

Proposed



Aquatic Animal Health

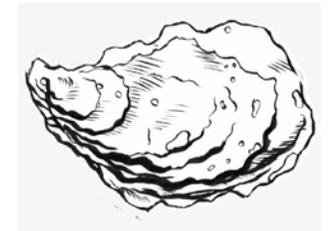
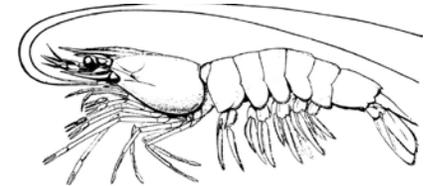
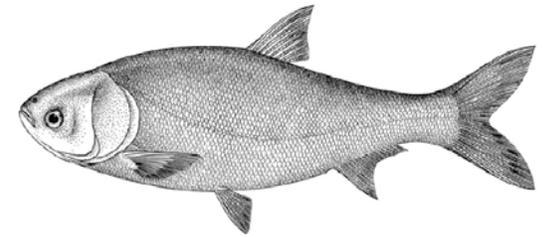
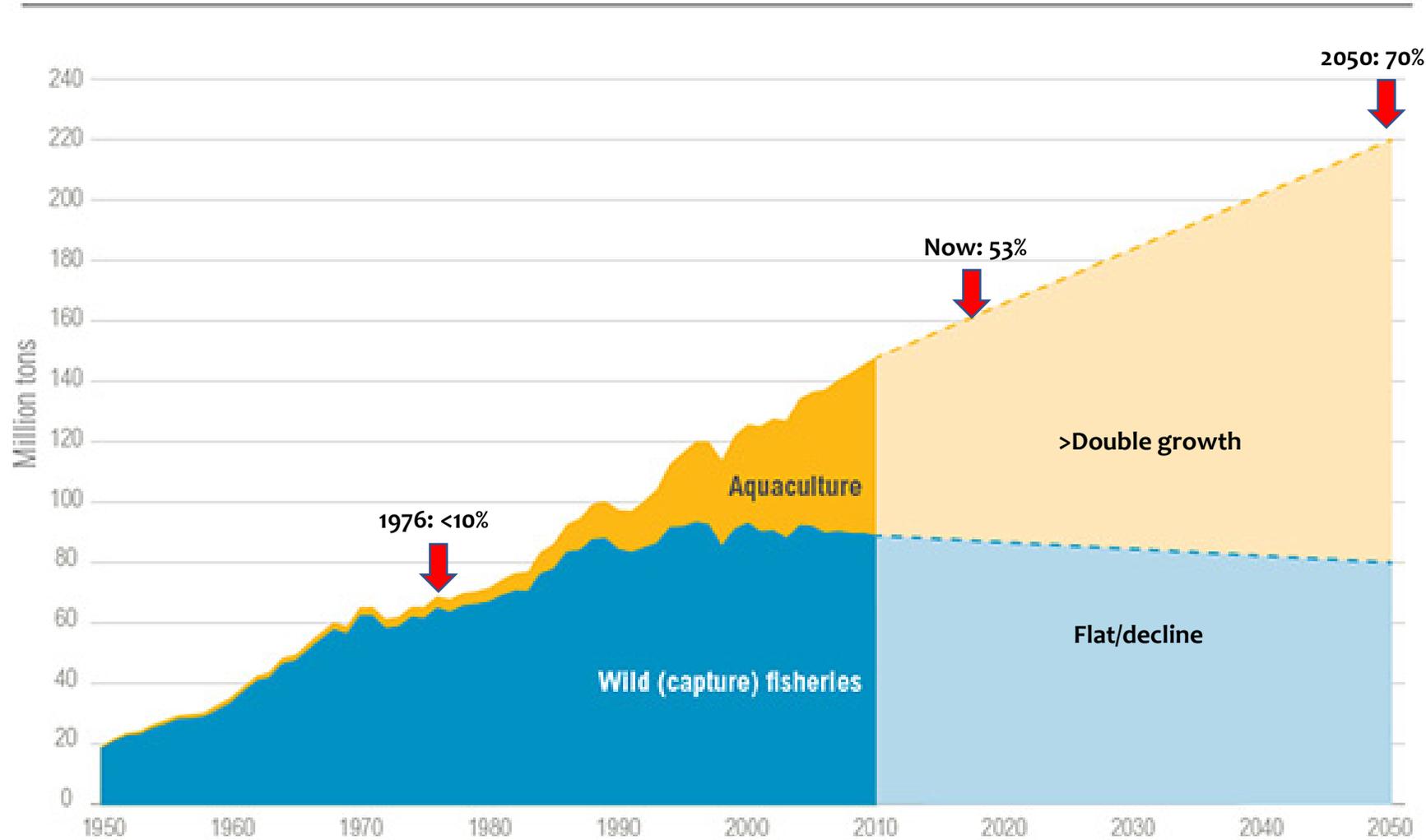


OIE Collaborating Centre for
Emerging Aquatic Animal Diseases

Dr Kelly Bateman and Professor Stephen Feist



Aquaculture Is Expanding to Meet World Fish Demand

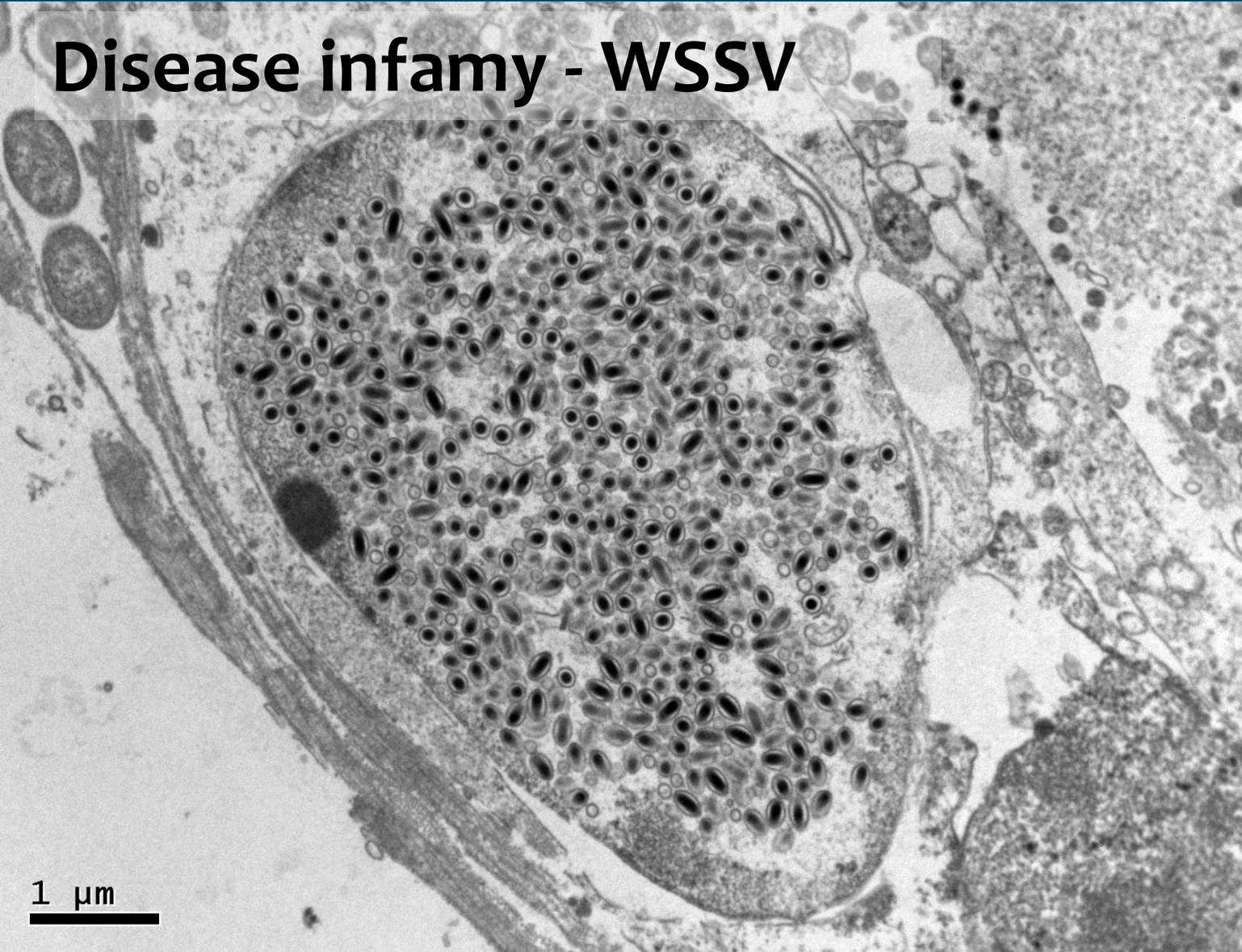


- Fastest growing food sector
- 90% in developing nations
- Highly traded

Source: Historical data 1950–2010: FAO. 2014. "FishStatJ." Rome: FAO. Projections 2011–2050: Calculated at WRI, assumes 10 percent reduction in wild fish catch between 2010 and 2050, and linear growth of aquaculture production at an additional 2 million tons per year between 2010 and 2050.

See www.wri.org/publication/improving-aquaculture for full paper.

Disease infamy - WSSV



Shrimp aquaculture ~ \$12-15bn pa⁻¹
WSSV is no.1 pathogen (>\$1bn pa⁻¹)
\$20bn since emergence
Losses to 'big 5' = all EU imports pa⁻¹
Emergent diseases are frequent (e.g. EMS)



Diseases continue to emerge...fast

Diseases of Crustaceans — Acute Hepatopancreatic Necrosis Disease (AHPND)

Signs of Disease

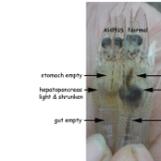
Disease signs at pond level

- Often pale to white hepatopancreas (HP) due to pigment loss in the connective tissue capsule.
- Significant atrophy (shrinkage) of HP.
- Often soft shells and guts with discontinuous contents or no content.
- Black spots or streaks sometimes visible within the HP.
- HP does not squash easily between thumb & finger.
- Onset of clinical signs and mortality starting as early as 10 days post stocking.
- Moribund shrimp sink to bottom.

Disease signs at animal level by histopathology

- Acute progressive degeneration of the HP accompanied initially by a decrease of R, B and F-cells followed last by a marked reduction of mitotic activity in E-cells.
- Progress of lesion development is proximal-to-distal with dysfunction of R, B, F, and lastly E-cells, with affected HP tubule mucosal cells presenting prominent karyomegaly (enlarged nuclei), and rounding and sloughing into the HP tubule lumens.
- The sloughed HP cells provide a substrate for intense bacterial growth, resulting in massive secondary bacterial infection (putative *Vibrio* spp.) and complete destruction of HP at the terminal phase of the disease.

Note: The only definitive histopathology is the massive sloughing off of HP tubule epithelial cells in the absence of bacteria.



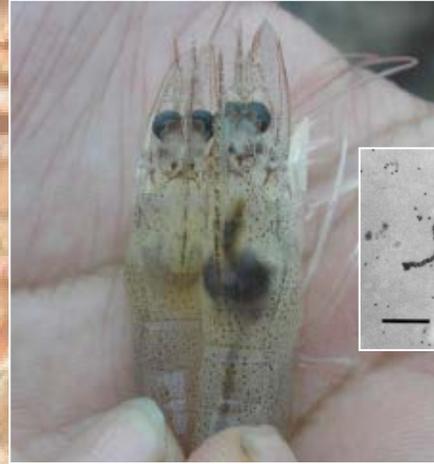
Gross signs of *Penaeus vannamei* affected by AHPND (left) compared to normal shrimp (right).
Source: D Lightner/T. Flegel



Pale atrophied hepatopancreas of juvenile *Penaeus vannamei*, indicative of AHPND.
Source: D Lightner



Pale atrophied hepatopancreas of juvenile *Penaeus monodon* from Vietnam with AHPND.
Source: D Lightner



The opportunistic marine pathogen *Vibrio parahaemolyticus* becomes virulent by acquiring a plasmid that expresses a deadly toxin

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undercurrentnews

seafood business news from beneath the surface

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Indonesia set to eclipse Thai shrimp supply as result of EMS

October 17, 2013, 7:24 pm

Eva Tallaksen



The early mortality syndrome (EMS) ravaging shrimp production in Asia and now in Mexico is redesigning Asia's supply landscape, according to data provided by James Anderson, who heads the World Bank global program on fisheries and aquaculture, at the GOAL 2013 conference in Paris.

Figures collected by the Food and Agriculture Organization and forecasts compiled by GOAL show China, Thailand and Mexico are expected to be the hardest hit by EMS, leaving Indonesia looking at producing roughly twice as much as Thailand this year.

An expected harvest of less than 300,000 metric tons in Thailand -- the exporters' association recently forecast 270,000t -- means the country that was Asia's second largest producer last year will be producing barely more than India, the region's fifth largest producer, in 2013.

It also means Indonesia is set to comfortably eclipse Thailand as the main supplier, with production of nearly 600,000t this year, slightly dropping in 2014, before hitting 600,000t in 2015. In comparison, Thailand's production is projected to hit barely 400,000t in 2015 (an estimated number from the presentation chart).

Share

CP Foods shrimp operation expected to lose THB 1.5bn in Q3

GOAL blog: Shrimp supply, demand talk dominates Paris conference

Black tiger reaction to EMS offers clues on disease

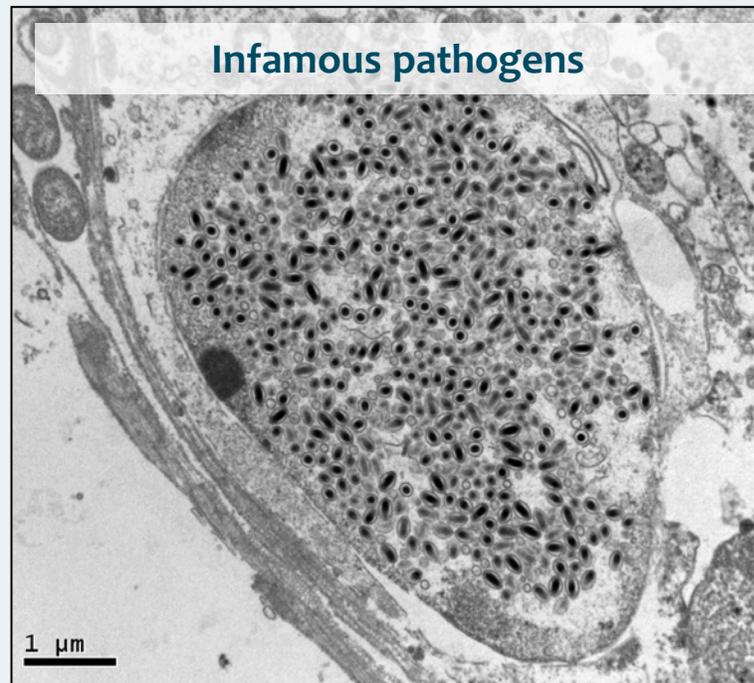
Myanmar: Aquaculture's 'last frontier'

VIDEO: For the first time in years, shrimp and fish production falls, says GAA

Disease is the #1 issue in limiting yield, reducing profit and preventing investment



Emergence rate is high



Deficit in trained professionals/AH investment



Dispersed industry. 90% in Asia

What is an emerging disease?

‘a new infection resulting from the evolution or change of an existing pathogen resulting in a change of host range, vector, pathogenicity or strain; or the occurrence of a previously unrecognized infection or disease’

A re-emerging disease is considered an already known disease that either shifts its geographical setting or expands its host range, or significantly increases its prevalence.



Emerging disease...

- Rapid detection and response to an emerging (or re-emerging) disease is crucial.
- From the time a new disease develops until it is detected, a critical time period elapses.
- Disease will have spread undetected for significant period of time before being detected and reported.
- Rapid detection can be slow in many developing countries (and some developed countries)
 - possible deficiencies in expertise, diagnostic laboratories, surveillance...
- Response capabilities depends on the available facilities.
- Methods to control emerging diseases in some developing countries are less effective.

OIE Collaborating Centre for Emerging Aquatic Animal Diseases Associate Partner Laboratories



- EURLs
- Associate Laboratories
- Collaborating Centres



- Securing aquatic animal health
 - identifying new and emerging disease conditions
 - reducing the transmission of diseases through risk management
 - decisions based on prompt and effective scientific investigations
- Ensuring transparency via dissemination of listed and emerging aquatic animal disease
 - Website
 - International Database on Aquatic Animal Diseases (IDAAD)
 - Registry for Aquatic Pathology (RAP)
- Offer expertise and assistance to countries where aquaculture occurs
- Promotion of diagnostic services through provision of training courses and workshops



For issues relating to Crustacean Health: kelly.bateman@cefas.co.uk



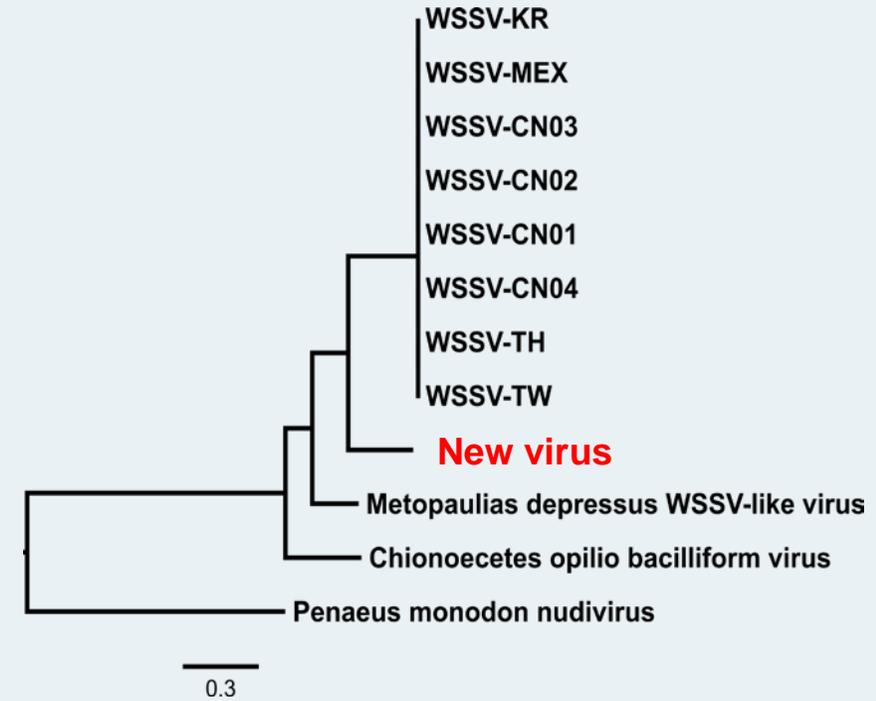
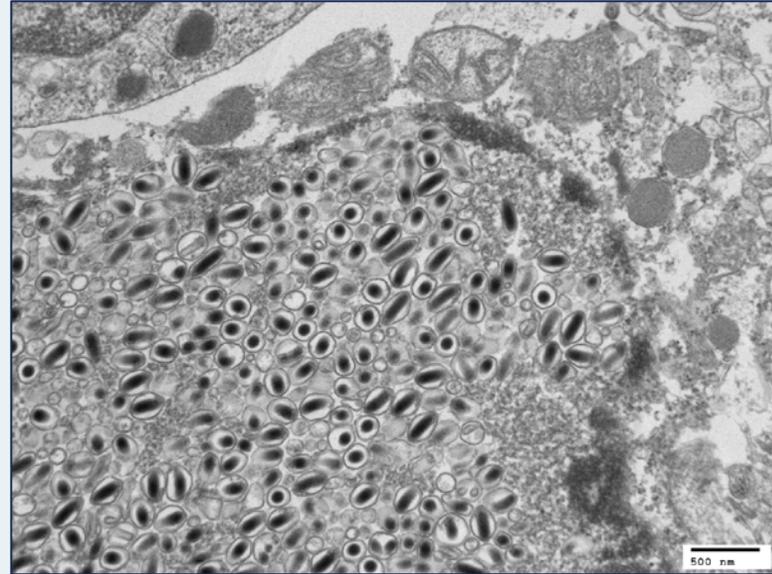
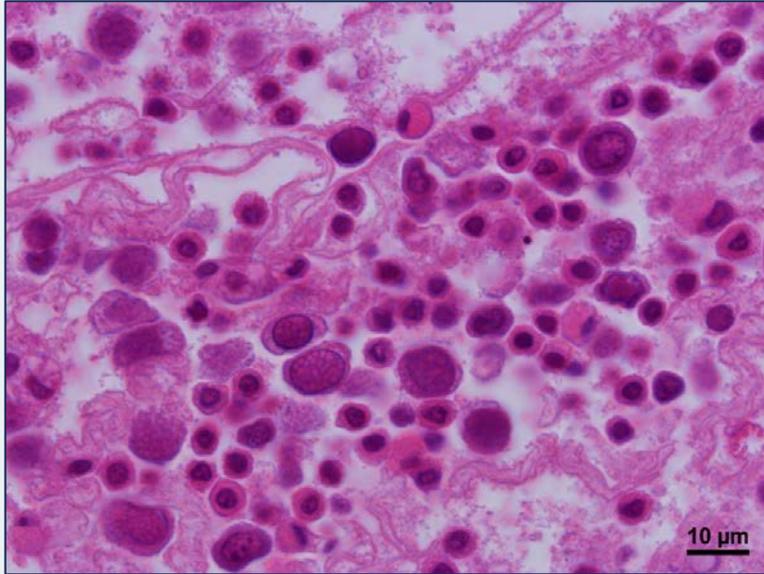
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For issues relating to Molluscan Health: frederico.batista@cefas.co.uk



All about the sampling...



Crustacean theme

Special Issue JIP - Health and Disease in Penaeid Shrimp - 2019

Immunity and health

Endocrine system

Microbiome

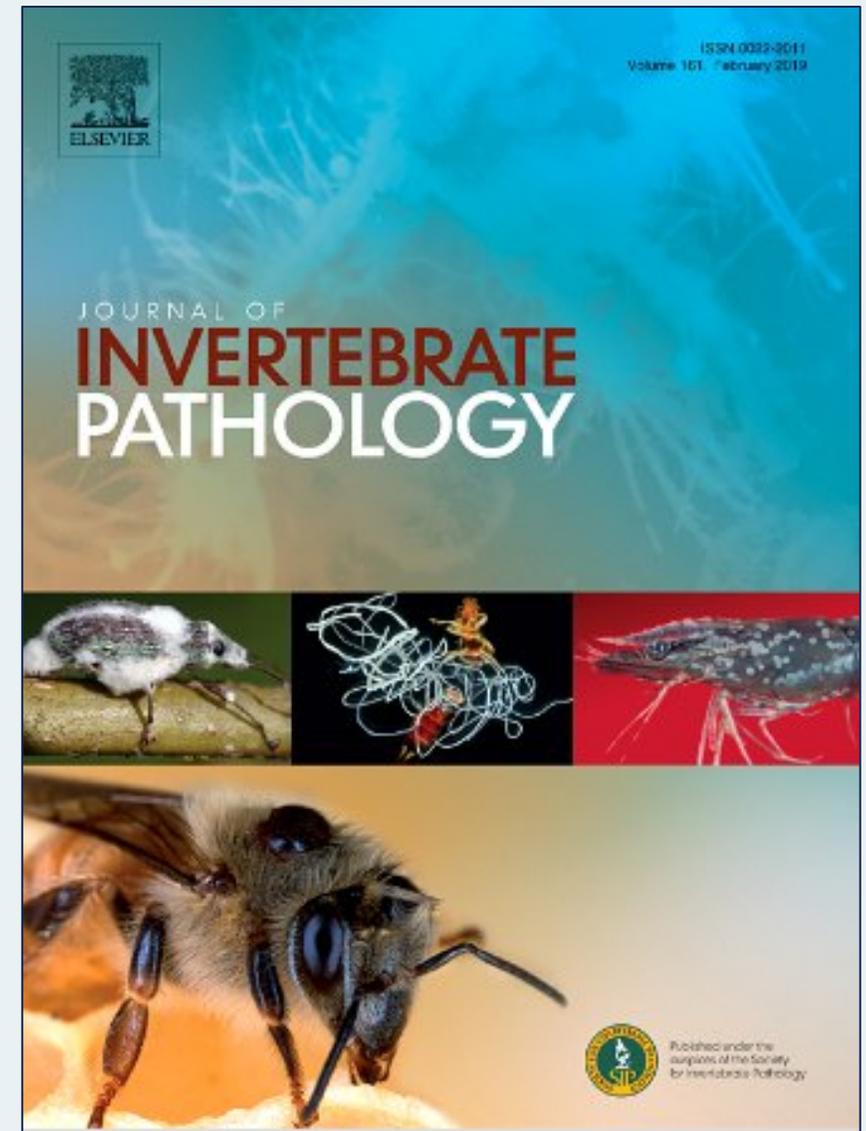
Emergent diseases

Environmental conditions and susceptibility

Biosecurity

Economics of disease

Indoor cultivation of shrimp, recirculating systems, Stress-related health conditions?



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- Associate Laboratories
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Aquatic Animal Health



OIE Collaborating Centre for
Emerging Aquatic Animal Diseases



Thank you