Kobe Gazette 3

August 8th (Tue), 2006

Evolution for Crop Protection, Public Health and Environmental Safety

(Sponsoring Organizations)

The International Union of Pure and Applied Chemistry (IUPAC) & Pesticide Science Society of Japan

Environmentally Benign Pesticides for all Creatures! Prof. Mori gives his Plenary Lecture

It is entirely possible that Prof. K. Mori may have synthesized more natural product compounds than any other chemist in the world. His work has never terminated at a synthetic goal, but has further analyzed its ecological and ethological roles in nature. Among his many research results, his lecture today summarized the following four subjects:

1. Pesticides and Our Daily Life
2. Japan's Contribution in Pesticides Discovery
3. Natural Products Synthesis and Pesticide Science
4. Enantioselective Pheromone Synthesis and Pesticide Science

He began his lecture with how the insecticidal activity of DDT saved lives of many Japanese people after the World War II. He then went on to talk about how resistance to DDT and various environmental problems made intensive research to find new types of insecticides necessary. Prof. Mori then made the point that this was the beginning of pesticide chemical research around the world.

In the second article, Japan's past contribution in pesticide discovery was summarized. Natural product chemistry developed through the search for of various compounds with biological activities. Through the development of synthetic techniques, complex molecules were made and at the same time syntheses based on various biological assays were developed.

Finally, he talked on enantioselective syntheses of pheromones of the dermestid beetle, the ambrosia beetle, the southern pine beetle and the Douglas fir beetle. There was an interesting relationship among enantiomers. In Louisiana, US, they are currently using a mixture of (+)-endo-brevicomin, frontalin and α-pinene in trap testing against the southern pine beetle.

Prof. Mori concluded the lecture by saying that the search for an environmentally benign pesticide, the use of the bioactive enatiomer, and soft chemistry are in the best interests of all creatures.

On behalf of the Organizing Committee and all participants at the Congress, we wish him all the very best with his future work.

NHK News Report of 11th IUPAC Congress

The Opening Ceremony of the 11th IUPAC ICPC Congress was reported in Monday August 7th's NHK morning news for the Kansai region. The report showed footage of Prof. Ohkawa in the Opening Ceremony, and also of Keynote Speaker Mr. James Collins. Particular attention was drawn to the large number of over-seas participants in this Congress.

All Day, Every Topic

Plenary Lecture
Dr. Shivaji Pandey (see page 2)
Main Hall 08:45-09:45

Research Director Forum
Main Hall 10:00-12:15

SAR & Design (ES-8)
Evening Seminar-8 (Room 403) 18:30-19:30

Insecticide (ES-10)
Room 502 15:30-18:30

Fungicide (S-9)
Main Hall 15:00-18:00
Selected Poster Workshop-5
Room 502 10:00-12:15

Herbicide
Selected Poster Workshop-1
Room 301 10:00-12:15

Genomics, New Technology (S-1)
Room 502 15:00-18:00

Biopesticides, Transgenic Crops (S-2)
Room 501 15:00-18:00
Evening 9 (IUPAC)
Room 501 18:30-19:30
Selected Poster Workshop-4
Room 501 10:00-12:15

Formulation & Application
Selected Poster Workshop-3
Room 403 10:00-12:15

Regulatory, Risk, Food
Selected Poster Workshop-2
Room 401 10:00-12:15
Luncheon 1 (PSSJ/Otsuka)
Room 301 12:30-13:30
Luncheon 7 (GL Sciences)
Room 403 12:30-13:30
Luncheon 8 (Fraunhofer)
Room 501 12:30-13:30
Luncheon 9 (RCC)
Room 502 12:30-13:30
Evening 6 (Eurofins)
Room 301 18:30-19:30

Environment (S-15)
Room 301 15:00-18:00
Luncheon 6 (PTRL West)
Room 401 12:30-13:30
Evening 7 (Immunochemical Soc.)
Room 401 18:30-19:30

Who's Who in the Congress
Dr. Shivaji Pandey
Plenary Lecturer -2

Shivaji Pandey is the Director of the Plant Production and Protection Division in FAO (Rome). He was born and raised in India, where he also had his early education. He obtained his MS and PhD in Plant Breeding and Plant Genetics from the University of Wisconsin, USA. Dr. Pandey worked for over 30 years in international agricultural research and development, serving as a scientist, the Regional Representative for South America, Director of Maize Program, and the Director of African Livelihoods Program at the International Maize and Wheat Improvement Center (CIMMYT) in Mexico and in its outreach programs.

In 2005, Dr. Pandey joined the Food and Agriculture Organization (FAO) of the United Nations as Director of Agricultural Support Systems Division, leading a team of nearly 40 scientists to support member countries to strengthen their capacity in linking small farmers to markets, providing financial services to farmers, food processing and value addition, food safety, developing infrastructure, farm mechanization, and using conservation agriculture.

In 2006, he was appointed Director of Plant Production and Protection Division at FAO, to lead work on increasing production and quality of all food and non-food crops to enhance food security and livelihoods especially of rural as well as urban poor. The work of the Division involves conservation and sustainable use of plant genetic resources, seed production, development of improved cultivars, use of appropriate agronomic practices, cropping systems, conservation agriculture, organic farming, and integrated pest management among others. International Treaties and Commissions such as ITPGRFA (International Treaty for Plant Genetic Resources for Food and Agriculture), GPA (Global Plan of Action), Global Trust for Biodiversity, IPPC (International Plant Protection Commission), Rotterdam Convention, and Basel Convention also form parts of this Division. Dr. Pandey also chairs the Inter-Departmental Working Group on Biotechnology at FAO which integrates research, development, and policy work on biotechnology of the Organization for agriculture, forestry, and fisheries. He has authored or co-authored over 150 publications. ↗

Yesterday's Highlights

Session 4
(Natural Product)

Speakers in the Natural Product Symposium demonstrated the wide range of approaches that scientists are using in attempts to develop new products from natural sources. From developing a better understanding of the complexities of long-known essential oil components and their interactions to utilization of high-throughput screening and characterization methods to identify new active molecules, many research groups continue to attack difficult research problems in this field. We heard that research continues into solving the exceedingly difficult isolation and structure elucidation problems related to the potato cyst nematode hatching stimulation factor. Likewise, it appears that a clear understanding of the long-sought-after spinosyn mode-of-action has recently been obtained for the first time. The impact of genetic manipulation on the production of small-molecule allelochemicals, and the product potential that might result, was amply illustrated. The ↗

Dr. N. B. Perry
(New Zealand)

Dr. M. B. Isman
(Canada)

Session 16
(Monitoring & Remediation of POPs)

Global and regional trends in the sources and distribution of persistent organic pollutants (POPs) were highlighted in this important lecture session. Developing countries were identified as sources of POPs related to mosquito control, such as DDT. On the other hand, developed countries were identified as sources of industry-related POPs, such as PCBs. Biomonitoring efforts were most effective at discerning the spatial distribution of these pollutants. The importance of available long ↗

↙ Shivaji Pandey has received many honors and awards – the most important ones include DSc from the Maharana Pratap University of Agriculture and Technology (India), Fellowship to the American Society of Agronomy, Fellowship to the Crop Science Society of America, and special recognitions from the governments of Bolivia, Colombia, Ecuador, and Vietnam.

↙ valuable contributions to agrochemistry that natural products may yet make were discussed, and new tools that are being developed to enable this result were described. Expectations are high that these new methods and approaches will result in new and valuable discoveries from this area, resulting in a recent resurgence in interest in this branch of science – **Paul Lewer**.

Session 18
(Genomics, Proteomics, Metabolomics)

The "Genomics, Proteomics and Metabolomics" workshop was a productive session in which three papers were presented by Drs Boyes, Shibata and Walsh. All three resulted in extensive Q & A sessions allowing further details to be discussed. Dr Boyes presented on Monsanto's (formerly Icoria's) gene discovery program generating high-throughput precise morphometric and phenotypic analysis of Arabidopsis mutants and transformants. Much discussion surrounded the ongoing application of this technology to soybean growth and yield. Dr Shibata detailed the integration of transcriptomic and metabolomic data involved in plant secondary metabolism at the Kazusa Institute using Arabidopsis and Lotus model systems. An extensive network of mapped interactions was defined, requiring the development of a novel strategy to achieve multigene transformations to further probe this system. Dr Walsh introduced the concept of chemical genetics and described a program between Dow AgroSciences and Exelixis that successfully identified several novel herbicide targets using this strategy. The advantages and challenges of the methodology were discussed at length in the discussion session - **Terrence A. Walsh**.

↙ term sample collections, for example historical soil collections, were highlighted as critical in determining the half-life of POPs in different regions of the globe. Mitigation and remediation of low level pesticide contamination was also identified as a critical need to prevent contamination of ground and surface waters in areas near agricultural operations. Simple approaches like biobed installations combined with more advanced technologies such as chemical oxidation and phytoremediation will be required in the future to address both current pesticide use and legacy contamination of agricultural lands - **McConnell, L. Laura**.

Prof. A. Katayama
(Japan)

Yesterday's Highlights

Session 20
(Global Food Safety & Trade Issues)

Approximately 275 people attended Session Lecture 20 on "Global Food Safety and Trade Issues". Dr. Jim Seiber of the USDA-ARC provided an overview of food safety research at the Western Research Center, especially on microbial toxins in food items. Other speakers focused on the different aspects of MRL (Maximum Residue Level) in food and feed items. Discussion on the needs of international harmonization of MRL calculation was lively. Dr. Jerry Baron of the IR4 Program presented an operation model showing how industry, government agencies (eg. USEPA) and IR4 can partner together in the generation of GLP residue data for registration of specialty crops - **Phillip W. Lee**.

Dr. P. S. Villanueva (USA)

Luncheon Seminar-2
(JCPA Crop Protection Outreach Campaign)

Importance of 'Dialogue' with consumers for a successful campaign was highlighted by Prof. N. Motoyama of Chiba University, based on the outcomes of campaigns in which he has taken part as a crop protection science expert. He proposed that drastic and favorable change of perception on pesticides among the participated consumers was heavily attributed to the method employed. Such methods to promote 'Dialogue' in campaigns, particularly 'Face to Face' and 'Animated Presentation', were well recognized as critical factors of success by participants - **Shunichi Miyakawa.**

Session 7
(MOA & Resistance Mechanisms- Insect Control)

A large and enthusiastic group gathered in the Main Hall for Session 7 "Mode of Action and Resistance Mechanism – Insect Control." Topics covered included model organisms for predictors of toxicology, mechanisms of action of spinosad, insect growth regulators and neonicotinoids, as well as mechanisms of resistance to neonicotinoids, ↙ organophosphates, carbamates and pyrethroids. Presented results indicated a new mode of action for insect growth regulators, high resolution of the acetylcholine receptor residues responsible for neonicotinoid and spinosad action, and up-to-date understanding of resistance to neonicotinoids, organophosphates and pyrethroids - **J. G. Scott**.

Session 10
(Formulation)

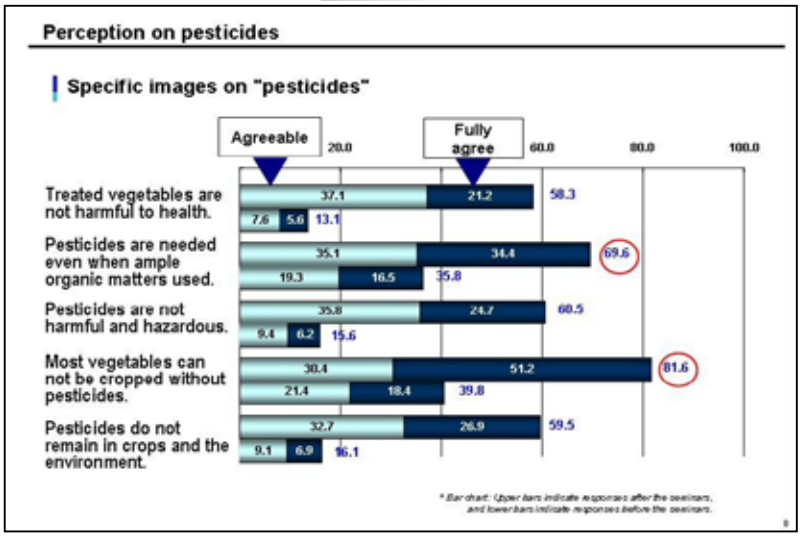
Advances in formulation and application technology.

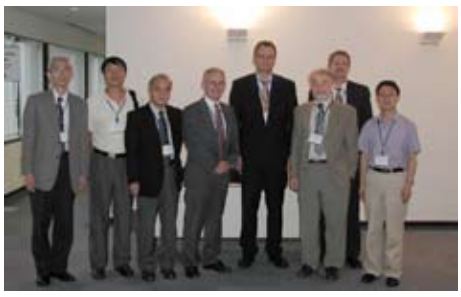
An outstanding 3-hour session that managed to encapsulate over 30 years of knowledge and was coated liberally with delicious future visions.

A review by P Mulqueen drew our attention to the current smart formulations involving a.i. combinations, stable emulsions with graft co-polymer technology, and controlled release microencapsulation controlled by pH effects. William Geigle gave an exposition of homogeneous granule blend technology which has simplified operational practices, cut down on regulatory lead in times and is providing tailored product compositions for different end-users.The potential of nanotechnology was the focus of Mathias Bratz`s talk. The huge change in physical, electrical, optical, absorptiveness and bioavailability properties of 100 nanometre particulates is truly mind-boggling, and left an impression of a future mega-shift in formulation potential. Tadakazu Watanabe presented a `logistic-kinetic` dynamic model of pesticide foliar uptake, which can attribute the effect of different adjuvants by their influence on critical uptake parameters. Huizhu Yuan from China noted microemulsion formulation registrations had gone from 33 in 2000 to 353 in 2005. An example of the benefits of such formulations was given using a chlorpyrifos formulation vs. a standard EC product. Tom Wolfe calculated that air inclusion nozzle technology could lead to 612,000 kg less each year of pesticide pollution in Canada. However, there has to be an understanding of the influences of carrier volume, product type and target plant to get best results - **J.A.Zabkiewicz**.

Right table

Above bar in each item shows the number of the answer of the consumer before starting this seminar, and the lower bar expresses the number of answers after having heard the seminar.





Yesterday's Highlights

Evening Seminar-1
(CropLife International)

"Probabilistic Approaches in Dietary Risk Assessment"

Lois Rossi of USA EPA, OPP, presented a comprehensive overview of the history and current use of probabilistic approaches to dietary RA in the USA. During the discussion she elaborated on the risk managers perspectives on the acceptability of the 99.9 percentile, the applicability of the methodology for acute and chronic RA, and the possible application for assessing consumer safety in respect of contaminated soft drinks in India.

Use of this new methodology in other parts of the world is, at present, limited by the lack of essential prerequisites such as detailed food consumption data, data on crop area actually treated, and sufficient monitoring data of actual residues in food crops.

It emerged that the probabilistic approach in most cases yields a more realistic assessment of actual dietary risk than the established deterministic methods - **Berhard Johnen**.

Weather Forecast (Kobe City)

8th (Tue)

Max temp. 31 °C, Min. temp. 26 °C

Overcast , rain in the evening

Time:	*0-6*	*6-12*	*12-18*	*18-24*
Chance of Rain:	*0%*	*50%*	*40%*	*70%*

9th (Wed)

Max temp. 31 °C, Min. temp. 26 °C

Rain, then clearing

Chance of Rain: 60%

Session-5
(Bioregulator for Crop Protection)

Regulation of plant growth and development by chemicals is an important strategy to enhance and improve the quality of plant production. Dr. T. Asami (RIKEN, Japan) explained how he developed small active molecules as tools for plant chemical biology. As Prof. Kenji Mori demonstrated in his plenary talk, by using these small molecules, hidden secrets in biological processes have been clarified. Dr. E. Curry (USDA, USA) showed successful use of plant growth regulators, in particular, 1-methylcyclopropene (1-MCP), in fruit quality improvement. Dr. P. Hedden (Rothamsted Research, UK) explained that the most effective way in the manipulation of gibbellerin (GA) status was the over-expression of GA 2-oxidase, GA-deactivating enzyme, which resulted in an improved grain quality in wheat. Dr. P. D. Petracek (Valent BioSciences Corporation, USA) reported that salicylate reduced herbicidal efficacy of paraquat (photosynthetic electron receptor from photosystem I) by inhibiting transport of paraquat to its site of action but potentiated inhibitors of photosystem II, protoporphyrinogen oxidase (PPO), and EPSPS (glyphosate) by the feedback inhibition of stress tolerance system.

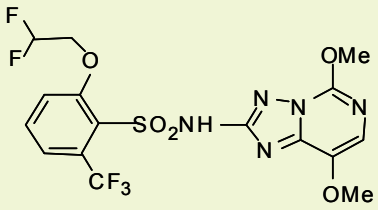
Although 5 talks had been scheduled in this session, Dr. C. Lovatt was not able to join us. Therefore, an additional short talk on plant growth promotion by 5-aminolevulinic acid (ALA), a precursor of chlorophylls and heme, was given by Dr. T. Tanaka (Cosmo Oil, Japan). These talks convinced us that synthetic and natural plant growth regulators along with genetic manipulation of the relevant genes would further contribute to plant production - **Koichi Yoneyama**.

<Chemist's Corner>

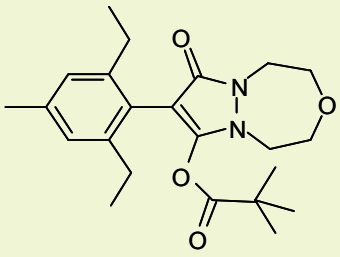
Interesting Herbicides

Here we introduce 3 new herbicides. Many more interesting herbicides are being reported daily in the Congress.

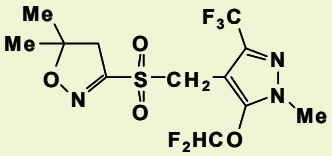
1) Dow AgroSciences
Session: S3-1
Poster: I-1-ii-11A
I-1-ii-10C, III-1-13A (residue)
Penoxsulam



2) Syngenta
Session: S3-2
Poster: I-1-ii-08A, 9B (=SPW1-1)
Pinoxaden



3) Kumiai
Poster: I-1-ii-04C (=SPW13-1)
KIH-485



Out and About Photos