



**Present status of Parasitic and Bacterial diseases in Fresh Water Fish Seed Farms in East
Godavari District, Andhra Pradesh**

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Abstract

Fisheries play an important role in providing livelihood option to the rural poor and also supporting Indian economy. The inland fisheries successes depend on the two critical factors the seed and the feed. The seed production systems of Indian Major Carps (IMC) were already standardized by Central and State Govt. Research institutes. Chinese hatchery standardized for Chinese carps were also adopted for IMC. Since 1960 commercial scale seed production of IMC is by the private hatcheries. But recently the seed quality is not up to the mark and it is deteriorating drastically. As a result, seed farms and grow out culture systems are affected with serious disease problems mostly with parasitic and bacterial diseases. It is mainly due to the inbreeding depression of stock. The present study was conducted from stretch of Kadiyam to Vetlapalem (along Samalkota irrigation canal). Fish farmers who are having nursery farms (spawn) reported that, fish were affected often with parasitic and bacterial diseases. On other hand local hatcheries (within the State) are not providing healthy spawn and also brood stock is not having genetic vigour as a result of inbreeding. Further local hatcheries are inadequate to supply spawn of grass carps and big head sufficiently. As a result a fish seed farmer always depends on the West Bengal traders for supply of seed of bighead and grass carp. The present paper highlighted on the importance and urgent necessity of brood stock development to reduce inbreeding depression and increasing genetic vigour.

Key words: Seed, Inbreeding, Diseases and Brood Stock

I. Introduction

The fisheries sector is comprehensive and having multi-dimensions. It played an important role in Indian economy during the financial year 2014-15, exports of marine products reached USD 5511 million and exports aggregated to 33,441 crores (MPEDA - press note). Despite of export value the feed companies, chemicals companies are earning crores of rupees which is undocumented by the department. This much growth is mainly due to the paradigm shift of culture systems, demand in the international markets bringing all the stakeholders to focus on the inland aquaculture (both fresh water and brackish water). However this trend, economic development of industry is very near to collapse due to inadequate quality seed to the farmers. This case applies not only to the brackish water farmers but fresh water culture systems too.

The fresh water carp seed is not having genetic vigour as a result of inbreeding. The main attributes for inbreeding are no selection of fish brood stock –fish of three hundred grams in weight, attaining maturity are bred in these hatcheries; very old fishes are also subjected to induced breeding,

Secondly no genetic diversity is maintained among the stock. Rather over the years progeny raised from the same stock, are being subjected to induced breeding; thus drawbacks of inbreeding are evident in the hatchery raised carp seed.

Thirdly, Compounded with these two hurdles there is another factor - indiscriminate interspecific hybridization in eco-hatcheries. Almost all hatchery facilities do not have adequate number of ponds to raise brood fishes, species wise or to segregate.

The Andhra Pradesh State Fisheries sector is contributing 2.39% of gross State domestic product GSDP (08-09). The quantity of fish/prawn produced is 12.52 lakh tons (102%) and the State is contributing about Rs. 6315.3 crores by way of marine products from India.

At present there is serious problem of parasitic and bacterial diseases in the nursery tanks and growout ponds. It is mainly due to inbreeding depression of stocks, inadequate maintenance of hatchery operations and lack of selection of brood stock for producing spawn of IMC. Further fish seed farmers are facing problem for getting grass carp and big head spawn from the West Bengal traders since hatchery technique for providing seed production in the State is inadequate. To address these issues study has been undertaken on Present status of Parasitic and Bacterial diseases in Fresh Water Fish Seed Farms in East Godavari District, Andhra Pradesh.

II. Methodology

Information was collected by visiting fresh water fish seed farms from villages Balabhadrapuram, Bikkavolu, Pasalapudi and Vetlapelem where seed rearing is done immensely. These villages were selected mainly based on the number of fish rearing farmers, societies, fish rearing and availability of hatcheries. Interview method and observation was used for collection of data.

The date and site of collection were recorded during the study period and the fishes were examined for external parasites at site of the farm. Infected fishes were transferred to the lab in oxygen filled plastic bags (Fig.1). External symptoms and health conditions of each specimen were recorded. The gills, fins, scales and operculum were removed with least damage and examined in the laboratory. The gills and body surface were checked thoroughly for any parasites. Each fin was thoroughly examined for parasites.

III. Result and Discussion

In East Godavari district, fresh water fish seed production was done immensely in the stretch of Samalkota irrigation canal and surrounding villages. Balabhadrapuram village is notable for fish seed farms. Fishes in most of the farms are infected with the parasites and bacteria. The main causative agent is *Myxobolus* spp. – gill parasites were observed. Further it leads to secondary bacterial infection causing columnaris.

Bikkavolu fish seed farms are also having similar parasitic infestation (*Myxobolus* spp.) whereas in pasalapudi and Vetlapalem village fishes are initially infected with parasitic disease and later suffered with dropsy condition, which was caused by bacteria.

It is mainly due to high stocking densities of fry and fingerlings during nursery operation. It generally increases stress condition, poor management in pond preparation; using poultry waste etc leading to susceptibility of fishes to infectious diseases.

Microscopic observations revealed that Myxozoans are multicellular, occur as pseudocysts within (histozoic) or between the tissue (coelozoic). The pseudocysts are in the form of white (Fig.2) to pale yellow pustules on the affected parts of the body and can be seen with naked eye. Myxozoans have been studied by few researchers in the Indian subcontinent.

Myxozoa are parasites that are widely dispersed in pond-reared fish tanks. Most infections in fish create minimal problems, but heavy infestations can become serious, especially in heavy

stockings of spawn and fingerlings. Myxozoans are parasites affecting a wide range of tissues (Fig. 3&4). They are an extremely abundant and diverse group of organisms, speculated by spore shape and size. Spores can be observed in squash preparations of the affected area at 200 or 400 x magnifications or by histological sections.

Description	Balabhadrapuram	Bikkavolu	Pasalapudi	Vetlapalem
Name of the disease	Parasitic diseases and columnaris	Parasitic diseases and columnaris	Parasitic diseases and Dropsy	Parasitic diseases and Dropsy
Causative agent	<i>Myxobolus</i> spp. and <i>Flavobacterium columnare</i> (F. <i>columnare</i>)	<i>Myxobolus</i> spp. and <i>Flavobacterium columnare</i> (F. <i>columnare</i>)	<i>Myxobolus</i> spp. and Bacteria	<i>Myxobolus</i> spp. and Bacteria
Infected organ	Gill, skin and fin	Gill, skin and fin	Gill and body	Gill and body
Gross observations	Skin lesions, Fin erosion and Gill necrosis	Skin lesions, Fin erosion and Gill necrosis	Gill necrosis, lesions and Dropsy	Gill necrosis, lesions and Dropsy
Frequency of diseases	Often	Often	Often	Often
Cultured fish Species	Catla, Rohu, Mrigal, Common carp and Grass carp	Catla, Rohu, Mrigal, Common carp and Grass carp	Catla, Rohu, Mrigal, Common carp and Grass carp	Catla, Rohu, Mrigal, Common carp and Grass carp
Disease susceptibility	Catla and Rohu	Catla	Catla and Rohu	Catla and Mrigal
Season	Rainy season at low temperature	Rainy season	Rainy season at low temperature	Rainy season
Average Size of the infected fishes	1cm-3 cm	1cm-2cm	1cm-2cm	1cm-3cm
Treatment being followed at field	Common Salt 20kg/ha supplemented in the feed 2-3 instalments at 4 day intervals and with OTC - 5g/100 kg fish	Common Salt 20kg/Ha supplemented in the feed 2-3 instalments at 4 day intervals and with OTC - 5g/100 kg fish for 7 days	Common Salt 20kg/Ha supplemented in the feed 2-3 instalments at 4 day intervals and with OTC - 5g/100 kg fish	Common Salt 20kg/Ha supplemented in the feed 2-3 instalments at 4 day intervals and with OTC - 5g/100 kg fish

***Flexibacter columnaris* (Columnaris disease or Saddleback disease):** Columnaris is an example of an external bacterial infection, which may be caused by secondary infections after parasitic disease occurs. Lesions usually first appear as small white spots on the caudal fin and progresses towards the head. The caudal fin and anal fins may become severely eroded and scale loss (Fig. 4&5). As the disease progresses, the skin is often involved with numerous gray white ulcers. Gills are a common site of damage and may be the only affected area. The gill lesions are characterized by necrosis of the distal end of the gill filament that progresses basally to involve the entire filament. *Flexibacter columnaris* infections are frequently associated with stress conditions. Predisposing factors for Columnaris disease are high water temperature (25°-32°C), crowding, injury, and poor water quality (low oxygen and increased concentrations of free ammonia).

Therapeutic treatment:

Prevention of fish diseases is essential to save crop loses to the aquafarmers. The infectious diseases will adversely affect growth and development of fish. Therefore, controlling disease is one of the foremost tasks in fish culture. NaCl (Common Salt) 100 kg/ha with lime 200 kg/ha at 4 day interval by spraying in the water is effective treatment for all parasitic fish diseases. Further

treatment with OTC - 5g/100 kg fish or Mix Terramycin (OTC) with the feed in a dose of 5% in feeding prevents secondary bacterial infection which causes by bacteria.

Plate	
	
Fig.1 Disease infected fishes were transferred to the lab in oxygen filled plastic bags.	Fig.2 Cyst of <i>Myxobolus</i> spp. present in the gills of <i>Catla catla</i>
	
Fig.3 <i>Myxobolus</i> spp. with distinct polar filament present in the gills of <i>Labeo rohita</i> (Giemsa stained, 1000x).	Fig.4 <i>Myxobolus</i> spp. with distinct polar filament present in the gills of <i>Labeo rohita</i> (Giemsa stained, 1000x).
	
Fig.5 Loss of scales in <i>Catla catla</i>	Fig.6 Complete loss of scales in <i>Catla catla</i> due to <i>Columnaris</i> and gill disease

IV. Conclusion

Parasitic and bacterial diseases are often problem in the seed farms and growout farms. The parasitic infections cause primarily to the fish tanks later fish will be susceptible to the secondary bacterial infections in the fish tanks. Treatment for these diseases is salt, lime and antibiotics may save the fish temporarily but, fish seed farms often face these problems, sometimes result is heavy mortalities. The main reason for these problems is lack of sufficient quantity of brood stock, inbreeding depression, poor hatchery management etc.

Hence, brood stock management, reducing inbreeding depression, proper hatchery management and practicing J.Bakos model to overcome inbreeding depression are recommended. This will help in reducing the parasitic and bacterial diseases in carps.

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