

SOLANACEAE 2022

XVII International Conference on the Plant Family of Solanaceae

A Joint Meeting with COST Action CA18210 RoxyCost



November 1-5, 2022 - Thessaloniki, Greece

SCIENTIFIC PROGRAM

Conveners of SOL2022

Angelos K. Kanellis, Mondher Bouzayen

PORTO PALACE HOTEL, THESSALONIKI, HELLAS

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**XVII SOLANACEAE2022 International Conference on the Plant Family of Solanaceae
November 1-5, 2022, THESSLONIKI, HELLAS**

PROGRAM

Tuesday November 1, 2022

16:00-18:30 Registration

18:30-18:40: Introduction to the SOLANACEAE2022
Angelos K. Kanellis and Mondher Bouzayen

Opening Talk

18:40-19:10 Apostolos Thymiopoulos (*invited talk*)
(THYMIOPOULOS VINEYARDS, Trilofos, Imathia, Greece)

The vineyards and wines of Northern Greece

19:10-24:00 Wine Tasting and Welcome Reception

TOPICS, CHAIRPERSONS AND INVITED SPEAKERS

Wednesday November 2, 2022

I. Exploration of Biodiversity and Evolution (Dani Zamir, Aureliano Bombarely)

08:30-08:55 **Dani Zamir** (*invited talk*)

(The Hebrew University of Jerusalem)

Epistatic QTL for Yield Heterosis in Tomato

08:55-09:20 **Aureliano Bombarely** (*invited talk*)

(Instituto de Biología Molecular y Celular de Plantas (IBMCP) (CSIC-UPV))

Insights of the complex origin of the *Nicotiana* genus, section Suaveolentes

09:20-09:35 **Lorenzo Barchi** (*selected talk*)

(University of Torino, Grugliasco, Italy)

The Worldwide population structure of over 3,400 eggplant accessions identified by SPET genotyping.

09:35-09:50 **Jacob R. Barnett** (*selected talk*)

(University of Massachusetts, Amherst, USA)

Fruit trait associations across the wild tomato clade suggest selective pressure from seed dispersers

09:50-10:05 **José Blanca** (*selected talk*)

(Universitat Politècnica de València, Valencia, Spain)

SPET genotyping of over 15,000 accessions of tomato reveals the genetic structure and history of the tomato germplasm at world level

10:05--10:35 **Coffee Break**

Topic II: Metabolome Structure/Metabolomics (Asaph Aharoni, Paul Fraser)

10:35-11:00 **Asaph Aharoni** (*invited talk*)

(Weizmann Institute of Science, Rehovot, Israel)

Exploring Sol Species in Natural Context: Lessons from Epicuticular Waxes and Alkaloids Deficient Tobacco Mutants

- 11:00-11:25 Paul Fraser** (*invited talk*)
(Royal Holloway University of London, Egham, UK)
- Isoprenoid biosynthesis and sequestration in tomato fruit and the role of plastoglobuli
- 11:25-11:40 Yury Tikunov** (*selected talk*)
(Wageningen University and Research, Wageningen, The Netherlands)
- Towards understanding of metabolic diversity of pepper fruit
- 11:40-11:55 Marilise Nogueira** (*selected talk*)
(Royal Holloway University of London, Egham, United Kingdom)
- Metabolic re-programming and cellular adaptation for high-level production of valuable ketocarotenoids
- 11:55-12:10 Zoe Hilioti** (*selected talk*)
(Centre for Research and Technology Hellas, Thessaloniki, Greece)
- Targeted transcription factor disruption leads to alterations in stem structure and composition
- Topic III: Genetics, Genomics and Epigenetics, (Esther van der Knaap, James Giovannoni)**
- 12:10-12:35 Esther van der Knaap** (*invited talk*)
(University of Georgia, Athens, USA)
- The hidden gems in semi-domesticated germplasm: the surprising levels of genetic diversity in fruit quality traits in tomato
- 12:35-13:00 James Giovannoni** (*invited talk*)
(USDA-ARS, Boyce Thompson Institute for Plant Research, Cornell University, Ithaca, USA)
- The role of seed development in tomato fruit ripening
- 13:00-14:15 Lunch**
- 14:15-14:30 Katharine M. Jenike** (*selected talk*)
Johns Hopkins University, Baltimore, MD, USA
- Establishing a *Solanum* Pan-Genome to Dissect Dynamics of Paralog Evolution

- 14:30-14:45 Sara Lopez-Gomollon** (*selected talk*)
(University of Cambridge, Cambridge, UK)
- Endogenous virus small RNAs regulate gene expression following genome shock in tomato hybrids
- 14:45-15:00 Corentin Clot** (*selected talk*)
(Wageningen University and Research, Wageningen, Netherlands)
- The polygenic basis of 2n pollen production in diploid potato
- 15:00-15:15 Martina V. Strömviik** (*selected talk*)
(McGill University, Montreal, Canada)
- The potato and wild relatives super pan-genome
- 15:15-15:30 Sander Peters** (*selected talk*)
(Wageningen University and Research, Wageningen, The Netherlands)
- Meiotic recombination, a process for guided genetic changes
- 15:30-15:45 Leah Rosental** (*selected talk*)
(Ben Gurion University, Beer Sheva, Israel)
- Genome-wide scan for genes regulating tomato leaf metabolic response to water stress

15:45-16:20 Coffee Break

Topic IV Molecular Breeding (Mathilde Causse, Giovanni Giuliano)

- 16:20-16:45 Mathilde Causse** (*invited talk*)
(INRAE, UR1052, Centre de Recherche PACA, Montfavet, France)
- Genetic control of tomato fruit quality: from GWAS to breeding
- 16:45-17:00 Gabriel Hoang** (*selected Talks*)
(INRAE, Univ. Bordeaux, Villenave d'Ornon, France)
- Identification of novel yield regulators using tomato induced variability
- 17:00-17:15 Eloisa Vendemiatti** (*selected Talks*)
(West Virginia University, Morgantown, USA)
- Genetic interactions coordinate type-IV trichome development in *Solanum* spp. and the evolution of the micro-trait in the Solanaceae

17:15-17:30 Kumar, Pawan (*selected Talks*)
(ARO, Volcani Center, Rishon-LeZion, Israel)

A new genetic resource for heat tolerance in tomato - phenotypic characterization of a *Solanum pimpinellifolium* BIL population

17:30-17:45 Sanjeev Kumar Sharma (*selected talk*)
(The James Hutton Institute, Dundee, Scotland, United Kingdom)

SPET genotyping within the gene-space for advancing genetics and breeding applications in potato

Topic VI: Vegetative Growth-Development (Christian Bachem, Naomi Ori)

17:45-18:10 Naomi Ori (*invited talk*)
(Hebrew University of Jerusalem, Rehovot, Israel)

A two-step auxin-GA cross talk regulates tomato organ patterning

18:10: 18:35 Christian Bachem (*invited talk*)
(Wageningen University and Research, Wageningen, The Netherlands)

Understanding Potato production in a changing world

18:35-18:50 Carlos Hernán Barrera-Rojas (*selected talk*)
(University of São Paulo, São Paulo, Brazil)

The miR156/SISBP15 regulates shoot architecture by connecting multiple hormone pathways in tomato

18:50-19:05 Raz Danieli (*selected talk*)
(ARO, Volcani Center, Rishon-LeZion, Israel)

Chilling induces sugar and ABA accumulation that antagonistically signals for symplastic connection of the potato tuber buds

19:05-19:20 Robert Säbel (*selected talk*)
(Leibniz Institute of Plant Biochemistry, Halle, Germany)

Heat stress induces type-IV trichomes in cultivated tomato

19:20-19:35 Petar Mohorović (*selected talk*)
(KU Leuven, Leuven, Belgium)

Ethylene inhibits photosynthesis via temporally distinct physiological, biochemical, and molecular responses in tomato

19:35-20:30 Poster Session
20:30 Dinner at your own

Thursday November 3, 2022

Topic V: Reproductive Growth - Fruit Development and Ripening (Nathalie Gonzalez, Julien Pirrello) *Session organized by COST Action RoxyCost - CA18210*

09:00-09:25 **Mondher Bouzayen** (*invited talk*)
(INP-Toulouse, GBF group, UMR5546 LRSV CNRS/UPS/INPT, Castanet-Tolosan, France)

Uncoupling fruit ripening and softening: looking for the Holy Grail

09:25-09:50- **Nathalie Gonzalez** (*invited talk*)
(INRAE, Villenave d' Ornon, France)

The importance of endoreduplication for cell patterning in the tomato fruit

09:50-10:15 **Julien Pirrello** (*invited talk*)
(INP-Toulouse, GBF group, UMR5546 LRSV CNRS/UPS/INPT, Castanet-Tolosan, France)

Transition to ripening in tomato fruit needs genetic reprogramming initiated in gel tissue

10:15-10:30- **Rahul Kumar** (*selected talk*)
(University of Hyderabad, Hyderabad, India)

A ripening-associated ethylene response factor ERF.D7 positively regulates fruit ripening via controlling the transcription of ARF2 orthologs in tomato

10:30-10:45 **Simon Michaeli** (*selected talk*)
(ARO, The Volcani Institute, Rishon LeZion, Israel)

Autophagy regulates tomato fruit ripening via its crosstalk with ethylene

10:45-11:00 **Guojian Hu** (*selected talk*)
(Ecole Nationale Supérieure Agronomique, UMR, INRA-INP/ENSAT Castanet-Tolosan, France)

The auxin-responsive transcription factor SIDOF9 regulates inflorescence termination in tomato

11:00-11:30 **Coffee Break**

11:30-11:45 **Norbert Bollier** (*selected talk*)
(INRAE, Villenave d' Ornon, France)

Functional characterization of FW2.2, a plasmodesmata located protein

11:45-12:00 **Long T. Tran** (*selected talk*)
(University of Tsukuba, Tsukuba, Japan)

Full penetration of the pollen tube, not fertilization, activates the cell division at the early stage of tomato fruit formation resulting in fruit set and development

12:00-12:15 **Andrii Vainer** (*selected talk*)
(Weizmann Institute of Science, Rehovot, Israel)

Hormone profiling of tomato reproductive organs reveals the vital role of indole-acetic acid conjugation in flower development

12:15-12:30 **Elie Maza** (*selected talk*)
(INP-Toulouse, GBF group, UMR5546 LRSV CNRS/UPS/INPT, Castanet-Tolosan, France)

About stable combinations of non-stable genes as reference genes for RT-qPCR data normalization

Topic VII: Genomics for quality and nutritional traits (Hiroshi Ezura, Mondher Bouzayen)

12:30-12:55 **Hiroshi Ezura** (*Invited talk*)
(University of Tsukuba, Tsukuba, Japan)

Improving Tomato Nutrition: The World First CRISPR Tomato Launched to a Japanese Market

13:00-14:30 **Lunch**

14:30-14:55 **Giovanni Giuliano** (*Invited talk*)
(ENEA, Rome, Italy)

The genetic architecture of fruit quality and nutritional traits in Solanaceous crops

14:55-15:20 **Antonio Granell** (*Invited talk*)
(CSIC, Universitat Politècnica de València, Valencia, Spain)

Biofortified tomatoes with increased levels of flavonoids, crocins and branched-chain amino acids

15:20-15:55 Arnaud Bovy (*Invited talk*)
(Wageningen University and Research, Wageningen, the Netherlands)

The genetic and functional analysis of flavor in commercial tomato: the *FLORAL4* gene underlies a QTL for floral aroma volatiles in tomato fruit

15:55-16:10 Charles Goulet (*selected talk*)
(Université Laval, Canada)

Synthesis of nitrogenous volatiles in tomato; exploring a new route

16:10-16:40 Coffee Break

Topic VIII: Abiotic and Biotic Stresses (Bettina Hause, Panagiotis Kalaitzis)

16:40-17:05 Kalliope K. Papadopoulou (*invited talk*)
(University of Thessaly, Larisa, Greece)

Residents turned to friends

17:05-17:30 Panagiotis Kalaitzis (*invited talk*)
(Mediterranean Agronomic Institute, Chania, Greece)

A prolyl-4-hydroxylase and Fascilin-Like Arabinogalactan proteins are involved in tomato abscission regulation and relocation of abscission zone

17:30-17:45 Alexandre Hereil (*selected talk*)
(INRAE, Centre de Recherche PACA, Montfavet, France)

Genome-wide association study of salt tolerance in tomato

17:45-18:00 Lucia Sandra Perez Borroto (*selected talk*)
(Wageningen University and Research, Wageningen, The Netherlands)

Development of drought-resilient potatoes with the Plantarray and PlantEye systems

18:00-18:15 Paula Teper-Bamnlker (*selected talk*)
(ARO, The Volcani Institute, Rishon LeZion, Israel)

Activation of an alternative pathway to sucrose metabolism increases tolerance of potato plant to abiotic stress

18:15-18:30 Alexandra Wormit (*selected talk*)
(Aachen University, Aachen, Germany)

Abiotic stress networks of secondary metabolism detected in *Capsicum* species by multi-omics analysis

18:30-18:45 Sophia Sonnewald, (*selected talk*)
(Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany)

Unravelling regulatory networks involved in heat stress tolerance of potato plants

18:45-19:00 Evangelia Stavridou (*selected talk*)
(CERTH, Thessaloniki, Greece)

Understanding the variable role of tomato roots in response to different abiotic stresses

19:00: 19:15 Łukasz Paweł Tarkowski (*selected talk*)
(INRAE, Université d'Angers, Angers, France)

Activation of tomato seed defenses through integration of seed and defense priming

19:15-20:15 Poster Session

20:15 Dinner at your own

Friday November 4, 2022

Topic IX: Secondary Metabolism (Harry Klee, Alain Goossens)

08:30-08:55 Harry Klee (*invited talk*)

(University of Florida, Gainesville, USA)

An integrated chemical and genetic approach to improve tomato flavor quality

08:55-09:20 Alain Goossens (*invited talk*)

(Ghent University, Ghent, Belgium)

Molecular interactions in tomato specialized metabolism

09:20-09:45 Joseph Hirschberg (*invited talk*)

(The Hebrew University of Jerusalem, Jerusalem, Israel)

Tomato carotenoids underground

09:45-10:00 Adam Jozwiak (*selected talk*)

(Weizmann Institute of Science, Rehovot, Israel)

A GAME changer: the discovery of a missing link in steroidal glycoalkaloid metabolism in Solanum

10:00-10:15 Denise Tieman (*selected talk*)

(University of Florida, Gainesville, USA)

Biochemical and genetic approaches to improving tomato flavor

10:15-10:30 Masaharu Mizutani (*selected talk*)

(Kobe University, Kobe, Japan)

Tandem gene duplication of dioxygenases drives the structural diversity of steroidal glycoalkaloids in Solanaceae

10:30-11:00 Coffee Break

11:00-11:15 Félix Juan Martínez Rivas (*selected talk*)

(Max-Planck-Institute, Potsdam-Golm, Germany)

Bacterial-type PEP carboxylase regulates fruit size and ripening time in tomato, *Solanum lycopersicum* L.

11:15-11:30 Alejandro Brand *(selected talk)*

Elucidating the role of Rubisco and PEPCK in the photosynthetic glandular trichomes of tomato

11:30-11:45 Špela Baebler *(selected talk)*

(National Institute of Biology, Ljubljana, Slovenia)

Transcriptional deregulation of stress-growth balance in *Nicotiana benthamiana* biofactories producing insect sex pheromones

11:45-12:00 Sayantan Panda *(selected talk)*

(Weizmann Institute of Science, Rehovot, Israel)

A Pair of microRNAs controls the unique pigmentation shift in developing Eggplant fruit skin

12:00-13:00 Lunch

13:00-19:00 Excursion to Archeological Site of Vergina, the Royal Capital of Macedonia (King Philipp II Tomb)

20:30-GALA DINNER

Saturday November 5, 2022

Topic X: Exploring Genomes, Transcriptomes, Proteomes and Metabolome in Solanaceae Plants (Nikolai Ivanov, Jaime Prohens) (sponsored by Philip Morris)

8:30-08:55 Nikolai Ivanov (invited talk)
(Philip Morris International R&D)

Advances in *Nicotiana* Omics Resources

08:55-09:20 Bettina Hause (invited talk)
(Leibniz Institute of Plant Biochemistry, Halle, Germany)

The transcription factors MYB21 and MYB24 - role in flower development of tomato

09:20-09:35 Ifigeneia Mellidou (selected)
(ELGO-DIMITRA, Thessaloniki, Greece)

A wide foodomics approach coupled with metagenomics elucidates the environmental signature of Protected Geographical Indication potatoes

09:35-09:50 Jhon Venegas-Molina (selected)
(Ghent University, Ghent, Belgium)

From protein structural changes to protein functions: discovering novel jasmonate signalling regulators by Limited Proteolysis-Mass Spectrometry

09:50-10:05 Dennis Psaroudakis (selected)
(Leibniz Institute of Plant Genetics and Crop Plant Research, Gatersleben, Germany)

Understanding Tomato Heat Response: A large-scale Transcriptomic Meta-Analysis

10:05-10:20 Kristina Gruden (selected)
(National Institute of Biology, Ljubljana, Slovenia)

A mini-TGA modulates gene expression through heterogeneous association with transcription factors in potato immunity

10:20-10:50 Coffee Break

10:50-11:05 Sara Diaz-Trivino (selected)
(Wageningen University and Research, Wageningen, The Netherlands)

Pepper chromosomal-scale assembly and panproteome analysis potential for analyzing key pepper traits

11:05-11:20 Sandra Smit (*selected*)
(Wageningen University and Research, Wageningen, The Netherlands)

Pangenomics to explore intra- and inter-genomic variation in Solanaceae genomes

Topic XI: Solanaceae Biotechnology (Cathie Martin, Angelos Kanellis)

11:20-11:45 Cathie Martin (*invited talk*)
(John Innes Centre, Norwich, United Kingdom)

Fortifying vitamins in tomato using genome editing

11:45-12:00 Jaime Prohens (*selected talk*)
COMAV, Universitat Politècnica de València, Valencia, Spain)

Identification of SmAPRR2 as a key gene controlling green pigmentation of the eggplant fruit peel

12:00-12:15 Prashant Kumar Singh (*selected talk*)
(ARO, The Volcani Institute, Rishon LeZion, Israel)

The tomato *ddm1b* mutant shows decreased sensitivity to heat stress accompanied by transcriptional alterations

12:15-12:30 Rosa M Rivero (*selected talk*)
(CEBAS-CSIC, Murcia, Spain)

Crosstalk between NO and melatonin in ROS-mediated response to abiotic stress combination in tomato plants

12:30-12:45 Seo-Young Lee (*selected talk*)
(Seoul National University, Seoul, South Korea)

Transgene-free gene editing in *Solanum lycopersicum* using potato virus X vector

12:45-13:00 Eugenia M. A. Enfissi (*selected talk*)
(Royal Holloway University of London Surrey, UK)

Biorenewable production of the vaccine adjuvant squalene

13:00-14:15 Lunch

Topic XII: Applied Aspects: Cultivation, Postharvest Physiology and Handling (Antonio Granell, Joseph Hirschberg)

14:15-14:30 Dani Eshel (*invited talk*)

ARO, The Volcani Institute, Rishon LeZion, Israel

Postharvest potato tuber as a model system for bud dormancy and vegetative growth

14:30-14:45 Avtar K. Handa (*selected talk*)

(Purdue University, West Lafayette, USA)

Potential and stability of tomato crop improvement by transgenic research: field evaluation of isogenic line homozygous for the introduced transgenes

14:45-15:00 Clara Pons (*selected talk*)

(CSIC-UPV, Valencia, Spain)

Preharvest conditions affecting the fruit quality of Mediterranean long shelf-life winter tomato

15:15-15:30 Hagai Cohen (*invited talk*)

ARO, The Volcani Institute, Rishon LeZion, Israel

Skin cracking in pepper fruit is concomitant with the buildup of lignin and affects pre- and post-harvest fruit quality

Best Posters Presentations

15:30-15:45

15:45-16:00

16:00-16:15

16:15-16:45 Coffee break

16:45-17:45 Solanaceae and Industry (Nikolai Ivanov, Stan Oome)

17:45-18:30 GENERAL DISCUSSION AND CONCLUSION