



AQD Matters

Internal newsletter of the SEAFDEC Aquaculture Department

Volume 2, Number 6, 30 June 2005

AQD Joins World Aquaculture 2005 in Bali

The SEAFDEC Aquaculture Department joined many research and development institutions from around the world in Bali, Indonesia, from 9 to 13 May for World Aquaculture 2005, the latest of the annual forum-event organized by the World Aquaculture Society (WAS)

The AQD delegation consisted of AQD Chief Rolando Platon, Deputy Chief Koichi Okuzawa, Research Division Head Wilfredo Yap, AQD Scientist Emilia Quintio, and Aquaculture Assistant Esteban Garibay.

Dr. Okuzawa presented a paper about "SEAFDEC's Regional Fish Diseases Program— its role in capability enhancement on fish health management in aquaculture in southeast Asia." Dr. Okuzawa is the new Regional Fish Health Expert and Program Leader starting March 2005, when Dr. Kazuya Nagasawa finished his term. The presentation focused on the accomplishments of Phase I of the Program funded by the Government of Japan Trust Fund from April 2000 to March 2005, and also included the approved plan of work for Phase II which started in 2004 and will last until 2008.

Dr. Quintio presented the "Highlights of the International Workshop in Culture, Fisheries, and Stock Enhancement of Portunid Crabs" held in Iloilo City from 20 to 22 January 2005 and attended by 57 participants from 11 countries.

Steve Garibay manned the SEAFDEC booth, which displayed information about the role of SEAFDEC in sustainable fisheries in the ASEAN countries and about AQD as an agent in quality development in aquaculture. Dr. Platon and Mr. Yap attended to the consultations at the SEAFDEC Booth. Steve sold or gave away AQD publications.

After the WAS meeting, Steve visited the Gondol Brackishwater Aquaculture Station to see the milkfish and grouper hatchery facilities and operations, courtesy of AQD's partners in Indonesia's Directorate-General of Aquaculture.

Dr. Platon and Mr. Yap had come to the WAS meeting from Kota Kinabalu, Malaysia, where they attended from 4 to 6 May the Inception Meeting on Human Resources Development for Sustainable Fisheries in the BIMP-EAGA (Brunei-Indonesia-Malaysia-Philippines East Asia Growth Area). During the inception meeting, the concept proposal for the aquaculture component of the HRD program was developed. The governments of the BIMP-EAGA seek an HRD program focusing on participatory-type training. Each country then defined its preferred topic, venue, and schedule for training. The concept proposal was then turned over to the Training and Information Division to flesh out further, and to implement between September 2005 and March 2006. Funding for the BIMP-EAGA HRD Program comes from the ASEAN Foundation (Japanese fund component).



AQD Chief RR Platon and the AQD delegation receive visitors and answer queries at the SEAFDEC booth



Fatty acid composition of zooplankton used in marine hatcheries in the Philippines

Denny Ramos Chavez

Production of planktonic food organisms is essential to hatcheries and tanks for the purpose are larger than the larval rearing tanks. However, hatcheries have paid little attention to the quality of natural food that is being grown and fed to the larvae. Low-maintenance algae is usually grown and fed to rotifers. As the larvae grow, larger prey and artificial diets are used. Recently, hatcheries have realized the need for better quality larval food and have started to manipulate the nutrient content as desired.

There have been many studies on the requirements of fish for, and the incorporation into the diet of, essential fatty acids, particularly the long-chain eicosapentanoic acid (EPA, 20:5 ω 3), docosahexaenoic acid (DHA, 22:6 ω 3), and more recently, arachidonic acid (ArA, 20:4 ω 6). Dr. Hiroshi Ogata and colleagues at SEAFDEC/AQD have shown that ArA can be incorporated into rotifers. However, as the ArA levels increase, the DHA levels decrease.

This report describes the fatty acid composition of the different natural food used in hatcheries in the Philippines, and the incorporation of arachidonic acid into rotifers.

Methods

Samples of mixed zooplankton with and without detritus were collected by plankton sampler from the mangrove area near AQD's Dumangas Brackishwater Station. Samples of the cladoceran *Moina* were collected from a freshwater pool, and copepods from a brackishwater nursery pond in Oton, Iloilo. The samples were scooped with a fine-mesh net, put in sealed bags, labeled, freeze-dried and stored at -80°C before lipid extraction.

Rotifers reared in *Nannochloropsis* were harvested and fed the artificial diet Culture Selco (INVE, Belgium). After 24 hours, the rotifers were enriched with DHA Protein Selco (INVE, Belgium) plus 0, 1, 2.5, and 5% arachidonic acid (triacylglycerol form), according to the standard enrichment protocol used at AQD.

Freeze-dried and pulverized samples were placed in a 2:1 mixture of chloroform and methanol to extract the lipids. Fatty acid methyl esters were prepared by trans-esterification with borontrifluoride in methanol, and were purified by thin-layer chromatography (Silicagel 70 plate; solvent system: 90% petroleum ether, 10% diethyl ether and 1% acetic acid by volume). The fatty acid methyl esters were analyzed by gas liquid chromatography (Shimadzu GC-17A equipped with a hydrogen flame ionization detector and an Omegawax 320 fused silica capillary column (30 m x 0.32 mm internal diameter). The column temperature was held at 160°C for 5 min, then increased at a rate of $4^{\circ}\text{C}/\text{min}$ to 210°C . The carrier gas was helium and the pressure was 80kPa. Fatty acids were identified by means of a reference standard (Funakoshi, Tokyo, Japan) and known fatty acid methyl esters in fish meal, and then quantified by an integrator (Shimadzu C-R7A plus).



Denny with JIRCAS President Dr. Mutsuo Iwamoto, Fisheries Division Director Dr. Koji Nakamura, and Research Adviser Dr. Hiroshi Ogata

Results

Zooplankton from mangrove areas contained DHA, but detritus did not (Fig. 1 next page). Copepods from brackishwater ponds and *Moina* from freshwater pools both contained ArA and EPA at higher percentages than DHA. Copepods and *Moina* also had higher ArA and EPA levels, but lower DHA/EPA and DHA/ArA ratios than zooplankton.

Rotifers fed with *Nannochloropsis* had high ArA and EPA but no DHA (Fig. 2). DHA increased upon feeding with Culture Selco and enrichment with DHA Protein Selco. ArA and EPA in rotifers fed Culture Selco were higher than in those fed DHA Protein Selco.

The result of ArA supplementation in addition to DHA Protein Selco is ambiguous (Fig. 3). Although 5% ArA incorporation showed the highest ArA in rotifers, 1% ArA incorporation resulted in the highest levels of all three essential fatty acids in rotifers.

Compared with earlier experiments, the EPA and DHA concentrations in rotifers enriched with DHA Protein Selco is much lower in this study. Likewise, the reciprocal ratios of DHA/EPA and DHA/ArA were lower in this study.

Acknowledgment

I thank the Japan International Research Center for Agricultural Sciences (JIRCAS) for the opportunity to visit Japan from 28 February to 31 March to do some research, particularly to analyze plankton samples for essential fatty acids. I am deeply grateful to Dr. Hiroshi Ogata and his wife Rieko for insights into the way of the Japanese people. Mr. Ashraf Mahmoud Suloma helped me in the analyses of my samples. Director Koji Nakamura of the Fisheries Division was always encouraging, and Ms. Nakano always had green tea and hot coffee.

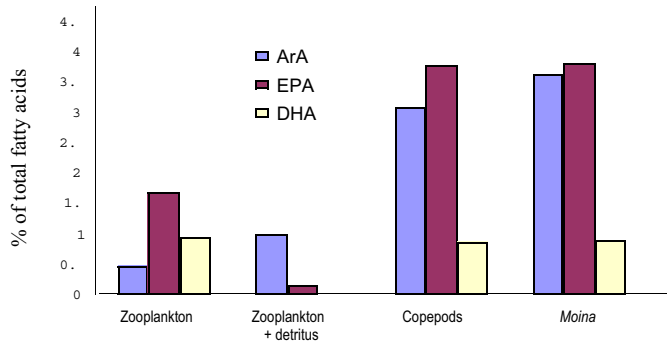


Fig. 1. ArA, EPA, and DHA levels of zooplankton from the wild

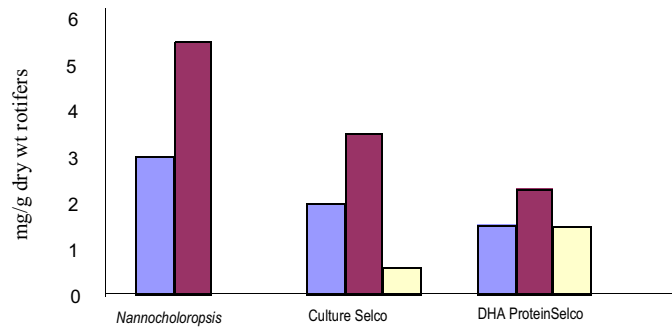


Fig. 2. ArA, EPA, and DHA in rotifers reared on Nannochloropsis, grown in Culture Selco, and enriched with DHA Protein Selco

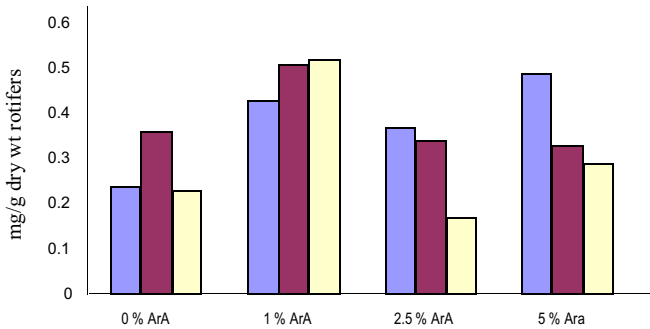


Fig. 3. ArA, EPA, and DHA in rotifers enriched with DHA Protein Selco plus different levels of arachidonic acid

14 finish marine fish hatchery course

SEAFDEC/AQD conducted the 21st Training Course on Marine Fish Hatchery from 4 May to 17 June 2005 for 14 hatchery owners, managers, technicians, and extension workers from Philippines (9), Saudi Arabia (1), Iran (2), Singapore (1), and Sri Lanka (1). The Course Officer was Ma. Teresa Mallare and the Technical Lead Trainor was Denny Chavez, AQD's Hatchery Manager. The course included mostly actual hatchery work, but also lectures, laboratory sessions, and field trips.

The trainees were provided with technical knowledge and skills on the spawning and larval rearing of marine fishes, including milkfish, seabass, grouper, snapper, and rabbitfish. They were trained how to produce natural food organisms for the fish larvae, and to monitor water quality and fish health. On top of the regular lectures, there were also special lectures on essential fatty acids in fish diets by Dr. H. Ogata, on vitamin supplements in fish diets by Dr. H. Furuita, and on viral nervous necrosis in fish by Dr. I. Kiryu.

Fish hatcheries are very important for sustainable aquaculture, and production of quality seedstock has always been an anchor program of AQD. Recently, an expanded role for fish hatcheries has come from the need to restock natural waters to replenish depleted fishery stocks. AQD has just initiated the program for Stock Enhancement of Threatened Species of International Concern. Thus, research, training, and technology transfer in marine fish hatchery will become ever more important.



Hisyamudin Salleh of Singapore stocks just hatched fish larvae in a rearing



The participants discuss hatchery procedures and assignments

The *Penaeus vannamei* controversy

The controversy regarding the Pacific white shrimp *Penaeus vannamei* stems from its being an exotic species being imported from Hawaii into the Philippines for farming in ponds formerly used for the local tiger shrimp *Penaeus monodon*. The fears are that *P. vannamei* will—

- displace *P. monodon* in the Philippine shrimp industry
- bring diseases that will further decimate tiger shrimp and other crustaceans
- escape into natural waters and adversely affect biodiversity

This controversy led SEAFDEC to convene the Regional Technical Consultation on the Aquaculture of *Penaeus vannamei* and Other Exotic Shrimp Species in Southeast Asia in Makati on 1-2 March 2005. At that meeting, it became clear that China, Thailand, and Indonesia now already farm and produce large quantities of *P. vannamei*, and that Vietnam, Myanmar, Cambodia, and Singapore have already started doing the same. Shortly after the consultation, Malaysia also decided to allow the import of *P. vannamei* for farming.

Some shrimp producers in Luzon have already imported *P. vannamei* in recent years, but the official stand of the government is still precautionary. Early this year, the government itself did a trial importation and quarantine of *P. vannamei* breeders at the National Integrated Fisheries Technology Development Center (NIFTDC) in Bonuan-Binloc, Dagupan City. Shortly before the Regional Technical Consultation, the SEAFDEC Aquaculture Department obtained samples of the *P. vannamei* breeders for examination by its Fish Health Laboratory. Exhaustive tests were done, including histopathology and virus identification by polymerase chain reaction (PCR) techniques.

On 22 March 2005, AQD Chief Rolando R. Platon transmitted the results of the exhaustive tests to Director Atty. Malcolm I. Sarmiento Jr. of the Bureau of Fisheries and Aquatic Resources.

In brief, the PCR tests showed that all the samples were negative of Taura Syndrome Virus or TSV. However, the last sample obtained personally by Dr. Leobert de la Peña proved positive of the Infectious Hypodermal and Haematopoietic Necrosis Virus or IHHNV. The havoc caused by this virus on farmed *P. vannamei* in the Americas was the driving force for the development of specific-pathogen-free (SPF) stocks. Thus, the presence of IHHNV in the *P. vannamei* broodstocks at the NIFTDC is totally unacceptable.

The histopathology showed that 100% of the samples were positive of the Hepatopancreatic Parvo Virus or HPV and that in all likelihood, the broodstock came from postlarvae that were already infected by HPV. Furthermore, the presence of melanized tissues showed that the animals suffered from, but survived, chronic vibriosis during development. This indicated poor husbandry in the hatchery.

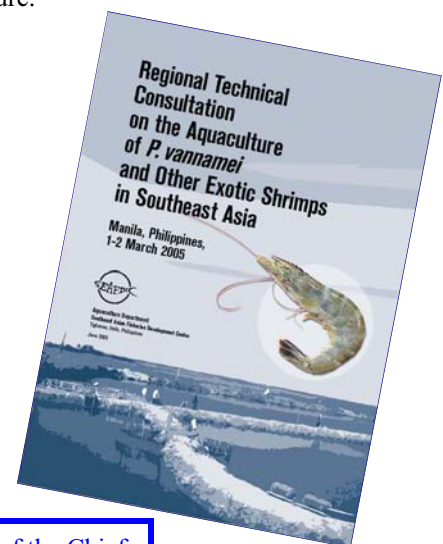
Given the disease information, AQD recommended the immediate destruction and proper disposal of the entire *P. vannamei* broodstock at the NIFTDC. The NIFTDC accepted the AQD recommendation and had all *P. vannamei* breeders destroyed (cooked!).

Should BFAR decide to import another batch of *P. vannamei* breeders, AQD also recommended the following procedures:

1. The NIFTDC hatchery facilities, including aeration and water lines must be thoroughly disinfected then completely dried out before the new stock arrives.
2. Appropriate water purification systems and measures must be installed in the hatchery, including proper filtration and treatment of incoming water by ozone, ultraviolet, or 400 ppm chlorine.
3. Appropriate wastewater treatment systems and measures must also be installed in the hatchery.
4. Disinfection bath must be installed for staff, footwear, as well as for tires of incoming vehicles
5. Allow the import of *P. vannamei* broodstock only from the six suppliers in the United States that have been accredited by the Thai Department of Fisheries. These six suppliers are known for their transparency and adherence to internationally accepted protocols covering transport of live shrimps.
6. Post-border PCR tests should be conducted immediately after the arrival of the imported stock.

In connection with the last recommendation, AQD offered the services of the Fish Health staff. If needed and if informed in advance, AQD's staff will be on hand to do the sampling upon arrival of the stock. AQD's staff will also be ready to provide continuing monitoring thereafter.

Dr. Platon assured BFAR of full assistance to enable the safe introduction of *P. vannamei* into the Philippines, as well as cooperation in other programs for the development of Philippine aquaculture.



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The *Penaeus vannamei* controversy

12

THE PUBLISHER OF SINCE 1858
MANILA BULLETIN
 THE NATION'S LEADING NEWSPAPER

Monday, June 20, 2005

Probe on banned 'suahe' shrimp sought

By **BEN R. ROSARIO**

Party-list lawmakers have asked the House of Representatives to conduct a probe into the proliferation in the local market of banned Pacific or western white shrimps, popularly known as "suahe."

Warning that the unabated smuggling of suahe could harm the local shrimp industry, Akbayan Representatives Mario Aguja, Loretta Ann Rosales, and Ana Theresa Hontiveros-Baraquel filed House Resolution 830 calling for an inquiry in aid of legislation on the problem.

"The exotic Pacific white shrimp is suspected to be a carrier of several viral diseases that local shrimp and pawn species are vulnerable to. These include white spot syndrome, the yellow head virus, and the luminescent vibro,"

Aguja said.

Aguja revealed that the country's shrimp industry is starting to peak. The flooding of imported shrimp could foil its success.

He said an outbreak of viral diseases that hit Negros Occidental shrimp farms in 1996-1997 resulted in the decline of shrimp production.

"The effect of the outbreak in Negros Occidental has caused a sharp decline of shrimp production from the peak of 90,000 metric tons to only 40,000 metric tons yearly and production has remained at this level since then," Aguja added.

According to him, an existing government ban on the importation of Pacific white shrimps is being openly defied by fish traders.

In filing the resolution, the Akbayan lawmakers assailed the Bureau of Fisheries and Aquatic Resources for

signing an agreement with the Agrifisheries World Incorporated (AWI) for a joint venture to conduct an experiment trial for the propagation of the vannamei shrimps.

AWI is an aquaculture firm based in China and Taiwan.

"The agreement was made even as there is a ban on the importation and culture of the species as contained in Fisheries Administrative Order 207 issued by the Department of Agriculture," the solons said.

They revealed that BFAR only stopped experimentation of the vannamei shrimps after the Southeast Asian Fisheries Development Center (SEAFDEC) revealed that the vannamei breeders being tested were afflicted with diseases.

Aguja called on government to immediately act on the reported illegal importation of suahe.

Dr. Celia speaks

Dear All,

I think the brouhaha over *P. vannamei* introduction and culture is going overboard. The allegation that *vannamei* carries white spot that may be transferred to *monodon* is false. In fact the reverse is true ...*vannamei* got WSSV from *monodon*! Luminous bacteria is found everywhere and is not in any quarantine list of pathogens to be avoided. Yellowhead is also a *monodon* disease. While it is true that dangerous exchange of pathogens can happen, there are best management practices (BMPs) and good aquaculture practices (GAPs) that BFAR should have impressed upon everyone to reduce disease risks and sustain good production.

Whoever is feeding the media with info must at least give it right. This nation already has more than enough political troubles and a congressional inquiry on *vannamei* is a small problem if only the NGOs were given the right information. Everybody knows that the *monodon* industry was already in trouble with production due to diseases prior to the entry of *vannamei*. It is not fair to keep on looking at *vannamei* as the harbinger of things evil, and an "invasive" and bad species. Many Asian countries are already cashing in on the product and have supplied their local markets with cheap shrimp.

The currently available *P. vannamei* SPF (and SPR) stocks are similar to the present chicken and hog genetic lines that were developed through long years of research selecting for fast growth, better feed conversion ratio, and other good traits. For biodiversity issues, we can learn a lot from the Americas where *vannamei* has been the popular exotic species being cultured for years (Belize, Brazil, Venezuela, states in the Atlantic coast of USA, etc.). I believe that there is an urgent need for *monodon* choice breeding lines, but several groups have tried it and no one has cracked it yet. Knowing that *P. monodon* is almost two decades behind *vannamei* in terms of breeding, shall we insist on chasing the "hens" (spawners) from the wild? I think this is even more destructive and an issue of greater concern. I'm afraid we are among the few remaining countries that have chosen to remain in the dark ages of shrimp culture. This probably is another example for our stubborn love for "Bisaya" varieties ... delicious and expensive.

In the meantime, Mang Pandoy will never get to taste shrimp.

Celia

The *Penaeus vannamei* controversy

Shrimp hatchery Q&A

----- Original Message -----

Subject: inquiry
 From: "Ricardo Torres" <rickytor@hotmail.com>
 Date: Fri, July 8, 2005 8:56 am

Sir/madam,
 I would like to put forward this inquiry re the state of our prawn culture industry. Based on your extensive knowledge of the matter, is it still commercially profitable to open up a (black tiger) prawn hatchery at this time? Do you have material reading (updated) on black tiger prawn culture? Thank you for your time and attention.

Sincerely,
 RG TORRES

----- Original Message -----

Dear Mr. Torres,

Your letter of inquiry was referred to me for appropriate response.

Am sorry to tell you that this is not the best time to invest on a shrimp hatchery. While shrimp farming remains a very profitable business, there is still a high risk of disease and the industry has not quite picked up yet. The remaining hatcheries are already having a hard time marketing their fry and often operate in full only when there is a definite order. Even if the fry is disposed getting paid in full is often a problem.

In the meantime even existing hatcheries who have been in business for a long time are having problem getting enough healthy spawners or broodstock which all come from the wild. Many of the natural spawners are affected with diseases so they either do not survive, has poor performance or cannot produce healthy fry which can pass inspection.

At any rate, if you are really interested in aquaculture, there are other commodities that you may want to invest in. Try browsing through our website at www.seafdec.org.ph. It may give you some idea on what other species may be good to invest in.

W. G. Yap

----- Original Message -----

Greetings. Reur question, it is still profitable to have a prawn hatchery in the Philippines. However, the main problem, especially for the small scale hatcheries is the market. Most of the hatcheries which are still operational today have their own "suki" or identified markets which consistently buy from them. Another problem of the prawn hatchery industry is the lack of spawners and even broodstock from the wild.

I hope you will find the info above useful for whatever venture you plan to undertake.

Truly yours,
 Fe Estepa

AQD to develop shrimp broodstocks

A facility for rearing shrimps to become captive broodstock will be built at SEAFDEC/AQD's Tigbauan Main Station. The facility is designed to have a net water area of 10,000 m² and will have one grow-out pond unit and eight compartments to hold eight separate family lines.

The broodstock facility will focus on developing broodstocks of sugpo, known in international trade as the black tiger shrimp *Penaeus monodon*. The tiger shrimp is known to have the fastest growth rate and attain the largest size among all species of marine shrimps.

Despite the advanced technologies for hatchery and grow-out of the tiger shrimp, the shrimp industry all over Asia still depends fully on the spawning of female shrimps caught from the wild. This total dependence on wild-caught spawners has lately stifled the growth of the industry because good-quality spawners are becoming scarce and expensive. Not only are they harder to find, the few that are caught are often found to harbor diseases, particularly the white spot syndrome virus (WSSV) which can cause high or even total mortality of farmed shrimp in brackishwater ponds.

It is the scarcity of healthy wild-caught sugpo spawners that has forced many shrimp growers in Asia to turn to an imported species, the Pacific white shrimp or *Penaeus vannamei*. This exotic shrimp species is already fully domesticated, and the breeding already commercialized such that ordering certified disease-free spawners is as easy as ordering breeding stocks of poultry. However, farming of this exotic shrimp is not yet legal in the Philippines, although already widespread in Thailand, Indonesia, Vietnam, and China. In fact, in terms of sheer volume produced, *Penaeus vannamei* is now the main farmed shrimp around the world.

SEAFDEC/AQD hopes to completely domesticate the sugpo in the planned broodstock development facility. Full domestication may take several years, so in the meantime, there will be studies on the commercial viability of growing shrimp broodstock in ponds. Once commercial viability is demonstrated, this will encourage private-sector investment in captive shrimp broodstock. This will make high-quality shrimp broodstocks available to hatcheries.

Domestication of shrimp broodstock at AQD is another initiative of AQD Chief Rolando Platon and Research Division Head Wilfredo Yap. Dr. Emilia Quintio is the Program Leader in charge of shrimp domestication. They are now making plans for the selection of broodstock and getting them to be like captive "hens" that can produce healthy young as needed by the grow-out industry.

The ground breaking ceremony for the shrimp broodstock facility is scheduled for the AQD Anniversary, with House Speaker Jose de Venecia, Jr. and Department of Agriculture UnderSecretary Cesar M. Drilon, Jr. to grace the occasion.

Status report from Palau

John Eric A. Basco

Warm greetings from the AQD aquaculture team in Ngatpang State, Palau!

Fish pond construction

Gate construction was started on 16 May when used Yanmar engine (8 hp) was provided by the Mariculture Demonstration Center for use by the AQD team. It is estimated that the main gate would be finished by the second week of June. Right after completion of the main gate, the secondary gate will be built. Backfilling of soil in the partition dike of the sedimentation pond is ongoing. However due to frequent rain here in Ngatpang, backfilling is delayed.

Grouper farming in cages

The grouper stocks in three floating cages were sampled on 19 May and found to have average body weights of 462 grams, 288 grams, and 284 grams after 132 days of grow-out. These groupers were fed 'trash' fish every other day at 5% of body weight. The younger groupers in a fourth cage were fed at 8% of body weight per day and weighed 88 grams after 62 days of grow-out.

Several restaurant owners from Koror have visited the cages and have expressed interest to buy the groupers larger than 450 grams. We await the arrival of the Governor of Ngatpang and for him to signal that we can harvest the groupers. Most probably, the selling price of the live groupers will be \$5 for 450 grams. Dead groupers here in Palau sell for \$1.50 for 450 grams.

Mudcrab farming in mangrove pens

On 16 April 2005, a stock of 2,048 *Scylla serrata* crablets (about 4 cm in carapace length) were imported from the Philippines into Ngatpang. Of these crablets, 314 died during transport, 500 were stocked in one compartment (area 500 m²) of the Ngatpang State Mangrove Pen Project, and the other 1,234 were stocked in three compartments of a privately owned crab pen in Old Ngatpang.

The crablets were weak upon arrival in Ngatpang, probably due to improper packing for the plane ride from the Philippines to Koror. Crablets were placed in trays (each 30 cm x 45 cm x 13 cm) without water, 600-700 crablets per tray, only covered with wet cloth inside unoxygenated plastic bags in a sealed box. Of the 500 crablets stocked in the State-owned crab pen, 131 have died. Now the remaining crablets have recovered from the transport stress and consume 700 grams of chopped 'trash' fish per day.

Since the crab pen project started, a total of 238 males and females (total weight 191 kg) have already been harvested. The harvest, including those donated for Ngatpang State occasions (40 kg) amounted to \$2,227. These crabs were fed about 1 kg of 'trash' fish daily.

AQD assists rabbitfish hatchery in Hue, Vietnam

SEAFDEC/AQD sent Aquaculture Assistant Esteban Garibay to Hue, Vietnam, to provide technical assistance to the Thua Thien Hue Fishery Extension Center in its project on rabbitfish seed production. Steve worked with the hatchery staff from 15 to 30 June 2005. Using the technologies developed at AQD, the Hue staff were able to spawn the rabbitfish *Siganus guttatus* and to rear the larvae. Larval survival, however, was still low because of low quality and quantity of larval food, mainly rotifers. Steve taught the hatchery staff how rotifers could be enriched according to techniques used at AQD.

Under the SEAFDEC-ASEAN Special Five-Year Program (Aquaculture Component: Supply of Good Quality Seed), AQD staff visited Thua Thien in mid-2003 to assess the hatchery facilities, and again from 10 to 24 November 2004 to train hatchery and extension personnel in spawning rabbitfish and producing larvae. Under the Program, Vietnam implements projects in rabbitfish aquaculture in Hue and milkfish aquaculture in Binh Dinh.



Floating cages for transport of rabbitfish broodstock



Thuan Thien Hatchery in Hue, Vietnam

From the Office of the Chief

Executive Order No. 1, Series of 2005-RRP, 25 May 2005 *Creation of a Management Committee*

In the interest of the service and in order to institutionalize and broaden participation of staff in major decisions affecting the Department, a Management Committee is created composed of the Chief as Chair, the Deputy Chief as Vice-Chair, and Division Heads and Program Leaders as Members. The Management Committee is a consultative body that the Chief may convene to discuss important matters.

Administrative Order No. 17, Series of 2005-RRP, 24 May *Renaming of the Data Bank as the Management Services Office under the Office of the Chief*

Administrative Order No. 18, Series of 2005-RRP, 25 May *Designation of Virgilia T. Sulit as Head of the Management Services Office*

Administrative Order No. 19, Series of 2005-RRP *Designation of Program Leaders*

Upon further refinement in the restructuring of departmental programs and in order to provide focus and ensure continuity in technology development through all the production phases of aquaculture species, program implementation shall be based on problem areas of specific commodities. The problem-based programs and the respective Program Leaders are:

<i>Programs</i>	<i>Program Leaders</i>
Shrimp Domestication	Dr. Emilia T. Qunitio
Crab Seed Production	Dr. Fe Dolores P. Estepa
Marine Fish Seed Production	Mr. Denny R. Chavez
Integrated Abalone Production	Ms Shelah Mae B. Ursua
Freshwater Aquaculture for Rural Development	Dr. Ma. Lourdes C. Aralar

Administrative order No. 21, Series of 2005-RRP, 8 June *Designation of Dr. Celia L. Pitogo as Course Officer of AquaHealth Online Distance Learning Course*

Administrative order No. 22, Series of 2005-RRP, 9 June *Designation of Atty. Jerry T. Opinion as Head of the Administration and Finance Division*

Atty. Jerry T. Opinion, CPA

AQD's new AFD Head is an amiable lawyer and accountant, 52 years young, married to Judge Ma. Elena G. Opinion, with four children, and residing in Mandurriao, Iloilo City. He is a part-time Instructor at the College of Commerce and Accountancy of the University of San Agustin, and had earlier worked as Vice-President of Panay Electric Company, Inc. and as Auditor in the Commission on Audit.

Welcome to AQD, Atty. Jerry!

On-the-job training and internships

The summer school break is always a busy time for AQD because of students who want to work here to get practical experience in aquaculture or to learn the methods of scientific research. From April to June 2005, AQD hosted 92 students from 15 schools for on-the-job training. These trainees work the required number of hours practicum for baccalaureate courses in fisheries and aquaculture. At the end of their training, the students wrote narrative reports for their schools, and they were evaluated by their respective supervisors at AQD.

Throughout the year, AQD also offers internships in particular laboratories or tasks, for a fee. From April to June, four interns worked at the abalone hatchery, two at the crab hatchery, one at the fish hatchery, and one at the biotech laboratory.

There were also two special trainees from the Hautea Prawn Farm. Two students from the University of Wales Bangor visited AQD to do some research, and three students from Aklan State University conducted their thesis at the Fish Health Laboratory.





Baguingin, Tigbauan



Parara Norte, Tigbauan



Sibalom River, Bagumbayan, Tigbauan



Identifying marine species at FishWorld



At UP-Visayas, Miagao



Miagao

A summer to remember

Ten students from Philippine Science High School—Western Visayas and six students from the University of the Philippines High School in Iloilo undertook the R&D Internships at FishWorld from April to May 2005. They worked and they played.

Dr. Jurgenne H. Primavera Outstanding Filipino Woman in Fisheries and Aquatic Resources Research, Development, and Industry

Dr. Jurgenne H. Primavera

AQD Senior Scientist
BSc Zoology, University of the Philippines-Diliman
MSc Zoology, Indiana State University
PhD Marine Science, University of the Philippines-Diliman
PhD Science *honoris causa*, Stockholm University 2004
Pew Fellow in Marine Conservation 2005



Dr. JHP, the ecologist and teacher — equally at home in the mangroves as in the conference room



What's new on the list? Dr. JHP is one of the Outstanding Filipino Women in Fisheries and Aquatic Resources Research, Development, and Industry, an award given out by the Philippine Council for Aquatic and Marine Research and Development of the Department of Science and Technology. JHP also received the Outstanding Book Award from the National Academy of Science and Technology for her *Handbook of Mangroves in the Philippines—Panay* with coauthors RB Sadaba, MJHL Leбата, and JP Altamirano. JHP's reports about research on mudcrab farming in the mangroves have been picked up by the international science media and posted on the internet. Indeed, her fame precedes her, and SEAFDEC/AQD is behind her.

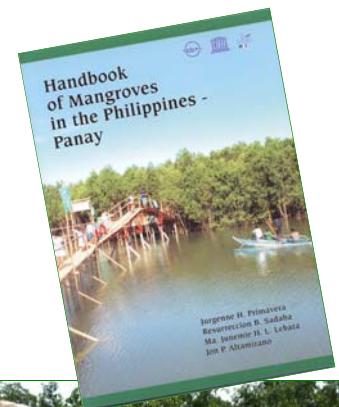
New Agriculturist
on-line
Reporting Agriculture for the 21st Century

Crab culture with a conscience

The rapid spread of aquaculture in recent decades has brought riches to some, ruin to many, exclusion to the poorest coastal dwellers, and environmental degradation. Scientists in the Philippines are adapting aquaculture to make it sustainable over the long term and suitable for small-scale, family-level operators. An innovative system of captive crab culture in live mangrove is being developed in the central Philippines and is now being verified and demonstrated on the southern island of Mindanao.

"Aquaculture needs to become more mangrove-friendly to be sustainable," argues Dr. Jurgenne H. Primavera of the Iloilo, Philippines-based Aquaculture Department of the Southeast Asian Fisheries Development Centre (SEAFDEC), an 11-member inter-governmental treaty organisation headquartered in Thailand. "That means developing aquaculture techniques that don't require clearing the trees."

Tantanang is one of many scenic bays in Alicia, a coastal municipality on western Mindanao's Zamboanga Peninsula. The region is known to the outside world mostly for its long-running Muslim insurgency, but Tantanang Bay is a local leader in environmental protection. Three-quarters of the residents of its 16 villages draw their livelihood from the bay, which includes a 5-hectare fish sanctuary.



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FEATURES


Mud and mangroves: farming crabs in the Philippines

24 June 2005
Source: New Agriculturist On-line

Aquaculture — the farming of marine species for human consumption — has spread rapidly in recent decades, with mixed results. Although profitable for some, it has led to the exclusion of poor people living in coastal settlements, as well as environmental degradation.

Scientists in the Philippines are trying to find another way: sustainable aquaculture using an innovative system of farming mud crabs in enclosures among live mangroves, coastal trees whose lower portions are submerged at high tides.

Researchers at the Aquaculture Department of the Southeast Asian Fisheries Development Centre (SEAFDEC) devised the initiative, which is being tested by villagers on the southern island of Mindanao.



Mud crabs are being farmed within mangrove forests in the Philippine

