The conference

Minette Karsten attended the 27th International Congress of Entomology (Appendix 1) in Kyoto, Japan between 25-30 August 2024. The congress was held at the Kyoto International Conference Center (https://www.icckyoto.or.jp/en/) with 4041 in-person participants from 82 regions and countries.

The programme

The programme consisted of 176 Oral sessions and 29 poster sessions with 1752 oral presentations and 1065 posters respectively. The detailed Scientific programme can be seen in Appendix 2. There were several sessions of interest: Tackling destructive forest pests: sharing lessons for the future, IPM of invasive insect pests in the specialty crops under the changing climate patterns, Environmental DNA: from insect monitoring to assessment of ecological interactions, Control strategies of Hemipteran pest bugs, Novel approaches in the management of invasive fruit flies (Diptera: Tephritidae), Recent advances on biological control of invasive insect pests, Fruit fly management technologies, A new era of pest management, new approaches from innovative methods, and Sterile insect technique (SIT): promoting operational success across programs and irradiation platforms.

Interesting presentations and general comments

The interesting presentations largely centred around integrated pest management of fruit flies, including spotted wing drosophila and Hemipteran pests, as well as advances in biological control and the use of other technologies to enhance pest management. Several talks were of interest and relevant to deciduous fruit growers in South Africa.

The Symposium on forest pests explored challenges of control, especially for several beetles and moths, and important recent developments. Work presented by Brett Hurley

(South Africa) highlighted the threat from new invasive species and the challenges from limitations on expertise and resources to manage new invasions in South Africa. Researchers from Germany (Pylatiuk), presented the use of an Entomoscope (open-source photomicroscope), used for taking images of invertebrates, and AI specifically neural networks to classify beetles to support the taxonomy of bark beetles. The accuracy was very high and has potential for automating the identification of new invasive beetles and other species. Work from Canada (Black and Marchall) showed that species distribution and fluctuating environmental temperatures can be used to predict the severity of eastern spruce budworm outbreaks and how these may shift under changing climates. Researchers showed that the models including the fluctuation in temperatures matched outbreaks in the past very well. These methods could be used to do the same for several invasive insect pest species in South Africa to aid management and/or containment.

Several presentations explored the monitoring and management of beetles. Carrillo et al. (USA) presented work on Laurel wilt, which is a pathogen (fungal) transmitted by the redbay ambrosia beetle and impacts avocadoes. The researchers showed the promising use of antagonistic and entomopathogenic fungi and limitations regarding application technology, like what South Africa is experiencing for polyphagous shot-hole borer. Interestingly the researchers noted that growers are replanting approximately 70% of avo trees that were lost to laurel wilt, indicating that growers certain that the pest-pathogen can be managed. Luo et al. (China) explored the use of a “dead-end trap tree” for Asian Longhorned beetle. They identified a highly susceptible native tree, which natural response causes mortality in the beetle’s larvae and eggs. This information was used to initiate planting of resistant trees in conjunction with the highly susceptible tree that resulted in ecological self-control of the beetle. This would be a very interesting research avenue for polyphagous shot-hole borer in South Africa. Research from New Zealand (Shaw) showed that stressed fruit trees, due to waterlogging and deep silt after a cyclone, had increased risk of ambrosia beetle attacks (*Xyleborinus saxesenii*, *Amasa truncate* and *Ambrosiodomus compressus*). Since adverse weather is predicted to increase in the future, risks to stressed fruit trees may also increase. Amalin et al. presented work on using acoustics to monitor and detect red palm weevil larvae inside palms to deliver

targeted biopesticides. Could be an avenue of research to pursue to quantify PSHB infestation inside fruit trees.

Kobori et al. presented work on monitoring pesticide susceptibility in the fall armyworm. The research was part of an international collaboration that utilised the same protocol to be able to compare changes in susceptibility, determining LC50, LC95 and the resistance coefficient. The results indicated that the LC50 values of various pesticides were higher in 2021 and 2022 compared to 2019. Monitoring of insecticide resistance is an important consideration as available active ingredients are decreasing. Implementing similar programmes in South Africa as a collaborative effort between the industry and agrochemical companies would be beneficial.

A large body of work was presented by several researchers on Tephritidae (true fruit flies) monitoring, management and SIT.

Several presentations explored management options of spotted wing drosophila (SWD). Sial et al. (USA), Daane & Wang and Stacconi et al. presented work on biological control of spotted wing drosophila. Sial et al. imported parasitoids from China and South Korea and conducted research in quarantine over 10 years. *Ganaspis brasiliensis* was released in the field recently and some recapturing in released sites have started. Daane & Wang discussed the importation of 3 SWD larval parasitoids to the USA. *Ganaspis nr sp. Brasiliensis*, *Asobara japonica*, and *Leptopilina japonica* was investigated as biological control options. *Ganaspis nr sp. Brasiliensis* was the most specific to SWD, releases started in 2022 with recorded parasitism levels of up to 65%. Stacconi et al. presented work from Italy, where *Ganaspis brasiliensis* was released in 2021. Following the efficacy of the released parasitoid in the USA and Italy will be informative for South African control of SWD. Marco et al. explored the use of volatile organic compounds as a repellent for SWD oviposition and the potential impact of VOCs (e.g., (E)-2-hexenal) on pollinators and natural enemies. The research can result in additional tools to combat SWD in South Africa.

Several pest insects are at risk of entering South Africa, including brown marmorated stink bug (BMSB) is causing economic damage in orchards in the USA and Europe. Rijal et al. developed several monitoring and management tools that could be integrated into

pest management programmes. They also investigated the spatial distribution of BMSB in almond orchards, indicating higher levels of damage at the edges of orchards, as well as likely differences in varietal susceptibility and the damage they cause. Scaccini et al. explored a new mass trapping system and the use of wettable sulphur applications as a control option for BMSB in pome fruit orchards. Black panel traps were shown to be more effective than yellow and transparent traps. Sulphur applications reduced BMSB infestation in treated plots, likely due to a deterrent effect, and no phytotoxicity on fruit or leaves were shown.

Relevance to Industry

- The Conference provided up to date research information on various pests of interest to the deciduous fruit industry (e.g., fruit flies, spotted wing drosophila, sucking insects), including novel monitoring and management methods of these pests. In the light of alternative control options as part of an integrated pest management approach becoming critical to not only manage pests in field, but also to maintain market access, several of the methods presented will be important for deciduous fruit growers in the future.

- Novel approaches and recent advances of SIT and biological control of important insect pests were presented that could assist in future management of insect pests in South Africa. Parasitoid work on spotted wing drosophila is of special importance, since it would be interesting to follow the success of these releases in the USA and Europe.

- Hemipteran pests have emerged as important pests in deciduous fruit in South Africa in recent years. An entire Symposium was dedicated to novel control strategies of these pests and several of these strategies could be implemented in South Africa for local pests. There was also focus on brown marmorated stink bug management, a pest that is high on the risk list for introduction into South Africa.

- Many key contacts were made (see below) or networks enforced that could provide support for future collaborations, especially in the light of new invasive pests (e.g., spotted wing drosophila).

Key contacts

Prof. Nikos Papadopoulos, Head of Entomology and Agricultural Zoology laboratory, University of Thessaly, Greece. Expertise: Insect Ecology and management of Tephritidae.

Dr Marion Javal, Researcher at the Institute for Research and Development (IRD), Montpellier, France. Expertise: insects to cope with environmental stresses, mainly using ecophysiological approaches, and especially on models of invasive species.

Prof. Brent Sinclair, Department of Entomology, Cornell University, College of Agriculture and Life Sciences, Ithaca, USA. Expertise: thermal biology and metabolism in the cold, related to pest management and other spheres.

Prof. Philipp Lehmann, Head of Department Zoological Institute and Museum Animal physiology group, University of Greifswald, Germany, Expertise: ecological and evolutionary physiology, stress tolerance, seasonality, diapause.

Dr Leigh Boardman, University of Memphis, USA. Expertise: evolutionary and physiological ecology of arthropod, improve predictions of the effects of climate change and invasive species spread, and improve the efficacy of chemical-free pest management strategies

Dr Jackie Lebenzon, Faculty of Science, Department of Biological Sciences, University of Calgary, Canada. Expertise: Environmental insect physiology, Mitochondrial remodelling, Metabolism, Thermal biology, Functional genomics.

Dr Corey Bazelet, National Science Program Coordinator – Fruit Fly Program, Domestic and Emergency Scientific Support (DESS), USDA APHIS PPQ Science and Technology, USA.

Dr Lisa Neven, Research Entomologist, USDA-ARS, Temperate Tree Fruit and Vegetable Research Unit, Washington, USA. Expertise: alternative post-harvest (non-chemical) and quarantine treatments for deciduous fruit, niche modelling to predict spread of invasive species, member of IPPC Postharvest Management Research Group.

Dr Dong Cha, Research Biologist, USDA-ARS, US Pacific Basin Agricultural Research Center, Hawaii, USA. Expertise: Chemical Ecology specifically for pest management and post-harvest treatments. Dong's lab developed the spotted wing drosophila attractant.

Appendix 1

ICE2024 KYOTO

XXVII International Congress of Entomology

New Discoveries through Consilience

Plenary Lecturers

Nancy A. Moran
The University of Texas at Austin, USA
Evolutionary Biology
Aug.26 MON 8:15-9:15

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Fredrik Ronquist
Swedish Museum of Natural History, Sweden
Phylogenetic Systematics
Aug.27 TUE 8:15-9:15

Yupa Hanboonsong
Khon Kaen University, Thailand
Economic Entomology
Aug.28 WED 8:15-9:15

Juan C. Corley
CONICET/The National University of Comahue, Argentina
Applied Entomology/ Forest Entomology
Aug.29 THU 8:15-9:15

Rosemary Sang
International Centre of Insect Physiology and Ecology (ICIPE), Kenya
Medical Entomology
Aug.30 FRI 8:15-9:15

Ryohei Kanzaki
The University of Tokyo, Japan
Neuroethology
Aug.30 FRI 16:30-17:30

ICE 2024 KYOTO
New Discoveries through Consilience

ice2024.org

Dates
2024 **25** SUN ▶ **30** FRI August

Venue
Kyoto International Conference Center https://www.icckyoto.or.jp/en/

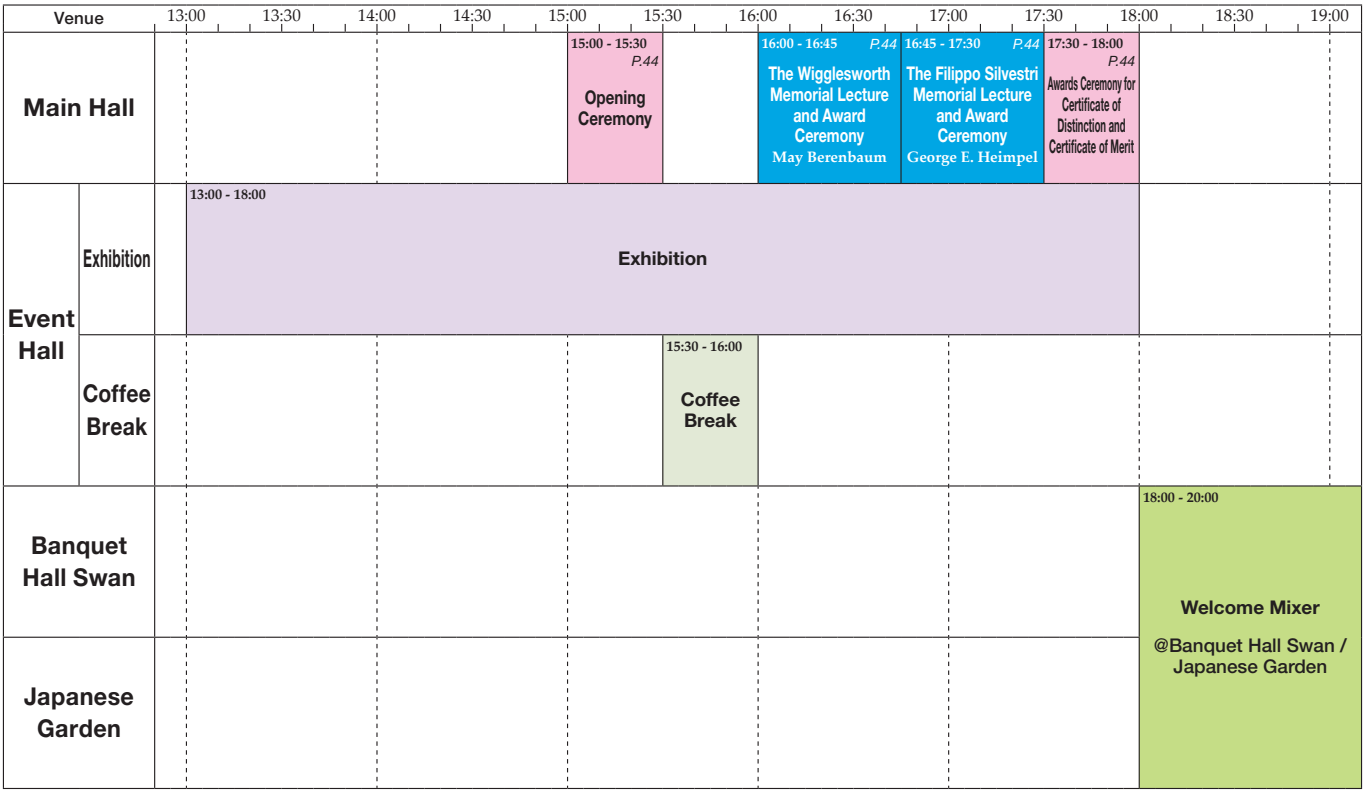
Co-hosts
Science Council of Japan, Union of Japanese Societies for Insect Sciences

Appendix 2

< Oral >

TIMETABLE, Sunday 25 August

KYOTO INTERNATIONAL CONFERENCE CENTER



TIMETABLE, Monday 26 August

KYOTO INTERNATIONAL CONFERENCE CENTER

Venue	7:00	7:30	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00
Main Hall				8:15 - 9:15 P.45 **Plenary Lecture 1** Nancy A. Moran									
RoomA							9:45 - 11:45 **[14-1]** P.45 Potential application of Empirical Dynamic Modeling for insect population dynamics						
Annex Hall 1							9:45 - 11:45 **[14-3]** P.46 Sterile Insect Technique (SIT) Applications for Area-wide Integrated Pest Management (AW-IPM)						
Annex Hall 2							9:45 - 11:45 **[14-5]** P.47 Insect vectors of plant pathogens: the biology of epidemics and development of public policy						
Room C-1							9:45 - 11:45 P.48 **[7-2]** Evolution of life history trade-offs in insects						
Room C-2							9:45 - 11:45 **[7-4]** P.49 Stick insect biology and evolution: an emerging model system						
Room D							9:45 - 11:45 **[16-1]** P.50 Physiology of insects in a warming world: from cellular to ecological and evolutionary responses						
Room E							9:45 - 11:45 **[16-3]** P.51 Arthropod saliva: from basic science to practical applications						
Room F							9:45 - 11:45 P.52 **[2-1]** Insect Bio Digital Transformation (Insect BioDX)						
Room G							9:45 - 11:45 P.53 **[20-1]** ad hoc session						
Room H							9:45 - 11:45 **[11-1]** P.55 The role of pollen lipids in bee nutrition: from larvae to landscapes.						
Room B-1							9:45 - 11:45 **[18-1]** P.56 Quantitative morphological adaptive evolution of beetles and related groups						
Room B-2							9:45 - 11:45 **[3-1]** P.57 Adaptive strategies of natural enemies including viruses and parasitoids interacting with insects						
Room I							9:45 - 11:45 **[13-1]** P.58 Ecology of biting flies: development of new control strategies						
Room J							9:45 - 11:45 **[5-1]** P.59 Long-term perspectives: Quaternary & Archaeological Entomology						
Room K							9:45 - 11:45 **[8-1]** P.60 Progress towards genome editing and gene drives in non-model organisms						
Room 554							9:45 - 11:45 P.61 **[12-1]** Global macroecology of insect invasions						
Room 555							9:45 - 11:45 **[4-1]** P.63 De-coding the Role of Insect Communication in IPM: Present Research and Future Directions						
Room 509							9:45 - 11:45 P.64 **[17-1]** Aging and longevity of social insects						
Room 510							9:45 - 11:45 **[10-1]** P.65 Biology of insect bacteriocytes and microbial symbionts						
Event Hall – Exhibition					9:00 - 18:00 **Exhibition**								
Event Hall – Poster			7:15 - 9:15 **Set Up**				9:15 - 11:45 **Viewing**			11:45 - 13:30 **Authors Present** P.136 11:45-12:35 Posters with odd numbers 12:40-13:30 Posters with even numbers			
Event Hall – Coffee Break							9:15 - 9:45 **Coffee Break**						
Banquet Hall Swan										11:45 - 13:30 **Lunchroom**			
Banquet Hall Sakura													

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13:30	14:00	14:30	15:00	15:30	16:00	16:30	17:00	17:30	18:00	18:30	19:00	19:30	20:00	20:30

13:30 - 15:30 [14-2] P.45 Genetic Population Engineering for Pest Management	16:15 - 18:15 [14-2] P.45 Genetic Population Engineering for Pest Management
13:30 - 15:30 [14-4] P.46 Bemisia tabaci: a pernicious pest and a super vector	16:15 - 18:15 [14-4] P.46 Bemisia tabaci: a pernicious pest and a super vector
13:30 - 15:30 [7-1] P.47 Evolution of termites and cockroaches (Blattodea)	16:15 - 18:15 [7-1] P.47 Evolution of termites and cockroaches (Blattodea)
13:30 - 15:30 [7-3] P.48 Arthropod Ecology in the Anthropocene	16:15 - 18:15 [7-3] P.48 Arthropod Ecology in the Anthropocene
13:30 - 15:30 [7-5] P.49 11th International Symposium on Chrysomelidae	16:15 - 18:15 [7-5] P.49 11th International Symposium on Chrysomelidae
13:30 - 15:30 [16-2] P.51 Low temperature biology: molecular mechanisms, physiological processes, and organismal consequences	16:15 - 18:15 [16-2] P.51 Low temperature biology: molecular mechanisms, physiological processes, and organismal consequences
13:30 - 15:30 [16-4] P.52 Neuroecology of mosquitoes beyond human-seeking	16:15 - 18:15 [16-5] P.52 PIWI proteins and PIWI-interacting (pi)RNAs in insects
13:30 - 15:30 [15-1] P.53 Transitioning Insecticide Science Technologies for the Development of Novel Chemistries	16:15 - 18:15 [15-1] P.53 Transitioning Insecticide Science Technologies for the Development of Novel Chemistries
13:30 - 15:30 [15-2] P.54 Bioinspired pest control	16:15 - 18:15 [15-2] P.54 Bioinspired pest control
13:30 - 15:30 [11-2] P.55 Pollination consilience: key roles of forests for pollinator conservation in anthropogenic landscapes	16:15 - 18:00 [11-2] P.55 Pollination consilience: key roles of forests for pollinator conservation in anthropogenic landscapes
13:30 - 15:30 [18-2] P.56 Building a better insect tree of life	16:15 - 18:15 [18-2] P.56 Building a better insect tree of life
13:30 - 15:30 [3-2] P.57 Classical Biological Control of Arthropod Pests: Theoretical Premise and Practical Challenges	16:15 - 18:15 [3-2] P.57 Classical Biological Control of Arthropod Pests: Theoretical Premise and Practical Challenges
13:30 - 15:30 [13-2] P.58 The Global Bed Bug Resurgence, 20 Years On	16:15 - 18:15 [13-2] P.58 The Global Bed Bug Resurgence, 20 Years On
13:30 - 15:30 [5-2] P.59 ad hoc session	16:15 - 18:15 [5-3] P.60 Grassland insects in East Asia: life history, population, phylogeography, and conservation
13:30 - 15:30 [20-2] P.61 Biotremology I - Behavioural and Sensory Ecology	16:15 - 18:15 [20-3] P.61 Biotremology II - Applied Biotremology
13:30 - 15:30 [12-2] P.62 Alien Pest Invasions: Strategies for Managing New Pest Introductions Driven by Trade, Travel, and Climate Change	16:15 - 18:15 [8-2] P.62 Advancing vector borne diseases identification, incrimination and control in the genomics era.
13:30 - 15:30 [6-1] P.63 New developments in entomological precision nutrition	16:15 - 18:15 [6-1] P.63 New developments in entomological precision nutrition
13:30 - 15:30 [17-2] P.64 From Digestion to Microbiome-Driven Behavior: Gut Functions and Symbiosis in Social Insects	16:15 - 18:15 [17-2] P.64 From Digestion to Microbiome-Driven Behavior: Gut Functions and Symbiosis in Social Insects
13:30 - 15:30 [10-2] P.65 Extended phenotypes emerging across insects, plants and microbes	16:15 - 18:15 [10-2] P.65 Extended phenotypes emerging across insects, plants and microbes
13:30 - 18:00 Viewing	18:00 - 19:00 Takedown
15:30 - 16:15 Coffee Break	

TIMETABLE, Tuesday 27 August

KYOTO INTERNATIONAL CONFERENCE CENTER

Venue	7:00	7:30	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00
Main Hall				8:15 - 9:15 P.67 Plenary Lecture 2 Fredrik Ronquist									
RoomA							9:45 - 11:45 [14-6] P.67 Tackling destructive forest pests: sharing lessons for the future						
Annex Hall 1							9:45 - 11:45 [14-8] P.68 Cutting-edge pest control techniques developed using ultrasound and semiconductor laser light						
Annex Hall 2							9:45 - 11:45 [7-6] P.69 Basic and applied studies of insect movement						
Room C-1							9:45 - 11:45 [7-7] P.70 Novel Interspecific Relationships Mediated by Trace Chemicals						
Room C-2							9:45 - 11:45 [7-9] P.71 ad hoc session						
Room D							9:45 - 11:45 [16-6] P.72 Insect circadian clocks						
Room E							9:45 - 11:45 [16-8] P.73 Extracellular RNAs and RNA-based intercellular communication in insects				12:00 - 13:15 P.74 Women in Entomology Luncheon Seminar		
Room F							9:45 - 11:45 [20-4] P.75 Manga, Comics, and Games as tools for Entomological Engagement!						
Room G							9:45 - 11:45 [2-2] P.76 Recent Advances in Basic and Applied Studies on Wild Silkworms and Silk in the World						
Room H							9:45 - 11:45 [11-3] P.77 Pollinators in agroecosystems - effective use and conservation-						
Room B-1							9:45 - 11:45 [18-3] P.78 ad hoc session						
Room B-2							9:45 - 11:45 [3-3] P.79 Genetic improvement of biological control agents						
Room I							9:45 - 11:45 [3-5] P.80 ad hoc session						
Room J							9:45 - 11:45 [13-4] P.81 Biology and management of Container-inhabiting Aedes mosquitoes						
Room K							9:45 - 11:45 [5-6] P.82 Unifying our view of insect biodiversity for conservation						
Room 554							9:45 - 11:45 [8-4] P.83 Insects genome and transcriptome data analysis						
Room 555							9:45 - 11:45 [4-2] P.84 ad hoc session						
Room 509							9:45 - 11:45 [17-3] P.86 Tracing the evolution of social behavior through comparison across species						
Room 510							9:45 - 11:45 [20-6] P.87 Data-intensive entomology: global standards and practices						
Event Hall – Exhibition					9:00 - 18:00 Exhibition								
Event Hall – Poster			7:15 - 9:15 Set Up			9:15 - 11:45 Viewing					11:45 - 13:30 Authors Present P.146 11:45-12:35 Posters with odd numbers 12:40-13:30 Posters with even numbers		
Event Hall – Coffee Break						9:15 - 9:45 Coffee Break							
Banquet Hall Swan											11:45 - 13:30 Lunchroom		
Banquet Hall Sakura													

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13:30 14:00 14:30 15:00 15:30 16:00 16:30 17:00 17:30 18:00 18:30 19:00 19:30 20:00 20:30

13:30 - 15:30	16:15 - 18:15
[14-7] P.67 IPM of Invasive Insect Pests in the Specialty Crops under the Changing Climate Patterns	[14-7] P.67 IPM of Invasive Insect Pests in the Specialty Crops under the Changing Climate Patterns
[14-9] P.68 Life table theory and computer simulation for pest management programs	[14-9] P.68 Life table theory and computer simulation for pest management programs
[14-10] P.70 Development and application of baits for subterranean termite control in the last three decades	[14-10] P.70 Development and application of baits for subterranean termite control in the last three decades
[7-8] P.71 Ecology, evolution and biodiversity of gall-inducing insects	[7-8] P.71 Ecology, evolution and biodiversity of gall-inducing insects
[7-10] P.72 Nutritional ecology: recent advances, and future challenges	[7-10] P.72 Nutritional ecology: recent advances, and future challenges
[16-6] P.72 Insect circadian clocks	[16-7] P.73 Emergence timing: from molecular, neurobiological and physiological mechanisms to evolutionary significance
[16-9] P.74 Insects and human brain disorders	[16-10] P.74 Juvenile Hormone: From biosynthesis to action. A symposium in memory of Professor Stephen S. Tobe (1944-2020)
[15-3] P.75 New developments in controlling insect pests with insecticidal proteins	[15-3] P.75 New developments in controlling insect pests with insecticidal proteins
[15-4] P.76 Realizing the potential of RNA biopesticides: what it takes to make RNAi commercial and durable	16:15 - 18:00 [15-4] P.76 Realizing the potential of RNA biopesticides: what it takes to make RNAi commercial and durable
[1-1] P.77 Novel technologies and seeds toward innovative mite management	[1-1] P.77 Novel technologies and seeds toward innovative mite management
[18-4] P.78 Phylogeny and Evolution of Beetles - Symposium celebrating 90th Birthday of John Francis Lawrence	[18-4] P.78 Phylogeny and Evolution of Beetles - Symposium celebrating 90th Birthday of John Francis Lawrence
[3-4] P.79 Recent advances in biology, ecology and application of egg parasitoids	[3-4] P.79 Recent advances in biology, ecology and application of egg parasitoids
[13-3] P.80 Advance in Management of Invasive Mosquitoes in Urban Areas	[13-3] P.80 Advance in Management of Invasive Mosquitoes in Urban Areas
[5-4] P.81 ad hoc session	[5-5] P.82 Automated monitoring of insects
[8-3] P.83 Frontiers in Research on the Molecular Basis underlying the Diversity of Insect Color Patterns	[8-3] P.83 Frontiers in Research on the Molecular Basis underlying the Diversity of Insect Color Patterns
[9-1] P.84 Comparative immune signaling between insects and other organisms: from recognition to effectors	[9-1] P.84 Comparative immune signaling between insects and other organisms: from recognition to effectors
[4-3] P.85 From Blum's semiochemicals parsimony to Wilson's consilience	[4-3] P.85 From Blum's semiochemicals parsimony to Wilson's consilience
[20-5] P.86 Environmental DNA: from insect monitoring to the assessment of ecological interactions	[20-5] P.86 Environmental DNA: from insect monitoring to the assessment of ecological interactions
[10-3] P.87 Symbiotic microorganisms alter insect behavior	[10-4] P.88 Advancing experimental manipulation of insect-bacterial associations

13:30 - 18:00 Viewing

18:00 - 19:00 Takedown

15:30 - 16:15 Coffee Break

TIMETABLE, Wednesday 28 August

KYOTO INTERNATIONAL CONFERENCE CENTER

Venue	7:00 – 13:00
Main Hall	8:15 - 9:15 P.89 **Plenary Lecture 3** Yupa Hanboonsong
RoomA	9:45 - 11:45 **[A-CICE]** P.89 The 2024 Awards from the Council of the International Congress of Entomology (CICE)
Annex Hall 1	9:45 - 11:45 **[14-11]** P.90 The fall armyworm as a threat to rice production in Asia and beyond
Annex Hall 2	9:45 - 11:45 **[7-11]** P.90 Latitudinal Trends in Insect Ecology
Room C-1	9:45 - 11:45 **[3-6]** P.91 Advances on Plant-Derived Food Sources in Biological Control
Room C-2	9:45 - 11:45 **[20-7]** P.91 Behavioural diversity: causes and consequences
Room D	9:45 - 11:45 **[16-11]** P.91 Bugs in the City: Urban Insect Ecophysiology
Room E	9:45 - 11:45 **[19-1]** P.92 The next biomimetics in insect's perspective for the sustainable symbiosis on the globe
Room F	
Room G	9:45 - 11:45 **[11-4]** P.93 Current entomophagy: food and nutrition security, circular economy, and breeding techniques
Room H	9:45 - 11:45 **[11-5]** P.93 Sustainable biowaste recycling and animal feed production using insects.
Room B-1	9:45 - 11:45 **[18-5]** P.93 Decoding Parasitic Lice: Systematics, Evolution, and Genomics
Room B-2	9:45 - 11:45 **[18-6]** P.94 Biodiversity and taxonomy of lepidopteran insects
Room I	9:45 - 11:45 **[13-5]** P.94 CRISPRing vectors: The new era of genome engineering towards vector-borne disease control
Room J	9:45 - 11:45 **[13-6]** P.95 Neglected vectors and pests in a changing climate
Room K	9:45 - 11:45 **[5-7]** P.95 Urban Arthropods
Room 554	9:45 - 11:45 **[12-3]** P.96 ad hoc session
Room 555	9:45 - 11:45 **[4-4]** P.96 Multi-trophic Interactions of Scolytinae in Näive Systems: Integrating Ecological Methods for Management
Room 509	9:45 - 11:45 **[6-2]** P.97 Insect cuticles: morphogenesis and physiological functions
Room 510	9:45 - 11:45 **[10-5]** P.97 Molecular Plant-Insect-Microbe Interactions
Event Hall – Exhibition	9:00 - 15:00 **Exhibition**
Event Hall – Poster	7:15 - 9:15 **Set Up**; 9:15 - 11:45 **Viewing**; 11:45 - 13:30 **Authors Present** P.152 (11:45-12:35 Posters with odd numbers; 12:40-13:30 Posters with even numbers); 11:45 - 13:30 P.152 Poster Presentation by Elementary, Junior High and Senior High School Students
Event Hall – Coffee Break	9:15 - 9:45 Coffee Break
Banquet Hall Swan	11:45 - 13:30 **Lunchroom**
Banquet Hall Sakura	

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13:30 14:00 14:30 15:00 15:30 16:00 16:30 17:00 17:30 18:00 18:30 19:00 19:30 20:00 20:30

14:00 - 15:30 P.89
Women in Entomology Lecture (Open to Public)

16:00 - 17:30 P.89
Citizen Program (Open to Public)

13:00 - 17:30 P.92
International Exchange Event for Japanese Elementary and Junior High School Students

13:30 - 15:00
Viewing

15:00 - 16:00
Takedown

15:30 - 16:00
Coffee Break

TIMETABLE, Thursday 29 August

KYOTO INTERNATIONAL CONFERENCE CENTER

Venue	7:00	7:30	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00
Main Hall				8:15 - 9:15 P.98 Plenary Lecture 4 Juan C. Corley									
RoomA							9:45 - 11:45 [14-12] P.98 Bringing it home: Advances in research on the international pest Popillia japonica						
Annex Hall 1							9:45 - 11:45 [14-14] P.99 Control Strategies of Hemipteran Pest Bugs						
Annex Hall 2							9:45 - 11:45 [14-16] P.100 Management of Insect Pests with Bt Crops: A Global Perspective						
Room C-1							9:45 - 11:45 [7-13] P.101 Climatic niche dynamics in a changing world						
Room C-2							9:45 - 11:45 [7-15] P.102 ad hoc session						
Room D							9:45 - 11:45 [16-12] P.103 Insect bioenergetics in changing environments						
Room E							9:45 - 11:45 [16-14] P.104 Vision in Lepidoptera - from genes to behavioural ecology						
Room F							9:45 - 11:45 [2-3] P.105 Genomic and molecular basis of the evolution of silk production in Arthropods						
Room G							9:45 - 11:45 [11-6] P.107 Insects at the Helm: Driving Food Security, livelihoods, and Environmental Sustainability in Agri-Food Systems						
Room H							9:45 - 11:45 [1-2] P.108 The 3rd International Workshop of IOBC-APRS-Predatory Mites. Part 1. Vegetables						
Room B-1							9:45 - 11:45 [18-7] P.109 Innovative technological solutions to accelerate the systematics of mega-diverse insect orders						
Room B-2							9:45 - 11:45 [3-7] P.110 Indirect interactions in biological control programs.						
Room I							9:45 - 11:45 [3-9] P.111 ad hoc session						
Room J							9:45 - 11:45 [13-8] P.112 Entomological approaches to tackle vector-borne zoonotic diseases						
Room K							9:45 - 11:45 [8-5] P.114 The genetic resources of domesticated silkmoth and wild silkmoth in the post-genomics era						
Room 554							9:45 - 11:45 [4-5] P.115 Chemical ecology and beyond by early-career scientists						
Room 555							9:45 - 11:45 [6-3] P.116 Chromatin and its dynamics in insect development and reproduction						
Room 509							9:45 - 11:45 [17-4] P.117 Recent advances in the study of complex behaviors in honey bees						
Room 510							9:45 - 11:45 [10-6] P.118 How do insects evolve to manage symbioses with microbes?						
Event Hall – Exhibition					9:00 - 18:00 Exhibition								
Event Hall – Poster			7:15 - 9:15 Set Up			9:15 - 11:45 Viewing				11:45 - 13:30 Authors Present P.160 11:45-12:35 Posters with odd numbers 12:40-13:30 Posters with even numbers			
Event Hall – Coffee Break						9:15 - 9:45 Coffee Break							
Banquet Hall Swan & Sakura										11:45 - 13:30 Lunchroom			
The Prince Kyoto Takaragaike													

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13:30 14:00 14:30 15:00 15:30 16:00 16:30 17:00 17:30 18:00 18:30 19:00 19:30 20:00 20:30

13:30 - 15:30	16:15 - 18:15
[14-13] P.98 Multi-disciplinary innovation for stored-product insect pest management	[14-13] P.98 Multi-disciplinary innovation for stored-product insect pest management
[14-15] P.99 Novel approaches in the management of invasive fruit flies (Diptera: Tephritidae)	[14-15] P.99 Novel approaches in the management of invasive fruit flies (Diptera: Tephritidae)
[7-12] P.100 Novel approaches to harness the worlds' natural history entomology collections	[7-12] P.100 Novel approaches to harness the worlds' natural history entomology collections
[7-14] P.101 The many facets of inordinate fondness: new insights into phytophagous beetle radiations	[7-14] P.101 The many facets of inordinate fondness: new insights into phytophagous beetle radiations
[7-16] P.102 Key Innovations in Insect Evolution	[7-16] P.102 Key Innovations in Insect Evolution
[16-12] P.103 Insect bioenergetics in changing environments	[16-13] P.104 The multi-functionality of insect fat: Its power and constraints
[19-2] P.105 Insect Insights: Decoding Nature Agile Flyers	[19-3] P.105 Using insect sensing and locomotor abilities in robots to overcome real-world challenges
[2-4] P.106 Raw silk production beyond textile: silkworm general rearing conditions and environmental impact of sericulture	[2-5] P.106 Recent advances in reproductive biology of honeybees
[15-5] P.107 Molecular determinants driving pesticide resistance and selectivity in invertebrates	[15-5] P.107 Molecular determinants driving pesticide resistance and selectivity in invertebrates
[1-3] P.108 The 3rd International Workshop of IOBC-APRS-Predatory Mites. Part 2. Fundamental biological studies	[1-4] P.109 The 3rd International Workshop of IOBC-APRS-Predatory Mites. Part 3. Fruit orchards
[18-8] P.109 ad hoc session	[18-9] P.110 27th annual SOLA Scarab workers symposium
[3-8] P.111 Recent advances on biological control of invasive insect pests	[3-8] P.111 Recent advances on biological control of invasive insect pests
[13-7] P.112 Epidemiology of Japanese Encephalitis in a changing climate	[13-7] P.112 Epidemiology of Japanese Encephalitis in a changing climate
[20-8] P.113 Diversity Beyond Insects: Global Gathering of Entomologists with Shared Knowledge across Disciplines	[20-8] P.113 Diversity Beyond Insects: Global Gathering of Entomologists with Shared Knowledge across Disciplines
[8-6] P.114 ad hoc session	[8-7] P.114 International sequencing initiatives: Building genomic resources and bridging research disciplines
[20-9] P.115 Diverse approaches to meeting pest management needs	[20-9] P.115 Diverse approaches to meeting pest management needs
[20-10] P.116 Perspectives on Forensic Entomology Research, Casework, and Protocols: Working Toward International Standards	[20-10] P.116 Perspectives on Forensic Entomology Research, Casework, and Protocols: Working Toward International Standards
[17-5] P.117 Genetics & Genomics in Ecology and Evolution of Social Insects	[17-5] P.117 Genetics & Genomics in Ecology and Evolution of Social Insects
[10-7] P.118 Harnessing insect vector-plant-pathogen interactions to innovate pest management	[10-7] P.118 Harnessing insect vector-plant-pathogen interactions to innovate pest management
13:30 - 18:00 Viewing	18:00 - 19:00 Takedown
15:30 - 16:15 Coffee Break	
19:00 - Gala dinner	

TIMETABLE, Friday 30 August

KYOTO INTERNATIONAL CONFERENCE CENTER

Venue	7:00	7:30	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00
Main Hall				8:15 - 9:15 P.120 Plenary Lecture 5 Rosemary Sang									
RoomA							9:45 - 11:45 P.120 [14-17] Fruit fly management technologies						
Annex Hall 1							9:45 - 11:45 P.121 [14-18] ad hoc session						
Annex Hall 2							9:45 - 11:45 P.122 [14-20] ad hoc session						
Room C-1							9:45 - 11:45 P.123 [14-22] Sterile Insect Technique (SIT): promoting operational success across programs and irradiation platforms						
Room C-2							9:45 - 11:45 P.123 [7-17] Biology and Evolution of Social Insect Symbionts						
Room D							9:45 - 11:45 P.124 [16-15] Dormancy, Diapause, and Allied Seasonal Responses						
Room E							9:45 - 11:45 P.125 [16-16] Interactive neuropeptide communications in biology and physiology						
Room F							9:45 - 11:45 P.126 [19-4] Robotics-inspired biology: Adaptive locomotion of insects and robots						
Room G							9:45 - 11:45 P.126 [15-6] Pesticide exposure and effects for insect pollinators						
Room H							9:45 - 11:45 P.127 [11-7] Harnessing Insect Pollination to Enhance Nutrition and Economic Benefits in Global South						
Room B-1							9:45 - 11:45 P.128 [18-10] ad hoc session						
Room B-2							9:45 - 11:45 P.129 [18-12] Biodiversity and evolution of Heteroptera (Hemiptera)						
Room I							9:45 - 11:45 P.130 [3-10] Development of new technologies for biological control and IPM in greenhouses.						
Room J							9:45 - 11:45 P.130 [13-9] Confronting the threat of arbovirus infections and their vectors						
Room K							9:45 - 11:45 P.131 [5-8] The unknowns of the causes, consequences, and patterns of insect decline						
Room 554							9:45 - 11:45 P.132 [12-4] Biology, ecology, and management of invasive forest insects						
Room 555							9:45 - 11:45 P.133 [6-4] Hormonal Regulation of Development						
Room 509							9:45 - 11:45 P.134 [17-6] Social insects and their temporal organization in physiology and behavior						
Room 510							9:45 - 11:45 P.134 [10-8] ad hoc session						
Event Hall – Exhibition					9:00 - 15:00 Exhibition								
Event Hall – Poster			7:15 - 9:15 Set Up			9:15 - 11:45 Viewing				11:45 - 13:30 Authors Present P.167 11:45-12:35 Posters with odd numbers 12:40-13:30 Posters with even numbers			
Event Hall – Coffee Break						9:15 - 9:45 Coffee Break							
Banquet Hall Swan										11:45 - 13:30 Lunchroom			
Banquet Hall Sakura													

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13:30 14:00 14:30 15:00 15:30 16:00 16:30 17:00 17:30 18:00 18:30 19:00 19:30 20:00 20:30

15:30 - 16:15 Coffee Break

16:15 - 16:30 P.120 Special Movie

16:30 - 17:30 P.120 **Plenary Lecture 6** Ryohei Kanzaki

17:30 - 18:00 P.120 Closing Ceremony

13:30 - 15:30 P.120 **[14-17]** Fruit fly management technologies

13:30 - 15:30 P.121 **[14-19]** Visual Sense and Optical Control Measures for Integrated Pest Management

13:30 - 15:30 P.122 **[14-21]** A New Era of Pest Management, New Approaches from Innovative Methods

13:30 - 15:30 P.123 **[14-23]** Exploring sustainable nematode management in APAC

13:30 - 15:30 P.124 **[7-18]** Dispersal polymorphism and polyphenism in insects: diversity in motion

13:30 - 15:30 P.124 **[16-15]** Dormancy, Diapause, and Allied Seasonal Responses

13:30 - 15:30 P.125 **[16-17]** Neuropeptide signalling in insects: diverse and pleiotropic actions

13:30 - 15:30 P.126 **[19-4]** Robotics-inspired biology: Adaptive locomotion of insects and robots

13:30 - 15:30 P.126 **[15-6]** Pesticide exposure and effects for insect pollinators

13:30 - 15:30 P.127 **[11-8]** Leveraging insect physiology for mass rearing practices

13:30 - 15:30 P.128 **[18-11]** New discoveries through consilience in orthopteran systematics

13:30 - 15:30 P.129 **[18-13]** Bee diversity in East and Southeast Asia: systematics and status of the fauna

13:30 - 15:30 P.130 **[3-11]** The viability of entomopathogenic nematodes and their symbionts-derived by-products as biological control agents

13:30 - 15:30 P.131 **[13-10]** Mosquito Biology and Genetic Biocontrol

13:30 - 15:30 P.132 **[5-9]** Making sense of global insect biodiversity: species discovery and monitoring using DNA-based methods.

13:30 - 15:30 P.132 **[12-5]** Advancing Fruit Fly Biosecurity Research: Applying New Tools in Microbial Ecology, Genomics, and Chemical Ecology

13:30 - 15:30 P.133 **[6-4]** Hormonal Regulation of Development

13:30 - 15:30 P.134 **[20-11]** East-to-west differentiation among spongy moth populations and its implications for biosurveillance

13:30 - 15:30 P.135 **[10-9]** ad hoc session

13:30 - 15:00 **Viewing**

15:00 - 17:30 **Takedown**

18:05 - 18:50 **Farewell Mixer**