



## Electronic Newsletter

### Fish Health Section/Asian Fisheries Society

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*Happy New Year!!!*



#### Focus on Koi Herpes Virus (KHV)

Many of us are now aware of the serious spread of KHV to Asia – in 2002 - to Indonesia, China (Dr. Jiang Yulin, Shenzhen Exit and Entry Inspection and Quarantine Bureau, pers. comm.) and Taiwan (Dr. Chien Tu, Taiwan's Animal Health Research Institute, pers. comm.) and most recently to Japan. Losses have been estimated at US\$ 5.5 M (roughly equivalent to 5 B rupiah) in Indonesia and approximately US\$ 1.4 M in Japan (ProMed News, 4 November 2003).

The suspected KHV outbreak in Indonesia was investigated by an Emergency Disease Control Task Force organized by NACA in June-July 2002. The focus of the Task Force investigation was to assess the disease situation, determine the possible involvement of KHV (a disease whose epidemiological characteristics were analogous to the ongoing outbreak based on preliminary findings of an earlier visit to Indonesia in June), and provide advice and recommendations to the Government of Indonesia on how to control the epizootic. The Task Force Members included Dr Angus Cameron, Dr. Somkiat Kanchanachan and myself, supported by a Local Task Force headed by Dr Ahmed Rukyani and a number of participating organizations and scientists/laboratories such as ACIAR, FAO, AAHRI, Centex-Thailand, Intervet (Singapore, Indonesia, Netherlands), Institute of Aquaculture (Stirling University, Scotland, UK) and UC Davis (California, USA).

According to the Task Force findings, an infectious agent/s is involved in the Indonesian outbreak based on epidemiological observations (e.g sudden onset, rapid spread, specificity to koi and common carp, analogy with KHV outbreaks), that the disease was introduced to Indonesia through fish importation and spread into other areas through fish movements. The observed pathology did not reveal a diagnosis of the earlier suspected KHV, no virus could be isolated nor virions observed through electron microscopy. However, the detection of viral DNA through PCR from all case samples, strongly indicated that KHV was present in koi and common carps in Indonesia and may have



*Members of the Emergency Disease Control Task Force organized by NACA in July 2002: Drs. Somkiat Kanchanakan (AAHRI), Melba Reantaso (formerly of NACA) and Angus Cameron (Ausvet) with senior officials (Drs. Sukadi and Rukyani) of Indonesia's Ministry of Marine Affairs and Fisheries (Photo courtesy of A Cameron, Ausvet).*

played a significant role in the observed mortalities. Since the outbreak in Indonesia (and those in China and Taiwan) are all first time diagnoses (PCR diagnostics) of a disease with significant magnitude, it is essential that all available diagnostic techniques (pathology, viral isolation, *in-situ* hybridization, and electron microscopy) be undertaken to confirm the involvement of KHV. Rigorous testing to confirm diagnosis, application of Koch's postulates and integrating epidemiology are all important and should be carried out. The Task Force findings recommended that this serious outbreak of koi and common carp be called '**Mass mortality of koi and common carp**' until a clear association with KHV or any other specific disease can be established.

The Government of Indonesia was advised to temporarily restrict the movement of koi and common carps through a Ministerial Circular which took effect in July 2002. An intensive information dissemination was also undertaken to raise awareness and inform the public sector about relevant information, including risks to human health, available at

that time. The Government of Indonesia was also advised to report the matter to OIE and a report was immediately sent to OIE in 26 June 2002.

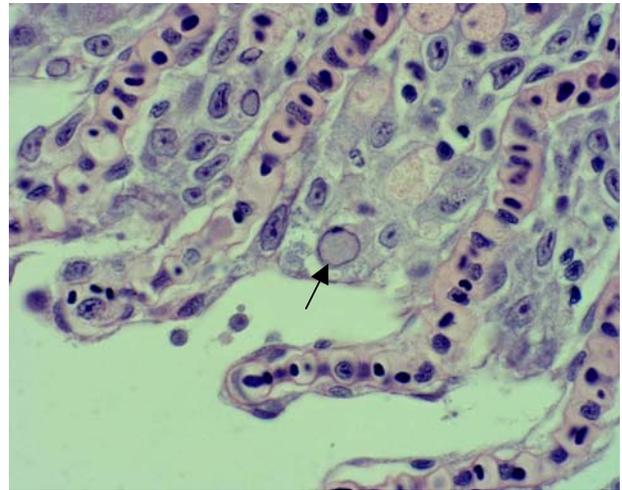
The Task Force investigation and the series of intensive information exchange about the disease served as an early warning to regional countries involved in common and koi carp aquaculture and trade. Since the completion of the Task Force work and perhaps due to the impacts of the Japanese outbreak as well as increasing KHV reports from many countries, concerted actions from various stakeholders are now taking place.

In October 2002, FAO responded immediately and positively by providing an emergency assistance through a Technical Cooperation Project (TCP) ‘Health management in freshwater aquaculture’ to further assist Indonesia in finding resolution to this emergency situation.



***Koi and common carps showing clinical signs of the disease, i.e. branchial haemorrhage and necrosis.***

The First Meeting of NACA’s Regional Advisory Group on Aquatic Animal Health (AG) held in November 2002 recommended the inclusion of ‘Koi mass mortality’ under the category ‘Unknown diseases of serious nature’ of the Quarterly Aquatic Animal Disease Reporting System (QAAD) of NACA/FAO and OIE. Several countries (e.g. Hong Kong SAR, Japan and Thailand) now have an on-



***KHV gill pathology. Hyperplasia and fusion of secondary gill lamellae; intranuclear inclusion (arrow) in the branchial epithelium (gill section stained with hematoxylin and eosin). Photo courtesy of Prof. R. Hedrick, UC Davis.***

going surveillance for KHV using Levels II, I and III diagnostics, respectively<sup>1</sup>. The disease is not currently listed under OIE’s ‘Notifiable Diseases’, however, an emergency notification was provided to OIE by the Indonesian Government in June 2002 as suggested by NACA. This mass mortality of koi and common carp is currently being reported by at least 21 countries in Asia-Pacific under the Asia-Pacific QAAD. The Second Meeting of the AG in November 2003 strongly recommended that efforts be made to improve surveillance and reporting of this disease. NACA continues to disseminate available information regarding this disease to the National Coordinators on Health of the 21 Governments in the region participating in the regional disease reporting.

In Singapore, since the published reports of KHV outbreak in Japan in October 2003, the AgriFood and Veterinary Authority (AVA), instituted compulsory inspection, testing and quarantine of all koi consignments imported from Japan as well as koi imports from Indonesia. Quarantine is for a minimum period of 3 weeks. A regular KHV surveillance program based on regular inspection and laboratory testing of koi samples from fish exporters has been carried out since January 2003, under an ‘Accredited Ornamental Fish Exporter Scheme’ (AOFES). No KHV positive cases has been detected to date. AVA has also held dialogue sessions with licensed fish exporters to address concerns, maintain industry awareness of the disease and prevent export of KHV infected fish (Dr. S Kueh, AVA, pers. comm.).

Japan’s Ministry of Agriculture, Forestry and Fisheries is considering suspension of carp exports (<http://www.practicalfishkeeping.co.uk/pfk/pages/item.php?news=119>). The largest koi-grading show in the country scheduled to be held in January 2004 has been cancelled by

the All Japan Nishikigoi Promotion Association (<http://www.practicalfishkeeping.co.uk/pfk/pages/item.php?news=139>).

An **International Workshop on KHV** will be held at the Diskus Conference Center in London, UK, 12-13 February 2004, to be participated by some 40 invited attendees (Dr. B. Hill, CEFAS, pers. comm.). The aim of the workshop is to raise the general awareness amongst regulators, scientists and the industry of the current status of KHV with respect to its management, identification and potential treatment. The meeting will be chaired by Mr Keith Davenport, Chief Executive of the Ornamental and Aquatic Trade Association (OATA). Dr Keith Way of CEFAS, Weymouth will act as principle rapporteur. A brief report including conclusions and recommendations for the current and future management, diagnosis and treatment of KHV is expected from this workshop.

An **International Conference on KHV** is also being organized by the Fisheries Agency of Japan in mid-March 2004, in Yokohama, Japan, as a forum to exchange information about KHV (Dr. S. Chinabut, AAHRI, pers. comm.).

Later during the year 2004, FAO is proposing to hold a regional workshop on **“Emergency Preparedness and Response to Aquatic Animal Diseases in Asia”** (Dr. R.P Subasinghe, FAO, pers. comm.). The Workshop will review the regional experiences in responding to disease emergencies, including the work accomplished through an FAO TCP project in Indonesia “Health management in freshwater aquaculture” aimed at providing technical assistance to improve national capacity to respond to the ongoing carp disease epizootic. The Workshop envisages to improve the national and regional understanding and knowledge on the importance of preparedness and response to diseases emergencies, discuss approaches for reducing such risks to cultured and wild aquatic fauna, and to establish an action plan to provide guidance and assistance to the countries in the region to move forward on this important issue.

This KHV incursion to the region presents a huge trade implication for the high value ornamental koi carp and the regionally important food fish common carp. KHV is a serious disease condition causing significant losses and has been reported from countries such as Israel<sup>2,3</sup>, the United Kingdom, Germany, Netherlands, Belgium, Denmark<sup>4,5</sup> and the United States<sup>2</sup>. It is now clear that unregulated trade in ornamental fish is responsible for the escalating global spread of the disease<sup>6</sup>.

ProMED-mail (<http://www.promedmail.org>), a program of the International Society for Infectious Diseases (<http://www.isid.org>) provided a number of historical news about KHV.

We shall continue to keep you updated as new information becomes available.

#### References Cited:

<sup>1</sup>NACA/FAO. (2003). Quarterly Aquatic Animal Disease Report (Asia and Pacific Region), 2003/1, January to March 2003. NACA, Bangkok, Thailand. 53 pp.

<sup>2</sup>Hedrick, R.P., Gilad, O., Yun, S., Spandenberg, J.V., Marty, G.D., Nordhausen, R.W., Kebus, M.J., Bercovier, H., Eldar, A. (2002). A Herpesvirus Associated with Mass Mortality of Juvenile and Adult Koi, a Strain of Common Carp. *J. Aquat. Anim. Health* 12, 44-57.

<sup>3</sup>Ariav, R., Tinman, S., Paperna, I. and Bejerano, I. (1999). First Report of Newly Emerging Viral Disease of *Cyprinus carpio* Species in Israel. 9th International Conference on Diseases of Fish and Shellfish. European Association of Fish Pathologists, 19-24, September 1999, Rhodes, Greece.

<sup>4</sup>OATA. (2001). Koi Herpes Virus (KHV). Ornamental Aquatic Trade Association (OATA). United Kingdom. 33 pp.

<sup>5</sup>Ariel, E. (2002). Ornamental disease vectors. *In: Book of Abstracts, Fifth Symposium on Diseases in Asian Aquaculture*, P 102, 25-28 November 2002, Brisbane,

<sup>6</sup>Gilad, O., S. Yun, K. B. Andree, M.A. Adkison, A. Lotkin, H. Bercovier, A. Eldar and R.P. (2002). Initial characteristics of koi herpes virus and the development of a polymerase chain reaction assay to detect the virus in koi, *Cyprinus carpio koi*. *Dis. Aquat. Org.* 48: 101-108.

### Member Update

**Warm welcome** to the following new members of the FHS/AFS:

- **Philippines:** Raymond John Peralta
- **Saudi Arabia:** A.P. Sangamaheswaran
- **Singapore:** Komar Cedric

**Best wishes and sincere thanks to Ms Elsie Tech who has left the AFS Secretariat.**

**Congratulations and Welcome to the New Executive Officer of AFS Secretariat: Ms Emy Flores**

### News/ Project Updates

**NEW ISVEE 10 Outcome/ISAAE and ISVEE 11 News.** A plenary lecture on epidemiological approach to aquatic animal health management, focusing on the opportunities and challenges to developing countries was delivered by RP Subasinghe. The papers presented included, for example,

techniques applied to aquaculture, mariculture, fisheries, the conservation of marine mammals and the role of epidemiology in food safety; shrimp diseases; salmonid diseases; and emerging diseases such as pilchard disease and large mouth bass virus. Jay Levine, ISAAE President, chaired a business meeting of the ISAAE. The Society has grown from the 6 members who assembled at ISVEE 8 in 1997 to its current total of 110. The next meeting of ISVEE will be in Cairns, Australia in 2006, when aquatic epidemiology will form a major theme of the conference. More information on ISAAE can be found at [http://www.ncsu.edu/project/cvm\\_ISAAE/](http://www.ncsu.edu/project/cvm_ISAAE/). Membership to the Society can be requested by contacting Flavio Corsin at [Flavio\\_Corsin@ncsu.edu](mailto:Flavio_Corsin@ncsu.edu). Scientists involved in aquatic diseases who wish to discuss epidemiological study designs, analytical methods or the use of specific software are welcome to subscribe to the ISAAE list server at <http://lists.upei.ca/mailman/listinfo/isaae>.

**NEW** **FAO TCP “Health Management of Shrimp Aquaculture in Andhra Pradesh” (TCP/IND/2902)**. This project, which commenced in June 2003, addresses one of the main disease problems that the shrimp sector in Andhra Pradesh has had to deal with in recent years – WSSV which caused an estimated loss of US\$ 200 M during 1999-2000. The immediate objectives are: (a) to improve the capacity for health management and reduction in risks of shrimp disease outbreaks in Andhra Pradesh; (b) to improve the sustainability of the sector through Integrated Coastal Area Management (ICAM), the use of Geographical Information Systems (GIS) technology, and appropriate institutional arrangements; and (c) to support better management of the sector through organizing farmers, improving farmer-farmer and state-farmer contacts, and diversification. The activities of the FAO project are designed to take advantage of the complementary assistance and inputs by ACIAR, NACA and MPEDA. For more information on the above project, please contact Dr. RP Subasinghe at FAO/FIRI ([Rohana.Subasinghe@fao.org](mailto:Rohana.Subasinghe@fao.org)).

**NEW** **Reducing risks of aquatic animal disease outbreaks: Pilot project in Ca Mau, Nghe An, Ha Tinh, Quang Ninh, and Khanh Hoa coastal provinces of Vietnam**. SUMA and NACA will implement a 2-year project from January 2004 to support the development and implementation of aquatic animal health disease control measures in selected coastal provinces of Vietnam. The objective is to reduce risk of fish and shrimp disease outbreaks and the negative impacts of such diseases on farming households and trade in aquatic animals, in five pilot provinces of coastal Vietnam. An aquatic animal health specialist to be based in Vietnam to implement the project will be hired by NACA. More details at <http://www.enaca.org>.

## Upcoming Events (with relevant sessions on aquatic animal health)

### February 2004

**2004 Annual Meeting of the Whirling Disease Symposium and the Western Division of the American Fisheries Society**. The conference, entitled “Native Fish Management: Policies, Politics and Practicalities” is being co-hosted by the Colorado/Wyoming and Bonneville Chapters. The 10th Annual Whirling Disease Symposium will be held in conjunction with the Salt Lake City meeting. The goal of the session is to provide a forum in which whirling disease researchers and fisheries managers can come together to share information and experiences related to the disease. Examples of topics include: *Myxobolus cerebralis* infection in both the salmonid and oligochaete hosts, biology of the parasite, effects of ecological factors on disease severity, diagnostic methods abstracts will be produced for this symposium. 29 February to 4 March 2004, Little America and Grand America Hotels Salt Lake City Information: Persons wishing to participate in this symposium should contact the Whirling Disease Foundation directly at [whirling3@mcn.net](mailto:whirling3@mcn.net)

### March 2004

**11th International Congress on Infectious Diseases**, March 4-7, 2004, Cancun, Mexico. information can be obtained from website at [http://www.isid.org/11th\\_icid/](http://www.isid.org/11th_icid/).

**Aquaculture America 2004: Triennial meeting of the World Aquaculture Society, 96<sup>th</sup> Meeting of the National Shellfisheries Association, and AFS Fish Culture Section**, 1-5 March 2004, Honolulu, HI. See [www.was.org](http://www.was.org) <http://www.was.org>. Contact [worldaqua@aol.com](mailto:worldaqua@aol.com) <<mailto:worldaqua@aol.com>>

**NEW** **Biosecurity 2004 Program of WAS, Hawaii, USA, 3-5 March 2004**. Some 30 presentations are lined up in this special session of the WAS 2004 Meeting in Hawaii. FHS Members participating include RP Subasinghe, CV Mohan, B Hill, R Perrera and P Hardy-Smith. The special session will conclude with a round table discussion focusing on needs, frameworks, components, and optimal implementation approaches from the farm to the nation. The presentations will highlight some of the health management activities undertaken in the Asia-Pacific region.

**29th Annual Eastern Fish Health Workshop**. March 22-24, 2004, Atlantic Beach, North Carolina. Three day general sessions plus one day continuing education workshop on understanding tumours and neoplasia in lower vertebrates. Information by e-mail to [Rocco.Cipriano@usgs.gov](mailto:Rocco.Cipriano@usgs.gov)

#### **April 2004**

**NEW** **Experts Meeting on Implementation of a Global Invasive Species Information Network (GISIN)**, 6-8 April 2004, Inner Harbor Area, Baltimore, Maryland, USA. Experts from all realms of invaders (aquatic, terrestrial, plants, animals, diseases) are invited to participate. Jointly funded by the Bureau of Oceans and International Environmental and Scientific Affairs (OES) of the U.S. Department of State, coordination by the U.S. National Biological Information Infrastructure (NBII) with collaboration from members of the Global Invasive Species Programme (GISP) Informatics Working Group and others from around the globe, and logistical and organizational support from Information International Associates, Inc. (IIA). The URL for the meeting Web site is <http://gisin.infointl.com/> and has an on-line registration/application form.

#### **May 2004**

**35<sup>th</sup> Annual Conference and Workshop of the International Association of Aquatic Animal Medicine (IAAAM)**, Galveston, Texas. Information at [www.iaaam.org](http://www.iaaam.org).

#### **June 2004**

**NEW** **Diseases of Warmwater Fish, June 7-18, 2004, Ruskin and St. Augustine, Florida**  
Diseases of Warmwater Fish offered by the University of Florida, College of Veterinary Medicine and Institute of Food and Agricultural Sciences (IFAS), Department of Fisheries and Aquatic Sciences will be held in Ruskin and St. Augustine, Florida. It is an intensive two-week class designed to provide instruction in the methodology of diagnosis and treatment of parasitic, bacterial, viral, nutritional and environmental diseases of warmwater food fish and aquarium species. The course is open to students, veterinarians, fisheries biologists, aquaculturists and professional aquarists. Enrollment is limited and registration will be accepted on a first-come, first-served basis. For more information visit the course website or contact Dr. Ruth Francis-Floyd by phone: 352-392-9617 ext. 229, FAX: 352-392-3672.

**GISVET 2004**, 21-25 June 2004, Ontario Veterinary College, University of Guelph, Guelph, Ontario, Canada. The GISVET conferences are becoming the main forum for the presentation of research into the spatial epidemiology of diseases of animals, including livestock and wildlife, and zoonotic diseases of concern to public health. The objective of GISVET 2004 is to provide an international forum for academic and governmental researchers and officials interested in advancing applications of Geographic Information Systems (GIS) and spatial analyses, statistical techniques and modeling, to challenges in animal health and zoonotics. This conference will provide a rich environment for sharing information and ideas to advance scientific knowledge and collaborations in support of GIS activities

involving livestock, wildlife and public health. The GISVET 2004 e-mail address is: [gisvet04@uoguelph.ca](mailto:gisvet04@uoguelph.ca); Web URL is [www.gisvet.org](http://www.gisvet.org)

**International Marine Aquarium Conference**, Chicago, IL, 25-27 June 2004. Information at <http://www.theimac.org>; or Dennis Gallagher, e-mail: [dennis2103@comcast.net](mailto:dennis2103@comcast.net).

#### **July 2004**

**Annual Meeting of the FHS/American Fisheries Society**  
One day continuing education workshop on current topics in fish parasitology being planned in conjunction with the annual meeting. July 2004, Shepherdson, West Virginia. Further information at: [http://training.fws.gov/vicki\\_blazer@usgs.gov](http://training.fws.gov/vicki_blazer@usgs.gov)

#### **September 2004**

**6th International Symposium for Viruses of Lower Vertebrates (The 6th ISVLV)**. This is the 6th scientific gathering of ISVLV. Previous meetings were held in Seattle, USA (2002), Weymouth, England (1998), Jouy-en-Josas, France (1995), Corvallis, USA (1991) and Munich, Germany (1988). The main theme of 6th ISVLV is to bridge accumulating insights on molecular virology into applied and environmental virology of lower vertebrates. Scientists interested in viruses of amphibians, reptiles and fish are cordially invited. The 2-3 day scientific program will include sessions on pathogenesis, immunity, structural biology, molecular biology, virus evolution and emerging viruses of lower vertebrates. 20-22 September 2004 Hakodate Kokusai Hotel in Hakodate, Hokkaido, Japan Contact Site: Co-organizer Assoc. Prof. Nishizawa, T. Graduate School of Fisheries Sciences, Hokkaido University, Hakodate, 041-8611, Japan; E-mail: [jinishi@fish.hokudai.ac.jp](mailto:jinishi@fish.hokudai.ac.jp)

**NEW** **13th International Conference on Aquatic Invasive Species**, September 19-23, 2004, Lynch West County Hotel, Ennis, County Clare, Ireland. Hosted by the Institute of Technology, Sligo, this annual four-day conference is widely considered the most comprehensive international forum for the review of accumulated scientific knowledge on the impacts of aquatic invasive species, presentation of the latest field research and data, new technologies or advancements in control and mitigation, discussion of policy and approaches to effective public education and outreach initiatives to prevent new introductions. Suggested topic areas include: (a) Policy, legislation and monitoring; (b) Ecological and ecosystem impacts; (c) Socio-economic impacts; (d) information exchange; (e) education and outreach initiatives; (f) vectors of introduction; (g) control technologies for industrial and non-industrial settings. Abstract deadline: before 31 December 2003 Early Registration deadline: 31 May 2004. Information Contact: Elizabeth Muckle-Jeffs Conference Administrator 1027 Pembroke Street, East Suite 200 Pembroke ON K8A 3M4 Canada North America: 1-800-868-8776 International: 613-732-3386 Fax: 613-732-3386 E-mail: [profedge@renc.igs.net](mailto:profedge@renc.igs.net)

Website: [www.aquatic-invasive-species-conference.org](http://www.aquatic-invasive-species-conference.org)

**NEW Australasian Aquaculture 2004: Profitting from Sustainability, September 26-29, 2004, Sydney Convention Centre – Sydney, Australia** This is first of a series of national aquaculture conferences to be held biennially near the major aquaculture producing areas of Australia by Asian-Pacific Chapter of WAS, National Aquaculture Council of Australia and Tasmania Aquaculture Council. The event is sponsored by Australia's Fisheries Research and Development Corporation, Department of Agriculture, Fisheries and Forestry and hosted by NSW Fisheries. Meeting Website: [www.australian-aquacultureportal.com](http://www.australian-aquacultureportal.com); [www.was.org](http://www.was.org); [www.fisheries.nsw.gov.au](http://www.fisheries.nsw.gov.au)

#### **October 2004**

**Aquaculture Europe '04.** Organised by the European Aquaculture Society (EAS) in cooperation with the European Society of Marine Biotechnology (ESMB) and the European Association of Fish Pathologists (EAFP). Will discuss policy issues, genetics and reproduction, larvae and juveniles, ongrowing, rapid detection methods, vaccines, 'bio' health management, consumer satisfaction and health, safety and traceability, bioactive products through aquaculture. 20-23 October 2004, Barcelona, Spain Conference Website: [www.easonline.org](http://www.easonline.org); <http://www.easonline.org/agenda/en/AquaEuro2004/default.asp>

#### **November 2004**

**NEW 7th Asian Fisheries Forum set for Penang, Malaysia.** With the theme "New Dimensions and Challenges in Asian Fisheries in the 21<sup>st</sup> Century", the 7<sup>th</sup> Asian Fisheries Forum will be held at the Hotel Equatorial in Penang, Malaysia from 30 November to 4 December 2004. Special symposia on "Advances in Shrimp Biotechnology", Technology Needs and Prospects for Asian Aquaculture: Participation of the Poor" and "Biotechnology for Growth and reproduction in Fish" are included. For more details, contact the 7<sup>th</sup> AFF Secretariat at [7aff2004@usm.my](mailto:7aff2004@usm.my)

#### **August 2005**

**Fifth International Symposium on Monogeneans**, 8-12 August 2005, Zhongshan University, Guangzhou China. First circular announcement at [http://www.diplectanum.dsl.pipex.com/ism5/ism5\\_first\\_circular.pdf](http://www.diplectanum.dsl.pipex.com/ism5/ism5_first_circular.pdf); E-mail: [china.ism5@zsu.edu.cn](mailto:china.ism5@zsu.edu.cn); [ism5\\_china@yahoo.com.cn](mailto:ism5_china@yahoo.com.cn)

#### **October 2005**

**NEW Joint Australian Society for Parasitology (ASP) / World Association for the Advancement of Veterinary Parasitology (WAAVP) Conference**, New Zealand, October 2005. Details not yet available.

#### **August 2006**

**NEW ISVEE 11, Cairns, Australia.** 11<sup>th</sup> triennial meeting of the International Society for Veterinary Epidemiology and Economics. Details not yet available.

**XXXVIIth Annual Meeting of the Society for Invertebrate Pathology; International Conference on *Bacillus thuringiensis*.** August 1-6, 2006 Helsinki, Finland Contact: [h.hokkanen@kolumbus.fi](mailto:h.hokkanen@kolumbus.fi)

**11th International Congress of Parasitology (ICOPA XI).** 6-11 August 2006 Scotland, UK. Website: <http://www.icopa-xi.org/>

### **Publications**

*Please support our Society by purchasing the following FHS publication:*

**NEW Diseases in Asian Aquaculture IV. 2002. FHS/AFS.** C.R. Lavilla-Torres and E. Lacierda-Cruz (eds). Contains 43 peer-reviewed original research and review papers, dealing with the diseases and health management of aquatic animals, with emphasis on the Asia-Pacific Region, presented during the Fourth Symposium on Diseases in Asian Aquaculture (DAA IV), Cebu., Philippines, November 1999. Details at <http://afs-fhs.seafdec.org.ph>

### **Aquatic Animal Health Resources**

New discount offer on antibodies to detect Ig from different fish species, please visit [www.aquaticdiagnostics.com](http://www.aquaticdiagnostics.com).

### **Past Aquatic Animal Health Events**

#### **November 2003**

**Regional Workshop 'Current Situation and Market Perspectives for Aquaculture Products'**, El Pardo Hotel, Miraflores, Lima, Peru, 5-7 November 2003.

**Second Meeting of the Regional Advisory Group on Aquatic Animal Health**, 10-12 November 2003, NACA Headquarters, Bangkok, Thailand. Details at <http://www.enaca.org>

**10<sup>th</sup> International Symposium for Veterinary Epidemiology and Economics (ISVEE)**, November 17-21, 2003, Santiago, Chile.

**Second SEAFDEC Hands-on Training for Important Viral Diseases of Shrimp and Marine Fish** in Collaboration with OIE and NACA, 05 Nov - 21 Nov

2003, Tigbauan, Iloilo. Information at  
<http://www.seafdec.org.ph/training/viraldiseases.php>

**23th Conference of the OIE Regional Commission for Asia, the Far East and Oceania**, 25 to 28 November 2003, Noumea, New Caledonia

**December 2003**

**Aquaculture Australia**, 3-5 December 2003, Sydney, Australia.

*Special thanks to A Cameron and R Hedrick for providing photos; S Adams, R Adlard, S Chinabut, F Corsin, B Hill, S Kueh, CF Lo, CV Mohan, RP Subasinghe, C Tu and J Yulin for providing information.*

**This Electronic Newsletter, intended for FHS/AFS members and other subscribers, contains information on member news/updates, regional/global project news/updates, important events, useful publications and other aquatic animal health resources to and from the Asia-Pacific region. Regular issues will come out on a monthly, bimonthly or quarterly basis depending on available information; newsletter archive can be accessed at <http://afs-fhs.seafdec.org.ph>. For contributions, subscription/unsubscription, please send e-mail to [melba@goeaston.net](mailto:melba@goeaston.net).**