

Culprit behind massive shrimp die-offs in Asia unmasked

Bacterium responsible for Early Mortality Syndrome of Shrimp – Crucial first step in finding effective ways to combat the disease

Extracted from FAO media release available on <http://www.fao.org/news/story/en/item/175416/icode/> (Last accessed on 26 June 2013)



Shrimp farm in Viet Nam. One million people in Asia depend on shrimp farming for their livelihoods. In 2011, the Asian region produced 3 million tonnes of shrimp, with a production value of \$13.3 billion.

3 May 2013, Rome - In a major breakthrough, researchers at the University of Arizona have identified the causative agent behind a mysterious disease that has been decimating shrimp farms in Asia. The disease, known as Shrimp Early Mortality Syndrome (EMS) or Acute Hepatopancreatic Necrosis Syndrome (AHPNS), has over the past two years caused large-scale die-offs of cultivated shrimp in several countries in Asia.

Infected shrimp ponds experience extremely high levels of mortality early in their growing cycle — as high as 100 percent death rates in some cases. A strain of a bacterium commonly found in brackish coastal waters around the globe, *Vibrio parahaemolyticus* was isolated by Prof. Don Lightner's team from the University of Arizona, and used to reproduce the disease EMS in healthy shrimp. It is believed the high virulence of this agent to shrimp may be due to a phage which affects this particular strain of *V. Parahaemolyticus*.

This breakthrough finding by UA of a bacterial aetiology is a crucial first step in finding effective ways to combat EMS. EMS/AHPNS initially surfaced in 2009. By 2010 outbreaks had become serious. In China in 2011, farms in Hainan, Guangdong, Fujian and Guangxi suffered almost 80 percent losses. In Thailand, shrimp production for 2013 is predicted to be down 30 percent from last year due to EMS. Production on some farms in eastern parts of the country has been cut by 60 percent.

FAO first fielded a mission to Viet Nam through its 'Crisis Management Centre for Animal Health' to investigate the disease in 2011 which pointed to an infectious agent and since 2012 is implementing an emergency technical assistance project in Viet Nam.



No risk to human health

The strain of *V. parahaemolyticus* isolated from shrimps with EMS appears not to have the genes associated with severe gastrointestinal sickness in humans. According to a seafood safety expert at FAO, Dr Iddya Karunasagar, there have been no reports of human illness being associated with EMS.

Only shrimp vulnerable

EMS affects two species of shrimp commonly raised around the world, the Giant Tiger Prawn (*Penaeus monodon*) and Whiteleg Shrimp (*P. vannamei*). Clinical signs of the disease include lethargy, slow growth, an empty stomach and midgut and a pale and atrophied hepatopancreas, often with black streaks. Within 30 days of a pond being stocked large-scale die-offs begin.

So far countries officially reporting EMS include China, Malaysia, Thailand and Viet Nam. But anyplace where *P. monodon* and *P. vannamei* are cultivated is potentially at risk. This includes most of Asia and much of Latin America, where shrimp farming is also important, as well African countries where shrimp are cultivated (Madagascar, Egypt, Mozambique and Tanzania). Disease spread would appear to be linked to proximity to already-infected farms or the movement of infected live shrimp, usually juveniles used to stock ponds. Lightner's team was unable to reproduce EMS using frozen and thawed shrimp samples, suggesting freezing kills the responsible bacterium. Since international shrimp trade is mostly in frozen form, there is apparently no or very low risk of disease transmission from these products.

Dealing with EMS

Now that EMS's causative agent is known more research is urgently needed to have a better understanding of how the disease spreads from farm to farm and implement appropriate countermeasures. At the same time, FAO is engaging with partners to organize a concerted, inter-regional effort to address the disease.

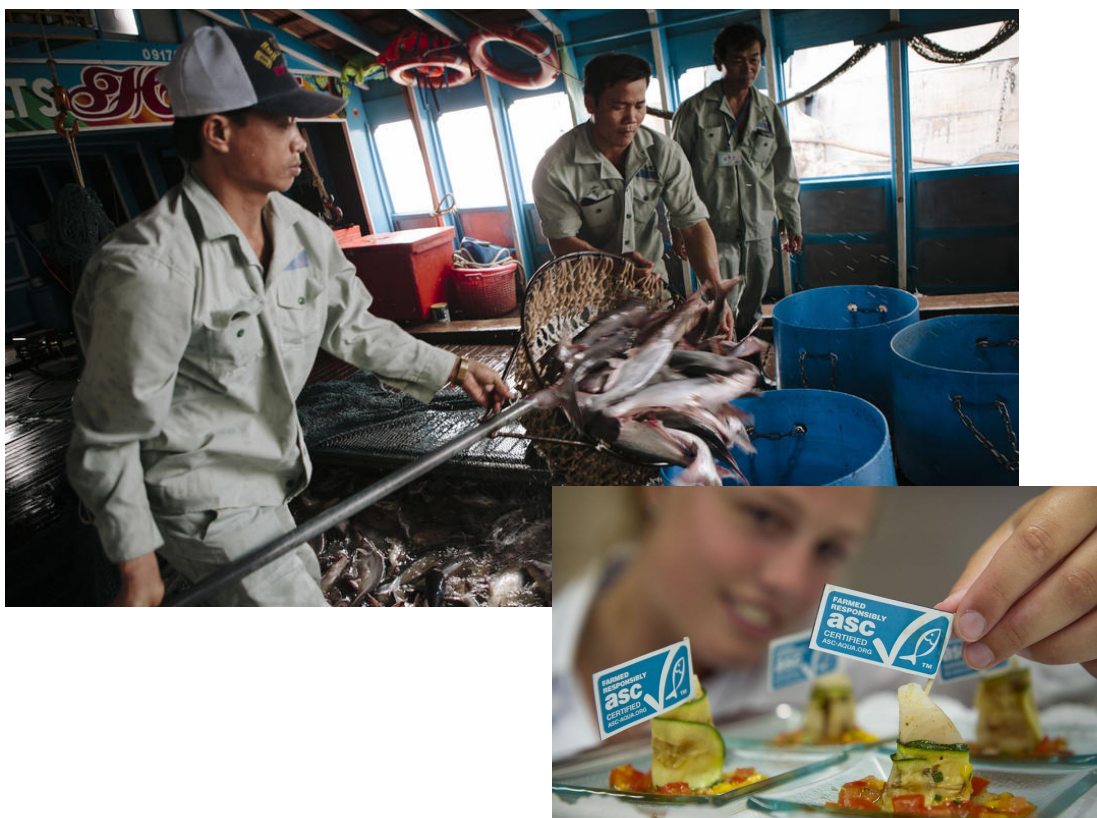
For shrimp farmers, reliance on already-established aquaculture and biosecurity best practices will help prevent EMS-related problems. These include:

- Post-larvae shrimp used for stocking should be purchased from reputable sellers, be accompanied by animal health certificates prior to being introduced on-farm, and subjected to a temporary quarantine prior to stocking.
- High quality feed should be used, and environmental stresses avoided, to keep shrimp healthy.
- The health of pond environments should be carefully maintained and young shrimp should be closely monitored. Any illness should be immediately reported to the proper authorities.
- Regular fallowing of aquaculture ponds should be considered as part of a routine on-farm program of aquatic animal health, as this practice has been

shown to break pathogen life cycles. Off farm, any movement of live or unfrozen shrimp products should also comply with established best practices.

World Wildlife Foundation (WWF) is helping catfish farming become more sustainable in Vietnam

Extracted from <http://worldwildlife.org/stories/in-vietnam-helping-catfish-farming-become-more-sustainable> (last accessed 27 June 2013)



Vietnam is the source of more than 90 percent of the world's pangasius (or Asian catfish) exports, which have increased 50-fold in the last decade. This rapid growth has led to significant environmental impacts. Pangasius is primarily farmed in 23 square miles of ponds across nine provinces of the Mekong River Delta—a critically important freshwater habitat.

WWF is working with 18 Vietnamese pangasius farms to help them comply with Aquaculture Stewardship Council (ASC) standards. The Vietnamese pangasius industry has taken up these standards voluntarily and vigorously. The Vietnamese government and the country's exporter association have made a commitment to certify 100 percent of the country's farmed pangasius by 2015, with half of that to be subject to rigorous ASC certification.



National surveillance program for aquatic animal diseases launched in India

Contributed by Dr P.K. Pradhan

Aquaculture in India over last two decades has shown phenomenal growth of 6-7% per year and has been identified as sunrise sector for meeting the growing demand of fish in the years to come. However, diseases are a primary constraint to the growth of the aquaculture sector. Although, the need of a National Surveillance Programme for Aquatic Animal Diseases had been realized in the country for more than two decades, this programme was not made operational. Recognizing the importance of disease surveillance and the need for setting up a coordinated national disease surveillance system, National Bureau of Fish Genetic Resources (NBFGR), Indian Council of Agricultural Research, Lucknow had convened an expert consultation in April 2012 which was attended by forty experts including research scientists, development officials and policy makers involved in aquatic animal health from all over the country as well as an expert from Network of Aquaculture Centers in Asia-Pacific, Thailand. As a follow up to the consultation recommendations, NBFGR undertook the exercise of developing a national project proposal and submitted the project for funding support to the Department of Animal Husbandry Dairying and Fisheries (DAHDF), Ministry of Agriculture, Government of India. DAHDF has approved the national project on aquatic animal disease surveillance for 5 years and funding to the tune of INR 320 million (about USD 5.2 million) has been allocated through the National Fisheries Development Board (NFDB), Hyderabad. The project is proposed to be implemented by 8 ICAR fisheries research institutes, 12 fisheries colleges and other organizations in 14 selected states of aquaculture importance. NBFGR has been taking the lead in coordinating this mega-project of National importance and the project is being monitored by DAHDF, Ministry of Agriculture, Govt. of India.

The project has been launched recently on 28th May by Dr. S. Ayyappan, Secretary, DARE and Director General, ICAR as Chief Guest. More than fifty fish health experts from 20 leading fisheries research institutions, fisheries colleges and other organizations participated in the Workshop. In the inaugural session on 28th May, 2013, Dr. J. K. Jena, Director, NBFGR and National Co-coordinator of the project in his welcome address gave a detailed outline of the project. He stressed on the importance of the project in formulating national disease control programmes, taking policy decisions for investment depending on the extent of economic loss and fulfilling international reporting obligations of the country to World Organization for Animal Health (OIE). Dr. B. Meenakumari, Deputy Director General (Fy.), ICAR in her presidential address mentioned that although Aquatic Animal Disease Surveillance Programme is a challenging task, NBFGR has taken a humble attempt to reach to the goal. Dr. Vishnu Bhatt, Fisheries Development Commissioner, DAHDF in his address intimated that this project should be institutionalized after completion of 5 years, so that disease surveillance will be a continuous activity. Dr. C. V. Mohan, Research and Development

Manager, Network of Aquaculture Centers in Asia-Pacific (NACA) stressed on the importance of the national surveillance programme in providing credible

information which can help the competent authority of the country for facilitating trade and management of transboundary diseases. He assured that NACA shall provide all assistance and help required to implement this programme in India. Dr. Madhumita Mukherjee, Executive Director (Tech.), NFDB assured all possible co-operation of NFDB for successful implementation of this important programme. The Chief Guest, Dr. S. Ayyappan in his inaugural address highlighted on the importance of national surveillance programme, need for building credibility amongst trading partners, lessons that can be learnt from the livestock sector in India, lessons that can be drawn upon from Asia Pacific, and the need for strong commitment from all the national institutions. He thanked DAHDF for supporting this project and funding through NFDB and thanked NACA for their technical support for the project. He congratulated Dr. J. K. Jena, Director, NBFGR and National Coordinator of the project for taking lead in initiating such a programme of national importance in very short duration.



Inaugural session of the Launch Workshop: (From left to right): Dr. S. Ayyappan, Secretary, DARE and Director General, ICAR addressing investigators of the collaborating institutes; Dr. J. K. Jena, Director, NBFGR and National Coordinator of the project; Dr. Vishnu Bhat, Fisheries Development Commissioner, DAHDF; Dr. B. Meenakumari, Deputy Director General (Fy.), ICAR; Dr. C. V. Mohan, Research and Development Manager, Network of Aquaculture Centers in Asia-Pacific (NACA), Bangkok and Dr. Madhumita Mukherjee, Executive Director (Tech.), NFDB.

Upcoming events:

25-29 August 2013

Perth Convention Exhibition Centre
Western Australia



24th International Conference of the World Association
for the Advancement of Veterinary Parasitology

**Preconference fish pathology
workshop, Perth, 22-24 Aug 2013**

Venue: Murdoch University

<http://www.waavp2013perth.com/waavp/program.html> for registration
and full program details

**2013 FRDC Australasian
Scientific Conference on Aquatic
Animal Health**, The Pullman Reef
Hotel, Cairns, 8-12 July 2013

Keynote presenters:

Prof. Hugh Ferguson

Prof. Don Lightner

**9th Symposium on Diseases in
Asian Aquaculture (DAA9)**

The Fish Health Section (FHS) of
the Asian Fisheries Society (AFS) is
very pleased to announce that the
9th Symposium on Diseases in
Asian Aquaculture (DAA9) will be
held in **Ho Chi Minh City,
Vietnam from 24-28 November
2014.**

Please look out for information on
DAA9 and FHS on our website
<http://www.fhs-afs.net>

**2nd International Symposium on
Ranaviruses**

Knoxville, Tennessee, US

27-29 July 2013

<http://ranavirus.com>



**European Association
of Fish Pathologists**

**16th International Conference
on Diseases and Shellfish,**
Tampere Finland, 2nd - 6th Sept
2013

Post-conference histology
workshop on the sensory system
7th Sept 2013

<http://eafp.org/>



Book review

Fish Vetting Essentials *By Dr Richmond Loh & Dr Matt Landos*

215 pages, A4 paperback, AUD99 plus P&P (S&H)

Available from: www.thefishvet.com.au

(Taken from World Aquatic Veterinary Medical Association Aquatic Vet News Vol. 6, No. 2, 2012)

This is a revised and expanded edition of the original Australian Fish Vetting Essentials, written by two veterinarians who are members of the Australian and New Zealand College of Veterinary Scientists' Aquatic Animal Health Chapter and between them have many years of experience in treating fish and other aquatic animals. The book is written in a concise and friendly style and delivers exactly as per the title. It is a book that can be read from cover to cover or dipped into as necessary to check dosages or show the client a picture of the parasite being discussed. The book may be divided into five sections: comparative anatomy and physiology, husbandry, disease investigation and diagnosis, therapeutics and what might be called miscellaneous but includes important topics such as diagnostic imaging and surgery.

The book starts with a section on comparative anatomy and physiology and then follows with brief descriptions and identifying key to the various groups of (mainly ornamental) fish. Whilst the discussion is brief and to the point, it does provide sufficient information so that a veterinarian new to aquatic medicine can feel confident they understand the principle differences of importance to diagnosis and treatment, whilst to those of us with more experience it provides a nice reference and chance to recall some of the concepts taught at college.

The next section I have termed husbandry and it ranges from setting up ponds and aquaria through water quality parameters to diet and nutrition and again the information provided covers these areas sufficiently to provide confidence to the practitioner, whilst not being too onerous. Of great use in this section are numerous tables, such as optimal pH for various species and acceptable and toxic levels of heavy metals. This is a feature that runs through the whole book, the necessary information is provided in an easy to read format, but if you require great depth to the subject, then you have to look elsewhere.

Following on is the disease investigation and diagnosis section. Here basic sampling techniques are described, as well as laboratory methods used, such as bacteriology, haematology and serum biochemistry. Having described how to carry out a clinical examination, the text moves to a description of the common fish diseases, again with a focus on ornamentals and many of the descriptions include photographs.

The therapeutics section is reasonably complete, although I was surprised that phenoxyethanol was not included under anaesthetics, possibly indicating a very slight bias towards those drugs available in Australia and



so towards those the authors are more familiar with. The final section ranges across several topics from surgery to reproduction as well as notifiable diseases.

This is a book which delivers exactly what it says on the cover and is a great addition to the consultation room and not just to gather dust in the practice library since it is designed to be used. The coverage is comprehensive, demonstrating the full toolbox available to the veterinarian and contains the sort of information in one text that I wish had been available when I started my own path along aquatic veterinary medicine. Every practice should have a copy.

*Review by: **Chris Walster**, Island Vets, UK*

Next Issue of the FHS Newsletter

Feature articles on aquatic animal health activities in Asia

Please send in articles for newsletter to the editor:

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People news

If you would like to let your fellow researchers know of your new adventures and whereabouts, drop me a line or two with your new contact details. Ed.