

Effect of salinity on growth and risk of White spot disease incidence in cultured shrimps (*Penaeus monodon*) in Sri Lanka

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Shrimp culture industry in Sri Lanka was first affected by the White Spot virus in May 1996. The disease was recorded from many areas in the North-Western province where 99% of the shrimp farms and 95% of the farms were non-functional due to the disease within 4 months of its first occurrence. Two consecutive attacks have been recorded there-after during the next 2 culture cycles. However it was interesting to note that the disease incidence reported from farms which had pond salinity levels above 35 ppt have been less than 5%.

According to the climatic zoning of Sri Lanka northern part of the North-Western province belong to the dry zone, where the annual precipitation is less than 1900mm. The recorded salinity levels in the water source in these areas, have been above 35 ppt during a considerable period of the year. However shrimp farmers continue with their culture cycles until the salinity levels rise above 64 and high mortality is observed in ponds.

The present study was carried out to investigate the effect of salinity on the growth and incidence of white spot disease on *Penaeus monodon* cultured in the dry zone of Sri Lanka. A survey on growth and white spot disease incidence was carried out for 1 1/2 year period. The results revealed that the shrimp were cultured for a period of 110 to 140 days. When salinity levels are less than 35 ppt during the culture cycle shrimps are grown to 35 - 45g in size while shrimps are grown upto 20 - 36g when the pond salinity is higher than 35ppt. Eighty percent of the ponds are stocked at salinity below 40ppt, although it may rise above 40ppt during the culture cycle in the dry zone. The growth during the first 2 months of the culture cycle is not significantly different from the shrimps stocked and cultured at salinity levels below 30ppt. ($t = 1.05 \times 10^{-4}$ at $p > 0.05$). Although a growth retardation was observed during the final month of the culture cycle, there was no significant difference in specific growth, of shrimps cultured at salinity levels below 35ppt and above 35ppt. ($p > 0.05$: $t = 1.1993 \times 10^{-2}$ at 90 - 100 days, $t = 4.45 \times 10^{-4}$ at 100-110 days, $t = 1.18 \times 10^{-5}$ at 110- 120 days, $t = 1.77 \times 10^{-8}$ at 120 - 130 days and $t = 3.91 \times 10^{-8}$ at 130 - 140 days). However there was a significant correlation between salinity and specific growth within the culture period between 90 to 130 days. (at $p > 0.05$: $r = 0.695$, $f = 39.219$ at 90 - 100 days; $r = 0.457$, $f = 11.058$ at 100 -110 days; $r = 0.33$, $f = 5.006$ at 110 -120 days; $r = 0.279$, $f = 2.793$ at 120- 130 days). During the period 130 to 140 days in the culture cycle, there is no significant correlation between salinity and specific growth. ($p > 0.05$: $r = -0.031$, $f = 0.017$).

There was a significant difference in White spot disease incidence in cultured shrimps between the areas where the pond salinity was above 40 ppt and in shrimps cultured at salinity levels below 35 ppt. ($p > 0.05$; $X^2 = 76.014$). However it was observed that there was a high incidence of Black gills above the salinity level of 60ppt.

According to these results if the stocking salinity was less than 35 ppt shrimp growth is not significantly affected by high salinity levels, during the culture cycle and the risk of white spot disease attack has been significantly low at high salinity levels.

Key Words: Shrimp culture and Environment, Shrimp disease.

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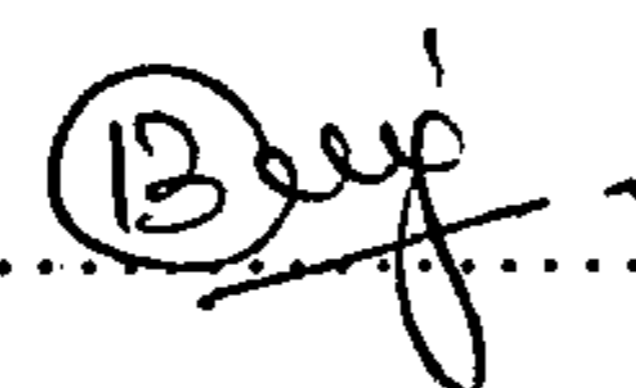
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