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A study on the optimal antibiotics usage in larval rearing of mud crabs, scylla serrata (forsskal, 1775)

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The aquaculture of mud crab, *Scylla serrata* tends to be a very lucrative business where many Pacific Island nations have profited from this commodity. Mud crab farming in Fiji is still very young and it has not been able to commercialize due to constraints faced in larval rearing process causing high mortality of zoea. While many countries have resolved this problem with the use of antibiotics and probiotics, Fiji has yet to ascertain a standard protocol for larval rearing. Probiotic import is currently not permitted, whereas antibiotics use should be controlled and limited as it could give rise to antibiotic resistance in bacteria. The research was done to evaluate the optimal antibiotic usage in larval rearing of mud crabs in Fiji. The antibiotic *Oxytetracycline* (OTC) was tested in two runs; 10ppm and 25ppm respectfully, each run having four treatments (T1-OTC use from zoea1 to zoea2, T2-OTC from zoea1 to zoea3, T3-OTC from zoea1 to zoea4, and T4-control, no OTC). . Results concluded that the use of OTC made a significant differences ($P<0.05$) in the larval survival from OTC usage until zoea2 (T2), at 25ppm yielding a final larvae survival of 45.30%. Better growth rate was also observed at 25ppm from T2, yielding a mean growth of 32% of megalopae, however the extended use of OTC until zoea4 gave a lower percentage yield of megalopae. High larvae mortality from zoea1 to zoea2 coincided with rotifer feeding to the larvae, while the low percentage yield of megalopae from the extended use of OTC may be due to the emergence of antibiotic resistant bacteria which hinders larvae growth rate. Therefore, the antibiotic oxytetracycline should be used at 25ppm concentration and restricted until zoea2, as these gave optimal larval survival and megalopae yield. This may be applied as a protocol to be implemented in mud crab hatchery operations as it controlled antibiotic use and at the same time optimized seed-stock for grow-out ponds, as a result would help commercialize mud crab farming in Fiji.

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