



Australian Government
Department of Agriculture,
Fisheries and Forestry



ASIA PACIFIC EMERGENCY REGIONAL CONSULTATION ON SHRIMP EARLY MORTALITY SYNDROME (EMS)/ ACUTE HEPATOPANCREATIC NECROSIS SYNDROME (AHPNS)

9-10 August 2012
Bangkok, Thailand

Prospectus

Rationale

The Asia-Pacific region, being the top producer of aquaculture products in the world, is continuously beset by emerging aquatic animal disease problems causing high mortalities and economic losses among small farmers as well as commercial producers. Recently, a new/emerging disease known as early mortality syndrome (EMS) in shrimp (also termed acute hepatopancreatic necrosis syndrome or AHPNS) has been reported to cause significant losses among shrimp farmers in China (2009), Vietnam (2010) and Malaysia (2011). It was also reported to affect shrimp in the eastern Gulf of Thailand (Flegel, 2012)¹. Outbreaks in Vietnam and Malaysia have caused severe economic losses and significantly lowered annual shrimp production.

The disease affects both *P. monodon* and *P. vannamei* and is characterized by mass mortalities (reaching up to 100% in some cases) during the first 20-30 days of culture (post-stocking in grow-out ponds). Clinical signs observed include slow growth, corkscrew swimming, loose shells, as well as pale coloration. Affected shrimp also consistently show an abnormal hepatopancreas (shrunken, small, swollen or discoloured). The primary pathogen (considering the disease is infectious) has not been identified, while the presence of some microbes including *Vibrio*, microsporidians and nematode has been observed in some samples. Lightner et al. (2012)² described the pathological and etiological details of this disease. Histological examination showed that the effects of EMS in both *P. monodon* and *P. vannamei* appear to be limited to the hepatopancreas (HP) and show the following pathology:

- 1) Lack of mitotic activity in generative E cells of the HP;
- 2) Dysfunction of central hepatopancreatic B, F and R cells;

¹ Flegel, T.W. 2012. Historic emergence, impact and current status of shrimp pathogens in Asia. *Journal of Invertebrate Pathology* 110:166-173.

² Lightner, DV, Redman, RM, Pantoja, CR, Noble, BI, Tran, L. 2012. Early mortality syndrome affects shrimp in Asia. *Global Aquaculture Advocate*, January/February 2012:40.

- 3) Prominent karyomegaly and massive sloughing of central HP tubule epithelial cells;
- 4) Terminal stages including massive intertubular hemocytic aggregation followed by secondary bacterial infections.

So far no potential causative pathogen has been found and possible etiologies include toxins (biotic or abiotic), bacteria and viruses (NACA-FAO 2011)³. Nonetheless, the spread of the disease and its devastating effect in the shrimp industry of the countries affected so far, will require proper contingency planning in other countries in the region, especially in *P. vannamei* culture which is commonly cultivated at present in many Southeast Asian countries. Added to this is the standing threat of infections myonecrosis (IMN) on *P. vannamei* culture, which is now somehow contained within Indonesia. Rumors of disease outbreaks caused by IMNV from other countries in Asia have so far been false (Senapin et al., 2011)⁴.

Identifying the primary cause of the disease is necessary, but while this information is not yet available, increased disease awareness and preparedness should be implemented by every shrimp-producing country in the region. Considering the great economic loss that EMS will cause in the region's shrimp industry, ways of preventing the spread and/or occurrence of this disease should be formulated by concerned experts, officials and other regulatory bodies. Farmers, on the other hand, should also properly cooperate with the concerned agencies by promptly reporting any suspected mortalities among cultured shrimp that appear to be similar to the clinical description of EMS/AHPNS. It is important that histological examination be carried out to confirm that suspected occurrences fit the AHPNS case definition devised by Dr. Lightner.

Considering the seriousness of this emerging shrimp disease, NACA and DAFF are convening this regional consultation involving global experts, national participants representing the Competent Authority and lead research institutions, regional and international organizations and private sector with the following objectives.

Objectives

This regional consultation will:

- a) Provide an overview of the current disease and its spread, with emphasis on the threat that it poses in the shrimp industry of the region;
- b) Assess the economic effects of the disease: outbreaks in China, Vietnam, Malaysia and Thailand;
- c) Identify any similar occurrences in other countries in the region;
- d) Develop a field level disease card and case definition as easy reference in monitoring the occurrence of the disease;
- e) Formulate a regional action plan – improved disease surveillance and reporting, and contingency measures to contain and prevent further spread of the disease;
- f) Develop or plan collaborative research on EMS/AHPNS, inter-regionally and internationally, to identify the primary causative agent, develop preventive measures, etc.; and,
- g) Formulate other regulatory measures for overall management of the disease.

³ NACA-FAO 2011. Quarterly Aquatic Animal Disease report (Asia and Pacific Region), 2011/2, April-June 2011. NACA, Bangkok, Thailand.

⁴ Senapin, S., Phiwsaiya, K., Gangnonngiw, W., Flegel, T.W. 2011. False rumours of disease outbreaks caused by infectious myonecrosis virus (IMNV) in the whiteleg shrimp in Asia. Journal of Negative Results in BioMedicine. 10: 10

Participants

Participants will be representatives from shrimp producing countries of the region including:

- ASEAN member countries
- NACA member countries

International and regional experts, including OIE experts, will be invited to make presentations and facilitate series of discussions pertaining to the disease.

Process

The workshop will include detailed lecture on the description of the new disease including gross signs, histopathological characteristics, production losses, suspected pathogens/causative agent, etc. An open discussion will follow the lecture so that the participants will have more insights on the importance of the disease. This will be followed by presentations on disease outbreak cases in China, Vietnam, Malaysia and Thailand. Similar cases observed in other countries (if any) will then be tackled in the discussion/forum.

Group discussions on various key issues will be facilitated by experts to develop recommendations and follow up actions. A disease card will be developed for wider dissemination as first-hand reference for the disease. Formulation of important regulations to contain and prevent the spread of the disease will be of high importance. Finally, collaborative research will be planned to pinpoint the primary causative agent of the disease, which is necessary for the development of prevention and control measures.

Expected Outputs

At the end of the two-day workshop, the following outputs are envisaged:

- Increased awareness on EMS/AHPNS;
- Field level Disease Card and case definition for EMS/AHPNS developed for publication and dissemination to shrimp-producing sectors in the region;
- Development of a template for outbreak investigation
- Regional action plan on emergency response and contingency planning developed;
- Surveillance, monitoring and reporting of EMS/AHPNS outbreaks improved;
- Collaborative research to identify the primary causative agent and development of preventive and control measures planned/developed.

Provisional Agenda

Day 1: 8 August 2012 - Arrival of Participants		
Day 2: 9 August, 2012		
0830-0900h	Registration	
0900-0915h	Formal Opening Session <ul style="list-style-type: none"> • Opening welcome Remarks by DG, NACA • Opening welcome Remarks by DAFF 	
0915-1000h	Background, Objectives, structure and Expected Outputs by NACA/DAFF Introduction of participants Announcements and local logistics Group Photo	
<i>1000-1030h: Coffee Break</i>		
	Moderators: Ingo Ernst (DAFF) and Mohan (NACA)	
1030-1100h	Characterization, distribution, impacts and case definition By Prof Lightner	
1100-1130h	Diagnostics-where we are? By Prof Tim Flegel	
1130-1200h	Epidemiology and risk factors-what we know? By Dr Flavio Corsin	
1200-1230h	Disease emergence –why and how? Prof Peter Walker	
<i>1230-1330h: Lunch Break</i>		
1330-1400h	Novel methods for “Hunting for Ghost Viruses” by Dr Jeff Cowley	
1400-1430h	Experiences from Vietnam	
1430-1500h	Experiences from China	
1500-1530h	Experiences from Thailand	
<i>1530-1600h: Coffee Break</i>		
1600-1630	Experiences from Malaysia	
1630-1700	Experiences from other countries (if any)	
1700-1730	General Discussions and Wrap up for the day	
Day 3: 10 August, 2012		
	Moderators: Jeff Cowley (CSIRO) and Ed Leano (NACA)	
0900-0920h	Is EMS a management problem? By Dr Matt Briggs	
0920-0940h	One month mortality syndrome-revisiting an old story in the context of EMS by Dr Celia Pitogo	
0940-1000h	Management of EMS-What works and what does not? By Prof Chalor Limsuwan	
1000-1020h	Disease preparedness-theory and practice By Dr Ingo Ernst	
<i>1020-1045h: Coffee Break</i>		
1045-1100h	Group discussion themes and expected outputs By Mohan and Ingo	
1100-1230h	Group 1: Knowledge gaps and research priorities Expert and Facilitator: Prof Timothy Flegel Group 2: Surveillance, early response measures and priorities	

	<p>Expert and Facilitator: Dr Flavio Corsin</p> <p>Group 3: National and regional contingency plans Expert and Facilitator: Dr Celia Pitogo</p> <p>Group 4: Case definition, outbreak investigation, and disease card Expert and Facilitator: Prof Don Lightner</p>	
<i>1230-1330h: Lunch Break</i>		
1330-1400	Finalization of group presentations by Rapporteurs and Facilitators	
	Moderator: Dr Supranee Chinabut and Dr Peter Walker	
1400-1500	Presentations of group findings and discussions	
<i>1500-1530h: Coffee Break</i>		
	Moderators: Eknath, Ingo, Mohan, Tim Flegel, Don Lightner	
1530-1630	Plenary discussions, recommendations and follow up actions	
1630-1700h	<p>Closing Formalities</p> <ul style="list-style-type: none"> • Closing remarks by DAFF • Closing remarks by NACA 	
Day 4: 11 August, 2012 – Departure of Participants		