Welcome to the 14th International Conference of the French Society of Plant Biology
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The Organizing Committee, the Scientific Committee, the Federation of the European Societies of Plant Biology, the French Society of Plant Biology and the Biosciences and Biotechnology Institute of Aix-Marseille welcome you to Plant Biology Europe.

This international meeting covers a wide range of Plant Science topics across multiple disciplines and at different scales.

Among the many different themes that are being addressed during the meeting, a particular emphasis is placed on plants and climate changes, algal biology and bioenergy.
SCIENTIFIC COMMITTEE

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CNRS, Paris Saclay

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CRAG, Barcelona

Laurent LAPLAZE
IRD, Montpellier

Laura DE GARA
Università Campus Bio-Medico di Roma, Roma

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Max Planck Institute for Biology, Tübingen

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Angers University, Beaucozé

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Alexandra MARAVAL  
CEA, Saint-Paul-Lez-Durance
MONDAY 3 JULY

09:00 – 09:30  Opening Ceremony – Amphitheater 900

09:30 – 10:15  Plenary – Amphitheater 900
Malcom Bennett, University of Nottingham, United Kingdoms
Uncovering the hidden half of plants: discovering novel ways roots sense and adapt to heterogeneous environments.

10:15 – 11:00  Plenary – Amphitheater 900
Raffaella Balestrini, National Research Council of Italy (CNR-IPSP), Italy
A central role of root symbionts: the plant response to environmental stresses

11:00 – 11:30  Coffee Break

11:30 – 13:00  Session 1: Plant and algal development and evolution Plenary Amphitheater 900
Chair: Yoan Coudert, CNRS/Ecole Normale Sup. de Lyon, France

11:30 – 11:50  Air channels create a directional light signal to regulare hypocotyl phototropism
Chrisitan FANKHAUSER

11:50 – 12:10  Understanding how flowering plants build communication devices on their petals
Lucie RIGLET

12:10 – 12:30  A new framework for root gravitropic response kinetics
Marta DEL BIANCO

12:30 – 12:50  Developmental patterning of head-like inflorescences in Asteraceae
Paula Elomaa

12:50 – 13:00  Yoan Coudert
Q&A
Session 2: Interfaces with plant and soil microbiota
Room 120
Chair: Raffaella Balestrini, National Research Council of Italy (CNR-IPSP), Italy

11:30 – 11:50  Impact of double root symbiosis (arbuscular mycorrhiza and nodulation) on nutrient distribution in cereal crop-legume interaction  
Pierre-Emmanuel COURTY

11:50 – 12:10  Evolution of microbial community dynamics during field retting of hemp “Canabis Sativa L.”  
Elaine BOU ORM

12:10 – 12:30  Psychrotolerant plant-associated bacteria can enhance cold tolerance in crop plants  
Michelle PERAZZOLLI

12:30 – 12:50  Role of zaxinone a novel growth-promoting apocarotenoid metabolite, in shaping rice rhizomicrobiota  
Teresa MAZZARELLA

12:50 – 13:00  Raffaella Balestrini  
Q&A

Session 3: The genetic architecture of quantitative traits in plants
Room 76
Chair: Martin Lascoux, Sweden

11:30 – 11:50  Fusing genome simulation and crop models for computer-aided breeding in future environments  
Arnaud DESBIEZ-PIAT

11:50 – 12:10  Regulation of sulfur content in Arabidopsis thaliana natural variants  
Daniela RISTOVA

12:10 – 12:30  Pervasive Under-Dominance in Gene Expression Underlying Emergent Growth Trajectories in Arabidopsis thaliana Hybrids  
Wei YUAN
12:30 – 12:50  **Reconsidering photoperiod-sensitivity for maize adaptation to climate change**  
Justine DROUAULT

12:50 – 13:00  **Martin Lascoux**  
Q&A

13:00 – 14:00  **Lunch**

14:00 – 14:45  **Plenary – Amphitheater 900**  
*Marie Barberon*, University of Geneva, Switzerland  
*Plasticity of root permeability for nutrient acquisition*

14:45 – 15:30  **Plenary – Amphitheater 900**  
*Juliette de Meaux*, University of Cologne, Germany  
*Polygenic selection and the evolution of gene expression in Arabidopsis lyrata*

15:30 – 16:00  **Coffee Break**

16:00 – 17:30  **Session 4: Macro- and micro-nutrients in plants**  
**Amphitheater 900**  
Chair: *Jérémy Lothier*, University of Angers, France

16:00 – 16:20  **The ability of Sorghum bicolor to cope with ammonium nutrition depends on root PEPC activity**  
*Marin Pena AGUSTIN JAVIER*

16:20 – 16:40  **Effect of N And Fe deficiencies in popular roots and root exudates metabolites**  
*Maria Teresa CIESCHI VILLALBA*

16:40 – 17:00  **Regulation of CRFs in plant nitrogen (N) sensing and signalling**  
*Marina BORGES OSORIO*

17:00 – 17:20  **To be or not to be: a glimpse of micronutrients role in the prediction of plant tissue fate in soybean embryo axis**  
*Joao Paulo RODRIGUES MARQUES*
Unravelling the spatiotemporal component of carrier-mediated nutrient transport in Arabidopsis thalian roots
Kevin ROBE

Jérémy Lothier
Q&A

Session 5: Domestication in retrospect and the future of breeding
Room 120
Chair: Maud Tenaillon, CNRS, Paris-Saclay, France

Changes in competitive ability over the course of durum wheat domestication are mediated by plant functional traits
Taïna LEMOINE

Genetic and phenotypic diversity in timothy and a closely related species
Yousef RAHIMI

Genome-wide association studies on DNA pools identifies promising maize landraces and genomic regions to develop next generation varieties
Stéphane NICOLAS

Soil, climate and host genotype shape the seed transmissible microbiome structure in the fonio cereal
Heribert HIRT

Maud Tenaillon
Q&A

FESPB Award for Best Young Scientist
Adaptation and mitigation strategies for grapevine response to climate change based on its physiology
Nazareth Torres
Session 6: Chromosomes and chromatin dynamics
Room 76
Chair: Mathilde Grelon, IJPB, Versailles, France

16:00 – 16:20 Chromatin dynamics during fertilization of a liverwort, Marchantia polymorpha
Tetsuya HISANAGA

16:20 – 16:40 Identification of the first synaptonemal complex central element proteins in plants
Marion PEUCH

16:40 – 17:00 Horizontal gene transfer in Hordeum species
Marek SZECOWKA

17:00 – 17:10 Mathilde Grelon
Q&A

17:10 – 17:30 FESPB Award for Best Young Scientist
Exploring the Genetic Variability of Bean Germplasm for Nutritional Benefits
Carla Sofia Santos

TUESDAY 4 JULY

09:00 – 09:45 Plenary – Amphitheater 900
Kirsten Bomblies, ETH Zürich, Switzerland
Getting organised – the (re)evolution of fertility after genome duplication

09:45 – 10:30 Plenary – Amphitheater 900
Karel Riha, CEITEC MU, Brno, Czech Republic
P-bodies and post-transcriptional gene regulation in plant reproduction and stress response

10:30 – 11:00 Coffee Break
11:00 – 12:30  Session 7: Plant responses to abiotic stresses (Session 1)
Amphitheater 900
Chairs: Laurent Laplaze, IRD, Montpellier, France
        Abdelazziz Smouni, Université Mohamed V, Rabat, Maroc

11:00 – 11:20  Improving tomato plant growth under salt and heat stress – rhizosphere-based solutions
Bruno SOUSA

11:20 – 11:40  Coupling chloroplast activity to environmental constraints: TOR set the brake on photosynthesis
Stefano D’ALESSANDRO

11:40 – 12:00  RabA-mediated plasma membrane trafficking increases plant tolerance to drought and heat
Yehoram LSHEM

12:00 – 12:20  New insights on magnesium deficiency-induced molecular alterations in Arabidopsis thaliana
Armand D. ANOMAN

12:20 – 12:30  Laurent Laplaze & Abdelazziz Smouni
Q&A

Session 8: Plant reproduction: mechanisms and evolution
Room 120
Chair: Susana Coelho, MPI, Germany

11:00 – 11:20  The F-box protein UFO controls flower development by redirecting the master transcription factor LEAFY to new cis-elements
François PARCY

11:20 – 11:40  Timely endosperm elimination in Arabidopsis requires a programmed cell death pathway regulated by NAC transcription factors
Nicolas M. DOLL

11:40 – 12:00  MAP Kinase signaling in cell polarity – a lesson from the plant tolerance to drought and heat
Martin BAYER
12:00 – 12:20  **Evolutionary interplay between polyploidy and self-incompatibility in plants: case studies from allo- and autotetraploid Brassicaceae lineages**

Xavier VEKEMANS

12:20 – 12:30  **Susana Coelho**

Q&A

**Session 9: Genome editing and its use for plant breeding**

Room 76

Chair: **Josep Casacuberta & Ivan Reyna-Llorens**, Spain

11:00 – 11:20  **Controlling transcription from within transcribed regions in plants**

Yoav VOICHEK

11:20 – 11:40  **An iterative gene editing strategy broadens eIF4E1 genetic diversity in Solanum Lycopersicum, triggering resistance to multiple potyvirus isolates**

Kyoka KUROIWA

11:40 – 12:00  **Predictable gene editing through Prime Editing in model plants and potential for crop breeding**

Fabien NOGUE

12:00 – 12:20  **CRISPR-based tool development to engineer plant genomes at the megabase scale**

Julia ARRAIZA RIBERA

12:20 – 12:30  **Josep Casacuberta & Ivan Reyna-Llorens**

Q&A

12:30 – 12:45  **Publishing with Molecular Plant and Plant Communications**

*Symposium by Molecular Plant*

12:30 – 13:30  **Lunch**
13:30 – 14:15

Plenary – Amphitheater 900

Mark Aarts, University of Wageningen - WUR, Wageningen, Netherlands

*Arabidopsis thaliana* natural variation for photosynthesis: a model to guide improving crop photosynthesis?

14:15 – 15:00

Plenary – Amphitheater 900

Davide Bulgarelli, University of Dundee – JHI, United Kingdoms

Structure, function and host control of the rhizosphere microbiota

15:00 – 15:30

Coffee Break

15:30 – 17:00

Session 10: Plant responses to abiotic stresses (Session 2)

Amphitheater 900

Chairs: Laurent Laplaze, IRD, Montpellier, France

Abdelazziz Smouni, Université Mohamed V, Rabat, Maroc

15:30 – 15:50

*Physiological and molecular responses of the Greek Mustard (Hischfeldia incana L.) to Pb stress*

Said EL HASNAOUI

15:50 – 16:10

*Characterization of a uranium-tolerant green microalga with high potential for the remediation of metal-polluted waters*

Camille BEAULIER

16:10 – 16:30

*Physiological drought responses of plane trees in an urban context and impact on isoprene emissions*

Juliette LEYMARIE

16:30 – 16:50

*Restricted O2 consumption in pea roots induced by hexanoic acid is linked to depletion of Krebs cycle substrates*

Sara GARGIULO

16:50 – 17:00

Laurent Laplaze & Abdelazziz Smouni

Q&A
Session 11: Organellar biology
Room 120
Chair: Ben Field, BIAM, Marseille, France

15:30 – 15:50 CRY1-to-GUN1 anterograde pathway promotes early PSII biogenesis  
Chaojun CUI

15:50 – 16:10 Genetic inactivation of mitochondrial complexes I and IV in Physcomitrium patens: deciphering the role of respiration in plant bioenergetics and primary metabolism  
Antoni Mateu VERA VIVES

16:10 – 16:30 Role of mitochondrial activities in the under-ground early development of Arabidopsis seedlings  
Livia MERENDINO-ISENI

16:30 – 16:50 Cytonuclear interactions in auto- and allopolyploids of Festuca-Lolium complex  
Jana SZECOWKA

16:50 – 17:00 Ben Field  
Q&A

Session 12: Comparative genomics
Room 76
Chair: Bruno Contreras-Moreira, CSIC Zaragoza, Spain

15:30 – 15:50 The first pan-genome of a non-vascular plant broadens the understanding of land plants adaptation to their environment  
Chloé BEAULIEU

15:50 – 16:10 Adapting CRISPR from Physcomitrium patens to sexually dimorphic moss, Ceratodon purpureus  
Emilie-Katherine TAVERNIER

16:10 – 16:30 The evolution of Arabidopsis centromeres  
Fernando RABANAL
16:30 – 16:50 **Divide and conquer: Evolutionary adaptations of the plant cytoskeleton during cell division**  
*Katharina BÜRSTENBINDER*

16:50 – 17:00 **Bruno Contreras-Moreira**  
Q&A

17:00 – 18:00 **Poster Session A**

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**WEDNESDAY 5 JULY**

09:00 – 09:45 **Plenary – Amphitheater 900**  
*Aline Muyle*, CEFE – CNRS Montpellier, FRANCE  
*Gene DNA methylation in plants: selective pressures and sex chromosome evolution*

09:45 – 10:30 **Plenary – Amphitheater 900**  
*Bruno Contreras-Moreira*, CSIC, Zaragoza, Spain  
*Learning to build and interrogate the pangenome of Brachypodium distachyon*

10:30 – 11:00 **Coffee Break**

11:00 – 12:30 **Session 13: Plant adaptation to climate change**  
*Amphitheater 900*  
*Chairs: Laura de Gara*, Italy

  11:00 – 11:20 **Partial root drying of maize grown in a split-root system leads to local and systemic metabolic adjustments and hydraulic redistribution**  
*Monika WIMMER*

  11:20 – 11:40 **Two examples of genome-wide evolutionary responses of European forest trees to past climate changes**  
*Martin LASCOUX*

  11:40 – 12:00 **Exploring phenotypic space for mining genotypes and alleles in maize**  
*Jonas RODRIGUEZ*
12:00 – 12:20  **Impact of development-induced structural changes on drought responses of winter oilseed rape leaf – NMR relaxometry, water relations and multi-omics investigations**  
Pierre-Nicolas BOULC’H

12:20 – 12:30  **Laura de Gara**  
Q&A

**Session 14: Epigenetic mechanisms and responses in plants**  
Room 120  
Chair: **Leandro Quadrana**, France

11:00 – 11:20  **Uncovering the gene expression regulatory mechanisms underlying self-incompatibility dominance networks in Arabidopsis**  
Rita A. BATISTA

11:20 – 11:40  **Global increase of the nuclear transcriptional regime during Arabidopsis photomorphogenesis: effects on gene expression**  
Clara RICHET-BOURBOUSSE

11:40 – 12:00  **Deciphering the epigenetic and molecular logic of WOX5 function in the columella stem cell niche of Arabidopsis thaliana**  
Ning ZHANG

12:00 – 12:20  **Mechanism of E3 ubiquitin ligase SIXERICO1/3 regulating high temperature resistance in tomato plants**  
Kaixin WANG

12:20 – 12:30  **Leandro Quadrana**  
Q&A

**Session 15: Mechanics and stress responses**  
Room 76  
Chair: **Benoit Landrein**, France

11:00 – 11:20  **Limited water stress modulates expression of circadian clock genes in Brachypodium distachyon**
roots and induces differential response of proline-metabolism related genes  
Janos GYORGYEY

11:20 – 11:40  
**Dynamics of the calcium signal elicited by mechanical stimulation of Arabidopsis root**  
Sébastien THOMINE

11:40 – 12:00  
**Multiscale modelling of cell adhesion and separation in plants**  
Rawen BEN MALEK

12:00 – 12:20  
**It's just a phase: Structural characterization of LLPS and its role in temperature sensing in plants**  
Chloé ZUBIETA

12:20 – 12:30  
**Benoit Landrein**  
Q&A

12:30 – 13:30  
Lunch

13:30 – 14:30  
Poster Session B

14:30 – 15:30  
Poster Session C

15:30 – 16:00  
Coffee Break

16:00 – 17:30  
Round table Plant Act

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**THURSDAY 6 JULY**

09:00 – 09:45  
**Plenary – Amphitheater 900**  
*Rosa Lozano-Duran*, University of Tübingen – ZMBP, Tübingen, Germany  
*How to conquer a plant using just eight genes: learning from geminiviruses*

09:45 – 10:30  
**Plenary – Amphitheater 900**  
*Gwyneth Ingram*, CNRS Lyon, FRANCE  
*Controlling communication during reproductive development: The genesis and roles of apoplastic barriers*

10:30 – 11:00  
Coffee Break
Session 16: Plant Immunity
Amphitheater 900
Chair: Rosa Loranzo-Duran, Germany

11:00 – 11:20 Investigating antiviral defenses protecting plant stem cells and germline
Marco INCARBONE

11:20 – 11:40 Gradual immune system maturation in the root affects plant microbe interaction
Elhanan TZIPILEVICH

11:40 – 12:00 Role of the plasma membrane signalling during plant virus propagation
Sébastien MONGRAND

12:00 – 12:20 Engineering danger sensing and signaling in plant immunity: use of oligosaccharins to enhance durum wheat resistance to fusariosis
Valentina BIGINI

12:20 – 12:30 Rosa Loranzo-Duran
Q&A

Session 17: Photosynthesis: understanding and progress in its manipulation
Room 120
Chair: Xenie Johnson, CEA CNRS AMU, France

11:00 – 11:20 From Algae to Sea Slugs: Functioning of Stolen Chloroplasts in Animal Cells
Luca MORELLI

11:20 – 11:40 Two vacuolar channels from the ALMT family regulate C4-organic acids metabolism
Roxane DOIREAU

11:40 – 12:00 From oxidative stress to antenna quenching: regulation of qH-energy dissipation in plants
Aurélie CREPIN
12:00 – 12:20  Chloroplast redox status modulates leaf development via changes in proteasomal activity and endoreduplication index
Arce ROCIO CECILIA

12:20 – 12:30  Xenie Johnson
Q&A

Session 18: The genetics of natural variation of plant-plant interactions
Room 76
Chair: Fabrice Roux, Montpellier, France, Christophe Robaglia, BIAM, Marseille, France

11:00 – 11:20  Evolution of cooperation in post-green revolution durum wheat cultivars
Michel COLOMBO

11:20 – 11:40  Chromatin regulation of and by gene islands in plants
Louis-Valentin METEIGNIER

11:40 – 12:00  Identification of genes and metabolites controlling plant-plant interaction
Sophie JASINKSI

12:00 – 12:20  Molecular bases of plant-plant interactions: identification of the molecular pathways depending on ESC-1, a RLK involved in the competitive response in Arabidopsis thaliana
Marie INVERNIZZI

12:20 – 12:30  Fabrice Roux
Q&A

12:30 – 13:00  Closing Plenary
variant in the first exon at 9539129 bp of chromosome 1 that resulted in the conversion of a lysine to glutamic acid, indicating that this gene might regulate flesh color changes at the protein level. These findings not only prove the importance of a phytoene synthase gene in pigmentation but also explain an important reason for the color change of watermelon flesh.

0206-C
ASSESSMENT OF RETAMA GENETIC DIVERSITY USING ISSR, REP, AND ITS-RFLP AND PHYLOGENY

Kaoutar KADDOURI1*; Mustapha MISSBAH EL IDRISSI 1

1 Centre de Biotechnologies végétales et microobiennes, Biodiversité et Environnement, Faculty of Sciences, Mohammed V University in Rabat, 4 Avenue Ibn Battouta, Agdal, Rabat, Morocco *kaoutarkaddouri2017@gmail.com

In this work, we assessed the genetic diversity among and within species of Retama, using ISSR and rep markers, and ITS phylogeny. Hence, a total of 48 and 18 bands were scored respectively for ISSR and rep, of which 83.33% and 88.89% were polymorphic. The polymorphic information content values were 0.70 with ISSR and 0.78 with the rep. The combined data AMOVA revealed lower variations among (25%) than within (75%) Retama species. The ITS sequences analysis revealed that R. dasycarpa has 99.83%, 99.01%, and 95.53% similarities with R. monosperma, R. raetam, and R. sphaerocarpa respectively. Retama raetam has 98.84, and 95.20 similarities with R. monosperma and R. sphaerocarpa. The ITS sequences phylogeny confirmed the close relatedness between R. monosperma and R. dasycarpa which were regrouped in the same cluster related to R. raetam. The principal coordinate analysis (PCoA) and the cluster analysis assembled the different samples into three groups.

0207-A
PATTERNS OF GENETIC AND METABOLIC VARIATIONS OF NEPETA NUDA L. IN THE CENTRAL BALKANS

Branislav ŠILER*; Luka PETROVIC 1; Tijana BANJANAC 1; Tamara LUKIC 1; Dragana MATEKALO 1; Marijana SKORIC 1; Uros GASIC 1; Jasmine NESTOROVIC ZIVKOVIC 1; Slavica DMITROVIC 1; Milutinovic MILICA 1; Neda ANICIC 1; Jelena BOZUNOVIC 1; Biljana FILIPOVIC 1; Milos TODOROVIC 1; Danijela MISIC 1

1 Institute for Biological Research "Siniša Stanković“ – National Institute of the Republic of Serbia, University of Belgrade, Bulevar despot Stefan 142, 11000 Belgrade, Serbia *branislav.siler@ibiss.bg.ac.rs

Numerous species belonging to the genus Nepeta are appreciated producers of various phenolic and iridoid compounds that have tremendously vast applicative value in pharmacology and agriculture but are also highly esteemed as chemotaxonomical markers. Nepeta nuda is a widespread Eurasian species, found in forest edges and clearings. We have collected leaf samples from 12 populations across the central Balkan Peninsula and investigated their genetic and phytochemical variations. We used 3 genomic and 7
transcriptome-derived microsatellite markers and revealed relatively low variation within the populations. Both qualitative metabolite profiling of methanol extracts (Q-TOFF LC/MS) and essential oils (GC/MS) analysis pointed out to high inter- and intra-population variations, especially regarding the content of iridoids. A UHPLC-QQQ-MS/MS approach targeted towards quantification of the most abundant iridoids and phenolics was highly efficient in the diversification of N. nuda populations.

0208-B
HIGH-RESOLUTION MAPPING OF FRUIT AND LEAF METABOLISM USING THE TWO NEWLY DEVELOPED S. PENNELLII BILS POPULATIONS

Esra KARAKAS*; Shai TORGEMAN 1; Dani ZAMIR 1; Alisdaire FERNIE 1; Saleh ALSEEKH 1

1 Hebrew University of Jerusalem, Robert H Smith Institute Pant Sciences & Genetics in Agriculture
*karakas@mpimp-golm.mpg.de

Exotic germplasm represents an important source for the expansion of the allelic diversity in inbred crop species. Here we aim to dissect the primary, secondary, and lipid metabolism using two newly developed tomato BILs populations by Zamir’s lab. The two BILs populations are of unprecedented size and created from a cross between a newly discovered self-compatible accessions of tomato species S. pennellii (5240) and two divergent modern cultivated inbred lines (S. lycopersicum cv. LEA and TOP). Fruit and leaf materials from over 3000 BILs were harvested and subjected to comprehensive metabolite profiling using both GC-MS and LC-MS analysis. QTL results indicated that the mapping resolution is extremely high, with several novel QTL mapped to a single candidate gene. To understand the molecular mechanisms of some of the novel loci, putative candidate genes were selected for further biological validation through CRISPR-Cas9, overexpression, and/or virus-induced gene silencing (VIGS).

0209-C
GENETIC BASIS OF FLOWER SIZE PLASTICITY IN ARABIDOPSIS THALIANA

Roosa LAITINEN*; Andrew WISZNIEWSKI 1; Estefania UBEREGUI; Gregory ANDREOU 2; Kimmo KIVIVIRTA 2

1 Max Planck Institute of Molecular Plant Physiology; 2 University of Helsinki
*Roosa.Laitinen@Helsinki.fi

Plasticity, the ability of an organism to adjust its' phenotype in different environments, provides a way for rapid adaptation. Nevertheless, genes controlling plasticity are still largely unknown. We have investigated the impact of temperature on flower size. Flower size has a central role in the reproductive strategy and therefore fitness of the plant. We grew 290 Arabidopsis thaliana accessions at 17 °C and 23 °C and quantified them for flower size plasticity. While on average, flowers were smaller at 23 °C, some accessions had larger flowers at the higher temperature. Using GWA analysis and candidate gene characterization, we showed that the MAF2-5 gene cluster underlies the temperature-mediated flower size