Entomology Science for the Service of Humanity and Conservation of Environment

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ICE

Council of International Congresses of Entomology

My Journey with the International Congresses of Entomology

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My Induction into the Council of International Congresses of Entomology

It was in 2004 that I received an email form Prof. Frantisek Sehnal, Czech Institute of Biology, whether I was interested to serve on the council of International Congresses of Entomology or else I can nominate a person with good scientific publication record, and willing to advance the cause of science of entomology. After some hesitation, I decided to serve on the council. Dr Sehnal was completely unknown to me at that time as the field of specialization was insect physiology, while most of my work is in the area of insect plant interrelationships. He then nominated me to the council, and I was elected to as a member in 2004 during the 22nd Congress in Brisbane, Australia. Following out continued interaction over the next 4 years, he proposed to me that I should serve as the president of the Council, as he intended to bring diversity to the council membership and its executive. And then the journey continued.

XXIIIrd International Congress of Entomology, July 2008 Durban, South Africa

The 23rd International Congress of Entomology (ICE), held in Durban, South Africa in July 2008, was attended by over 2,000 delegates from different countries. It was a grand success, and I congratulate the local

organizing committee led by Prof. Robin Crew and Prof. Shirley Hanrahan for having organized and conducted an event of this scale in a highly professional manner. The ICE office bearers at the time, Prof. Frantisek Sehnal - President, and Takken Willem - General Secretary, had done an excellent job in conducting the affairs of the council, and helping the South African Entomological Society to organize the 2008 congress. I was also highly impressed by the conduct of the 2004 congress in Brisbane. The council led by Prof. Linn Riddiford, and the organizers Dr Myron Zalucki and Dr James Ridsdill-Smith had done an excellent job. I had the pleasure of meeting Lynn along with Dr Steve Clement – USDA - Washington State University, in her office in Seattle in 2006. It was a pleasure to talk to her on the work in progress, and to find that she was as enthusiastic as a new researcher about her recently accepted manuscripts PNAS, Science, and the rest. It was a true tribute to her professionalism that the Entomological Society of America organized a symposium in her honor during the 2006 annual meeting of ESA in Indianapolis. And this is just one of the many honors that have been bestowed on her over the years for her contribution to the understanding of hormonal control of insect development and behavior. It was a fitting gesture from the ICE, that she was nominated as an honorary member of the ICE.

There were two strong and competitive proposals for hosting the next entomology congress in 2012. The ICE decided to award the next congress to South Korea in Deagu. It was the enthusiastic approach of the South Korean team and the extra mile they were prepared to go, that tilted the decision in their favor, although they needed to go a long way to put up the facilities to host the next congress, and prepare a comprehensive program covering various aspects of entomology to attract the entomologists from different parts on the world and from different disciplines, to come and participate in the next congress. In Durban, the ICE council under the leadership of Prof. Frantisek Sehnal, deliberated on various issues facing the congress, and the science of entomology, and I congratulate Prof. Sehnal and the team for conducting the affairs of the council in a highly professional manner. The council elected Dr Hari Sharma - India as the president, Prof Shirley Hanrahan - South Africa as vice-president, and Dr James Ridsdill-Smith - Australia as general secretary for the next four years. The new president of the council of ICE extolled the participants of the 2008 congress to continue to focus on excellence in science of entomology for the service of humanity.

Council of the International Congress of Entomology, Durban, South Africa

"*I feel greatly humbled on being elected as the new President of the Council of International Congress of Entomology, and I thank the council members, and the entomologists participating in ICE 2008 for reposing this faith in me. The other office bearers and members of the ICE will make all efforts to advance the cause of science of entomology for fighting hunger and serving the humanity. It was in Durban in 1914 that the "Great March to Independence" was undertaken by Mahatma Gandhi, and nearly a century later, let us commit ourselves to undertake the "Great March to Fight Hunger, Poverty, and Disease" through excellence in the science of entomology for the service of mankind and the environment. With this singular motto in our minds, let us move forward, and see you at the ICE 2012, at Deagou, South Korea".*"

Over the past six months, James Ridsdill-Smith, Jiaan Cheng, Hideharu Numata, and Shirley Hanrahan have been interacting with the South Korean colleagues to lay the foundation for the next congress in 2012. It was very heartening to note that several members of the ICE were actively involved in sharing their thoughts and providing valuable inputs for the next congress, and organizing the webpage of the next Congress. Useful exchange of views also occurred among some members of the council on the sidelines of the annual meeting of the Entomological Society of America in Nov 2008 at Reno. I am sure, the organizing committee of the ICE 2012 will benefit from these inputs, and take on board many of the useful suggestions that have been made by the members of the ICE council. The Secretary General, Dr James Ridsdill-Smith had been very active, and has done a commendable job in keeping us all informed of the steps taken to get the accounts straightened out, update the profile of the council members, and interact with various stake holders.

Newly Elected Executive of the Council of International Congress of Entomology, July 2008, Durban, South Africa

Coming to the issues that face the science of entomology at present, the one that strikes me most is the impending climate change and its implications for insects, pest management, and food security. While considerable efforts have been made to predict the effects of climate change in different regions, and its impact on rainfall, rise in temperature, and their impact on crops and food security, comparatively little attention has been paid on the likely effects of global warming on distribution and population dynamics of insect pests and their natural enemies, expression of plant resistance to insects, and the efficacy of various pest control interventions under variable climate and global warming. It is high time that the entomologists began to focus on these issues and begin to gain an understanding of how global warming and climate change in different agro-ecosystems will influence the insect pests, and the need to design more robust pest management strategies. There is certainly a need to develop pest management strategies that are robust and least disruptive to the environment to mitigate the effects of climate change to reduce crop losses and improve food security.

Another area that requires in-depth studies and critical analysis is the use of DNA based technologies for pest management {insect diagnosis, studying insect - plant relationships, marker-assisted selection for insect resistance, and use of genetically modified plants and insects for pest management]. Do these technologies really offer clear advantages over the conventional methods? Or do they simply confirm what we can see or do with the conventional approaches. We must continue to ask these questions time and again before embracing the new and giving up conventional wisdom. The use of recombinant DNA techniques will certainly enhance our ability to minimize the losses due to insect pests to meet the increased demand for food and fiber. Understanding the nature of gene action and metabolic pathways associated with insect resistance, induced resistance, and marker aided identification of newer insecticide molecules with a different mode of action will certainly add to the armory of pest management tactics that we have at our disposal to fight the ravages of insect pests. However, development, testing, and release of products generated through biotechnology-based processes should be continuously monitored for their bio-safety to the non-target organisms in the environment, and optimized based on experience. This will require a dynamic and streamlined regulatory structure, which is clearly supportive of the benefit of biotechnology, but highly sensitive to the wellbeing of human beings and the environment.

ICE

Council of International Congresses of Entomology

Invitation

XIV International Congress of Entomology 2012

Dear Fellow Entomologists,

On behalf of the Council for International Congresses of Entomology, I extend a cordial invitation to all Fellow Entomologists to participate in the "24th International Congress of Entomology", being hosted by the Entomological Society of South Korea, at Daegu in 2012. The Entomology Congress will be a great opportunity to learn about the advances made in the science of entomology in the recent past, and promote dialogue and establish collaboration between the entomologists from different continents. The Entomology Congress will also provide an unique opportunity to learn about the advances made in the science of entomology in Korea, and visit the Institute of Industrial Entomology, Yecheon, and the Hampeong Butterfly and Insect Exhibition.

The deliberations during the entomology congress, comprising of invited lectures by the leading entomologists in different disciplines and over 15 concurrent sessions, will provide a unique opportunity to listen to, and interact with the pioneers from different branches of entomology, and a platform for interaction between the young and the experienced entomologists. The deliberations during the Entomology Congress will also create an awareness of the challenges that we need to address for sustainability of the environment and food security. There will also be ample opportunities for interaction

Hardie, Jim
UK
Hoy, Marjorie A
USA
Kang, Le
China
Kim, Byung-Jin
Korea
Lane Robert
USA
Numata, Hideharu
Japan
Sehnal, Frantisek
Czech Republic
Takken, Willem
The Netherlands
Zalucki, Myron P
Australia

between the scientists from public and private institutions, which will accelerate the pace of translating innovations into action for the welfare of mankind.

The congress will provide ample opportunities to discuss the use of genetically modified organisms such as plants, natural enemies, and microbes for pest management and their non-target effects on the environment. Another important topic that warrants urgent attention is the issue of global warming and its influence on geographic distribution of insect pests, effects on bio-control agents, and effectiveness of synthetic insecticides for insect control. Critical issues related to invasive species, bio-security, insecticide residues in food and food products, and development of resistance to insecticides and genetically engineered plants will also be addressed in relation to sustainable crop protection.

The enthusiasm and excitement displayed by the Organizing Committee and the local administration certainly promises that the "24th International Congress of Entomology" will be a grand success. I am sure, the Organizing Committee will plan and organize the Entomology Congress in a highly professional and dedicated manner to make it a grand success, and I look forward to see you all in South Korea in 2012.

Sincerely yours,

Hari C Sharma

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President - International Congresses of Entomology

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XXIV International Congress of Entomology
19 - 25 Aug 2012, Daegu, South Korea

The ICE2012 was attended by 2,224 scientists from 97 countries. There were 133 sessions with 1262 papers and 940 posters. The oral presentations and posters were authored by more than 5,000 scientists.

New Era in Entomology: Welcome Address

Hari C Sharma, Chairman, Council of the International Congresses of Entomology

Your Highness, Bumil Kim - Mayor of Daegu; Dr Sang-Dai Park - President, The Korean Federation of Science and Technology Societies; Prof Byungjin Kim – President of the Local Organizing Committee ICE2012, Dr Ho-Yong Park, President, Entomological Society of Korea; Members of the Council of International Congresses of Entomology, ladies and gentlemen, Good afternoon.

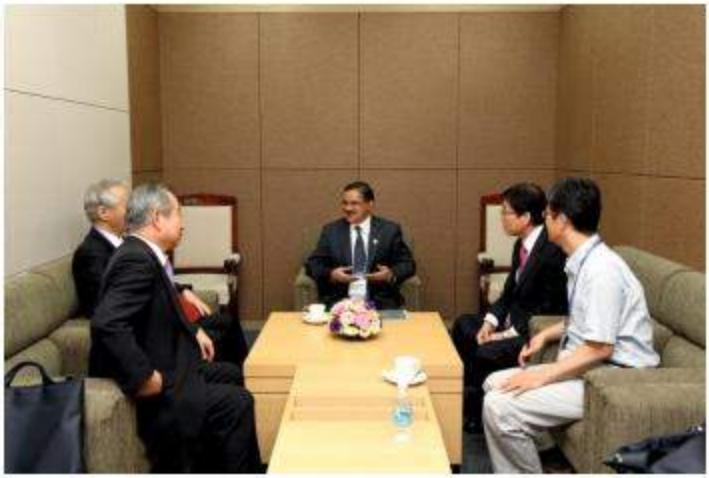
On behalf of the Council of International Congresses of Entomology and my own behalf, I extend a warm welcome to all Fellow Entomologists participating in the "XXIV International Congress of Entomology", being hosted by the Entomological Society of South Korea. The Congress theme, "**New Era in Entomology**", is highly appropriate one to usher in a new revolution in entomological science for conservation of biodiversity and environment and minimize the losses due to insect pests to increase crop production for food security.

Dr Hari Sharma, Chairman of the Council of the International Congresses of Entomology, addressing the inaugral Session of ICE2012.

I am sure, the scientific deliberations spread over 17 sections with five plenary speakers of international repute will create an awareness of the progress made, and pinpoint the challenges that we need to address for conservation of the environment. The congress will also provide an opportunity to discuss some of the important issues such as use of genetically modified plants, natural enemies, and microbes for pest management, and their biosafety to the environment. Rapid and cost effective development and adoption of biotechnology-derived products will depend on developing a full understanding of the interaction of genes within their genomic environment, and with the external environment in which their conferred phenotype must interact. Another important topic is the impact of global warming and climate on arthropods, and its implications for crop production. Critical issues related to invasive species, bio-security, development of resistance to insecticides and genetically engineered plants will also be addressed during the congress. The enthusiasm and excitement displayed by the Organizing Committee and the local administration certainly promises that the "24th International Congress of Entomology" will be a memorable event, and I look forward to your enthusiastic participation and contributions to make it a "Grand success".

I thank you all for your active participation, and have a nice evening.

Members of the Council of the International Congresses of Entomology and the Local Organizing Committee of the XXIV International Congress of Entomology with the winners of the Certificates of Distinction, 19 Aug, Daegu, Korea.



Hari Sharma (Center), Chairman of the Council of the International Congresses of Entomology with the President of the Korean Federation of Science and Technology (2nd from left), and President of the Local Organizing Committee, Byungjin Kim (2nd from right) 19 Aug 2012, Daegu, Korea.

ICE2012: Plenary Lectures

Stephen Simpson, School of Biological Science, University of Sydney, Australia. From individuals to populations: a tale of swarms, cannibals, ageing and human obesity.

Takema Fukatsu, National Institute of Advanced Industrial Biology and Technology, Japan. Biodiversity, symbiosis and evolution.

Thomas W Scott, Department of Entomology, University of California, Mosquito Research Laboratory, USA. Pathogen transmission dynamics at the human-mosquito interface.

Ilka Hanski, Department of Biological and Environmental Sciences, University of Helsinki, Norway. Insect biodiversity and its conservation in fragmented landscapes.

Christian Borgemeister, International Centre of Insect Physiology and Ecology, Kenya. Insect science and poverty alleviation – tales from Africa.

Kongming Wu, Institute of Plant Protection, Chinese Academy of Agricultural Sciences, China. Ecological succession of insect populations in Bt cotton agroecosystem: a case analysis in China.

Presentation of Certificates of Distinction

The council presented certificates of distinction to three entomologists in the opening ceremony, which carries a citation and a cash prize of $5000/-. The certificates were presented by the Chairman of the ICE Council - Hari Sharma, and the citations were read by the Secretary General, James Ridsdill-Smith.

Joop C van Lenteren - University of Wageningen, The Netherlands. For his work on developing protocols for biological control of insect pests, plant pest natural enemy interactions, assessment of risk associated with introduction of bio-control agents, quality control and mass multiplication of natural enemies, and education and training in the field of biological control.

John Anthony Pickett - Rothamsted Research, UK. For his work on chemical ecology of the interactions between insects and the plants, semiochemicals, chemical basis of push-pull strategy for pest management, education and training.

Hugh M Robertson - University of Illinois, USA. For his work on insect genomics, evolution, molecular taxonomy, genes involved in olfaction and taste, transposable elements, and vectors of human diseases.

Meetings of Council of XXIV International Congress of Entomology,

19 – 25 Aug 2012, Daegu, Korea

The meetings of the ICE council were held on 19, 20, 23 and 24th Aug 2012. The meetings were chaired by Hari Sharma to elect new council members, select the venue for the next congress, and elect new office bearers of the council. Fifteen members of the council attended the meetings, while May Berenbaum and Robert Lane participated through video-conferencing.

Dr Tom Scott, Dr Susheng Liu and Dr Frantisek Marec were elected as the new members of the council, and the chair welcomed the new members to the ICE council. Dr Robert Lane, Dr Marjorie Hoy and Dr Frantisek Sehnal retired as council members. The chair thanked them all for their distinguished services to the ICE.

The council also decided to involve the national societies and/or their representatives for nominations for the award of certificates of distinction, and election of new council members representing different regions and disciplines, with particular emphasis of gender balance. The bid presented by the Entomological Society of America was accepted by the council, and the 25th International Congress of Entomology will be held in 2016 in Orlando, Florida, USA. The Entomological Society of America will organize the ICE2016 in collaboration with the entomological societies from the region.

The council reposed faith in the present office bearers, and also nominated Prof. Hideharu Numata as the Deputy Secretary General for the period 2012-2016. The other office bearers of the council for the next four years are: HC Sharma – Chairman (India), Shirley Hanrahan – Vice-Chairperson (South Africa), Dr James Ridsdill-Smith – Secretary General (Australia), and Hideharu Numata – Deputy Secretary General (Japan).

Thanking the council members for reposing their faith in the council executive, Dr Sharma said: "I feel greatly humbled and honored on being re-elected as Chair of the Council of the International Congresses of Entomology, and we will make all the efforts to advance the cause of science of entomology for the service of humanity".

Presentation of Certificates to Honorary Members

Frantisek Sehnal (left) and Junichi Yukawa (center) were elected as honorary members in recognition of their outstanding contributions to Entomology and to the International Congresses of Entomology.

Left - Prof. Byungjin Kim and Team were honored with an Appreciation Award for their excellent efforts in Organizing the XXIV International Congress of Entomology. Right - Hari Sharma congratulating the President of Entomological Society of America for being selected as the host 25th International Congress of Entomology in 2016.

ICE Council Members with the
Members of the Royal Society of Entomology,
UK; and Entomological Society of America.

Biotech Applications in Insect Bio-Industry and Conservation of Insect Biodiversity

Hari C Sharma, President, Council of the International Congresses of Entomology

2nd International Symposium for Insect Bio-EXPO, 18 – 19 July 2012, Yecheon, Korea

Dear Mr. Hyun Joon Lee, Governor of Yecheon County, friends, ladies and gentlemen. At the outset, let me thank the organizers of the **Yecheon Insect Bio-EXPO** for providing me an opportunity to participate in this wonderful event, and interact with you. I extend my good wishes to you on behalf of the Council of the International Congresses of Entomology, and my own behalf.

It is with great surprise and humbleness that we observe the miracle of egg hatching or birth in insects, which further astonishes us by the invisible transformation of a worm-like caterpillar into a beautiful butterfly or moth. We can mimic Mother Nature in minute details, but probably can never come close to creation of biodiversity that has evolved on our planet. Insects are the most dominant group on earth, and constitute over 75% of the total species on earth. Insects perform several important functions, and act as pollinators and scavengers. They also act as natural enemies of crop pests, and also provide honey and silk. They are one of the most important components of animal diversity on earth. However, a large number of insects are also serious pests of crops or act vectors of plant and human diseases. It is unimaginable to live on earth without the beautiful butterflies, moths, and beetles around us.

Some people may regard insects only as a nuisance or a worthless component of their surroundings, but Parks such as **Yecheon Insect Bio-EXPO** play a very important role in the education of general public and conservation of the environment. This serves not only as an eye opener to the visitors to the park, but is also an important industry that supplies insects for pollination, and other items for food, fiber, and exports. There is a need to pay utmost attention for conservation of the habitats in which the insects live, and develop eco-parks to serve as a refuge for the useful and endangered species.

There is a great potential for using modern tools of biotechnology for identification of insects, and for gaining an understanding of their biology, population structure, behavior, and insect – host plant interactions. Genetic engineering and marker-assisted selection has a great potential for developing crop cultivars with resistance to insect pests, and thus, reducing the need to use pesticides. Rapid and cost effective development and adoption of biotechnology-derived products will depend on gaining a full understanding of the interaction of genes within their genomic environment, and with the environment in which their conferred phenotype must interact for pest management and conservation of the environment. Genetic engineering can also be used to produce robust natural enemies, broaden their host range or enable their production on artificial diet or non-host insect species that are easy to multiply under laboratory conditions. Molecular techniques can also be used to. Genetic transformation can also be employed to improve commercial production of pollinators, develop more productive strains of honeybees and silkworm, and production of pharmaceuticals and biomolecules.

Creation of wild life reserves and eco-parks is also a measure of the cultural sensitivities and level of commitment of people to preserve the environment for the future generations. The Republic of Korea and the Yecheon County can be proud of having created the **Insect Bio-EXPO**. Many of us are envious of this fact, and we congratulate you for this singular achievement. It is particularly gratifying that the Korean people appreciate and use the modern science and technology, and yet give great importance to the conservation of species that have inhabited the earth millions of years before us.

I am fully convinced that a combination of modern science and technology, including the application of modern tools of biotechnology, will usher in a new era of efficient production of insects and the commercial products derived from them, and help in conservation of biodiversity for the future generations. I am glad that the Republic of Korea has set this excellent example for the rest of the world, and it will certainly engineer the creation of several such parks all over the world, and I congratulate you for this great achievement. I thank you once again for this wonderful opportunity to share my thought with you.

Namaskar ! Have a nice Day.

Hari C Sharma

President, International Congresses of Entomology

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Presentations made in ICE2012

Conducting the symposium on 'Effect of climate change on arthropod diversity, pest management and food security" (right), and delivering the oral presentations (right).

Conducted a symposium on the "Effect of climate change on arthropod diversity, pest management and food security, and made three presentations. The other three presentations were co-authored with Dr MK Dhillon. Also give the keynote address at the Insect BioExpo, Yecheon.

- Effect of global warming on insect – host plant – environment interactions- HC Sharma
- Induced resistance to insects: Potential applications in pest management – HC Sharma
- Transgenic grain legumes for pest management: Potential and limitations – HC Sharma
- Effect of climate change on bio-efficacy of IPM technologies – MK Dhillon and HC Sharma
- Relative abundance of natural enemies of crop pests on Bt-transgenic and nontransgenic cottons in India – MK Dhillon and HC Sharma
- Effect of GM crops on nontarget organisms - MK Dhillon and HC Sharma
- Application of modern tools of biotechnology for insect industry and pest management – HC Sharma, Insect BioExpo, 18-19 Aug 2012, Yecheon, Korea

Entomology: Past, Present and Future: Presidential Address

Hari C Sharma, Chairman, Council of the International Congresses of Entomology.

The entomological fraternity has a great tradition of making landmark discoveries that have led to major breakthroughs in science, and award of Nobel Prize to scientists at different times, including the discovery of insecticidal properties of DDT by Paul Muller, deciphering the dance language of honeybees by Karl R von Frisch, and transmission of the malarial parasite, Plasmodium by Anopheles by Ronald Ross. However, there are several challenges that need to be addressed in future.

We need to address the issues arising out of the use of genetically engineered organisms in agriculture and industry, biosafety of genetically modified organisms to the environment, and develop more productive strains of silkworm, honeybees, and efficient pollinators. We need to develop an understanding of the interaction of genes within their genomic environment, and the external environment in which their conferred phenotype must interact.

We also need to understand the effects of climate change on biodiversity, geographic distribution of arthropods, and pest outbreaks. There is a need to assess the effect of climate change on the efficacy of various pest management tactics and food security, and address the issues related to invasive species, bio-security, quarantine, and trade.

The ICE Council, which provides continuity and direction to the entomology congresses, has made significant progress in establishing a webpage and mobilizing resources for distinguished scientist awards. The council will try to establish a close relationship with national and regional entomological societies to promote the science of entomology. Several interesting papers were presented in various themes of the ICE2012, and I congratulate you all for the excellent achievements in various fields.

I take this opportunity to thank the Mayor of Daegu – Bumil Kim, Dr Byungjin Kim and his Team, and several volunteers for doing an excellent job in organizing ICE2012. I also thank Mayor of Yecheon – Hyun Joon Lee, and Dr YJ Kwon for organizing the Insect BioExpo and providing the support to entomologists from the developing countries. Finally, I thank you all for your cooperation in making the ICE2012 a "Grand Success". The council has recommended ESA to host the ICE2016 at Orlando Florida in 2016.

Thank you, and have a nice evening!

Hari C Sharma addressing the Plenary Session of the XIV International Congress of Entomology.

President of LOC, Byungjin Kim (left) and Ho-Yong Park (middle),
President of the Entomological Society of Korea,
addressing the XXIV International Congress of Entomology.

Right - ICE executive committee for 2012-2016 (right).
Hari Sharma – Chairman, Shirley Hanrahan – Vice-Chair Person,
James Ridsdill-Smith – Secretary General, and
Hideharu Numata – Deputy Secretary General.

International Symposium on Insect Bio-Industry: Achievements and Challenges, 18 – 19 Aug 2012, Yecheon, Korea

Inaugural Address: Biotech Applications in Insect Bio-Industry and Conservation of Insect Biodiversity

Hari C Sharma, President, Council of the International Congresses of Entomology

Your Excellency, Mr Hyun Joon Lee - Governor of Yecheon, Mr Hansung Lee – Member of National Assembly, Republic of Korea, Prof YJ Kwon, friends, ladies and gentlemen. At the outset, let me thank the organizers of the **Yecheon Insect Bio-EXPO** for providing me an opportunity to participate in this wonderful event, and interact with you. I extend you good wishes on this occasion on behalf of the Council of the International Congresses of Entomology and my own behalf.

It is with great surprise and humbleness that we observe the miracle of egg hatching or birth in insects, which further astonishes us by the invisible transformation of a worm-like caterpillar into a beautiful butterfly or moth. We can mimic Mother Nature in minute details, but probably can never come close to creation of biodiversity that has evolved on earth for millions of years. Insects are the most dominant group on earth, and constitute over 75% of the total species on earth. Insects perform several important functions. They act as pollinators, scavengers, and natural enemies of crop pests. Insects also provide honey, silk, lac and medicines, and one of the most important components of animal diversity on earth.

However, a large number of insects are also serious pests of crops or act as vectors of plant and human diseases. It is unimaginable to live on earth without the beautiful butterflies, moths, and beetles around us. Some people may regard insects only as a nuisance or a worthless component of their surroundings, but Parks such as **Yecheon Insect Bio-EXPO** play a very important role in education of the general public and conservation of the environment. This serves not only as an eye opener to the visitors to the park, but is also an important industry that supplies insects for pollination, food, fiber, and exports. There is a need to pay utmost attention for conservation of the habitats in which the insects live, and develop eco-parks to serve as a refuge for the useful and endangered species.

There is a great potential for using modern tools of biotechnology for identification of insects, and for gaining an understanding of their biology, population structure, behavior, and insect – host plant interactions. Genetic engineering and marker-assisted selection can be used for developing crop cultivars with resistance to insect pests, and thus, reducing the need to use

pesticides. Rapid and cost effective development and adoption of biotechnology-derived products will depend on gaining a full understanding of the interaction of genes within their genomic environment, and with the environment in which their conferred phenotype must interact for pest management and conservation of the environment. Genetic engineering can also be used to produce robust natural enemies, broaden their host range or enable their production on artificial diet or non-host insect species that are easy to multiply under laboratory conditions. Genetic engineering can also be used to improve the commercial production of pollinators, develop more productive strains of honeybees and silkworm, and production of pharmaceuticals and biomolecules.

Creation of wild life reserves and eco-parks is also a measure of the cultural sensitivities and level of commitment of people to preserve the environment for the future generations. The Republic of Korea and the Yecheon County can be proud of having created the **Insect Bio-EXPO**. Many of us are envious of this fact, and we congratulate you for this unique achievement. It is particularly gratifying that the Korean people appreciate and use the modern science and technology, and yet give great importance to the conservation of species that have inhabited the earth millions of years before us. I am fully convinced that a combination of modern science and technology, including the application of modern tools of biotechnology, will usher in a new era of efficient production of insects and the commercial products derived from them, and help in conservation of biodiversity for the future generations. I am glad that the Republic of Korea has set this excellent example for the rest of the world, and it will certainly engineer the creation of several such parks all over the world, and I congratulate you for this great achievement. I thank you once again for this wonderful opportunity to share my thoughts with you. Have a nice day!

Dr Hari C Sharma giving the Inaugural Address at the International Symposium on Insect Bio-Industry: Achievements and Challenges, 18 – 19 Aug 2012, Yecheon, Korea

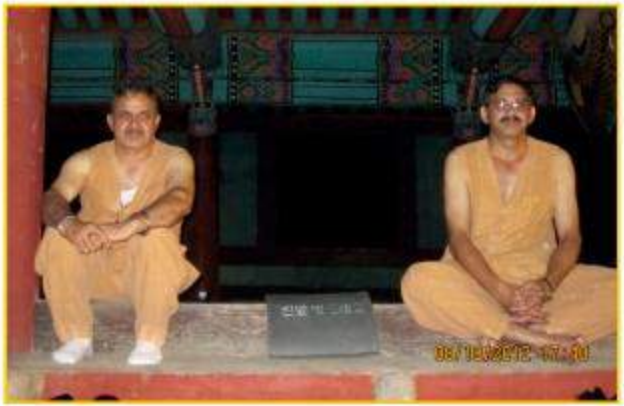
Presentation of Certificates of Honor at the Insect BioExpo, Yecheon, Korea

On behalf of the International Congress of Entomology, the Chairman of the ICE Council, Hari C Sharma presented a certificate of honor to the Governor of the Yecheon - Hyun-Joon Lee, for his excellent efforts to preserve insect biodiversity, popularizing insect science and encouragement of insect bio-industry, and to Prof YJ Kwon for his contributions to entomology, and providing support over 100 scientists from the developing countries to participate in the 24th International Congress of Entomology.

Presentation of certificates of honor to His Excellency, Mr Hyun-Joon Lee, Governor of Yecheon (left), and to Dr YJ Kwon, Prof. of Entomology (right), Kyungpook National University, Daegu, Korea.

Mementoes were also presented to Dr Sharma by the Head Monk of Yongmunsa Temple (a gold plated plaque of the first Buddhist Monk in Korea, and the Mayor of Daegu, Bumil Kim (b silver coin released on the occasion of IAAF WCH 2011 Games held in Daegu, Korea).

Interacting with delegates from India and Pakistan (left), discussing council matters with Frantisek Sehnal - Past President (center), and with Dr Mukesh Dhillon and Prof YL Zhang (right).



Meditating at the Buddhist Shrine at Yecheon.

Pictures from the
Insect BioExpo – Yecheon.
Nearly one million people
visited the exhibition
in Aug 2012.

Snap shots from the cultural events held during ICE2012.

Acknowledgements

I thank ICRISAT management for approving the trip, and Prof. YJ Kwon and Prof. Byungjin Kim for their kind hospitality, the executive and members of the ICE Council, and the local organizing committee for their cooperation and help for making XXIV International Congress of Entomology a grand success.

ICE

ICE2016: XXVth International Congress of Entomology

Invitation from the President

Dear Fellow Entomologists,

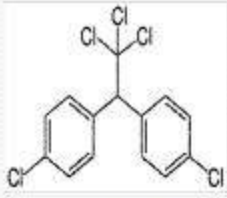
On behalf of the Council for International Congresses of Entomology, I extend a cordial invitation to "Fellow Entomologists" to participate in the "XXV International Congress of Entomology, September 25-30, 2016, Orlando, Florida, USA". The XXV Congress, which is being organized by the Entomological Society of America in collaboration with other entomological societies, with the theme "Entomology Without Borders", will provide a great opportunity to discuss and learn the recent advances in the science of entomology, and establish contacts and collaborations among the entomologists from different parts of the world. The deliberations during the 25th International Congress of Entomology, comprising of plenary speeches in different disciplines in the morning, and over 20 concurrent sessions each day, will create an awareness of the challenges that we need to address for sustaining food security and the environment. The congress will also provide opportunities for interaction among the scientists from public and private institutions and the publishers to accelerate the pace of translating innovations into action for the welfare of mankind.

The congress will focus on the challenges being faced by the entomologists on the use of genetically modified organisms for pest management and their biosafety in the environment.

UK Kang, Le China Khan, Zeyaur Kenya Kim, Byung-Jin Korea Liu, Shu Sheng China Marec, Frantisek Czech Republic Obeng-Ofori, Daniel Ghana Scott, Tom USA Takken, Willem The Netherlands Zalucki, Myron P. Australia	Another important issue that warrants urgent attention is likely consequences of global warming on geographical distribution of insect pests and pest management. There is a need to develop strategies to mitigate the effects of climate change on crop protection, and address the critical issues related to invasive species and bio-security. The enthusiasm and excitement displayed by the organizing committee certainly promises that the "25th International Congress of Entomology" will be a grand success. The venue for the Entomology Congress, Orlando, Florida, will provide an appropriate setting and up-to-date technical facilities for the congress. I am sure the XXV Entomology Congress will be organized in a highly professional manner to make it a grand success, and I look forward to seeing you in Orlando in September 2016. **HC Sharma, Chairman,** **International Congresses of Entomology** **www.int-cong-ent.org**

XXVth International Congress of Entomology, 23 – 30 Sept 2016, Orlando, Florida, USA

The purpose of the Council is to provide continuity and direction for the International Congresses of Entomology, and to serve as the Entomology Section of the International Union of Biological Sciences (IUBS). It may also encourage the holding of smaller inter-Congress meetings. The Council consists of not more than twenty-three (23) members, who shall represent as wide a field as possible both geographically and by entomological discipline. Membership of the Council shall be limited to distinguished entomologists who are interested in the welfare and future of the International Congresses of Entomology. Members are elected for one term of 8 years. Members can be re-elected for a second term but are not permitted to serve more than two consecutive terms.The Council also appoints Honorary Members as prescribed in the Constitution. Honorary Members are appointed from among entomologists who have made outstanding contributions to entomological knowledge, who have influenced entomology substantially both within and outside their own countries or regions, and who have made important contributions to the International Congresses of Entomology



Progress & Challenges in Pest Management for Food Security & Conservation of the Environment

Hari C Sharma*, President, Council of the International Congresses of Entomology.
*Vice Chancellor - YSP University of Horticulture & Forestry, Nauni, 173230, Solan, Himachal Pradesh, India.

Welcome Address

The President of ESA - May Berenbaum, Co-chairs of LOC - Walter Leal and Alvin Simmons, the Members of ICE Council, Participants, Ladies and Gentlemen. Good Evening! On behalf of the ICE and my own behalf, I extend you all, a warm welcome to "ICE 2016". The Congress theme, "Entomology Without Borders", is most appropriate to address emerging issues of global warming and food security.

Milestone Discoveries in Entomology

The discovery of insecticidal properties of DDT by Paul Muller, Dance language of honeybees by Karl von Frisch, and Transmission of malaria by Anopheles - Ronald Ross are the milestone discoveries in entomology, that have won the Nobel Prize. In the 25th ICE, we have 12 plenary presentations, including the two by the Nobel Laureates, and over 300 symposia, and poster presentations that make ICE2016 - A Landmark Congress.

However, issues such as: i) Climate change effects on biodiversity, pest management and food security, ii) Impact of climate change and synthetic chemicals on honeybees, pollinators, and beneficial insects, and iii) The emerging challenges from global warming, invasive species, and biosafety of GMOs to NTOs need urgent attention.

The enthusiasm displayed by the LOC certainly promises that you will relish the scientific program of "ICE2016". I thank the LOC, the supporting organizations, and the Participants, and look forward to your cooperation in making ICE2016 a "Grand success".

Presidential Address

On 11th Sept 1893 in the World Parliament of Religions, the Great Indian Saint, Swami Vivekananda said, "Help and not fight; Assimilation and not destruction; and Harmony not dissension"!And these words are equally true today. May I call upon the Fellow Entomologists today to give expression to these words through "Entomology without borders" to fight hunger, malnutrition and poverty.

Tremendous progress has been made in our understanding of molecular markers for insect resistance, genome sequences, gene expression, induced resistance, and RNAi technology. Use of GMOs, biopesticides, ecological engineering and biocontrol has contributed immensely for sustainable IPM for food security, and a safer environment to live.

And There are several challenges including, i) Harmful effects of insecticides on pollinators, development of insect resistance to insecticides and GMOs, and insecticide residues in food, ii) Global warming, invasive species, biosafety of GMOs and the products of RNAi technology and synthetic biology need urgent attention.

I extend my good wishes to the new executive of ICE led by May Berenbaum (President, USA), Marek Frantisek, (Vice President, Czech Republic), and Myron Zalucki (Secretary General, Australia). I am sure, you all have relished the scientific program of "ICE2016", and I take this opportunity to thank the LOC led by Walter Leal and Simmons Alvin for organizing the Landmark ICE2016!

"Your life is message to the world, make sure it is inspiring" - Swami Vivekananda.

And I am sure you will make a mark in Entomology to make your contributions a source of inspiration for the future generations.

Have a Nice Evening.

Namaskar!

Winners of
ICE Certificates of Distinction

By awarding these Certificates of Distinction, the Council wishes to emphasize the central and continuing importance of entomology in both basic and applied studies, ranging from populations and organisms down to cellular and molecular levels. Entomology is historically, economically and socially salient to human endeavor. It continues to be of critical importance to agriculture, forestry, human and animal health, and environmental well-being in most countries of the world. Insects have also proven to be excellent models for many fundamental studies in biology. By awarding these certificates, the Council hopes to help inspire and connect all entomologists throughout the world. The following scientists have been honored with Certificates of Distinction at the 2016 International Congress of Entomology in Orlando, Florida.

Professor Angharad Gatehouse is the chair of the Invertebrate Molecular Biology Department at the University of Newcastle. Her over-arching research interests are in the molecular and biochemical bases of insect-plant interactions for the development of novel approaches to crop protection. As part of this, her research interests also encompass the potential impact of such technologies on non-target organisms, particularly beneficial insects including pollinators such as bees, and natural enemies such as parasitoids and predators

Professor Ring Cardé holds a distinguished professorship and the Alfred M. Boyce Chair in Entomology at the University of California, Riverside. His main research interests are in basic and applied aspects of odor-mediated behavior of insects, focusing on communication by pheromones in moths and host-finding by female mosquitoes.

Professor Maureen Coetzee is director of the Wits Research Institute for Malaria, School of Pathology in the Faculty of Health Sciences, at the University of the Witwatersrand, Johannesburg, South Africa. Her research interest is in applied aspects of malaria vector mosquito control, but also includes use of the latest molecular technology to provide insight into mosquito species diversity, biology, and behaviour.

ICE 2016

Plenary & Keynote Speakers Included the Nobel Prize Winners- Peter Agre and Jules Hoffmann

Peter Agre won the Nobel Prize in Chemistry for discovering Aquaporins, and Jules Hoffman won Nobel prize in Medicine for discovering activation of innate immunity. Left: HC Sharma with Peter Agre.

Dr. Peter Agre - Johns Hopkins School of Medicine, USA, spoke on "Opening doors worldwide through medical science". Dr. Agre is the Bloomberg Distinguished Professor at the Johns Hopkins School of Medicine and Bloomberg School of Public Health. Dr. Agre shared the 2003 Nobel Prize in Chemistry for discovering aquaporins, a family of water-channel proteins found throughout nature that underlie numerous physiological processes and clinical disorders.

Dr. Jules Hoffmann - Strasbourg University Institute for Advanced Study, France, delivered the lecture on, "Innate immunity: from insects to humans". Dr. Hoffmann is a professor of integrative biology at the Strasbourg University Institute for Advanced Study. Dr. Hoffmann was awarded the 2011 Nobel Prize in Physiology or Medicine for "discoveries concerning the activation of innate immunity". He shared the 2011 Nobel Prize in Physiology and Medicine.

Dr. Carolina Barillas-Mury - National Institute of Allergy and Infectious Diseases, USA, spoke on, " Mosquito Immunity and the Invisible Parasite: Implications for Global Malaria Transmission'. She is interested in understanding the interactions between the mosquito immune system and Plasmodium parasites that are critical for malaria transmission, with the ultimate goal of disrupting the parasite's life cycle and preventing human disease.

Dr. Jacqueline Beggs - University of Auckland, New Zealand, spoke on, "Ecological impacts of insect invaders". Jacqueline has demonstrated the major impact of introduced Vespula wasps in New Zealand, and her research on biological control and population modelling of these wasps has provided a sound basis for ongoing development of control tools.

Dr. James R. Carey - University of California, Davis, USA, spoke on, "Insect biodemography: A 21st century guided tour". He has authored more than 250 scientific articles, including landmark papers in Science that shaped the way scientists think about lifespan limits and actuarial aging, and two articles in the Annual Review series that provide new syntheses on insect biodemography.

Dr. Fred Gould - North Carolina State University, USA, delivered his lecture on, "Will genetically engineered pests protect health, biodiversity, and crop production? He focuses on the potential for engineering insect pests to suppress disease and crop loss, and to protect endangered species.

Dr. Jennifer Fewell - Arizona State University, USA, delivered the lecture on, "The spirit of the hive: mechanisms of social evolution". She was the Founding Director of ASU's Center for Social Dynamics and Complexity. Her research focuses on the organization of insect societies, and on the interplay between self-organization and selection in shaping social groups.

Dr. José Roberto Postali Parra - ESALQ-University of Sao Paulo, Brazil, delivered the lecture on, "The egg parasitoid, Trichogramma as a tool for IPM in Brazil". His field of expertise is insect biology, nutrition, and biological control, with emphasis on parasitic Hymenoptera.

Dr. John A. Pickett - Rothamsted Research, UK, delivered the lecture on, "Agro-ecological manipulation of insect behaviour shows how to exploit signaling between insects and their hosts via GM. His major contributions are in chemical ecology, and involved with research activities in the UK and around the world.

Dr. Baldwyn Torto - International Centre of Insect Physiology & Ecology (ICIPE), Kenya, delivered the lecture on, "Rift valley fever in East Africa: three frontiers, one purpose". He is currently coordinating research aimed at conserving the rich honey bee diversity in Africa for important ecosystem services for food security, and he is also championing the development of improved management tools against vector-borne emerging infectious diseases on the continent.

Meetings of the Council of

International Congress of Entomology: The Outcomes

The ICE Council meetings were attended by Hari Sharma (Chair), May Berenbaum, David Denlinger, Silvia Dorn, Shirley Hanrahan, Jim Hardie, Kang Le, Zeyaur Khan, Liu Shu-sheng, Frantisek Marec, HideharuNumata, Dan ObengOfori, James Ridsdill-Smith, Thomas Scott, Willem Takken, and Myron Zalucki.The members of the LOC, Walter Leal, Alvin Simmons and David Gammel gave an informal report on ICE2016. The Council members felt that only two awards are too few and will exclude many good candidates. It was suggested that there should be 3 – 4 awards, and change the nature of the awards given as cash to a Gold Medal.

The council elected 12 new members (Christian Borgemeister, Yu-Chan Chao, Takema Fukatsu, Angharad Gatehouse, Jocelia Grazia, Walter Leal, Joop Van Lenteren, Dimitry Musolin, Francesco Pennachio, and Charles Vincent.

The council also elected the new Executive: Chair: May Berenbaum, Vice Chair: Frantisek Marec, and Secretary General: MeronZalucki.The council also elected the **Honorary Members of ICE:** James Ridsdill-Smith and Willem Takken.

ICE2020: Council members discussed the three bids for ICE202 at some length, and voted for Helsinki, Finland to be the next venue for ICE 2020. The Chair, Dr Hari C Sharma informed the delegation of the decision taken by the council.

The ICE2016 was attended by 6,682 delegates from 102 countries, and 42% were from outside the USA. The Council members congratulated Walter Leal, Alvin Simmons and David Gammel for the smooth running of a very successful Congress. The Secretary General expressed his belief that the new Council needs to develop and agree on different criteria for future nominations of Council Members, Certificates of Distinction and Honorary members of ICE. In order to strengthen the ICE, the plenary lectures and the awards should be spread across regions and disciplines as widely as possible.

The Chair, Dr Hari Sharma also presented certificates of appreciation to the Members of the Local Organizing Committee of the Entomological Society of America.

Acknowledgements

I thank His Excellency, The Governor of Himachal Pradesh, Sri Devvrat ji for approving the trip, ICRISAT management for covering the travel costs, and the ESA officials for their kind hospitality.