



SIP 2021 Virtual Meeting

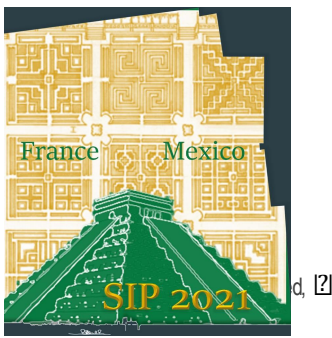
2021 International Congress on Invertebrate Pathology and Microbial Control

53rd Annual Meeting of the Society for Invertebrate Pathology



28th June - 2nd July 2021

CNRS – University of Tours- France
University of Guanajuato – Mexico
Le Studium Loire Valley Advanced Studies



Program at a Glance

SIP 2021 Virtual Meeting

28th June - 2nd July 2021
 CNRS – University of Tours- France
 University of Guanajuato – Mexico



All events are scheduled on Paris time = UTC+2

Friday 18th June - Sunday 27th June

Contributed presentations on VOD and posters will be made available to registered participants for early view from the conference website, as soon as they are posted.

Monday 28th June

00:00-23:59 Contributed papers on VOD

00:00-23:59 Posters papers to view at leisure

13:00-13:30 Opening Ceremony

13:30-15:00 Plenary Symposium

Current challenges for the microbial control of Spodoptera frugiperda

15:00-15:15 Break

15:15-16:45 Plenary Symposium

Current challenges for the microbial control of Spodoptera frugiperda

16:45-17:00 Break

17:00-19:00 Diseases of Beneficial Invertebrates Divisional Symposium

Pathological advances in carcinology

Tuesday 29th June

00:00-23:59 Contributed papers on VOD

00:00-23:59 Posters papers to view at leisure

13:15-13:45 Chat sessions

DBI: *Diseases of Beneficial Invertebrates*

MCO: *Microbial Control with Virus*

NEM: *Nematodes as model in applied biology and soil ecology*

13:45-14:00 Break

14:00-16:00 Microbial Control Division Symposium

Promising microbial control options for fall armyworm, a global perspective

16:00-16:15 Break

16:15-16:45 Chat sessions

FUN: *Entomopathogenic fungi diversity 1*

VIR: *Advances in Insect molecular virology*

16:45-17:00 Break

17:00-19:00 Virus Division Symposium

Place of baculoviruses in the fight against Covid-19

19:00-19:15 Break

19:15-19:45 Chat sessions

BAC: *Pathogen physiology*

FUN: *Entomopathogenic fungi diversity 2*

VIR: *Baculovirus replication and morphogenesis*

Wednesday 30th June

00:00-23:59 Contributed papers on VOD

00:00-23:59 Posters papers to view at leisure

13:15-13:45 Chat sessions

BAC: *Pesticidal Protein Mode of Action*

FUN: *Physiological Interactions*

VIR: *Host-pathogen interactions*

13:45-14:00 Break

14:00-16:00 Fungi Division Symposium

New Advances in the World of the Entomophthorales

16:00-16:15 Break

16:15-16:45 Chat sessions

FUN: *Applied Aspects 1*

MIC: *Insect microsporidia: host pathology and disease control*

VIR: *Endogenous viruses*

16:45-17:00 Break

17:00-19:00 Microsporidia Division Symposium

Microsporidia of invertebrate hosts in aquatic and terrestrial habitats

19:00-19:15 Break

19:15-19:45 Chat sessions

Trans: *Insect as Food and Feed*

MCO: *Microbial Control with Proteins*

Thursday 1st July

00:00-23:59 Contributed papers on VOD

00:00-23:59 Posters papers to view at leisure

13:15-13:45 Chat sessions

MCO: *Microbial control interactions*

MIC: *Microsporidia biodiversity and physiology*

VIR: *Virus detection and identification*

13:45-14:00 Break

14:00-16:00 Diseases of Beneficial Invertebrates & Virus Cross-Division Symposium

Viruses of Pollinators

16:00-16:15 Break

16:15-16:45 Chat sessions

BAC: *Receptors and resistance*

FUN: *Applied aspects 2*

NEM: *Advances in formulation, application and control of pests*

VIR: *Viral bioinsecticide*

16:45-17:00 Break

17:00-19:00 Bacteria Division Symposium

Analysis of Vip3A and Cry protein mechanism of action

19:00-19:15 Break

19:15-19:45 Chat sessions

BAC: *Strains and proteins*

MCO: *Microbial control with fungi*

Friday 2nd July

00:00-23:59 Contributed papers on VOD

00:00-23:59 Posters papers to view at leisure

13:30-15:30 Nematode Symposium

Entomopathogenic nematodes or scavengers: Revisiting the emerging new nematodes classified as EPN

15:30-15:45 Break

15:45-17:15 SIP Awardee Symposium

Martignoni Award 2021

Early Career Award 2020 & 2021

17:15-17:30 Break

17:30-18:30 SIP Business Meeting

Announcement of Student Prizes

18:30 Meeting Closure

Abbreviations for the different divisions:

BAC: Bacteria; DBI: Diseases of Beneficial Invertebrates; FUN: Fungi; MCO: Microbial Control; MIC: Microsporidia; NEM: Nematode; VIR: Virus; Trans: Trans-divisional
 VOD: Video on demand

Scientific Program



All live events are scheduled on Paris time = UTC+2

For this first virtual SIP meeting, participants will have access to four types of media:

- 1- **Live symposia** on a dedicated ZOOM platform
https://us02web.zoom.us/meeting/register/tZAtdOurrTMiGNVbeJe_aL3CvMbYziEbELMs
- 2- Contributed **oral presentation** are available on the VIMEO platform through
<http://www.lestudium-ias.com/content/2021-international-congress-invertebrate-pathology-and-microbial-control-53rd-annual-meeting>
Login information have been transmitted by mail to all participants by maurine.villiers@lestudium-ias.fr
- 3- Contributed **posters**
<http://www.lestudium-ias.com/content/2021-international-congress-invertebrate-pathology-and-microbial-control-53rd-annual-meeting>
It is the same link and login as above, i.e. sent by mail to all participants by maurine.villiers@lestudium-ias.fr on Monday 21st June
- 4- **Topical live chat session** to discuss groups of contributed oral presentation and posters in separate rooms from the same ZOOM platform
https://us02web.zoom.us/meeting/register/tZAtdOurrTMiGNVbeJe_aL3CvMbYziEbELMs

Only registered participants will be able to attend these events and all platforms are password protected.

To access live events, SIP participants need first to register on zoom via this link

https://us02web.zoom.us/meeting/register/tZAtdOurrTMiGNVbeJe_aL3CvMbYziEbELMs

(You may need to download the latest version of zoom - you can do it now from here: <https://zoom.us/download?zcid=1231>)

Monday 21st June - Sunday 27th June

Contributed presentations and posters are be made available to registered participants for early view from the conference website, as soon as they are posted.

<http://www.lestudium-ias.com/content/2021-international-congress-invertebrate-pathology-and-microbial-control-53rd-annual-meeting>

Login information have been transmitted by mail to all participants by maurine.villiers@lestudium-ias.fr.

Abbreviations:

BAC: Bacteria; DBI: Diseases of Beneficial Invertebrates; FUN: Fungi; MCO: Microbial Control; MIC: Microsporidia; NEM: Nematode; VIR: Virus;

Trans: Trans-divisional

VOD: Video on demand

Monday 28th June

00:00-23:59 Contributed oral presentations available at
00:00-23:59 Posters papers to view at leisure

Opening Ceremony

13:00-13:30

Welcome Address

Dr Elisabeth Herniou and Dr Cristina Del Rincon Castro, Convenors
Ms Sophie Gabillet, Le Studium, France
Dr David Giron, Insect Biology Research Institute, CNRS-Université de Tours and Entomocentre, France
Dr. Mauro Napsuciale Mendivil, University of Guanajuato, Mexico
Dr Christina Nielsen Leroux, President of the SIP

Plenary Symposium

13:30-15:00

Current challenges for the microbial control of *Spodoptera frugiperda*

Organizers: Cristina del Rincon Castro & Elisabeth Herniou

- 13:30 **How not to waste a crisis: A pest invasion as an opportunity to scale up biopesticides** - Dr Buyung Hadi, UN Food and Agriculture Organization (FAO), Italy
- 14:00 **Know your enemy: Integrative study of plasticity, adaptive evolution and speciation in the Fall armyworm.** - Dr Emmanuelle D'Alençon, National Research Institute for Agriculture, Food and the Environment (INRAE) - France
- 14:30 **Reclaiming an ancestor's legacy: Fortifying the maize microbiome against fall armyworm herbivory using teosinte microbiota** - Prof Julio Bernal, Texas A&M University - USA

15:00-15:15 *Break*

Plenary Symposium

15:15-16:45

Current challenges for the microbial control of *Spodoptera frugiperda*

Cristina del Rincon Castro & Elisabeth Herniou

- 15:15 **Two decades of collaborative research on *Spodoptera frugiperda* MNPV.** - Dr Trevor Williams, Institute of Ecology - Mexico
- 15:45 **How SfMNPV has moved from a concept to a control method of *Spodoptera frugiperda*** - Dr Holly Popham, AgBiTech - USA
- 16:15 **Challenges and opportunities for bacterial control of *Spodoptera frugiperda*** - Prof Juan-Luis Fuentes, The University of Tennessee - USA

16:45-17:00 *Break*

Diseases of Beneficial Invertebrates Divisional Symposium

17:00-19:00

Pathological advances in carcinology

Jamie Bojko

- 17:00 **Disease slows crawling crabs and alters modeled connectivity between North American *Callinectes sapidus* populations** - Dr Andrew Kough, Shedd Aquarium - USA
- 17:20 **Floridian blue crab (*Callinectes sapidus*) diseases across freshwater and marine environments** - Erin Walters, Florida Wildlife Research Institute - USA
- 17:40 **Diversity and disease of mobile benthic fauna in Florida Bay after harmful cyanobacteria blooms degrade hard-bottom habitat** - Elizabeth Duermit-Moreau, University of Florida - USA
- 18:00 **Emergence of paramoebiasis in edible crabs (*Cancer pagurus*) from UK waters** - Dr Kelly Bateman, Cefas - UK
- 18:20 **A widely distributed pathogenic reovirus affecting the Atlantic blue** - Mingli Zhao, Institute of Marine and Environmental Technology - USA
- 18:40 **Disease connectivity: Investigating disease dynamics in shore crabs, *Carcinus maenas*** - Dr Charlotte Davies, Swansea University, UK

00:00-23:59 Contributed papers on VOD
00:00-23:59 Posters papers to view at leisure

Chat Session

13:15-13:45

DBI: Diseases of Beneficial Invertebrates

Moderators Kelly Bateman & Elisabeth Herniou

- DB-O-STU-Atherley The enemy that lurks: egg-predators of the Caribbean spiny lobster – [Nicole Atherley](#), Ross University School of Veterinary Medicine, Saint Kitts and Nevis
- DB-O-Duffield Identification and quantification of entomopathogenic viruses in reared crickets - [Dr Kristin Duffield](#), USDA, USA
- DB-O-Gourbal Epigenetic and metabolomic changes in hemocytes underlie innate immune memory in the vector snail *Biomphalaria glabrata* - [Dr Benjamin Gourbal](#), University of Perpignan, France
- DB-O-STU-Herren Immune priming in *Tenebrio molitor* induced by temperature stress and a fungal pathogen – [Pascal Herren](#), UK Centre for Ecology & Hydrology, UK
- DB-P-STU-Pichon A Single Cell RNA sequencing approach to characterize *Biomphalaria glabrata* hemocyte responses in innate immune memory – [Remi Pichon](#), Hosts Pathogens Environments Interactions, UMR 5244, CNRS, IFREMER, UM, University of Perpignan Via Domitia, France
- DB-O-STU-Pienaar First evidence of long-lasting association between viruses and the Black soldier fly, *Hermetia illucens* – [Robert Pienaar](#), Insect Biology Research Institute (IRBI), University of Tours / CNRS, France
- DB-O-STU-Price The Consumption and survival rate of *Lilioceris cheni* (Coleoptera:Chrysomelidae) on Air Potato Leaves Exposed to *Cordyceps fumosorosea* (Hydrocreales: Cordycipitaceae) – [Terri Price](#), UF/IFAS, USA
- DB-O-Querejeta Drivers and role of bacterial diversity and composition along the developmental stages of the Black Soldier Fly (*Hermetia illucens*) - [Dr Marina Querejeta Coma](#), Insect Biology Research Institute (IRBI), University of Tours / CNRS, France
- DB-O-Usta First Record of *Lysinibacillus sp.* From *Varroa destructor* and Potential Bioinsecticide for Honeybee Health - [Dr Usta Mehtap](#), Trabzon University, Turkey

Chat Session

13:15-13:45

MCO: Microbial Control with Virus

Moderators Miguel Lopez Ferber & Tamryn Marsberg

- MC-O-Grzywacz A Novel Formulation for Baculoviruses Protects Biopesticide from Degradation by Ultraviolet Radiation – Laboratory and Plant Trials with *Spodoptera littoralis* Nucleopolyhedrovirus Confirms Greatly Extended UV Stability – [David Grzywacz](#), Natural Resources Institute, University of Greenwich, UK
- MC-P-STU-Hussain Developing a sustainable attract and infect strategy for the control of the fall armyworm, *Spodoptera frugiperda*, in Africa – [Ahmed G. Hussain](#), Wageningen University and Research, Netherlands
- MC-P-Li Identification of a PGRP-Ib gene in *Spodoptera exigua* with antiviral function against *S. exigua* multiple nucleopolyhedrovirus (SeMNPV) – [Jie Li](#), Qingdao Agricultural University, China
- MC-P-Marshall Production of *Oryctes nudivirus* (OrNV) through the DSIR 1179 *Heteronychus arator* cell line – [Sean Marshall](#), AgResearch Ltd (Lincoln Campus), New Zealand
- MC-O-Moore Successful selection of a UV-resistant *Cryptophlebia leucotreta* betabaculovirus for a more persistent biopesticide - [Dr Sean Moore](#), Citrus Research International, South Africa
- MC-O-Ruiu LdMNPV baculovirus as a regulator of gypsy moth population dynamics in cork oak forest - [Dr Luca Ruiu](#), University of Sassari, Italy

Chat Session

13:15-13:45

NEM: Nematodes as model in applied biology and soil ecology

Moderator Emilie Lefoulon

- NE-P-STU-Blanco-Perez Impact of differentiated vineyard management on the activity of entomopathogenic nematodes in La Rioja (Spain) – [Rubén Blanco-Pérez](#), ICVV-CSIC, Spain
- NE-P-STU-Cassells The effects of female pheromone exposure on lethal fighting in *Steinernema carpocapsae* males – [Maria Cassells](#), Maynooth University, Ireland
- NE-P-STU-Chelkha Unraveling the effect of the presence of earthworms or their cutaneous excreta and entomopathogenic nematodes in the soil bacterial community, biocontrol capacity, and plant traits - [Maryam Chelkha](#), Ecole Normale Supérieure (E.N.S.), Centre « Eau, Ressources Naturelles, Environnement et Développement Durable (CERNE2D), Morocco
- NE-O-STU-Hayashi Effect of *Bacillus thuringiensis* spores on the second stage juveniles of soybean cyst nematode – [Yuki Hayashi](#), Obihiro University of Agriculture and Veterinary Medicine, Japan
- NE-P-Kim Target molecules of *Bacillus thuringiensis* crystal proteins in *C. elegans* – [Dr You-Mie Kim](#), UMASS MED, USA
- NE-O-Kusakabe Synergistic nematicidal activity of secondary metabolites produced by the entomopathogenic bacterium *Photobacterium* sp. *sonorensis* (Enterobacteriaceae) against the root knot nematode, *Meloidogyne incognita* (Nematoda: Tylenchida) – [Dr Ayako Kusakabe](#), University of Arizona, USA
- NE-P-Lefoulon Transcriptomic analysis of two entomopathogenic *Steinernema* nematodes highlights metabolic costs associated with *Xenorhabdus* endosymbiont carriage – [Dr Emilie Lefoulon](#), University of Arizona, USA
- NE-O-STU-Ramakrishnan Characterization of Entomopathogenic Nematodes at Rapid Desiccation - Jayashree [Ramakrishnan](#), Hebrew university of Jerusalem, Agricultural research organization, Israel

13:45-14:00 Break

Microbial Control Division Symposium

14:00-16:00

Promising microbial control options for fall armyworm, a global perspective

Roma Gwynn

- 14:00 **An a priori strategy for using market-ready microbial biocontrol products for FAW control: technical, economic and end-user consideration** - [Roma Gwynn](#), Rationale, UK; [Michael Brownbridge](#), Bioworks, USA & [Travis Glare](#), Bioprotection Institute, New Zealand
- 14:30 **Beauveria bassiana for FAW in Cambodia: from on-station experiments to farmer-led experiments and work with non-farmer stakeholders 2017-2020** - [Rica Joy Flor](#), IRRI, Cambodia
- 15:00 **A Kenyan and regional perspective of activities on using microbial control agents against FAW: product development and farmer adoption** – [Subbi Sevgan](#), ICIPE, Kenya
- 15:30 **Progress in Brazil for the control of FAW with microbial pathogens** - [Italo Delalibera](#), University of Sao Paulo, Brazil.

16:00-16:15 Break

Chat Session

16:15-16:45

FUN: Entomopathogenic fungi diversity 1
Moderator Chengsu Wang & Patricia Golo

- FU-O-Bushley Infection of *Spodoptera frugiperda* with the entomopathogenic fungus *Beauveria bassiana*– Dr [Kathryn Bushley](#), USDA/Cornell University, USA
- FU-O-Clifton Diversity of native Hypocrealean fungi infecting the invasive spotted lanternfly in the United States – Dr Eric [Clifton](#), Cornell University, USA
- FU-P-STU-Im Management of cotton aphid, *Aphis gossypii* using entomopathogenic *Beauveria bassiana* – [Ye Ram Im](#); Jeonbuk national university, South Korea
- FU-O-STU-Pagani Laboratory evaluation of the effectiveness of commercial entomopathogenic strains *Beauveria* and *Metarhizium* for control of the Cornfield Wireworm (Coleoptera: Elateridae) – [Mika Pagani](#), Virginia Polytechnic Institute and State University, USA
- FU-P-STU-Segers Susceptibility of *Bruchus rufimanus* Boheman 1833 (Coleoptera: Chrysomelidae) to three entomopathogenic fungi: Limits of conidial suspension sprayings and pledging alternatives in integrated pest management strategy – [Arnaud Segers](#), Gembloux Agro Bio-tech, Belgium
- FU-P-STU-Simeto Screening of entomopathogenic fungi for virulence against Emerald Ash Borer eggs– Sofia [Simeto](#), University of Minnesota, USA

Chat Session

16:15-16:45

VIR: Advances in Insect molecular virology
Moderator Rollie Clem & Manli Wang

- VI-O-Hodgson *Drosophila* as a model to identify viral envelope protein trafficking pathways – Dr [Jeff Hodgson](#), Cornell University, USA
- VI-O-STU-Huditz Identification and Tissue tropism of newly identified iflavivirus and negevirus in tsetse flies *Glossina morsitans morsitans* – [Hannah-Isadora Huditz](#), Wageningen University and Research, Netherlands
- VI-O-STU-Liu.Xiaoxuan *Bombyx mori* Pupae Efficiently Produce Recombinant AAV2/HBoV1 Vectors with a *Bombyx mori* Nuclear Polyhedrosis Virus Expression System – [Xiaoxuan Liu](#), School of Life Sciences, Jiangsu University, China
- VI-O-STU-Liu.Qingsen Generation and characterization of the AcMNPV-*Bombyx mori* bidensovirus chimeras– [Qingsen Liu](#), School of Life Sciences, Jiangsu University, China
- VI-O-Nalcacioglu Functional and Morphological Analysis of Invertebrate Iridescent Virus 6 (IIV6) Potential Matrix Protein (415R) – [Remziye Nalcacioglu](#), Karadeniz Technical University, Turkey
- VI-O-Pinheiro-Lourenco Construction of a vector for expression of recombinant proteins in insect cells' mitochondria – [Fernando Pinheiro Lourenco](#), University of Brasilia - UNB, Brazil
- VI-P-STU-Pontes Equivalence of cypoviruses α -helices: evidence of convergent evolution of structure and function – [Fernanda Pontes](#), Baculovirus Laboratory, Cell Biology Department, Institute of Biological Sciences, Universidade de Brasilia - UNB, Brazil
- VI-P-STU-Vanes Separating small extracellular vesicles from baculovirus virions – Lex van Es, Oxford Brookes University, UK
- VI-O-Wang A functional peroral infectivity complex is present in the envelope of White Spot Syndrome Virus of shrimp – [Dr Xi Wang](#), Wuhan Institute of Virology, Chinese Academy of Sciences, China

16:45-17:00 Break

Virus Division Symposium

17:00-19:00

Place of baculoviruses in the fight against Covid-19

Elisabeth Herniou & Cristina Del Rincon Castro

- 17:00 **Four decades of the Baculovirus Expression System – from early beginnings to being at the forefront of global efforts against COVID-19** - Dr [Linda King](#), Oxford Brookes University, UK
- 17:35 **Two-component nanoparticle vaccine displaying glycosylated spike S1 domain induces neutralizing antibody response against SARS-CoV-2 variants** – [Gobern Pijlman](#), Wageningen University, Laboratory of Virology, Netherlands
- 18:10 **Baculovirus-Sf9 Insect Cell Technology in the Development of a COVID-19 Vaccine** - Dr [Gale Smith](#), Novavax – USA
- 18:45 **Discussion**

Chat Session

19:15-19:45

BAC: Pathogen physiology
Moderators Vincent Sanchis & Rahul Banerjee

- BA-O-STU-Chen_Haibo The fate of bacteria of the *Bacillus cereus* group in the amoeba environment – [Haibo Chen](#), INRAE- MICALIS, France
- BA-O-Grizanova Together or separately? Effect of *Bacillus thuringiensis* spores and Cry toxins on Colorado potato beetle – [Dr Ekaterina Grizanova](#), Novosibirsk State Agrarian University, Russia
- BA-P-STU-Mugo-Kamiri Effect of Diet and Antibiotic on the growth and fitness of laboratory reared *Spodoptera exigua* (Hübner) – [Loretta Mugo](#), Insect Biology Research Institute (IRBI), CNRS - University of Tours, France
- BA-O-STU-Muita Cellular mechanisms causing midgut damage and insect death upon exposure to *Bacillus thuringiensis* insecticidal toxin – [Biko Muita](#), The University of Adelaide, Australia
- BA-O-Pothula *Xenorhabdus bovienii* strain *jolietti* requires Type 6 secretion systems to kill closely related bacteria and colonize its nematode host? – [Dr Ratnasri Pothula](#), School of Animal and Comp. Biomedical Sciences, University of Arizona, USA
- BA-O-STU-Prigot Immune priming protection against pathogens: what can terrestrial crustaceans tell us about this innate immune ability? – [Cybele Prigot](#), Université de Poitiers - UMR CNRS 7267, France
- BA-O-STU-RamirezSerrano Influence of arbuscular mycorrhizal symbiosis and nitrogen levels on the performance of *Spodoptera exigua* developing on maize: are effects mediated by a change of the insect gut microbiota? - [Beatriz Ramirez Serrano](#), Insect Biology Research Institute (IRBI), CNRS- University of Tours, France
- BA-P-STU-Savio Impact of probiotic bacteria on *Tenebrio molitor* fitness, gut microbial composition and susceptibility to *Bacillus thuringiensis* serovar *tenebrionis* and *Metarhizium brunneum* infections – [Carlotta Savio](#), INRAE- MICALIS, France
- BA-O-STU-Upfold The role of the microbiota in host resistance to pathogens in *Galleria mellonella* larvae – [Jennifer Upfold](#), INRAE- MICALIS, France

Chat Session

19:15-19:45

FUN: Entomopathogenic fungi diversity 2
Moderators Dana Ment & Brian Lovett

- FU-O-Ahmad Antagonistic effects of endophytic *Metarhizium robertsii* in maize against the phytopathogen, *Cochliobolus heterostrophus* – [Dr Mary Barbercheck](#), Pennsylvania State University, USA
- FU-P-STU-Garcia Multifunctionality of endophytic entomopathogenic fungi: plant growth promotion and *Spodoptera littoralis* (Boisduval) (Lepidoptera: Noctuidae) control in melon – [Fabian Garcia Espinoza](#), University of Cordoba, Spain
- FU-O-STU-Hollabaugh Identifying Ecological Relationships among *Beauveria bassiana* and Kudzu Bug, *Megacopta cribraria* – How Does Seasonality and Endophytic Presence of the Entomopathogen Influence Incidence on Kudzu Bug in East Tennessee? – [Kassie Hollabaugh](#), University of Tennessee, USA
- FU-O-STU-Naradorn Effect of *Induratia fengyangensis* volatile compounds on West Indian sweet potato weevil, *Euscepes postfasciatus* (Fairmaire) – [Naradorn Chui Chai](#), Kyushu University, Japan
- FU-O-STU-Uthoff Development of seed coatings for *Phacelia tanacetifolia* with beneficial fungi for plant strengthening and protection against plant parasitic nematodes – [Jana Uthoff](#), Bielefeld University of Applied Sciences, Germany
- FU-P-Villamizar Characterization and production of *Metarhizium majus* isolated from coconut rhinoceros beetle in Samoa, Philippines and Malaysia – [Dr Laura Villamizar](#), AgResearch Ltd (Lincoln Campus), New Zealand

Chat Session

19:15-19:45

VIR: Baculovirus replication and morphogenesis
Moderators Vera Ros & Crsitina Del Rincon Castro

- VI-O-Bannach Hyper-expression of baculovirus P10 and processing by viral cathepsin are required for nuclear disintegration and release of polyhedra from *Autographa californica* multiple nucleopolyhedrovirus-infected cells – [Dr Carina Bannach](#), Oxford Expression Technologies Ltd., UK
- VI-O-Chen *Autographa californica* Multiple Nucleopolyhedrovirus Ac16 modulates the accumulation of IE1 – [Dr Guoqing Chen](#), China national rice research institute, China
- VI-O-STU-Chen The *Autographa californica* Multiple Nucleopolyhedrovirus ac26 Gene Is Critical for Morphogenesis of Occlusion Body - [Tong Chen](#), Wuhan institute of Virology, Chinese Academy of Science, China
- VI-O-DelRinconCastro Identification of differential genes in primary infection of *Spodoptera frugiperda* (Lepidoptera:Noctuidae) with an SfNPV baculovirus – [Dr Cristina Del Rincón Castro](#), University of Guanajuato, Mexico
- VI-P-Fan Baculovirus Utilizes Cholesterol Transporter NIEMANN–Pick C1 for Host Cell Entry – Youpeng Fan, State Key Laboratory of Silkworm Genome Biology & Chongqing Key Laboratory of Microsporidia Infection and Prevention, Southwest University, China
- VI-O-Feng Identification of *Spodoptera frugiperda* importin alphas that facilitate the nuclear import of *Autographa californica* multiple nucleopolyhedrovirus DNA polymerase – [Dr Guozhong Feng](#), China National Rice Research Institute, China
- VI-O-STU-Gasque Both the enzymatic- and structural properties of *Autographa californica* multiple nucleopolyhedrovirus (AcMNPV) protein tyrosine phosphatase (PTP) are insignificant for brain entry in *Spodoptera exigua* caterpillars – [Simone Gasque](#), Wageningen University and Research, Netherlands
- VI-O-STU-Liu.Yue The role of BmNPV Bm65 protein in the repair of ultraviolet-induced DNA damage – [Yue Liu](#), School of Life Sciences, Jiangsu University, China
- VI-O-Zhanqi BmNPV induces cell cycle arrest and enhances viral replication by depleting BmCDK1 and BmCyclinB – [Dr Dong Zhanqi](#), Southwest University, China

Wednesday 30th June

00:00-23:59 Contributed papers on VOD

00:00-23:59 Posters papers to view at leisure

Chat Session

13:15-13:45

BAC: Pesticidal Protein Mode of Action
Moderator Neil Crickmore

- BA-O-STU-Alzahrani Investigating the importance of Cry2A activation in its activity toward *Aedes aegypti* – [Faisal Alzahrani](#), University of Sussex, UK
- BA-P-STU-Heath Establishing the role of glycans and lipids in the mechanisms of Tpp1/Tpp2 (Bin) toxin- [Emily Heath](#), Cardiff University, UK
- BA-O-Khorramnejad Is activation of *Bacillus thuringiensis* Cry1Ia proteins necessary for toxicity? - [Dr. Ayda Khorramnejad](#), University of Valencia / Institute of Biotechnology and Biomedicine (BioTecMed), Spain
- BA-O-STU-Pinos Hetero-oligomerization of *Bacillus thuringiensis* Cry1A proteins enhance binding to the ABCC2 transporter of *Spodoptera exigua*- [Daniel Pinos](#), University of Valencia / Institute of Biotechnology and Biomedicine (BioTecMed), Spain
- BA-O-STU-Quan Specific binding of radiolabeled Vip3Af to brush border membrane vesicles from *Spodoptera* spp. and determination of the domains involved- [Yudong Quan](#), University of Valencia / Institute of Biotechnology and Biomedicine (BioTecMed), Spain

Chat Session

13:15-13:45

FUN: Physiological Interactions
Moderators Henrik De Fine Licht & Linda Muskat

- FU-O-STU-Erdos Experimental evolution as an approach for increasing virulence in insect pathogenic fungi – [Zoltan Erdos](#), University of Exeter, UK
- FU-P-STU-Ferreira Influence of culture medium supplementation on *Metarhizium robertsii* protease production and response to heat stress – [Juliana Ferreira](#), Brazil
- FU-O-STU-Fiorotti Unveiling The Phagocytosis Process In *Ixodes Ricinus* Challenged By *Metarhizium Robertsii* – [Jéssica Fiorotti](#), Federal Rural University of Rio de Janeiro (UFRRJ), Brazil
- FU-O-Kim *Beauveria bassiana* ERL836 and JEF-007 with similar virulence show different gene expression when interacting with cuticles of western flower thrips, *Frankniella occidentalis* – [Prof. Jae Su Kim](#), Jeonbuk National University, South Korea
- FU-O-Ma Secondary metabolites produced by a novel isolate of *Metarhizium robertsii* (CPD006) during mass production – [Dr. Li Ma](#), Kwantlen Polytechnic University, Canada
- FU-P-Quiroga Kinetic, enzymatic and thermal evaluation of *Metarhizium anisopliae* conidia produced in solid fermentation – [Ginna Quiroga](#), Colombian Agricultural Research Corporation – Agrosavia, Colombia
- FU-P-STU-Slowik Quantification of filamentous growth of entomopathogenic fungi using spectrophotometry for rapid and high-throughput analysis – [Anna Slowik](#), University of Copenhagen, Denmark

Chat Session

13:15-13:45

VIR: Host-pathogen interactions
Moderators Johannes Jehle & Linda King

- VI-O-Clem MicroRNA targeting of Sindbis virus confirms the importance of midgut replication in disseminated infection of *Aedes aegypti* - [Prof. Rollie Clem](#), Kansas State University, USA
- VI-O-Etebari Genomic analysis of *Oryctes rhinoceros* nudivirus (OrNV) and its host, Coconut Rhinoceros Beetle (*Oryctes rhinoceros*), in South Pacific Islands – [Dr. Kayvan Etebari](#), The University of Queensland, Australia
- VI-P-Jackson Electron microscopy study confirms infection of coconut rhinoceros beetle (CRB-G) gut cells by OrNV V23B – [Dr. Trevor Jackson](#), AgResearch Ltd (Lincoln Campus), New Zealand
- VI-O-Li Identification of a PGRP-Ib gene in *Spodoptera exigua* with antiviral function against *S. exigua* multiple nucleopolyhedrovirus (SeMNPV) – [Dr. Jie Li](#), Qingdao Agricultural University, China
- VI-O-STU-Llopis-Gimenez Baculovirus infection alters olfaction of its lepidopteran host *Spodoptera exigua* (Hübner, 1808) – [Angel Llopis-Gimenez](#), University of Valencia (Biotechmed Institute), Spain
- VI-O-STU-MacielVergara A silent killer of crickets: insights on the transmission of Acheta domesticus densovirus – [Gabriela Maciel Guevara](#), Wageningen University, Netherlands
- VI-O-STU-Mattia Investigating the vertical transmission of covert infections by SeMNPV in *Spodoptera exigua* – [Annamaria Mattia](#), Wageningen University and Research, Netherlands
- VI-O-STU-Yang Gene expression profiles of different *Cydia pomonella* granulovirus isolates in midguts of type II resistant coding moth larvae – [Shili Yang](#), Julius Kühn-Institut, Federal Research Centre for Cultivated Plants, Germany

13:45-14:00 Break

New Advances in the World of the Entomophthorales

Ann Hajek

- 14:00 **The patient puppetmaster: how *Massospora spp.* infect and manipulate cicada hosts**– Dr. Brian Lovett, West Virginia University- USA
- 14:20 **Taking control: Mechanistic insights into the behavioral hijacking of fruit flies by the zombie fungus *Entomophthora muscae***– Dr. Carolyn Elya, Harvard University - USA
- 14:40 **The entomopathogenic fungus *Entomophthora muscae* uses volatiles to fatally attract and trick house fly males to mate with contagious female cadavers.** Dr. Andreas Naundrup, University of Copenhagen- Denmark
- 15:00 **Fermentation and formulation of *Pandora sp. nov.* for biological psyllid pest control.** Dr. Linda Muskat, University of Applied Sciences Bielefeld- Germany
- 15:20 **Can fungal epizootics reduce yield loss caused by aphids in cereals?** Dr. Stéphanie Saussure, Norwegian Institute of Bioeconomy Research - Finland
- 15:40 **Batkoa major infecting spotted lanternflies: Host range and population structure.** Dr. Ann E. Hajek, Cornell University - USA

16:00-16:15 Break

Chat Session

16:15-16:45

FUN: Applied Aspects 1
Moderator Annette Bruun Jensen

- FU-O-STU-Bielski Evaluation of different *Beauveria bassiana* GHA formulations against overwintering spotted lanternfly (*Lycorma delicatula*) egg masses with various seasonal applications – Jason Bielski, Virginia Tech, USA
- FU-O-Rizal Virulence of field-collected entomopathogenic fungi to diamondback moth larvae – dose, temperature and host starvation effects – Leela Rizal, University of Queensland, Australia
- FU-O-STU-Yu For semi-field tests, ERL836 as a conidial form was treated on the pine tree logs with overwintering larvae, and a promising insecticidal activity against emerging adults from the logs was confirmed - Jeong Seon Yu, Jeonbuk National University, South Sudan
- FU-P-Fernandes Heat stress causes physical damage on the conidial surface of *Metarhizium anisopliae* – Dr. Éverton Fernandes, Brazil
- FU-P-Naretto_Rangel Fungal tolerance to Congo red, a cell wall integrity stress, as indicator of ecological niche – Dr. Drauzio Eduardo Naretto Rangel, University São Paulo, Brazil
- FU-P-STU-Kawa The infection mechanism and dynamics of orally administered *Beauveria pseudobassiana* and toxicity of its secondary metabolites in *Anopheles stephensi*- Shoma Kawa, Obihiro University of Agriculture and Veterinary, Japan

Chat Session

16:15-16:45

MIC: Insect microsporidia: host pathology and disease control
Moderator Daniela Pilarska

- MI-O-Dolgikh Expression of scFv-fragments against *Vairimorpha* (*Nosema ceranae*) hexokinase and ATP/ADP carriers suppress microsporidia intracellular development in Sf9 insect cells – Dr. Viacheslav Dolgikh, All-Russian Institute of Plant Protection, Russia
- MI-O-Gomez-Moracho The gut parasite *Nosema ceranae* impairs olfactory learning in bumblebees – Dr. Tamara Gomez-Moracho, Research Center on Animal Cognition (CRCA), Center for Integrative Biology (CBI); CNRS, University Paul Sabatier, France
- MI-O-Grushevaya *Nosema pyrausta* as natural mortality factor of Ostrinia moths – Inna Grushevaya, All Russian Institute of Plant Protection, Russia
- MI-O-Malysh The microsporidium *Nosema pyrausta* in the beet webworm, *Loxostege sticticalis*, Dr. Julia Malysh, All-Russian Institute of Plant Protection, Russia
- MI-O-STU-Maoshuang_ran *Nosema bombycis* suppresses host cell apoptosis via Nbsrpin14 inhibiting the host Caspase protease BmICE activity – Dr. Ran Maoshuang, State Key Laboratory of Silkworm Genome Biology, Southwest University, China
- MI-O-Zhanqi Dong Silver nanoparticles are effective in controlling microsporidia – Dr. Dong Zhanqi, Southwest University, China

Chat Session

16:15-16:45

VIR: Endogenous viruses
Moderators Salvador Herrero & Gaelen Burke

- VI-P-STU-Alexanderfrederic Induction of apoptosis in insect cells by tyrosine phosphatases from *Cotesia flavipes* bracovirus – Andrews Alexander Frédéric Monvoisin Santos Fisch, Institute of Biological Sciences, University of Brasilia, Brazil
- VI-O-STU-Cerqueira-Leobold Characterization of a new nudiviral endogenization event in the Campopleginae wasp *Campoplex capitator* – Alexandra Cerqueira de Araujo, Insect Biology Research Institute (IRBI), University of Tours / CNRS, France
- VI-O-Coffman A viral mutualist employs post-hatch transmission for vertical and horizontal spread among parasitoid wasps – Dr. Kelsey Coffman, USDA-ARS Daniel K. Inouye US Pacific Basin, USA
- VI-O-Crava Endogenous viral element-derived Piwi-Interacting RNAs (piRNAs): insights from Spodoptera genus – Dr. Maria Cristina Crava, University of Valencia, Spain
- VI-O-STU-Dai The fusion of envelopes of *Microplitis bicoloratus* bracovirus during assembly and invasion - Ming-Wu Dai, Yunnan University, China

- VI-O-Drezen Organization and evolution of endogenous bracovirus in parasitoid wasp genomes – [Dr. Jean-Michel Drezen](#), Insect Biology Research Institute (IRBI), University of Tours / CNRS, France
- VI-O-Huguet Role of endogenized lef-4 and lef-8 nudiviral genes in Virus-Like-Particle production in the parasitoid wasp *Venturia canescens*, [Prof. Elisabeth Huguet](#), Insect Biology Research Institute (IRBI), University of Tours / CNRS, France
- VI-O-STU-Tims Effect of Viral RNA Polymerase on Expression of Wasp and Viral Genes in *Microplitis demolitor* – [Kelly Tims](#), University of Georgia, USA

16:45-17:00 Break

Microsporidia Division Symposium

17:00-19:00

Microsporidia of invertebrate hosts in aquatic and terrestrial habitats

Yuri Tokarev

- 17:00 **Comprehensive survey of microsporidia reveals extensive ecological and phenotypic diversity.** [Prof. Aaron Reinke](#). University of Toronto - Canada
- 17:20 **Microsporidia in trematodes: an overview and new findings in the USA and Russia.** [Dr. Yuliya Sokolova](#). NIDCD, NIH - USA
- 17:40 **A new microsporidian parasitizing invasive *Carcinus* sp. in the Argentinian Atlantic.** [Dr Jamie Bojko](#). Teesside University - UK
- 18:00 **Specific mosquito gut microbiome members are associated with microsporidian infection.** [Dr. Artur Trzebny](#). Adam Mickiewicz University - Poland
- 18:20 **A review of research on microsporidia infecting pest insects in Bulgaria.** [Dr Daniela Pilarska](#). New Bulgarian University – Bulgaria
- 18:40 **How do microsporidia of insect hosts interact with insect parasitoids?** [Prof Yuri Tokarev](#). All-Russian Institute of Plant Protection – Russia

19:00-19:15 Break

Chat Session

19:15-19:45

Transdisciplinary: Insect as Food and Feed and in Mass Rearing

Moderators Christina Nielsen-Leroux & Helen Hesketh

- VI-P-Defilippo Preliminary observations of viral presence in a mass rearing crickets used as feed and food – [Dr. Francesco Defilippo](#), Istituto Zooprofilattico Sperimentale Lombardia e Emilia Romagna, Italy
- DB-O-Duffield Identification and quantification of entomopathogenic viruses in reared crickets – [Dr. Kristin Duffield](#), USDA, USA
- VI-O-STU-HernandezPelegrin The RNA virome of the medfly: a necessary step to optimize medfly control – [Luis Hernández Pelegrín](#), University of Valencia (Biotechmed Institute), Spain
- DB-O-STU-Herren Immune priming in *Tenebrio molitor* induced by temperature stress and a fungal pathogen – [Pascal Herren](#), UK Centre for Ecology & Hydrology, UK
- VI-O-STU-Huditz Identification and Tissue tropism of newly identified iflavivirus and negevirus in tsetse flies *Glossina morsitans morsitans* – [Hannah-Isadora Huditz](#), Wageningen University and Research, Netherlands
- VI-O-STU-Lim Harnessing the Potential of Real Time Portable Next Generation Sequencing as a Surveillance Tool for Pathogens in Mass Reared Insects - [Fang Shiang Lim](#), Julius Kühn Institute, Germany
- VI-O-STU-MacielVergar A silent killer of crickets: insights on the transmission of *Acheta domesticus* densovirus – [Gabriela Maciel Vergara](#), Wageningen University, Netherlands
- VI-O-STU-Malysh Insect iridescent virus type 6 is widespread in wild and cultured insects – [Svetlana Malysh](#), All-Russian Institute of Plant Protection, Russia
- BA-P-STU-Mugo-Kamiri Effect of Diet and Antibiotic on the growth and fitness of laboratory reared *Spodoptera exigua* (Hübner) – [Loretta Mugo](#), Insect Biology Research Institute (IRBI), University of Tours / CNRS, France
- DB-O-STU-Pienaar First evidence of long-lasting association between viruses and the Black soldier fly, *Hermetia illucens* – [Robert Pienaar](#), Insect Biology Research Institute (IRBI), University of Tours / CNRS, France
- DB-O-Querejeta Drivers and role of bacterial diversity and composition along the developmental stages of the Black Soldier Fly (*Hermetia illucens*) – [Dr. Marina Querejeta Coma](#), Insect Biology Research Institute (IRBI), University of Tours / CNRS, France
- BA-P-STU-Savio Impact of probiotic bacteria on *Tenebrio molitor* fitness, gut microbial composition and susceptibility to *Bacillus thuringiensis* serovar tenebrionis and *Metarhizium brunneum* infections – [Carlotta Savio](#), INRAE, France
- FU-P-STU-Slowik Quantification of filamentous growth of entomopathogenic fungi using spectrophotometry for rapid and high-throughput analysis – [Anna Slowik](#), University of Copenhagen, Denmark
- BA-O-STU-Upfold The role of the microbiota in host resistance to pathogens in *Galleria mellonella* larvae- [Jennifer Upfold](#), INRAE- MICALIS, France
- MI-O-Zhanqi Dong Silver nanoparticles are effective in controlling microsporidia – [Dr. Dong Zhanqi](#), Southwest University, China

MCO: Microbial Control with Proteins

Moderator Baltasar Escriche

- MC-O-Barrera Granulovirus derived proteins (GVPs) to enhance insecticidal activity of *Serratia entomophila* against grass grub – [Dr. Gloria Barrera Cubillos](#), University of Cordoba, Spain
- MC-P-STU-Conde-bravo Insecticidal action of proteins from the crude extract of *Beauveria bassiana* on the Mediterranean fruit fly *Ceratitis capitata* – [Juan Carlos Conde-Bravo](#), University of Cordoba, Spain
- MC-O-STU-Jabeur A novel binary pesticidal protein from *Chryseobacterium arthrosphaerae* controls *Diabrotica virgifera virgifera* via a different mode of action to existing commercial proteins – [Rania Jabeur](#), Ecole doctorale Gaia-Université de Montpellier/ Limagrain Europe, France
- MC-O-Patel The project Bio-Protect: Target-specific RNA-based bioprotectants for sustainable crop production in a changing climate – [Prof. Anant Patel](#), Bielefeld University of Applied Sciences, Germany
- MC-O-SosaGomez Outbreaks of *Rachiplusia nu* (Guenée) in southeastern and southern Brazil are associated with its field resistance to Cry1Ac toxin – [Dr. Daniel Sosa-Gómez](#), Embrapa Soybean, Brazil
- MC-O-Yutao Xiao Two ABC transporters are differentially involved in the toxicity of two *Bacillus thuringiensis* Cry1 toxins to the invasive crop-pest *Spodoptera frugiperda* (J. E. Smith) - [Prof. Yutao Xiao](#), Agricultural Genomics Institute, CAAS, China

Thursday 1st July

00:00-23:59 Contributed papers on VOD

00:00-23:59 Posters papers to view at leisure

Chat Session

13:15-13:45

MCO: Microbial control interactions

Moderator Albrecht Koppenhöfer

- MC-O-Coombes Interaction between indigenous entomopathogenic nematodes and the fungus *Metarhizium anisopliae* against late instar false codling moth larvae – [Dr. Candice Coombes](#), Centre for Biological Control, Rhodes University, South Africa
- MC-O-STU-Deschodt Mixed pathogen infections and successful transmission: A complex interaction between host plant, timing of infection and pathogen groups – [Pauline Deschodt](#), Simon Fraser University, Canada
- MC-O-Espinel A combined microbial strategy for the biological control of the fall armyworm *Spodoptera frugiperda* in maize – [Dr. Carlos Espinel](#), Colombian Agricultural Research Corporation – Agrosavia, Colombia
- MC-P-Gomez Effect of interactions among nucleopolyhedrovirus and *Metarhizium rileyi* on the mortality of *Spodoptera frugiperda* larvae under laboratory conditions – [Dr. Juliana Gomez-Valderrama](#), Colombian Agricultural Research Corporation – Agrosavia, Colombia
- MC-O-Marsberg Synergism between a baculovirus and an insect growth regulator? – [Dr. Tamryn Marsberg](#), Citrus Research international, South Africa
- MC-O-Schoenwandt Innovative formulations for biological plant protection in horticulture – [Dr. Desiree Jakobs-Schoenwandt](#), Bielefeld University of Applied Sciences, Germany
- MC-O-STU-Spence Less is More; Improved Control of *Trialeurodes vaporariorum* by Co-Application of an Entomopathogenic Fungus and an Insect Growth Regulator, [Eleanor Spence](#), Warwick University, UK
- MC-O-Vesga Suppressive soil communities as potential insect pest control tools – [Dr. Pilar Vesga](#), University of Lausanne, Switzerland

Chat Session

13:15-13:45

MIC: Microsporidia biodiversity and physiology

Moderator Aaron Reinke

- MI-O-STU-Ehrenbolger Differences in structure and hibernation mechanism highlight diversification of the microsporidian ribosome – [Kai Ehrenbolger](#), The Laboratory for Molecular Infection Medicine Sweden (MIMS), Sweden
- MI-O-STU-Frolova Four microsporidian hyperparasites of the bristle worm *Pygospio elegans* – [Ekaterina Frolova](#), Institute of cytology RAS; Saint Petersburg State University, Russia
- MI-P-Isakova Occurrence of microsporidia in trematodes infecting snails in St. Petersburg (Russia) water basins – [Dr. Nadezhda Isakova](#), The Herzen State Pedagogical University, Russia
- MI-O-STU-Kireeva Genetic diversity of microsporidia from lepidopteran insects in Russia and neighboring countries – [Darya Kireeva](#), Saint Petersburg State University, Russia
- MI-O-Kononchuk Novel findings of Microsporidia in predatory mites – [Anastasiya Kononchuk](#), All Russian Institute of Plant Protection, Russia
- MI-O-STU-Rumiantseva Susceptibility of beet webworm larvae to microsporidia from Lepidoptera – [Arina Rumiantseva](#), All Russian Institute of Plant Protection, Russia

Chat Session

13:15-13:45

VIR: Virus detection and identification

Moderators Sassan Asgari & J Jörg Wennmann

- VI-P-Defilippo Preliminary observations of viral presence in a mass rearing crickets used as feed and food – [Dr. Francesco Defilippo](#), Istituto Zooprofilattico Sperimentale Lombardia e Emilia Romagna, Italy
- VI-O-STU-HernandezPelegrin The RNA virome of the medfly: a necessary step to optimize medfly control – [Luis Hernández Pelegrín](#), University of Valencia (Biotecmed Institute), Spain
- VI-O-STU-Lim Harnessing the Potential of Real Time Portable Next Generation Sequencing as a Surveillance Tool for Pathogens in Mass Reared Insects - [Fang Shiang Lim](#), Julius Kühn Institute, Germany
- VI-O-STU-Malysh Insect iridescent virus type 6 is widespread in wild and cultured insects – [Svetlana Malysh](#), All-Russian Institute of Plant Protection, Russia
- VI-O-STU-Duartedejesus Insect and plant virus diversity associated with the vine mealybug *Planococcus ficus* – [José Luis Duarte de Jesús](#), Ensenada Centre for Scientific Research and Higher Education, México
- VI-O-STU-Mengual Compatibility of covert infections with RNA viruses with natural enemies in *Spodoptera exigua* – [Adrià Mengual-Martí](#), University of Valencia (Biotecmed Institute), Spain
- VI-O-Nakai *Oryctes rhinoceros* nudivirus infections of G-haplotype coconut rhinoceros beetles (*Oryctes rhinoceros*) in Palauan PCR-positive populations – [Dr. Madoka Nakai](#), Tokyo University of Agricul & Tech, Japan

13:45-14:00 Break

Viruses of Pollinators

Bryony Bonning

- 14:00 **Combined impacts of virus and nutrition on honey bee health.** Dr. Adam G. Dolezal-USA
- 14:30 **DWV/VDV1 infectious clones and their application for study of bee-virus interactions.** Dr. Eugene Ryabov-UK
- 15:00 **Virus-blocking peptides to mitigate virus burden in the honey bee.** Dr. Ya Guo - China
- 15:30 **Comparative virus population genetics in *A. mellifera* and *A. cerana* in Asia.** Dr. Lena Wilfert - Germany

16:00-16:15 Break

Chat Session

16:15-16:45

BAC: Receptors and resistance

Moderators Juan Ferré & OP Perrera

- BA-O-STU-AndresGarrido Cadherin fragment from *Spodoptera exigua* enhances Cry1A toxicity to *Grapholita molesta* – Ascensión Andrés Garrido, University of Valencia / Institute of Biotechnology and Biomedicine (BioTecMed), Spain
- BA-O-STU-CottoRivera Bt resistance-associated alteration of aminopeptidase N (APN) gene expression is independent of the ABCC2 gene in *Trichoplusia ni* – Rey Cotto-Rivera, Cornell University, USA
- BA-O-Heckel Identification of a new Cry1Ac resistance gene in *Heliothis virescens* – Prof. Davis Heckel, Max Planck Institute for Chemical Ecology, Germany
- BA-O-Hernandez-Martinez Comparison of in vitro and in vivo binding sites competition of *Bacillus thuringiensis* Cry1 proteins in two important corn pests – Dr. Patricia Hernández-Martínez, University of Valencia, Spain
- BA-O-STU-Lazaro-berenguer In vivo competition assays between Vip3 proteins confirms the existence of shared binding sites among them in *Spodoptera littoralis* with different relevance on the toxicity- Maria Lázaro-Berenguer, University of Valencia, Spain
- BA-O-Nelson Functional validation of DvABCB1 as a receptor of Cry3 toxins in western corn rootworm, *Diabrotica virgifera virgifera* – Dr. Mark Nelson, Corteva Agriscience, USA
- BA-P-STU-Pinos Alteration of a Cry1A shared binding site in a laboratory selected strain of *Ostrinia furnacalis* resistant to Cry1A proteins – Daniel Pinos, University of Valencia / Institute of Biotechnology and Biomedicine (BioTecMed), Spain
- BA-O-Wang_Ping Resistance to Bt Cry1Ac in *Trichoplusia ni* is conferred by multiple gene mutations – Dr. Ping Wang, Cornell University, USA
- BA-O-STU-Yonghao The Silkworm ABCC transporters are involved in susceptibility difference for each *Bacillus thuringiensis* Cry1Ab, Cry1Ac and Cry1Fa toxin – Wang Yonghao, Tokyo University of Agriculture and Technology, Japan

Chat Session

16:15-16:45

FUN: Applied aspects 2

Moderator Stefan T. Jaronksi & Stéphanie Saussure

- FU-O-STU-Agbessenou Making the right decision: Temperature-dependent modelling approach and spatial prediction reveal suitable areas for deployment of two *Metarhizium anisopliae* isolates for sustainable management of *Tuta absoluta* – Ayaovi Agbessenou, International Centre of Insect Physiology and Ecology, Kenya
- FU-O-Fernandez-Bravo Effect of natural occurrence of *Metarhizium spp.* on soil arthropod communities in three permanent grassland plots in Switzerland – Dr. Maria Fernandez-Bravo, Agroscope, Switzerland
- FU-NE-O-STU-Hansen Virulence and natural associations of entomopathogens with adults of the cryptic *Phlyctinus callosus* species complex- Steffan Hansen, Stellenbosch University, South Africa
- FU-O-Ment Not only a formulation: The effects of Pickering emulsion on the entomopathogenic action of *Metarhizium brunneum* – Dr. Dana Ment, ARO, Israel
- FU-O-Senthil Field evaluation of *Akanthomyces (=Lecanicillium) psalliotae* and development of an Integrated Pest Management strategy against cardamom thrips, *Sciothrips cardamomi* - Dr. CM Senthil Kumar, ICAR-Indian Institute of Spices Research, India
- FU-O-Wu Post-application persistence and field efficacy of a new strain of *Cordyceps javanica* against the silverleaf whitefly, *Bemisia tabaci* biotype – Dr. Shaohui Wu, Agricultural Genomics Institute, CAAS, China
- FU-O-STU-Park Biopesticide using Entomopathogenic fungi *Beauveria bassiana* Entomopathogenic fungi-mediated management in field - So Eun Park, Department of Agricultural Biology, Jeonbuk National, South Korea

Chat Session

16:15-16:45

NEM: Advances in formulation, application and control of pests

Moderator Ivan Hillpold

- NE-O-STU-Dunn Optimisation of the in vitro liquid culture process of *Steinernema yirgalamense* and *Steinernema jeffreyense* using local resources for cost-effective production – Murray Dunn, Stellenbosch University, South Africa
- NE-P-STU-Gonzalez Screening of adjuvants to enhance the entomopathogenic nematode survival and adherence after aerial application on grapevine leaves - María del Mar González-Trujillo, Institute of Vine and Wine Science (ICVV), Spain
- NE-O-Hiltpold Potential of entomopathogenic nematodes to mitigate the insect vector of the Syndrome de Basse Richesse in sugar beet – Dr. Ivan Hiltpold, Agroscope, Switzerland
- NE-P-Mikaia Potential of entomopathogenic nematode isolates from Germany and Israel to control the tomato leaf miner (*Tuta absoluta*, Meyrick) (Lepidoptera: Gelechiidae) in Georgia - Prof. Nona Mikaia, Sokhumi State University, Tbilisi, Georgia, Georgia
- NE-P-Ruiz-Vega Performance of *Steinernema glaseri* pre-conditioned IJs formulated as pellets with sodium polyacrylate – Dr. Jaime Ruiz-Vega, Instituto Politecnico Nacional, México
- NE-O-RamanSandhi Entomopathogenic nematodes applied as infected *Galleria mellonella* cadavers against wireworms (Coleoptera: Elateridae) – Dr. Ramandeep Kaur Sandhi, Cornell University, USA
- NE-O-Shapiro-Ilan Biocontrol with Benefits: Control of Peachtree Borer with Entomopathogenic Nematodes – Dr. David Shapiro-Ilan, USDA-ARS, USA
- NE-P-STU-Vicente-Diez *Steinernema carpocapsae* and *Xenorhabdus nematophila* based products for the control of the grapevine moth and the grey mold in vineyards – Ignacio Vicente-Díez, Institute of Vine and Wine Science (ICVV), Spain

Chat Session

16:15-16:45

VIR: Viral Bioinsecticide

Moderators Sean Moore & Holly Popham

- VI-O-Cuartas Bio-Insecticidal potential of alphabaculovirus and betabaculovirus mixtures to control the Fall Armyworm *Spodoptera frugiperda* (J.E. Smith, 1797) (Lepidoptera: Noctuidae) – Dr. Paola Emilia Cuartas, Colombian Agricultural Research Corporation – Agrosavia, Colombia
- VI-O-DelRinconCastro2 Characterization of native Mexican strains of baculovirus with virulence towards *Spodoptera frugiperda* (Lepidoptera: Noctuidae) – Dr. Cristina Del Rincón-Castro, University of Guanajuato, México
- VI-P-Harrison Insecticidal properties of isolates of *Spodoptera frugiperda* multiple nucleopolyhedrovirus (SfMNPV) against corn- and rice-strain *Spodoptera frugiperda* larvae, and genome analysis of selected SfMNPV isolates – Dr. Robert Harrison, USDA-ARS Insect Biocontrol and Behavior Laboratory, USA
- VI-O-Hinsberger 1 Multiple baculovirus infections in codling moth: CpGV-R5 help to CpGV-M cannot be substituted by CrpeNPV – Dr. Aurélie Hinsberger, IMT Mines Alès, France
- VI-O-Hinsberger 2 Mixed infections of type I resistant codling moth larvae in treated orchard leaves - Dr. Aurélie Hinsberger, IMT Mines Alès, France
- VI-O-STU-Oehlmann Amplicon-based sequence analyses of single nucleotide polymorphisms reveal the genetic structure of LdMNPV field populations – Christian Oehlmann, Julius Kühn Institute (JKI), Germany
- VI-O-STU-Renoult Resistance of *Cydia pomonella* to all viral isolates used in biological control in Europe – Sofian Renoult, INRAE, France
- VI-O-vandermerwe Yeast-baculovirus synergism for the improved control of *Thaumatotibia leucotreta*, an important pest of citrus in Africa – Marcel van der Merwe, Rhodes University, South Africa

16:45-17:00 Break

Bacteria Division Symposium

14:00-16:00

Analysis of Vip3A and Cry protein mechanism of action

Colin Berry

- 17:00 **Mechanism of action of Vip3 proteins inferred from their structures.** Dr. Patricia Casino, University of València, Spain
- 17:30 **Pesticidal protein mechanism of action – the importance of experimental verification.** Dr. Neil Crickmore, University of Sussex -UK
- 17:40 **Experimental evidence for Cry protein MoA models.** Dr. Alejandra Bravo, Universidad Nacional Autónoma de México – México
- 18:10 **The activity of Cry protoxins.** Dr. Mario Soberón, Universidad Nacional Autónoma de México – México
- 18:40 **General Discussion**

19:00-19:15 Break

Chat Session

19:15-19:45

BAC: Strains and proteins Moderators Juan Luis Jurat Fuentes & Jorge Ibarra

- BA-P-STU-Quan The rapid evolution of resistance to Vip3Aa insecticidal protein in *Mythimna separata* (Walker) is not related to altered binding to midgut receptors – Yudong Quan, University of Valencia / Institute of Biotechnology and Biomedicine (BioTecMed), Spain
- BA-O-Banerjee Peptide mediated enhancement of a bacterial ETX-MTX pesticidal protein for suppression of the southern green stink bug, *Nezara viridula* – [Dr. Rahul Banerjee](#), University of Florida, USA
- BA-O-STU-Geng A novel insecticidal protein is toxin to *Ostrinia furnacalis* and *Agrotis ipsilon* – [Yang Geng](#), Huazhong Agricultural University, China
- BA-O-STU-Hamze *Pseudomonas protegens* as a biocidal agent against Diptera of medical-veterinary importance – [Rim Hamze](#), University of Sassari, Italy
- BA-O-Ibarra Occurrence of endophytic *Bacillus thuringiensis* strains in wild vegetation plants – [Dr. Jorge E. Ibarra](#), Cinvestav-Unit Irapuato, México
- BA-P-STU-Williamson Crystal Structure of *Lysinibacillus sphaericus* Tpp49 using Serial Femtosecond Crystallography – [Lainey Williamson](#), Cardiff University, UK
- BA-O-STU-ValenciaLozano Effect of the Cry10Aa protein from *Bacillus thuringiensis* expressed in *Coffea arabica* plants on the coffee berry borer (*Hypothenemus hampei*) - [Dr. Jorge E. Ibarra](#), Cinvestav-Unit Irapuato, México
- BA-P-Mishra Streamlined phage display library protocols for identification of insect gut binding peptides highlight peptide specificity – [Dr. Ruchir Mishra](#), University of Florida, USA

Chat Session

19:15-19:45

MCO: Microbial control with fungi Moderators Li Ma & Nina Jenkins

- MC-O-STU-Antara Chitin amended media: A solution for improved entomopathogenic fungi against codling moth - [Nushrat Harun Antara](#), Julius Kühn-Institut, Institute for Biological Control, Germany
- MC-P-Garrido-Jurado The ingestion of *Metarhizium*-colonized plants produces direct and indirect effects on the cotton leafworm *Spodoptera littoralis* – Dr. Inmaculada Garrido-Jurado, [University of Cordoba](#), Spain
- MC-O-STU-George Impact of tannins from bioactive plants on the growth and spore production of the biocontrol fungus *Duddingtonia flagrans* – [Anthony George](#), Queens University Belfast, UK
- MC-O-STU-Leite Have entomopathogenic fungi used for biocontrol of pest insects potential to affect social bees? – [Mariana Leite](#), University of São Paulo, Brazil
- MC-P-STU-Lima Tick cuticle lipids may limit infection by entomopathogenic fungi – [Valesca Lima](#), Federal University of Goiás, Brazil
- MC-O-STU-Pedrazzini What is the effect of geographic and temporal separation of the Common cockchafer on the population structure of its main fungal pathogen? – [Chiara Pedrazzini](#), Agroscope/ETH, Switzerland
- MC-P-STU-Ribeiro-Silva Conidial production from granules of *Metarhizium humberi* microsclerotia on soil samples - [Cárita de Souza Ribeiro-Silva](#), Universidade Federal de Goiás, Brazil
- MC-P-STU-Romero-Conde Influence of abiotic factors on the persistence and viability of microsclerotia produced by the entomopathogenic fungus *Metarhizium* spp. (Hypocreales: Clavicipitaceae) – [Antonia Romero](#), University of Cordoba, Spain
- MC-O-SreeramaKumar A mycelial–conidial formulation of a silkworm-safe isolate of *Hirsutella thompsonii* to control *Polyphagotarsonemus latus* in mulberry – [Dr. Prakya Sreerama Kumar](#), CAR – National Bureau of Agricultural Insect, India
- MC-P-STU-Zottele Digging into the past: *Metarhizium brunneum* as control agent against the sugar beet weevil (*Asproparthenis punctiventris*) – [Maria Zottele](#), Leopold-Franzens University Innsbruck, Austria

Friday 2nd July

00:00-23:59 Contributed papers on VOD
00:00-23:59 Posters papers to view at leisure

Nematode Division Symposium

13:30-15:30

Entomopathogenic nematodes or scavengers: Revisiting the emerging new nematodes classified as EPN

Raquel Campos-Herrera

- 13:30 **Scavenging among entomopathogenic nematode species: Are there better performers?** Dr. Ernesto San-Blas. University of O'Higgins - Chile
- 13:50 **Entomopathogenicity and scavenging behaviour of *Oscheius* nematodes and their competition with entomopathogenic nematodes.** Dr. Vladimir Puza. Biology Center CAS, Czech Republic
- 14:10 **The enigmatic status of *Oscheius onirici* (Nematoda: Rhabditida).** Dr. Giulia Torrini. CREA - Research Centre for Plant Protection and Certification - Italy
- 14:30 **Biological and taxonomic characterization of a superior infective isolate of *Acrobeloids* spp.** Dr. Javad Karimi. Ferdowsi University of Mashhad - Iran
- 14:50 **The cost of fighting for surviving in a complex world: entomopathogenic nematodes as scavengers.** Dr. Raquel Campos-Herrera. ICVV-CSIC – Spain
- 15:10 **Old and new examples of nematodes classified as EPNs.** Dr. Adler Dillman, University of California- USA

15:30-15:45 *Break*

Plenary Symposium

15:45-17:15

SIP Awardee Symposium

Vera Ros

- 15:45 Welcome and honoring Martignoni Awardee – Vera Ros
- 15:50 Presentation Mauro Martignoni Awardee
***bv/odv-e26* is required for virus-induced host behavioral manipulation in lepidopteran nucleopolyhedroviruses**
Hiroyuki Hikida, *University of Tokyo, Japan*
- 16:10 **Laudatio of Early Career Awardee 2020 Jörg Wennmann** - Dr Johannes Jehle, Julius Kühn Institute (JKI), Germany
- 16:15 **Deciphering the population structure of baculoviruses by nucleotide polymorphisms** – Dr Jörg Wennmann, Julius Kühn Institute (JKI), Germany
- 16:40 **Laudatio of Early Career Awardee 2021 Patricia Golo** - Dr. Richard Humber, USDA ARS, USA
- 16:45 **Fungi for tick control: what do we know and what do we need to know?** Dr Patricia Golo, Universidade Federal Rural do Rio de Janeiro, Brazil

17:15-17:30 *Break*

Plenary Session

17:30-18:30

SIP Business Meeting

Christina Nielsen Leroux & Helen Hesketh

Announcement of Student Prizes – Vera Ros

18:30 - Meeting Closure