

# INFORMATION



JUSTUS-LIEBIG-  
UNIVERSITÄT  
GIESSEN



ZIB LOEWE Zentrum für  
Insektenbiotechnologie  
& Bioressourcen



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Website: [www.insecta-conference.com](http://www.insecta-conference.com)

**CONFERENCE LANGUAGE:** English

## CONFERENCE VENUE:

### **SEPTEMBER 5:**

**Aula of Justus Liebig University Giessen (JLU)**

Ludwigstraße 23, 35390 Giessen, Germany

### **SEPTEMBER 6 & 7:**

**Building „Neue Chemie“**

Heinrich-Buff-Ring 58, 35392 Giessen, Germany

## ACCOMMODATION RECOMMENDATION:

Please visit our website to view the recommended hotels:

[www.insecta-conference.com](http://www.insecta-conference.com)

## International Symposium on Insects



# INSECTA 2018

**5. - 7. SEPTEMBER 2018  
GIESSEN, GERMANY**

## PROGRAM



# PROGRAM

## WEDNESDAY, SEPTEMBER 5

02:30 p.m. REGISTRATION

03:30 p.m. GREETINGS & KEYNOTE LECTURES

### **The regulatory Framework for Production and Use of Insects as Feed in the EU in Order to ensure the Safety of the Food Chain: Situation and Outlook**

Wolfgang Trunk

DG SANTE / Animal Nutrition, Veterinary Medicines, Brussels, Belgium

### **Adaptive Strategies of Insects to Challenging Environments**

Heiko Vogel<sup>1</sup>, Shantanu Shukla<sup>1</sup>, Martin Kaltenpoth<sup>2</sup>, David G. Heckel<sup>1</sup>, Andreas Vilcinskas<sup>3,4</sup>

<sup>1</sup> Department of Entomology, Max Planck Institute for Chemical Ecology, Jena, Germany

<sup>2</sup> Institute of Organismic and Molecular Evolution, Johannes Gutenberg University of Mainz, Germany

<sup>3</sup> Institute of Insect Biotechnology, Justus-Liebig-University of Giessen, Germany

<sup>4</sup> Department Bioresources, Fraunhofer Institute for Molecular Biology and Applied Ecology, Giessen, Germany

### **Insect Meal as a Source of Protein in Animal Nutrition**

Klaus Eder

Justus-Liebig University Giessen, Germany

### **Studying Insect Biotechnology & Bioresources**

Marc Schetelig

Justus-Liebig University Giessen, Germany

06:00 p.m. GET-TOGETHER

07:30 p.m. END OF PROGRAM

# PROGRAM

## THURSDAY, SEPTEMBER 6

08:00 a.m. REGISTRATION

09:00 a.m. KEYNOTE LECTURES

### **Monitoring the Microbiota during industrial Insect rearing to unravel Feed and Food Safety**

Leen Van Campenhout

KU Leuven, Department of Microbial and Molecular Systems, Lab4Food, Technology Campus Geel, Geel, Belgium

### **The greater Wax Moth *Galleria mellonella* in the Study of microbial Pathogenesis and antimicrobial Drug Discovery**

Eleftherios Mylonakis

Alpert Medical School of Brown University, Providence, Rhode Island, USA

### **The Importance of Collaboration in the Insect Industry**

Andreas Aepli

Bühler Insect Technology Solutions AG

10:15 a.m. SESSION 1

Topic 1 Food Safety for Using Insects

### **Legal Challenges and Opportunities for Insects as Novel Food**

Nicolas Carboneille

Bird & Bird LLP, Brussels, Belgium

### **Microbiological Parameters in national European Guidelines for Edible Insects – Challenges for the Future**

Nils Th. Grabowski, Birte Ahlfeld, Corinna Kehrenberg

Hannover University of Veterinary Medicine, Foundation, Institute for Food Quality and Food Safety, Hannover, Germany



### **Microbial Characterisation of the Grasshopper *Ruspolia differens* Serville, a wild harvested Edible Insect in Uganda**

Geoffrey Ssepuuya<sup>1</sup>, Enya Wynants<sup>1</sup>, Christel Verreth<sup>2</sup>, Sam Crauwels<sup>2</sup>, Bart Lievens<sup>2</sup>, Johan Claes<sup>1</sup>, Dorothy Nakimbugwe<sup>3</sup>, Leen Van Campenhout<sup>1</sup>

<sup>1</sup> KU Leuven, Department of Microbial and Molecular Systems, Lab4Food, Technology Campus Geel, Geel, Belgium

<sup>2</sup> KU Leuven, Department of Microbial and Molecular Systems, Laboratory for Process Microbial Ecology and

Bioinspirational Management, Sint-Katelijne-Waver, Belgium

<sup>3</sup> Makerere University, Department of Food Technology and Nutrition, CAES, Kampala, Uganda

### **10:15 a.m. SESSION 2**

#### **Topic 2 Insects production systems**

### **A new mathematical Approach to predict optimal environmental Conditions in the Larvae Growth Process**

Adi Jonas-Levi, Tamar Zemach

Tel-Hai College, Kiryat Shmona, Israel

### **The effects of Temperature on Growth Rate, Feed Conversion Efficiency and Protein Content of Yellow mealworm (*Tenebrio molitor*)**

Jonas Lembcke Andersen, Dahl Bjørge Julie, Johannes Overgaard, Hans Malte, Ida Berggreen, Natasja Gianotten, Lars-Henrik Heckmann

Danish Technological Institute, Life Science, Aarhus C, Danmark

#### **Topic 3 Application of insects as feed and food**

### **Willingness-to-try edible Insects – The Impact of Consumers' Perception and visual Characteristics of Insect Dishes**

Eric Barrera Albores, Isabel Schäufele, Ulrich Hamm  
University of Kassel, Department of Agricultural and Food Marketing, Witzenhausen, Germany

### **11:35 a.m. COFFEE BREAK / POSTER PRESENTATION**

### **12:00 a.m. SESSION 3**

#### **Topic 3 Application of insects as feed and food**

### **A Peptidase from the Bug *Spilostethus pandurus* for Food Processing**

Wendell Albuquerque, Martin Rühl, Martin Gand, Holger Zorn  
Justus Liebig University Giessen, Food Chemistry and Food Biotechnology, Giessen, Germany

### **Sustainable production of high quality feed from animal (*Hermetia*) and plant (*Lemna*) sources**

Herwig Gutzeit, Ariane Müller

TU Dresden, Faculty of Biology, Dresden, Germany

### **A House for the Critters: Bringing Insects into People's Kitchens**

Andreas Walter<sup>1</sup>, Thomas Klammssteiner<sup>2</sup>, Carina Desirée Heussler<sup>2</sup>, Heinrich Pan<sup>3</sup>, Markus Schermer<sup>4</sup>, Heribert Insam<sup>2</sup>

<sup>1</sup> MCI-Management Center Innsbruck, Biotechnology & Food Engineering, Innsbruck, Austria

<sup>2</sup> University of Innsbruck, Department of Microbiology, Innsbruck, Austria

<sup>3</sup> Fablab

<sup>4</sup> University of Innsbruck, Department of Sociology, Innsbruck, Austria

### **Species Differentiation of Insect Protein in Compound Feed using proteomics Approach**

Ikram Belghit<sup>1</sup>, Josef D. Rasinger<sup>1</sup>, Erik-Jan Lock<sup>1</sup>, Marc Berntssen, Olivier Fumière<sup>2</sup>,

Marie-Caroline Lecrenier, Marc Dieu, Magnus Palmblad

<sup>1</sup> Institute of Marine Research, Bergen, Norway

<sup>2</sup> Agricultural Product Valorisation Department

### **12:00 a.m. SESSION 4**

#### **Topic 4 Non-food applications of insects**

### **Mycotoxin detection in Food- and Feed-Staffs by living Insects as Rapid Test**

Marlen Albrecht

Pilot Pflanzenoeltechnologie Magdeburg e.V., Magdeburg, Germany

### **Transcriptomic and proteomic Analysis of the Bombardier Beetle defensive Gland to identify Proteins mediating the explosive defense Reaction**

Nicolai Rügen<sup>1</sup>, Heiko Vogel<sup>2</sup>, Natalie Wielsch<sup>2</sup>, Miray Tonk<sup>3</sup>, Andreas Vilcinskis<sup>3</sup>

<sup>1</sup> Fraunhofer Institute for Molecular Biology and Applied Ecology, Bioresources, Gießen, Germany

<sup>2</sup> Max Planck Institute for Chemical Ecology, Entomology, Jena, Germany

<sup>3</sup> Justus Liebig University, Institute for Insect Biotechnology, Gießen, Germany



**Impact of Waste Management Technologies on Environment: relative Life Cycle Assessment of Potato Peels Management with anaerobic Fermentation, Pigs and Insects**  
Shashank Goyal, Sergiy Smetana, Volker Heinz  
German Institute of Food Technologies - DIL e.V.,  
Food Data Group, Quakenbrück, Germany

## Topic 2 Insects production systems

### **Safety and Productivity Assessment of *Hermetia illucens* Larvae reared on solid Aquaculture Waste**

Eric Schmitt <sup>1</sup>, Ram K. R. Shanmugam <sup>2</sup>, Johan Johansen <sup>3</sup>,  
Raymond Leushuis <sup>1</sup>, Erik-Jan Lock <sup>4</sup>, Aman Paul <sup>4</sup>, Joop Van Loon <sup>2</sup>  
<sup>1</sup> Protix B.V., Dongen, Netherlands

<sup>2</sup> Wageningen University, Laboratory of Entomology,  
Wageningen, Netherlands

<sup>3</sup> Salten Havbrukspark AS, Nygårdssjøen, Norway

<sup>4</sup> Institute of Marine Research, Bergen, Norway

## 12:00 a.m. SATELLITE MEETING

### INTRODUCTION

#### **Resistance and sequestration: drivers of insect-plant coevolution**

Georg Petschenka  
Group Leader, JLU Gießen

#### **Complex relationship between the pea aphid *Acyrtosiphon pisum* and its bac-terial symbiont *Serratia symbiotica***

Marisa Skaljac  
DOW, Fraunhofer IME

#### **Highly efficient CRISPR Cas HDR for genome editing in insects**

Roswitha Aumann, Irina Häcker, Marc F. Schetelig  
JLU Gießen

#### **Approaches towards heterologous expression of biosynthetic gene clusters for the production of natural products**

Nils Böhrringer  
JLU Gießen

#### **Harm and heal?**

##### **Pharmacological potential of animal venoms**

Andre Billion  
Fraunhofer IME, Gießen

## 01:40 p.m. LUNCH BREAK / POSTER PRESENTATION

## 02:40 p.m. SATELLITE MEETING

#### **Development of insect pathogens as biological control**

Kwang-Zin Lee  
Fraunhofer IME

#### **Combined Microfluidics/FACS platform for antibiotic drug discovery of insect-associated microorganisms**

Markus Oberpaul  
Sanofi-Fraunhofer Center for Natural Product Research

#### **Evolutionary venomomics of neglected pancrustaceans**

Björn M von Reumont  
JLU Gießen

#### **Recombinant Production of Insect derived antimicrobial Peptides in stably transformed *Drosophila melanogaster* S2 Cells**

Jan Zitzmann, Tobias Weidner, Peter Czermak  
Technische Hochschule Mittelhessen – University of Applied Sciences, Institute of Bioprocess Engineering and Pharmaceutical Technology, Giessen, Germany

## 04:20 p.m. END OF SATELLITE MEETING

## 02:40 p.m. SESSION 5

### Topic 1 Food Safety for Using Insects

#### **Microbial Community Dynamics and Functions in Black Soldier Fly larvae (*Hermetia illucens*, Diptera: Stratiomyidae) reared on various Diets**

Thomas Klammsteiner <sup>1</sup>, Andreas Walter <sup>1</sup>, Carina D. Heussler <sup>2</sup>,  
Blaž Stres <sup>3</sup>, Florian M. Steiner <sup>2</sup>, Birgit C. Schlick-Steiner <sup>2</sup>,  
Wolfgang Arthofer <sup>2</sup>, Heribert Insam <sup>1</sup>

<sup>1</sup> University of Innsbruck, Department of Microbiology,  
Innsbruck, Austria

<sup>2</sup> University of Innsbruck, Department of Ecology,  
Innsbruck, Austria

<sup>3</sup> University of Ljubljana, Department of Animal Science,  
Domžale, Slovenia



### **Transmission of Salmonella sp. from contaminated Wheat Bran to Mealworms (*Tenebrio molitor*)**

Enya Wynants<sup>1</sup>, Lotte Frooninckx<sup>2</sup>, Sabine Van Miert<sup>2</sup>, Johan Claes<sup>1</sup>, Leen Van Campenhout<sup>1</sup>

<sup>1</sup> KU Leuven, Microbial and Molecular Systems, Geel België

<sup>2</sup> Thomas More University College of Applied Sciences, RADIUS, Geel, België

### **Identification, Heat-survival and Outgrowth of endospore-forming Bacteria harboured by edible Insects**

Dries Vandeweyer, An Borremans, Christel Verreth, Bart Lievens, Leen Van Campenhout

KU Leuven, Microbial and molecular systems, Geel, Belgium

### **Yuck to yummy Factor? The growing global acceptance of edible Insects and the Need for a Good Agricultural Practices (GAP) Insect Production Standard**

Joash Mathew<sup>1,2</sup>, Enrique Uribe<sup>2</sup>

<sup>1</sup> ISA Lille, école d'ingénieurs en sciences du vivant, Sustainable food technology and management, Lille, France

<sup>2</sup> GLOBALG.A.P. c/o FoodPLUS GmbH, Standards Development, Koeln, Germany

### **Optimization of Decontamination and Drying Processes to secure Safety and Storage Stability of Black Soldier Fly Products (*Hermetia illucens*)**

M'ballou Cissé<sup>1</sup>, Yolaine Leboeuf<sup>1</sup>, Marie-Hélène Deschamps<sup>1</sup>,

Grant W. Vandenberg<sup>1</sup>, Cristina Ratti<sup>2</sup>, Linda Saucier<sup>1</sup>

<sup>1</sup> Université Laval, Département de sciences animales, Québec, Canada

<sup>2</sup> Université Laval, Département des sols et de génie agroalimentaire, Faculté des sciences de l'agriculture et de l'alimentation, Québec, Canada

### **02:40 p.m. SESSION 6**

#### **Topic 2 Insects production systems**

### **The Use of increasing false Flax [*Camelina sativa* (L.) Crantz] Cake Levels as rearing Substrate of Black Soldier Fly (*Hermetia illucens*) Larvae**

Marco Meneguz<sup>1</sup>, Incoronata Galasso<sup>2</sup>, Giovanna Battelli<sup>3</sup>, Remo Reggiani<sup>2</sup>, Francesco Gai<sup>4</sup>, Laura Gasco<sup>1</sup>

<sup>1</sup> Department of Agricultural, Forest and Food Sciences, University of Turin, Grugliasco, Italy

<sup>2</sup> Institute of Agricultural Biology and Biotechnology, National Research Council, Milano, Italy

<sup>3</sup> Institute of Science of Food Production, National Research Council, 20133 Milano, Italy

<sup>4</sup> Institute of Science of Food Production, National Research Council, 10095 Grugliasco, Italy

### **Influence of Temperature, Humidity and Moisture Source on the early Development of the yellow Mealworm (*Tenebrio molitor*)**

Carl Coudron, David Deruytter, Jonas Claeys, Stefan Teerlinck Inagro, Roeselare, Belgium

### **Bio-Conversion of different organic Substrates into high Protein and Fat Black Soldier Fly Larval Biomass for Feed and Non-Feed Applications**

Anton Gligorescu, Christian Fischer, Lars-Henrik Heckmann Danish Technological Institut, Bioengineering and Environmental Technology, Aarhus, Denmark

### **Nutritional Requirements of Black Soldier Fly larvae**

Thomas Spranghers, Sharon Schillewaert, Filip Wouters VIVES Hogeschool, Agro-and Biotechnology campus Roeselare, Roeselare, Belgium

### **Impact of Beetle Age and Density on Fecundity of *Tenebrio molitor***

Ida Elisabeth Berggreen<sup>1</sup>, Jonas Lembcke Andersen<sup>1</sup>, Lars-Henrik Heckmann<sup>1</sup>

<sup>1</sup> Danish Technological Institute, Life Science, Aarhus C, Danmark

### **04:50 p.m. COFFEE BREAK / POSTER PRESENTATION**

### **05:20 p.m. SESSION 7**

#### **Topic 3 Application of insects as feed and food**

### **Edible Bugs in European Food Culture: a cultural analytical Approach towards overcoming the yuck Factor**

Claudia Manzo

Lund University, Department of Arts and Cultural Sciences, Lund, Sweden



## Comparison of wet and dry processing and fractionation for mealworms (*Tenebrio molitor*)

Verena Bösch

Research Institute of Feed Technology of the International Research Association of Feed Technology e.V. (IFF),  
Braunschweig-Thune, Germany

## Marketing edible Insects to Vegans and Vegetarians based on nutritional and ethical Considerations

Josh Galt <sup>1,2</sup>, Curran Hendry <sup>1,2</sup>

<sup>1</sup> Micro Livestock International, USA

<sup>2</sup> Angka Changrit Kampuchea NGO, Cambodia“

## 05:20 p.m . SESSION 8

### Topic 4 Non-food applications of insects

## Pharmaceutical Potentials of Insect Larvae: a high-throughput Proteomics and lipidomics Approach

Vahideh Rabani, Hamed Cheatsazan, Siamak Davani

UFR de sciences médicales et pharmaceutiques,

Université de Bourgogne Franche-Comté, Besançon, France

## A new Approach to control Pest Thrips (Thysanoptera) using artificial Diets to test Effects and Impacts of active Substances

Marcus Jilge, Stephanie Krueger, Julia Chuttke, Gerald Moritz

Martin-Luther-University, Developmental Biology, Halle/

Saale, Germany

## Purification of Insect Cell Culture derived recombinant Baculovirus by steric Exclusion Chromatography for Cell Therapy Application

Keven Lothert <sup>1</sup>, Felix Beyer <sup>1</sup>, Gundula Sprick <sup>1</sup>,

Peter Czermak <sup>1,2,3,4</sup>, Michael W. Wolff <sup>1,5</sup>

<sup>1</sup> University of Applied Sciences Mittelhessen, Institute of Bioprocess Engineering and Pharmaceutical Technology, Giessen, Germany

<sup>2</sup> Kansas State University, Department of Chemical Engineering, Manhattan, USA

<sup>3</sup> Justus-Liebig-University of Giessen, Giessen, Germany

<sup>4</sup> Fraunhofer Institute for Molecular Biology and Applied Ecology (IME) - Bioresources, Giessen, Germany

<sup>5</sup> Max Planck Institute for Dynamics of Complex Technical Systems, Bioprocess Engineering, Magdeburg, Germany“

## 06:35 p.m. END OF LECTURES

## 07:30 p.m. EVENING EVENT

Including the PPM Best Poster Presentation Award

# PROGRAM

## FRIDAY, SEPTEMBER 7

### 09:00 a.m. KEYNOTE LECTURE

## Insects and Global Food Security

Stuart Reynolds

Department of Biology and Biochemistry,

University of Bath, Bath, UK

### 05:20 p.m . SESSION 9

### Topic 4 Topic 2 Insects production systems

## Different rearing substrates exhibit direct influence on growth and macronutrient composition of *Hermetia illucens* (L.)

(Diptera: Stratiomyidae) larvae at an industrial scale

Andrea Scala <sup>1</sup>, Rosanna Salvia <sup>1</sup>,

Jeffery Tomberlin <sup>2</sup>, Patrizia Falabella <sup>1</sup>

<sup>1</sup> University of Basilicata, Department of Science, Potenza, Italy

<sup>2</sup> Texas A&M University, Department of Entomology, College Station, USA

## Inhibition of Histone Acetylation and DNA Methylation negatively Affects Life History Traits of the Pea Aphid (*Acyrtosiphon pisum*)

Phillipp Kirfel, Marisa Skaljic, Jens Grotmann,

Katja Michaelis, Andreas Vilcinskas

Fraunhofer IME, Giessen, Germany

## Safe and Sustainable Feed for *Tenebrio molitor* from Domestic Side Streams of Bio-Economy

Iina Hirvisalo <sup>1</sup>, Maija Karhapää <sup>1</sup>, Maarit Mäki <sup>1</sup>,

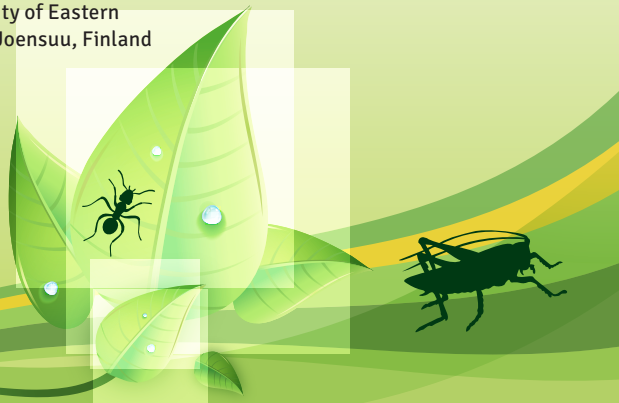
Pertti Marnila <sup>1</sup>, Lindqvist Bengt <sup>1</sup>, Hilka Siljander-Rasi <sup>1</sup>,

Miika Tapio <sup>1</sup>, Lauri Jauhiainen <sup>1</sup>, Taina Jalava <sup>1</sup>,

Heikki Roininen <sup>2</sup>, Jaana Sorjonen <sup>2</sup>

<sup>1</sup> Natural Resources Institute Finland (Luke), Helsinki, Finland

<sup>2</sup> University of Eastern Finland, Joensuu, Finland





**Feed Conversion Efficiency and Nutritional values of Common House cricket (*Acheta domesticus*) and Field Cricket (*Gryllus bimaculatus*) fed on Agro-byproducts**  
Mary Orinda <sup>1</sup>, Rreuben Mosi <sup>2</sup>, Monica Ayieko <sup>2</sup>, Fred Amimo <sup>3</sup>, Hamisi Nchimbi <sup>4</sup>

<sup>1</sup> Jaramogi Oginga Odinga University of Science and Technology, Departement of Agricultural Economics and Agribusiness Management, Bondo, Kenya

<sup>2</sup> Jaramogi Oginga Odinga University of Science and Technology, Departement of Plant, Animal and Food Sciences, Bondo, Kenya

<sup>3</sup> Jaramogi Oginga Odinga University of Science and Technology, Departement of Health Sciences, Bondo, Kenya

<sup>5</sup> University of Dodoma, Departement of Biological Sciences, Dodoma, Tanzania

### **Exploring RNA Viruses from edible Insects:**

#### **A Case Study using Termites**

Dino P. McMahon, Hannah E. Davis

Freie Universität Berlin / Bundesanstalt für

Materialforschung und -prüfung (BAM), Berlin, Germany

### **09:35 a.m. SESSION 10**

#### **Topic 3 Application of insects as feed and food**

### **Processing of Honeybee Drone Brood as a Protein Source: Enhancement of Sustainability Level with high-Moisture- and dry Extrusion Technology**

Magdalena Ulmer, Sergiy Smetana, Volker Heinz  
Deutsches Institut für Lebensmitteltechnik e.V.,  
Quakenbrück, Germany

### **Modular insect plants – a crucial concept to penetrate the animal feed market**

Paul Antony Whittle

Buhler Insect Technology Solutions AG, Wuxi, China

### **Insects as a Source of Vitamin B12 – Opportunities and Obstacles**

Anatol Schmidt <sup>1</sup>, Helmut K. Mayer <sup>1</sup>

<sup>1</sup> BOKU – University of Natural Resources and Life Sciences Vienna, Department of Food Science and Technology, Vienna, Austria

### **Comparison of suitable Drying Techniques on nutritional Quality of Mealworms (*Tenebrio molitor*)**

Nina Kröncke <sup>1</sup>, Verena Böschén <sup>2</sup>, Claudia Keil <sup>3</sup>,

Sandra Grebenteuch <sup>4</sup>, Sebastian Demtröder <sup>1</sup>, Andreas

Thünemann <sup>5</sup>, Lothar Kroh <sup>4</sup>, Hajo Haase <sup>3</sup>, Rainer Benning <sup>1</sup>

<sup>1</sup> University of Applied Sciences Bremerhaven,

Institute of Food Technology and Bioprocess

Engineering, Bremerhaven, Germany

<sup>2</sup> Research Institute of Feed Technology of the International Research Association of Feed Technology e.V., Braunschweig-Thune, Germany

<sup>3</sup> TU Berlin, Institute of Food Technology and Food Chemistry, Department Food Chemistry and Toxicology, Berlin, Germany

<sup>4</sup> TU Berlin, Institute of Food Technology and Food Chemistry, Department, Food Chemistry and Analytics, Berlin, Germany

<sup>5</sup> Federal Institute for Materials Research and Testing (BAM), Berlin, Germany

### **Product Development of Food with edible Insects**

Simon Hvid <sup>1</sup>, Thomas Petersen <sup>1</sup>, Lars-Henrik Lau Heckmann <sup>2</sup>,

Anne Louise Dannesboe Nielsen <sup>3</sup>

<sup>1</sup> Danish Technological Institute, Food Technology, Aarhus, Denmark

<sup>2</sup> Danish Technological Institute, Water and Resource, Aarhus, Denmark

<sup>3</sup> Danish Technological Institute, Aarhus, Denmark

### **11:40 a.m. COFFEE BREAK / POSTER PRESENTATION**

### **12:10 a.m. SESSION 11**

#### **Topic 3 Application of insects as feed and food**

### **Bees-meal and cuticle-poor Black-Soldier-Fly-meal, used as a sole source of protein, show casein-matching body weight and body protein gain as well as casein-matching body protein retention efficiency in C57BL/6 mice**

Roe Gutman <sup>1,2</sup>, Matan Fialko <sup>1,3</sup>,

Jean-Jacques Itzhak Martinez <sup>2,4</sup>, Adi Jonas-Levi <sup>5</sup>

<sup>1</sup> Laboratory of Integrative Physiology (LIP),

MIGAL - Galilee Research Center, Kiryat Shmona, Israel

<sup>2</sup> Department of Animal Sciences, Faculty of Sciences and Technology, Tel-Hai Academic College, Upper Galilee, Israel

<sup>3</sup> Department of Biotechnology, Faculty of Sciences and Technology, Tel-Hai College, Upper Galilee, Israel

<sup>4</sup> Laboratory of Animal Ecology and Biodiversity, MIGAL – Galilee Research Center, Kiryat Shmona, Israel

<sup>5</sup> Department of Food Sciences, Faculty of Sciences and Technology, Tel-Hai Academic College, Upper Galilee, Israel

**Exploring the Potential of Honeybee (*Apis mellifera carnica*) Larvae and Pupae for the Production of high added-Value Food Supplements and Nutraceuticals**  
 Deželak Matjaž <sup>1</sup>, Adriana Pereyra Gonzales <sup>1</sup>,  
 Lovro Sinkovič <sup>2</sup>, Domen Jaklič <sup>1</sup>, Slavko Bernik <sup>1</sup>,  
 Ažbeta Gosak <sup>1</sup>, Drago Kočar <sup>3</sup>, Mitja Kolar <sup>3</sup>, Rok Kopinč <sup>1</sup>  
<sup>1</sup> Medex d.o.o., Ljubljana, Slovenia  
<sup>2</sup> Agricultural Institute of Slovenia, Ljubljana, Slovenia  
<sup>3</sup> Faculty of Chemistry and Chemical Technology,  
 Chair of Analytical Chemistry, Ljubljana, Slovenia

## Topic 2 Insects production systems

**An optimized Feeding Strategy for Black Soldier Fly Larvae (*Hermetia illucens*, L) for Biomass Production and organic Waste Reduction**  
 Evans Nyakeri  
 Jaramogi Oginga Odinga University of  
 Science and Technology, Bondo, Kenya

## Topic 4 Non-food applications of insects

**Insects as Feed for and from Aquaponics: What about Environmental Issues?**  
 Denise Ott <sup>1</sup>, Jens Liebscher <sup>2</sup>, Ariane Müller <sup>3</sup>,  
 Janine Dinske <sup>4</sup>, Sebastian Braun <sup>1</sup>, Dirk Schmidt <sup>1</sup>,  
 Jens Dautz <sup>4</sup>, Herwig O. Gutzeit <sup>3</sup>  
<sup>1</sup> EurA AG, Erfurt, Germany  
<sup>2</sup> Bio.S Biogas GmbH Beiersdorf, Germany  
<sup>3</sup> Technical University of Dresden (Institute of Zoology),  
 Dresden, Germany  
<sup>4</sup> TERRA URBANA GmbH Zossen, Zossen, Germany

**Novel Enzymes for Stem Cell Harvest**  
 Tanja A. Grein <sup>1</sup>, Jasmin Leber <sup>1</sup>, Florian Petry <sup>1</sup>,  
 Zdeněk Franta <sup>2</sup>, Anne-Kathrin Pöppel <sup>2</sup>, Katharina  
 Merkwitz <sup>1</sup>, Denise Salzig <sup>1</sup>, Holger Zorn <sup>2,3</sup>, Peter Czermak <sup>1,2</sup>  
<sup>1</sup> Institute of Bioprocess Engineering and Pharmaceutical  
 Technology, University of Applied Sciences Mittelhessen,  
 Giessen, Germany  
<sup>2</sup> Fraunhofer Institute for Molecular Biology and Applied  
 Ecology (IME), Project group Bioresources, Giessen, Germany  
<sup>3</sup> Institute of Food Chemistry and Food Biotechnology,  
 Justus Liebig University Giessen, Giessen, Germany

**Production and Purification Strategy of an Insect-derived antimicrobial Peptide in the microbial Expression System *Escherichia coli***  
 Mathias Joachim <sup>1,2</sup>, Doreen Gerlach <sup>3</sup>, Peter Czermak <sup>1,2,3,4</sup>  
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