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Mass Seed Production of Mud Crab *Scylla olivacea* in Captive Conditions in Bangladesh: Opportunities and Challenges

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Scylla olivacea aquaculture has primarily been based on the capture and fattening of juvenile wild mud crabs. The species became threatened as a result of its natural reliance on cultural and environmental changes. The brood stock, embryonic development, and breeding strategy of the mud crab were examined in order to produce mass seed in Bangladesh with the goal of introducing this species into a culture system. Broods were collected from the Moheshkhali and Badarkhali mangrove areas of Cox's Bazar and transported to the private hatcheries. The mother crabs were fed ad-libitum fresh squid, oyster meat, and shrimp muscle. About 52.94% of broods were spawned within 11.67 ± 6.36 days after ablation and hatched within 9–10 days at a temperature of 26–31° C and a salinity of about 30 ppt. The average fecundity was approximately 1.0 ± 0.50 million, and the hatching rate was 50%. A single brood (batch) produced 0.607 ± 0.13 million zoea at a time. The newly hatched zoea were stocked in 2 MT water-holding capacity fiberglass tanks at 100 crablets per liter. The larvae were fed ad libitum shrimp larval feed and Artemia nauplii.

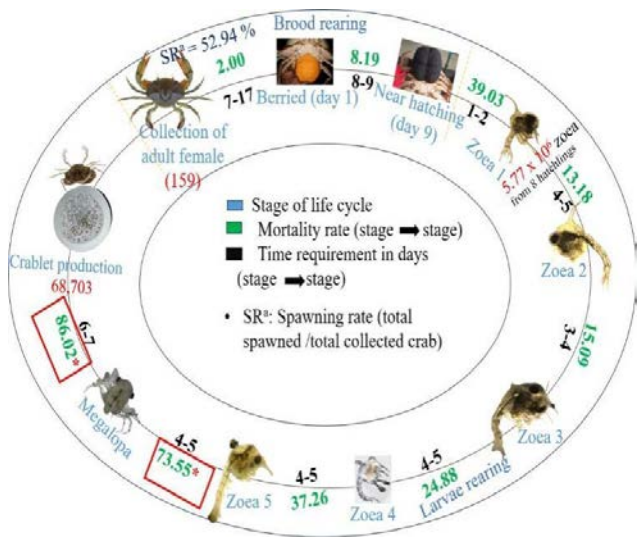

Figure: A summary of the time required, survival rate for development from one stage to the next for mass seed production.

The mean survival rate from Zoea-1 to Zoea 5, Zoea- 5-Megalopa, and Megalopa-crablet was 31±12.90%, 22.45±5.70%, and 15.98±7.34%, respectively. 4 megalopa/liter showed a better survival rate. The development from Zoea 1 to Megalopa required 15 to 17 days. The highest mortality was observed during the metamorphosis from zoea 5 to megalopa and megalopa to crab 1. The first crab stage was obtained 26 to 29 days after hatching. There were about 22 batch trialed; among them, 8 batches successfully completed the whole cycle; others could not complete due to the mass mortality occurring at various stages. From the 8 completed batches, the highest survival rate was from zoea-1 to crablet, which was 3.21% from batch.

The key challenges that were faced during mass seed production include maintaining optimal environmental conditions, controlling diseases and pathogens, managing feed availability and quality, and addressing hatchery limitations. Integration with well-established shrimp hatcheries and south-south collaboration with intact mangrove brood sources were the principal opportunities for large-scale seed production in the future. To overcome losses, addressing poor hatchery facilities, temperature control, and decreasing stocking density in the megalopa stage is crucial. Rectifying these obstacles holds the potential to revolutionize crab culture and contribute significantly to the blue economy.