# Shimon Rachmilevitch January 2019

# CURRICULUM VITAE

• Personal details

Name: Shimon Rachmilevitch

Date and place of birth: June 19th 1970, New York, USA

Address: Albert Katz Department of Dryland Biotechnologies, Blaustein Institutes for Desert Research, Ben Gurion University of the Negev, Sede Boqer Campus 84990 Israel

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• Education

B.Sc. - 1993-1996, Hebrew University of Jerusalem, Biology.

M.Sc. - 1997-1998, Hebrew University of Jerusalem, Plant Sciences.

Name of advisor: Prof. Joe Gale.

Title of thesis: Effects of the K/T boundary atmosphere on C3 and C4 plants.

Ph.D. - 1999-2003, Hebrew University of Jerusalem, Plant Sciences.

Name of advisor: Prof. Joe Gale.

Title of thesis: Acclimation of plants to stress: Implications for respiration, photosynthesis and stress.

• Employment History

2014-present: Associate Professor

2017-2018: Visiting Associate Professor within the College of Agriculture and Life Sciences at Cornell University.

 2012: Tenured, The Jacob Blaustein Institute for Desert Research, Ben-Gurion University of the Negev.

2011-2014: Senior Lecturer, The Jacob Blaustein Institute for Desert Research, Ben-Gurion University of the Negev.

2007-2011: Lecturer, The Jacob Blaustein Institute for Desert Research, Ben-Gurion University of the Negev.

2008: Visiting Professor, Harvard University.

2006-2007: Visiting Scientist, Department of Organismic and Evolutionary Biology, Harvard University.

2004-2006: Visiting Scientist, Department of Plant Biology & Pathology, Rutgers State University of New Jersey.

2003-2004: Post-Doc Research Associate, Department of Vegetable Crops, UC Davis.

1997-2002: Teaching assistant, Hebrew University of Jerusalem: Introduction to Plant Sciences, Israel’s vegetation, Plant Anatomy of desert plants.

• Professional Activities

1. Positions in academic administration (Departmental, Faculty and University)

2016-present: Director of center of knowledge – The root zone, a leverage for modern agriculture.

2015-2017: Director of the French Associates Institute for Agriculture and Biotechnology of Drylands.

2013-2015: Head of Teaching committee - French Associates Institute for Agriculture and Biotechnology of Drylands, Albert Katz International School, Ben-Gurion University of the Negev.

2013- 2015: Organizer and head of four week international course for Chinese and Indian students, sponsored by the Israeli Council for Higher Education.

2009-2012: Teaching committee - French Associates Institute for Agriculture and Biotechnology of Drylands, Albert Katz International School, Ben-Gurion University of the Negev.

1. Professional functions outside Universities/Institutions

2007–present: Israeli Plant Science Society Council.

2012-2016: STREESS COST, Representative of Israel.

2015-present: Chair of the Israeli Plant Science Society.

1. Editor

Ecophysiological Aspects of the Rhizosphere, Special issue editor in Frontiers in Plant Science (2013).

Plants Coping with Abiotic and Biotic Stresses: A Tale of Diligent Management, Special issue editor in BioMed Research International (2014).

1. Ad-hoc reviewer for journals

2005-present: Scientific manuscript reviewer for: Physilogia Plantarum, Plant Cell and Environment, Photosynthetica, Plos One, Frontiers in Plant Science, Annals of Botany, Water, Nature Communications, Plant and Soil.

1. Membership in professional/scientific societies

2002-present: American Society of Plant Biologists.

2005-present: Crop Science Society of America.

2009-present: Israel Society for Plant Biology.

• Educational activities

(a) Courses taught

1. Plant ecophysiology and Stress indicators: Methods, instrumintation and research.
2. Carbon metabolism in plants.
3. Institutes noon- Window to the research at the Institutes for Desert Research (organizer 2008/9).
4. Climate change, convergence of disciplines – concentrated course (summer 2010 and 2012).
5. Guided reading-plant ecophysiology.
6. Student seminar.
7. Summer course for students from China and India: Plant Soil Atmosphere Continuum in respect to agriculture in arid regions.

(b) Research students

2008-2009: Eitan Amiel, M.Sc student.

2009-2011: Avital Yosef, M.Sc student.

2009-2011: Amber Hill, M.Sc student.

2011-2013: Jiangsan Zhao, M.Sc. student.

2009-2013: Amir Eppel, Ph.D student.

2009-2013: Oren Shelef, Ph.D student.

2009-2015: Uri Hochberg, M.Sc and Ph.D. student.

2013- 2015: Brian Hoefgen, M.Sc. student.

2014- 2016: Chunping Miao, M.Sc. student (in collaboration with Prof. Jonathan Ephrath).

2014- 2016: Hila Gil, M.Sc. student (in collaboration with Dr. Gilboa Arye).

2011-2017: Sivan Isaacson, Ph.D student (in collaboration with Prof's. Jonathan Ephrath and Dan Blumberg).

2011-2016: Tal Rapaport, Ph.D. student (in collaboration with Prof. Arnon Karnieli).

2012-2018: Amber Hill, Ph.D. student.

2013-2018: Moti Shomron, Ph.D. student.

2013-2018: Itay Hacohen, Ph.D. student.

2013- 2017: Amonon Cochavi, Ph.D. student (in collaboration with Prof's. Jonathan Ephrath and Hanan Eizenberg).

2014-2018: Moses Kwame Aidoo, Ph.D student (in collaboration with Dr. Naftali Lazarovitch and Prof. Aaron Fait).

 2014-2016: Mengqi Zhang, M.Sc. student (in collaboration with Dr. Phyllis Weintraub).

2014-2016: Asal Kattel, M.Sc. student student (in collaboration with Prof. Jonathan Ephrath)

 2014-2018: Jhon Okoth, Ph.D student (in collaboration with Dr. Naftali Lazarovitch and Dr. Uri Yermiyahu).

2015-2017: Shachar Pinkovitch M.Sc. student (in collaboration with Prof. Arnon Karnieli).

 2016-2018: Yoav Shavit M.Sc. student (in collaboration with Prof. Arnon Karnieli).

 2016-present: Nitsan Bar-Shmuel M.Sc. student (in collaboration with Dr. Michal Segoli).

 2017-present: Naomi Waldman Shmuel M.Sc. student (in collaboration with Prof. Naftali Lazarovitch).

 2018-present: Sophie Obersteiner M.Sc. student.

 2018-present: Petar Jovanovic Ph.D. student (in collaboration with Dr. Ran Erel ARO).

 2018-present: Wen Lingling Ph.D. student (in collaboration with Prof. Aaron Fait).

 2019-present: Yaniv Lupo Ph.D. student.

 2019-present: Aviad Perri (in collaboration with Dr. Uri Hochberg).

(c) Vistors and Post Docs

2008: Dr. Ina Meier, Post-Doctoral scholar (in collaboration with Prof. Jonathan Ephrath).

 2009-2012: Dr. Boris Rewald, Post-Doctoral fellow (in collaboration with Prof. Jonathan Ephrath).

2010: Prof. Michlle Holbrook (Harvad University).

 2011-2012: Dr. Volkan Oral, Post-Doctoral fellow (in collaboration with Prof. Jonathan Ephrath).

2012-2013: Dr. Sikander Pal, Post-Doctoral fellow.

2014-2017: Dr. Inga Dirks, Post-Doctoral fellow.

2015-2016: Dr. Reut Berger-Tal, Post-Doctoral fellow.

2016-2018: Dr. Michal Meir, Post-Doctoral fellow.

2016-2018: Dr. Daniela Jerszurk, Post-Doctoral fellow (in collaboration with Prof. Naftali Lazarovitch).

2017-2018: Prof. Juliana Lichston, visitig Prof. on sabattical.

2018-present: Dr. Timur Yergaliyev Post-Doctoral fellow (in collaboration with Dr. Amir Szitenberg).

2019-present: Dr. Natali DeFalco Post-Doctoral fellow.

• Awards, Citations, Honors, Fellowships

(a) Honors, Citation Awards

1997-2002:Teaching Assistant scholarship, Hebrew University of Jerusalem.

1999: The Alexandra Poljakof-Meiber excellence award.

2000-2002: The Hebrew University of Jerusalem traveling fellowship.

2005: Peter Selmer Loft Memorial Scholarship.

 2009-2014: Incumbent Sonnenfeldt-Goldman Career Development Chair for Desert Research.

2012: Toronto award for excellence in research.

 (b) Fellowships

2003-2004: BARD Post Doctoral fellowship

• Scientific Publications

H index: 22 in ISI; 27 in google scholar

Total number of citations: 1602 in ISI; 2617 in google scholar

Total number of citations (without self-citations): 1457 in ISI

1. Book chapters
2. [Lieman-Hurwitz](http://www.springerlink.com/content/?Author=Judy+Lieman-Hurwitz) JT,  [Asipov](http://www.springerlink.com/content/?Author=Leonid+Asipov) LC, [Rachmilevitch](http://www.springerlink.com/content/?Author=Shimon+Rachmilevitch) SS, [Marcus](http://www.springerlink.com/content/?Author=Yehouda+Marcus) YC, and [Kaplan](http://www.springerlink.com/content/?Author=Aaron+Kaplan) API (2005) Expression of cyanobacterial ictB in higher plants enhanced photosynthesis and growth. *In* Plant responses to air pollution and global change. Springer, New York, USA.
3. Rachmilevitch SPD, DaCosta MS, and Huang BPI (2006) Physiological and Biochemical Indicators for Stress Tolerance, *in* Plant environment interactions. Editor Bingru Huang. CRC Press, New York, USA.
4. Rewald BPD, Eppel AS, Shelef OS, Hill AS, Degu AS, Friedjung AS and Rachmilevitch SPI (2011) Life at the dry edge – Plants adaptations to hot deserts, *in* Life at extremes: Environments, organisms and strategies for survival, Editor Elanor M. Bell. CAB International, UK.
5. Rewald BPD, Shelef OS, Ephrath JEPI and Rachmilevitch SPI (2013) Adaptive plasticity of salt-stressed root systems. *In* Ecophysiology and responses of plants under salt stress, Editors Ahmad, P., Azooz, M.M. & Prasad, M.N.V. Springer, New York, USA.
6. Refereed articles and refereed letters in scientific journals (Ranking according to ISI)
7. Rachmilevitch SS, Reuveni JC, Pearcy RWC and Gale JPI (1999) A high level of oxygen, as occurred toward the end of the Cretaceous period, increases leaf diffusion conductance. *Journal of Experimental Botany* 50 (335): 869-872.

(IF. 5.83; JR 14/212, Plant Sciences; Citations 5, Q1).

1. Gale JPI, Rachmilevitch SS, Reuveni JC and Volokita MC (2001) The high oxygen atmosphere toward the end-Cretaceous; a possible contributing factor to the K/T boundary extinctions and to the emergence of C4 species. *Journal of Experimental Botany* 52 (357): 801-809.

(IF. 5.83; JR 14/212, Plant Sciences; Citations 6, Q1).

1. Mittler RPI, Merquiol ES, Hallak-Herr ES, Rachmilevitch SS, Kaplan AC and Cohen MT (2001) Living under a “dormant” canopy: a molecular acclimation mechanism of the desert plant *Retama raetam*. *Plant Journal* 25 (4): 407-416.

(IF. 5.468; JR 13/209, Plant Sciences; Citations 92, Q1).

1. Rizhsky LS, Hallak-Herr ES, Van Breusegem FC, Rachmilevitch SS, Barr JEC, Rodermel SC, Inze DC and Mittler RPI (2002) Double antisense plants lacking ascorbate peroxidase and catalase are less sensitive to oxidative stress than single antisense plants lacking ascorbate peroxidase or catalase. *Plant Journal* 32 (3): 329-342.

(IF. 5.468; JR 13/209, Plant Sciences; Citations 206, Q1).

1. Merquiol ES, Pneuli LS, Cohen MT, Simovitch MS, Rachmilevitch SS, Goloubinoff PC, Kaplan AC and Mittler RPI (2002) Seasonal and diurnal variations in gene expression in the desert legume Retama raetam. *Plant Cell and Environment* 25 (12): 1627-1638.

(IF. 6.169; JR 10/209, Plant Sciences; Citations 13, Q1).

1. Angert AS, Rachmilevitch SS, Barkan ET and Luz BPI (2003) Effects of photorespiration, the cytochrome pathway, and the alternative pathway on the triple isotopic composition of atmospheric O2. *Global Biogeochemical cycles* 17 (1): 1030-1044.

(IF. 4.495; JR 11/184 Geoscienses; Citations 57, Q1).

1. Lieman-Hurwitz JT, Rachmilevitch SPD, Mittler RC, Marcus YC and Kaplan API (2003) Enhanced photosynthesis and growth of transgenic *Arabidopsis* and tobacco plants that express a gene involved in HCO3- accumulation in cyanobacteria. *Plant Biotechnology* *Journal* 1: 43-50.

(IF. 6.09; JR 11/209, Plant Sciences; Citations 56, Q1).

1. Rachmilevitch SPD, Cousins ABPD and Bloom AJPI (2004) Nitrate assimilation in plant shoots depends on photorespiration. *Proc. Natl. Acad. Sci. USA* 101 (31): 11506-11510.

(IF. 9.423; JR 4/63, Multidisciplinary Sciences; Citations 153, Q1).

1. Levy MPD, Rachmilevitch SPD and Abel SPI (2005) Transient Agrobacterium-mediated gene expression in the *Arabidopsis* hydroponics root system for subcellular localization studies. *Plant Molecular Biology Reporter* 3 (2): 1-6.

(IF. 1.932; JR 70/212, Plant Sciences; Citations 7, Q2).

1. Govrin EMS, Rachmilevitch SS, Tiwari BSPD, Solomon MT and Levine API (2006) An elicitor from *Botrytis cinerea* Induces the hypersensitive response in *Arabidopsis thaliana* and other plants and promotes the gray mold disease. *Phytopathology* 96 (3): 299-307.

(IF. 2.896; JR 43/212, Plant Sciences; Citations 62, Q1).

1. Rachmilevitch SPD, Lambers HC and Huang BPI (2006) Root respiratory characteristics associated with pant adaptation to high soil temperature for geothermal and turf-type *Agrostis* species. *Journal of Experimental Botany* 57 (3): 623-631.

(IF. 5.83; JR 14/212, Plant Sciences; Citations 42, Q1).

1. Rachmilevitch SPD, Huang BPI and Lambers HPI (2006) Assimilation and allocation of carbon and nitrogen of thermal and non-thermal *Agrostis* species in response to high soil temperature. *New Phytologist* 70 (3): 479-490.

(IF. 7.33; JR 9/212, Plant Sciences; Citations 36, Q1).

# Rachmilevitch SPD, Xu YS, Gonzalez-Meler MAC, Huang BPI and Lambers HC (2007) Cytochrome and alternative pathway activity in roots of thermal and non-thermal *Agrostis* species in response to high soil temperature. *Physiologia Plantarum* 129: 163-174.

# (IF 3.33 JR 32/212, Plant Sciences; Citations 31, Q1).

1. Rachmilevitch SPD, Lambers HC and Huang BPI (2008) Short-term and long-term root respiratory acclimation to elevated temperatures associated with root thermotolerance for two *Agrostis* grass species. *Journal of Experimental Botany* 59 (14): 3803-3809.

(IF. 5.83; JR 14/212, Plant Sciences; Citations 16, Q1)

## TencerYC, Idan GC, StromMC, Nusinow UC, BanetDC, CohenEC, Schröder PC, Shelef OS, Rachmilevitch SC, Soares IC, Gross AC and Golan-Goldhirsh API (2009) Establishment of a constructed wetland in extreme dryland. [Environmental Science and Pollution Research](http://www.springerlink.com/content/112851/?p=32288df80c5c4b82bd8a4a5cd0cf4136&pi=0). 16 (7): 862-875.

## (IF 2.741; JR 79/229 Environmental Sciences; Citations 10, Q2).

## Damari-Weissler HS, Rachamilevitch SC, Aloni RC, GermanMAC, Cohen SC, Zwieniecki MAC, Holbrook NMC and Granot DPI (2009) LeFRK2 is required for phloem and xylem differentiation and the transport of both sugar and water. Planta 230 (4): 795-805.

## (IF 3.361 JR 30/212, Plant Sciences; Citations 25, Q1).

1. Shelef OS, Lazarovitch NC, Rewald BPD, Golan-Goldhirsh AC and Rachmilevitch SPI (2010) Root halotropism? salinity effects on Bassia indica Roots. *Plant Biosystems* 144 (2): 471-478.

(IF 1.39 JR 102/212, Plant Sciences; Citations 18, Q2).

## Gendler TT, Gutterman YPI and Rachmilevitch SPI (2010) Survival of Schismus arabicus seedlings exposed to desiccation depends on annual periodicity. Planta 231: 1475-1482.

## (IF 3.361 JR 30/212, Plant Sciences; Citations 6, Q1).

1. Rewald BPD, Rachmilevitch SPI and Ephrath, YPI (2011) Salt stress effects on root systems of two mature olive cultivars. *Acta Horticoltura*e 888: 109-128.

(Appears in ISI without IF; Citations 4).

1. Rewald BPD, Ephrath YPI and Rachmilevitch SPI (2011) A root is a root is a root? Water uptake rates of root orders. *Plant Cell and Environment* 34: 33-42.

(IF. 6.173; JR 12/212, Plant Sciences; Citations 54, Q1).

1. **Rewald B**PD**,** Rachmilevitch SC, McCue MDPD and Ephrath, J.E. PI (2011) Influence of saline drip-irrigation on fine root and sap-flow densities of two mature olive varieties. *Environmental and Experimental Botany*: 72: 107–114.

(IF. 4.369; JR 18/212, Plant Sciences; Citations 16, Q1).

## Shelef OS, Golan-Goldhirsh AC and Rachmilevitch SPI (2012) Physiological parameters of plants as indicators of water quality in a constructed wetland. [Environmental Science and Pollution Research](http://www.springerlink.com/content/112851/?p=32288df80c5c4b82bd8a4a5cd0cf4136&pi=0) 18:1234–1242.

## (IF 2.741; JR 79/229, Environmental Sciences; Citations 8, Q2).

1. Bloom AJPI, Rubio JSPD, Randeall LT, Rachmilevitch SC, Cousins ABC and Carlisle EAPD (2012) CO2 enrichment inhibits shoot nitrate assimilation in C3 but not C4 plants and slows growth under nitrate in C3 plants. *Ecology* 93(2):355-67.

(IF 4.809; JR 20/153, Ecology; Citations 53, Q1).

1. Huang BPI, Rachmilevitch SC and Jichen XuS (2012) Root carbon and protein metabolism associated with heat tolerance. *Journal of Experimental Botany* 63(9):3455-65.

(IF. 5.83; JR 14/212, Plant Sciences; Citations 33, Q1).

1. Rewald BPD, Gendler TT, Raveh EC, Ephrath JEPI and Rachmilevitch SPI (2012) Phenotypic plasticity and salt accumulation among root orders of salt-stressed *Citrus* trees. *Journal of Experimental Botany* 63: 2717-2727.

(IF. 5.83; JR 14/212, Plant Sciences; Citations 26, Q1).

1. RewaldBPD, Meinen CS, Trockenbrodt MC, Ephrath JEC and Rachmilevitch SPI (2012) Root taxa identification in plant mixtures – Current techniques and future challenges. *Plant and Soil* 359: 165-182.

(IF. 3.052; JR 11/83, Agronomy; Citations 24, Q1).

1. Amiel ES, Ofir RC, Dudai NC, Soloway EC, Rabinsky TT and Rachmilevitch SPI (2012) *β – Caryophyllene*, a compound isolated from the biblical balm of Gilead (*Commiphora gileadensis*) is a selective apoptosis inducer for tumor cell lines. *Evidence-based Complementary and Alternative Medicine*, Article ID 872394, 8 pages, doi:10.1155/2012/872394.

(IF. 1.74; JR 10/26, Integrative and Complementary Medicine; Citations 29, Q2).

1. Shelef OS, Gross AC and Rachmilevitch SPI (2012) The use of Bassia indica for salt phytoremediation in constructed wetlands. *Water Research* 46(13): 3967-3976.

(IF. 6.942; JR 1/88, Water Resources; Citations 38, Q1).

1. Hochberg US, Degu AS, Fait API and Rachmilevitch SPI (2012) Near isohydric grapevine cultivar displays higher photosynthetic efficiency and photorespiration rates under drought stress as compared with near anisohydric grapevine cultivar. *Physiologia Plantarum* 147: 443–452.

 (IF 3.33 JR 32/212, Plant Sciences; Citations 38, Q1).

1. Eppel AS, Keren NC, Salomon ES, Volis SC and Rachmilevitch SPI (2013) The response of *Hordeum spontaneum* desert ecotype to drought and excessive light intensity is characterized by induction of O2 dependent photochemical activity and anthocyanin accumulation. *Plant Science* 201: 74-80.

 (IF 3.437 JR 28/212, Plant Sciences; Citations 5, Q1).

1. Pongrac PPD, Vogel-Mikuš KC, Regvar MC, Kaligarič MC, Vavpetič PV, Kelemen M, Grlj NC, Shelef OS, Rachmilevitch SC and Pelicon PPI (2013) On the distribution and evaluation of Na, Mg and Cl in leaves of selected halophytes. *Nuclear Instruments and Methods in Physics Research Section B, Beam Interactions with materials and Atoms* 306: 144–149.

(IF 1.109 JR 18/33, Nuclear Science & Technology; Citations 3, Q3).

1. Shelef OS, Gross AC and Rachmilevitch SPI (2013) Role of plants in a constructed wetland: current and new perspectives. *Water* 5(2):405-419.

(IF 1.832 JR 34/88, Water Resources; Citations 47, Q2).

1. Meier ICPD, AngertAC, Falik OC, Shelef OS and Rachmilevitch SPI (2013) Increased root oxygen uptake in pea plants discriminating against non-self neighbors. *Planta* 238: 577-586.

(IF 3.361 JR 30/212, Plant Sciences, Citations 10, Q1).

1. Hill AS, Rewald BPD and Rachmilevitch SPI (2013) Belowground dynamics in two olive varieties as affected by saline irrigation. *Scientia Horticulturae* 162: 313-319.

(IF 1.624 JR 8/36, Horticulture, Citations 4, Q1).

1. Shelef OS, Helman YC, Behar APD, Friedman AC and Rachmilevitch SPI (2013) Tri-Party Underground Symbiosis between a Weevil, Bacteria and a Desert Plant. *PLOS One* 8(11) e76588.

(IF 2.806 JR 15/64, Mutidisciplinary Sciences, Citations 6, Q1).

1. Yosef-Friedjung AS, Choudhary SPPD, Dudai NC and Rachmilevitch SPI (2013) Physiological conjunction of allelochemicals and desert plants *PLOS One*. 8)12) e81580.

(IF 2.806 JR 15/64, Mutidisciplinary Sciences, Citations 6, Q1).

1. Hochberg US, Degu AS, Toubiana DS, Gendler TT, Nikoloski ZC, Rachmilevitch SC and Fait API (2013) Metabolite profiling and network analysis reveals coordinated changes in grapevine water stress response. *BMC Plant Biology* 13(1): 184-189.

(IF 3.964 JR 23/212, Plant Sciences, Citations 62, Q1).

1. Rewald BPI, Godbold DLPI, Falik OPI and Rachmilevitch SPI (2014) Root and rhizosphere processes-high time to dig deeper. *Front. Plant Sci.* doi: 10.3389/fpls.2014.00278. (editorial).

(IF 4.291; JR 20/212, Plant Sciences, Citations 1, Q1).

1. Eppel AS, Shaked RT, Eshel GS, Barak SC and Rachmilevitch SPI (2014) Low induction of non-photochemical quenching and high photochemical efficiency in the annual desert plant *Anastatica hierochuntica*. *Physiologia Plantarum* 151(4) 544-558.

(IF 3.33 JR 32/212, Plant Sciences; Citations 6, Q1).

1. Rapaport tS, Hochberg US, RachmilevitchSPI, Karnieli API (2014) The Effect of Differential Growth Rates across Plants on Spectral Predictions of Physiological Parameters. *PLOS One* 9(2)e88930.

(IF 2.806 JR 15/64, Mutidisciplinary Sciences; Citations 11, Q1).

1. \*Freedman AS, Gross AC , Shelef OS, Rachmilevitch SC, and Arnon SPI (2014)

Salt uptake and evapotranspiration under arid conditions in horizontal subsurface flow constructed wetland planted with halophytes. *Ecological Engineering.* 70: 282-286.

(IF: 2.914; Journal ranking; 74/229, Environmental Sciences; Citations 15, Q2).

1. \*Degu AS, Hochberg US, Sikron N T, Venturini LC, Buson GC, Ghan RC, Plaschkes IC, Batushansky AS, Chalifa-Caspi V C, Mattivi F C, Delledonne M C, Pezzotti M C, Rachmilevitch SC, Cramer GRC and Fait API (2014) [Metabolite and transcript profiling of berry skin during fruit development elucidates differential regulation between Cabernet Sauvignon and Shiraz cultivars at branching points in the polyphenol pathway](http://www.biomedcentral.com/1471-2229/14/188). BMC Plant Biology **14**: 188.

(IF 3.964 JR 23/212, Plant Sciences; Citations 42, Q1).

1. \*Hochberg US, Degu AS, Gendler T T Fait API and Rachmilevitch SPI (2015) The variability in the xylem architecture of grapevine petiole and its contribution to hydraulic differences. *Functional Plant Biology* 42(4): 357-365.

(IF: 2.121, Journal ranking; 64/212, Plant Sciences; Citations 8, Q2).

1. \*Hochberg US, Degu AS, Cramer GC, Rachmilevitch SC and Fait API (2015) Cultivar specific metabolic changes in Shiraz and Cabernet Sauvignon in relation to deficit irrigation and hydraulic behavior. *Plant. Physiol. Biochem* 88: 42-52.

(IF: 2.724, Journal ranking; 49/212, Plant Sciences; Citations 20, Q1).

1. \*Hill AS, Shelef OT, Dawson TC and Rachmilevitch SPI (2015) The Role of Dew for Negev Desert Plants. *Oecologia* 178(2) 317-327. (Highlighted student paper).

(IF: 3.13, Journal ranking; 41/153, Ecology; Citations 18, Q2).

1. \*[Rouached H](http://apps.webofknowledge.com/OneClickSearch.do?product=UA&search_mode=OneClickSearch&excludeEventConfig=ExcludeIfFromFullRecPage&SID=V1rx2GE2uCfD8cDxyVy&field=AU&value=Rouached%2C+Hatem)C, [Sikander](http://apps.webofknowledge.com/OneClickSearch.do?product=UA&search_mode=OneClickSearch&excludeEventConfig=ExcludeIfFromFullRecPage&SID=V1rx2GE2uCfD8cDxyVy&field=AU&value=Pal%2C+Sikander) PC, [Rachmilevitch SC,](http://apps.webofknowledge.com/OneClickSearch.do?product=UA&search_mode=OneClickSearch&excludeEventConfig=ExcludeIfFromFullRecPage&SID=V1rx2GE2uCfD8cDxyVy&field=AU&value=Rachmilevitch%2C+Shimon) [Libault M](http://apps.webofknowledge.com/OneClickSearch.do?product=UA&search_mode=OneClickSearch&excludeEventConfig=ExcludeIfFromFullRecPage&SID=V1rx2GE2uCfD8cDxyVy&field=AU&value=Libault%2C+Marc)C and [Lam-Son P](http://apps.webofknowledge.com/OneClickSearch.do?product=UA&search_mode=OneClickSearch&excludeEventConfig=ExcludeIfFromFullRecPage&SID=V1rx2GE2uCfD8cDxyVy&field=AU&value=Tran%2C+Lam-Son+Phan)PI (2015) Plants coping abiotic and biotic stresses: a tale of diligent management. *BioMed research international* doi: 10.1155/2015/754754. (editorial).

(IF: 2.476, Journal ranking; 67/160, Biotechnology and applied microbiology; Citations 4, Q2).

1. \*Rubio-Asensio JSPD Rachmilevitch SC and Bloom AJPI (2015) Responses of Arabidopsis and wheat to rising CO2 depend on nitrogen source and nighttime CO2 levels. *Plant Physiology* 168(1) 156-163.

(IF: 6.456, Journal ranking; 11/212, Plant Sciences; Citations 21, Q1).

1. \*Rachmilevitch SC, Cohen IS and Huang BPI (2015) Carbon Allocation Patterns into Proteins and Lipids Associated with Superior Tolerance of Perennial Grass to High Soil Temperature. *Crop Science* 55 (5), 2262-2269.

(IF: 1.629, Journal ranking; 24/83, Agronomy; Citations 2, Q2).

1. \*Rapaport TS, Hochberg US, Karnieli API and Rachmilevitch SPI (2015) Combining leaf physiology, hyperspectral imaging and partial least squares-regression (PLS-R) for grapevine water status assessment. *ISPRS Journal of Photogrammetry and Remote Sensing* 109, 88-97.
(IF. 6.387; JR 1/29, Remote Sensing; Citations 21, Q1).
2. \*Hochberg US, Batushansky AS, Degu AS, Rachmilevitch SPI and Fait API (2015) Metabolic and physiological responses of Shiraz and Cabernet Sauvignon
(Vitis vinifera L.) to elevated temperatures. *International Journal of Molecular Sciences* 16 (10), 24276-24294.

(IF. 3.226; JR 54/166, Chemistry; Citations 12, Q2).

1. \*Yehoshua SBC, Rachmilevitch SPI, Amiel ES, Ofir RC, Dudai NC and Soloway EC (2015) Revival if the extinct balm of gilead in Israel: studying its anti-cancer activity. *Acta Horticulturae* 1088 509-514.

(Appears in ISI without IF; Citations 0)

1. \*Shelef OC, Stavi IC, Zduril PC and Rachmilevitch SPI (2016) Land-use change, a case study from southern Italy: General implications for agricultural-subsidy policies. *Land Degradation & Development* 27(4) 868-870.

(IF: 9.787, Journal ranking; 1/34, Soil Science; Citations 8, Q1).

1. \*Eppel AS and Rachmilevitch SPI (2016) The photosynthetic and photo-protective response of the annual desert plant *Anastatica  hierochuntica* in response to drought. *Photosynthetica* 54 (1) 143-147.

(IF: 1.507, JR: 92/212, Plant Sciences; Citations 1, Q2).

1. \*Shelef OS, Guy OC, Soloway EC, Kam MC, Degen AAC and Rachmilevitch SPI (2016) Domestication of plants for sustainable agriculture in drylands – experience from the Negev desert*. Arid Land Research and Management* 30(2) 209-228.

(IF. 1.015; JR 25/34, Soil Science; Citations 1, Q3).

1. \*Stein OS, Damari-Weissler HS, Secchi FPD, Rachamilevitch SC, German MC, Yeselson YS, Amir RS, Schaffer AS, Holbrook MC, Aloni RC,Zwieniecki MC and Granot DPI (2016) The tomato plastidic fructokinase SlFRK3 plays a role in xylem development. *New Phytologist*. 209 1484-1495.

(IF. 7.33; JR 9/212, Plant Sciences; Citations 10, Q1).

1. \*Shelef OS, Gendler TT, Gutterman YC and Rachmilevitch SPI (2016) Low water availability and salinity effects on seedling viability of Bassia indica compared to B. iranica and B. prostrata (Chenopodiaceae). *Seed Science Research* 26 (1) 77-83.

(IF. 1.842; JR 75/212, Plant Sciences; Citations 2, Q2).

1. \*Dirks IPD, Raviv BS, Shelef OS, Hilll AS, Eppel AS, Aidoo MKS, Hoefgen BS, Rapaport TS, Gil HS, Geta ES, Kochavi AS, Cohen IS and Rachmilevitch SPI (2016) Green roofs - What can we learn from desert plants? *Israel Journal of Ecology & Evolution* 62 (1-2), 58-67.

(IF. 0.727; JR 130/153 Ecology; Citations 4, Q4).

1. \*Hochberb US, Albuquerque CC, Rachmilevitch SPI, Cochard HC, David-Schwartz RC, Brodersen CC, McElrone AC and Windt CWPI (2016) Grapevine petioles are more sensitive to drought induced embolism than stems: evidence from in vivo MRI and microCT observations of hydraulic vulnerability segmentation. *Plant Cell and Environement* 36 1886-1894.

(IF. 6.173; JR 12/212, Plant Sciences; Citations 23, Q1).

1. \*Seidel SHPI, Rachmilevitch SC, Schitze NC and Lazarovitch NC (2016) Modelling the impact of drought and heat stress on common bean with two different photosynthesis model approaches. *Environmental Modelling & Software* 81 111-121. (IF. 4.404; JR 6/105, Computer science, interdisciplinary applications; Citations 6, Q1).
2. \*Aidoo MKS, BdolachES, FaitAPI, Lazarovitch NPI and Rachmilevitch SPI (2016) Tolerance to high soil temperature in foxtail millet (*Setaria italica* L.) is related to shoot and root growth and metabolism. *Plant Physiology and Biochemistry* 106 73-8

|  |
| --- |
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1. \*Shelef OS, Pongrac PPD, Primoz PC, Pelicon PC, Vavpetic PC, Keleman MC, Seifan MC, Rewald BC and Rachmilevitch SPI (2016) Insights into root structure and function of Bassia indica: water redistribution and element dispersion*. Functional Plant Biology* 43(7) 620-631.

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1. \*Pal SPD, Zhao JS, Khan APD, Yadav NPD, Batushansky AS, Barak SC, Rewald BC, Fait API, Lazarovitch NPI, and Rachmilevitch SPI (2016) Paclobutrazol induces tolerance in tomato to deficit irrigation through diversified effects on plant morphology, physiology and metabolism. *Scientific Reports* 6 39321.

(IF. 4.259; JR 10/64, Multidisciplinary Sciences; Citations 8, Q1).

1. \*Eshel GS, Shaked RT, Kazachkova YS, Khan AS, Eppel AS,Cisneros AS, Acuna TT,Gutterman YC, Tel-Zur NC, Rachmilevitch SC,Fait AC and Barak SPI (2017) Anastatica hierochuntica, an Arabidopsis Desert Relative, is Tolerant to Multiple Abiotic Stresses and Exhibits Species-Specific and Common Stress Tolerance Strategies with its Halophytic Relative, Eutrema (Thellungiella) salsugineum. *Frontiers in Plant Science* 7 1992.

(IF 4.291; JR 20/212, Plant Sciences, Citations 7, Q1).

1. \*Hochberg US, Degu AS, Fait API and Rachmilevitch SPI (2017) Grapevines hydraulic diversity- a critical consideration for irrigation management. *Acta Horticulturae* 1150 443-447. Proceeding of the VIII International Symposium on Irrigation of Horticultural Crops.

(Appears in ISI without IF; Citations 0)

1. \*Hochberg US, DeguAS, RachmilevitchSC, CramerGC, FaitAPI (2017) Water deficit on whole plant physiology, molecular processes and grape berry quality. *Acta Horticulturae* 1157 239-254. Proceeding of the IX international symposium on grapevine physiology and biotechnology.

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1. \*Aidoo KS, Sherman TC, Lazarovitch NPI, Fait AP:I and Rachmilevich SPI (2017) A bell pepper cultivar tolerant to chilling enhanced nitrogen allocation and stress-related metabolite accumulation in the roots in response to low root zone temperature. *Physiologia Plantarum* 161(2) 196-210.

(IF 3.33; JR 33/212, Plant Sciences; Citations 3, Q1).

1. \*Cochavi AS, Rapaport TS, Gendler TT,Karnieli AC, Eizenberg HPI, Rachmilevitch SPI and Ephrath JEPI (2017) Recognition of Orobanche cumana below-ground parasitism through physiological and hyper spectral measurements in sunflower (*Helianthus annuus* L.). *Frontiers in Plant Science* 8 909 [doi.org/10.3389/fpls.2017.00909](https://doi.org/10.3389/fpls.2017.00909)

 (IF 4.291; JR 20/212, Plant Sciences, Citations 3, Q1).

1. \*Aidoo KS, Sherman TC, Ephrath JC, Fait API, Rachmilevich SPI and Lazarovitch NPI (2017) Grafting as a method to increase tolerance response of bell pepper to extreme temperatures. *Vadose zone Journal* 17(1) doi:10.2136/vzj2017.01.0006.

(IF 1.73; JR 29/85, Water resources, Citations 3, Q2).

1. \*Rapaport TS, Hochberg US, Cochavi AS, Karnieli API and Rachmilevich SPI (2017) The potential of the spectral ‘water balance index’ (WABI) for crop irrigation scheduling. *New phytologist* 216(3): 741-757.

(IF 7.33; JR 9/212, Plant Sciences, Q1).

1. \*Isaacson Ss, Ephrath JEc, Rachmilevitch SC, Maman SC, Ginat HC and Blumberg DGPI (2017) Long and short term population dynamics of acacia trees via remote sensing and spatial analysis: Case study in the southern Negev Desert. *Remote sensing of environment* 198 95-104.

(IF 6.265; JR 2/29, Remote Sensing; citations 1, Q1).

1. \*Jiangsan Z, Rewald Bc Lazarovitch NPI and Rachmilevitch SPI. (2017) Plasticity of biomass allometry and root traits of two tomato cultivars under deficit irrigation × chemically-induced drought hardening by Paclobutrazol. *Irrigation Science* 35 6 501-514.

(IF 1.822; JR 21/83, Agronomy, Q2).

1. \*Bar-Shmuel Ns, Rogovin Es, Rachmilevitch SCO, Friedman ALCO, Shelef OCO, Hoffman IT, Rosenberg TT, Behar ACO, Shavit RPD, Meng FPD and Segoli MPI (2018) Tripartite symbiosis of plant-weevil-bacteria is a widespread phenomenon in the Negev Desert. *Scientific Reports* 8, Article number: 2420. doi:10.1038/s41598-018-20828-w

(IF: 4.259, Journal ranking; 10/64, Multidisciplinary sciences; Citations 0; Q1).

1. \*Stavi IPI, Rachmilevitch SPI and Yizhaq HPI (2018) Small‐scale Geodiversity Regulates Functioning, Connectivity, and Productivity of Shrubby, Semi‐arid Rangelands. *Land* *Degradation & Development* 29(2): 205–209.

(IF: 9.787, Journal ranking; 1/34, Soil Science, Citations 9, Q1).

1. \*Cochavi As, Ephrath JPI, Eizenberg HPI and Rachmilevitch SPI (2018) Phelipanche aegyptiaca parasitism impairs salinity tolerance in young leaves of tomato. *Physiologia Plantarum* 164:191-2013.

(IF 3.33; JR 32/209, Plant Sciences, Citations 0, Q1).

1. \*Pincovici Ss, Cochavi As, KarnieliAPI, EphrathJC and Rachmilevitch SPI (2018)Source-sink relations of sunflower plants as affected by a parasite modifies carbon allocations and leaf traits. *Plant Science* 271: 100-107.

(IF 3.437; JR 28/212, Plant Sciences, Citations 0, Q1).

1. \*Zhou KS, Jerszurki DPD, Rachmilevitch SPI, Jhonathan EphrathPI (2018) Effects of photoselective netting on root growth and development of young grafted orange trees. *Scientia Horticulturae* 238: 272-280.

(IF 1.624 JR 8/36, Horticulture, Citations 1, Q1).

1. \*Cohen IS, Rapaport TS, Berger-Tal RT and Rachmilevitch SPI (2018) The effects of elevated CO2 and nitrogen nutrition on root dynamics. *Plant Science* 272: 294-300.

(IF 3.437; JR 28/212, Plant Sciences, Citations 0, Q1).

1. \*Stavi IPI, Rachmilevitch SC and Yizhaq HPI (2018) Geodiversity decreases shrub mortality and increases ecosystem tolerance to droughts and climate change. *Earth Surface Processes and Landforms* 43: 2808-2817.

(IF 3.369; JR 22/122, Geosciences, Multidisciplinary, Citations 1, Q1).

1. \*Cohen Is, Rapaport Ts, Chalifa-Caspi VC and Rachmilevitch SPI (2018) Synergistic effects of abiotic stresses in plants: a case study of nitrogen limitation and saturating light intensity in Arabidopsis thaliana. *Physiologia Plantarum* (accepted March 2018)

(IF 3.33; JR 32/212, Plant Sciences, Citations 0, Q1).

1. \*Omondi JOS, Lazarovitch NC, Rachmilevitch SC, Boahen SC, Ntawuruhunga PC, Sokolowski ES, and Yermiyahu UPI (2018) Nutrient use efficiency and harvest index of cassava decline as fertigation solution concentration increases. *Journal of Plant Nutrition and Soil Science* 181(5): 644-654.

(IF 2.163 JR 18/87, Agronomy, Citations 0, Q1).

1. Cochavi AS, Rachmilevitch SPI and Bel GPI (2018) The effect of irrigation regimes on plum (*Prunus cerasifera*) root system development dynamics. *Plant Biosystems* (accepted July 2018).

 (IF 1.39 JR 102/212, Plant Sciences, Citations 0, Q2).

1. \*Aidoo Ms, Sherman Tc, Lazarovitch NPI, Fait API and Rachmilevitch SPI (2019) Physiology and metabolism of grafted bell pepper in response to low root-zone temperature. *Functional Plant Biology* (accepted October 2018).

(IF 2.083 JR 72/212, Plant Sciences, Citations 0, Q2).

1. \*Stavi IPI, Rachmilevitch SPI and Yizhaq HC (2019) Geodiversity effects on soil quality and geo-ecosystem functioning in drylands. *Catena* (accepted January 2019).

(IF 3.256 JR 39/190, Geociences, Citations 0, Q1).

\* Since last promotion

\*\* The function of each author of an article is as follows: Principal InvestigatorPI, studentS, post-doctoral fellowPD, co-researcherC, technician/laboratory assistantT

\*\*\* In publications 16 and 55 Rachmilevitch was originally missplled (Rachamilevitch)

\*\*\*\*Data Sources/Date: Citations, IF & Rank - JCR, 1.1.2019

(c) Scientific reports and technical papers

1. Rachmilevitch S (1999) Plants and Dinosaurs. *National Geographic* (Hebrew edition, the Israeli point).

2. Shelef O, Rachmilevitch S (2014) A plant, a beetle and a bacteria meet. *Galileo* (in Hebrew).

3. Shelef O, Dag A, and Rachmilevitch S (2014) Preservation of olive trees. *Ecology and Environment* (in Hebrew).

• Patents

1. U.S. Patent no. 02720425-IL0200250 entitled "Enhancing inorganic carbon fixation by photosynthetic organisms". Inventors: Kaplan A, Lieman-Hurwitz J, Rachmilevitch S, Mittler R, Bonfil D and Schatz D.
2. U.S. Patent no. 20050108790 entitled “Plants characterized by enhanced growth and methods and nucleic acid constructs”. **Inventors:** Kaplan A, Lieman-Hurwitz J, Asipov L, Schatz D, Mittler R, Rachmilevitch S and Bonfil D.

• Lectures and Presentations at Meetings and Invited Seminars

November 2008: MARD scientific symposium. Oral and poster presentstions (Amman, Jordan).

February 2009: Annual meeting of the Israeli Society of Plant Sciences. Poster presentations (Rechovot, Israel).

March 2009: The Dahlia Greidinger International Symposium. Oral presentation (Haifa, Israel).

March 2009: Faculty of Agriculture, Hebrew University of Jerusalem. Departmental seminar.

June 2009: The Even Ari annual meeting, Institutes for Desert Research, Ben Gurion University of the Negev. Oral presentation.

September 2009: Rootrap, International Symposium on Root Research, " Oral and poster presentstions (Vienna, Austria).

November 2009: Dept. of Plant Sciences, Tel Aviv University, Departmental seminar.

November 2009: Dept. of Plant Sciences, Hebrew University of Jerusalem. Departmental seminar.

November 2009: Dept. of Ecology of Drylands, Institutes for Desert Research, Ben Gurion University of the Negev. Departmental seminar.

April 2010: Dept. of Plant Sciences, Weizman Institute. Departmental seminar.

 August 2010: International Symposium on Woody Roots ". Oral and poster presentstions (Victoria, BC, Canada).

August 2010: Annual meeting of the Ecological Society of America. Poster presentstion. (Pittsburgh, USA).

August 2010: Annual meeting of the American Society of Plant Biology. Poster presentstion. (Montreol, Canada).

September 2010: Annual meeting of the Society for Medicinal Plant and Natural Product Research. Poster presentstion. Yosef-Friedjung A, Rachmilevitch S, Dudai N, [The cultivation of medicinal desert plants](http://apps.isiknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=Q1GFcJ564oFhpk2LnLP&page=1&doc=2&colname=WOS&cacheurlFromRightClick=no). *Planta Medica* 76(12) 1204-1204.

(Berlin Germany).

November 2010: The third International coneference on desrtification, Institutes for Desert Research, Ben Gurion University of the Negev. Oral and poster presentations

December 2010: Dept. Of Earth Sciences, Hebrew University of Jerusalem. Departmental seminar.

October 2011: Annual meeting of the Crop Science Society of America. Oral and poster presetations (San Anotonio, USA).

October 2011: CAREX conference on life in extreme environments. Oral presentation (Dublin, Ireland).

November 2011: OliveBioTeq International conference for olive tree and olive products. Oral presentation (Chania Crete, Greece).

 February 2012: GADASH annual meeting (Rechovot, Israel).

 March 2012: Dept. of Plant sciences, Volcani ARO, Institue seminar.

 March 2012: WWPR2012, International Water Association, Wastewater purification and reuse. Oral presentation (Crete, Greece).

December 2012: Key note speaker at the Alexandra Poljakof-Meiber and Alfred Meier excellence awards ceremony. Hebrew University of Jerusalem.

September 2013: The Even Ari annual meeting, Automated methods for continuous measurements in agriculture and forestry (Sede Boqer, Israel).

October 2013: The Entomological Society of Israel meeting (Oranim, Israel).

October 2013: Dept. of Ecology of Drylands, Institutes for Desert Research, Ben Gurion University of the Negev. Departmental seminar.

April 2013:The 9th International Symposium on Grapevine Physiology and Biotechnology (La Serena, Chile).

May 2014: Dept. of Physics, Institutes for Desert Research, Ben Gurion University of the Negev. Departmental seminar.

 December 2014: Newe Yaar, ARO center, Institue seminar.

 June 2015: Rhizospere 4, Mastricht, Netherlands. Oral and Poster presentations.

November 2015: Agricultural Research Organization, Volcani Center. Departmental seminar.

October 2015: Brazilian Society for Plant sciences, Iguacu, Brazil. Keynote Invited speaker.

December 2015: Tel Aviv University, Department of Plant Sciences, Departmental seminar.

January 2016: Hebrew University, Givaat Ram, Department of Plant Sciences, Departmental seminar.

April 2016: Plant Biology Annual meeting, Austin, Texas.

November 2016: 6th national Biodiesel conference of Brazil, Key note speaker.

May 2017: CropSym – Crop abiotic stress, Hebrew University, Rechovot, Invited speaker.

Oct 2017: BESS- Biogeochmistry and Enviorment and Sustainability, Cornell University, Invited speaker.

Feb 2018: Cornell University, Horticulture section seminar.

Feb 2018: Bighamton University, Biology department seminar.

May 2018: Rutgers University, Invited Speaker.

June 2018: GRC – Salt and stress in Plants, New Hampshire.

January 2019: ARO Volcani center, Stomata meeting in memory of Shmuel moreshet, Invited speaker.

• Research Grants

1. 2007-2010: Studying grasses collected from along the climatic gradient. Pi. EC-FP7 International Reintegration Grant ($100,000).
2. 2010-2012: A multidisciplinary study on grapevines including plant physiology, metabolic profiling, and spectroscopy. Pi (in collaboration with Dr. Aaron Fait and Prof. Arnon Karnieli). Israel Ministry of Agriculture ($130,000).
3. 2010-2012: Detection, characterization and quantifying the physiological damage mechanism of [*Orobanche cumana*](http://www.farmalierganes.com/Otrospdf/publica/Orobanchaceae%20Index.htm#Orobanche_cumana) *Wallr.* and *Phelipanche aegyptiaca (Pers.)*. co-Pi (in Collabtion with Prof. Dan Blumberg and Prof. Jonathan Ephrath) Israel Ministry of Agriculture ($80,000).
4. 2010: The role of Actara as a growth regulator. Pi (in collaboration with Dr. Natali Lazarovitch) Syngenta ($35,000).
5. 2009-2011: Co Pi (in colaboration with Dr. Orna Reizman). The role of the forest gap on recolnaziation of oak seedlings. KKL ($25,000).
6. 2010: New scientist equipement grant. Pi. ISF ($54,000).
7. 2011-2012: Salt phytoremediation. Pi (in collaboration with Dr. Shai Arnon) Koshland Grant ($40,000).
8. 2011: Towards improved Grapes Nutrition and defense. (in collaboration with Dr. Aaron Fait) Jewish Fund for the Future ($25,000).
9. 2010-2012: A multidisciplinary study on grapevines including plant physiology, metabolic profiling, and spectroscopy. Pi (in collaboration with Dr. Aaron Fait and Prof. Arnon Karnieli) Israel Ministry of Agriculture ($130,000).
10. 2010-2014: The role of dew in desert plants. Pi. ISF ($230,000).
11. 2012-2013: The role of root orders in trees. Koshland Grant (in collaboration with Dr. Golan Bell) ($40,000).
12. 2011-2013: The role of pesticides as growth regulators. Pi (in collaboration with Dr. Naftali Lazarovitch and Dr. Aaron Fait) Syngenta ($460,000).
13. 2012-2013: Salt phytoremdeiation with Bassia indica. Pi (in collaboration with Prof. Amit Gross) ICA ($20,000).
14. 2012-2013: Salt Phytoremediation. RCF ($25,000).
15. 2013: ISF Workshop organization grant ($15,000).
16. 2013: Examining the agricultural potential of a novel newly designed aeroponics system. (in collaboration with Dr. Naftali Lazarovitch) Rubanenko fund ($20,0000).
17. 2013-2016: Developing new tools for winevine growth assesment. (in collaboration with and Prof. Arnon Karnieli) Israel Ministry of Agriculture ($160,000).
18. \*2014: Effect of root zone temperatues in bell peppers. (in collaboration with Dr. Naftali Lazarovitch) Syngenta ($150,000).
19. \*2014-2016: The phosphorus nutrition of European beech and Palestine oak under a future warmer and drier climate: experiments and transect studies. (in collaboration with Dr. Ina Meier) Niedersachsen-Israeli Research Cooperation Program. ($335,000).
20. \*2014: Effect of low root zone temperature on plant carbon budget. Evogene ($15,000).
21. \*2014: The effect of root architecture on whole plant tolerance in tomato. Rootility ($15,000).
22. \*2014-2015: Climate change effects on tomato’s roots. Frances and Elias Margolin trust ($40,000).
23. \*2014-2015: Do neighboring plants interfere with stress tolerance ability? Koshalnd fund. ($40,000).
24. \*2015-2016: Tri part symbiosis, Koshland Grant (in collaboration with Dr. Michal Segoli) ($40,000).
25. \*2015-2018: Geodiversity effects on the physiology and viabilty of shrublands in semi arid regions (in collaboration with Dr. Ilan Stavi). ISF. (225,000$).
26. \*2016: A New Tool for Deficit Irrigation (in collaboration with Prof. Arnon Karnieli). ICA (45,000$).
27. \*2016-2018: Center of knowledge – The root zone, a leverage for modern agriculture. Ministries of Economy and Agriculture. (Coordinator of a 25 researchers collaboration). (3,200,000$).
28. \*2018: Abiotic and Biotic interactions in the rhizosphere – three day interantional workshop. ISF (20,000$).
29. \*2018-2020: The fate of Velum im drip irrigated soils. Bayer (PI in collaboration with Gilboa Arye and Zeev Ronen)(385,000 Euro).

\*Since last promotion

• Present Academic Activities

1. The role rootsctocks play in abiotic stress tolearance of vegetable crops.
2. Multidisciplinary study on grapevines including plant physiology, metabolic profiling, and spectroscopy (In collaboration with Dr. Aaron Fait and Prof. Arnon Karnieli).
3. Photochemical acclimation and adaptation mechanisms of desert plants.
4. The role of dew in desert plants.
5. The role of geodiversity of arid and semi-arid vegation biodiversity and tolerance.
* Reserch synopsis and activities

The overall goal of the research in my lab is to explore adaptation and acclimation mechanisms of plants to the desert environment in both natural and agriculture vegetation. Understanding tolerance mechanisms of plants grown in desert environments is invaluable for increasing the genetic pool of tolerant plants for agriculture and for maintaining biodiversity in natural ecosystems. A main focus of the research is the root system. Specifically, my research is to explore the unique tolerance mechanisms of carbon metabolism, photochemistry, hydraulics and anatomy and the interaction between these mechanisms, of both roots and shoots that enable plants to prosper in drylands. The lab takes the advantage of its location in the desert and studies the surrounding natural and agricultural ecosystems. Studies in the lab span from basic (the role of dew, geodiversity, photosynthesis and photoprotection) to applied (root-scion interaction, wine vine acclimation and adaptation) research. Thus, the research material includes different species, from trees such as citrus and oaks to annuals such as barley and millet, local natural species such *as Artemisia siberi, Salsola inermis* and *Anastatica hierochuntica* and agricultural crops such as wine vine, tomato and bell peppers. The specific research projects try to address the main goal as stated above and include:

* 1. Stock and scion relationships under a-biotic stress in vegetables

This research will focus on building a system which will test the durability of the root stock and the optimal stock-scion combination, by using morphological - metabolic – molecular – and physiological tests on grafted crops and adapting them to arid regions. This is a long term project, as a part of which continuous as well as non-continuous experiments will be conducted on the root zones of durable stocks, with supplementation of biological and chemical growth enhancers.

* 1. Physiological and metabolical responses of Cabernet Sauvignon and Shiraz grapevine (*Vitis vinifera*) cultivars to water stress

The research focuses on two cultivars with different hydraulic behavior, Cabernet Sauvignon (near isohydric) and Shiraz (near anisohydric) in an atempt to comprehend the origins and outcomes of the differences in hydraulic behaviour. The cultivars are subjected to different irrigation regimes, and their physiological and metabolomic responses are compared. Water relations, anatomy, photosynthesis (gas exchange and flourometry), and metabolism responses are tested during different experimental conditions. Differences between the cultivars suggest hydraulic conductance and stomatal conductance are the origin of the phenomena and that metabolism of the cultivars depends on hydraulic behaviour. It apears that cultivars of different hydraulic behavior demand specific cultivar-based irrigation regime.

1. Photosynthesis and photo-protection in local annual plants

Light is essential for plant growth, since it provides the energy that drives carbon assimilation through photosynthesis. As a byproduct of this reaction, there is continuously occurring photo-damage to the PSII reaction centers that can lead to photo inhibition. One common and dynamic mechanism of photo-protection is non photochemical quenching (NPQ), which converts energy of light directly into heat.

Two different studies are conducted in order examine photo-protective and photosynthetic response in annual desert plants.

NPQ and photosynthesis are examined in different desert plant species including *Anastatica hierochuntica* (known also as Rose of Jericho). It was found that NPQ in *Anastatica* was very low in comparison to both model and crop plants species, as well as to other desert plants. *Anastatica* plants used relatively high amount of light to drive chemical processes (PSII ETR), carbon assimailtion at relatively high water use efficiencies. The photo protective and photosynthetic response in *Anastatica hierochuntica* plants is unique, and might serve as an adaptation to the short growing period of annual plants in deserts. Similar mechanisms are currently examined in different annual and perininnial desert species.

1. Role of dew in desert plants

Water availability is a major factor influencing plant growth and survival in most terrestrial ecosystems, particularly in arid areas. Dew is a common source of water in many deserts and may constitute over 30% of the total annual water input. The importance of dew in desert environments lies in its reliability as a stable water source throughout the year as compared to the unpredictability of rains. Dew can affect plants in different ways from changing their microenvironment to being a direct water source. Although the accumulation of dew on plants is a common phenomenon, the importance of dew to ecosystems in general and particularly to plants in unclear.

We assess the importance of dew in the water balance of individual indigenous plants growing in dry environments. The research is conducted both in the field and in controlled growth chambers under different water regimes. To determine the fraction of dew directly absorbed by plants, we will use techniques of artificial exclusion (or formation) of dew and stable isotope fractionation analysis. The fact that dew has a significantly different 18/16O ratio than those of rain and soil water will enable us to distinguish between the sources of absorbed water by the plants. The findings of the study will throw light on the importance of absorption of dew to the water relations, physiology and drought tolerance of desert plants. Understanding the importance of dew for plants will have a major impact on ecology, agriculture, and basic physiology.

1. The role of geodiversity of arid and semi-arid vegation biodiversity and tolerance.

 Geodiversity has recently been attracting increasing attention as a measure of diversity for physical components of natural environments. It showed positive relations with biodiversity, as well as with several ecosystem services. Yet, so far, geodiversity studies have focused on relatively large spatial scales, ranging between hillslope, basin, and landform scales. It is proposed that either natural- or anthropogenic-induced, small-scale geodiversity, has a large impact on the functioning of semi-arid rangelands. It is further proposed that greater small-scale geodiversity can increrase the on-site retention of water and soil resources, decreasing the vulnerability of rangelands to droughts and climatic changes. Our research aims to study the role of geodiversity in the tolerance and biodiversity perinnial and annual plants.

* Books and articles to be published

Publications submitted

(a) Grafting tomato (*Solanum lycopersicum*) onto varied rootstock

Improves chill tolerance in chill sensitive tomatoes Itay Cohen, Asal Kattal, Reut Berger Tal , Jhonathan Efrath and Shimon Rachmilevich.

Nitrogen fertilzation and elevated CO2 increase root growth in tomato plants Itay Cohen and Shimon Rachmilevitch.

(b) In preperation

# Root dynamics of two grapevine cultivars grafted onto the same rootstock

Brian Hoefgen, Uri Hochberg, Jhonathan Ephrath and Shimon Rachmilevitch.

Dew and desert plants – how does it work? Amber Hill and Shimon Rachmilevitch.

* Additional activities
1. Reviewer of manuscripts

Plant cell and Environment, Photosyntetica, Physiologia Plantarum, [Environmental Science and Pollution Research](http://www.springerlink.com/content/112851/?p=32288df80c5c4b82bd8a4a5cd0cf4136&pi=0), Plant Breeding, Crop Science, Israeli Journal of Plant Sciences, Planta.

1. Reviewr of research proposals

ISF, BARD, BSF, GIF, Ministry of Agriculture.

1. Reviewer of Ph.D and M.Sc thesis

BGU, HUJI, Technion.

1. Organizer of conferences and meetings
2. Israeli Society of Plant Sciencs, Sede Boqer, Israel (2011).
3. Israeli Society of Plant Sciencs, Bet Dagan, Israel (2013).
4. The Israeli meeting of academic research in wine-vines, Sede Boqer, Israel (2013).
5. The Even Ari annual meeting, Automated methods for contiuous measurements in agriculture and forestry (September 8-11, 2013).
6. Gracious, The Italy Israel wine-vine conference (October 29-31, 2014).
7. Israeli Society of Plant Sciencs, Rechovot, Israel (2015).
8. Israli Society of Plant Sciences, Tel Aviv, Israel (2016).
9. International Society of Root Research, Yearin Hotel, Israel (July 2018)
10. Israeli Society of Plant Sciencs, Sede Boqer, Israel (2019).
11. Organizer of International courses

Organizer and head of an annual four weeks summer course for students from China and India: Plant Soil Atmosphere Continuum in respect to agriculture in arid regions. Sede Boqer, Israel (2013, 2014, 2015).