April - May 2013 www. seafdec.org.ph

AQD Matters

Newsletter of the SEAFDEC Aquaculture Department (AQD), Tigbauan, Iloilo, Philippines

AQD scientists go to India for ISMAF 2013

SEAFDEC/AQD collaborated with Rajiv Gandhi Centre for Aquaculture (RGCA), the R&D arm of Marine Products Export Development Authority (MPEDA), to organize the *International seminar-workshop on mud crab aquaculture and fisheries management* (ISMAF 2013) in Tamil Nadu, India from 10 until 12 April 2013.

AQD scientists Dr. Emilia Quinitio, Dr. Junemie Lebata-Ramos, Dr. Veronica Alava, Dr. Fe Estepa, Dr. Mae Catacutan and AQD scientist emerita Dr. Jurgenne Primavera represented the Department during the seminar-workshop as paper presenters and workshop leaders.

During the program, Dr. Quinitio was given a citation for her contribution to the mud crab industry in India and was awarded by the President of RGCA & Chairperson of MPEDA Ms. Leena Nair.

The three-day seminar-workshop was held in RGCA with over a hundred participants. There were 8 country papers, 31 contributed papers in the technical sessions (22 oral and 9 poster presentations), 3 workshops and 2 field trips.

AQD scientists Dr. Veronica Alava, Dr. Mae Catacutan, Dr. Junemie Lebata-Ramos and Dr. Fe Estepa presented their studies during the seminar-workshop

India honors Dr. Emilia Quinitio

Dr. Emilia Quinitio was given citation for her contribution to the mud crab industry in India. Dr. Quinitio has been providing technical assistance to RGCA since 2004. She disseminated AQD's technologies in mud crab hatchery, nursery and grow-out by conducting training and managing field work. She helped in designing RGCA's first mud crab hatchery was inaugurated during the ISMAF 2013.

Photos courtesy of ET Quinitio & MJHL Ramos

Scientists and stakeholders convene for food safety

Food safety for all

The International workshop on food safety of aquaculture products in Southeast Asia was held from 8 to 9 May in Iloilo City.

This workshop was organized by AQD with funding from the GOJ-Trust Fund. It focused on the status of food safety and traceability of aquaculture products including the standard protocols used for the detection of contaminants and regulatory mechanisms in SEAFDEC member countries.

SEAFDEC Deputy Secretary-General Mr. Hajime Kawamura was happy with AQD's successful promotion of sustainable aquaculture and he also noted that AQD should continue to extend support and enhance the capacity of small-scale aquaculture operators to adapt the necessary preventive and control measures.

AQD Chief Dr. Felix Ayson explained that this workshop served as the venue to address the concerns on food safety and to come up with recommendations on how to harmonize food safety standards. "AQD has been in the forefront of developing technologies for sustainable production of safe food products through aquaculture," he added.

A total of 150 aquaculture and food safety experts, scientists, representatives and observers from 11 countries attended the workshop.

AQD Deputy Chief Dr. Teruo Azuma is the chairperson of the workshop's organizing committee.

RIBBON-CUTTING AQD Chief Dr. Felix Ayson, Deputy Secretary-General Mr. Hajime Kawamura and AQD Deputy Chief Dr. Teruo Azuma during the ribbon-cutting of the poster presentations display

"I am happy to note that AQD had been successful in leading and supporting the SEAFDEC member countries in attaining their goals to achieve sustainability in aquaculture"

Mr. Hajime Kawamura
SEAFDEC Deputy Secretary-General

Photos by Devcom

POSTER PRESENTATION VIEWING (Above from left to right) Dr. Leobert de la Peña with a participant from Brunei Durassalam during the poster viewing. AQD senior technician Pedrita Caballero presenting her research to Dr. Michiaki Yamashita of Japan. AQD associate scientist Dr. Ma. Michelle Peñaranda with Dr. Eduardo Leaño

(Clockwise) Former AQD scientists Dr. Oseni Millamena, Dr. Gilda Lio-Po and Dr. Felicitas Pascual attend the workshop. AQD Chief Felix Ayson chats with Dr. Mark Tamplin

Dr. Mark Tamplin, AQD scientist Dr. Rolando Pakingking and Dr. Clarissa Marte. Dr. Teruo Azuma, Dr. Mark Tamplin and the participants during workshop discussion on research gaps and research collaboration of member countries

Member countries report on food safety

Representatives of SEAFDEC member countries reported on food safety conditions in their respective areas during the workshop.

As per the presentations, most countries formulated legal frameworks to monitor and control chemicals used in aquaculture practices. Registration systems were established to control quality of fish produce, as well. For example in the Philippines, two-year expiration for production and processing establishments is applied but once violation is found during the annual monitoring, the registration can be invalidated even before the expiration date. In all countries, the registered establishments and farms are the only ones allowed to export.

Exporting fish to the European market is the common target of all member countries. The countries shared in their presentations the requirements and qualities expected for a country to allow export to Europe, however the body agreed to conduct more research and study regarding the matter. Also, the countries' concern on managing the quality of the produce from small-scale fish farmers was addressed through the formation of local cooperative to guide the fishers.

The reports highlighted both the developments and problems the food safety in Southeast Asia and was led to the configuration of probable solutions. The audience also shared their opinions on the topics through the open forum.

Good news! You can now download the book of abstracts and the report on the International workshop on food safety of aquaculture products in Southeast Asia from the website: **http://www.seafdec.org.ph/2013/free-downloads/**

Representatives from 10 member countries are Simeona Regidor, Philippines; Chau Thi Tuyet Hanh, Vietnam; Suwanna Worasing, Thailand; Noraini Anggas, Brunei Darussalam; Michiaki Yamashita, Japan; Thongkhoun Khonglalaine, Lao PDR; Tuti Hartati Siregar, Indonesia; Helen Phang, Singapore; Hla Htay, Myanmar; and Bun Chantrea, Cambodia

Ten studies on making food safe

"Our planet Earth is a closed system," noted Dr. Mark Tamplin of the University of Tasmania (Australia). "We can expect that the effects of human population growth will coincide with increases in densities of pathogenic micro-organisms and chemicals that will impact aquaculture, the primary future source of fish products." Dr. Tamplin was the plenary speaker.

Ten other papers were presented from these institutions working on food safety:

(1) DA-BFAR and Tokyo University of Marine Science (Japan) suggested that the extract from edible mushroom (*Flammulina velutipes*) found rich in ergothioneine can be an effective alternative to synthetic compounds (whose residues can be health hazards) which are currently used to minimize post-mortem melanosis in shrimps (*Penaeus monodon* and *P. vannamei*).

(2) University of the Philippines Diliman studied the human pathogens *Escherichia coli* and *Salmonella enterica* isolated from tilapia and oyster meats. The result is not a surprise ~ heat (cooking) can kill the pathogens ~ and it does mean eating heat-treated ceviche recipes.

(3) National Research Institute of Fisheries Science (Japan) weighed in on the issue of fish as healthy food, citing their nutritional survey of remote island populations in Japan. It seems the fish-eating populace have selenoneine as a major form of selenium in their blood; and in the laboratory, selenoneine plays a role in detoxifying methylmercury (MeHg), a chemical contaminant.

(4) Negros Prawn Producers Cooperative (Philippines) reported that ethoxyquin, an antioxidant used in feeds, in concentrations exceeding the limit of 0.01 ppm led to rejection by Japan of shrimps shipped from the Philippines and Vietnam. The cooperative calls for more government support in terms of testing laboratories, control of the use of ethoxyquin in feeds, and monitoring farm and other inputs.

(5) In three presentations, Department of Health (Philippines) and DA-BFAR noted the governmental processes and infrastructure in approving / licensing food and drugs. Both noted that the goverment must become more sensitive by replacing obsolete legislation with new ones and by aligning codes-of-practices and systems with international food safety requirements.

(6) In two papers, the University of the Philippines Visayas (UPV) elicited awareness of the complexity of the issue of agro-chemicals in fisheries. UPV aims to bring professionals into the study and process of food safety by offering a degree in food science and collaboration with the industry and other partners.

Dr. Michiaki Yamashita (top) presented his paper on the risk and benefits of fish consumption. Dr. Yamashita with Dr. Azuma, Dr. Ayson and Mr. Kawamura

Government affirms SEAFDEC role

The Philippines represented by Atty. Asis Perez as this year's chairperson of the SEAFDEC Council

We would not be hosting the *45th SEAFDEC Council meeting* if the Philippine government does not appreciate and support the work of SEAFDEC in general and of AQD in particular," Assistant Secretary Hon. Salvador Salacup of the Department of Agriculture told media during a short pre-meeting briefing on 1 April in Cebu City. Hon. Salacup has agribusiness, marketing and fisheries under his wing. "AQD has made significant contributions and greatly helped the Philippines by extending to our national technology centers its aquaculture technologies."

The 5-day meeting reviewed the progress and plans of SEAFDEC programs, taking into consideration the needs of partners in the region and the *Resolution and plan of action* adopted by SEAFDEC member countries in 2011.

Concerning aspects that are relevant to AQD's work programs and administrative matters, the SEAFDEC Council:

- requested SEAFDEC to explore ways on how to strengthen institution building activities especially in developing traceability system for aquaculture products as well as other activities that would enable the countries in the region to address trade requirements
- requested AQD to consider extending support to Cambodia and its recently established Marine Aquaculture Research and Development Center in terms of enhancing the capacity of the country's technical officers in seed production for coastal and marine aquaculture
- expressed their support to initiatives made on the establishment of the new SEAFDEC department in Indonesia (IFRDMD or the Inland Fishery Resources Development and Management Department); also reminded SEAFDEC to exert efforts that will ensure complementarity of works (i.e. avoid duplication) with existing SEAFDEC departments and other institution
- Atty. Asis Perez, SEAFDEC Council Director for Philippines and BFAR National Director was elected chair of the SEAFDEC Council for 2013-2014. The 5-day meeting was attended by SEAFDEC council directors and their representatives from all member countries (albeit Malaysia was online), officials of the SEAFDEC Secretariat and departments, and international / regional organizations (FAO/RAP, Mekong River Commission, Coral Triangle Initiative and WorldFish).

– B ACOSTA

AQD meets new DSG

AQD staff welcomes the new SEAFDEC Deputy Secretary-General Mr. Hajime Kawamura during the general assembly held on 10 May at AQD's main station in Tigbauan, Iloilo. The purpose of his visit was to familiarize with the programs, facilities and personnel of the department.

Mr. Kawamura replaced Mr. Kenji Matsumoto who completed his three years term as SEAFDEC Deputy Secretary General on March 2013. Prior to the nomination, Mr. Kawamura served as staff of Cabinet Secretariat of Japan. He also has extensive experience working at the Fisheries Agency of Japan for more than 30 years, including his temporary transfer to the Japan International Cooperation Agency (JICA).

In a speech to AQD staff, Mr. Kawamura expresses his appreciation on the achievement of AQD for the past 40 years. He said that he will prioritize projects that will greatly help SEAFDEC member countries. He also mentioned that the GOJ Trust Fund will always be available to support the projects under its regional programs. "I consider SEAFDEC as a one big family therefore, it is important that all the departments must collaborate and work together in order to overcome the barriers affecting the fisheries industry," he added.

Photos by GK Falgani

(Right) AQD Chief Dr. Felix Ayson, Deputy Secretary-General Mr. Hajime Kawamura and AQD Deputy Chief Dr. Teruo Azuma. (Below) AQD staff with the SEAFDEC officials

AQD's ITSO one step closer to accreditation

AQD's Innovation and Technology Support Office (ITSO) committee attended a seminar-workshop on patent search and documentation from 16 to 18 April at Talisay City, Negros Occidental, Philippines. This is the second of a five-part series of training that the ITSO committee is required to attend prior to taking the accreditation exam.

The seminar-workshop had lectures on the overview of the intellectual property system, classification of patent documents, types of patent search and its tools and strategies. The ITSO committee composed of Dr. Roger Edward Mamauag (associate scientist), Dr. Michelle Peñaranda (associate scientist), Engr. Margarita Arnaiz (Biotechnology laboratory manager), Mr. Daryl Superio (senior information assistant), and Ms. Lyn Lee Lucero (Administrative assistant) also learned how to use online patent databases during their hands-on exercises.

(L-R) Engr. Virginia Aumentado, Chief of the Patent Information Analytics & Technology Monitoring Division, lectures on classification of patent documents. AQD ITSO committee during the workshop on patent searching . AQD ITSO committee Engr. Margarita Arnaiz, Dr. Michelle Peñaranda, Ms. Lyn Lee Lucero (1st row, 3rd-5th person from the left), Mr. Daryl Superio, and Dr. Roger Edward Mamauag (2nd row, 3rd-4th person from the left) together with the other participants

Symposium focuses on algae benefits

The Philippine Phycological Society Inc (PPSI) in cooperation with SEAFDEC/AQD held its fifth national symposium and scientific meeting on 16 April at AQD's Tigbauan Main Station (TMS) in Iloilo, Philippines.

"Our theme this year which is 'Exploring algae diversity for health, environment and industry' reflects our continuing commitment to bring to the public mind the strategic importance and manifold usefulness of algae in our quotidian and long-term concerns." said PPSI president Dr. Maribel Dionisio-Sese during the opening ceremonies. AQD Chief Dr. Felix Ayson also pointed out that only a few of the algal species have been successfully cultivated, hence, there are still a lot of algal species that need to be explored and studied.

During the event, six scientific papers were presented which focused on the human consumption & health benefits, importance in the aquaculture industry, and pharmaceutical applications of algae.

Around 100 participants from the academe and government agencies (Bureau of Fisheries and Aquatic Resources and Department of Science and Technology) attended the symposium. In addition, PPSI also organized a training workshop on nutritional products of algae held 17-18 April at TMS with about 15 participants. The training workshop included lectures and practical sessions on uses of agar, alginates & carageenan; agar & carageenan extraction; gel testing; growth kinetics; and lipid, protein & carbohydrates analysis.

(Clockwise) AQD Chief Dr. Felix Ayson, "Father of Kappaphycus farming" Dr. Gavino Trono Jr, Marine biologist Dr. Paciente Cordero, and PPSI president Dr. Maribel Dionisio-Sese officially open the *fifth national symposium and scientific meeting of PPSI*. Dr. Hilton Lam of UP College of Medicine-Manila (left) and Mr. Miguel Raymundo Heredia of DLA Naturals Inc. (right) view the poster exhibit. AQD researcher Ms. Maria Rovilla Luhan demonstrates agar and carageenan extraction. Dr. Nemesio Montaño of UP Marine Science Institute lectures on the uses of agar, alginates, and carageenan

Three courses on freshwater commodities @ BFS

Training courses on seed production and culture of giant freshwater prawn (4-8 March), tilapia (12-16 March) and catfish (1-5 April) were conducted at the AQD's Binangonan Freshwater Station in Rizal.

A total of 15 participants (five in each course) completed the three courses. They had lectures on the biology & sustainable management of farmed commodities and aquaculture economics. Also, hands-on practical sessions were done to give the trainees an actual experience in fish farming operations.

These are the first three training courses of AQD for 2013. For more information on the upcoming training courses, go to http://www.seafdec.org.ph/2013/2013-training-schedule/

Catfish



One of the trainees, flanked by AQD technicians, during the egg stripping exercise. A trainee injecting human chorionic gonadotropin (HCG) to induce spawning in female catfish. Engr. EV Aralar and the trainees determining the physico-chemical parameters of water in cages

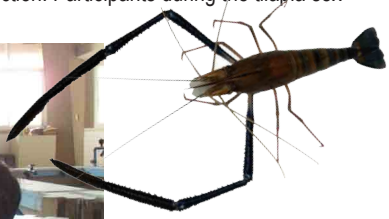
Tilapia



Dr. R Pakingking showing the trainees how to identify a healthy tilapia through dissection. Participants during the tilapia sex identification activity. A trainee examining a zooplankton under a microscope

Giant freshwater prawn





A trainee measuring salinity of water. Trainees during the practical exercise on giant freshwater prawn broodstock selection

AQD registers as book publisher

SEAFDEC/AQD has registered as a book publisher with the National Book Development Board (NBDB), the government agency mandated to develop and support the Philippine book publishing industry. Since 2002, AQD had produced at least 45 copyrighted publications including farmer-friendly manuals, and textbooks on fish health and fish nutrition.

Categorized as applied science, all books contain information on aquaculture technologies (hatchery, nursery, grow-out, stock enhancement, community fishery resources management) based on the results of the research conducted by AQD.

Librarian meetings

AQD and ASLP organize a workshop

Photos by IT Tendencia

Librarians and information professionals during the training session

The 88 workshop participants

Eighty-eight librarians and information professionals from different parts of the country came to AQD's Tigbauan Main Station in Iloilo to attend the workshop *Organize IT digitally, open-source tools for your library* organized by Association of Special Libraries of the Philippines (ASLP) in partnership with SEAFDEC/AQD from 15 to 17 May 2013.

The workshop introduced open-source library tools and systems to librarians and information professionals to keep them abreast of the latest trends and technologies which they can apply and adapt to their libraries and information centers. The participants were also provided hands-on experience as they learned the use of Dspace (institutional repository), Greenstone (digital library software), and Koha (integrated library system).

Aside from co-organizing the workshop, AQD library staff including library and data banking services section OIC Mr. Stephen Alayon (introduction to institutional repositories), senior information assistant Mr. Daryl Superio (controlled vocabulary and metadata) and information assistant Mr. Elvi Nemiz (what is Dspace?) gave lectures.

Workshop speakers and AQD staff Mr. Stephen Alayon (OIC of library and data banking services section), Mr. Daryl Superio (senior information assistant) and Mr. Elvi Nemiz (information assistant)

AQD hosts regional conference

AQD became the home to 93 librarians and staff for the 2013 PLAI-WVRLC summer conference *On Accreditation and Compliance with the Standards: The Western Visayas Experience* on 24-25 May.

Participants during registration and conference proper.

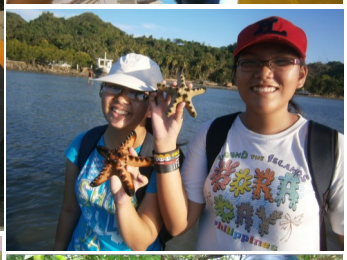
Photos by IT Tendencia

The speakers and participants of the 2013 PLAI-WVRLC summer conference

The two-day conference aimed to update and prepare Western Visayas librarians and staff on the requirements for accreditation & LIS profession and to identify strategies to apply & common pitfalls to avoid in application. From 20 to 22 November 2013, Iloilo City will be the venue of the PLAI National Congress 2013 that will gather more than 300 librarians and information professionals to be headed by SEAFDEC/AQD & its Library and Data banking Services Section.

The Philippine Librarians Association, Inc (PLAI) is the umbrella organization of librarians in the country and the Western Visayas Region Librarians Council (WVRLC) is one the PLAI chapters representing Region VI.

FishWorld internship 2013



From 17 April to 15 May 2013, 15 of us from Philippine Science High School, three from Iloilo National High School, and six from Siargao National Science High School spent an eventful summer at FishWorld. We conducted field surveys and collections in Jordan, Dumangas, Villa, Atabayan, and Buyuan, released a sea turtle in Guimbal, and rescued a sunfish in Oton. We examined the external and internal morphology of marine animals and learned how to identify species by their scientific names. We learned the fundamentals of aquaculture and how necessary it is to food security. The mushy things like teamwork, cooperation, understanding—we learned them too.

Each day more exciting than the last. A mix of fun and work. Tables to fill up, numerous specimens to name, and presentations to finish. Splashing through the intertidal to find soft corals, shells, crabs. *Avicennia marina* has similar trunk bark as a guava tree. Only male fiddler crabs have an enlarged claw. There are five species of sea turtles in the Philippines.

Every day a cycle of silence and noise. Looking for specimens, silence. Tripping over a rock, noise. Preparing slides, silence. Talking about games or watching movies, noise. Ma'am Doris talking, silence. Us talking, noise. Ma'am Doris bringing halo-halo, ice candy, and sirigwelas. Pandemonium. Her being a wonderful supervisor made FishWorld conducive for learning. Just as soon as we made new friends, we had to say goodbye, and be happy for the memories.

— Paula, Fea, Denise of PSci

RUBY JUBILEE 2013

SEAFDEC/AQD @ 40: Improving lives through sustainable aquaculture

40 years of R&D aquaculture

Aquaculture today is no longer dependent on wild seed stocks since technologies for full-cycle aquaculture have been developed by SEAFDEC/AQD for most commodities.

AQD's work in the past 40 years has focused on developing the breeding and culture technologies for tiger shrimp, milkfish, tilapia, carps, catfish, mussels, oysters, giant freshwater prawn, high value marine fishes (seabass, groupers, red snapper, rabbitfish, pompano), seaweeds, abalone, mud crab and sandfish.

AQD also did research on mangroves, stock enhancement and community-based fishery resource management to better protect aquatic resources while ensuring that resource users continue to benefit and profit from resource use.

Special lecture series

A series of special lectures related to AQD's R&D thematic areas (meeting social and economic challenges in aquaculture; producing quality seed for sustainable aquaculture; promoting healthy and wholesome aquaculture; maintaining environmental integrity through responsible aquaculture and adapting to climate change) was conducted during period of the Ruby Jubilee celebration.

Photos by Devcom

(Clockwise) Dr. Resurreccion Sadaba, Dr. Tereso Abella, Dr. Roger Edward Mamauag and Dr. Clarissa Marte during their lectures

On oil spill

Dr. Resurreccion Sadaba of UP Visayas presented the highlights of UPV's oil spill response program covering 2006 until 2012. The program was in response to the sinking of the Solar I tanker in the waters off Guimaras in 2006.

According to Dr. Sadaba, understanding the short and long term impacts of oil spill on sensitive coastal ecosystems is a basic requirement for the restoration of human & ecological communities and rehabilitation of highly valuable areas. For example in mangroves, the immediate effects of oil spill includes chlorosis, defoliation that leads to death in total of 0.932 ha of mangroves areas but after five years, the mangroves showed "high recovery potential" though there might still be an amount of sub-lethal effects needed to be monitored. By being aware of such effects, it can generate knowledge and protocols to help the country to be more prepared for future incidents.

In the past, AQD had been actively participating in various activities that aim to restore the pristine island of Guimaras. Days after the MT Solar I oil spill in Guimaras last 11 August 2006, AQD had volunteered to clean-up parts of the affected coastal area in San Roque, Nueva Valencia. One of the most alarming effects of the incident was the damage to the fishing communities; hence, an ICDSA project "milkfish cage culture program" was initiated in Nueva Valencia on 2007 to improve the socioeconomic condition of the affected fisherfolks. It was in collaboration between Petron Foundation Inc, Citi Foundation and SEAFDEC/AQD.

Dr. Sabada's lecture on 22 March at SEAFDEC/AQD's Tigbauan Main Station in Iloilo was attended by 39 students of University of the Philippines Visayas (UPV) and 46 AQD staff.

On quality tilapia seed

"Tilapia is the food of yesterday, food of today, and food of the future," said Central Luzon State University-Freshwater Aquaculture Center Director Dr. Tereso Abella during his talk on Sustaining the quality of tilapia seed through genetic selection held 25 April at AQD's Tigbauan Main Station.

But this is only possible if good quality tilapia seeds are supplied to fish farmers leading to an increase in tilapia production. The Philippines is geared towards this direction since both government-owned and international R&D institutions have worked together in improving strains of locally farmed tilapia through selective breeding and other genetic improvement technologies. To date, several genetically improved tilapia are now available to fish farmers, these includes FAsT (Freshwater Aquaculture Center Selected Tilapia), GMT (Genetically Male Tilapia) or YY-super male tilapia, GIFT (Genetically Improved Farmed Tilapias), GET-ExCEL (Genetically Enhanced Tilapia-Excellent strain that has Comparable advantage with other tilapia strain for Entrepreneurial Livelihood projects), and GSTTM (GenoMar Supreme Tilapia).

According to Dr. Abella, fish seed quality is judged by growth rate, survival, uniformity of size at harvest, growth performance and the marketable size product classification of the different strains. He also added that increasing the quality of fish seed is a continuing process wherein advanced studies should be done in order to produce a more superior fish seed.

On protein hydrolysates

On 30 May, AQD associate scientist Dr. Roger Edward Mamauag discussed the processing of alternative ingredients for fish diets through chemical or enzymatic degradation to yield hydrolysates in his lecture, Protein hydrolysates as alternative ingredient in marine fish diets.

Dr. Mamauag presented three studies on the use of peptides and hydrolysates in fish diets. He explained that hydrolysates are described as well-defined and functional peptides that can improve fish growth, feed efficiency and digestibility when incorporated in diets. In his first study he talked about the results of a growth trial with larvae

and juvenile red sea bream (Pagrus major) fed diets supplemented with two types of methionine: DL-methionine (DL-Met) and methionine di-peptide (Met-Met). He found out that methionine supplementation in either form can improve performance parameters of fish. Not only that, he also mentioned that the palatability and feed efficiency of the diet is enhanced. In the second study he presented the utilization of soy peptide hydrolysates at different inclusion levels in the diets of Japanese flounder (Paralichthys olivaceus). Result showed that there is an improve growth and feed efficiency at 20% inclusion level in the diets. Moreover, he said that if the inclusion level in the diet increased to 30-40% it can reduce growth. His last study deals with the use of tuna by-product which was hydrolysed using a commercial enzyme from Bacillus subtillis (Aroase - 10) and fed to red sea bream at different inclusion levels. The result of his experiment showed that hydrolyzed tuna meal exhibited improved growth, feed intake, and digestability at 25% inclusion level in the diet. He also added that it has functional peptide factors that influence plasma cholesterol level.

After the conduct of his three experiments he concluded that: (1) peptides form of amino acid is an efficient supplement in fish diets; (2) hydrolyzing the protein ingredients can improve its nutritional quality (increased protein content, functional properties, digestability); and (3) performance parameters are improve when hydrolysates are added in the diet in moderation.

(Left to right) AQD Chief Dr. Felix Ayson, AQD scientist Dr. Edgar Amar, associate researcher Mr. Joseph Leopoldo Laranja and a student from UPV ask questions during the open forum

Photos by Devcom

On bangus mariculture

On 20 June, Dr. Clarissa Marte, chair of the Integrated Services for the Development of Aquaculture and Fisheries Cooperative, discussed about the marine cage culture industry during her talk titled *We can make bangus mariculture a sustainable industry*. The contribution of milkfish marine cage and pen culture to the annual fishery production has increased since the first mariculture park was established in 2001. Fish farmer groups and small-scale operators have not ventured in cage farming since it requires a large investment and they have limited access to financial sources. Mariculture parks (MP), if not managed properly can pose potential negative impact to the ecosystem and capture fisheries. Hence, policies should be in place to guide LGUs and operators to ensure environmental sustainability, social equity and financial viability of mariculture activities.

These issues can be addressed through the Sustainable Mariculture Investment Program (SMIP) of the Development Bank of the Philippines (DBP). DBP through a grant from the Norwegian Agency for Development Cooperation commissioned SEAFDEC/AQD in association with Taytay sa Kauswagan Inc to implement a technical assistance project for SMIP. The technical assistance team assessed selected MPs and developed technical assessment standards as inputs to credit-related interventions. They also provided technical advisory assistance to mariculture projects proposed for credit support by DBP. The team also developed appropriate financing schemes to finance mariculture projects and financing program framework with emphasis on strategic investment projects.

With the information at hand, a loan-grant proposal was prepared for presentation to external donors/lending institutions to assist DBP-SMIP in establishing mariculture parks. This loan-grant can also provide affordable financing programs dedicated to the Philippine's mariculture industry. Lastly, through this loan-grant, DBP-SMIP will be able to increase adoption of sustainable practices for milkfish mariculture and provide financial assistance to small-scale fish farmers.

Improving lives through... camaraderie and sports

SEAFDEC - UPV
PALARO 2013

AQD (top) and UPV (left) family during the opening parade

Aside from the long relationship and collaboration in research, AQD and UPV gathered for the Palaro 2013 with the theme *Strengthening institutional linkages through sports* from 29 to 30 April 2013.

The two institutions battled it out for the competitive sports of basketball, volleyball, swimming, table tennis, badminton, lawn tennis, chess & darts and for quirky games of amazing race, catch the dragon's tail and beer drinking.

At the end, UPV triumped with 82.5 points over AQD with 75 points.

Now, here are photos of some of the memorable times during the event...

(Above) UPV Chancellor Rommel Espinosa and AQD Chief Felix Ayson together light the cauldron (inset) UPV Chancellor Espinosa and AQD Chief Ayson share their messages for the participants & guests of the Palaro 2013 during the opening program

AQD won in marathon (both men and women).

Research head Dr. Relicardo Coloso, AQD scientist Dr. Rolando Pakingking Jr, Training and information head Dr. Evelyn Grace Ayson and Administration and finance head Ms. Kaylin Corre at the Palaro 2013 opening ceremony





Photos by MT Castaños

Amazing race. Four teams vie to finish a race that measure not only the physical strength but also the wit and intellect. The challenges range from solving puzzles to performing novelty tasks



Photos by RH Ledesma

Catch the dragon's tail. UPV men rise to the challenge by beating the men of AQD in this traditional Chinese playground game





Photos by JM de la Cruz

Chess. Players concentrate on making strategic moves to beat their respective opponents. In this case, AQD janitor vs UPV Vice Chancellor (left), guess who won?



Photos by Devcom


Photos by JM de la Cruz

Darts. Players aim for the bull's eye at darts

Table tennis. Administration and finance head Ms. Kaylin Corre serves a good game of table tennis

Photos by MT Castaños

Photos by JM de la Cruz

Badminton. Players smash the badminton game

Photos by JM de la Cruz and RH Ledesma

Lawn tennis. Players from SEAFDEC ace at lawn tennis against UPV

Volleyball. An outstanding game of volleyball was displayed during the Palaro 2013 between the two institutions. AQD ladies (below) gave wonderful serves.

Photos by JM de la Cruz

Photos by MT Castaños

AQD technician Raffy Barrido hits and strikes the ball for the team

AQD Chief Dr. Felix Ayson and Training & information head Dr. Evelyn Grace Ayson joined the rest of staff during the volleyball game.

Photos by JM de la Cruz & RH Ledesma

Basketball. They dribble, they shoot, they score! The players of UPV and AQD feat into the well-loved game of basketball. AQD's team claimed for the win in the game of agility, speed and power. After a very close fight, AQD men (left) triumphs after the third game

Photos by JM dela Cruz and RH Ledesma

Photos by RH Ledesma

Swimming. A measure of strength and endurance, swimming is one of the games vied by AQD and UPV players. Swimmers compete in different strokes. AQD and UPV swim teams (left)

Beer-drinking. This is one of the most entertaining game during Palaro 2013. The objective of the game is for the two opposing teams to race and finish drinking the beer until the last drop.

Photos by JM dela Cruz and RH Ledesma




Photos by RH Ledesma and GK Faigani

(From left to right) UPV Vice Chancellor for Administration Nestor Yunque and AQD Chief Felix Ayson with words of thanks to the participants of Palaro 2013. Most Valuable Players at Palaro 2013: Catherine Anecita from UPV and Joemel Sumbing from SEAFDEC/AQD with the chief and chancellor

Closing program. UPV won the over-all championship after winning eight (amazing race, catch the dragon's tail, table tennis, badminton, women's basketball, men's volleyball, women's volleyball and swimming) events versus AQD who won 6 (men's and women's marathon, beer-drinking, lawn tennis, chess and men's basketball). The two teams tied at darts


Photos by MT Castanos

The supporters. Since not everyone in AQD are sport-savvy, the players received an overwhelming support from the other employees. The staff displayed unity as they support every game during the sportsfest. Also, it was also a good time for employees to mingle with each other outside the offices. This, indeed, is a way to establish stronger bonds



Photos by JM de la Cruz

Health-related activities

A very successful bloodletting, free medical consultation, and eye exam activities were organized 10-12 April at AQD's Tigbauan Main Station in Iloilo.

Blood letting

Out of 59 potential donors, 40 were bloodlet after the pre-screening made by PNRC (Philippine National Red Cross – Region 6). The number is the highest so far since AQD started the activity in 2010. At left, (clockwise) The donor is interviewed regarding health, lifestyle and disease risks factors. Blood typing is done to classify donor blood; blood iron is also determined to ensure that the donor has a sufficient level. The donor is subjected to a short physical exam that includes taking the pulse, temperature and blood pressure. During bloodletting, 450 cc of blood is taken from the donor. Donors at the extraction area

Photos by JM de la Cruz

Medical mission

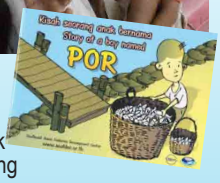
Free medical check-up was given to 182 residents of Brgy. Buyu-an (Tigbauan) and Nanga (Guimbal) with free medicines (eg. antibiotics), multivitamins, among others, distributed. Donating a generous amount of medicines were the (1) office of congressional representative Hon. Ferj Biron, (2) Caduceus Clinical & Laboratory Services headed by Dr. Sonia Gallon and (3) Department of Health – Region 6. The four examining physicians were residents of Pedro Trono Memorial Hospital.

For the waiting kids, a storytelling session was arranged. It featured "The story of a boy named Por", a storybook produced by SEAFDEC Training Department in Thailand (AQD's sister department) that focuses on lessons about responsible fishing.

Photos by Devcom

AQD conducts a free consultation for residents of its neighbor-villages on 11 April at its Tigbauan Main Station. The activity is part of AQD's ruby jubilee celebration 2013

Donating a generous amount of medicines were the office of congressional representative Hon. Ferj Biron and the Caduceus Clinical & Laboratory Services headed by Dr. Sonia Gallon



Ms Nira Grace Llona (inset), OIC head of Human Resource Management Section, shared the Story of Por — a storybook produced by SEAFDEC Training Department in Thailand (AQD's sister department) that focuses on lessons about responsible fishing.

Eye Exam

AQD accepted the offer of E. Pineda Optical Clinic (#11 San Jose St, Jaro, Iloilo City) to give free eye examination & refraction test and discounts on eyeglasses & contact lenses to AQD staff. A total of 28 employees were served on 12 April. (Top to bottom left) AQD staff during eye exam with an optometrist; Employees trying on prescription and over-the-counter glasess

Research seminars

Food safety and quality

Dr. Mark Tamplin (director of the Food Safety Center of Tasmanian Institute of Agriculture, University of Tasmania in Australia) discussed the use of predictive tools to manage the safety and quality of food. Dr. Tamplin explained that predictive microbiology assumes that microbial behavior is quantifiable by characterizing environmental factors like pH and temperature which influence microbial viability during food handling and processing. Predictive softwares such as the Refrigeration Index, ComBase Growth Predictor, Seafood Spoilage & Safety Predictor, Sym'Previus & Pathogen Modeling Program are now available to help industries meet food safety standards.

Mudcrab practical diet developed

With mud crab culture increasing in importance, AQD scientist Dr. Mae Catacutan pointed out that adequate formulated feed is important in the sustainability of mud crab production. Dr. Catacutan conducted a study on *Development of practical diet for the grow-out culture of mud crab Scylla serrata in ponds* which she presented on 31 May. Traditionally, mud crabs are fed with trash fish but it has issues on storage, water fouling and as carrier of disease agents. To address this, Dr. Catacutan developed a formulated feed that can be used at more than 80% of the crab ration and only around 20% of trash fish with improved feeding management. Also, development of an efficient feed can enhance the crab's fat body content and fullness of flesh which can increase its market price. Dr. Catacutan also suggested that in order to improve efficiency of crab feed formulations, effective non-synthetic feed binder (e.g breadflour, agar, carageenan) and natural feed attractant (e.g. fish meal, squid liver powder) should be used.

Restocking of giant clams

AQD scientist Dr. Ma. Junemie Hazel Lebata-Ramos presented her paper *The role of MPAs in the success of giant clam Tridacna gigas restocking in central Philippines: a comparison of growth and survival from three ocean nurseries* on 4 April. According to Dr. Ramos, giant clam is listed as a vulnerable species in the IUCN red list of threatened species and was identified as one of the species for the stock enhancement program of AQD during the *Regional technical consultation on stock enhancement of species of international concern* in July 2005. For this project, Dr. Ramos and her co-authors (Ms. Ellen Flor Solis, Mr. Joemel Sumbing, and Mr. Jeff Bogart Abrogueña) reared the clams in three protected sites [Culasi, Antique; AQD's Igang Marine Station (IMS) in Guimaras; and Sagay, Negros Occidental] until they reached the size of 20 cm SL (shell length) prior to release. The authors found that this size of clam can survive in the wild, and that they grow faster in warmer temperature. Hence, clam growth and survival are highest in IMS which is also a protected shallow reef area.

Antioxidant in fish

Dr. Michiaki Yamashita, head of Food Safety Assessment Group-National Research Institute of Fisheries Science in Japan, talked about the *The strong antioxidant "selenoneine" in tuna blood and its roles in selenium redox metabolism*. In 2010, Dr. Yamashita and his colleagues discovered that the antioxidant selenoneine is the predominant form of selenium (an essential micronutrient for humans) present in tuna blood. Dr. Yamashita also administered selenoneine to yellowtail fish and found out that the presence of this substance reduced ROS (reactive oxygen species-reactive molecules and free radicals derived from molecular oxygen) and metmyoglobin formation. Selenoneine also protects the tuna's dark muscle from changing color.

Aquaponics: perch and high-value fruit

Mr. Kong Chee Leong of the UCSI University in Malaysia shared the results of his study *Commercial jade perch - rockmelon aquaponic system* on 10 May. According to Mr. Leong, aquaponics is the integration of recirculating aquaculture system (RAS) and hydroponic system where the wastewater from the fish tank is recycled to serve as fertilizer for the plant. In return, the plant acts as bio-filter of the system.

Mr. Leong's design of a simple aquaponics uses jade perch (*Scortum barcoo*) and rockmelon (sold at USD 3.75/ piece). In this set up, the effluents from the cement fish tank pass through a full netted greenhouse for the rockmelon. The set-up also reduced fertilizer cost by 30% and improved fruit production by 300% compared to conventional farming.

PHB accumulating bacteria improves growth of shrimp PL

Tiger shrimp (*Penaeus monodon*) is a commercially important aquaculture species but it is prone to diseases caused by *Vibrio*. With this in mind, AQD researcher Mr. Joseph Leopoldo Laranja Jr conducted the study *Poly-ß-hydroxybutyrate (PHB) accumulating Bacillus spp. improve the growth, survival and robustness of Penaeus monodon postlarvae* which he presented to fellow AQD researchers on 31 May. According to Mr. Laranja, PHB-accumulating bacteria can be a possible bio-control agent in aquaculture. He based this assumption from a previous study done by Halet et al (2007) that shows the protective effect of these bacteria for *Artemia franciscana* in challenge tests with pathogenic *Vibrio campbellii*.

For his study, Mr. Laranja fed the shrimp PL with a formulated diet containing *Bacillus*. After 30 days of culture, the shrimp were subjected to challenge tests with *V. campbellii*. He found that shrimp PL have better survival rate, growth and are more robust compared to shrimp not fed the *Bacillus* diet.

AQD donates vehicle to the municipality of Leganes

AQD donated a vehicle (Nissan Urvan) to the municipality of Leganes, Iloilo on 8 May 2013. The vehicle was AQD's token of gratitude to Leganes for allowing it to lease a portion of the municipality's land which was used for its research activities from 11 April 2012 to 11 March 2013.

The signing of the Deed of Donation at the Leganes Municipal Hall, Iloilo

AQD Chief Dr. Felix Ayson (2nd from left) turn overs the vehicle key to (from left to right) Leganes mayor Hon. Enrique Rojas witnessed by Engr. Samson Jaspe, AQD Administration and Finance Division head Ms. Kaylin Corre, and AQD lawyer Atty. Rodolfo Pollentes Jr

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DTI and JICA delegates visit AQD

Mr. Westly Rosario and his team of delegates from Japan International Cooperation Agency (JICA) and Department of Trade and Industry (DTI) visit AQD for a simple orientation. They were exposed to the AQD's programs, studies and facilities with a specific interest on milkfish hatchery on 29 May 2013 at Tigbauan, Iloilo.

The group visited AQD to know more about the department; the technologies and services, in view of future partnership.

(Left to right) A delegate feeding milkfish broodstock at the integrated fish broodstock hatchery complex. Mr. Westly Rosario with team of delegates