat

- Cobia are pelagic and are normally solitary except for annual spawning aggregations; They will congregate at reefs, wrecks, harbours, buoys and other structural oases. They may also enter estuaries and mangroves in search of prey.
- They are found in warm-temperate to tropical waters.
- They are carnivores, feeding on crustaceans, cephalopods, and small fishes such as mullet, eels, jacks, snappers, pinfish, croakers, grunts, and herring.

BIOLOGY

- They are able to tolerate a wide range of temperatures (eurythermal) and salinity (euryhaline) .
- Sexual maturity -in males at 1-2 years and in females at 2-3 years . Females grow larger and faster with maximum sizes up to 60 kg.
- Spawning occurs in both nearshore and offshore waters where females release thousand to million eggs (1.4 mm diameter) which are then fertilized by the males.

- Cobia larvae grow rapidly and are large in comparison to most marine species .
- Juvenile fish are found in both nearshore and offshore waters, often among weedlines where they seek shelter from predators and can feed

BROOD STOCK MANAGEMENT

- Broodstock management usually includes collection,
selection and domestication of brood
control of maturation
spawning and egg collection.
- Broodstock development is mostly practised in sea cages in order to ensure good water exchange and healthy environment.

- Brood fishes can be stocked at a density of about 2 kg/m³.
- Trash fishes (sardines, scads etc.) are fed once in a day at the rate of 5% of biomass
- Bigger fishes of 10-15 kg weight having normal shape without any deformity and with healthy behaviour are selected as broodstock. The other important criteria for broodstock include bright colour and with anus easily recognizable.

- Separation of males and females from the broodstock cage is required for conditioning the fish for breeding.
- Cannulation can be done to assess the maturity condition of the female. The maturation characteristics of female include egg with size above 0.7 mm, non-adhesive, white colour and round shape.
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- Usually two males and one female are introduced to the spawning tank. Natural spawning also can be obtained if brooders are selected properly.
- Induction of spawning can be done by injecting LHRHa $20 \mu\text{g kg}^{-1}$ for females and $10 \mu\text{g kg}^{-1}$ for males.
- Spawning occurs within 12-24 h after the injection.
- Egg collection can be done manually from the tank by employing $500 \mu\text{m}$ net.

Broodstock development and captive breeding at Mandapam

- The wild collected cobia brood fishes (hooks and line commercial catches)
- Conditioned for 2-3 days in 10 t FRP tanks before transferring to cages.
- These fishes were fed twice daily (@5% of bw) with sardines and other fish species like Pellona and Ilisha and occasionally with squids and portunid crabs.
- Vitamin and mineral supplements were also given twice a week along with the feed.
- The sexes were separated by cannulation using a flexible catheter (2 mm inner diameter) and stocked in separate cages.
- Thereafter, the females were cannulated every fortnight to assess the diameter of the eggs.

Induced Spawning

- Spawning can be obtained either naturally or by inducing with hormone
- The brooders were induced for spawning with HCG at doses of 500 IU per kg body weight for female and 250 IU per kg body weight for males.
- The spawning occurred within 36 hours after injection.
- The number of eggs spawned by cobia ranges from 0.4 to 2.5 million

- The fertilized eggs were incubated in 2 tonne capacity rectangular / circular tanks (SD 200 to 500 eggs per lt)
- The eggs were hatched after 22 h of incubation at a temperature range of 28-30 °C.
- The percentage of hatching was 80%
- The newly hatched larvae measured 2.2-2.7 mm in total length

LARVICULTURE AND SEED PRODUCTION

- Cobia eggs are pelagic with single oil globule which is reabsorbed completely at 7 d.
- Larval mouth opens at 2-3 d (temperature dependent).
- Metamorphosis starts from 9-11 d.

NURSERY REARING FIRST PHASE

- 0.2 - 2g to 5g fry grow rapidly to fingerlings
- Size 8-10 cm (20 to 45 d)
- In large ponds with green water or in hapas in the sea. • Artificial feed are provided manually to satiation, 5 to 6 times daily.
- Grading should be undertaken
- 30 to 600 - 1000 g (75-150 d to 180 d).

GROW-OUT FARMING

- Cobia is cultured in offshore grow-out cages until they reach marketable size. Culture period ranges between 6-8 months.
- Small scale family owned cage farms and commercial cage farms are employed for cobia grow-out farming. Usually most of the cage farms integrate nursery and grow-out culture in one area for convenient transfer of fish stock from nursery to grow-out cages.
- Sinking and floating pellet feeds are used in grow-out cages.