

A breeder of the soil-cleaning worm *Marphysa iloiloensis*.
[PHOTO BY MAE MANDARIO]

aqd matters

January-February 2020

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

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New species of soil-cleaning worm named after Iloilo

A NEW species of mudworm, known to clean the soil in fishponds, was recently identified and named after Iloilo, the province where its eggs were collected and hatched.

Now called *Marphysa iloiloensis*, eggs of this mudworm, locally referred to as *ulod-ulod*, were collected by Mary Anne Mandario, an Ilongga and an associate researcher of the Southeast Asian Fisheries Development Center (SEAFDEC).

Mandario said she collected the eggs, encapsulated in “jelly cocoons,” from SEAFDEC’s fishponds in Dumangas and transported them to SEAFDEC’s Polychaete Hatchery in Tigbauan where they were hatched and grown to adult size.

The new species was listed in the World Register of Marine Species (WoRMS) database in September 2019 after it was

confirmed distinct from other mudworms with help from Australian taxonomist Dr. Christopher Glasby and his team.

Mandario has been studying mudworms, commonly found in fishponds and coastal mangrove wetlands, for their ability to eat decomposed feed from aquaculture and for their potential as food for crab and shrimp breeders.

Food for shrimp and crabs


“Several studies have shown that polychaetes when used as feed could improve the reproductive performance of crustacean broodstock,” she said.

Mandario is currently developing a mass production technique for *M. iloiloensis* at SEAFDEC that hopes to promote their use as supplemental diet for shrimp and crab breeders.



Jelly cocoons that contains the eggs of *Marphysa iloiloensis* at SEAFDEC/AQD’s Polychaete Hatchery in Tigbauan, Iloilo. PHOTO BY MAE MANDARIO

She also added that the development of a reliable culture technique for this species will lessen dependence on wild stocks as well as attain a disease-free and sustainable supply of mudworm for aquaculture use.

“This is a promising study that could help boost the production of healthy crablets and shrimp postlarvae and at the same time help clean the culture environment,” said Dan Baliao, chief of SEAFDEC Aquaculture Department. 

- RH LEDESMA



www.seafdec.org.ph

SEAFDEC reminds shrimp growers to avoid stocking ponds during cold months

TO PREVENT the entry of shrimp diseases, shrimp farmers are advised not to stock their ponds during cold months if their farms are not biosecurity-compliant or fully equipped to prevent the entry of shrimp diseases.

Experts from the Aquaculture Department of the Southeast Asian Fisheries Development Center (SEAFDEC) warn that shrimps get stressed when exposed to temperatures below 27 degrees Centigrade, predisposing them to diseases.

A study by Dr. Eleonor Tendencia, scientist at the Aquaculture Department of the Southeast Asian Fisheries Development Center (SEAFDEC/AQD), showed that a drop in temperature weakens the immune response of shrimp, thereby making them prone to infection. The study cites the pattern of white spot syndrome virus outbreaks in tiger shrimp when atmospheric temperatures are low.

Based on satellite readings provided by the National Oceanic and Atmospheric Administration in the United States, sea surface temperatures in Western Visayas are lowest in February where it reaches a monthly average minimum

of 25.5 degrees Centigrade in Iloilo and Negros Occidental.

“A higher rate of culture success can be attained during the warmer months from April to October,” said Mr. Victor Emmanuel Estilo, shrimp pond culture expert of SEAFDEC/AQD.

Estilo also recommends that shrimp farmers, especially those whose facilities are not fully equipped to prevent the entry of land, water and air-borne pathogens and disease carriers, to consider having only one production run per year within the warmer months.

To maximize utilization of ponds, Estilo suggested growing high-value marine fish species such as snappers (*maya-maya*) and Asian sea bass (*bulgan*) during cold months.

“Inter-cropping with these predatory fish species in shrimp ponds is advantageous since they prey on wild disease-carrying crustaceans; thus, effectively breaking the chain of contamination within the pond,” said Estilo.

Oplan Balik Sugpo

Even then, shrimp farmers should always take extra precautions to prevent the entry of diseases by using high health or



A shrimp pond at SEAFDEC/AQD's Dumangas Brackishwater Station, ready for harvest in October 2019, seen here with paddle wheels and bird scare devices on top. PHOTO BY RD DIANALA

specific pathogen free (SPF) postlarvae (PLs), effective pond water filtration systems, de-contamination facilities (tire and foot baths) at single farm and pond entrances, and crab fences and bird-scaring devices among others.

Recurring disease outbreaks are considered the most serious problem faced by shrimp farmers. With this constraint, SEAFDEC/AQD under its banner program “Oplan Balik Sugpo,” intensified its research activities on identification, detection, prevention, and treatment of diseases plaguing the industry. It has also come

up with protocols and is studying other variables to prevent the occurrence of diseases in shrimp stocks.

Last year, SEAFDEC/AQD successfully demonstrated tiger shrimp culture runs when it harvested 2.8 tons and 4.4 tons from a 5,000 and 8,000-square meter pond in October and November.

According to SEAFDEC/AQD chief Dan Baliao, the technology used to achieve this harvest is “easy to adopt and apply” for shrimp farmers and is “proven effective if given the proper aquaculture management.” **a**

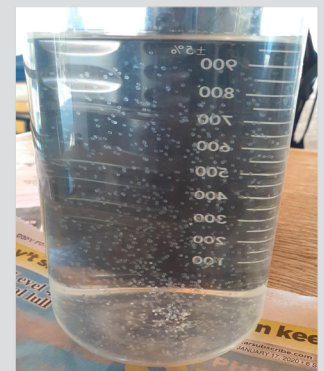
- RH LEDESMA

Millions of milkfish eggs are still produced despite cold months

THE ongoing environmental manipulation on milkfish breeders at the SEAFDEC/AQD hatchery has been facilitating their spawning as evidenced by the number of eggs collected since the start of the spawning off-season

(December 2019 to February 2020). Recently, in one spawning only, incubation tanks were nearly fully stocked due to millions of eggs produced. Reserved canvass larval rearing tanks have already been utilized as the concrete tanks can no longer accommodate the

volume of produced eggs and larvae. It is hoped that the spawning, larval rearing, and marketing of fry will continue until the end of February 2020 before the normal spawning season begins (March to November). **a**



High school teachers embark on research methodology training sponsored by Japan

TO ENHANCE the capacity of local high school science teachers, a training on research methodology and technical writing was organized with funding support from the Government of Japan.

Twenty-two high school science teachers attended the training facilitated by the Southeast Asian Fisheries Development Center/ Aquaculture Department (SEAFDEC/AQD) in coordination with the Department of Education (DepEd) Division of Iloilo, held from 28 to 30 January 2020 in Tigbauan, Iloilo.

“This training course aims to enhance the teacher’s capacity to write simple and doable research proposals by providing them with knowledge and skills,” said Dr. Koh-ichiro Mori, Japan Trust Fund manager and SEAFDEC/AQD’s deputy chief.

During the 3-day training, the teachers listened to lectures and did practical activities on research and development process, experimental design, data and statistical analysis, scientific literature and patent searches,



Dr. Leobert de la Peña (left photo), head of SEAFDEC/AQD’s Research Division and one of the resource persons of the training on Research Methodology and Technical Writing, lectures about the research and development process on 28 January 2020 in Tigbauan, Iloilo. PHOTOS BY JF ALDON

writing research proposals, and technical writing for publication in scientific journals. Moreover, as their final output for the training, the teachers made research proposals by group and were critiqued by the training’s resource persons.

“Truly, this training has met its purpose to help its participants in the field of research to uphold quality education and make our loads lighter especially in checking the manuscript of our learners and finding references for different studies,” said Ana Lagaña, a participant from Lemery National High School.

At the closing ceremony of the training on 30 January 2020 held in Tigbauan, Iloilo, Dr. Lilibeth Estoque, DepEd

Schools Division assistant superintendent, reminded the teacher-participants to make the best out of the learnings they gained since no amount of training or seminar-workshops can make better researchers unless it is put into actual teaching and practice.

Moreover, in the same event, Dan Baliao, chief of SEAFDEC/AQD, also told the teachers to enhance the capability of their schools through their teaching and SEAFDEC/AQD will be at the threshold of helping them. The Chief also thanked the Japanese government, represented by Dr. Mori, for the support in the activity.

This training course for teachers is the second offering of SEAFDEC/AQD with the

first one conducted last year. This year’s participants came from public high schools in Iloilo, namely: Barotac Viejo National High School, Batad National High School, Don Casimero Andrada National High School, Estancia National High School, Guimbal National High School, Igaras National High School, Lemery National High School, Nicomedes R. Tubar Sr. National High School, Miagao National High School, Oton National High School, Roberto H. Tirol High School, San Joaquin School of Fisheries, San Rafael National High School, Sara National High School, Tigbauan National High School, and Tubungan National High School. **a**

- RH LEDESMA



Participants of the training on Research Methodology and Technical Writing pose with the resource persons Daniel David Pamplona (6th from left) and Vicente Balinas (8th from left), SEAFDEC/AQD’s Training and Information head Dr. Edgar Amar (7th from left), and Training Coordinator Rosenio Pagador (rightmost) on 28 January 2020 in Tigbauan, Iloilo. PHOTO BY JF ALDON

Fisheries library goes digital, thousands of materials freely downloadable

FISH farmers, researchers, students, and academics can now avail themselves of readily accessible materials, journal articles, and books written by scientists and researchers of the Southeast Asian Fisheries Development Center (SEAFDEC) – thousands of which are freely searchable and downloadable over the Internet through its digital library.

What initially started out as a space intended to store, preserve, and share the research output of experts from the Iloilo-based SEAFDEC Aquaculture Department (AQD), has grown to a large online repository of knowledge accessed by millions from all over the world.

The institutional repository received over 16.5 million searches since it was established in 2011 and was accessed over 5 million times. User information revealed that academics, researchers, fish farmers, and both private and government employees from around the world use the service.

“To date, we have a total of 3,382 items in our digital library. Those

materials were downloaded over a million times, and that’s in 2019 alone,” shared Stephen Alayon, head of the SEAFDEC/AQD Library and Data Banking Services Section which established the repository now accessible at <http://repository.seafdec.org.ph>.

Digital libraries or repositories, such as the SEAFDEC/AQD Institutional Repository (SAIR), are information systems that store, manage, and provide access to digital content of any format.

“Through SAIR, we managed to promote publications written by our in-house scientists and researchers and helped generate higher citations through increased visibility,” Alayon said, adding that their goal for 2020 is to reach at least 20 million searches.

Easily accessible and interactive

The charm of SAIR is found in its seamless design and user-friendly interface.

“We wanted to create an organized atmosphere so that the users won’t feel overwhelmed with



Libraries aren’t dead, in fact, they’re going digital. A library user accesses aquaculture information materials from the SEAFDEC/AQD library’s online repository. PHOTO BY DEVCOM SECTION

information,” said Elvi Nemiz who oversees and maintains SAIR.

The repository uses DSpace, an open-source software developed at Massachusetts Institute of Technology (MIT) Libraries. It is also compliant with the standards of Open Archives Initiative (OAI), an organization that works to enhance people’s access to scientific and informative materials online.

“Aside from our easy-to-use website, we also make sure that someone is always ready to answer questions from the users,” Nemiz added.

SEAFDEC/AQD has made its inquiry management mechanism easier as the users can immediately “ask a

librarian” through Facebook messenger and e-mail.

“We wanted to make knowledge and information more accessible to our stakeholders from students who are working on assignments, reports, science investigatory projects, theses or advancing their degrees to fish farmers who are simply looking for solutions to their aquaculture problems,” said Alayon.

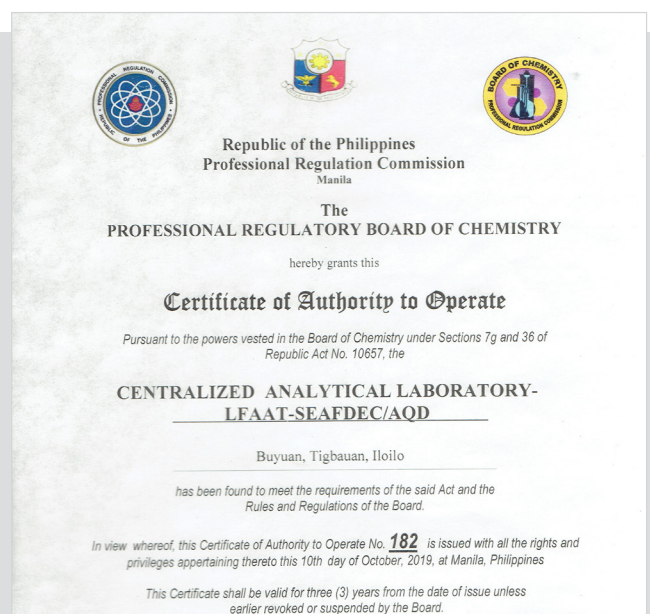
However, Alayon still encouraged students, teachers, fish farmers, and other stakeholders to visit physical libraries such as the SEAFDEC/AQD Library in Tigbauan, Iloilo, which hosts a wealth of other publications, available only in print due to copyright protection. **a**

- JM DE LA CRUZ

Centralized Analytical Laboratory gets Certificate of Authority to Operate

KUDOS to the Laboratory Facilities for Advanced Aquaculture Technology (LFAAT) team headed by Engr. Margarita Arnaiz for facilitating the granting of a Certificate of Authority to Operate (CAO) to SEAFDEC/AQD’s Centralized Analytical Laboratory. The certificate was issued on 10 October 2019 by the Professional Regulatory

Board of Chemistry and is valid for three years. The CAO is in compliance with Sec. 35 of RA 10657 known as the Chemistry Law of the Philippines, which states that “only firms, corporations and government agencies duly authorized by the Board that hold a valid certificate may operate a chemical laboratory or engage in the practice of chemistry or chemical analysis in the Philippines.” **a**



Backyard catfish farming, an accessible source of income for Filipinos



The Asian catfish, *Clarias macrocephalus*, is indigenous to the Philippines and is said to have a more tender and more delicious meat than exotic catfish species.

THE tender and flavorful meat of catfish, locally known as *pantat* or *hito*, is the reason why this fish continues to be popular to the Filipino taste bud. Whether at roadside grills, beach resorts, or urban restaurants, *adobadong pantat* and grilled *hito* whet the appetite.

It helps that this fish is easy to grow, even in backyards where it can survive in otherwise harsh environments, thanks in huge part to its arborescent organ next to its gills allowing it to breathe atmospheric air.

The simplicity of catfish farming makes it a viable source of income and food for many rural households that are willing to stick it out for three to five months during which the native catfish can reach 80 to 150 grams and are ready to be sold.

Based on computations by the Southeast Asian Fisheries Development Center (SEAFDEC) in 2017, a 1,000

- square meter pond stocked with 10,000 fingerlings can yield 770 kilograms of catfish and net a farmer P22,971 in profits with an 80 percent return of investment.

The African catfish (*Clarias gariepinus*), also grown in the Philippines, can grow to larger sizes, but SEAFDEC says this exotic species has been outcompeting the more palatable native catfish in the natural environment. Instead, scientists recommend that the indigenous *Clarias macrocephalus* (bighead, native catfish) and *Clarias batrachus* (Thai catfish) be grown instead.

How to grow catfish

Catfish can be grown in small earthen freshwater ponds, ideally at least 50 square meters in area with water 70 centimeters deep. However, larger ponds up to 3,000 square meters are more economical because more fish

can be stocked and harvested, if one has enough of a water supply.

Concrete tanks, including converted pig pens, may also be used to grow catfish. However, about 4 inches of clay soil must be lined at the bottom and, just like in ponds, properly disinfected with lime and fertilized to encourage growth of natural food.

Kangkong and water hyacinth may be planted, where possible, to serve as natural shelter for the growing catfish, but these should not cover more than 20 percent of the area lest they obstruct the feeding frenzy of the catfish which readily devour feeds, kitchen refuse, trash fish, chicken entrails, or stale bread.

To ensure the successful culture of any fish, the use of quality fingerlings from a reliable supplier is necessary. Fingerlings, ideally three to five grams when stocked,

must be uniformly sized and actively swim in groups.

Be mindful of stocking density

Transporting and stocking fingerlings must be done with care to minimize the stress on the fish. Stocking density can vary between 10 to 20 pieces per square meter of area in ponds and 10 to 30 pieces per cubic meter of water in tanks.

During the first month, only 30 to 50 percent of the water must be changed weekly. As the catfish grow and devour more food, water change must be increased to 50 to 70 percent, twice a week until harvest.

Feeding rate is 10 percent of biomass during the first two months and tapered to eight percent until harvest. If all goes well, catfish may be harvested when they reach 80 to 200 grams after four to six months of culture. **a**

- RD DIANALA/RH LEDESMA

Scientist participates in meeting for eel project

BANGKOK, Thailand - Dr. Maria Rowena Eguia, scientist at SEAFDEC/AQD, joined the project planning meeting for the second phase of the SEAFDEC eel project with funding support from the Japan-ASEAN Integration Fund (JAIF).

For this project, SEAFDEC/AQD, as represented by Dr. Eguia, will be part of the DNA-based population genetics survey and e-DNA-based eel species

identification and detection protocol development.

The meeting for the JAIF project titled, "Development of Stock Assessment Methods and Strengthening of Resources Management Measures for tropical Anguillid Eels in Southeast Asia" was attended by 33 participants including representatives from the ASEAN member states. It was held on 3 February 2020. [a](#)



Dr. Maria Rowena Eguia (2nd row, 5th from right) poses with the other participants of the planning meeting for the SEAFDEC eel project at the Lotus Bangkok Hotel in Thailand on 3 February 2020. *PHOTO COURTESY OF MRR EGUIA*

Social media: a tool in enhancing an institution's visibility

WITH the aim of increasing its reach to its target audience, SEAFDEC/AQD organized a social media training for its staff who will be handling the social media accounts of the institution.

SEAFDEC/AQD invited the social media strategist of Oceana Philippines, Mr. Lorenzo Arada, to be the resource speaker of the training.

Mr. Arada talked about social media platforms, features, and terms;

establishing a brand in social media; creating highly engaging posts; growing and engaging the target audience; and creating a social media strategy among others. There were also activities on creating captions and making a social media calendar.

The training was held at the TID Conference Room in 21 January 2020 which was attended by 15 SEAFDEC/AQD staff who were mostly from the Training and Information Division. [a](#)



Mr. Lorenzo Arada (standing) supervises the participants of the social media training during an activity on making a social media calendar at the TID Conference Room on 21 January 2020. *PHOTO BY JF ALDON*

HRMS promotes health awareness through a seminar series

AS PART of the Health Awareness Seminar Series of the Human Resource Management Section (HRMS), a hypertension and diabetes seminar was held at the RD Audio-Visual Room on 20 February 2020.

Dr. Rhea S. Espinosa, a specialist on adult diseases and the resource person of the seminar, educated SEAFDEC/AQD employees about the causes, symptoms, and prevention of hypertension and diabetes. She also emphasized the importance of having a healthy lifestyle as a way to avoid these diseases.

The seminar was attended by 50 employees mostly in their mid-



Dr. Rhea S. Espinosa (center) receives a Certificate of Appreciation from Administration and Finance Division head Ms. Amelita Subosa (left) and Human Resource Management Section officer-in-charge Ms. Sunshine Mae Salonga (right). *PHOTO BY JF ALDON*

30's and up. Attendees acknowledged the effort of the organizer for facilitating such informative activity and the resource speaker for her apt response to queries.

This activity was realized through the coordination of HRMS with SEAFDEC/AQD's accredited hospital, the Medicus Medical Center Corporation. [a](#)

- MB FRANCISCO

AQD holds refresher seminar on driving

IN ORDER to upgrade the skills and knowledge of SEAFDEC/AQD drivers on traffic rules and regulations, the Human Resource Management Section facilitated a refresher seminar on 15 November 2019.

The seminar, held at the TID Conference Room, was conducted by Mr. Jose Romeo F. Jamerlan, deputy chief of Operations Division of the Land Transportation

Office-Region VI, in Iloilo City. He emphasized in his talk the Land Transportation Office's road safety advocacy and the prevailing special laws on land transportation.

Fifty-three employees who attended the seminar majority of whom were drivers of SEAFDEC/AQD's stations in Tigbauan, Dumangas, and Guimaras. [a](#)

- MB FRANCISCO



Mr. Jose Romeo F. Jamerlan explains about road safety to SEAFDEC/AQD employees during the refresher seminar on driving. *PHOTO BY JF ALDON*

Newly-hired Employees



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AQD information staff share expertise in SEAFDEC workshop

THAILAND - Information staff of SEAFDEC/AQD served as resource persons for various topics in the Inter-Departmental Information Workshop held on 4-7 February 2020 at TD in Samut Prakan and SEC in Bangkok.

The workshop, attended by information staff from SEC, TD, AQD, MFRDMD, and IFRDMD, aimed to boost the execution and monitoring of SEAFDEC's various information channels. Topics touched on SEAFDEC's institutional repositories, publications, websites, social media accounts, and data security.

"For this workshop, I am indeed grateful that AQD staff agreed to serve as resource persons again to share their knowledge and experiences

on the issues that we are about to discuss," remarked SEAFDEC secretary general Malinee Smithrithee as she opened the discussions.

Elvi Nemiz and Stephen Alayon of the Library and Databanking Services Section served as resource persons for harmonizing the structure of SEAFDEC institutional repositories. Nemiz also coached repository administrators on the methods of monitoring repository usage while Alayon presented ways of tracking SEAFDEC publications.

Ronilo Subaldo of the Management Information System Office proposed ways to harmonize the reporting of website statistics and presented options to lower the cost of maintaining



AQD resource persons (L-R) Ronilo Subaldo, Elvi Nemiz, Rex Delsar Dianala, and Stephen Alayon receive a Certificate of Appreciation from SEAFDEC secretary general Malinee Smithrithee (center). PHOTO COURTESY OF RD DIANALA

servers. Rex Delsar Dianala of the Development Communication Section presented the importance of social media, suggested ways that SEAFDEC can maximize the Facebook platform, and facilitated basic harmonization of SEAFDEC Facebook accounts.

The workshop was conducted in response to recommendations during the 20th Meeting of SEAFDEC Information Staff Program held on October 2019 in Puerto Princesa City, Philippines. 📍

- RD DIANALA

Identification of antigen-sampling cells in gills, key to mucosal vaccine development

DR. GOSHI KATO, an assistant professor at Tokyo University of Marine Science and Technology, presented his study on gill-epithelial antigen sampling cells to SEAFDEC/AQD research staff in Tigbauan, Iloilo on 28 January 2020.

During his seminar titled "Gill-epithelial antigen-sampling cells in rainbow trout: A novel mucosal antigen sampling system of teleost fish during bath-vaccination," Dr. Kato explained that the whole body of teleost fish or ray-finned fish like rainbow trout is covered by mucus but specific antigen-sampling cells have not yet been identified in the mucosal tissues.

Dr. Kato and his co-authors were able to identify two antigen-sampling cells that take up antigens on the epithelial surface of the gills. One type of the antigen-sampling cells had large vacuoles in the cytoplasm. These were macrophages (cells responsible for detecting, engulfing and destroying pathogens and apoptotic cells) and dendritic or antigen-presenting type of cells. The other one exhibited similar characteristics to mammalian M (membranous epithelial, microfold, or microvillous) cells that are atypical epithelial cells that phagocytize or ingest antigens.

The results of their study can be valuable in developing

mucosal vaccines that specifically target gill epithelial antigen-sampling cells. Moreover, due to the rapidly growing aquaculture industry, effective mucosal vaccines for farmed fish administered through bath vaccination is needed.

Bath vaccination is preferred since it can significantly reduce working costs and stress induced by



Dr. Goshi Kato (left) receives a Certificate of Appreciation from SEAFDEC/AQD deputy chief Dr. Koh-ichiro Mori for conducting a seminar at SEAFDEC/AQD. PHOTO BY JF ALDON

vaccination via injection of individual fish is also avoided. 📍

- RH LEDESMA