



APIMONDIA

SCANDINAVIA

SWEDEN | DENMARK | NORWAY

2025

23-27 SEPTEMBER



COPENHAGEN



Bee United in Scandinavia!

ABSTRACT BOOK

ORGANIZED BY



HOSTED BY



www.apimondia2025.com

INDEX

ORAL PRESENTATIONS	1-186
INVITED SPEAKERS	2-6
APITHERAPY	7-31
BEE BIOLOGY	32-64
BEE HEALTH	65-116
BEEKEEPING ECONOMY	117-123
BEEKEEPING FOR RURAL DEVELOPMENT	124-140
BEEKEEPING TECHNOLOGY AND QUALITY	141-172
POLLINATION AND BEE FLORA	173-186
POSTER PRESENTATIONS	187 - 731
APITHERAPY	188-232
BEE BIOLOGY	233-311
BEEKEEPING ECONOMY	312 - 327
BEE HEALTH	328 - 491
BEEKEEPING TECHNOLOGY AND QUALITY	492 - 627
POLLINATION AND BEE FLORA	628 - 684
BEEKEEPING FOR RURAL DEVELOPMENT	685 - 731
ABSTRACTS OF POSTERS	732 - 961
(Presented as images on pages 190-731)	
APITHERAPY	733-757
BEE BIOLOGY	758-789
BEE HEALTH	790 - 846
BEEKEEPING ECONOMY	847 - 855
BEEKEEPING TECHNOLOGY AND QUALITY	856 - 918
POLLINATION AND BEE FLORA	919 - 938
BEEKEEPING FOR RURAL DEVELOPMENT	938 - 961

Note: Original text of abstracts are kept faithfully and misspelling mistakes are the responsibility of the authors, not the organisers/editors.



BEE BIOLOGY

PRESENTING AUTHOR	TITLE	PAGE
Katrina Klett	Vitellogenin as a Physiological Marker of Swarming in Honey Bees (<i>Apis mellifera</i>)	47
Kaylin Kleckner	Beelining in the bush: Wild honey bee nest natural history and turnover in South Africa	52
Kiara Nicole Rodriguez	Microbial Community Profiling of <i>Tetragonula biroi</i> (Friese) Hives: Insights from Pollen-Microbiome Interactions	46
Kristýna Myslíňová	Variations in amino acid and lipid profiles of honey bee hemolymph and gut microbiome composition in response to different dietary protein sources	38
Laurence Plamondon	Effects of various fall feeding sugar sources on survival, health, and performance of honey bee colonies (<i>Apis mellifera</i> L.)	35
Luca Fontanesi	A dynamic picture of the diffusion of { <i>Apis mellifera</i> } mitochondrial DNA lineages in Italy over the last few decades utilizing honey as a source of honey bee population genetic information	59
M Alice Pinto	An unparalleled survey of honey bee genetic diversity in Europe – insights from wing shape, nuclear whole genome, and mitochondrial DNA data	51
Matthew T. Webster	Whole genome sequencing reveals resilience of European honeybees to climate change	49
Melanie Margarita Kirby	The Synergy of Sustainable Selection: Interlacing Sustainable Management Practices, Epigenetics and Adaptive Bee Breeding for Changing Climes & Times	63
Michael Thiele	Resilience and Adaptation of Wild Honeybees: A 7-Year Study at the Galbreath Wildlands Preserve (2021-2028) and Its Implications for Apiculture and Conservation	33
Nyaton Kitnya	Giant Honeybees of Asia: Based on Morphological and Genetic Study	54
Raffaele Dall'olio	Status Report on BeeGuards Innovative Breeding Strategies	55
Rui Guo	Unraveling the modulatory manner and function of circRNAs in the Asian honey bee larval guts	34
Ségolène Maucourt	Integrated Breeding Strategy for <i>Apis mellifera</i> : Towards Sustainable Beekeeping	58
Shang Jui Fu	The Development of Brain Structure in Worker Honey Bees: A Micro-CT Study of Neuropil Volume Dynamics	43
Sharoni Shafir	Dietary omega-6:3 fatty acids ratio affects honey bee (<i>Apis mellifera</i>) spatial cognition: maze and landmark learning	56
Shelley Hoover	Relative effects of the queen and brood on honey bee worker ovary suppression	36
Steve Rogenstein	<i>Free-B</i> : Studying free-living honey bee colonies to safeguard diversity, ensure resilience, and promote transformative change in beekeeping	39
Thibault Leroy	From genomes to holobionts: can the reanalysis of large-scale bee sequencing projects open new perspectives?	45
Wahizatul Azmi	Optimization of In-Vitro Rearing of Indo-Malaya Stingless Bee (<i>Heterotrigona itama</i>) Queen: A Strategy to Improve the Meliponiculture Management and Conservation of Insect Pollinator in Tropical Landscapes	48
Yanna Chu	Embryogenesis of haploid honey bee (<i>Apis mellifera</i> L.) takes longer than diploid worker	41
Yu Fang	Optimizing anesthetic effects of carbon dioxide to honey bee (<i>Apis mellifera</i> L.)	43
Yuanzhen Liu	Genomic Analysis of Wild Bee Populations in Scandinavia Informs Biodiversity Conservation	40
Jorge Langa	Generating a comprehensive metagenome-assembled genome (MAG) catalogue of the honey bee gut	56
Kamila Canale Tabet	Exploring the genetic landscape of honeybees in Ivory Coast	44



OP-077 [Bee Biology]

An unparalleled survey of honey bee genetic diversity in Europe – insights from wing shape, nuclear whole genome, and mitochondrial DNA data

M. Alice Pinto¹, Fernanda Li¹, Ana R. Lopes¹, Demetris Taliadoros², Maíra Costa¹, Carlos Yadro¹, Larissa Cunha¹, Dora Henriques¹, Giselle Martin Hernandez², Alexandre Albo³, Laima Blažytė-Čereškienė⁴, Robert Brodschneider⁵, Valters Brusbardis⁶, Norman Carreck⁷, Leonidas Charistos⁸, Robert Chlebo⁹, Giovanni Cillia¹⁰, Mary F. Coffey¹¹, Bjorn Dahle¹², Ellen Danneels¹³, Constantin Dobrescu¹⁴, Janja Filipi¹⁵, Anna Gajda¹⁶, Kristina Gratzter⁵, Linn Groeneveld¹², Fani Hatjina⁸, Jes Johannesen¹⁷, Michal Kolasa¹⁸, János Körmendy-Rácz¹⁹, Marin Kovačić²⁰, Preben Kristiansen²¹, Anna Dupleix-Marchal²², Maritta Martikkala²³, Grace McCormack²⁴, Raquel Martín-Hernández²⁵, Antonio Nanetti¹⁰, Borce Pavlov²⁶, Marco Pietropaoli²⁷, Benjamin Poirot³, Zheko Radev²⁸, Aivar Raudmets²⁹, Vincent René-Douarre³⁰, Ivo Roessink³¹, Maja Ivana Smodiš Škerl³², Gabriele Soland³³, Dalibor Titera³⁴, Joseph van der Steen³⁵, Andri Varnava³⁶, Flemming Vejsnæs³⁷, Dirk C. de Graaf¹³, Mathew Webster²

¹CIMO, LA SusTEC, Instituto Politécnico de Bragança, Bragança, Portugal - ²Uppsala University, Sweden

³APINOV, France - ⁴Institute of Ecology, Nature Research Centre, Vilnius, Lithuania - ⁵University of Graz, Austria

⁶Latvian Beekeepers Association, Latvia - ⁷Carreck Consultancy Ltd

⁸Institute of Animal Science & Department of Apiculture, Greece - ⁹Slovak University of Agriculture, Nitra, Slovakia

¹⁰Research Centre for Agriculture and Environment (CREA-AA), Bologna, Italy

¹¹Department of Agriculture, Food and the Marine, Ireland

¹²Norwegian Beekeepers Association, Norway - ¹³University of Ghent, Belgium - ¹⁴ROMAPIS, Romania

¹⁵University of Zadar, Croatia - ¹⁶Warsaw University of Life Sciences, Poland

¹⁷DLR-Westerwald-Ostfeld, Germany - ¹⁸Jagiellonian University, Poland

¹⁹Hungarian Apitherapy Association, Hungary - ²⁰Faculty of Agrobiotechnical Sciences Osijek, Croatia

²¹Apinordica AB, Sweden

²²CoActions/Alt-RD, 46-48 rue Ferdinand Buisson, FR-33130 Bègles, France; CRISES, EA 4424, Université Paul Valéry, FR-34000 Montpellier, France

²³Finnish Beekeepers Association, Finland - ²⁴University of Galway, Ireland

²⁵Centro de Investigación Apícola y Agroambiental Marchamalo, Spain

²⁶Makedonska pcela- Negorci (MacBee) - Macedonian association for preservation of Macedonian native honey bee (*Apis mellifera macedonica*), Gevgelija, North Macedonia

²⁷Istituto Zooprofilattico Sperimentale del Lazio e della Toscana, Italy

²⁸Tobacco and tobacco products institute, 4108 Markovo, Bulgaria - ²⁹Estonian Beekeepers Association, Estonia

³⁰FEdCAN, European federation for the conservation of dark bee, France

³¹Wageningen Environmental Research, the Netherlands (ivo.roessink@wur.nl)

³²Agricultural Institute of Slovenia, Slovenia - ³³Apigenix, Institute for Beegenetics, Gaicht 19, 2513 Twann, Switzerland

³⁴Bee Research Institute at Dol, Czech Republic - ³⁵Alveus AB Consultancy, Netherlands

³⁶Department of Agricultural Sciences, Cyprus University of Technology, Cyprus

³⁷Danish Beekeepers Association, Denmark

Europe is home to 10 subspecies of *Apis mellifera*, classified into four main lineages sensu Ruttner: M (western and northern European), C (southeastern European), A (African), and O (Middle Eastern). However, large-scale movements of honey bee genetic material—driven by transhumance and, more importantly, queen trading—has intensified gene flow, particularly from the C-lineage subspecies *A. m. carnica* and *A. m. ligustica*, threatening the genetic integrity of several subspecies and blurring the genetic boundaries between subspecies.

Here, we analyzed over 1,200 recently collected samples from apiaries in 33 countries using a multi-marker approach: maternally inherited mitochondrial DNA (tRNA^{Leu}-cox2 intergenic region), nuclear genome-wide single nucleotide polymorphisms (SNPs), and wing shape (DeepWings©) to provide the most updated and extensive account of honey bee genetic variation in Europe. Our results reveal a strong dominance of C-lineage ancestry across Europe, with noteworthy introgression signals in island subspecies and *A. m. mellifera* populations outside conservation apiaries. Notably, all three markers consistently captured these broad introgression patterns.

This unprecedented survey highlights a worrying trend of genetic homogenization in European honey bee populations. Moreover, the widespread prevalence of C-lineage genetic introgression underscores the need for conservation efforts to preserve the diversity shaped by evolution, which is crucial for adaptation to growing environmental challenges.

