

A staff member holds one of the milkfish broodstock undergoing a routine sampling procedure at the new milkfish broodstock tanks at the Tigbauan Main Station. SEAFDEC/AQD is currently home to 779 milkfish broodstock, the oldest of which are a group of 66 40-year-olds. Photo by NG Armada

aqd matters

September–October 2023

Newsletter of the SEAFDEC Aquaculture Department, Tigbauan, Iloilo, Philippines

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Regional Training Course on Advanced Aquaculture Technologies a success

TWENTY participants from SEAFDEC-Member Countries, also known as ASEAN Member States (AMSs), have successfully completed the Regional Training Course on Advanced Aquaculture Technologies for Commercially Important Commodities in Southeast Asia. The intensive 17-day training, organized by SEAFDEC/AQD, took place from 9-26 Oct. 2023.

The training was part of the Regional Capacity Building Network (RECAB) on Aquaculture, wherein delegates from Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam have congregated to enhance their knowledge and skills in various aspects



A trainee actively participating in one of the practical sessions, focused on collecting biological data of a snapper. Photo by EV Antolino

of aquaculture, guided by AQD experts and scientists.

Amaladoss Anburaj, a senior scientist at Temasek Polytechnic in Singapore, expressed his reason for

joining the course, stating, "as a scientist and educator, I have spent many years of my career working in the lab but hardly had any opportunities to

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work in the field. Therefore, I joined the course to gain knowledge in the field of aquaculture, learn innovative practical skills, and increase my professional network."

"SEAFDEC/AQD with its long history of 50 years has developed innovative technologies in the farming of fishes, crustaceans, mollusks and natural live food and it would be the best place in Southeast Asia for any training in aquaculture," he added.

Komsun Thongtaem, Fishery Biologist of Thailand's Department of Fisheries, highlighted SEAFDEC/AQD's reputation, stating, "SEAFDEC/AQD is a famous and prominent organization in the field of aquaculture, and many of my co-workers have also completed SEAFDEC/AQD training. I wanted to be a part of this program to develop myself and create aquaculture networks with ASEAN member countries."

The curriculum covered a wide array of topics, including biology, broodstock management, hatchery and breeding technology, nutrition, feeding, disease management, biosecurity measures and protocols, food safety of aquaculture products, and the impact of climate change.

Furthermore, it included lectures, hands-on learning, and field visits to local aquaculture operations. These activities are designed to provide



The trainees during their tour at the Aklan Agri-Aqua Demonstration Farm & Training Center. Photo courtesy of Training Section

comprehensive insights into the commodities that are the research focus at AQD.

Anburaj reflected on the experience, stating, "The RECAB training was an enriching experience, and the knowledge gained/techniques learned will enable me to embark on new projects and contribute to our national mission '30/30.' The connections developed during the training will undoubtedly serve as the foundation for future collaborations and shared efforts in the field of aquaculture."

Yong Chomnou from Cambodia, on the other hand, plans to use the learnings he gained to organize training courses for farmers on fish farming techniques. His goal is to promote a wide range of aquaculture, reduce the import of fish from outside, increase the aquaculture of

fish, consider climate change's impact on aquaculture, and develop new fish species that are resistant to climate change.

The RECAB program is a part of the project "Assistance for Capacity Development in the Region to Address International Fisheries-related Issues," funded by the Government of Japan through the Japanese Trust Fund. Its goal is to strengthen the capacity of fisheries officers from the AMSs as well as strengthen regional cooperation and network among the AMSs on various disciplines of fisheries and aquaculture.

The closing program, meanwhile, was graced by the newly appointed SEAFDEC Secretary-General, Dr. Suttinee Limthammahisorn. [a](#)

— NG ARMADA

SEAFDEC Secretary-General explores SEAFDEC/AQD Headquarters



Ms. Therese Geanga, technical staff, showcases the giant freshwater prawn larvae to Secretary-General Suttinee Limthammahisorn during her visit to the nursery. Photo by NG Armada

DR. Suttinee Limthammahisorn, the newly appointed Secretary-General of SEAFDEC/AQD, embarked on a tour of SEAFDEC/AQD last 26 to 27 October 2023.

The journey unfolded with a warm welcome at the Training and Information Division, where Chief Dan Baliao extended greetings to Dr. Limthammahisorn. A veteran in the field, Dr. Limthammahisorn previously served as the Director of the Coastal Aquaculture Research and Development Division at the Department of Fisheries in Thailand.

Chief Baliao, recognizing her wealth of experience, remarked during the program, "A woman with lots of experience, her extensive background in fisheries and aquaculture would surely help the organization in steering the Southeast Asian region toward sustainable development of fisheries and aquaculture."

Following the program, the Secretary-General, accompanied by Chief Baliao and members of the Executive Committee, explored the state-of-the-art AQD facilities at the Tigbauan Main Station. This provided an opportunity for Dr. Limthammahisorn to witness firsthand the cutting-edge research and initiatives undertaken by AQD in the realm of aquaculture.

The journey continued with visits to AQD stations, including the Igang Marine Station in Nueva Valencia, Guimaras, and the Dumangas *Continued on next page...*

SEAFDEC/AQD readies future tiger shrimp breeders as 'Oplan Balik Sugpo' pushes on

ABOUT 4,000 tiger shrimp, weighing approximately 27 grams each and PCR-negative for white spot syndrome virus (WSSV), acute hepatopancreatic necrosis disease (AHPND), and Enterocytozoon hepatopenaei (EHP), were transported by SEAFDEC/AQD from its Dumangas Brackishwater Station to its Tigbauan Main Station between 11 and 13 September 2023.

These grown shrimp were produced in our very own hatchery and ponds. Now, we are keeping them in our new broodstock facility so they can soon spawn another generation of fully captive shrimp," said Chief Dan Baliao whose brainchild is the "Oplan Balik Sugpo," the banner program of the

research center.

Upon arrival at Tigbauan, the shrimp underwent an acclimatization process to help them adjust to their new environment. This process involves gradually introducing the shrimp to their new tanks' temperature, salinity, and water conditions. Acclimatization minimizes stress and ensures the shrimp's health and well-being.

After the acclimatization period, the shrimps were disinfected with an iodine solution before they were transported to the shrimp broodstock facility.

At the close of the three-day stocking activity, Tanks 3 and 4 of the newly established Black Tiger Shrimp Broodstock Facility housed 2,080 and 2,069 shrimp, respectively.



Disease-free black tiger shrimp breeders play a crucial role in the success of the 'Oplan Balik Sugpo' program as they produce high-quality postlarvae. Photo by NG Armada

"Disease-free black tiger shrimp breeders are crucial for the success of the 'Oplan Balik Sugpo' program as they produce high-quality

postlarvae with a higher likelihood of survival and better growth," stated Research Division Head Dr. Leobert de la Peña.

Postlarvae refers to early juvenile shrimp produced in hatcheries that are ready to be stocked in farms when they are about 20 days old.

On the other hand, the broodstock facility plays a crucial role as it serves as a specialized facility dedicated to rearing and producing the disease-free breeders. These breeders are essential for producing enough high-quality postlarvae.

The "Oplan Balik Sugpo" program aims to revitalize and boost the black tiger shrimp industry in the Philippines. It focuses on various strategies, including producing high-quality postlarvae in a biosecure hatchery and promoting environment-friendly practices for grow-out culture in ponds. [a](#)

— NG ARMADA



Stocking tiger shrimp breeders is a key component of the "Oplan Balik Sugpo" program, which aims to revitalize and boost the black tiger shrimp industry. Photo by NG Armada

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Brackishwater Station in Dumangas, Iloilo. These excursions provided a comprehensive overview of AQD's multifaceted efforts in different aquaculture environments, showcasing the organization's commitment to driving advancements in the field.

Dr. Limthammahisorn, who assumed the role of Secretary-General, succeeds Ms. Malinee Smithrithee, marking a transition in leadership that brings with it fresh perspectives and renewed dedication. Interestingly, this visit to AQD was not Dr. Limthammahisorn's first; she had previously graced the institution's premises in the 1990s as a participant in a training program. [a](#)

— NG ARMADA

AQD joins Iloilo Farmers' and Fisherfolks' Week Celebration



AQUACULTURE flyers were displayed and distributed for free during the 2nd Farmers' and Fisherfolks' Week Celebration at the Iloilo Provincial Capitol on 2–6 October 2023.

The informative flyers served as a valuable resource for both seasoned farmers and aspiring aquaculture entrepreneurs, providing insights on the farming of different aquaculture commodities.

The event, with the theme “Mangunguma kag Mangingisda kaupod sang Probinsya sa pagtibong sang Ekonomiya,” was organized pursuant to Provincial Ordinance No. 2023-297, which designates the first week of October every year as Farmers' and Fisherfolks' Week in the Province of Iloilo. [a](#)

— NG ARMADA

SEAFDEC/AQD connects with stakeholders during int'l trade exhibit

SEAFDEC/AQD entertained hundreds of fish farmers, government personnel, investors, and other stakeholders during the Agrilink, the Philippines' largest international trade show for agribusiness, food, and fisheries, held in Pasay City on 5-7 October 2023.

Chief Dan Baliao was present, along with scientists, consultants, and other technical and information staff who shared their knowledge and advice with stakeholders. They discussed issues including those encountered in their farms and the ways that SEAFDEC/AQD could help them.

The research center also displayed live giant freshwater prawn (“ulang”), silver therapon (“ayungin”), and PrimoAlga, a concentrated algae product, which drew visitors to the research center's exhibit.

The SEAFDEC/AQD bookstore was visited by hundreds of fish farmers, government personnel, and other stakeholders, who purchased hard copies of aquaculture manuals or scanned QR codes to download electronic copies. The manuals covered a wide range of topics, including best practices in pond management, disease prevention and treatment, and breeding techniques.

Additionally, those interested to enroll in SEAFDEC/AQD's hands-on training courses were able to pre-register for the courses in the coming year. The courses last from five days to three weeks depending on the topic or the commodity focus.

Agrilink's ribbon-cutting and opening ceremonies were led by Senator Cynthia Villar, Chairman of the Senate Committee on Agriculture and Food; Department of Agriculture Senior Undersecretary Domingo F. Panganiban; and Ricardo Tolentino, Agrilink 2023 Chairman. [a](#)

— NG ARMADA



During the Opening Ceremony of the event, SEAFDEC/AQD's Executive Committee members had the photo opportunity with Department of Agriculture Senior Undersecretary Domingo F. Panganiban (center). *Photo by JF Aldon*



Scientists, consultants, and other technical and information staff generously share their knowledge and advice with stakeholders visiting SEAFDEC/AQD's booth. Discussions encompassed various issues faced by stakeholders in their farms, exploring ways in which SEAFDEC/AQD could provide assistance and support. *Photo by JF Aldon*

Developments in tiger shrimp, crustacean research showcased in conference

SEAFDEC/AQD featured its flagship program to revive the giant tiger shrimp (*Penaeus monodon*) at the 14th Philippine Shrimp Congress, which was held 20 to 22 September 2023 at the SMX Convention Center Bacolod.

Erish Estante-Superio, SEAFDEC/AQD's shrimp commodity leader, spoke on the second day of the congress to give updates on the progress of the "Oplan Balik Sugpo" program and other activities of the research center to develop mangrove crab, giant freshwater prawn, and slipper lobster culture technologies.

In an exhibition held alongside the

event, SEAFDEC/AQD displayed live giant tiger shrimp that were recently harvested from its Dumangas Brackishwater Station. A miniature model of the new shrimp broodstock facility in Iloilo was also on display to represent the research center's efforts to develop disease-free, farm-sourced broodstock.

SEAFDEC/AQD's algae paste product, the PrimoAlga, was also featured in the exhibit to promote it as an alternative to liquid algal cultures. Algae paste can be a back-up starter in case of crashes in algal cultures, or it can be directly fed to zooplankton and larvae.

A mobile bookstore was also set up in the exhibition to disseminate SEAFDEC/AQD's aquaculture manuals to the

shrimp farmers, government personnel, and other stakeholder that were attending the congress.

Chief Dan Baliao, along with some scientists, researchers, and other technical and information staff were also present and engaged with the congress attendees. In a moment of recognition during the opening ceremony on the first day, Chief Dan Baliao received a plaque on behalf of the research center as one of the event's organizers.

Themed "The Philippine Shrimp Industry: Adapting to the Regional Open Market," the three-day event drew nearly a thousand participants from various industry players in the shrimp value chain. [a](#)

— RD DIANALA & NG ARMADA



Chief Dan Baliao receives a plaque on behalf of the research center as one of the event's organizers. Photo by JF Aldon



SEAFDEC/AQD's scientists, researchers, and other technical and information staff actively participate in the event, engaging with congress attendees and addressing their queries. Photo by JF Aldon

Research collab on whiteleg shrimp nets 4.2 tons

IN a collaborative research endeavor between SEAFDEC/AQD and the National Fisheries Research and Development Institute (NFRDI), approximately 4.2 tons of whiteleg shrimp (*Litopenaeus vannamei*) were harvested on 6-7 Oct. 2023.

This bountiful harvest took place at the NFRDI-Freshwater Fisheries Research and Development Center in Taal, Batangas and marked the second successful run of whiteleg shrimp grow-out culture.

The shrimps were cultured from July to



The bountiful harvest at the NFRDI-Freshwater Fisheries Research and Development Center in Taal, Batangas marks the second successful run of whiteleg shrimp grow-out culture through the collaborative efforts of SEAFDEC and NFRDI. Photo courtesy of NFRDI

October 2023 in five brackishwater ponds with a total area of 4,000 square meters and with a stocking density of 30 pieces per square meter. Utilizing an environmentally friendly technique over the span of 90 days, the research achieved a remarkable 100% survival rate among the shrimp, with an average body weight of 28 grams.

The collaboration between SEAFDEC and NFRDI commenced in March 2023. [a](#)

— NG ARMADA

Deputy Chief Ito shares successful case studies at int'l conference

DR. Sayaka Ito, Deputy Chief of SEAFDEC/AQD, took center stage as one of the plenary speakers during the 7th International Conference on Fisheries and Aquatic Sciences (7th ICFAS) held from 18–20 October 2023, at the Grand Xing Hotel in Iloilo City.

In front of a diverse audience, which included academics, representatives from civil society, government officials, and members of non-government organizations, Dr. Ito presented his research on “Stock Management of Small-Scale Shrimp Fishery: case studies in Northern Laos and Northeast Japan” on the conference’s second day.

His presentation shed light on a case study involving an indigenous shrimp species, *Macrobrachium yui*, locally called “Khung Bo” in northern Laos. Dr. Ito discussed the development and implementation of stock management measures in this region, where shrimp sampling was conducted monthly from 2007 to 2014 in the main river, forest river, and cave stream of Na-pho village. It was found that shrimp catch is higher in the rainy season, and the annual catch had decreased significantly over five years. Similar trends were observed in other areas, which became a regional social problem.

To address these issues, a fishing regulation was established under the Law on Fisheries of Lao PDR. Additionally, a community-based shrimp fishery committee was formed to enforce fishing regulations and promote the sustainable use of aquatic resources.

Dr. Ito also presented a case study of successful stock management of the grass shrimp species *Pandalus latirostris*, known locally as “Hokkai ebi,” in eastern Hokkaido, Japan. This study led to a year-long fishery closure and revisions to fishery



In front of a diverse audience Dr. Sayaka Ito presents his research on “Stock Management of Small-Scale Shrimp Fishery: case studies in Northern Laos and Northeast Japan” on the second day of the 7th International Conference on Fisheries and Aquatic Sciences. Photo by JF Aldon

regulations in 2007. The changes included increasing the mesh size of traps from 24 mm to 33 mm, limiting the number of traps to 50 per license from the previous 250, and significantly reducing the fishing season from eight months to two months. These concerted efforts resulted in a remarkable recovery of the shrimp stock since 2010. Moreover, the community-based approach to shrimp resource management received accolades from the Japanese Minister of Agriculture, Forestry and Fisheries and became widely recognized in Japan as a successful case of aquatic resource management. [a](#)

— NG ARMADA

AQD joins consortium for enhanced science collaboration in WV

CHIEF Dan Baliao signed a Memorandum of Commitment on 16 Oct. 2023, designating SEAFDEC/AQD as one of the Consortium-Member Institutions (CMIs) in the project titled “Enhanced Regional Collaborative Program in Western Visayas.” This initiative is led by the West Visayas State University (WVSU) and the Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development.

The aim is to promote the application of science, technology, and innovation in Western Visayas, specifically in agriculture, aquatic resources, and natural resources. This endeavor will be achieved through the following key components: Strategic Research and Development; R&D Results and Utilization; Capability Building and R&D Governance; and Policy Analysis and Advocacy. WVSU serves as the hosting agency for the consortium.

The agreement will be in effect and enforced for three years, beginning 1 Jan. 2023. [a](#)



Chief Dan Baliao signs the agreement, witnessed by Dr. Leobert de la Peña, Dr. Roger Edward Mamauag, and representatives from the Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development. Photo by NG Armada

— NG ARMADA

Members of the SEAFDEC/AQD Executive Committee, external evaluators, scientists, researchers, and technical assistants strike a pose during the second day of the In-house Review and Planning Meeting last 28-29 September 2023. Photo by DEVCOM



Projects reviewed, plans for 2024 unveiled

SEAFDEC/AQD conducted an “In-house Review and Planning Meeting” last 28-29 Sept. 2023 at its main station in Tigbauan, Iloilo.

The meeting, done in a hybrid (in-person and online) format, evaluated the past, ongoing and proposed projects (research, verification, information, administrative), keep track of accomplishments, and consolidate programs for the coming year as well as assess the collaborations of AQD with the Philippine Government.

“This particular two-day meeting is special because we are doing it during the department’s golden year, and I strongly believe that AQD would not have existed for fifty years without the guidance that this annual meeting provides,” said Chief Dan Baliao.

This year’s panel of external evaluators is composed of Dr. Maria Theresa Mutia of the National Fisheries Research and Development Institute, Dr. Erwin

Ilaya and Ms. Riza Chua of Bureau of Fisheries and Aquatic Resources, Dr. Roy Villanueva of Iloilo State University of Fisheries Science and Technology, and Dr. Carmelo del Castillo of the University of the Philippines Visayas.

On the first day of the meeting, updates were provided regarding AQD’s collaborations with the Philippine Government, such as the Fry Sufficiency Program, the Joint Mission on Accelerated Techno-Transfer Program (JMANTTP), the Oplan Balik Sugo, the Development of Cost-Efficient Feeds, and Manpower Development.

Program and project leaders, meanwhile, have reported on 40 new and ongoing research, verification, and extension studies across different programs.

“As the current chief of AQD, I want to see R&D efforts that are geared towards meeting the immediate needs of the industry - such as improving various

levels of productivity of aquaculture farming systems throughout the region,” Baliao added.

The second day of the meeting featured reports from section heads of the Training and Information Division and the Administrative and Finance Division, highlighting the progress of training, information dissemination, and administrative activities, respectively.

“In the future, SEAFDEC/AQD will continue to collaborate with the agencies of its host country and other stakeholders to support aquaculture development in the Philippines. The different studies being done by our researchers would hopefully make a positive and lasting impact on the aquaculture industry not only in the Southeast Asian region but also in the whole Asia and Pacific region,” Baliao concluded. **a**

— NG ARMADA

Scientist shares research on cost-efficient feeds during fisheries convention



DR. Roger Edward Mamauag presents his research on cost-efficient feeds during the plenary of the 10th Fisheries Scientific Conference. Photo courtesy of NFRDI

DR. Roger Edward Mamauag, a SEAFDEC/AQD scientist, showcased his research on cost-efficient fish feeds during the 10th Fisheries Scientific Conference (SciCon) held on 11-12 October 2023 at the Marikina Convention Center in Marikina City.

His presentation, titled “Development of Cost-Efficient Feeds for Milkfish and Tilapia,” showed how SEAFDEC/AQD’s formulated diet outperformed commercial feeds. The formulated feed uses by-products from corn and poultry abattoirs, and coconut-fermented copra meal to replace fish meal as protein source.

Fish meal is an expensive feed ingredient considered to be unsustainable

because it takes more fish from the wild to produce a lesser volume of farmed fish.

Dr. Mamauag’s study is part of a broader project in collaboration with the National Fisheries Research and Development Institute (NFRDI) and the Bureau of Fisheries and Aquatic Resources (BFAR).

The plenary of the Fisheries SciCon highlighted the vital role of research in addressing food security and ensuring the sustainable management of the country’s fishery resources. [a](#)

— NG ARMADA



Free eye examination for staff, dependents

TO ensure the health and well-being of its workforce, SEAFDEC/AQD collaborated with Galvez Optical Clinic to provide on-site eye examinations at the Department’s Tigbauan Main Station last 15 September 2023.

Furthermore, this initiative – a part of the continued celebration of the SEAFDEC/AQD’s 50th Anniversary – benefitted 63 individuals composed of employees and their dependents, offering them free eye examinations and refraction tests, along with special discounts on eyeglasses and contact lenses.

Studies have shown that poor vision health and eye injuries have a negative impact on employee productivity, AQD has made it an annual tradition to partner with eye care centers, fostering a healthy vision culture among its staff. [a](#)

— NG ARMADA

Mr. Rex Delsar Dianala (center) and Mr. Elvi Nemiz (right) join their counterparts from four other departments and the SEAFDEC Secretariat to discuss SEAFDEC's progress and strategies to improve the content and reach of the organization's information materials. Photo courtesy of SEAFDEC/MFRDMD



Information staff discuss strategies to improve information dissemination

INFORMATION staff from the Aquaculture Department (AQD) actively engaged in discussions during the Twenty-fourth Meeting of the SEAFDEC Information Staff Program (24ISP Meeting) in Melaka, Malaysia on 17–19 October 2023.

Mr. Rex Delsar Dianala, of AQD's Development Communication Section, and Mr. Elvi Nemiz, of the Library and Databanking Section, joined their counterparts from four other departments and the SEAFDEC Secretariat to discuss SEAFDEC's progress and strategies to improve the content and reach of the organization's information materials.

During the meeting, the AQD representatives met the new SEAFDEC Secretary General, Dr. Suttinee Limthammahisorn, who expressed her support to the information programs of the Department. Meanwhile, the recommendations from the meeting will be submitted to the Department Chiefs' Meeting later in 2023 for consideration.

This year's 24ISP Meeting was hosted by the Marine Fishery Resources Development and Management Department. [a](#)

— NG ARMADA



aqd matters

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Scientist investigates how male shrimp get fertility boost from worms

Polychaetes, commonly known as mud worms, have been fed to shrimp and other crustaceans for some time now. They're nutritious and promote ovarian maturation and reduce the latency period in shrimp. Which is to say that the mother shrimp get to breed sooner and more often. And the more they breed, the more shrimp eventually get harvested in farms and reach your table as tempura or "sinigang."

Adding mud worm to feeds promotes fertility in both female and male shrimp. But what exactly is in mud worms that make them fertility-boosting shrimp food? So far, we know that the lipid fraction of mud worm extracts supports female fertility the most. However, is it the same for the male shrimp?

Dr. Sheryll Santander-Avanceña,

a scientist at SEAFDEC/AQD, conducted some experiments and sought to answer this very question. She raised male Indian white prawns (*Penaeus indicus*) and supplemented their food with a variety of mud worm extracts.

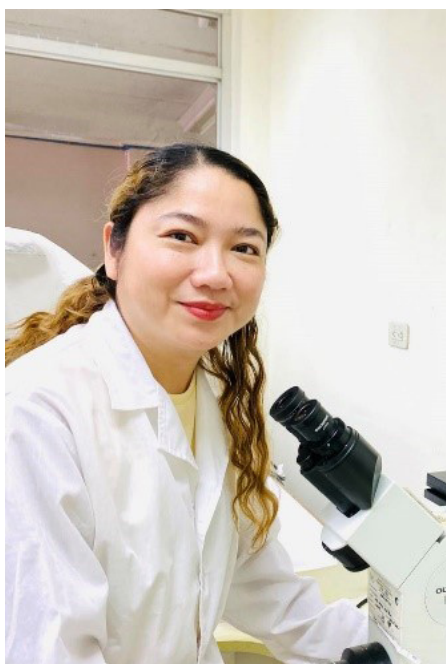
With her team from SEAFDEC/AQD and the University of the Philippines Visayas, Dr. Avanceña noted that, as expected, the diet that the male prawns consumed slightly increased their sperm count. They also found out that the broodstock's sperm had improved protein and lipid content. This means that just as a diet with mud worms improves female shrimp fertility, it also does the same for male shrimp.

Now, exactly what part of the polychaete extracts boosted male shrimp fertility? The study pinpointed the Total Soluble Fraction (which is composed of amino acids) and the Neutral Lipid Fraction (NLF). The study

suggested that the arachidonic acids present in the NLF improved sperm quality as this compound and its derivatives are known to stimulate sperm synthesis.

While more research ought to be done to know the specific substances in polychaete extracts that promote male shrimp fertility, the study suggested that customizing maturation diets for female and male shrimp might be worthwhile.

More details on this experiment may be found in the article "Reproductive quality evaluation of male Indian white prawn *Penaeus indicus* broodstock-fed diets supplemented with polychaete extracts (*Marphysa* sp.)," published by Dr. Avanceña and her team in the journal *Invertebrate Reproduction & Development*. Request for an article copy here: <https://repository.seafdec.org.ph/handle/10862/6451>. [a](#)





Garlic extract to treat fish infections? A research team first assesses the effects of garlic on tilapia

GARLIC works with tilapia not only as a culinary ingredient, but also as a treatment for fish health problems in the farm. Garlic contains active compounds such as alliin that have antimicrobial and antiparasitic properties in fish, making it a potential organic and environmentally safe remedy over chemical treatments.

However, too much garlic in the water can also be toxic to fish. Thus, a research team at SEAFDEC/AQD, led by Associate Researcher Gregoria Erazo-Pagador conducted a study to examine the toxicity of garlic powder on Nile tilapia.

With her assistants, Haydee Dumarán-Paciente and Blan Jericho Caloyloy, Ms. Pagador immersed juvenile Nile tilapia in different concentrations of garlic powder, from 150–400 milligrams per liter, and compared their responses and mortality rates to a

control treatment with no garlic powder. They then computed for the 96-hour median lethal concentration of garlic powder which is the concentration where half of the exposed fish will die in a span of 96 hours.

The findings revealed that exposure to higher concentrations of garlic powder, specifically 250 milligrams per liter and above, resulted in abnormal behaviors like lethargy and gasping for air. The mortality rate was also significantly higher at a concentration of 400 milligrams per liter.

Based on the findings of the study, the researchers established the median lethal concentration of garlic powder for Nile tilapia to be 225.86 mg per liter at a water temperature of 27°C. These findings emphasize the importance of understanding the potential impacts of natural compounds like garlic on aquatic organisms before considering them as alternatives to chemical treatments in aquaculture practices.

The research team published the results of their study in the research note, “Behavior Changes and LC50 of Dried Garlic (*Allium sativum*) Acute Toxicity in Nile Tilapia (*Oreochromis niloticus*) Juvenile” in Volume 106 Issue No. 2 of the Philippine Agricultural Scientist.

You may request for a copy of their publication here: <https://repository.seafdec.org.ph/handle/10862/6448>.**a**





How to prevent shrimp diseases with hydrated lime

SHRIMP farming is a profitable business, but it can also be risky. Shrimp can get sick from various diseases, which can cause huge losses for farmers. How can we prevent these diseases and protect our shrimp?

One way is to use hydrated lime. Hydrated lime is a chemical that can change the pH of the soil and water in the pond. pH is a measure of how acidic or basic something is. By applying hydrated lime to the pond soil, we can make it more basic, or alkaline.

A study by SEAFDEC/AQD senior scientist Dr. Eleonor Tendencia showed that applying hydrated lime to bring the pond soil pH to

11 or higher can eliminate white spot syndrome virus (WSSV) from the soil. The higher pH also got rid of crabs which can be carriers of diseases, as well as fishes that can prey on the farmed shrimp.

The research findings are detailed in the article, “Lime application to

condition soil to pH 11 controls growth of harmful vibrios and WSSV,” which was recently published in the Bulletin of the European Association of Fish Pathologists. The paper may be downloaded through this link: <https://repository.seafdec.org.ph/handle/10862/6445>. **a**

