

ISF-BIDR Workshop 2015

Surviving the extremes: Abiotic stress tolerance in extremophile plants

February 2-5, 2015

Sede Boqer Campus, Midreshet Ben-Gurion, ISRAEL



PROGRAM

Sunday, February 1

20:30 Welcome dinner for international speakers

Monday, February 2

08:00-09:45 Registration and refreshments

09:45-10:00 Greetings and opening remarks

- Dr. Simon Barak, Mediator
- Prof. Boris Zaltzman, Director, Jacob Blaustein Insts. for Desert Research
- Prof. Sammy Boussiba, Director, French Assoc. Inst. for Agriculture and Biotechnology of Drylands

Plenary Lecture Jill Farrant, University of Cape Town, South Africa
10:00-11:00

A systems biology approach to understanding the mechanisms of vegetative desiccation tolerance

11:00-11:20 Coffee break (sponsored by LemnaTec GmbH and Merkel Technologies Ltd.), KAKAL Building [13]

Session 1 Extremophile *Arabidopsis* relative model systems I
11:20-13:05 Chair: Simon Barak

11:20-11:25 **Elizabeth Weretilnyk**, McMaster University, Canada
In memory of Marilyn Griffith - an extremophile pioneer

11:25-11:50 **Simon Barak**, Ben-Gurion University, Israel
Natural stress tolerance in extremophile relatives of *Arabidopsis thaliana*

11:50-12:15 **Qi Xie**, Chinese Academy of Sciences, China
A mobile C2 domain protein from *Theillungiella salsuginea* enhances salt tolerance

12:15-12:40 **Ute Kraemer**, Ruhr-Universität Bochum, Germany
Metal hyperaccumulation in *Arabidopsis halleri*

12:40-13:05 **Marcus Jansen**, LemnaTec GmbH, Germany
Non-invasive phenotyping technology enables detecting and quantifying responses to abiotic stress

13:05-14:35 Lunch and commercial booths, KAKAL Building [13]

Session 2 Extremophile *Arabidopsis* relative model systems II
14:40-16:20 Chair: Dirk Hincha

14:40-15:05 **Amir Eppel**, Ben-Gurion University, Israel
The unique photochemistry of the annual desert plant *Anastatica hierochuntica*

15:05-15:30 **Ismail Turkan**, Ege University, Turkey
Chloroplastic alternative electron sinks and antioxidant defence of the extremophile *Eutrema parvulum* (*Theillungiella parvula*) under salinity

15:30-15:55 **Yana Kazachkova**, Ben-Gurion University, Israel
Mechanisms of salt-mediated delay in *Theillungiella* (*Eutrema*) *salsuginea* seed germination



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- 15:55-16:20 **Arie Altman**, Hebrew University, Israel
Are extremophile model plants practically relevant? The *Populus euphratica* case: physiological, molecular and practical considerations
- 16:20-18:00 Coffee break, poster session, commercial booths, KAKAL Building [13]
- 18:00 Dinner (French Assoc. Inst for Agriculture and Biotechnology of Drylands Building [25])
- 19:15-19:45 **Paula Kabalo**, Guest speaker, Ben-Gurion University, Israel
One leader and a million Prime Ministers - David Ben-Gurion and the Israeli public: dialogue and debate
- 20:15 Bus 1. To: Beer-Sheva, North (University) Train Station.
Bus 2. To Ramon Inn, Mitzpe Ramon

Tuesday, February 3

09:30-10:30 Tour – Midreshet Ben-Gurion

10:30-10:50 Coffee break, KAKAL Building [13]

Session 3
10:50-13:30 **From the arctic to the desert to the sea....to outer space I**
Chair, Gideon Grafi

- 10:50-11:15 **German Spangenberg**, La Trobe University, Australia
Xenogenomics - Gene discovery and functional genomics in an antarctic extremophile
- 11:15-11:40 **Zvi Peleg**, Hebrew University, Israel
A multipronged approach towards identifying genetic resistance to multiple abiotic stresses in *Brachypodium distachyon*
- 11:40-12:05 **Shimon Rachmilevitch**, Ben-Gurion University, Israel
Tri-party underground symbiosis between a weevil, bacteria and a desert annual plant
- 12:05-12:30 **Yitzchak Gutterman**, Ben-Gurion University, Israel
The importance of epigenetic changes in seeds during seed development and maturation as affected by day length and seed position, on the survival of annuals inhabiting extreme deserts
- 12:30-12:55 **Sergey Shabala**, University of Tasmania, Australia
Coping with extreme salinities: lessons from halophytes
- 12:55-13:30 **Joseph Gale**, Hebrew University, Israel
Could oxygenic photosynthesis and advanced life exist under the extreme conditions of the recently discovered extra-solar system planets”?
- 13:30-14:45 Lunch and commercial booths (KAKAL Building [13])

Session 4
14:50-18:30 **From the arctic to the desert to the sea....to outer space II**
Chair, Dorothea Bartels

- 14:50-15:15 **Philip Mullineaux**, University of Essex, UK
C3 photosynthesis in the desert species *Rhazya stricta* under extremes of heat, high light and low humidity: How does it do it?



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- 15:15-15:40 **Dana Charuvi**, Weizmann Institute, Israel
Photoprotection during dehydration of the resurrection plant *Craterostigma pumilum*
- 15:40-16:05 **Gideon Grafi**, Ben-Gurion University, Israel
Reduced epigenetic constraints in *Zygophyllaceae* species
- 16:05-16:30 **Gidon Winters**, Dead Sea and Arava Science Center, Israel
Effects of a simulated heat wave on photophysiology and gene expression of high- and low-latitude populations of seagrasses (*Zostera marina*)
- 16:30-16:50 Coffee break (sponsored by **Tivan-Biotech**), (KAKAL Building [13])
- 16:50-17:15 **Assylay Kurmanbayeva**, Ben-Gurion University, Israel
Sulfate metabolism in *Salicornia* and *Sarcocornia*
- 17:15-17:40 **Lital Davidi**, Weizman Institute of Science, Israel
Origin and composition of two types of lipid globules in *Dunaliella bardawil*
- 17:40-18:05 **Oded Beja**, Technion, Israel
Viral photosynthesis
- 18:05-18:30 **Nir Keren**, Hebrew University, Israel
An easily reversible structural change underlies the protection mechanism enabling a desert crust cyanobacterium to survive desiccation
- 18:30-20:20 Dinner and jazz band, French Assoc. Inst for Agriculture and Biotechnology of Drylands Building [25]
- 20:30 Bus 1. To: Beer-Sheva, North (University) Train Station.
Bus 2. To Ramon Inn, Mitzpe Ramon

Wednesday, February 4

- 08:30 Sightseeing excursion – Dead Sea/Masada
- 18:30 Banquet dinner

Thursday, February 5

- | Session 5 | Exploring "ExtremOmes" |
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| 09:30-13:10 | Chair, Elizabeth Weretilnyk |
| 09:30-09:55 | Maheshi Dassanayake , Louisiana State University, USA
Niche adaptations of plants: Insights from extremophile genomics |
| 09:55-10:20 | Gil Eshel , Ben-Gurion University, Israel
The <i>Anastatica hierochuntica</i> transcriptome – a preliminary overview |
| 10:20-10:45 | Dorothea Bartels , University of Bonn, Germany
Comparative transcriptomics to identify key features of desiccation tolerance in resurrection plants |



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- 10:45-11:10 **Mel Oliver**, USDA-ARS-MWA-PGRU, University of Missouri, USA
Combining phylogenetic comparisons with “omics” to uncover adaptive aspects of the response to desiccation in the resurrection grass *Sporobolus stapfianus*
- 11:10-11:30 Coffee break (sponsored by **We Prove Solutions**), KAKAL Building [13]
- 11:30-11:55 **David Toubiana**, Ben-Gurion University, Israel
Correlation-based network analysis to decipher the seasonal rhythm-associated metabolic changes in *Schismus arabicus*
- 11:55-12:20 **Dirk Hincha**, Max Planck Institute, Germany
Natural variation in salt and freezing tolerance of *Arabidopsis* and *Thellungiella*
- 12:20-12:45 **Elizabeth Weretilnyk**, McMaster University, Canada
An extreme lifestyle-for plants revealed through transcriptomes of *Eutrema salsugineum*
- 12:45-13:10 **Mark Humble**, We Prove Solutions, Netherlands
NextGen digital phenotyping: fresh approaches for exploring plant stress responses
- 13:10-14:20 Lunch and commercial booths (KAKAL Building [13])
- Session 6**
14:25-17:00 **Exploiting extremophile plants for agriculture**
Chair: **Maheshi Dassanayake**
- 14:25-14:50 **John Cheeseman**, University of Illinois, USA
Exploiting plants from extreme environments: a race against population growth and climate changes
- 14:50-15:15 **Aviah Zilberstein**, Tel Aviv University, Israel
Towards harnessing evolutionary biodiversity of Tamarix (salt cedar) to generate desert forests as a source for renewable energy
- 15:15-15:40 **Sammy Boussiba**, Ben-Gurion University, Israel
Unbalanced growth conditions regulate the production of secondary metabolites in microalgae
- 15:40-16:00 Coffee break (sponsored by **Agrisera Antibodies**), KAKAL Building [13]
- 16:00-16:25 **Menachem Moshelion**, Hebrew University, Israel
Risk-taking plants: Anisohydric behavior as a stress-resilience trait
- 16:25-16:50 **Rivki Ofir**, Dead Sea and Arava Science Center, Israel
Desert plants as a source of compounds with anti-cancer activity
- 16:50-17:00 Closing remarks
- 17:30 Bus to Beer-Sheva North (University) Train Station and the to Tel Aviv (Savidor) Train Station and Hotels.



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