



The 2nd International Conference

Insects to Feed the World

Wuhan
China P.R.

15 -18 May 2018



PROGRAMME



主办单位(Hosts)



承办单位(Organizers)

华中农业大学生命科学技术学院
College of Life Science and Technology; Huazhong Agricultural University
农业微生物学国家重点实验室
State Key Laboratory of Agricultural Microbiology
农业微生物学专业委员会
Professional Committee of Agricultural Microbiology
昆虫微生物组学专业委员会
Professional Committee of Insect Microbiome
湖北省暨武汉微生物学会
Hubei Society for Microbiology
武汉亿倍生物工程有限公司
Wuhan Yiji Bioengineering Ltd.
洁姆环保科技
EVO Conversion Systems X JM Green



Local organizing committee

- **Ziniu Yu**

Huazhong Agricultural University, China
P. R.

- **Longyu Zheng**

Huazhong Agricultural University, China
P. R.

- **Jibin Zhang**

Huazhong Agricultural University, China
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- **Hong Yang**

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- **Zhaolu Zhu**

International advisory board

South and Central America

- **Eraldo M. Costa Neto**

Universida de Estadual de Feira de
Santana, Brazil.

North America

- **Jeffery K. Tomberlin**

Texas A&M University, USA.

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Sericultural Research Institute, Chinese
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Research Institute of Luminous Organisms,
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- **Katharina Unger**

Livin Farms Ltd., Hong Kong.

Europe

- **Antoine Hubert**

International Platform of Insects for
Food and Feed (IPIFF), Belgium.

- **Arnold van Huis**

Wageningen University & Research, the
Netherlands.

Africa

- **Segenet Kelemu**

Africa Insect Science for Food and Health,
Kenya.



Tuesday, 15 May 2018

PLENARY LECTURES (ZHONGNAN HALL 1)

CHAIR: L. ZHENG

OFFICIAL OPENING

9:30-10:10

OPENING STATEMENT

Local organizing committee – Prof. Ziniu Yu

International advisory board – Prof. Arnold van Huis

Wuhan association for science and technology – Vice-Chairman Ruoguang Zhang

Huazhong Agricultural University – Vice-president Xianlong Zhang

10:10-10:50

Insects for food, feed and health: a global perspective - A. van Huis

10:50-11:30

Challenge and opportunity of Insect protein exploitation in China – Y. Huang

11:30-12:00

Photo session

12:00-13:30

Lunch and posters

13:30-15:00

PLENARY LECTURES (ZHONGNAN HALL 1)

CHAIR: A. VAN HUIS

13:30-14:00

The resource of edible insects in China - Y. Feng, X. Chen and M. Zhao)

14:00-14:30

Research and industrialization of *Hermetia illucens* L. in China - J.B. Zhang, L.Y. Zheng, M.M. Cai and Z.N. Yu

14:30-15:00

A triangulated foundation to promote efficient and safe production of the black soldier fly at an industrial scale - J.K. Tomberlin, J.A. Cammack, S. Yang and H.R. Jordan

15:00-15:30

The future of insect proteins from a food system perspective - K.W.P. Aarts

15:30-16:00

Coffee/Tea break

ORAL PRESENTATIONS IN PARALLEL SESSIONS

16:00-17:40

FEED PRODUCTION SYSTEMS (ZHONGNAN HALL 1)

CHAIRS: E.M. NYAKERI, C. LALANDER AND J.B. ZHANG

16:00-16:20

The bioconversion capability of *Hermetia illucens* larvae: a morphofunctional study of the larval midgut - D. Bruno, M. Bonelli, S. Savoldelli, S. Cappellozza, M. Casartelli and G. Tettamanti

16:20-16:40

An analysis of the nutritive value of the black soldier fly larvae reared on different substrates - M. Shumo

16:40-17:00

Optimal feeding strategy of the BSF larvae for biomass production and organic waste reduction in Kenya - E.M. Nyakeri, F.A. Amimo, M.A. Ayieko and S. Hamed

17:00-17:20

Technical and biological aspects in the BSF mass rearing: how to reduce variation? - J. van Schelt

17:20-17:40

Ventilation requirements in a modular black soldier fly larvae system for waste treatment and feed production - C. Lalander, E. Ermolaev, S. Johannesdottir and B. Vinnerås

16:00-17:40

FARMING INSECTS (ZHONGNAN HALL 2)

CHAIRS: D.G.A.B. OONINCX AND Z. WU

16:00-16:20

A scalable black soldier fly production system - F. Yang and Z. Wu

16:20-16:40

Utilization of *Hermetia illucens* larvae for the production of feed - H. Katz

16:40-17:00

Development of nursery diets for the mass rearing of black soldier fly - M.J. Woods, L.C. Hoffman and E. Pieterse

- 17:00-17:20 **Can insects synthesize vitamin D after exposure to ultraviolet light?** - D.G.A.B. Oonincx, P. Van Keulen, M.D. Finke, F.M. Baines, M. Vermeulen and G. Bosch
- 17:20-17:40 **Insect farming: a socially sustainable component of the agricultural sector?** - A. Halloran
- 16:00-17:40 ETHNO-ENTOMOLOGY (CHANGJIANG HALL)**
CHAIR: J. LESNIK AND R. HAN
- 16:00-16:20 **Research and development of *Ophiocordyceps sinensis*** - R. Han and L. Cao
- 16:20-16:40 **Domestication of African gourmet caterpillars** - D. Ambühl
- 16:40-17:00 **Review of past and current status of insects for food and feed in Kenya: reintroducing entomophagy** - M.A. Ayieko
- 17:00-17:20 **Women and edible insects: a deep, deep history** - J. Lesnik
- 17:20-17:40 **Settlement behaviour of new queens of the weaver ant *Oecophylla smaragdina*** - T. Phusakhon and D. Wiwatwitaya
- 16:00-17:40 MARKETING AND ECONOMICS (GENERAL PALACE)**
CHAIRS: G. MOTT
- 16:00-16:20 **Edible insects under all its forms: from niches to mass market?** - F. Nock
- 16:20-16:40 **Bug based packaged food: market obstacles and opportunities** - M. Reverberi
- 16:40-17:00 **Fad or trend – an honest outlook on the edible insect market in North America and beyond** - M. Ashour, G. Mott
- 17:00-17:20 **Insights from marketing edible insects and feed insects in South East Asia** - L. Wein
- 17:20-17:40 **De novo transcriptome sequencing and analysis revealed molecular basis of rapid fat accumulation by black soldier fly** - Z.L. Zhu, X. Liu, Q.Q. Yang, H. Wang, H.R. Wang, W.J. Feng, M.M. Cai, J.B. Zhang, Z.N. Yu and L.Y. Zheng

Wednesday, 16 May 2018

PLENARY LECTURES (ZHONGNAN HALL 1)

CHAIR: J.F. TOMBERLIN

- 09:00-09:30 **Edible insects and food security in Africa: needs and opportunities, environmental issues of edible insects** - S. Kelemu, B. Torto, C. Tanga, S. Sevgan, I. Osuga, C. Mutungi, S. Niassy, G. Diiro, S. Ekesi and K. Fiaboe
- 09:30-10:00 **Promoting consumption of edible insects: a Kenyan perspective** - J. Kinyuru
- 10:00-10:30 **Coffee/Tea break**

ORAL PRESENTATIONS IN PARALLEL SESSIONS

10:30-12:10 FEED PRODUCTION SYSTEMS (ZHONGNAN HALL 1)

CHAIRS: E.M. NYAKERI AND C. LALANDER AND J.B. ZHANG

- 10:30-10:50 **Fed-batch cultivation of *Hermetia illucens* L. on almond by-products: impacts of feeding rate and inoculation density** - J. Vandergheynst, L. Palma, S. Ceballos, P. Johnson, D. Niemeier and M. Pitesky
- 10:50-11:10 **The design and application of automation equipment for pilot-scale black soldier fly composting of swine manure** - S. Yang
- 11:10-11:30 **Cultivation of *Hermetia illucens* L. on almond by-products: impacts of moisture, nitrogen, and particle size** - L.G. Palma, J.S. Vandergheynst, S.J. Ceballos, P.C. Johnson, D. Niemeier and M. Pitesky

- 11:30-11:50 **Temperature-dependent development, survival and reproduction of black soldier fly *Hermetia illucens* (Diptera:Stratiomyidae)** - S.Y. Chia, C.M. Tanga, D. Salifu, S. Subramanian, K.K.M. Fiaboe, S. Niassy, J.J.A. van Loon, M. Dicke and S. Ekesi
- 11:50-12:10 **Preliminary result of high fibre material impact on growth performance of black soldier fly larvae (*Hermetia illucens*)** - M. Meneguz, A. Dama, C. Caimi, M. Gariglio, A. Schiavone, F. Gai and L. Gasco
- 10:30-12:30 *FARMING INSECTS (ZHONGNAN HALL 2)***
CHAIRS: M.J. WOODS AND Z. WU
- 10:30-10:50 **Potentials and barriers for insect farming in Kenya** - N. Roos
- 10:50-11:10 **Cricket farming in Asia by Cricket lab** - N. Bery
- 11:10-11:30 **Technical efficiency of a cricket farm in Kenya** - M.A. Orinda, R.O. Mosi, M.A. Ayieko, F.A. Amimo and H.Y. Nchimbi
- 11:30-11:50 **Effect of rearing substrates on the fitness parameters of newly recorded edible cricket *Scapsipedus marginatus* in Kenya** - H.J.O. Magara, C.M. Tanga, S. Hugel, S.A. Mohamed, F.M. Khamis, M.A. Ayieko, D. Salifu, S. Niassy, S. Subramanian, K.K.M. Fiaboe, N. Roos and S. Ekesi
- 11:50-12:10 **Insects for resilience of family farming: perspectives, challenges, and scenarios centred around biomass transformation** - R. Lantieri-Jullien and S. Person
- 12:10-12:30 **Insect farming: a strategy for providing sustainable nutrition and economic empowerment for orphanages in the DRC** - A. Franklin, N. Brandt and N. Ureda
- 10:30-11:50 *ENVIRONMENTAL IMPACT (CHANGJIANG HALL)***
CHAIRS: A. HALLORAN
- 10:30-10:50 **Life cycle assessment of insect production systems: lessons learned and the way forward** - A. Halloran
- 10:50-11:10 **Attenuation of antibiotic resistance genes in chicken manure by black soldier fly larval conversion** - M. Cai, S. Ma, R. Hu, J.K. Tomberlin, L. Zheng, W. Li, Z. Yu and J. Zhang
- 11:10-11:30 **The degradation of tetracycline by black soldier fly (Diptera: Stratiomyidae) larvae with intestinal microorganisms** - M. Cai, R. Hu, S. Ma, J.K. Tomberlin, C. Yu, K. Zhang, W. Li, Q. Li, Z.N. Yu and J.B. Zhang
- 11:30-11:50 **Greenhouse gas emissions from fly larvae composting with *Hermetia illucens*** - E. Ermolaev, C. Lalander, F. Erlöv and B. Vinnerås
- 10:30-12:50 *CONSUMER ATTITUDES (GENERAL PALACE)***
CHAIRS: L. TORRI AND M. SHOCKLEY
- 10:30-10:50 **Social perception on entomophagy in Korean and Ethiopian population** - C. Jung, S. Ghosh, A. Dekebo and V.B. Meyer-Rochow
- 10:50-11:10 **Disgust sensitivity towards insects and its relationship with demographic and cultural factors** - F. Tuccillo, S. Bonelli and L. Torri
- 11:10-11:30 **Consumer attitudes in blind insect based food tastings** - M. Shockley and M. Lillard
- 11:30-11:50 **The role of chefs in sustained consumer acceptance of insect-based foods** - R. Flores
- 11:50-12:10 **Using outreach to enhance public familiarity and comfortability with entomophagy: let taste do the talking!** - J.F. Grant, M.M. Tate and K.O. Knowles
- 12:10-12:30 **Kenyan consumer's preferences, willingness to pay, and potential demand for insect-based food products** - S.B. Olsen and M. Alemu
- 12:30-12:50 **Acceptability of crickets among caregivers and children in Cambodia** - B. Main, S. Jo, A. Mildon, S. Blaney, V. Hun and C. Chhea
- 12:50-14:30 **Lunch and posters**

PLENARY SESSION (ZHONGNAN HALL 1)

CHAIR: C.L.R. PAYNE

- 14:30-15:00 **The contribution of high school students to succession and development of eating insect culture as a case of *Vespula* spp.** - K. Nonaka and H. Yanagihara

ORAL PRESENTATIONS IN PARALLEL SESSIONS

15:00-16:00

FEED PRODUCTION SYSTEMS (ZHONGNAN HALL 1)

CHAIRS: E.M. NYAKERI AND C. LALANDER AND J.B. ZHANG

- 15:00-15:20 **Effect of bacterial supplementation on black soldier fly growth and conversion** - E. Kooienga, K. Franks, J.K. Tomberlin and H.R. Jordan
- 15:20-15:40 **How does starving of black soldier fly (Diptera: Stratiomyidae) larvae impact its bacteria?** - F. Yang, J.K. Tomberlin and H.R. Jordan
- 15:40-16:00 **Impact of diet nutrition and moisture on the bacterial community associated with *Hermetia illucens* (L.)** - J.A. Cammack, L. Zheng, H.R. Jordan and J.K. Tomberlin

15:00-16:00

INSECT DISEASES (ZHONGNAN HALL 2)

CHAIR: G. MACIEL-VERGARA

- 15:00-15:20 **Developing a service for diagnosing and managing insect diseases to assist the growing insect industry** - J. Eilenberg and A.B. Jensen
- 15:20-15:40 **Microsporidian pathogens of mass-reared insects – a future threat to edible insect cultivation?** - S. Bjornson
- 15:40-16:00 **Opportunistic bacteria as pathogens of mealworms** - G. Maciel-Vergara, A.B. Jensen and J. Eilenberg

15:00-16:00

FOOD PRODUCTION SYSTEMS (CHANGJIANG HALL)

CHAIRS: L.H. HECKMANN AND V.J. LEHTOVAARA

- 15:00-15:20 **Performance of pre-weaning kids fed a milk replacer containing either cricket or black soldier fly** - D. Astuti, J. Hersade, L. Lola, F. Fani, D. Suci and K. Wiryawan
- 15:20-15:40 **Product development of food with edible insects** - A.L. Dannesboe Nielsen
- 15:40-16:00 **Could we produce even more healthy insects for humans?** - V.J. Lehtovaara, A. Valtonen, J. Sorjonen, M. Hiltunen, K. Rutaro, G.M. Malinga, P. Nyeko and H. Roininen

15:00-16:00

CONSUMER ATTITUDES (GENERAL PALACE)

CHAIRS: L. TORRIO AND M. SHOCKLEY

- 15:00-15:20 **First survey on the insect protein consumption and acceptance of insect farm between high school students in Zambia** - M. Meneguz, S. Piccinini, R. Bottiroli and L. Gasco
- 15:20-15:40 **Latvian consumers' attitude to the use of non-traditional source of protein in food** - I. Gedrovica
- 15:40-16:00 **Italian consumers' attitude towards insects as food: effect of gender, personality traits, and insect visibility** - L. Torri and G. Volpato

16:00-16:30

Coffee/Tea break

16:30-17:50

FEED PRODUCTION SYSTEMS (GENERAL PALACE)

CHAIRS: E.M. NYAKERI AND C. LALANDER AND J.B. ZHANG

- 16:30-16:50 **The promising roles of microbiota in the black soldier fly (*Hermetia illucens*) mass rearing and industrial applications** - L. Zheng, J. Zhang and Z. Yu
- 16:50-17:10 **Life-history traits of the housefly, *Musca domestica* L. (Diptera: Muscidae), reared on three manure types** - C. Miranda and J.K. Tomberlin

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| 17:10-17:30 | Primary studies on the diversity of culturable bacteria in the intestinal tract of the larvae of black soldier fly - C. Mei, J. Wang and H. Yang |
| 17:30-17:50 | Black soldier fly larvae (<i>Hermetia illucens</i>) bridges waste to resource: a full-scale operation - Z. Zhang, Y.P. Huang and Z.N. Yu |
| 16:30-16:50 | <i>INSECT DISEASES (ZHONGNAN HALL 2)</i> CHAIR: G. MACIEL-VERGARA |
| 16:30-16:50 | A bacterial pathogen in cricket farming: identification, biology, and suggestions on how to control it - G. Maciel-Vergara, C.M. Tanga, E. Aoko, S. Ekesi, A.B. Jensen, J.J.A. van Loon, J.W.M. van Lent, J. Eilenberg and M.M. van Oers |
| 16:50-17:30 | <i>EFFECT OF INSECT DIETS ON ANIMALS (ZHONGNAN HALL 2)</i> CHAIRS: C. EMHART AND L. GASCO |
| 16:50-17:10 | Inclusion of <i>Hermetia illucens</i> larvae to the diet of broiler quails: effect on immunity and caecal microbial populations - L. Van Emmenes, M.J. Woods, M. Cullere, D. Pasotto, E. Pieterse, L.C. Hoffman and A. Dalle Zotte |
| 17:10-17:30 | Use of house flies as poultry feed by smallholder farmers in West Africa: prospects and constraints - M. Kenis And Ifwa Partners |
| 16:30-17:30 | <i>FOOD PRODUCTION SYSTEMS (CHANGJIANG HALL)</i> CHAIRS: L.H. HECKMANN AND V.J. LEHTOVAARA |
| 16:30-16:50 | Eating insects: a sustainable livelihood assessment of insect consumption and harvesting in Kenya, Kakamega - M. Sigurgeirsdottir |
| 16:50-17:10 | Development of an inVALUABLE insect sector in Denmark - L.H. Heckmann |
| 17:10-17:30 | Innovative insect production – food from wood - J.M. Grunder |
| 18:30-22:00 | BANQUET (ZHONGNAN HALL 1) |

Thursday, 17 May 2018

PLENARY LECTURES (ZHONGNAN HALL 1)

CHAIR: H. YANG

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| 09:00-09:30 | Environmental impact of insects compared to other protein sources - A. Mathys and S. Smetana |
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ORAL PRESENTATIONS IN PARALLEL SESSIONS

09:30-10:10 PROCESSING ORGANIC SIDE STREAMS (ZHONGNAN HALL 1)

CHAIRS: A. MATHYS AND J. ZHANG

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| 09:30-09:50 | Conceptual model of biowaste processing with black soldier fly larvae - M. Gold, S. Diener, C. Zurbrügg and A. Mathys |
| 09:50-10:10 | Implementation of circular economy through black soldier flies for non-food applications - C.H. Fischer |

09:30-10:10 EFFECT OF INSECT DIETS ON ANIMALS (ZHONGNAN HALL 2)

CHAIRS: C. EMHART AND L. GASCO

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| 09:30-09:50 | Dietary Madagascar cockroach meal on growth performance of broiler quails - J. Cota, C.A. Jesus, L.A.G. Trindade, D.V. Costa, F. Ferreira and R.R. Wenceslau |
| 09:50-10:10 | Replacement of soy using insect meal in a commercial free range egg Chilean company - C. Emhart, R. Delgado, P. Albarran and F. Urrego |

- 09:30-10:10** **FOOD PRODUCTION SYSTEMS (CHANGJIANG HALL)**
CHAIRS: L.H. HECKMANN AND V.J. LEHTOVAARA
- 09:30-09:50 **Honey bee drone brood for human consumption: creating awareness for a discarded resource** - A.B. Jensen and A. Lecocq
- 09:50-10:10 **Glucosamine hydrochloride from silkworm (*Bombyx mori* L.) pupae shell inhibit in vitro human plasma lipid peroxidation** - R. Rosmiati, C.M. Kusharto, F. Anwar and P. Suptijah
- 09:30-10:10** **ETHICS, FOOD SAFETY, LEGISLATION, AND POLICY (GENERAL PALACE)**
CHAIRS: E. SCHMITT
- 09:30-09:50 **Insects for food and feed – four challenges** - H. Röcklinsberg, C. Gamborg and M. Gjerris
- 09:50-10:10 **Food safety management system in insect farms for human consumption** - M.R. Maylis Radonde
- 10:10-10:40 **Coffee/Tea break**
- 10:40-12:20** **PROCESSING ORGANIC SIDE STREAMS (ZHONGNAN HALL 1)**
CHAIRS: A. MATHYS AND J. ZHANG
- 10:40-11:00 **Efficiency of organic stream conversion by black soldier fly larvae: a review of the scientific literature** - G. Bosch, M. Veenenbos, H.H.E. van Zanten, N.P. Meijer, H.J. van der Fels-Klerx and J.J.A. van Loon
- 11:00-11:20 **Side streams of Finnish bio industry as possible insect feeds** - J.M. Sorjonen, V.J. Lehtovaara, P. Mooney, J. Lindgren, M. Karhapää, A. Valtonen, H. Siljander-Rasi, E. Hirvisalo, L. Jauhiainen, P. Marnila, M. Mäki, M. Tuiskula-Haavisto and H. Roininen
- 11:20-11:40 **Turning Ugandan waragi waste into value-added livestock feed using *Hermetia illucens*** - D. Dobermann and L.M. Field
- 11:40-12:00 **Learning by doing – experiences with a pilot BSF waste treatment unit in Indonesia** - B.M.A. Dortmans, A. Fadhila, S. Diener and C. Zurbrügg
- 12:00-12:20 **Bio-conversion of three organic wastes by black soldier fly (*Hermetia illucens* L.) larvae in New Zealand** - Z. Liu, M. Minor, P. Morel and A. Najjar-Rodriguez
- 10:40-12:20** **EFFECT OF INSECT DIETS ON ANIMALS (ZHONGNAN HALL 2)**
CHAIRS: C. EMHART AND L. GASCO
- 10:40-11:00 **Does insect-based feed lead to higher profit in layer chicken enterprises?**
- K.K.M. Fiaboe, D.W. Nyingi, I.M. Osuga, L. Munga, A.M. Wachira, D.M. Mwangi, C.M. Tanga, S. Ekesi and D. Nakimbugwe
- 11:00-11:20 **Behaviour and growth performance of young turkeys fed live black soldier fly larvae** - T. Veldkamp and T.G.C.M. van Niekerk
- 11:20-11:40 **Evaluation of carcass and meat traits of Muscovy duck fed with black soldier fly partially defatted meal** - M. Gariglio, S. Dabbou, C. Caimi, I. Biasato, F. Gai, M.T. Capucchio, E. Biasibetti, M. Birolo, A. Trocino, R. Vincenzi, M. Meneguz, L. Gasco and A. Schiavone
- 11:40-12:00 **Insect production for the aquaculture sector: growth performances** - G. Daoulas
- 12:00-12:20 **Apparent digestibility of insect protein meals for rainbow trout** - L. Gasco, A. Schiavone, G. Serra, R. Anedda, A. Trocino, C. Caimi, M. Gariglio, V. Malfatto, S. Dabbou, E. Devic, S. Chatzifotis, M. Meneguz and F. Gai

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| 10:40-12:20 | <i>NUTRITION, PROCESSING AND CONSERVATION (CHANGJIANG HALL)</i> <i>CHAIRS: S. MEZDOUR AND C.M.M. LAKEMOND</i> |
| 10:40-11:20 | Mealworm larvae production systems: transformation processes – insect-based protein products - S. Mezdour |
| 11:20-11:40 | Insects: protein content and browning/blackening during processing - C.M.M. Lakemond |
| 11:40-12:00 | Comparison of nutritional composition of five commercially available edible insects and honeybee brood - S. Ghosh, C. Jung, H.Y. Sohn and V.B. Meyer-Rochow |
| 12:00-12:20 | Amino acid composition and protein quality of Eri-silkworm (<i>Samia cynthia</i>) pupae flour - C.M. Kusharto, R. Rosmiati and Y.E.P. Sinaga |
| 10:40-12:20 | <i>ETHICS, FOOD SAFETY, LEGISLATION, AND POLICY (GENERAL PALACE)</i> <i>CHAIRS: E. SCHMITT</i> |
| 10:40-11:00 | Edible insects of Korea: policies and progress - C. Jung and S. Ghosh |
| 11:00-11:20 | Quality control applications for hyperspectral analysis of black soldier fly insect products - E. Schmitt |
| 11:20-11:40 | Viability of the liver fluke <i>Dicrocoelium dendriticum</i> in <i>Formica polyctena</i> ants after exposure to different treatments - A.B. Jensen, J. Malagocka, J. Eilenberg and B.L. Fredensborg |
| 11:40-12:00 | Eat insects to save capitalism? - A. Müller |
| 12:00-12:20 | Entomolization: the influence on earth and space before 2030 - Y.C. Chong |
| 12:20-14:30 | Lunch and posters |
| | PLENARY LECTURES (ZHONGNAN HALL 1) CHAIR: E. SCHMITT |
| 14:30-15:00 | Insects can not only 'feed the world'; they can also 'heal the world'! - V.B. Meyer-Rochow |
| 15:00-15:30 | Insect industry development in Europe and beyond - A. Hubert |
| 15:30-16:00 | Conserve Insect Biodiversity from the Perspective of a Chinese NGO - J. Zhou |
| 16:00-16:30 | Coffee/Tea break |
| | PLENARY: ROUNDTABLE ON INTERNATIONAL ACTIONS FOR THE DEVELOPMENT OF THE INSECT INDUSTRY |
| 16:30-17:20 | Presentations by the Associations (10 min each): IPAA - Olympia Yarger; AFFIA - Anne Deguerry; AAIS - Saliou Niassy; IPIFF - Heinrichy Katz; NACIA - Marianne Shockley |
| 17:20-17:40 | Joined actions: creation of white paper; creation international standards for insect products; certification (global standards); education (awareness campaigns), promotion of good hygiene practices |
| 17:40-18:30 | Discussion with the audience - association representatives |

Friday, 18 May 2018

PLENARY LECTURES (*ZHONGNAN HALL 1*)

CHAIR: N. ROOS

- 09:00–09:30 **The nutritional role of edible insects** - C.L.R. Payne, S. Cox, D. Dobermann and A. Badolo
- 09:30–10:00 **What if these tools could change your food habits: devices and methods to empower humans to co-create a healthy food system** - K. Unger
- 10:00–10:30 **Industrial design of insect plants to achieve safe products with consistent quality** - A. Baumann and F. Cordesmeier
- 10:30–11:00 **Automation vs labour: consequences of production decisions in scale insect farming** - G. Mott
- 11:00–11:30 **Coffee/Tea break**

ORAL PRESENTATIONS IN PARALLEL SESSIONS

- 11:30–12:10** ***PROCESSING ORGANIC SIDE STREAMS (ZHONGNAN HALL 1)***
CHAIRS: J. ZHANG
- 11:30–11:50 **Efficiency of converting manure into protein feed and organic fertilizer by *Hermetia illucens* larvae and bacteria** - X.P. Xiao, L.Y. Zheng and J.B. Zhang
- 11:50–12:10 **Almond hulls – a good feedstock for insect farming** - G. Huang and K. Lapsley
- 11:30–12:10** ***EFFECT OF INSECT DIETS ON ANIMALS (ZHONGNAN HALL 2)***
CHAIRS: C. EMHART AND L. GASCO
- 11:30–11:50 **Influence of black soldier fly pulp on growth performance, body composition and health status of juvenile mirror carp** - X.X. Xu, M. Azmi Boktor Youssef, J.X. Xing, J.S. Zhou, H.B. Yu and H. Ji
- 11:50–12:10 **Histological evaluation in sturgeon's gut fed *Hermetia illucens* meal** - C. Caimi, K. Varello, F. Gai, M. Gariglio, M. Meneguz, D.R. Francese, S. Dabbou, A. Schiavone, M. Prearo, E. Bozzetta and L. Gasco
- 11:30–12:30** ***NUTRITION, PROCESSING AND CONSERVATION (CHANGJIANG HALL)***
CHAIRS: S. MEZDOUR AND C.M.M. LAKEMOND
- 11:30–11:50 **Nutritional contribution of insects to improve diets in Kenya: from known to unknown** - J.N. Kinyuru
- 11:50–12:10 **Drying of insects and larvae: towards valorisation into high-value functional proteins** - H. Romdhana and S. Mezdour
- 12:10–12:30 **Effects of domestic cooking on protein digestibility and mineral bio-accessibility of wild harvested edible insects** - F.A. Manditsera, P.A. Luning, V. Fogliano and C.M.M. Lakemond
- 11:30–12:30** ***SPECIAL SIDE SESSION "A DISCUSSION OF NEO-COLONIAL APPROACHES TO EDIBLE INSECTS, AND HOW WE CAN WORK TO DECOLONISE THE FIELD IN BOTH RESEARCH AND INDUSTRY" (GENERAL PALACE)***
MODERATORS: CHARLOTTE PAYNE AND JOHN KINYURU
- 12:30–14:00 **Lunch**

- 14:00–14:40** **PROCESSING ORGANIC SIDE STREAMS (ZHONGNAN HALL 1)**
CHAIRS: J. ZHANG
- 14:00-14:20 **Impact of soybean curd residues co-conversion by *Hermetia illucens* larvae assisted by *Pedicoccus acidilactici* on biomass** - A.A. Soomro, K. Rehman, L.Y. Zheng, M.M. Cai, S.C. Hu, A. Mathys, Z.N. Yu and J.B. Zhang
- 14:20-14:40 **Farming crickets using food waste: an action-based approach** - T.B.W. Seekings
- 14:00–14:40** **EFFECT OF INSECT DIETS ON ANIMALS (ZHONGNAN HALL 2)**
CHAIRS: C. EMHART AND L. GASCO
- 14:00-14:20 **The effect of defatted *Hermetia illucens* meal on growth performance and intestinal enzymes of gilthead seabream** - G.M. Cusimano, F. Gai, L. Genovese, G. Maricchiolo, L. Caccamo, B. Chiofalo and L. Gasco
- 14:20-14:40 **Comparing whiteleg shrimp (*Penaeus vannamei*) larvae performance fed an insect meal-based feed to a commercial brand** - E. Devic and F. Ducharne
- 13:30–14:40** **NUTRITION, PROCESSING AND CONSERVATION (CHANGJIANG HALL)**
CHAIRS: S. MEZDOUR AND C.M.M. LAKEMOND
- 14:00-14:20 **Can cricket-based porridge improve nutritional status of school children in Kenya – a randomized controlled trial** - C. Kipkoech, S. Konyole, S. Imathiu, N. Roos and J.N. Kinyuru
- 14:20-14:40 **Sustaining nutritious diets for Cambodian children with crickets** - B. Main
- 14:00–14:40** **SPECIAL SIDE SESSION "A DISCUSSION OF NEO-COLONIAL APPROACHES TO EDIBLE INSECTS, AND HOW WE CAN WORK TO DECOLONISE THE FIELD IN BOTH RESEARCH AND INDUSTRY" (GENERAL PALACE)**
MODERATORS: CHARLOTTE PAYNE AND JOHN KINYURU
- PLENARY SESSION (ZHONGNAN HALL 1)**
- 14:40-15:30** **CLOSURE OF THE CONFERENCE**
CHAIR: L. ZHENG
- 14:40-15:00 **CONCLUSIONS AND RECOMMENDATIONS (J.K. TOMBERLIN)**
- 15:00-15:30 **OFFICIAL CLOSURE**
- 15:30-16:00 **Coffee/Tea break**

POSTERS

1. **Strategy for using insects as alternative protein sources for animal feed and prospects for future production in Poland** T. Bakuła, M. Zasępa and K. Kwiatek
2. **Possible anti-stress effect of insect foods** S. Ishikawa, S. Okada, A. Eguchi and T. Inoue
3. **Improving termite collection for poultry feed in smallholder farms in Northern Burkina Faso** S. Nacambo, F. Sankara and M. Kenis
4. **Field evaluation of pet food using enzyme hydrolysate of insects** S.M. Bae, C.M. Lee, S.B. Lee, J.W. Kim, Y.H. Hwang, B.J. Lee and K.P. Hong
5. **A comparison of dog reactions to insects and commercial feed aromas – a preliminary study** B. Kierończyk, M. Rawski and D. Jozefiak
6. **Effect of defatted black soldier fly larvae meal on growth and serum biochemical parameters of *Pelteobagrus fulvidraco*** G.X. Wang, Y.H. Huang, Y.P. Sun, K. Peng, J.R. Hu, H.M. Wu and S.S. Chen
7. **Effect of insect meals in microbiota composition of the gastrointestinal tract of Siberian sturgeon (*Acipenser baerii*)** A. Jozefiak, J. Mazurkiewicz, S. Nogales-Merida, M. Rawski, L. Hoffmann, S. Talibov, K. Dudek, P. Gobbi, B. Kierończyk, A. Benzertiha and D. Jozefiak
8. **Effect of full-fat insect meals on rainbow trout microbiota** A. Jozefiak, J. Mazurkiewicz, S. Nogales-Merida, M. Rawski, L. Hoffmann, S. Talibov, P. Gobbi, B. Kierończyk, A. Benzertiha and D. Jozefiak
9. **Hydrolysed full-fat insect meals in sea trout nutrition** D. Jozefiak, S. Talibov, J. Mazurkiewicz, S. Nogales-Merida, M. Rawski, L. Hoffmann, M. Gobbi, B. Kierończyk, A. Benzertiha and A. Jozefiak
10. **Growth performance of Siberian sturgeon (*Acipenser baerii*) fed with insect meals** D. Jozefiak, J. Mazurkiewicz, S. Nogales-Merida, M. Rawski, L. Hoffmann, K. Dudek, S. Talibov, B. Kierończyk, A. Benzertiha, P. Gobbi and A. Jozefiak
11. **Full-fat insect meal in rainbow trout nutrition** D. Jozefiak, J. Mazurkiewicz, S. Nogales-Merida, M. Rawski, S. Talibov, P. Gobbi, B. Kierończyk, A. Benzertiha and A. Jozefiak
12. **Black soldier fly (*Hermetia illucens*) larvae – a superior protein source in aquaculture feeding** T. Katz, A. Hurvitz, L. Solowey, N. Gur, Y. Simon and A. Biton
13. **Effect of *Tenebrio molitor* oil on growth performance and nutrients digestibility in broiler chickens** D. Jozefiak, A. Benzertiha, B. Kierończyk, M. Rawski, A. Jozefiak, P. Gobbi, S. Nogales-Merida, S. Talibov and J. Mazurkiewicz
14. **Effect of *Tenebrio molitor* oil on selected blood parameters and internal organs weight of broiler chickens** D. Jozefiak, A. Benzertiha, B. Kierończyk, M. Rawski, A. Jozefiak, P. Gobbi, S. Nogales-Merida, S. Talibov and J. Mazurkiewicz
15. **Total replacement of soybean oil with *Tenebrio molitor* oil affects the fatty acid profile of breast meat in broilers** B. Kierończyk, D. Jozefiak, A. Jozefiak, A. Benzertiha, M. Rawski, P. Gobbi, S. Nogales-Merida, S. Talibov and J. Mazurkiewicz
16. **Effect of total replacing soybean oil with *Tenebrio molitor* oil on growth performance of broiler chickens** B. Kierończyk, D. Jozefiak, A. Jozefiak, A. Benzertiha, M. Rawski, P. Gobbi, S. Nogales-Merida, S. Talibov and J. Mazurkiewicz
17. **Effect of full-fat insect meal addition in broilers diet on microbiota in the gastrointestinal tract** A. Jozefiak, D. Jozefiak, B. Kierończyk, M. Rawski, A. Benzertiha, P. Gobbi, S. Nogales-Merida, S. Talibov and J. Mazurkiewicz
18. **The effect of *Shelfordella lateralis* full-fat meal supplementation in broilers diet on growth performance** D. Jozefiak, A. Jozefiak, B. Kierończyk, M. Rawski, A. Benzertiha, P. Gobbi, S. Nogales-Merida, S. Talibov and J. Mazurkiewicz
19. **Efficiency of converting manure into protein feed and organic fertilizer by *Hermetia illucens* larvae and bacteria** X.P. Xiao, L.Y. Zheng and J.B. Zhang

20. **Growth of *Hermetia illucens* on waste from mass rearing of other insect species** C. Jucker, C.D. Moore, M.P. Mesiano, M.G. Leonardi, D. Lupi and S. Savoldelli
21. **Effect of increased prepupae density in pupation crates on the emergence rate of black soldier flies** B.M.A. Dortmans, S. Mahmood, T. Rahayu, T. Kusumawardhani, D.R. Asmara and C. Zurbrugg
22. **Effect of larval density of black soldier fly (Diptera: Stratiomyidae) on bacterial succession in diets and larval gut** S. Schreven, H. de Vries, G. Zeni, H. Smidt, M. Dicke and J. van Loon
23. **Evaluation of adults density of *Hermetia illucens* in the production of eggs under controlled conditions** P. Gobbi, D. Jozefiak, A. Jozefiak, B. Kierończyk, M. Rawski, A. Benzertiha, S. Nogales-Merida, S. Talibov, K. Dudek and J. Mazurkiewicz
24. **Developmental plasticity: larval conditions and adult investment in morphological traits in the black soldier fly** N.W. Birrell and G.I. Holwell
25. **Effects of juvenile hormone analog on the development of black soldier fly larvae and adult emergence** W.J. Feng, Z.L. Zhu, H.R. Wang and L.Y. Zheng
26. **Environmental and substrate effects on the pupation and adult emergence of *Hermetia illucens* (Diptera: Stratiomyidae)** H.R. Wang, Q.Q. Yang, H. Wang, X. Liu, Z.L. Zhu, W.J. Feng and L.Y. Zheng
27. **The effect of feeding substrates on the growth of *Hermetia illucens*** B. Kierończyk, M. Rawski, A. Zaworska, W. Czekąła and D. Jozefiak
28. **Effect of feeding substrates on the chemical composition of *Hermetia illucens*** B. Kierończyk, M. Rawski, A. Zaworska, W. Czekąła and D. Jozefiak
29. **Growth performance of the black soldier fly (*Hermetia illucens*) on by-products from brewing production** C. Jucker, M. Palamara Mesiano, N. Amiresmaeili, M.G. Leonardi, D. Lupi and S. Savoldelli
30. **The influence of diet on the morphofunctional properties of *Hermetia illucens* (Diptera: Stratiomyidae) larval midgut** M. Bonelli, D. Bruno, N. Gianfranceschi, C. Jucker, M.G. Leonardi, G. Tettamanti and M. Casartelli
31. **Effect of inorganic salt on *Hermetia illucens* growth** Q.Q. Yang, X. Liu, H. Wang, J.B. Zhang, Z.N. Yu and L.Y. Zheng
32. **Towards optimization of slaughtering methods for larvae of the black soldier fly (*Hermetia illucens*)** J. Larouche, M.-H. Deschamps, L. Saucier, M. Cisse, Y. Lebeuf and G.W. Vandenberg
33. **Preliminary evaluation of an electronic counting device for rapid and precise counting of black soldier fly larvae** G. Vandenberg, J. Richard-Giroux, A.S. Fournier, C. Andrews and M.-H. Deschamps
34. **Total gas and methane emissions of black soldier fly *Hermetia illucens* grown on different organic wastes** G. Gislón, S. Colombini, L. Bava, S. Savoldelli, D. Lupi and C. Jucker
35. **Dynamic succession of black soldier fly (*Hermetia illucens*) gut microbiota during metamorphosis** X. Liu, J. Wang, H. Wang, Q.Q. Yang, S. Chen, Z.L. Zhu, H.R. Wang, W.J. Feng, M.M. Cai, J.B. Zhang and L.Y. Zheng
36. **Antibacterial activity of *Hermetia illucens* against pathogen naturally present in the pig manure and its mechanism** O.A.O. Elhag, X.P. Xiao, L.Y. Zheng and J.B. Zhang
37. **The effect of the egg associated bacteria on the hatching of *Hermetia illucens* eggs** Q.Q. Yang, H. Wang, X. Liu, W.J. Feng, J.B. Zhang, Z.N. Yu and L.Y. Zheng
38. **Influences of bacteria on the conversion efficiency and nutrient accumulation of *Hermetia illucens* in chicken manure** X.P. Xiao, L. Mazza, L.Y. Zheng and J.B. Zhang
39. **Metamorphic remodelling of the larval midgut in *Hermetia illucens*** D. Bruno, M. Bonelli, C. Jucker, D. Lupi, M. Casartelli and G. Tettamanti
40. **Anti-protease activity in fish intestinal homogenates is correlated to proximal composition of black soldier fly meals** M.-H. Deschamps, A. Tshinyama, Y. Lebeuf, C. Lavigne and G.W. Vandenberg

41. **Effects of exposure *Tenebrio molitor* larvae to zearalenone** K. Obremski, P. Wojtacha, T. Bakula, D. Obremaska, B. Pachota, A. Myszkowska and M. Pajdowska
42. **Acrylamide induces oxidative stress in *Tenebrio molitor* larvae** K. Obremski, P. Wojtacha, T. Bakula, D. Obremaska, B. Pachota, A. Myszkowska and M. Pajdowska
43. **Effects of diet on larval development of *Zophobas morio* (Coleoptera: Tenebrionidae) in controlled conditions** P. Gobbi, D. Jozefiak, A. Jozefiak, B. Kierończyk, M. Rawski, A. Benzertiha, S. Talibov, S. Nogales-Merida, K. Dudek and J. Mazurkiewicz
44. **Effects of diet on larval development of *Tenebrio molitor* (Coleoptera: Tenebrionidae) in controlled conditions** P. Gobbi, D. Jozefiak, A. Jozefiak, B. Kierończyk, M. Rawski, A. Benzertiha, S. Talibov, S. Nogales-Merida, K. Dudek and J. Mazurkiewicz
45. **The influence of bisphenol A of the *Tenebrio molitor* larvae** K. Obremski, P. Wojtacha, T. Bakula, D. Obremaska, B. Pachota, A. Myszkowska and M. Pajdowska
46. **Cricket farming for food security in refugee settings: a pilot study in Kakuma, Kenya** J.N. Kinyuru, P. Kibuku, M.A. Ayieko, M. Naukkarinen and N. Roos
47. **Growth performance of house cricket (*A. domesticus*) and field cricket (*G. bimaculatus*) fed on agro-by-products** M.A. Orinda, R.O. Mosi, M.A. Ayieko and F.A. Amimo
48. **Prebiotics potential of chitin derived from farmed crickets: a gateway to improved gut health?** C. Kipkoech, S. Imathiu, N. Roos and J.N. Kinyuru
49. **Exploring the host plants of the edible grasshopper, *Ruspolia differens*, in Uganda** A. Valtonen, R. Opoke, G.M. Malinga, P. Junes, P. Nyeko and H. Roininen
50. **The present conditions of edible insects in Japan and future issues** T.M. Matsui and K.M. Matsui
51. **Factors influencing willingness to pay for insect-based feeds among smallholder fish, pig and poultry farmers in Kenya** C.M. Tanga, S.Y. Chia, K.K.M. Fiaboe, J.N. Macharia, G.M. Diiro, S. Subramanian, S. Niassy, J.J.A. van Loon, M. Dicke and S. Ekesi
52. **Entomophagy, urbanization, and livelihood commodification: a case study from Naivasha, Kenya** G. Volpato, R. Ellena and L. Torri
53. **Exploring the ethno-entomology of the Babukusu community in Western Kenya** A. N. Muriithi, I. Onjala and A. Mukhebi
54. **Multiple and sustainable uses of termites and termite mounds in southern Africa and South-east Asia** K. Nonaka, E. Ono, S. Miyagawa, C. Takenaka and J. Nzira
55. **Exhibition design to reduce disgust for eating insects** N. Sakamoto and K. Nonaka
56. **Application of emerging technologies to transform and valorise insects according to the biorefinery concept** H. Mhemdi and S. Mezdour
57. **Optimization of freeze substitution and inclusion with glycol methacrylate for histological studies of black soldier fly** J.J.A. Beniers, M.-H. Deschamps and G.W. Vandenberg
58. **Crop straw utilization by the blow fly *Chrysomya megacephala*** X. Qi, G. Zhang, Z. Li and C. Niu
59. **Effects of corn straw fermentation by *Trichoderma viride* and yeast on rearing *Musca domestica* (Diptera: Muscidae)** G. Zhang, Z. Li, X. Qi and C. Niu
60. **Protein molecular spectral features in the heterogeneous feed matrix/issue with advanced vibrational molecular apectros** P. Yu
61. **Very hungry FOR caterpillars? The contribution of the edible caterpillar *Cirina butyrospermi* to the food security of rural smallholders in Burkina Faso.** C.L.R. Payne

Venue

Zhongnan Garden Hotel

Wuchang Wuluo Road No.558
Wuhan, Hubei
People's Republic of China

| | | |
|-----------------|---------------------|---------------------------------|
| Zhongnan Hall 1 | - main and parallel | -Nanyuan Building, third floor |
| Zhongnan Hall 2 | - parallel | -Nanyuan Building, third floor |
| Changjiang Hall | - parallel | -Nanyuan Building, third floor |
| General Palace | - parallel | -Nanyuan Building, second floor |
| Zhongnan Hall 1 | - banquet | -Nanyuan Building, third floor |
| Garden Hall | - lunch and dinner | -Nanyuan Building, second floor |

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