

# AQUA Dept NEWS

Internal Newsletter of the SEAFDEC Aquaculture Department

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## AQD holds program review meetings



The AQD senior staff held a series of program review meetings from February 4 to 6 at TMS to discuss the status of various activities of the De-

partment based on the program approved in 1998.

The research staff reported: results of completed research studies, status of ongoing research studies, and information gaps (topics that needed more studies). They also suggested priority activities (projects and plans) to hasten attainment of AQD objectives.

The RD programs discussed in the meetings were reported by: (1) Clarissa Marte - Broodstock management and seed quality improvement of cultured species; (2) Felix Ayson -

Development of improved technologies in fish and crustacean hatchery/nursery production; (3) Aurelio de los Reyes - Development of appropriate aquaculture technologies and practices; (4) Ilda Borlongan - Development of nutritionally efficient and environment-friendly feeds; (5) Wenresti Gallardo - Development of strategies for stock enhancement for priority species like abalone, top shell, giant clam, window-pane shell, and sea horse; (6) Jurgenne Primavera - Mangrove-friendly shrimp culture project; (7) Ma. Lourdes Aralar - Development of appropriate

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## 'Green water' culture system in shrimp growout explained



AQD's Dumangas Brackishwater Station successfully used the 'green water culture' system.

The reason behind the success of the 'green water culture' system in tiger shrimp production is now understood.

This was explained in the paper titled "*Vibrio harveyi* and the 'green water culture' of *Penaeus monodon*" by Gilda Lio-Po, Eduard Leño, Roselyn Usero, and Nicolas Guanzon, Jr. published in *Disease control in fish and shrimp aquaculture in Southeast Asia - diagnosis and husbandry techniques*, edited by Yasuo Inui and Erlinda Cruz-Lacierda. 2002. 215pp.

The 'Green water culture' system is an innovative culture technique for grow-out of shrimp. It utilizes rear-

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## Millamena lectures in Spain

AQD senior scientist Oseni Millamena (recently retired) is in Spain from February 9 to 16 to conduct a lecture in the Universidad de Las Palmas de Gran Canaria, Canary Island.

She will be talking on the topics "Induction of reproduction in shrimps" and "Shrimp culture in the Philippines." Millamena will be giving lectures to Masteral students upon the request and invitation of Prof. Marizol Izquierdo, head of the Aquaculture Department of the said university.

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technologies for use in lakes; (8) Yasuo Inui - Aquaculture disease management and SEAFDEC-JIRCAS Collaboration.

TID head Pastor Torres reported on the status of training courses, fellowships, and information dissemination programs of AQD. Last year, AQD was able to offer nine short courses, two online courses and accommodate 130 on the job trainees (OJT) and 27 interns. Due to the shift in priority of the Government of Japan, there will be less regular training courses this year. Some of the changes to be implemented will be the intensification of Specialized Internship Courses, addition of more Online Courses, continuation of Regular

Courses that are popular (based on demand), Course and material development (add courses when feasible, Self-Instructional CD-ROM), and the Rural Aquaculture Development (RAD) Training Demo Project.

For the information program, there will be minimal changes expected (quarterly SAA will have limited pages, 2002 Highlights out by March, manuals will be sold as materials become available, Aquafarmers' Corner at website ongoing, ADN for AQD family still published weekly, 2/3 of journal subscriptions will be retained, and upgrading of Internet server to 128 kbps).

Meanwhile, TVS Head Dan Baliao will also present the status and plans of the various programs he is heading on February 10.

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cultured ponds as major source of rearing water for shrimp grow-out culture. In addition, tilapia may be stocked in cages in polyculture with shrimp. This culture technique was reported to prevent disease outbreaks attributed to luminescent *Vibrio* and improves survival and production.

Because of the successful production runs attributed to 'green water culture' system for grow-out of tiger shrimp, this culture technique has gradually gained acceptance among shrimp farmers. In the same manner, AQD found it necessary to conduct scientific investigations on the basis of this success.

The effectiveness of 'green water culture' system in preventing luminous vibriosis may be attributed to the presence of bacteria, fungi, and algae that secrete *V. harveyi* growth

inhibitory factors.

Examinations showed that total bacterial counts in the hepatopancreas of shrimps in the 'green water culture' system were lesser than that in shrimps with luminous vibriosis. The bacterial flora associated with the hepatopancreas of shrimps in 'green water culture' systems was predominated by non-luminous *Vibrio* indicating that it favorably affects the bacterial population of the rearing waters and of the culture shrimps.

The study also showed that some bacteria, fungi, and phytoplankton associated with 'green water culture' system secrete growth inhibitory metabolites against *V. harveyi*. The undetectable levels of luminous bacteria in the hepatopancreas of shrimps cultured with tilapia and in the mucus of tilapia are positive indicators that 'green water culture' system does prevent the multiplication of the luminous *Vibrio*. This is attributed to the strong antibacterial activity of protein extracts in fish mucus.

The abundant presence of filamentous fungi and yeasts in the gut and mucus of tilapia in 'green water culture' contributes to the inhibition of the growth of *V. harveyi* through

**Bet you  
didn't know...**

Starfishes don't  
have brains and  
turtles can breathe  
through their butts.

the production of intra- and extracellular metabolites. The tilapia mucus that apparently prevents the colonization of *V. harveyi* on the fish skin shed the anti- *V. harveyi* factors into the rearing waters thereby contributing to the bio-control of this bacterial pathogen. Many marine fungi also produce novel compounds and enzymes. Fungi are good sources of beta-glucans, which is known to exert an immunostimulating effect on tiger shrimp against *Vibrio* infections.

Microalgae as absorbers of carbon dioxide and providers of oxygen, improve water quality in the aquatic environment through oxygenation and filtration. These processes help prevent the occurrence of diseases caused by pathogenic bacteria and fungi. Moreover, phytoplanktons are potential sources of anti-microbial compounds. *Chlorella*, for instance, is used in the preparation of the antibiotic Chlorellin. Therefore, the microbial flora associated with the "green water culture" system is an excellent source of indigenous microorganisms with probiotic potentials.

It is likely that the low to undetectable levels of luminous *Vibrio* in the 'green water culture' system for tiger shrimp is a result of the combined inhibitory effects of factors in the fish mucus and microbial flora of this culture system.

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