

# Kobe Gazette

# 6

August 11th (Fri), 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

### More globally harmonized MRLs needed! Dr. K. D. Racke appeals in the Plenary Lecture -4

**As the final speaker of the Congress Plenary lecture, Dr. Racke (Dow AS, IUPAC) gave a 1-hour speech yesterday entitled of "Food safety assessment and international trade implications of pesticide residues in food".**



The food-chain compromise practised by farmers and consumers assumes that pesticides are used according to good agricultural practice (GAP) in a manner which minimizes residues in harvested food and does not impact human health. The maximum residue limit (MRL) is a regulatory standard that reflects GAP and allows control of residues.

Increased international trade of fruits and vegetables has increased the complexity of the food chain compromise. The world food code as promulgated by Codex has supported development of a system of internationally harmonized MRLs and represents the best hope for ensuring fair trade and consumer protection on a worldwide basis.

The increased prominence and influence of EU MRLs, Japan MRLs, and U.S. tolerances associated with recent changes in food safety legislation has created a regionalized approach to regulation of trade. Continued disharmony of MRLs between major food-importing regions may result in trade barriers and irritants, retarded adoption of new, reduced risk pesticides, and decreased consumer confidence. To address this latter development, some food associations and retailers have adopted private standards and food policies which may undermine

science-based approaches. Continued improvements in accuracy of food safety and risk communication information are needed. The global benefits of free trade will require that creative approaches be adopted to help develop a more harmonized international approach toward regulation of pesticide residues in food. Encouraging developments include recent improvements in the Codex system which have accelerated MRL promulgation, cooperative evaluation approaches being pursued by several of the OCED countries, availability to farmers of practical recommendations for proactively managing residues in exported commodities, and more accurate communication of MRL standards and pesticide residue information. - **Chairperson: D. J. Hamilton (Australia)**

#### Luncheon Seminar 17 IUPAC/FAO

"INFOCRIS and the IUPAC compendium of agrochemical information"

Luncheon seminar 17 dealt with the IUPAC/FAO/IAEA project which will give easier access to information on agrochemicals via an IUPAC web page. The seminar started with a presentation by Dr. J. Unsworth giving an outline of the information which is available on the internet and the care that must be taken when using it. The second half of the seminar was led by Ian Ferris from IAEA/FAO who demonstrated the INFOCRIS database (<http://www-infocris.iaea.org>) which will give a comprehensive profile of the properties of agrochemicals. The IUPAC web page should go live during the coming year. For more information, or if you would like to participate in this project, please contact Dr. J. Unsworth ([johnlydiaunsworth@compuserve.com](mailto:johnlydiaunsworth@compuserve.com)) - **J. B. Unsworth (U.K.)**

### About Kobe Gazette "6"

With so many interesting and important sessions being held on August 10 (Thursday), and in addition the Poster Award Ceremony, we have decided to issue Kobe Gazette 6, and publish it on the home page of the Pesticide Science Society of Japan.

### Closing Ceremony

The Closing Ceremony was held in the Main Hall of the International Conference Center Kobe from 17:00, in front of an audience of nearly 400 people, with Dr. K. Tanaka presiding as Master of Ceremonies. Following the poster award ceremony (see page 4), Dr. Racke reviewed the Kobe Congress, which was followed by the Torch Relay Ceremony for the 12th IUPAC ICPC in Melbourne, Australia. Three committee members (Dr. Umetsu, Dr. Ueyama, Prof. Sasaki) also received testimonials for their outstanding contributions to the Congress from the IUPAC Advisory Committee. Finally, Dr. Umetsu introduced the behind-the-scenes Congress staff and officially declared the Congress closed (photos on page 4).

### Number of Congress Participants

The total number of participants including staff reached more than 2,000 (see page 3).

#### Luncheon Seminar 16 Otsuka Chemical Holdings/T. J. C. Chemical/ Mitsui & Co. Ltd.

"Agriculture and crop protection in Thailand and Vietnam"

Mr. Zaprong from T.J.C. Chemical Co., Ltd., Thailand and Mr. Dong from HAI Agrochem Joint Stock Company, Vietnam presented agriculture and crop protection in their countries. In both countries most of pesticides are imported from China, India, and other countries. Although the total imported pesticides by value have increased year after year, due to the policy of both governments to expand the organic agriculture and IPM, less and safer pesticides for the environment and humans are required. More people than the number (40) of available seats attended the seminar, showing the great interest of scientists in this seminar theme - **Miki Akamatsu (Japan)**.

## Poster Award Ceremony

The Poster Award committee, chaired by Dr. J. Unsworth, met for the first time on Sunday 6th August. At this meeting it was decided that the award winning posters would be decided on the basis of the votes cast in the ballot of congress participants and on the judgement of the committee members. Consequently, the committee was divided into three groups of experts, one each for subject categories I, II and III, which would make an in-depth review of Posters in their field of expertise. On the 10th of August the committee met for the second and final time to decide on the posters that would be nominated for awards. The committee unanimously agreed that it had been set a difficult task as the Posters were of a high standard and were not only well presented but also contained much interesting science. However, after much discussion on the merits of various Posters, and taking into account ballot results, the award winning Posters were finally selected.

The award ceremony took place during the closing ceremony of the Congress and the prizes were presented by Dr. Alexander Klausener, Head of Research at Bayer CropScience - **J. B. Unsworth (U.K.)**.

Category	Prize Class	Poster Number	Title	Author(s)	Country
I	Special	I-2-02C	Structure based molecular design of AHAS inhibitors	Jian-Guo Wang	China
II	Special	II-1-ii-08A	Study of acetoxyacid synthase through mutation and QSAR	Zhen Xi	China
III	Special	III-3-14C	Modelling environmental behaviour of photosensitive pesticides by revealing features of degradation and possible ways of interactions	Attila Kiss	Hungary
I	Bronze	I-103C	5- (2,6-Difluorobenzyl) oxymethyl-5-methyl-3-(3-methylthiophen-2-yl)-1, 2-isoxazoline as a Useful Rice Herbicide	In Taek Hwang	Republic of Korea
II	Bronze	II-1-iii-27B	A new evaluation method for plant defense activators based on potentiation of elicitor-responsive photon emissions (ERPE) in rice cells	Hiroyuki Iyozumi	Japan
III	Bronze	III-110A	Development of Acetylcholine Esterase Detection Kit for the Determination of Organophosphorus and Carbamate Residues in Agricultural Samples	Bo-Mee Kim	Republic of Korea
I	Silver	I-1-ii-09B	Managing grass weeds in cereals: chemistry and biology of the novel herbicide pinoxaden	Fredrik Cederbaum & Michel Muehlebach	Switzerland
II	Silver	II-1-i-28A	Flubendiamide stimulates Ca <sup>2+</sup> pump activity coupled to RyR-mediated calcium release in lepidopterous insects	Takao Masaki	Japan
		II-1-i-26B	Elucidation of the mode of action of Rynaxypyr <sup>TM</sup> , a selective ryanodine receptor activator	Daniel Cordova	USA
III	Silver	III-5-06A	Aerobic mineralization of hexachlorobenzene by <i>Nocardioide</i> sp. PD653	Kazuhiro Takagi	Japan
I	Gold	I-1-i-02B	Alac-Acetogenins are a new class of inhibitors of mitochondrial complex I	Naoya Ichimaru	Japan
II	Gold	II-1-i-18C	A nicotinic acetylcholine receptor point mutation (Y151S) conferring insecticide resistance causes reduced agonist potency to a range of neonicotinoids	Z. Liu (China), Neil S. Millar (UK)	China, U.K.
III	Gold	III-1-24C	Multiresidue analysis of 500 pesticide residues in agricultural products using GC/MS and LC/MS	Yumi Akiyama	Japan



↑ Dr. Yumi Akiyama (left) received the BCS Gold Prize from Dr. Klausener (middle) of Bayer CropScience. At same time the IUPAC testimonials were given by Dr. Unsworth (right), the Chairperson of the Poster Award Committee.

Dr. Millar (UK) gave an acceptance speech on behalf of all the prize winners. ↓



Three Organizing Committee members were → given testimonials for their outstanding contribution to this Congress from IUPAC. (from left Prof Sasaki, Dr. Ueyama, Dr. Umetsu\*)  
\*Dr. Umetsu represented the Pesticide Science Society of Japan.

### Closing Ceremony



↑ After the torch relay ceremony, Dr. Elizabeth M. Gibson gave a Welcome Speech to the 12th IUPAC ICPC in 2010 in Melbourne. She wore the traditional "Happi" coat given by Prof. Ohkawa.



Yesterday's Highlights

Selected Poster Workshop 12  
Fate & Bioremediation of Selected Pesticides

Dr. David Kirkpatrick of Huntingdon Life Sciences summarized the biotransformation of the fungicide ethaboxam in terrestrial and aquatic environments. The detailed studies indicated that ethaboxam does not pose any unacceptable risks. Dr. Jimmy O'Connor, also of Huntingdon Life Sciences, talked about the fate of the acaricide pyridaben in the environment by summarizing results of aerobic and anaerobic soil metabolism, soil and water photolysis, batch equilibrium, hydrolysis and field dissipation studies. Dr. Yasuyuki Ijima of Nissan Chemical Industries presented his poster on the metabolic fate of the fungicide amisulbrom. He presented degradation results from both laboratory and field-scale soil studies conducted with both Japanese and European soils and provided a proposed metabolic route. Professor Ettore Capri, of the Catholic University of the Sacred Heart in Italy, presented a bioremediation-oriented talk on mitigating point-source contamination by pesticides using biomass beds on a small farm in Italy. Dr. Xiao-Ming Ou, of the Hunan Research Institute of Chemical Industry in China, presented his poster on the persistence and dissipation behavior of a novel insecticide, A9908, in the Liuyang River in China. Degradation of the insecticide involved various routes. The final poster, revealing the anaerobic biodegradation of 4-alkylphenols by a nitrate-reducing enrichment culture was presented by Mr. Atsushi Shibata of the Nagoya University and showed that 4-alkylphenols with linear alkyl chains numbering one to eight were degraded by the isolated microbe - **Mark J. Schocken (USA)**

Selected Poster Workshop 13  
Herbicide Action and Plant Growth Regulation

Five speakers presented from Hungary, Japan and USA, with one topic from Greece on "metabonomics of natural products" cancelled. Three of the speakers were graduate students and gave high quality, fresh presentations. A wide range of topics were covered, from the molecular biology of parasitic weeds (*Striga* spp.), safener (dicloromethyl ketal) action on glutathione-s-transferase, glyphosate resistant weeds (*Amaranthus* spp.), brassinosteroid biosynthesis inhibition with *Arabidopsis* mutant, to the mode of action of KYB-39 ( $\zeta$ -carotene desaturase inhibitors). The last one was selected on-site. The chairperson also commented on the similarity of herbicide and plant growth regulators by illustrating plant growth retardant and/or low dosage of herbicide for weed management, which has been used on footpaths and riverbanks in Japan. About 50 participants joined this workshop and actively interacted with all speakers on their topics - **Yasuhiko Yogo**

Session Lecture 12  
Resistance Management and IPM

(No summary report given.)

Selected Poster Workshop 14  
Risk Assessment & Mitigation of Pesticide & POPs Contamination

The projects described within this SPW addressed core issues related to risk assessment and mitigation of contaminants: toxicity testing, persistence, and bioavailability. The need for testing a variety of aquatic organisms to determine the most sensitive species for a particular chemical was highlighted in a detailed study by the first speaker, Dr. K. Barrett. Dr. H. Inui described a novel approach for contaminant remediation using transgenic plants carrying specific drug-metabolizing genes, and Dr. F. Lui examined the natural attenuating capacity of sediment materials to biodegrade chlorinated hydrocarbons under various environmental conditions. S. K. Parmanik presented a detailed study of oryzalin photodegradation pathways where 12 degradation products were isolated and identified. Finally Dr. J. Gan presented a novel and effective approach to determine the bioavailable fraction of extremely insoluble pyrethroid insecticides in water/sediment systems. The session included both young and senior scientists addressing both toxicological and chemical-based research projects - **Laura McConnell (USA)**.

Selected Poster Workshop 15  
Disease Control (Chemistry & Natural Products)

The Disease Control Poster Workshop was one of the last workshops at the IUPAC conference. Many people visited the session who were interested in the different topics of the selected posters including chemical, biochemical and biological aspects. The workshop exhibited a very nice run through the disease control area, with highlights on talks about complex synthesis work on natural products like phytotoxins, natural products as source for new fungicidal lead structures with room for optimization work, and natural compounds that influence plant immunity. Other lectures dealt with the success story of a new rice fungicide (from a forest fungus to a new fungicide), with the isolation and structural evaluation of very complex fungi-inhibiting molecules, and with the synthesis and fungicidal activity of huge macrocycles - **Thomas Seitz (Germany)**.

Selected Poster Workshop 11  
Insect Control (Chemistry & Natural Products)

An enthusiastic group of around 200 scientists meet in the Main Hall for the Selected Poster Workshop 11 "Insect Control - Chemistry & Natural Products". Topics of the six presentations were: the 2nd generation spinosyn XDE-175 (Dow AgroScience), the new acaricide cyflumetofen (Otsuka Chemical), anthranilic diamides (DuPont Crop Protection), new insecticidal hydrazone derivatives (Nissan Chemical Industries), mitochondrial complex I inhibitor acetogenins (Kyoto Univ.) and a novel peptide (pp3158) from silkworms (Univ. of Tokio). The session demonstrated that in recent years many new and innovative discoveries have been made in the field of insect control. The audience showed their appreciation for the excellent talks by asking numerous questions and giving big applause - **Peter Maienfisch (Switzerland)**.

Luncheon Seminar 18  
PSSC/PSSJ

"Current and Future R & D Activities in Agrochemical Area in China and Japan: Herbicide"

At this joint seminar co-sponsored by the Pesticide Chemistry Societies of China and Japan. Prof. Z-M. Li [Nankai University (China)] and Prof. H. Matsumoto [Univ. of Tsukuba (Japan)] introduced the most recent scientific topics in herbicide R&D from both countries. At the beginning of his presentation, Prof. Li referred to the long and friendly relationship between both Pesticide Chemistry Societies, and presented his recent research results entitled "Structure-activity relationship of novel sulfonylurea inhibitors on AHAS". Prof. Matsumoto then introduced his study "Mode of action of several classes of herbicides causing photooxidative injury in plants" - Keiji Tanaka (Japan).

Congress Participants Final Numbers

A. Registered & Actual Participants

1. Japan	681
2. USA	107
3. Germany	58
4. Republic of Korea	57
5. People's Republic of China	41
6. United Kingdom	34
7. Switzerland	14
8. India	12
9. Australia	11
10. Israel, Thailand	10
12. Hungary	7
13. Belgium, France, Taiwan, Viet Nam	6
17. Canada, New Zealand, Romania	5
20. Philippines, Russia	4
22. Costa Rica, Egypt, Malaysia, Sri Lanka, The Netherlands, Ukraine	3
27. Argentina, Brazil, Iran, Italy, Kenya, Kyrgyz Republic, Mexico, Norway, Singapore, Sudan	2
38. Austria, Bangladesh, Chile, Greece, Haiti, Indonesia, Jordan, Oman, Palestinian Authority, Peru, Saudi Arabia, Scotland, Solomon Islands, Spain, Syria	1

**Total 52 Countries (A) 1,142**

B. Participants for Seminars (in Japanese)

1. Pesticide Residue Seminar	90
2. Open Seminar for General Public	250

**Total for Special Seminar (B) 340**

C. Accompany Persons 45

D. Congress Staff

1. Staff (Organizing Committee, JCOM)	128
2. Commercial Exhibition Staff	224
3. Luncheon & Evening Staff	132
4. Hospitality Room Staff	28

**Total Staff (D) 512**

E. Press, Journalists 14

**Total Number of Participants (A+B+C+D+E) 2,053**

## Yesterday's Highlights

### Session Lecture 3 New Chemistry

The drive to develop new products in the agricultural chemistry arsenal is fueled by the need for resistance management tools and greater levels of selectivity and environmental safety. This session highlighted several innovative new products, derived either from new modes of action (MOA) or from new classes of chemistry related to established MOA's.

Two new classes of herbicide chemistry are based on either on disruption of fatty acid metabolism or acetolactate synthase inhibition. Dr. Michel Muehlbach described the combination of innovative chemistry with a safer and a highly effective adjuvant to create Axial® (Syngenta Crop Protection), a cereal herbicide with outstanding control of grass weeds. Tim Johnson (Dow AgroSciences) described how reversing the direction of the sulfonamide group relative to previous broadleaf sulfonamide herbicides results in improved grass weed activity, leading to penoxsulam (Dow AgroSciences), a herbicide that controls grasses, sedges and broadleaf weeds in rice.

New insecticides functioning at the ryanodine receptor were described by Dr. George Lahm (Rynaxypyr™, DuPont) and Dr. Akira Seo (Flubendiamide, Nihon Noyaku). These products are extremely efficacious against a wide variety of lepidopteran species, with wide margins of environmental safety. Lack of cross-resistance with existing insect control agents will provide growers with an important new resistance management tool.

New products for control of fungal diseases were also covered. Boscalid is a multipurpose fungicide introduced recently for use in specialty crops. Dr. Michael Keil (BASF) described its synthesis, highlighting a very efficient and economical Suzuki coupling reaction to generate a biaryl intermediate.

Finally, Dr. Thomas Wegmann (Bayer CropScience) described the chemistry and biology of Fluopicolide, a highly effective, long lasting oomycete fungicide.

Fluopicolide represents a new chemical family with a novel mode of action showing no cross resistance with other oomycete fungicides. It provides consistent high level performance often able to set a new standard in oomycete

### Session Lecture 11 Metabolism and Toxicology



Although placed at the end of the congress, well over 100 interested people attended the plenary session on metabolism and toxicology. After a brief period of remembrance for Prof. Randy Rose (photo), who was originally meant to be one of the speakers of the session but unfortunately died about 1.5 month before the congress in a car accident, the session started with a presentation on a topic related to metabolism. Mike Skidmore (Syngenta, UK) presented interesting new results from an ongoing research project on the bioavailability of conjugated metabolites and bound residues. With a topic related to metabolism as well as toxicology another distinguished speaker, Prof. Yasushi Yamazoe (Tohoku Univ., Japan) gave an overview over Cyt P450 enzymes in the human metabolism. He also discussed the prediction of Cyt P450 enzyme induction by pharmaceuticals or agrochemicals using *inter alia* recombinant Cyt P450 constructs. This was followed by a presentation of Prof. Robert Krieger (Riverside Univ., USA), a well-known expert in his field, on human occupational and residential chemical exposures. He advocated the use of biomarkers to clarify the significance of trace amounts of pesticides or their metabolites after pesticide use but also maintained that that the risks of pesticide use in relation to other everyday risks may be overestimated in the public. Finally Dr. David Myers (Huntingdon Life Sciences, UK) gave a detailed and informative insight into the study design of milk transfer studies and discussed its relevance for developmental neurotoxicity. All in all, the plenary session provided a snapshot on ongoing developments in the field of metabolism and toxicology of agrochemicals and pesticides since the presentations covered scientific as well as regulatory aspects - **Juergen Krauss (Switzerland)**

control in a wide range of crops delivering a favourable profile to meet the quality assurance requirements of foodchain customers - **G. D. Crouse (USA)**.

### Session Lecture 13 Environmental Chemistry/Residue Analysis

Dr. John Vargo, University of Iowa Hygienic Lab, initiated Session 13 with a discussion of modifications and improvements to U.S. EPA Method 535 (analysis of chloroacetanilides, chloroacetamides, and their chloroethanesulfonic and oxanillic acids degradates in water). The sensitivity of the method was increased 14-23 times depending on analyte and the sample analysis time was decreased from 40 to 18.5 minutes.

Dr. Michelangelo Anastassiades, CVUA Stuttgart, discussed the QuEChERS (quick, easy, cheap, effective, rugged, and safe) method and how its applicability had been expanded to include additional analytes and sample matrices. Details of the procedure were described and how the final fractions could be analyzed using either GC/MS or LC/MS/MS. Acceptable recoveries and repeatability were obtained during three inter-laboratory ring tests.

Dr. Hiroto Tamura, Meijo University, presented his work on the analysis of alkylphenols and their polyethoxylates (endocrine disruptors in fish) in soil using matrix assisted laser desorption ionization-mass spectrometry (MALDI) due to the difficulties associated with analyzing these compounds using traditional GC and LC techniques. These compounds are used in a variety of industrial applications thus, their presence in rivers and ground water is becoming a primary concern. The fate and behavior of these compounds in water have been studied but little is known about their fate on arable land.

Dr. Guomin Shan, DOW AgroSciences, discussed their work on the monitoring of Bt Proteins in soil using a novel biomimetic extraction procedure. The analysis of Bt (*Bacillus thuringiensis*) proteins in soil have been hampered by poor extractability and detection. Thus, Dr. Shan's team approached the problem by first recognizing that deposit feeding invertebrates already possess the ability to extract nutritionally important soil or sediment proteins so they investigated the gut fluid from various species of land and sea dwelling worms to examine the extractability of Bt proteins from soil using these fluids. Artificial worm gut fluid was later prepared based on characterization of the fluids associated with the highest extractabilities. Final analysis was accomplished using immunoassay.

Dr. Johannes Corley, IR-4 Rutgers University, presented a thorough discussion of the need for standardized definitions of limits of detection, limit of quantification, and the error associated with each measurement of analytical methods. This is becoming increasingly important as regulatory agencies around the world seek global harmonization of tolerances or maximum residue levels (MRLs) and uniform risk assessments. Dr. Corley noted that these definitions also need to be relatively easy to implement and consider matrix effects and interferences - **Robert Yokley (USA), Fengmao Liu (China), and Isao Saito (Japan)**



Dr. M. M. Keil  
(BASF, Germany)

## August 11 Excursion

### Just one episode Super-insect in Japan!

An eight-legged butterfly from Todaiji Temple (Nara) was explained by a researcher from Nihon Noyaku during Excursion A-1, held on August 11, 2006.

