Study/Account Code: _____

AQUACULTURE DEPARTMENT
SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER

Theme: : Seed Quality for Sustainable Aquaculture

Commodity: Marine Fish (Grouper)

Division/Section/Station: TVDD/Tigbauan Main Station

Funding: AQD (in PhP) P46,805.05

Funding: External - Kiko Technology

Duration (mo): 6 **Starting**: June 2013 **Ending**: Nov 2013

Study/Activity Title: Larval Rearing of Grouper (*Epinephalus fuscoguttatus*) using Kiko Technology

Proponents: Ofelia S. Reyes **% Time:** 10

Rationale:

The inconsistent survival of grouper fry in the hatchery is one of the major constraints in the development of grouper industry globally. The present survival rate of grouper fry is still low compared with other marine species. Nutritional content and size of live food fed at the early stage (Duray, 1994), application of thyroid hormones to accelerate metamorphosis (de Jesus et at., 1998), stocking density (Duray et al., 1997), size and background color of larval tank (Duray et al., 1996) were among the studies done under hatchery condition at SEAFDEC/AQD. Other limiting factor that significantly affects the production of grouper fry in the hatchery is the water quality. Water is not just where the fish live, the quality directly affects feed efficiency, growth rates, survival, and health of the fish. Therefore, physical, chemical and biological properties of the water for the larval rearing of grouper should be suitable to improve survival and growth of grouper.

Kiko Technology is a value added product which energizes all sources of water. It increases the frequency of vibration, profile of water, decreases the surface tension and causes water to absorb more far-infrared radiation thus, increasing the water's FIR content. It has been shown to improve the quality and production of some agriculture products

(kikotechnology.com/files/factsheets). Recently, it has been tried in aquaculture and showed promising results.

The study aims to determine the water quality and larval performance of the grouper, *E. fuscoguttatus*) using the Kiko Technology (titan mini cartridges).

Methodology:

Grouper eggs will be collected from the Big Hatchery Complex at SEAFDEC/AQD and will be transported to Finfish Hatchery for hatching. Eggs will be treated with iodine solution before incubation at 50 ppm to reduce the bacterial population and to avoid the occurrence of parasite contamination from the broodstock tank to the larval rearing tank.

Two treatments will be tested: Treatment 1- Control or no tritan mini cartridges; Treatment 2- with tritan mini cartridges. The cartridge will be placed in the middle of the larval rearing tank. Each treatment will be replicated thrice. A complete randomized design will be followed.

Larvae will be stocked in six 3-t circular tanks with conical bottom at 15 ind/li. Fifty larvae will be taken for initial length measurements. Larvae will be fed enriched-rotifer from day 2 to 15 at 10-15 ind/ml/day. Newly-hatched *Artemia* will be given daily starting at day 15 at 0.5 *Artemia*/ml. Larvae will be fed with enriched 3-day old *Artemia* at 1-3 ind/ml daily starting 25 days post hatching. Rotifer and *Artemia* densities will be monitored in the morning and afternoon to make sure that the desired level is maintained. These will be added when the density falls below the desired feeding level. Static culture system will be followed starting day 1 until day 45. Water temperature and salinity will be monitored daily while dissolved oxygen will be monitored twice a week. Water pH, nitrite and ammonia will be monitored daily for the first 5-7 days and twice a week thereafter.

At least 10 grouper fry will be sampled for growth (length and weight) 15, 35, 45 and 60 days after stocking. After each sampling period, survival will be estimated using the water column sampler. All fry will be counted at the end of the experiment. Final body measurements and general condition/appearance of the fry will also be determined. Culture period will last 60 days and 2-3 runs will be conducted during the spawning season.

Budgetary Requirement:

Maintenance and Operating Expenses (Phil P)

Artemia cysts	8,100.00
Larval diet	150.00
Emulsion	750.00
Water analyses	18,000.00
Sub-Total	27,000.00

Honorarium of Study Leader – first 5 days
for 3 actual runs
(salary P31,100/mo or P1,036.67/day) 15,550.05

Administrative cost (10%) 4,255.00

Grand total **P46,805.05**

Activities

Activities	Year 2013					
	Quarters					
	1 June	2 July	3 Aug	4 Sept	5 Oct	6 Nov
Larval rearing of grouper						
Run 1	x	x x x x	x			
Run 2			x x x	x x x		
Run 3				x	x x x x	x
Report writing		x		x		x

References

de Jesus, E.G.T., Toledo, J.D., and Simpas, M.S. 1998. Thyroid hormones promote early metamorphosis in grouper (*Epinephelus coioides*) larvae. General and Comprehensive Endocrinology, 112:10-16.

Duray, M.N. 1994. Daily rates of ingestion on rotifers and *Artemia* nauplii by laboratory-reared grouper larvae of *Epinephelus suillus*. Philippine Scientists, 31:32-41.

Duray, M.N., Estudillo, C.B., and Alpasan, L.G. 1996. The effect of background color and rotifer density on rotifer intake, growth and survival of grouper (*Epinephelus suillus)* larvae. Aquaculture, 146:217-224.

Duray, M.N., Estudillo, C.B., and Alpasan, L.G. 1997. Larval rearing grouper *Epinephelus suillus* under laboratory condition. Aquaculture, 150:63-76.

Submitted by:

Ofelia S. Reyes 4/2/13

Ofelia S. Reyes

Study Leader

Noted by:

VR Alava 5 Apr 2013

Veronica R. Alava

Section Head

Recommending Approval:

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Program Leader/ TVDD Division Head

Approved by:

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Chief

Date: 10 April 2013