

Plant Metals Conference and MC Meeting

Proceedings Book

Trace metal metabolism in plants
COST Action 19116

ANKARA , TURKEY





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Trace metal metabolism in plants

COST Action 19116

30 AUGUST - 2 SEPTEMBER 2022

Location: Biological Sciences Building, METU

PROCEEDINGS BOOK

ISBN: 978-625-00-9037-4

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30 AUGUST - 2 SEPTEMBER 2022

Location: Biological Sciences Building, METU

Location: Culture & Convention Center, METU

30th August

15.00-17.30: Registration

18.30-23.00: Welcome dinner

31st August

09.00-18.45: Lectures with coffee breaks and one lunch break
free evening

1st September

09.00-12.30 Poster session and talks

12.30-14.30 Lunch break

14.30-18.00 Lecture and MC meetings

19.00-22.00 Gala dinner

2nd September

09.00-12.30 Work group planning

12.30-13.00 Concluding remarks

DETAILED PROGRAMME

30th August, 2022 (Tuesday)	
15:00 – 17:30	Registration (@Biology Department*)
18:30 – 23:00	Welcome Dinner (@Zeytin Restaurant**)
31st August, 2022 (Wednesday)	
09:00 – 09:40	Opening ceremony (Speakers: Local organizer (Seckin Eroglu), COST action chair Hendrik Kuepper)
09:40 – 10:10	WG1 Lecture: Nathalie Verbruggen, Contrasting metal accumulation in <i>Arabidopsis halleri</i> populations
10:10 – 10:40	Break (Mounting posters @ Atrium) (Coffee+cookies)
10:40 – 12:25	WG1 selected talks
10:40 – 10:55	Célestine Belleoil, Root transport mechanisms involved in metal hyperaccumulation in <i>Noccaea caerulea</i>
10:55 – 11:10	Deon Mandebere, Iron determines seed germination speed by weakening endosperm through ROS
11:10 – 11:25	Feixue Liao, Regulation of the zinc deficiency response in the legume model <i>Medicago truncatula</i>
11:25 – 11:40	Short break
11:40 – 11:55	Amir Maqbool, Transcriptomics insights of IDC-tolerant soybean varieties under high pH indicates a sub-family of amino acid transporters are linked to iron homeostasis in plants
11:55 – 12:10	Matthias Wiggerhauser, Stable isotope fractionation: a tool to identify major processes that separate cadmium from zinc in plants?
12:10 – 12:25	Santiago Alejandro Martinez, Characterization of metal tolerance proteins in <i>Beta vulgaris</i> reveals diversity of micronutrient homeostasis mechanisms in dicotyledons
12:25 – 12:35	Group photo
12:35 – 14:15	Lunch break
14:15 – 14:45	WG2 Lecture: Marie Theres Hauser, Does peptide mediated cell wall signaling detect metal ions?
14:45 – 15:00	Short break
15:00 – 16:45	WG3 selected talks
15:00 – 15:15	Irena Macek, Plants play a crucial role in the development of soil fungal communities in remediated substrate after EDTA washing of metal contaminated soils
15:15 – 15:30	Hendrik Küpper, Trace metals at the frontline of pathogen defence responses in plants
15:30 – 15:45	Giovanni dal Corso, DNA methylation in the hyperaccumulator <i>Noccaea caerulea</i> “Ganges” prevents ROS damages thus increasing Cd hypertolerance
15:45 – 16:00	Short break (Coffee+cookies)
16:00 – 16:15	Florian Delerue, Leaf metal exclusion or accumulation is related to soil resource exploitation strategy in European Calaminarian species: Evidence for a leaf elemental and economic spectrum?
16:15 – 16:30	Michel Mench, Advancing in the application of innovative phytomanagement strategies in contaminated areas of the SUDOE space (the Phy2SUDOE Project)
16:30 – 16:45	Speaker absent/Free slot
16:45 – 17:00	Short break

17:00 – 18:45	WG4 selected talks
17:00 – 17:15	Ephrem Habyarimana, Identification of genetic factors governing grain Fe and Zn contents in sorghum
17:15 – 17:30	Faheem Shehzad Baloch, Genetic and genomic resources for biofortifying the crops grains with few examples
17:30 – 17:45	Hagai Yasuor, Biopolymeric Nano-vehicles for zinc application in plants
17:45 – 18:00	Short break
18:00 – 18:15	Valerie Bert, Characterization of <i>Arabidopsis halleri</i> and <i>Urtica dioica</i> responses to Zn and Cd: Soil management practices to help biofortification?
18:15 – 18:30	Levent Öztürk, Interactive effects of climate change, nitrogen and zinc nutrition on growth and yield performance in wheat

Free evening

1st September, 2022 (Thursday)

09:00 – 09:15	WG5 selected talk
09:00 – 09:15	Seçkin Eroğlu, Iron Localization in Everyday Fruits
09:15 – 09:45	WG5 Lecture: Robert Dulfer, EU Projects - Dissemination, Communication, and Exploitation of Achievements
09:45 – 12:30	Poster session (@ Atrium) (Coffee+cookies)
12:30 – 14:00	Lunch
14:00 – 14:30	WG6 Lecture: Muhammed Imran, Intellectual property rights (IPR): importance for young scientists to learn
14:30 – 15:45	MC meeting Report of activities by the leaders of the Action: chair / STSM coordinator, vice chair / ITC conference grant coordinator, science communications officer, WG leaders incl.
15:45 – 16:00	Short break (Coffee+cookies)
16:00 – 17:30	MC meeting Discussion and decision of goals and budget of the third grant period
17:30 – 19:00	Free time/Unmounting posters
19:00 – 22:00	Gala dinner (@Zeytin Restaurant**)

2nd September, 2022 (Friday)

09:00 – 09:30	WG1 – Metal transport: Activity planning
09:30 – 10:00	WG2 – Metalloproteins: Activity planning
10:00 – 10:30	WG3 – Environment: Activity planning
10:30 – 11:00	Break (Coffee+cookies)
11:00 – 11:30	WG4 – Agronomy: Activity planning
11:30 – 12:00	WG5 – Dissemination: Activity planning
12:00 – 12:30	WG6 – IPP: Activity planning
12:30 – 13:00	Concluding remarks, farewell

*Biology department: <https://goo.gl/maps/pR4jCSxpF6NXbeCKA>

** Zeytin Restaurant: <https://goo.gl/maps/wqRkT8Kqp2otmWjU8>

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RAPD-PCR Based Evaluation of Genotoxic Influence of Metal Stressors in Plant Model Systems

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The presented study was designed to get the possibility to measure the outcome of long term exposition of high concentrations of different metal stressors on DNA damage in plant model systems. We used different plant species as models, like *Taraxacum officinale* L. (Asteraceae), *Matricaria recutita* L. (Asteraceae), *Robinia pseudoacacia* L. (Fabaceae), and *Urtica dioica* L. (Urticaceae). Metal contents (cadmium, lead, copper, nickel, and zinc) in the samples was determined by using ICP-AES technique. DNA damage was investigated by a Random Amplified Polymorphic DNA (RAPD) technique, and RAPD profiles of plants exposed to metal stress and control plants (non-exposed) were compared. Agarose-gel electrophoresis reveal total of 37 bands with molecular weights ranging from 1250 to 5000 bp. Distinctive polymorphism of 72.97% (27 bands) total in all plant species investigated was estimated. The dendrogram constructed using NTSYSpc programme, showed that there is grouping in separate clusters of the same plant model collected from two different areas (metal-exposed and control samples). The number of polymorphic bands observed in samples exposed to metals suggests that long term metal-exposition in high doses can cause mutations on genomic level in investigated model plants. These bands are unique and distinctly differentiated the samples, and can act as markers for evaluation of the environmental metals exposition. Encounter the fact that plants are used as food or in medical purposes, the issue of possible genotoxicity initiated by metal contamination must be concerned.

Keywords: DNA damage, Heavy metals, Plant model, Genotoxicity