

AQUA Dept NEWS

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Deep water farming of seaweeds show promise

It may come as a surprise to many but shrimp is not our major aquaculture export. That honor belongs to seaweeds.

Last year, Philippines was the number three top producer of seaweed in the world, next only to China and Japan, respectively. It has employed about 120,000 workers.

Seaweeds are sources of the extracts carrageenan and agar. The former from *Kappaphycus*, originally called *Eucheuma* and the latter from *Gracilaria*. The extracts are top dollar earners with increas-



A farmer shows off his young Kappaphycus plants

ing demand far exceeding world supply. Carrageenans are used as additives in the pharmaceutical and cosmetic industry as binders in tablets and as growth media for microor-

ganisms like bacteria, and fungi especially yeast. Agar is widely used as well in the food industry.

However, seaweed farming as commonly done in shallow waters has problems associated with excessive grazing by herbivores like sea urchins, siganids (rabbitfish), and starfish. This constraint hampers production of seaweed.

Fortunately, studies at AQD have shown that deep sea farming of seaweeds (more than 10 meters deep) is feasible and profitable too. In a study by

to page 3

Japanese visits AQD

Sei-Ichi Hayashi of Kagoshima University visited AQD on August 21.



Hayashi just passed through AQD to conduct a research seminar. He was officially invited by the UPV College of Fisheries.

His lecture was on lipoprotein and lipid metabolism of eel. He discussed the mechanism of lipid transfer from

Aquaculture nutrition book launched in ISCOF

The book *Nutrition in Tropical Aquaculture* was launched at the Iloilo State College of Fisheries (ISCOF), Barotac Nuevo, Iloilo on August 19.

The book launching activity was

the liver to the muscle of migratory species of eel.

Hayashi is a cell biologist and works at the Laboratory of Food and Chemistry in Kagoshima University. He is also a professor of the said university.

part of a 3-day celebration slated by ISCOF for their 24th Foundation Day Anniversary. The AQD delegation was headed by Drs. Oseni Millamena, Relicardo Coloso, Felicitas Pascual, and Ms. Mae Catacutan.

The book launching was in cognizance of the role of AQD in providing the academe with current educational materials relevant to aquaculture in the tropics and disseminating up-to-date knowledge in aquaculture technology.



Learning aquaculture technology via the Internet

Twenty-five international learners completed the first Internet-based distance-learning course on “Principles of Health Management in Aquaculture” (AquaHealth Online) on August 19.

The learners came from ten countries, namely: Egypt, India, Cambodia, Indonesia, Malaysia, Myanmar, Thailand, Vietnam, Singapore, and the Philippines.

AquaHealth Online moves away from a student and teacher face-to-face setting to a distance-learning mode. Knowledge and skills needed in fish health management are actually transferred via information technology. Learners from all over the world could participate without leaving their respective places of work.

The learners proceeded with the course as if they were in a classroom, except that they faced computer screens instead of instructors. Under guidance from specialists, they performed exercises on their own and submitted reports of their work also through the Internet. They took examinations administered by proctors near the places of their work. What is unique about the course is the unlimited interaction among learners, wherein insights and experiences are shared, enhancing

further the learning process.

Health management in aquaculture is traditionally one of the most sought-after and well-attended international classroom type training courses at AQD. It is due to the fact that no aquaculture venture would succeed without proper consideration to health management practices.

Upon registration, the learners were given a CD-ROM containing 12 learning modules and a course guide. The course guide provided the students with the introduction, description, goals and objectives, outline, requirements (skills and equipment), manner of assessment (grading system), and activities for each chapter.

The course requires only basic skills in computer operations. Self-assessment questions (SAQ) tested the learners’ progress at each module. These questions prepared them in taking the proctored examinations.

After participating in the course, learners were expected to: (a) recognize shrimp and fish disease, (b) identify the cause(s) of the disease, (c) explain how a disease develops, (d) apply preventive and control measures to lessen the risks posed by the disease, and (e) use appro-



prate techniques for the preparation of samples for disease diagnosis.

The course was handled by eleven fish health specialists from AQD with a combined 25 years of experience in various fields of aquaculture health management such as virology, bacteriology, mycology, parasitology, serology, immunology and molecular biology.

AquaHealth Online was developed with the technical assistance of the UP Open University, the country’s premier institution in distance education and Internet-based learning systems.

Encouraged by the positive response of AquaHealth Online learners, AQD launched another distance learning course “Basic Principles of Nutrition in Tropical Aquaculture” or AquaNutrition Online on the same day AquaHealth online ended.

– S Pedrajas

Seahorses can be grown in brackishwater

Hatchery-bred seahorse *Hippocampus kuda* juveniles could tolerate water salinities from 15 ppt to 50 ppt. Optimum growth and survival were observed at 15- 20 ppt.

These were the findings of AQD researcher Grace Garcia in a study titled “Tolerance of seahorse *Hippocampus kuda* (Bleeker) juveniles to various salinities” presented during a Research Division seminar

series at TMS on August 22.

Nine week-old hatchery-bred seahorse juveniles were transferred from ambient seawater salinities (32-33ppt) to different salinity levels ranging from 0 ppt to 85 ppt.

After 4 and 18 days of exposure, no adverse effect in growth, survival and total body water was seen at 15 ppt and 20 ppt respectively. Thus, hatchery-bred *H. kuda* can be

grown in brackishwater environments.

Seahorses are popular aquarium fish and highly valued in traditional Chinese medicine. However, their number in the wild has declined due to intense harvesting and habitat degradation. AQD researchers aim to improve production of seahorse juveniles in the hatchery in lieu of wild harvest.

First record of VNN in the Philippines



AQD documented the first outbreak of viral nervous necrosis (VNN) or viral encephalopathy and retinopathy (VER) among hatchery-reared larvae of grouper in the Philippines.

This was recorded by researchers Yukio Maeno of JIRCAS and Leobert dela Peña and Erlinda Cruz-Lacierda of AQD in their research titled “Nodavirus infection in hatchery-reared orange-spotted grouper *Epinephelus coioides*: First record of viral nervous necrosis in the Philippines” published in *Fish Pathology* 37 (2): 87-89, 2002.

In April 2001, high mortality was observed among hatchery-reared larvae of grouper at AQD. Mortality was 5-10% daily and reached

100% within 10 days. At day 34 after hatching, the larvae began to show disease signs which included reduced feeding activity, darkened pigmentation, lethargy and abnormal swimming behavior such as rotating, spinning, and horizontal looping.

Viral etiological study using histopathology, cell culture with SNN-1 cell line, reverse transcription polymerase chain reaction (RT-PCR) and electron microscopy were used to identify the cause of mortality.

Histopathology of moribund fish demonstrated marked vacuolation of the brain, spinal cord and retina. Cytopathic effects were observed in SNN-1 cells inoculated with the tissue filtrate of affected grouper. Electron microscopy revealed non-enveloped virus particles measuring 20 to 25 nm in diameter in the cytoplasm of degenerated SNN-1 cells. Piscine nodavirus (betanovirus), was detected in the affected tissues and SNN-1 cells inoculated with the tissue filtrate of affected fish by RT-

PCR. Nodavirus is the causative agent of VNN.

Viral nervous necrosis was first described in Japanese parrotfish and barramundi in Japan. The disease occurs mostly in larvae and juveniles resulting to high mortalities. Since then, the disease has been reported in a variety of cultured marine fish species in Europe, Asia, Australia and North America. It has been associated with high mortalities in cultured grouper species in Southeast Asia such as the brown spotted grouper, greasy grouper, red spotted grouper, humpback grouper and carpet cod.

Consequently, VNN has the potential to cause severe economic loss in aquaculture. Thus, there is an urgent need to examine the susceptibility of other important aquaculture fishes to the virus, continued epidemiological surveillance of piscine nodaviruses, and the development of effective control measures. Screening of broodstock and their corresponding larvae for VNN is also imperative to prevent the spread of the disease.

Deep water... from page 1

researchers Anicia Hurtado and Renato Agbayani, they found out that deep water farming is possible, provided that wave action is moderate to strong with the bottom having good anchorage. The deep water method is commonly called *alul*. The study also assessed the seaweed planter's practice of using multi-raft and long-line methods in three cultivation areas in Zamboanga del Sur in Mindanao.

The result showed that although the method is expensive, production is greater. The average return on investment (ROI) on five croppings per year was 170 percent with a

payback period of less than one year.

Further, the study showed the significant effects of seaweed farming to the socio-economic benefits of the community. Food, clothing, and shelter have improved with higher cash income, and schooling of children has been upgraded to collegiate level.

Consequently, the number of professionals in the community has increased; these professionals are now leaders. Even semi-permanent to permanent homes have been built which were non-existent before seaweed farming was introduced.

- M Surtida

There are only three kinds of people: people who make things happen, people who watch things happen, and people who wondered what happened.

— **Sonny Barger**, former President of Hell's Angels - Oakland, California Chapter

JOKES

Married In Heaven



On their way to get married, a young couple was involved in a fatal car accident. The couple found themselves sitting

outside the Pearly Gates waiting for St. Peter to process them into Heaven. While waiting, they began to wonder: Could they possibly get married in Heaven? When St. Peter showed up, they asked him. St. Peter said, "I don't know. This is the first time anyone has asked. Let me go find out," and he left. The couple sat and waited for an answer...

...for a couple of months. While they waited, they discussed that IF they were allowed to get married in Heaven, SHOULD they get married, what with the eternal aspect of it all. "What if it doesn't work?" they wondered, "Are we stuck together FOREVER?" After yet another month, St. Peter finally returned, looking somewhat bedraggled. "Yes," he informed the couple, "you CAN get married in Heaven."

"Great!" said the couple, "But we were just wondering, what if things don't work out? Could we also get a divorce in Heaven?" St. Peter, red-faced with anger, slammed his clipboard onto the ground. "What's wrong?" asked the frightened couple. "OH, COME ON!!" St. Peter shouted, "It took me three months to find a priest up here! Do you have ANY idea how long it'll take me to find a lawyer?"



To be a good friend, open your ears and heart more often than your mouth.

Seafood Galore

This recipe won as runner-up in the seafood dish contest held at FishWorld during AQD's 29th anniversary. Try it and be the judge yourself!

Ingredients

- 2 cups green shell meat
- 2 medium carrots cut into ½ cm x 3 cm
- 2 cups coconut heart cut into ½ cm x 6 cm
- ¼ cup shrimp, shelled
- 1 cup red bell pepper cut into ½ cm x 3 cm
- ½ cup Baguio beans cut into 3 cm long
- 2 cups togi (bean curd) washed and properly cut
- 1 tsp shrimp paste (ginamos)
- 1 medium onion (for sautéing)
- 2 cloves garlic (for sautéing)
- ½ cup water (shell broth)
- 1 tsp salt
- 1 tbsp cooking oil
- ½ cup coconut cream (extracted without water)
- 1 cup young coconut meat shredded



Procedure

1. Sauté garlic in hot oil until brown and then add onions and sauté until limp and transparent.
2. Add green shell meat, shrimp, salt, and shrimp paste.
3. Add water and continue sauteing until shrimp turn to light pink.
4. Add cut up veggies and bell pepper until cooked but crispy to bite.
5. Add shredded young coconut meat.
6. Remove from open flame and add coconut cream.
7. Serve hot with garnishing of nylon shell, wedges of ripe tomatoes and other veggies.

(This is good for a family of six)

Neighbors

Two neighbors had been fighting with each other for four decades.

Bob bought a Great Dane and taught it to use the bathroom in Bill's yard. For one whole year Bill ignored the dog.

So Bob then bought a cow and taught it to use the bathroom in Bill's yard. After about a year and a half of Bob's cow crapping in Bill's yard, being ignored all the while, a semi pulled up in front of Bill's house.

Bob ran over and demanded to know what's in the 18-wheeler. "My new pet elephant," Bill replied solemnly.

ROUND-UP

Denny R. Chavez, Associate Researcher from the Nursery Section transferred to the Technology Commercialization/ Technical Assistance Section (TECTAS) of TVCD effective August 8.

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