

- Ideally the visibility should be maintained in the range of 30-40 cm to avoid water quality deterioration.
- Prawns are very sensitive to low dissolved oxygen in water.
- When the oxygen level in the pond is critically low (<3 ppm) the prawns come to the surface along the periphery which indicate the need for taking immediate remedial actions such as water exchange or operation of aerators to avoid mortality of stock.
- It is necessary to replace at least 30% of water at regular intervals, if the water quality deteriorates during the later part of the culture.
- Provision of pond water aeration (by paddle wheel aerator or pump operation) is recommended especially during the final 2-3 months when the biomass in the pond is higher.
- Aeration during early morning hours and during the cloudy days helps better oxygenation of the pond water.
- During grow out culture period water quality need to be maintained at optimum levels (DO:>4 ppm, pH:7-8, alkalinity:60-100 ppm and transparency: 30-40 cm) for higher survival and growth.



Feeding management

- Feed management is an important aspect of aquaculture. Excess feeding leads to wastage of feed and deterioration of water quality, while lack of feed/under feeding leads to cannibalism in prawns or slow growth.
- Prawns are fed twice daily with commercial prawn or shrimp feed @ 5-6% of their biomass which is gradually reduced to 2% towards the end of the culture period in monoculture.
- However, only floating fish feed @ 5-6% of body weight of fish should be given two split doses initially and then gradually reduced to 2 % towards the end of the culture period in polyculture system.
- Feed is broadcasted into the pond from dyke. Sinking feed can also be given in check trays placed 2-3 m away from the dyke for better feed management.
- In absence of commercial feed in polyculture, mixture of groundnut/mustard oil cake and rice bran at 1:1 by weight fortified with vitamins and minerals can also be given in two splits doses daily and provided in dough form preferably in feed trays or gunny bags hung at uniform distance inside the pond.
- Feeding should be reduced during cloudy days and winter months.
- Regular monthly sampling needs to be carried out to assess the growth and health of the stock as well as to revise the daily feeding ration.

Health management

- Poor rearing conditions like low water depth, excess stocking, over feeding, silting etc. are responsible for the disease problems in freshwater prawn culture.
- Loss of appendages, brown or black colouration/patches on shell, fouling on body are some of the symptoms seen in diseased prawn. If these symptoms noted, water should be exchanged (30-50%), reduce the stocking density, water quality should be tested and immediately consult the expert to avoid any loss of stock due to disease.

Harvesting

- Fishes/prawns attaining the marketable size can be harvested periodically to reduce the pressure of density on the pond and thereby providing sufficient space for the growth of other stocked individuals.
- Partial harvesting to remove larger prawns (>40g) may start from 5th months of culture using seine net of suitable mesh size and this should continue every month till final harvest.
- This will allow faster growth of smaller ones with more space and food. The remaining prawns and carps can be finally harvested by netting followed by complete draining of the pond.
- In monoculture, at a stocking density of 3 nos./m² the average final size after 8 months of culture would be about 60g if good quality pellet feed is provided to the prawns. Final survival rate of 70-80% is expected and the production may range from 1200 to 1500 kg/ha.
- However, in polyculture, prawn survival is expected to be more than 80 % with average size more than 60g with a production of 600-700 kg/ha of prawn and about 5.0 tonne/ha of fish. The carp and prawn polyculture has been proved to be highly profitable with low production cost.



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Genetically Improved Fast Growing Freshwater Prawn (Scampi) For Higher Production And Income



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Introduction

Giant freshwater prawn, *Macrobrachium rosenbergii* (Scampi) is an indigenous species of India inhabiting rivers, canals, estuaries and coastal waters. It is one of the most important cultivable species of freshwater systems due to its high price, large size, faster growth, good taste and high export demand. It is cultured in freshwater as well as slightly brackish water (<7 ppt) and can be cultured alone (monoculture) or with compatible species (polyculture) like rohu, catla and Chinese carps like silver and grass carp. This species is locally known as Galda/Gaja/Tatra chingudi/chingidi in Odisha and West Bengal.

ICAR-CIFA has developed a genetically improved and fast growing scampi through genetic selection in collaboration with WorldFish, Penang, Malaysia. The selection programme was started in the year 2007 and in 2019, 11th generation of fast growing scampi was produced with an average selection response of 7% per generation or a cumulative response of 70%. The new fast growing variety was developed from three different stocks of scampi collected from Gujarat, Kerala and Odisha. Every year around 50 to 60 families are produced by selecting the largest males and females from the previous generation families. This procedure is repeated every year as the generation interval of scampi is one year. Prawns from each family are tagged with Visible Implant Alpha (VIA) numeric tags to identify them and to have pedigree information for genetic selection. This newly developed fast growing scampi are also found to be performing better in farmers fields in Odisha and Andhra Pradesh. A package of practices for scientific culture of this improved scampi was also developed.

Why to culture Genetically Improved Scampi?

- Productivity of genetically improved scampi is 60-70% higher than other un-improved stock.
- Therefore, adoption of genetically improved scampi can increase production, enhance profitability and improve income of fish farmers.
- It can be cultured with compatible species like catla, rohu and Chinese carps.



Genetically improved seed availability

- Genetically improved prawn seeds are available at ICAR-CIFA, Bhubaneswar and its multiplier units. The institute is also ready to accept requests from interested scampi hatchery owners for collaboration for wider dissemination in the country.

Package of practices for culture

Basically the package of practices for culture of improved scampi/prawn is similar to that of un-improved scampi. It can be cultured in existing fish ponds or in new ponds. While constructing a new pond the following points are to be noted.

New pond construction

- Culture site where water temperature remains above 20°C for 6-8 months are suitable.

- Select site that have a reliable source of good quality freshwater with pH above 7.0 and alkalinity about 100 ppm.
- Pond bottom soil should be clayey loam or sandy loam.
- Pond should be preferably rectangular in shape and size of 0.2-1.0 ha is easy to manage.
- Provision of inlet and outlet and water control structures should be there for ease of operation.
- Pond bottom should have suitable slope towards the outlet.
- Depth of water should be maintained at minimum of 1.0-1.5m (3-5 feet).
- Smaller ponds which can easily be drained to harvest prawns are always preferable.

Pond preparation

- Ponds should be drainable, dried and bottom should be exposed to sunlight for at least a week, those that are non-drainable should be applied with either mahua oil cake @ 2,500 kg/ha-m or commercial bleaching powder (30% chlorine) @ 350 kg/ha-m of water at least three weeks before seed stocking.
- Once the pond is dried, agriculture lime is applied on the bottom soil @ 200 kg/ha if the soil pH is 7; if the soil pH is less than 7 then the rate of lime is increased.
- Water is properly filtered and filled in the pond upto a level of 1.0 m in nursery and 1.5 m grow out pond.
- Phased manuring with a mixture of groundnut oil cake at 250 kg, cow dung 70 kg and single super phosphate 17 kg/ha have shown to be effective in production of desired plankton.
- A thick paste of half of the above amounts are prepared by addition of sufficient water and applied as basal dose 2-3 days prior to stocking. The same dose is repeated later preferably at five days' intervals depending on the plankton levels of the ponds.
- As prawns grow by moulting (shedding of outer shell) and are very soft and can be easily eaten by other prawns, earthen pipes, small tree branches, tyres, pvc pipes etc. are provided in the pond as hide out to save them from predators during moulting.
- Pond is covered with nylon net or thread to save prawns from predatory birds.



Nursery pond management

- After two weeks of pond preparation healthy genetically improved post larvae (PL) of 15 to 20 mm procured from recognized prawn hatcheries should be stocked after proper acclimatization.

- The nursery rearing can be done in small earthen ponds, cemented tanks or in nylon hapas. The size of the nursery pond can range from 0.02 to 0.1 ha. The recommended stocking density of post larvae (seed) ranges from 50-100 per m². In case of cemented tanks water should be aerated and water exchange should be done at least weekly. In case of hapa rearing, hapa should be changed fortnightly to avoid clogging.
- Provision of floating weeds inside a PVC frame covering 10% of the pond water area is recommended to provide shade and shelter to PL.
- Commercially available scampi/shrimp feeds (starter feed in crumbled form) is recommended for good growth and survival. It should be fed with @100% biomass per day for first two weeks and reduced to 20% of the biomass towards the end. If the farmer doesn't have access to commercial feed, then powdered groundnut oil cake and rice bran can also be used.
- Nursery period may range from 45 to 60 days during which the PL grows to juvenile upto 2-5g size with a survival rate of 75-80% with proper feeding and water quality maintenance.



Growout pond management

- Juveniles of 2-5 g harvested from nursery ponds are stocked in well prepared larger grow out ponds of 0.1 to 1.0 ha.
- If mohua oil cake or bleaching powder is used as piscicide during pond preparation, it must be ensured that toxicity is reduced and oxygen balance is established in the pond prior to seed release.
- For monoculture practice prawns can be stocked @ 30,000-40,000 juveniles while for polyculture 10,000-15,000 prawn juveniles along with 6,000-7,000 fingerlings of catla and rohu per ha are stocked.
- Polyculture of carp and prawn has the advantage that both prawn and carp utilize different food niches effectively. Polyculture of carp and prawn is recommended for higher productivity and income. The recommended fish species composition is catla and rohu is 1:1 or 1:2 depending on pond productivity.
- The post-stocking fertilization measures includes fortnightly application of cow dung @ 0.5 tonne/ha, urea @10 kg/ha and SSP @15 kg/ha in case the water is clear and transparency is higher than 40 cm. The organic manure and inorganic fertilizers are applied in alternative weeks to maintain the natural productivity status.

Water quality management

- Water transparency (visibility) and colour of the pond is an important indicator of the health of pond ecosystem. In unproductive pond the visibility can upto the bottom which will lead to growth of bottom algae that adversely affect the growth and survival of the prawns.