Present status and prospects of Murrels Farming in Andhra Pradesh, India

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ABSTRACT
This short review summarizes the current status of the Murrels fisheries in inland waters. Murrels are perhaps the most important indigenous fishes occurring in almost all wild inland water bodies in Andhra Pradesh including India. Murrels can be recognized by the shapes of head, which resembles that of a snake. They are air-breathing and carnivorous in nature. They can live for many hours out of water. Murrels are highly esteemed as food in Andhra Pradesh. Murrels are known for their medicinal and recuperative values. As consumers prefer murrels over carps, most of the catches belonging to this group are disposed off alive. The expansion of murrel supplies to maintain food security is a priority concern in the state. Therefore, it is imperative to make murrel culture, popular among fish farmers and unemployed youths for income generation.

Keywords: Andhra Pradesh, Murrels, Culture practices, EUS infection, NFDB.

1. Introduction
Andhra Pradesh (A.P) state is one of the important states in India. It has 23 districts with the Hyderabad Capital and an area of the state is 2, 75,068 sq.km. The state is endowed with more than 0.8 million hectares of inland water bodies with good potential for fish production. The present inland fish production of the state is 1.24 million tons and occupies second position in the country. Murrels and Catfishes are the second most important group of freshwater fishes of commercial importance in A.P.

Murrels belonging to the family Channidae (Ophiocephalidae) constitute the most common and dominant group of air breathing freshwater fishes and are highly regarded as a food fish in the Andhra Pradesh. There are several species of murrels belonging to the genus Channa (syn. Ophiocephalus), but only four types of murrel species are available in A.P. viz Channa striatus, C. punctatus, C. marulius and C. gatchua (Table: 1) [1]. Among these, one species, namely Channa striatus also called striped murrel, enjoys a good deal of popularity as food fish in many parts of A.P along with India. Besides the high quality of their flesh in terms of taste and texture, they also have good market value due to the low fat, fewer intramuscular spines, medicinal qualities and available in live condition.

Murrels are also known as “Snake-heads” from the shape and appearance of the head, which resembles that of a snake. Body elongated, anteriorly cylindrical, posteriorly compressed. Dorsal and anal fins are single and long, caudal fin round. They are also noted for their air-breathing habit. On the roof of its pharynx, the fish has a pair of cavities which have folded linings, richly supplied with blood vessels for taking in air. These accessory respiratory organs enable these fishes to survive out of water for a few hours or migrate from one pool to another. They are therefore called “live fishes”.

2. Cultivable species
Murrels are predatory inhabit and feed on variety of fauna present in the water. However, the high demand and high market value and their capacity to withstand in adverse weather conditions make them suitable candidate species for aquaculture. Out of the eight different species of murrels found in India Channa marulius (Hamilton), C. striatus (Bloch) and C. punctatus (Bloch) are important from the cultural and economic point of view. These are also cultured by most of the farmers along with major carps in the state including India.
2.1 *Channa maulius*: This is about the largest of murrels in India, the average size being about 45 cm but may attain over a meter and grows above 4 kg weight. The body is sub-cylindrical, tapering from the head to tail; maxilla extending beyond the eye. Colouration varies with environment. Generally grayish green on the back, pale white below; adult with 5-6 faint bands/streaks below the lateral line in irregularly shaped, roughly parallel. And also conspicuous white dots on the body and fins. Found in all large rivers, as they prefer deep clean stretches of water with a sandy or rocky bottom, unlike several of its related species. It is cultured in tanks, ponds and irrigation canals in A.P.

![Fig 1: Channa marulius](image1)

![Fig 2: Channa maulius harvested stock](image2)

2.2 *Channa striatus*: These fishes are medium-sized and are distributed widely from the Indo-Gangetic plain to peninsular India. Body dark brown or black above, yellowish or orange below. Prefer stagnant, muddy waters. Feed on worms, insects, tadpoles and frogs. Today *C. striatus* is widely cultivated in tanks of Andhra Pradesh and attains a size of 90 cm and grows above 2 kg weight.

2.3 *Channa punctatus*: A widely disturbed species smaller in size and prefers stagnant waters. Variable in colors, usually greenish brown above, yellow below, but may take a purplish to black hue. The average length of an adult fish is about 20 cm. prolific breeder and grows up to 0.25 kg weight.

![Table 1: Types of murrels cultured in Andhra Pradesh](table1)
Fig 3: *Channa striatus*

Fig 4: *C. striatus* harvested stock

Fig 5: Fisherman with well grown *C. striatus*
Fig 6: *Channa punctatus*

Fig 7: Murrel seed in early stage

Fig 8: Murrel seed advanced stage
3. Cultural practices

3.1 Seed Collection: The murrel breeds all around the year from rain-fed ditches and shallow water bodies with rich aquatic weed vegetation. Seed of these species, under parental care can move in shoals in search of food along the marginal areas of the breeding environment. While moving they make characteristic ripples on the water surface which can be easily noticed from a distance. The entire shoal can be collected easily when it is moving till the marginal weed-free areas using a fine meshed net. The fingerlings of the murrels are available in rivers, reservoirs, perennial tanks and other derelict water bodies [2]. The present demand for murrel seed is, by and large, met from wild collections. Maximum seed availability is from May to August. The commercial culture of murrels is still not common due to inadequate seed availability.

3.2 Seed Stocking: Murrels permit high stocking density, as they are hardly fishes and tolerate overcrowding due to the additional support of air breathing organs. The stocking density is 20,000 to 30,000 fingerlings/ha. Fishermen usually collect the murrel seed from the available natural sources and sells to the culturists. Fish farmers stock these murrel seed along with carp seed in their culture tanks and allows them to grow for 6-9 months or even more. In exclusive carp culture ponds, formers stock 300-500 murrel fingerlings per hectare to control the weed fishes particularly tilapia fish. This gives additional income to the farmers in the state.

Fig 9: Murrel fingerlings

Fig 10: Healthy murrel fingerlings
3.3 Harvesting: Although murrels are caught in gill nets, drag nets and cast nets, the gear mainly intended to catch murrels are long line and various types of traps. It is also a common practice to bale out water from pools and ditches where murrels are known to live, for hand picking them.

3.4 Market demand: Murrels fetch a high price ranging from Rs. 300-400 (US $ 5-7) per kg in different markets. In general the prices of murrels are much more than those of carps and cat fishes. Heavy demand exists for murrels in entire Andhra Pradesh state including India. Some like them for their delicious taste, while others prefer them because of their nutritional and medicinal value. The demand also arises because they are sold alive in the market, and can be purchased in a fresh condition.

3.5 Production trends: Murrels contribute to the extent of about 5 percent to the total inland fish production from rivers and reservoirs and from 10 to 15 percent from tanks, ponds etc. Production of murrels under traditional composite culture system ranges from 50 to 250 kg/ha in 6-8 months. On an average, marketable sizes of murrels can be obtained in 8-9 months. C. marulius is expected to attain 400-600 g in 6-8 months, C. striatus (300-400 g) and C. punctatus (150-200 g) giving yields of 300-500 kg/ha under semi-intensive culture along with carps. Murrels are quite popular among fish consumers in the state. It has scope for development in the state as alternate species but non-availability or adequate seed is the main constraint.
3.6 **EUS infection:** Murrels are easily susceptible to the Epizootic Ulcerative Syndrome (EUS). The most severely affected ones are *Channa striatus*, and *C. marulius* rarely sees in *C. punctatus* and *C. gatchua*, resulting in large scale mortalities in every year in the state. Murrels of all sizes are affected. However, the incidence of infection is more in the younger ones. Affected murrels with mild lesion may not show any clinical sign, whereas those with marked ulcerative lesions exhibit distinct abnormal swimming behavior with frequent surfacing.

EUS is characterized by the occurrence of large hemorrhagic or necrotic ulcerative lesions on the base of fins and other parts of the body, which later become larger inflamed areas with acute degeneration of epidermal tissues. Initially, the disease appears as red colored lesions, *hemorrhagic* in nature. These red lesions spread and enlarge gradually becoming deeper and assuming the form of ulcers. With further advancement, the scales fall off; ulcers become deep necrotizing or lesions. The starts rotting while still alive and eventually die.

4. **Health and Entertainment**

Murrels being typical “live fishes” and having soft flesh devoid of fat are considered to have medicinal value and provide nutritious food, particularly the sick. Murrel fingerlings are used for giving medicine every year in the month of June on the eve of *Mrigasira Karthi* day for dispensation to asthma patients (Fish Medicine) that gather from all over the country in Hyderabad City since long back. In most of the hotels in the state people is mostly prefers murrel fish curry and fry in their feast.

In addition to its food value, they are so significant in biological control of mosquito’s larvae and aquatic insect’s population in stagnant water pools which are harmful to human beings. Murrels are well known food fishes in India including A.P. but it also best known game fishes as it attracts the lures easily and caught by the fish by anglers. This not only gives entertainment to the public but also gives income source to the organizing persons.
Fig 15: Murrel seed effected with EUS

Fig 16: Local marketing

Fig 17: Murrel fish & seed transport tin
Fig 18: Inserting medicine in murrel seed mouth

Fig 19: Putting murrel seed in asthma patients mouth

Fig 20: Skinless murrel pieces
Against the availability of vast fresh water resources, only a limited of the area are used for murrel farming in A.P. The Godavari and Krishna are the major rivers flowing in the A.P. Many reservoirs /Projects constructed on these rivers and its tributaries in the state leaving many hectares of land become water logged in the vicinity of the canals of the projects and unfit for agriculture and the vast water logged area is available for fisheries development in the command area. As such still there is ample resource for the growth of inland fisheries activities including murrel farming.

The State Government is fully aware of the potential of murrel farming; the technology is a constraint for breeding and feeding of murrel farming in a commercial way. There is a good domestic market available for murrels, as returns by adopting murrels as a variety in their fish culture practices. With the proper utilization of the available resource and the technology, the state can augment the murrel production, and the fish farming community can reap better returns for their products.

6. Conclusions
In tropical countries like India, where available of water logged areas, derelict water bodies in which dissolved oxygen concentration is low. Air-breathing fishes like murrels may have a significant advantage for aquaculture as they can very well thrive in this environment. More studies need to be initiated in murrel breeding and nutrition to undergo a commercial large scale production in the country due to its significant food value and demand in many parts of India.

The National Fisheries Development Board (NFDB) established in Hyderabad in the year 2006 for the development of fisheries in the country which is also planning to provide financial assistance for the development of breeding, feeding and culture technology of the murrels particularly *C. striatus* in India. Murrels are known to tolerate a wide range of water parameters particularly survive in low dissolved oxygen and derelict waters. Hence, they are more suitable for culture in derelict/vegetation infested ponds and tanks. It also offers tremendous potentialities for providing employment opportunities to the vast rural poor and unemployed youths. Murrels are the alternative species in aquaculture besides carps and catfishes in India.

7. Reference