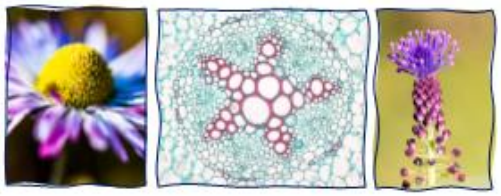
ITALIAN BOTANICAL SOCIETY WORKING GROUPS
CELLULAR AND MOLECULAR BIOLOGY &
BIOTECHNOLOGIES AND DIFFERENTIATION

FROM PLANT MORPHOLOGY TO SUSTAINABILITY

INTERNATIONAL MEETING



JUNE 11-13, 2025
BARI

SALA «A. LEOGRANDE», CENTRO
POLIFUNZIONALE STUDENTI,
PIAZZA C. BATTISTI, 1

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Contributions marked with ◥ are considered for the selection of two papers that will be published free of charge in Plant Biosystems

JUNE 11th

12:00-14:00 Registration

(14:00-16:30) Session 1 - NEW PERSPECTIVES IN PLANT BIOLOGY

Chair: Mario De Tullio

Understanding chloroplast gene expression for rational engineering of plastid genomes and biotechnological applications
LOIACONO, F.V. **Invited Speaker, Charles University, Prague**

Inducible expression of trichome-associated transcription factors in *Cannabis sativa* suspension cultures
ARMELLIN, M., *Corazza, F., Bellan, A., Dal Monte, R., Carpi, A., Trainotti, L.*

Auxin response factors in reproductive development: a comparative study of OsARF1 and its orthologs AtARF11/AtARF18
NARDI, C., *Spanò, M., Camperio, A., Vignati, E., Greco, E., Bruno, L., Di Marzo, M., Colombo, L.*

Pollen-mediated control of ovule development in *Ginkgo biloba*: insights into auxin regulation and epigenetic mechanisms
TALARICO, E., *Greco, E., Camoli, M., Guarasci, F., Araniti, F., Muto, A., Di Marzo, M., Offer, E., Moschin, S., Chiappetta, A., Baldan, B., Colombo, L., Bruno, L.*

Unravelling reproductive mechanisms in *Ginkgo biloba*: from male cone development to pollen-ovule cross-talk ◥
OFFER, E., *Moschin, S., Talarico, E., Colombo L., Bruno, L., Baldan, B.*

Plant responses to vibrational and acoustic stimuli: biochemical and molecular responses in Arabidopsis
PLACÌ, R., *Albano, A., Renna, L., Schioppa, E., Salerno, G., Masi, E., Spagnolo, B., Marsella, G., Viscardi, M., Rizzi, F., Nicassio, F., Maffezzoli, A., Scarselli, G., Tufariello, M., Lenucci, M. S.*

New insights into tomato P4H3 function: a key regulator of plant architecture, fruit development, and seed resilience ◥
LOPERFIDO, D., *Mizzotti, C., Zumajo-Cardona, C., Araniti, F., Panagiotis, K., Ezquer, I.*

CrAT-seq: a novel reduced representation sequencing technique targeting protein-coding regions in plant genomes
Deglialberti M., Abbruscato, P., Ravasi, G., Silvestri A., Mucciarelli M., Lanfranco L., Adamo M., ***CHIALVA M.***

The endoplasmic reticulum quality control of glycoproteins is involved in cadmium stress perception and response in *Arabidopsis thaliana* through the brassinosteroid signaling pathway
DE BENEDICTIS, M., *Gallo, A. & Santino, A.*

16:10-16:30 COFFEE BREAK

(16:30-19:00) Session 2 - BIOACTIVE COMPOUNDS

Chair: Lorenzo Ferroni

Selection of plant species with anti-inflammatory and/or antimicrobial properties and *in vitro* callus production
FRISONE, L., *Tassoni, A., Ferri, M.*

Marine diatom extract as sustainable tools for enhancing plant resistance against fungal pathogens
BELLINI, E., *Savio, S., Lorrai, R., De Santis, S., Frezza, C., Sciubba, F., Patriarca, A., Capobianco, G., Serranti, S., Congestri, R., Ferrari, S.*

Optimized extraction of bioactive compounds from brazilian green *Coffea arabica* L. beans using conventional methods and natural deep eutectic solvents
Benati, G., ***PETTAZZONI, I.***, *Navarini, L., Ferri, M., Tassoni, A.*

Exploring the function of rice florigenic proteins during inflorescence development
BONO, G. A., *Giaume, F., Mineri, L., Mirone, F., Betti, C., Brambilla, V., Fornara, F.*

Sorghum bicolor subsp. *bicolor* as a source of bioactive compounds with a cholesterol lowering effect: first data on its lipid-derived extracts
CARONNI, S., *Sabatini, F., Lonati, E., La Ferla, B., Palestini, P., Bulbarelli, A., Russo, C., Lange, H., Citterio, S.*

Evaluation of phytotoxicity of essential oils derived from by-products of aromatic and medicinal plants
MALASPINA, P., *Polito, F.,* *De Feo, V., Cornara, L.*

Engineering biocompatible nanosystems to improve delivery of plant biostimulants
GUARNERI, G., *Magnabosco, P., Marcato, S., Calliku, I., Di Vizio, B., Lupinelli, S., Agnoli, S., Baldan, B., Carletti, P., Navazio, L.*

The chemical composition and biological activity of *Nigella sativa*
DENTATO, M., *Postiglione, A., Badalamenti, N., Bruno, M., Basile, A., Maresca, V.,*

In depth metabolomic characterization of autochthonous legume landraces from Apennine Italian regions
RENELLA, A., *Falcione, M., Boutet, S., Corso, M., Sferra, G. Scippa, G.S., & Trupiano, D.*

Sustainable production of betanin-rich extracts from *Beta vulgaris* leaves in SETIS® Bioreactor
BAROZZI, F. *Placì, R., Capaci, P., Lenucci, M.S., Ciccarella, G., Di Sansebastiano, G.P.*

June 12th

(8:45-11:00) Session 3 - DEVELOPMENT AND DIFFERENTIATION

Chair: Lorella Navazio

Functional characterization of the AUXIN RESPONSE FACTOR 11/MONOPTEROS (OsARF11/MP) in *Oryza sativa* during reproductive phase
SPANÒ M., *Di Marzo M., Disbudak C., Vignati, E., Nicolai, N.A., Kater, M., Greco, E., Bruno, L., Colombo, L.*

Peptide hormones in fruit development: insights from tomato
FRANCESE, C., *Boschin, M., Armellin, M., Pavanello, A., Salvagnin, U., Trainotti, L.*

New insights into the role of CLE peptides in fruit ripening
BOSCHIN, M., *Francese, C., Armellin, M., Pavanello, A., Bellan, A., Trainotti, L.*

Plant sensitivity to inorganic arsenic exposure: a comparison between two rice (*Oryza sativa* L.) genotypes, Carnaroli and Zhonghua 11
LANNI, F., *Piacentini, D., Giorgione, R., Astolfi, M.L., Altamura, M.M., Falasca, G., Fattorini, L.*

Sorghum bicolor salt-sensitive genotype grown in saline soil benefitted the eBL seed-priming treatment
PEDUZZI A., *Piacentini D., Speranza E., Della Rovere F., Iozia, L.M., Varone, L., Altamura, M.M., Falasca, G.*

GERAS a regulator of Arabidopsis silique senescence
DRAGISIC, M.S., *Bacchetta, M., Braida, C., Rotasperti, L., Mizzotti, C., Masiero,S.*

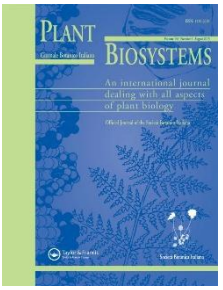
Regulatory roles of NAC genes in fruit elongation, senescence, and xylem formation in *Arabidopsis thaliana*
MIZZOTTI C., *Bacchetta M., Dragisic M. S., Braida, C., Cavalleri, A., Rotasperti, L., Colombo, L. Masiero, S.*

Maternal regulation of nutrient availability plays a pivotal role during ovule and seed development in Arabidopsis
Banfi, C., Babolin, N., Astori, C., Mizzotti, C., Gabrieli, F., Vega-Léon, R., Leo, G., Grossniklaus, U., Tucker, M., Araniti, F., Ezquer, I., Muino, J. M., Kauffman, K., ***DI MARZO, M.***, *Colombo, L.*

Unveiling transcriptional networks governing seed coat control of endosperm development in *Arabidopsis thaliana*
GABRIELI, F., *Zumajo-Cardona, C., Cavalleri, A., Albertini, E., Ezquer, I., Colombo, L.*

HEATSTOP: Understanding the impact of heat stress on pollen-pistil communication in crops
RUGGIRELLO, F., *Suanno, C., Del Duca, S.*

Communication from the Editor-in-Chief of PLANT BIOSYSTEMS – An Official Journal of the Italian Botanical Society **Prof. LUIGI SANITÀ DI TOPPI**



11:00-11:30 COFFEE BREAK

(11:30-12:45) Session 4 - STRESS RESPONSES AND ENVIRONMENTAL BIOTECHNOLOGIES (I)

Chair: Franca Tommasi

Plant responses to micro- and nanoplastic contamination under short- and long-term exposure: a case study on *Ocimum basilicum* L.
DI GENNARO, G., *Ceccanti, C., Spanò, C., Bottega, S., Lauria, G., D'Asaro, L., Giorgetti, L., Landi, M., Ruffini Castiglione, M.*

Populus alba (white poplar) thiol-peptide compounds allow intracellular and extracellular cadmium detoxification
VITELLI, V., *Bellini, E., Sorce, C., Saba, A., Andreucci, A., Sanità di Toppi, L.*

Response to heat stress of different microalgae
CARROZZO, S., *De Pascali, M., Negro, C., De Bellis, L., Basset, A., Canini, A., Lenucci M.S., Piro, G., De Caroli, M.*

Targeting gene expression and culture conditions to enhance Fucoxanthin production in *Thalassiosira rotula*
MADEO, M.L., *Orefice, I., Ferrari, M., Greca, T., Bruno, L., Romano, G., Cozza, R.*

The microalga *Neochloris oleoabundans* for the re-use of fruit by-products
Demaria, S., Pancaldi, S., Sorbolev, A., Scioli, G., Di Prodi, K., ***BALDISSEROTTO, C.***

Enhancing *Emiliania huxleyi* growth with recycled calcium from oyster shells
GIACÒ, P., *Baldisserotto, C., Chenet, T., Pasti, L. & Pancaldi, S.*

12:45-13:15 PHOTO CONTEST AWARDS CEREMONY

13:15-14:30 LUNCH

(14:30-18:00) Session 5 - THE HIDDEN HALF

Chair: Mattia Terzaghi

Root meristem organization is associated with an auxin-related determination of redox status
Jiang, K., ***FELDMAN, L.*** **Invited Speaker, University of California, Berkeley**

Some Responses of the maize root to mechanical stress
Potocka, I., Śróbka, J., Karczewski, J., ***SZYMANOWSKA-PUŁKA, J.*** **Invited Speaker, University of Silesia, Katowice**

Vascular Cambium: The key to lifelong adaptability in woody plant roots
CHIATANTE, D., *Montagnoli, A., Terzaghi, M., Trupiano, D., Scippa, G.S.* **Invited Speaker, University of Insubria**

16:00-16:30 COFFEE BREAK

The role of the *DEEPER ROOTING 1 (DRO1)* gene family in tomato (*Solanum lycopersicum* L.) organ development and response to drought stress
GRECO, E., *Talarico, E., Kouhen, M., Manicone, F., Sofo, A., Chiappetta, A.A., Trupiano, D., Bruno, L.*

SlDRO1 as a candidate regulator of root adaptation under drought stress in tomato
KOUHEN, M.*, Greco, E., Manicone, F., Bruno, L., Sofo, A., Trupiano, D.*

A symbiotic MLO gene regulates root development via RALF-triggered Ca2+ signalling in *Lotus japonicus*
BINCI, F.*, Guarneri, G., Somoza, S.C., Capparotto, A., Vascon, F., Cendron, L, Navazio, L., Giovannetti, M.*

New insight into the role of microRNAs on wheat (*Triticum aestivum* L.) seminal root development
TONIELLI, G.*, D'Agostino, A., Di Marco, G., Pepe, G., Teofani, A., Pontecorvi, C., Helmer Citterich, M., Canini, A., Gismondi, A.*

A novel dual-compartment hydroponic system for investigating inter-plant root signaling responses to water stress
LASORELLA, C*., Pazienza, G., Cardinale, D., Perrella, G. Sofo, A., De Tullio, M., Terzaghi, M.*

Effect of an urbanisation gradient on the root microbiota of *Celtis australis*
MASSON, S., *Chialva, M., Votta, C., Ferratini, C., Polidori, N., Tagliaferri, E., Biino, U., Lanfranco L.*

Brassinosteroids and jasmonates counteract arsenic stress in Arabidopsis thaliana differently modulating root system plasticity
DELLA ROVERE, F. *Fernando Malimage, S.A, D'Angeli, S., Peduzzi, A., Piacentini, D., Altamura, M.M, Falasca, G.*

18:00 ADMINISTRATIVE MEETING OF THE WORKING GROUPS "CELLULAR AND MOLECULAR BIOLOGY" – BIOTECHNOLOGIES AND DIFFERENTIATION" OF THE ITALIAN BOTANICAL SOCIETY

20,00 SOCIAL DINNER Restaurant "Polvere di Stelle", Grande Albergo delle Nazioni, Lungomare Nazario Sauro, 7

JUNE 13th

(8:45-11:00) Session 6 - STRESS RESPONSES AND ENVIRONMENTAL BIOTECHNOLOGIES (II)

Chair: Francesco Guarino

An emerging approach on plant-microbe interaction under abiotic stress conditions
GILLINI, A., *Zuzolo, D., Tartaglia, M., Prigioniero, A., Guarino, C., Trupiano, D.*

Bio-activated biochar for recovering degraded soils: response of forest and agri-food species
PAZIENZA, G., *Lasorella, C., Piccolo P., Guarino F., Terzaghi M.*

Aquatic moss as new multipurpose live biomass: from biofiltration to bioproduction
DI SANSEBASTIANO, G.P., *Anglana, C., Letizia, F., Del Piano, I., Barozzi, F.*

Monitoring microbial communities in urban soils: insights into biodiversity and antibiotic resistance between bulk soil and plant rhizosphere
GENTILE, A., *Di Stasio, L., Oliva, G., Piccolo, P., Tangredi, D.N., Guarino, F., Cicatelli, A., Vigliotta, G., Castiglione, S.*

Adaptive responses of *Triticum dicoccoides* and *Triticum durum* to natural CO_2 enrichment: a leaf anatomical and physiological perspective
CINTI E., *Carli A., Haworth M., Cerri M., Centritto M., Onofri A., Atzori G., Zuluaga D., Reale L.*

Modifications of traits of the Ni hyperaccumulator *Odontarrhena chalcidica* in relation to different plant provenience and cultivation regimes
MONTANARINI, B., *Salinitro, M., Randi, M.R., Cavalletti, D., Monari, S., Echevarria, G., Tassoni, A.*

Agrivoltaics as a sustainable strategy to enhance food security under water scarcity
SEMERARO, T., *Scarano, A., Curci, M.L., Calisi, A., Lenucci, M.S., Santino, A., Basset, A., De Caroli, M.*

Evaluation of gadolinium effects on *Solanum lycopersicum* L. cultivated in a hydroponic system
GIULIANO, F., *Petta, G.,Terzaghi, M.,Castiglione, S., Cicatelli, A.*

Developmental dynamics of *Arbutus unedo* L. flower: morphological and molecular evidence
D'AGOSTINO, A., *Di Marco, G., Canini, A., & Gismondi, A.*

Sulfur metabolism and chromium tolerance in *Scenedesmus acutus*: the role of OAS-TL and Cysteine Desulfhydrase activities
MOLINARI G., *Marieschi M., Ferrari M., Torelli A.*

11:00-11:30 COFFEE BREAK

(11:30-14:00) Session 7 – SYMBIOSES, INTERACTIONS AND BIODIVERSITY

Chair: Marcello Salvatore Lenucci

Influence of endophytic fungi isolated from mint on the growth of tomato seedlings
DOVANA, F., *MUCCIARELLI, M.*

Plants and bacteria interaction in the soil: analysis of the emitted volatile compounds
RUSSO, C., *Rizzi, C., Termopoli, V., Sabatini, F., Caronni, S., Lange, H., Citterio, S.*

Specificity of elementomic profiles and photosynthetic efficiency in two red chicory (*Cichorium intybus* L.) cultivars in a coastal environment
MARTINA, A., *Marrocchino, E., Ballestriero, M., Mattia, N., Ferroni, L.*

Assessment of genetic and morphological diversity in *Tilia* spp. inside the Campus of the University of Salerno (Italy)
TANGREDI, D. N., *Giuliano, F., Cicatelli, A., Castiglione, S.*

Bioprospecting the Italian flora for the discovery of new bioactive phytochemicals and the exploration of chemodiversity in different plant clades
NEGRI, S., *Bisson, L., Pietrolucci, F., Zorzi, G., Commisso, M., Dusi, V., Avesani, L., Guzzo, F.*

Engineering of *Synechocystis* sp. PCC 6803 and *Synechococcus* sp. PCC 7002 for the photocatalytic production of hydrogen
FERRARI, M., *Marieschi, M., Ceresini, D., Molinari, G., Milan, L., Bolchi, A., Spagnoli, G., Torelli, A.*

A nature-based tool to design vegetation barriers along road infrastructure to contain anthropogenic atmospheric particulate matter: characterization of leaf functional traits
POSTIGLIONE, A.

Biochar and compost amendments reshape the rhizosphere microbiome in a mature olive orchard
PICCOLO, P., *Guarino, F., Cicatelli, A., Terzaghi, M., Castiglione, S.*

Metabolomics, melatonin regulation, and microbial interactions in lettuce under phosphate stress
VENCO, A., *Capparotto, A., Ciampanelli, A., Sudiro, C., Vuolo, F., Giovannetti, M., Commisso, M.*

Light-drive modulation of antioxidant systems and growth in lentil seedlings under red and blue LEDs
BOTTIGLIONE, B., *Villani, A., De Leonardis, S., Paciolla, C.*

14:00 AWARD CEREMONY - APC WAIVERS FOR THE PUBLICATION OF TWO PAPERS IN **PLANT BIOSYSTEMS**

Closing of the Meeting

The Role of the *DEEPER ROOTING 1* (*DRO1*) Gene Family in Tomato (*Solanum lycopersicum* L.) Organ Development and Response to Drought Stress

[1]***Greco, E.,** [1]Talarico, E., [2]Kouhen, M., [3]Manicone, F., [3]Sofo, A., [1]Chiappetta, A.A., [2]Trupiano, D., [1]Bruno, L.

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[3] Dipartimento di Scienze Agrarie, Forestali, Alimentari e Ambientali, Università della Basilicata, Via dell'Ateneo Lucano, 85100 Potenza, Italia.

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Drought stress is a major abiotic stress that significantly limits plant growth and development. Although plants activate various defense mechanisms, severe drought often exceeds their capacity to adapt [1]. The root system is the primary organ to perceive the water stress and, consequently, to modify its architecture in order to ensure the survival of the plant. In particular, the root growth angle has been shown to play a critical role in drought avoidance, influencing the plant's capacity for water uptake. The ability of roots to shape their growth angle is regulated by the *DRO1* gene family, which belongs to the IGT protein family [2]. Recent studies on *Oryza sativa* have shown that increased expression of the *DRO1* gene enhances root growth angle, improving the plant's ability to tolerate water stress [3]. In addition, overexpression of *DRO1* gene in *Arabidopsis* and in *Prunus domestica* led to deeper-rooting phenotypes [4]. In this context, the aim of this work was to functionally characterize the *DRO1* gene family in *Solanum lycopersicum* (L.), a globally important crop, and understand their involvement under water stress conditions. For this porpouse, a gene expression analysis was first performed in all tomato organs during different stage of plant development, and *in situ* hybridization was conducted on root and stem. Subsequently, the *SlDRO1* gene expression profile was analyzed in plants exposed to three different water stress condition for 10 days. The obtained results showed a distinct spatial-temporal expression profile of the *SlDRO1* gene in all tomato organs. In addition, the *SlDRO1* cyto-histological domains were confined throughout the meristematic zone, in the rhizodermis and in the vascular tissues within the root differentiation zone. In the same way, the *SlDRO1* transcripts were detected in the vascular tissue of the stem. Concerning *SlDRO1* gene expression under drought stress, our findings revealed an overall upregulation of *SlDRO1* across all plant organs, with a pronounced increase observed under conditions of extreme water stress. In conclusion, our findings reveal a distinct expression profile and spatial distribution pattern of the *SlDRO1* gene, supporting the hypothesis of its site-specific involvement in plant development and functional regulation. In addition, the upregulation of the *SlDRO1* gene in plants subjected to water stress suggests a possible involvement of this gene in the response *pathways* to drought stress.

References

[1] Sato *et al.,* The Plant Journal (2024) 117, 6;
[2] Waite and Dardick. Current Opinion in Plant Biology (2021) 59:101983;
[3] Uga *et al.,* Nature Genetics (2013) 45(9):1097-102;
[4] Guseman *et al.,* The Plant Journal (2017) 89, 1093–1105.