Farming of scampi and tiger shrimp together: A case study from West Bengal, India

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Scampi produced at Mrityunjoy's farm.

In tiger shrimp *Penaeus monodon* farming, farm ponds connected to estuaries, brackishwater rivers and creeks are considered ideal since pond water salinity of 12-20ppt is a favourable parameter and basic requirement. The giant freshwater prawn *Macrobrachium rosenbergii*, which has become an important cultured species in freshwater aquaculture systems, requires pond water conditions similar to the Indian major carps. Recently it has been experienced that remarkably both *M. rosenbergii* and *P. monodon* could be cultured simultaneously in the same environment, i.e., freshwater ponds. Sri Chandra has worked extensively as technical supervisor to commercial shrimp and scampi producers in brackishwater and freshwater farms respectively in Purba Medinipur District in West Bengal.

Sri Mrityunjoy Bal, S/o Sri Bishnupada Bal, residing at Vill. Gorbhera under Dighanagar Mouza, P.O. Gurgram, Block Bhagabanpur-1 under PS Bhagabanpur, Dist. Purba Medinipur, West Bengal, is a moderately resource-rich professional prawn farmer, who has been involved in nursery rearing and grow-out monoculture of *M. rosenbergii* since 2004. He owns three scientifically-managed, perennial and rain-fed grow-out ponds of approximately 0.1 ha, 0.2 ha and 0.36 ha in area, having 1.2-1.8 metres depth. Since March-April 2013, he has been practicing farming of both these species together in his first two freshwater ponds. During March-April, he procures seeds of *M. rosenbergii* (5-8mm; paddy grain size, counted by spoon) and *P. monodon* (PL-15; 14-15mm size) from professional riverine prawn/shrimp seed fishers; seeds of such size of these two species are available in the Rupnarayan River (captured at Kolaghat, distance of 65km from Gorbhera village) and the Keleghai River (at Sabang) in this district during March to July. Mainly scampi seeds are available in the Keleghai River. Seeds are transported at his pond site either in aluminium hundi or empty dalda oil plastic containers of 15 litre capacity, with pores on lid, each containing 5,000-5,500 pieces. Each seed of *M. rosenbergii* and *P. monodon* costs Rs. 2.00-2.50 and 40-50 paisa respectively. Scampi seeds available during July-August are not much preferred for farming.

Scampi and tiger shrimp.

During April, in a 400m^2 nursery pond he normally stocks 10,000 *M. rosenbergii* and 20,000 *P. monodon* seed and rears them together for 35-45 days, within which *M. rosenbergii* and *P. monodon* attain 3.9-5cm and 7.7-9cm (3g) in body size respectively, suitable for grow-out farming. Since pond soil pH in this region is between 4.5-5.0, a higher dosage of lime is applied before seed stocking. Commercially available granular-type feed is provided to both species @ 80-100g/10,000 seed every day during the first ten days of rearing, 100-140g/10,000 seed during the second ten days, 140-480g during the third ten days and 480-880g/10,000 seed every day during the fourth ten days (ie. until day 40). Although it is scampi feed, it is given to both species and *P. monodon* accepts it.

In the end of June and at the onset of monsoon, in his 0.2 ha grow-out pond, Sri Mrityunjoy had stocked 10,000 *M. rosenbergii* juveniles obtained from nursery pond and 4,000 of *P. monodon* of size 7.7-9cm. *P. monodon* is harvested in the end of September or early October before Durga Puja and in this four month period of grow-out culture, tiger shrimp attained 40g body weight on average, almost of same size with only 5g size variation and 70-75% survival. It fetches him a farm gate price of Rs. 400-450/- (US$6.15-6.92) per kilogram. Protein-rich pelleted feed 'Waterbase Magnum XL Premium Prawn Feed' (25kg sack, Rs. 80/- per kg; 1.5-2.0mm pellet diameter) is provided to both scampi and tiger shrimp in the pond four times a day; a strict feeding schedule is maintained beginning with 7% feed application per day in the first week of culture (considering 2.5-3.0g average body weight (abw)), 6% feed every day in the second week of culture (considering 4-5g abw), 5% feed every day in the third week of culture (6-7g abw); it continues and ends up with 1.5% feed every day in the thirteenth week of culture (considering 35-37g abw), 1.2% feed every day in the fourteenth week of culture (38-40g abw); in the continuation period of culture beyond 90 days, the final schedule is maintained. Sri Mrityunjoy uses 'grower' type feed (1-2mm diameter pellet) to scampi and tiger shrimp up to 25gm size and 'finisher' type feed (2-3mm pellet) is used thereafter till time of harvest.

M. rosenbergii is harvested from his pond at the end of January of the next year and in this seven month period of grow-out culture, beginning from June-July, scampi attains 45g body weight on average, with wide variation in size from 25g to 90g. Farm gate price of such scampi is Rs. 500-550/- per kg (US$8.46) and Rs. 600/- (US$9.23) for those above 100g weight. In days of insufficient rainfall, tubewell water/ groundwater is let into culture ponds. Sri Mrityunjoy's elder brother Sri Gangadhar Bal is also a professional Scampi producer and practices monoculture of *M. rosenbergii* only.

Both of them mentioned that occurrence of *P. monodon* seeds in river Rupnarayan at Kolaghat and nearby areas is less in comparison to *M. rosenbergii* seeds and also demand for

hatchery-bred *P. monodon* seeds is much greater than for wild riverine seeds. Seed collectors prefer to capture and segregate *M. rosenbergii* seeds. According to them, hatchery-produced *P. monodon* post larvae will not survive in scampi culture ponds; it will require brackishwater conditions. Only riverine *P. monodon* seeds can be cultured in association with *M. rosenbergii*. Although present, the availability of tiger shrimp seeds in the Rupnarayan River at Kolaghat (salinity: assumed maximum 4-5ppt, in March-April) is not sufficient and those are mainly found in Ramnagar Canal, Mandarmoni Canal and Pichhaboni Canal, which are naturally-occurring creeks in the same district, much nearer to the estuary and Bay of Bengal and have 12-18ppt salinity. Sri Mrityunjoy mentioned that *P. monodon* seeds collected from these creeks will not be able to survive in his freshwater scampi ponds, and but that they are ideal for brackishwater ponds. Kolaghat station in the Rupnarayan River is located at a distance of 135 km from the sea.

Sri Mrityunjoy applies dolomite and triple super phosphate in recommended dosages during the culture period and uses a mini pump (drawing up pond water and forced release/ flushing out up to a distance from pond dyke) to maintain the dissolved oxygen level in the pond water. He has not faced any problems of viral infection (WSSV or MBV) in growing *P. monodon* in his freshwater scampi culture ponds in last three years. In his opinion, there is much less risk of occurrence/ outbreak of devastating viral diseases in farmed *P. monodon*, when cultured in freshwater conditions in low density and using seed obtained from regions such as the Rupnarayan River with less than 4-5ppt water salinity. It has been determined in previous studies that water salinity in Rupnarayan at Kolaghat is 0.01ppt in monsoon, 0.20ppt in post-monsoon, another study showed 0.22ppt, maximum salinity in year 1993 was 0.9ppt, salinity as mean of three seasons: 0.5ppt. Scampi farmers can also obtain *M. rosenbergii* seeds of

Sri Mrityunjoy with his mixed harvest.

10-20mm size from the Shilabati River at Ghatal in Dist. Paschim Medinipur during March-May. Juvenile-sized scampi seeds are available in the Keleghai River at Egra and Potashpur in Purba Medinipur during July to October. In Purba Medinipur District of West Bengal, which is the major district where *M. rosenbergii* is cultured in monoculture systems on a commercial scale, the main producing areas include Bhagabanpur, Moina, Sabang, Pingla and Junput Police Stations/Blocks. In 25-30 villages of the aforesaid blocks, presently there are about 1,250-1,300 professional prawn farmers. The farming practice shown by Sri Mrityunjoy Bal is expected to encourage tiger shrimp farmers to rear the species in freshwater systems in low density, so that the risk of viral disease problems can be reduced.

Haul of scampi and tiger shrimp.