916/B

Comparison of water quality and primary productivity between shrimp and seabass culture ponds.

A.S.L.E. Corea

Inland Aquatic Resources and Aquaculture Division, National Aquatic Resources Research and Development Agency (NARA), Sri Lanka

Since shrimp culture is affected by various diseases, farmers are faced with heavy economic losses. Therefore some farmers have tried to introduce species diversification. Sea bass is a brackish water fish found living in the natural environment of the Northwestern province and is a potential replacement to shrimp as this species too has an export market. Some farmers are trying to culture seabass in abandoned shrimp ponds. One farmer was culturing both species. The present study investigates the water quality of both culture species and the primary productivity in the ponds.

The water quality and chlorophyll content was monitored for 16 weeks during the shrimp culture period. Water exchange was 30% of the total volume weekly for both species. And both species were provided artificial feed. Shrimp ponds were regularly treated with probiotics for water management, while fish ponds did not receive this treatment. All ponds were aerated.

Salinity(fish: 14.37 ± 3.88 ppt and shrimp:14.25 ± 3.73ppt), pH, (fish: 8.20 ± 0.35 and shrimp:8.14 ± 0.25),temperature(fish and shrimp: 28 ± 1.5^{o}C), dissolved oxygen(fish: 4.99 ± 0.54mg/l and shrimp:4.86 ± 0.15 mg/l), total suspended solids(fish: 125 ± 10.22 mg/ l and shrimp:122..38 ± 14.35 mg/l), phosphate(fish: 0.34 ± 0.24mg/l and shrimp:0.39 ± 0.23 mg/l), and nitrate(fish: 1.50 ± 0.46 mg/l and shrimp:1.37 ± 0.47 mg/l) did not show a significant difference between the culture ponds for the two different species. However,there was a significant difference between ammonia, (0.11± 0.04 mg/l for fish and 0.062 ± 0.02 mg/l for shrimp), nitrite(0.14 ± 0.02 mg/l for fish and 0.02 ±0.08 mg/l for shrimp), and chlorophyll (14.3±3.2 µg/l for fish and 11.9 ± 3.3 µg/l for shrimp) for the 2 different culture species ($p<0.05$). The phytoplankton density was also significantly higher in fish ponds but the zooplankton density was higher in shrimp ponds and did not show a significant difference statistically. The ammonia and nitrite content in the fish ponds were higher than shrimp ponds, most probably because probiotics helped controlling the ammonia and nitrite in shrimp ponds. Since the water is pretreated before entering shrimp ponds it takes more time for developing algae and that again is controlled by the probiotics used, as nutrient circulation is controlled. But in fish ponds no probiotics were used and therefore the algal content was higher, with more chlorophyll. All water quality parameters monitored were within acceptable limits for brackish water species, but the total suspended matter content remained at a high level for both species. It was concluded that since shrimp ponds operate under controlled conditions compared to the fish ponds, productivity of shrimp ponds was controlled by these additives. Therefore the natural primary productivity was higher in fish ponds than shrimp ponds.

Key words: Plankton productivity, Shrimp culture, Seabass fish culture, pond water quality

scorea@nara.ac.lkTel: +94 719353621/+94 721808529